WHAT IDEONOMY CAN DO

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"A TABLE OF 186 'THINGS IDEONOMY CAN DO'"

1. Heighten aesthetic appreciation.
2. Show how things are alike.
3. Suggest alternatives.
4. Improve analysis of situations.
5. Uncover anomalies.
6. Help answer questions.
7. Structure argument.
8. Explore assumptions.
9. Characterize behavior.
10. Analyze the nature of beliefs.
11. Indicate the consequences of beliefs.
12. Define the canonical possibilities of a thing.
13. Assess capacity.
14. Identify the causes of things.
15. Clarify chains of events.
16. Help characterize the role of chance.
17. Characterize change.
18. Fertilize character.
19. Expand civilization.
20. Show how to classify things.
21. Show how things can be usefully combined.
22. Increase understanding of complexity.
23. Reveal the many concauses of a thing.
24. Analyze conflict.
25. Deepen conscience.
26. Show what is and is not conserved.
27. Uncover content.
28. Identify contradictions.
29. Map the structure of controls.
30. Suggest creations.
31. Augment creativity.
32. Refine criteria.
33. Heighten critical awareness.
34. Take account of cycles.
35. Improve debate.
36. Help one avoid deception.
37. Define concepts.
38. Aid description.
39. Illuminate how a thing develops.
40. Diagrammatize concepts.
41. Reconcile differences.
42. Suggest the fundamental dimensions of things.
43. Define all physical dimensions.
44. Accelerate discoveries.
45. Facilitate discussion.
46. Distinguish things.
47. Maximize diversity.
48. Depict dynamics.
49. Clarify economics.
50. Define effects.
51. Suggest the effects of human nature.
52. Aid engineering.
53. Show how a thing affects its environment.
54. Show how a thing is affected by its environment.
55. Demonstrate equivalences between things.
56. Classify human errors.
57. Aid evaluation.
58. Clarify events.
59. Illuminate evil.
60. Provide examples.
61. Suggest examples.
62. Suggest exceptions to laws.
63. Consider excuses.
64. Suggest experiments.
65. Extend things elsewhere.
66. Point to extreme possibilities.
67. Unearth fallacies.
68. Originate new fields of research.
69. Identify flows.
70. Point to all the forms things can have.
71. Advance the foundations of a subject.
72. Erect frameworks for thought.
73. Enumerate the functions of a thing.
74. Foster wisdom about the future.
75. Generalize notions.
76. Suggest goals.
77. Show paths to goals.
78. Clarify good.
79. Help treat the hardest things.
80. Describe hierarchies.
81. Unveil higher realities.
82. Help one think about the history of a thing.
83. Expand horizons.
84. Develop an idea.
85. Advance ideals.
86. Dramatize ideas and facts.
87. Reduce ignorance.
88. Pierce illusions.
89. Discipline imagination.
90. Help one know what is important.
91. Help describe the individuality of a thing.
92. Improve industrial goods.
93. Point to infinities.
94. Help extract maximum information from a single datum.
95. Propose innovations.
96. Accentuate intelligence.
97. Enable one to plot the successive interactions of two things.
98. Show the interdependences of ideas.
99. Suggest new interests.
100. Multiply inventions.
101. Invert things.
102. Give one greater access to existing knowledge.
103. Help bring the totality of human knowledge into play in the treatment of a single thing.
104. Improve the use of human knowledge.
105. Advance language.
106. Identify laws.
107. Aid learning. (5.117)
108. Reveal the limitations of things.
109. Enhance logical rigor.
110. Aid mastery of a subject.
111. Stimulate the advance of pure and applied mathematics.
112. Enhance meaning.
113. Improve the use and understanding of metaphor.
114. Develop methodologies.
115. Help model things.
116. Lessen mortmain or the stifling effect of habit, tradition, and orthodoxy.
117. Identify needs.
118. Depict networks.
119. Suggest higher niveaux.
120. Treat obscurity and ambiguity.
121. Help circumvent obstacles.
122. Bring to light important omissions and neglects.
123. Help explore and exploit the Omniverse.
124. Suggest opportunities.
125. Point to the ways in which opposites meet and merge.
126. Reveal underlying order.
127. Explicate origin.
128. Exploit paradoxes.
129. Clarify pathology.
130. Help one discern patterns.
131. Aid perception.
132. Perfect things.
133. Show how to see things from all perspectives.
134. Improve the planning of research.
135. Show a thing's potential.
136. Rationalize practices.
137. Predict things.
138. Curtail prejudices.
139. Enable preparation.
140. Describe the present.
141. Help one formulate principles.
142. Improve the characterization of probabilities.
143. Explain processes.
144. Aid proof and disproof.
145. Help quantify anything and everything.
146. Show what questions should be asked about something.
147. Describe range and distribution
148. Help study reactions.
149. Catalyze reform.
150. Aid research into new regimes.
151. Reveal relationships between seemingly unrelated things.
152. Coordinate diverse research.
153. Create new research tools.
154. Discover new resources.
155. Supply Rosetta stones.
156. Give insight into rules.
157. Construct scenarios.
158. Discourage trivial scholarship.
159. Make science even more scientific.
160. Increase security.
161. Enable self-criticism.
162. Explicate sequences and series.
163. Find shortcuts and simplifications.
164. Train new skills.
165. Enrich speculation.
166. Find stories in everything.
167. Improve strategy.
168. Lessen stupidity.
169. Foresee surprises.
170. Unravel symbolism.
171. Augment teaching. (5.107)
172. Originate technology.
173. Test notions.
174. Transcend things.
175. Elucidate transformations.
176. Transvalue things.
177. Define types of things.
178. Suggest ultimates.
179. Help one cope with the unfamiliar.
180. Unify things.
181. Suggest uses.
182. Suggest the diverse values of a thing.
183. Amplify wealth.
184. Interrelate wholes and parts.
185. Heighten wisdom.
186. Expand our world view.

WHAT IDEONOMY CAN DO

What is it that ideonomy will be able to do, once it exists or has developed sufficiently as a pure and applied science? What will it help or enable people to do who make use of its methods, instruments, materials, perspectives, findings, institutions, and professionals?

There are many reasons why these things should be indicated in advance. First of all, they can initially and continuously steer the genesis and evolution of the field. Those who would advance ideonomy can foreknow the directions in which they should labor and the abilities of the human race which they should specifically seek to enhance.

Secondly, initial support for ideonomy can justify and regulate itself by reference to the explicit promise of the creatable discipline.

Finally, a prior listing of the would-be future capabilities of ideonomy can later serve as a test of what the field can actually do, as well as provide a basis for evaluating the degree of success and accomplishment of those who undertook to found, establish, and exploit ideonomy.

The following discussion enlarges upon Figure [ ], "A Table of 186 'Things Ideonomy Can Do'", which the reader should glance at in advance. Most but not all of the table's entries correspond to all or part of ideonomy's 320 named Concerns.

Heighten Aesthetic Appreciation

Simply indicating the idea that lies behind, defines, or pertains to a thing can often give some sense as to why it is or may be beautiful. Making the essence, function, or mechanism of a thing apparent can have this effect; indeed, there is something innately beautiful about ideas.

When a thing, phenomenon, process, or possibility is encompassed in a particularly complete, circumscribed, or multifold way, aesthetic pleasure can result. And ideonomy seeks to achieve these things in an unprecedented measure.

New ways of thinking and perceiving things should follow upon the use of ideonomy, and a general growth of human intelligence and sensibility. This sort of innovation is commonly both cause and effect of beauty's apprehension. In fact, ideonomy should eventually lead to the development of additional forms, styles, themes, and purposes of art.

A philosophical principle in ideonomy asserts that everything is infinitely complex and beautiful, and one of the major reasons why the field was originally conceived was that it might provide some of the necessary means for recognizing and mastering Nature's fundamental infinitude.

Show How Things Are Alike

Beauty frequently derives from analogies constructed, explored, or celebrated in works of art. Such analogies may be purely artificial or they may naturally reside in things as they are, in the interrelations of those things, in man's relations thereto, or in human nature itself.

But analogies transcend beauty in their interest and importance. They also have to do with truth, utility, obligations, and human destiny; and whatever serves these things, they can serve.

A primary concern of ideonomy is to provide man with a tool kit for reaching far deeper into the infinite analogical foundations of physical reality, of his own mind, and of the spiritual fabric of civilization than he has ever gone before or had the power to go—with a particle accelerator, in effect, capable of shattering the apparent atoms of our being into their hidden component similarities and dissimilarities.

Ideonomy can be used to discover how like or superficially unrelated things are similar—on many different levels, in many different dimensions, and in very different manners. It can indicate the extent of analogies, and the causes and effects or corollaries of analogies. It can suggest which things resemble which other things, or the clusters of general and partial likeness of things. It can point not only to analogies between things but to analogies between analogies, in ascending and descending hierarchies and inductive and deductive series. It can specify chains of analogies that transform via discrete decrements and increments, that diverge, converge, and anastomose, even in cyclic groups, and that interconnect all things in a surprisingly continuous and unified way.

Suggest Alternatives

Life is lived and human business is conducted for the most part in blithe unawareness of the spectrums and arrays of alternative possibilities, choices, interpretations, forms, methods, goals, and values that open out on all sides.

Yet the kinds of alternatives, their bases, and their elements recur again and again in a way that is almost indifferent to the field, the phenomenon, or the general problem or circumstance.

Ideonomy has the power to illuminate alternatives in all of these cases and to make the treatment of alternatives much more methodic, efficient, and straightforward.

Improve Analysis of Situations

The way in which people ordinarily analyze things and situations is extraordinarily inefficient. Analysis tends to be superficial, clumsy, crude, irrational, and nearly purposeless. There is little planning, method, strategy, or structure. The same mistakes are made, the same things are forgotten, the same opportunities are missed—almost endlessly.

Ideonomy can help to rectify these problems and to rationalize the analytic process universally.

Uncover Anomalies

Anomalies exist everywhere and yet for some reason are almost everywhere avoided. They should be sought out and embraced as important clues and opportunities and as indicators of problems, yet normally they are feared, hated, ignored, dismissed, or completely overlooked.

Ideonomy can correct this unenlightened outlook and simultaneously provide the necessary means for the systematic discovery, analysis, explanation, and exploitation of anomalies in every department of human knowledge and experience.

It can suggest some of the larger implications of the existence of anomalies, classify anomalies into types, and predict where, when, and why anomalies will occur.

Help Answer Questions

Just as certain questions have certain answers, certain genera of questions have certain genera of answers. The genera of both are apt to be poorly remembered and poorly known, and ideonomy can function mnemonically to make the matching of question to answer easy, fast, precise, reliable, comprehensive, diverse, mechanical and yet also intelligent, conscious, and creative, logical and scientific, universalistic or standardized and yet also evolutionary, explicit, and modelable—to a much greater degree than ever before.

More generally, examples, types, and taxa of questions can be correlated respectively with examples, types, and taxa of answers—for predictive, evaluative, educational, expository, and other purposes. This can indicate errors and non sequiturs, make for more consistent arguments and more logical conclusions, free attention to concentrate on novel or creative question-answer elements or relationships by separating them from others that have already been decided or are automatic or trivial, promote the automation of question-asking and -answering, lead to the computerized discovery and exploration of complex, massive, and growing arrays, matrices, spaces, series, networks, hierarchies, vergences, and other ordere and dynamic structures of finite and infinite sets of question-answer interrelationships, further the generalization of questions and answers both and mutually, and so on.

Ideonomy can show inter alia the logical, grammatic, syntactic, stylistic, vocabular, tactical, strategic, quantitative or qualitative, and semantic ways in which an arbitrary, general, or specific question or answer—either given or potential—can be varied, permuted, transformed, modulated, used, or advanced. It can suggest the reasons for—and implications, corollary requirements, problems, positive features, developmental possibilities, etc of—these ways; or for or of all genera and other taxa of questions and answers.

The empirical and logical series of sub- and super-questions and sub- and super-answers that pertain to questions and answers are indicable by ideonomy.

Structure Argument

Most argumentation and most arguments are little and badly structured, and one has the impression that what structure there is is almost accidental. The loss is not just the arguer's but everyone's, for defective and absent argumentation can vitiate—or reduce the value or interest of—such counterargumentation as the argumentation might respond to, inspire, or interact and interweave with dialectically, and the totality of arguments over space and history contribute to the growth, consolidation, perfection, and further differentiation of a single, integral, invisible but all-pervasive mental structure or to the general architecture of the human mind. One could think of this structure in its aspect of a chain, every successive and antecedent link of which is necessary for the progress and perpetual integrity of the whole; as a concatenation of arguments that can have no greater strength than that of its least or weakest link, and that must fail when any of its billions of links fail for any reason. Or one could think of the same structure in its multiplicative or exponential aspects: the rapid expansion of powers that a series of arguments can produce is simultaneously and equally an expansion of potential weaknesses and failures, and of demands upon the system overall and at each of its points, or co-arguments.

Ideonomy can be used to survey the entire range of arguments that are to be found everywhere and in all fields, that concern the most varied matters, that make use of the most varied means, that exhibit the most diverse structure, and that serve the most encyclopedic ends and needs.

It can then be used to characterize, distinguish, distill, classify, systematize, formalize, and index these arguments, to specify their basic elements and laws, to show how they can be combined, controlled, transformed, generalized, perfected, and answered, and to indicate which should apply where, when, why, and how.

It can cull the best arguments of each standard type, and make them efficiently accessible on a computer as a library of exemplars and guides. Logical, generic, and expedient transitions between different arguments can be shown.

Ideonomy can be used to explore the : structure, progression, subthemes, axioms, assumptions, style, levels, tactics, fallacies, errors, omissions, argumentative links and nodes, set structure, hierarchic and network structure, chains and series, options and capacities, alternative forms and courses, conceptual dimensions, correspondences and coherences or lack thereof, successes and failures, excellences and weaknesses, data, deceptions, and analogical transformations : of one's own or others' arguments.

It can help one to construct or refine an argument.

It can be combined with artificial intelligence to program a computer to automatically rebut one's arguments or statements, to debate one, or to argue for certain positions or to required or desirable goals.

Various types of ideonomic diagrams, or so-called ideograms, can be constructed to plan, enhance, analyze, monitor, critique, administer, stimulate, transform, unify, expedite, teach, illustrate, proceduralize, compare, record or aid memory of, amplify, communicate, simplify, or edit arguments, or to interrelate them with the entirety of ideonomy.

The types of answers and solutions that naturally pertain to various types of questions and problems can be indicated.

Ideonomy can also train one to structure one's arguments by exposing one repeatedly to all of the various possible permutations of different arguments.

Explore Assumptions

It is important to know what one's assumptions are, or what assumptions are being made when something is proposed. The most impeccable scientific papers are inevitably riddled with assumptions, and few of these assumptions are explicitly referred to. Yet evaluating the paper may require one to at least be cognizant of its underlying fabric of assumptions, and perhaps the rank-order, interconnections, equivalences, justifications, meanings, senses, families, circularities, roles, names, problems, relationships, boundaries, analogs, groupings, dynamics, risks, classes, hierarchies, sequences, and transformations of some of the assumptions.

There are universal types of assumptions—and universal taxons and systems of classification thereof—to which all assumptions whatever belong. These things can be discovered, researched, taught, and exploited.

There are also both tendential and necessary clusters of assumptions. Certain assumptions tend to be made together and some types of assumptions are absolutely inseparable and unisolable.

When certain pairs or sets of assumptions occur together, or occur together in certain ways or measures, other assumptions are implied that would otherwise be improbable. The tendency of sets of assumptions to imply the existence and nonexistence of other sets of assumptions, that in turn imply existence and nonexistence of still other sets (or hyper-sets) of assumptions, and so on ad infinitum, justifies a search for the total structure of all possible assumptions, and for rules, tests, and criteria that would enable us to exploit that structure efficiently.

Unconscious assumptions are often made that one would not consciously wish to make or find acceptable. Ideonomy can help one to ferret out such insidious or automatic assumptions.

One can explore in advance what the consequences might be if one were to make certain assumptions, since generic assumptions have generic consequences and chains of consequences, and various models and scenarios can be constructed from standard rules and elements.

Through ideonomy one can survey the important forms and examples of : ignorance, unsolved problems, unanswered questions, peculiar difficulties, complexities, paradoxes, ambiguities, prejudices, controversies, etc : and then ponder the world of mere or dubious assumptions that such things would also imply to exist and be important, either in general or in specific cases.

Characterize Behavior

If one is observing the behavior of a gerbil a language is necessary to codify the behavior or to translate it into a form in which one can remember, analyze, understand, integrate, reimagine, mentally experiment upon or predict, systematize, quantify, follow, communicate, or simply perceive it in the first place. One common way of doing this is to anthropomorphize the observed or presumptive behavior of such an animal, which in the present case would mean imagining the gerbil as oneself or oneself as the gerbil.

The example could be taken to suggest a general need and opportunity for the development of a vocabulary and grammar able to characterize the behavior of any phenomenon or entity. Science and human language, in their present form, are notably deficient in the ability to describe the behavior of most things, or to relate the behavior of one thing to the behavior of another, and so our world's manifestly diverse and complex behavior remains largely opaque and uncomprehended. This is tragic, given the importance of behavior to fathoming the full and authentic nature of things—or to the very being of things, if you will.

Where there is a certain form of behavior, ideonomy can suggest—through its scope and generalization—the purposes, causes, effects, laws, needs, capacities, potentials, goals, mechanisms, dimensions, elements, interests, limitations, courses, variants, quantities, and evolution of that behavior, as well as its combinations and interactions with various other forms of behavior or the behavior of other things.

Ideonomy can suggest how to find analogies between seemingly disparate and unrelated examples of behavior, and such analogies can in turn lead to the systematic discovery of unsuspected behavioral differences.

Analyze the Nature of Beliefs

All of us are prejudiced against the recognition that human beliefs are regulated by, and a function and product of, natural mechanisms—and that they can be described and explained as or via : sociological, historical, psychological, anthropological, biological, physical, mathematical, or even logical : phenomena or laws.

Yet history teaches us—or has tried to teach us—that the human mind always has an idiosyncratic, local, and temporal character, and that beliefs are rooted in and reflect the silly quirks of our environment and heredity.

By analyzing certain beliefs with the utmost care, ideonomy can provide universal and enduring models for understanding beliefs in general.

It can take note of the recurring fallacies, limitations, and other defects of beliefs; of the ignorance, stupidity, presumption, oversights, excesses, oversimplifications, perseverations, abuses, reifications, fantasies, excuses, ambiguities, obscurities, exclusivity, automorphisms, pathologies, arrogances, rigidities, reactionariness, and emotionality that tends to characterize beliefs; and of the natural origins, sources, determinants, dynamics, interactions, and fates of beliefs.

It can encyclopedically survey and systematize the multidimensional and unidimensional ranges of beliefs that have come and gone historically, that coexist in the present, or that are possible—and the permutations and combinations thereof. It can diagram historical chains of beliefs.

From such things it can begin to construct a universal science of beliefs (pistology).

Ideonomy can distinguish beliefs that are apt to be arbitrary from those that are probably valid. It can suggest critical tests and experiments.

It can retrieve or make explicit the : organic or virtual : axiomatic and empirical structure of beliefs.

It can identify thresholds for the appearance and disappearance of beliefs, and for their intertransformation and substitution.

It can give insights into beliefs by ridiculing and satirizing them.

It can help justify or argue beliefs.

It can discover at once unexpected similarities, analogies, commonalities, correspondences, tautologies, interconnections, interdependences, correlations, plexures, coherences, reconciliations, syntheses, unities, complementarities, homologies, continuities, convergences, and counterpoint of beliefs—and surprising differences, divergences, antitheses, conflicts, contradictions, incommensurabilities, and orthogonalities.

Ideonomy can suggest how novel or arbitrary beliefs could materialize in fanciful situations or as the product of particular environments, circumstances, or events; and the spectrum of beliefs given facts might inspire.

It can suggest where or when extant or orthodox beliefs are apt to fail or be abandoned, and the beliefs that are then apt to supersede them.

It can illuminate the comparative roles of chance and necessity in the generation of beliefs, and their subtle interplay.

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Ideonomy can help one to explore the manifold, heterogeneous, anamorphic, ulterior, ultimate, and absurd consequences of beliefs.

What is liable to happen if the people of a nation believe that war is impossible?

What are the consequences of believing that one's prayers are answered by a god?

What might be entrained by a belief in: nothing (nihilism), the natural superiority of women to men, the omnipotence of chance in human affairs, the relativity of truth, life's cosmic universality, the equivalence of the universe to a binary or serial computer, or the illusoriness of ball lightning (e.g. its reducibility to an optical hallucination or a myth)? Or that God doesn't (or daren't?) play dice with the universe, that everything one believes is false, that the universe was created one week in BC4004 (or 12 orders of magnitude faster, and 6 orders of magnitude later, than it was in reality), that the universe should be closed in space and time ("for aesthetic reasons"), that the universe must have sprung into being 8-20 eons ago ex nihilo, that e contra the universe should be time-invariant on the largest scale (manifest a "steady state"), that nothing can travel faster than light, that gravitation must be the most basic force of all, that if one should venture too far eastward one shall drop off the edge of the world, or that something as patently absurd as ideonomy might actually be possible?

To what extent do one's beliefs dictate what one sees, thinks, does, or is able to do—and the reverse? To what relative degree do they limit and empower one? Are they major or minor factors in life? Are the distinctions that the total set of human beliefs make less fundamental, and more superficial, than ordinarily assumed (in the portraits of reality they compose, and equip the human race with)?

To what extent does the value of beliefs lie, not in their discrete or relative veracity or prima facie meaning, but in other and possibly subtler properties they may have: say of a pragmatic, psychically reassuring, ideogenic, heuristic, excitatory, symbolic, mentally simplifying, social, or surrogate nature? (Religions—their rituals and doctrines—might, for example, have nothing whatever to do with truth and yet still be valuable, perhaps by analogy to the potential value of night dreams.)

The sorry fact is that, in a neurological sense, we still do not know what "belief" is, fundamentally or operationally; or what the natural causes, functions, effects, and importance of the phenomenon are. We do not know whether it would be possible to operate without any beliefs at all, say in a purely probabilistic, empirical, pragmatic, mechanical, recursive, stoichiometric, or formal manner, or via a set of transcendental axioms (or what that would mean).

Are man's professed beliefs actually underlain by a very or entirely different set of real beliefs, that operate anonymously, unconsciously, unsuspectedly, and yet magisterially in all of human affairs?

Other questions that we have to ask and must ultimately answer are: How esemplastic is the human imagination, how able to integrate disparate facts, or various empirical discordances produced by a range of different beliefs? How flexible are facts, theories, and beliefs themselves; what is the ability of experience to accomodate alternative perspectives, interpretations, and life practices?

Conflicting beliefs—or heterodoxies—are a severe test of the ambiguity of nature, demonstratedness or demonstrability of scientific knowledge, and hidden complexity of the mind.

Ideonomy could help generate, implement, and evaluate such tests—or a systematic program of experiments to at last ascertain and quantify the actual validity, accuracy, value, meaning, relationships, effects, and completeness of human beliefs.

Not knowing what belief in general is, we are in no position to know or even vaguely compute the total number—or total variety—of the collective beliefs of the human family, or even the sum beliefs of a single individual, or that play some role in the life of the latter at any random instant of time or in given situations. Thousands? Trillions? We have no right to say anything.

Yet ideonomy gives us the ability to automatically generate alternative beliefs in astronomical numbers—canonical ranges of beliefs of every possible scale, type, and reference. By means of it we could conjure up and inspect what would progressively approximate to the abstract space of all possible beliefs. Ideonomy would also enable such inspection to be done efficiently, or in a surprisingly knowing and expeditious way.

From within this rigorous, exhaustive, and transcendent space we could look back out upon the far simpler space of the actual human mind, and see at last the particular things that are there—the finite identity, behavior, and consequences of the miniature set of human beliefs. For after all, beliefs are little more than patterns in a chess game whose ultimate meaning is simply the process that they define or the drama they enable.

In a certain sense, in other words, we take them too seriously; for we let them run our lives. Instead of using them, we let them use us. It is time for a proletarian revolution, however, and the enslaved masters should take over. Enough of pistocracy (government by beliefs)!

Again, how much do we actually know? How much of what we assume to be knowledge is simply unlettered belief, belief ignorant of its own insubstantiality, arrogance, circularity, and mischievousness?

A clue may be gotten from a known illusion: that of the solidity, continuity, determinacy, simplicity, and sovereignty of the macroscopic world. Modern science has staggered us with the revelation of the quite opposite character of the universe on either progressively smaller or progressively larger scales. At these scales, for example, nature is almost altogether empty—mere constellations of points, perhaps, or a chaotic, seething foam. And alien. Anthropomorphism is impossible. There is not a trace of surburban sprawl.

Why then the anomalous oasis in the middle, the impossible ordinariness of the intermediate scale?

The answer may be an echo of the quasi-teleological Anthropic Cosmological Principle of Branden Carter. It is not that the macroscopic landscape that we think of as home is intrinsically special, necessarily, it may simply be that we have so long grown accustomed to it—having in fact been evolved from, by, and as an organic part of it over billions of years—that we have lost the ability to see it for what it is in and of itself, or in its pristine bizarreness.

What we see as we look out upon our made-to-order Middle Earth, in other words, may not be the raw, unprocessed influx of elementary sensory facts—or the image of a delomorphous, familiar, and comfortable realm that they seem to import—but rather the accumulated, archetypal memories streaming through our phylogenetic tree and projecting an idyllic scene: much as a film projector throws old movies upon a blank screen.

Imagine a telegraphic message coming to us in Morse code from an unknown sender in an unknown place. As we gradually decipher what seems to be an endless message we find that it contains an encyclopedic description of our world. The sender speaks of the house he occupies and the street outside, of the people rushing back and forth and how they are dressed, of the countryside and its plants and animals, and so on from A to Z. Somehow a complete image of the world—a cosmography—is gotten across through the austere medium of dots and dashes (... ---). It is not that the mysterious sender tells us everything or reports the world's every detail, but that the concatenation of what he does say elicits an evolution of images in our mind whose effect is implicitly cosmopoietic.

Whoever the daft sender is, however, he must be a poet, for his reportage is so eloquent, spirited, and evocative that we find ourselves captive listeners. Hours roll by but we do not care, for what does life have to offer that could surpass in interest the humanity, majesty, and gaiety of this narrative?

Finally the tale marches to an end, but the message itself concludes with a stupefying surprise:

Entities in another universe where space is googol-dimensional and time ordinarily runs backwards but sometimes runs forward, who are constructed of fractals and octonions and who communicate among their negatively-many selves by means of cosmic strings modulated by essential singularities and a p-adic language, have recently (in the near future) built an intercosmic transmitter out of the local equivalent of the Dirac quantum-mechanical vacuum in order to send across the friendly message just received.

To solve the semantic problem of communicating between two such phenomenologically disparate cosmoses as ours and theirs, these entities have also constructed a machine to translate the story of their world into English and the things it symbolizes for us.

It was this machine, then, that was the unknown sender of the message we received, which represented a vivid description by the entities of their fantastically alien universe, translated however into familiar human referents and relationships of an optimally equivalent nature.

The point of the above fantasy is that our objective picture of the external world could easily be an artificial and synthetic image—a worldlike belief—constructed from minimal actual information in a largely arbitrary way, or as a 'useful slice from a continuum of alternative —equivalent and nonequivalent—possibilities'.

The apparent "solidity, continuity, determinacy, simplicity, and sovereignty" of the macroscopic world may in fact be an illusion created by: averaging, sampling, integration, abstraction, expedience, ancient representational relaxation, biological codification (say in the course of evolution), sociogenesis, neurological figuration or condensation, stupidity, laziness, mental exclusion, mental minimalism or stoichiometry... or a hundred other things.

So what we actually know may be little indeed, and most of human knowledge may consist of circular references to human beliefs, or of multitudinous diffractions of a few bits of infinitely complex knowledge.

The consequences of beliefs may be vast beyond imagining. For this reason beliefs and their effects should be regarded by science as complex and difficult phenomena that are all-important to understand.

Define the Canonical Possibilities of A Thing

This refers to the basic and finite set of forms, variations, types, properties, dimensions, and/or the like that a given thing can have. A thing can have other forms (or whatever) but they, by contrast, will be of a secondary, derived, or subordinate nature; they will, that is, be reducible to the canonical or primary possibilities.

The claim that the total possibilities of things are canonically limited, or characteristic and finite, does of course make many obvious, and infinitely many inobvious, assumptions. Such assumptions in turn involve a welter of problems, and both the assumptions and their problems will have to be systematically, rigorously, progressively, and exhaustively explored—both theoretically and empirically—in the future. For the most part, however, these are simply opportunities for novel and valuable discoveries, and the partiality or tentativeness of the truth or form of the canonical limitations that are known or that are bound to be discovered will undeniably have utility beforehand or in some limited way.

Even if a given thing is not, or proves not to be, canonically limited in one, or one assumed, way, it may nevertheless be so limited in any of infinitely many other ways. The realities and possibilities are, in any case, important to investigate, and in many instances failures of canonicality —whether general or exceptional—will have profound significance in their negative or surprising way.

Often things will prove to be quasi-canonically limited, or else canonically pseudo-limited.

Some examples of the kinds of things that are apt to prove canonically limited, in either a strict or such relaxed ways, are: forms, motions, causes, effects, appearances, and types.

In crystallography, or for three-dimensional crystals, there are various canonical and quasi-canonical sets of things: e.g. lattice constants, 7 crystal systems, 14 Bravais space lattices, 42 Niggli space lattices, 24 Delaunay space lattices, 32 crystal classes, 320 Fedorov space groups, and generators. These describe all possible 'pure' crystallographic forms and types and crystallogenic motions. Of course other, related and unrelated, possibilities emerge when one complicates the system: goes to some other dimensionality, explores non-Euclidean dimensions or manifolds, considers different physical constituents or the various physical qualities they produce or involve, introduces temporal (genetic) perturbations, recognizes hybridal crystals, etc.

To date our knowledge of canonical sets and systems of causes or effects is, by comparison, limited, but eventually such things will be sought and found everywhere, and it is worth considering in advance what in a general way such things will mean, require, and allow, what should be sought or is apt to be discovered first, what methods may be needed to find and exploit such things, etc.

Where one would expect canonical causes and effects to be discovered first is, of course, on the subatomic, atomic, molecular, and "ultraparticle" scales, or on the scales of quantum-mechanical phenomena. Hierarchies, series, networks, clusters, rings, radiations, trees, surfaces, lattices, vergences, "soils", and other meta-structures of canonical possibilities will be found that are of a progressively larger, more complex, and more powerful and embracive (canonical) character.

In particular, canonical events, phenomena, laws, transformations, processes, paradoxes, etc will be discovered of a truly or tendentially universal or pandisciplinary kind.

But how many possible configurations of internal and external combustion engine are there? This is a macroscopic canonical question that has already been investigated by a number of workers, such as Robert U. Ayres.

Similarly Carl Sagan has pondered the quasi-canonical set of possible morphological and dynamical genera of planetary systems that stars in the universe could have, for the help this might be in estimating the total number of inhabited or inhabitable planets.

But one might also wish to know the canonically possible number of: character types, molecular species in a family, elementary particles of a class—or even classes of elementary particles, musical forms, genomic structures (on a given level or of a given type), phenotypes defined by sets of polymorphisms, types of tastes or smells, solitons, manufacturable textiles, defects of materials, computer errors of a given class, computer architectures, weather events, auroras, thoughts, systems of government, or dance steps in choreography.

As ideonomy progressively assembles more and more diverse types of canonical things in ever more fields and in connection with ever more phenomena and problems, comparisons between these cases and things will be possible, and this will lead to the working out of general laws of canonicality that have the power to describe and predict canonical possibilities in arbitrary cases.

Assess Capacity

Ideonomy can help one to recognize, recall, or think about the general capacity of things or the capacities of things in general.

Specifically it can assist research into the capacity of things to grow, develop, change, interact with other things, overcome problems, adapt, absorb or process things, change their capacities, specialize or generalize, tolerate some insult or interference, hide, produce a specific effect, facilitate a process, reproduce, move about, pass through a barrier, resist change, compete with other things, etc.

It is important to know a great number of things about such capacities, including their capacitive: limits, defects, boundaries, constraints, causes, effects, origins, histories, courses, variations, couplings, interferences, tradeoffs, analogies and equivalences, differences, senses, corollaries and implications, elements, rates, intensities, dynamics, ambiguities, problems, values, uses, intertransformations, incidences, synergisms, processes, laws, needs, matrixes, and meta-structures.

Ideonomy might show a given type of capacity to be more widespread than it has traditionally been thought to be, or on the contrary to be rarer than assumed or than one would have thought.

It can be used to suggest odd or anomalous capacities of things: of the bios to tolerate fairly substantial fluctuations of the so-called solar constant, of cancer to withstand a chemotherapeutic dosage, of the mind to learn to use geometric as opposed to arithmetic mantissae of logarithms, of the mind to master the doing of many different tasks simultaneously, of a molecule to tolerate a level of perturbation that one would have thought disruptive, of a chess player to nullify the harm done when he makes a serious error, of a seemingly obsolete mathematical technique to be adapted for new purposes, or of bacteria for processing a novel or unnatural pollutant.

One could use ideonomy to enlarge, maximize, or modify a thing's capacity or to give the thing new capacities. It might be employed to give the human body the capacity to digest cellulose or an added capacity to fight contagions.

Identify the Causes of Things

If the causes of things are indeed surprisingly general, then ideonomy can be used to predict them. One way it could accomplish this is by first pointing out the analogies that things that are of interest have to other things, or the range of their analogs. This could lead in indirect ways to the discovery of unsuspected causes that are somehow shared by the analogs or mediated by the analogies—or perhaps even by coanalogs of the analogs or analogies among the analogies themselves.

Taxological schemes and systems that have been constructed to classify the various possible types of causes of one phenomenon, or of the phenomena and entities of one science, can be adapted—or else combined and synthesized with the totality of such schemes and systems—to suggest the causes of things for which they were not originally designed; or, in connection with such causes, to suggest general or particular aspects or circumstances thereof—such as effects, implications, interrelationships, processes, or diagnostic features of the causes.

It is only when one knows the causes of things that one really begins to understand the things themselves.

Clarify Chains of Events

In the real world one thing leads to another, that leads to another, and that in turn leads to another, in an endless, meaningful, and surprising chain. Yet science has only just begun to examine, trace, explain, connect, classify, and make use of these interminable and all-pervasive chains that saturate and discipline the temporal world.

To treat such chains one must be aware of the types of things and events that can form, be involved in, or result from the chains, of the ways in—and means by—which events can chain or things can be connected in chains, of the peculiar phenomena that chains have a tendency to give rise to, of the difference that the existence of such chains in nature makes, and of the extent of man's present knowledge and ignorance of the chains.

What are the biggest chains? What are the smallest? What are the circularities, counterflows, and reciprocities of chains of events? What are the bundlings, interweavings, branchings, and anastomosings of different, all actual, or all possible chains and chainings of events?

Which chains of events are accidental and which are necessary? Which chains of events are entrained by one another? Which chains of events are unique and which are cyclic, or possessed of a tendency to occur over and over again?

Which chains of events lead on to other chains of events? What are both the abstract and concrete hierarchies, networks, circuitries, and other archetypal structures and systems of chains of events?

Ideonomy can clarify which chains of events, or types thereof, are likely to exist or operate in a given situation, or are apt in such a situation to have a particular role or effect. It can suggest tests to discriminate, or experiments to explore, the possibilities.

Where chains of events are vast, as in those represented by biological lineages over the history of the Earth, it can assist with the endless analysis, intercorrelation, ordering, filling in, synthesis, and restructuring of such chains.

It can discover those chains of events that lead to identical, and to different, conclusions.

It can use chains of events that have been operating in the past to predict the future or analyze the present.

Help Characterize the Role of Chance

No one knows for sure the total or specific roles that chance, or particular forms or types of chance, have played in the history of the world or play in the world now.

No one knows what the relative and absolute contribution of chance is, or its power to create, alter, and regulate events, phenomena, or reality as a whole.

It is not known what chance really is, nor what it really is not.

No one knows the possible diversity of chance, or of its types, causes, processes, elements, laws, effects, and phenomena.

No one knows how different elements, types, chains, levels, spheres, laws, forces, or evolutions of chance interact—or how they interfere with, cancel, reinforce, control, or ignore one another.

No one knows how good or bad chance is, or the world is because of chance.

No one knows all the things that chance may affect, or all the channels it may have in nature.

We lack knowledge of how to influence, counteract, and harness chance.

We know little about the possible or actual contribution of chance to processes and phenomena on the micro, macro, or cosmic scale, much less to the dynamic continuum thereof.

Yet already we see indications that the same set of aleatory phenomena reappear, and the same set of stochastic processes operate, throughout the universe and at every level in nature.

Ideonomy can be used to construct a scheme that will generate, define, interrelate, and explain every possible type and manifestation of chance, or that as it evolves will do so progressively.

It can be used to compare, distinguish, describe, measure, and judge different forms and instances of chance.

It can nourish discussion of chance and guide theoretical and experimental inquiry into its nature and possibilities.

Characterize Change

The whole history of science has been that of the progressive discovery of change and transcendence of illusions of changelessness.

What has been thought to be increate and infinitely old is discovered to have had an origin at a finite time in the past; what has been thought to be inert and static is found to be active, dynamic, and moving; what has been thought to be immortal, ageless, and immutable is shown to be worn and aged, to be plastic and unstable, to decay and have a finite future; what has been thought to be fixed is shown to be evolving, retrogressing, or transforming into something else; what has been thought to be absolute, singular, objectival, and self-existent is realized to be but a mirror or indissociable function of its infinitely complex and protean environment, itself inspecific, or a process at heart; what has been thought to exhibit but a single, simple, or fixed type of change, is demonstrated to have or undergo many, complex, or protean forms and types of change; and what has been thought to be part of but a single system of change is seen to participate in many or innumerable systems of change.

To fully characterize change one must describe its roots, measure its rate and direction, define its goals or limits, specify its processes, learn about the conditions in which it occurs, look at it from the point of view of other possible forms of change, isolate its nuances, identify its dimensions, indicate its effects and corollaries, refer to or formulate its laws, ascertain the breadth of its exemplification, etc.

Ideonomy can indicate how a given thing is changing, has changed, will change, could be changed, or does not change—and the reasons, extent, implications, etc thereof.

Some change is purely relative. Ideonomy can be used to describe the infinity of relative changes of a thing, or the ways in which the thing changes relative to other things, reciprocally, or as a function of the changes of other things.

Fertilize Character

Fertilize character? At first one would think this would be asking rather too much of ideonomy, or of any science, but there are both direct and indirect reasons why the new science can contribute to the development and functioning of man's character.

An indirect reason is that contact with scientific discipline and wisdom can always, in principle, enrich character, morality, and the spirit. Even mathematics can have this effect. Moreover, science and technology—as is increasingly clear—are the primary source of mankind's material power, and the ultimate cause of civilization's greatest advances and catastrophes. It is manifest at the moment that they are remaking the world. Because of them questions are being asked, challenges are being faced, opportunities are being created, and decisions are being required that are staggering and even a bit terrifying.

Ideonomy itself promises to revolutionize the human order. It may also be a singular help in dealing with the general problems of the future, in part because it could enlarge the scope, vigor, and fundamentality of thought—and the foresight and wisdom—of the entire human race.

Character can emerge where there is comprehensive experience, intellectual adventure, shared excitement, consciousness of change and evolution, intensity of existence, and moral drama.

Ideonomy could provide all of these critical things.

The astronomically large and breathtakingly diverse sets of interrelated possibilities it can create—by using ideogenic formulas to combine lists of terms in multidimensional idea spaces—supply comprehensive experiences such as are never encountered in real life or mundanely. Preparing, generating, examining, winnowing, and variously reusing these literal worlds of possibility can be a source of the highest intellectual adventure. Collaborating with from one to thousands of other individuals in the development, evaluation, and use of these cognitive worlds, or in progressive probing and exploitation of the celestial ideocosm, can lead to shared excitement and intensity of existence, and a concomitant heightened awareness of change and evolution—especially when our own world is visibly altered as a result. Because ideonomy has been deliberately designed to explicate the equally complex, diverse, and under-studied moral aspects and possibilities of existence, and of all products of ideonomy itself, it likewise has the ability to impress the individual with the moral drama underlying everything or that threads its way inevitably through all the choices he makes in life.

Ideonomy, more specifically, can introduce one to vast idea spaces of psychological possibilities, or that define possibilities for human character equal to and greatly surpassing those of life. Obviously exposure to these may have a special power to educate and fertilize character, both in the sense of perfecting the character of the average person and in the sense of maximizing the total diversity, individuality, and pluralism of the Earth's population.

Also worthy of note is the attention that ideonomy pays through its divisions to: beauties, excellences, perfections, ideals, goods, defects, limitations, criticisms, bads, responsibilities, functions, roles, effects, chains of consequences, wholes, ecological aspects of things, interdependences, reciprocities, laws, and rules. It has been the neglect of precisely such things in modern education, and in the practice of science, government, and other professions, that has led to the distinctive ethical shallowness of our society. So ideonomy could help to fertilize character simply by repairing an omission in our culture.

Expand Civilization

This ideonomy can do as a result of its enhancement of life, differentiation of industrial goods, services, and jobs, enlargement of individual and global wealth, additions to the scope of thought and experience, facilitation of creativity, invention, and innovation, and exponential amplification of scientific and technological research.

Within our single world ideonomy can create—or stimulate an awareness and visionary pursuit of—an infinity of worlds.

Ideonomy can even enable us to examine the essence of civilization, and the peculiar laws that specify its anatomy and physiology and guide its evolution.

Since ideas are virtually the lifeblood of civilization, it is hard to imagine anything that could contribute more to civilization than a science thereof. In a way, a science of ideas would also be a science of civilization itself.

Show How To Classify Things

Things form or belong to sets, and the sets have both special and universal laws and elements that define the ways in which the things in those sets can and should be classified.

There has been little effort to date to systematically identify the sets to which the world's diverse things belong, and the classificatory laws and elements of those sets.

As a result, things remain grossly under-classified, under-described, and under-defined. Yet classification must precede, and often directly gives rise to, understanding. Its value, in fact, is manifold.

A premier objective of ideonomy is to classify everything and to do so in every useful way, and many of its organons and methods have been designed with this purpose in mind.

An early and significant discovery of ideonomy is that the ways in which we classify fishes, say, may not only be applicable to the categorization and pigeonholing of gems, clouds, jokes, and the possible ways of climbing trees, but able to provide insights from without when so used; that a classification of any set of things that does not take account of the possible classifications of all other things, will inevitably be impoverished and fallacious in fundamental ways, and may even be meaningless in some ultimate, if elusive, sense.

Ideonomy provides methods and means for the experimental classification of arbitrary things, so that novel possibilities may be tested, explored, and compared, and already existing classificatory schemes thereby evaluated, supplemented, and refined.

The new science can enable the individual to discover directly what will happen if he classifies a certain thing in a certain way, or fails to classify it the old or obvious way. For this reason it is a teaching instrument and a device for intensifying the understanding that an individual has for what he does, or would do, ordinarily, and for standard classifications and classificational systems. To really understand a thing, for example, one must appreciate its necessity, raison d'etre, perfection, and preferability to all alternatives; indeed, one must learn how to admire it.

Ideonomy can also show a person how to construct a scheme, or develop a system, to classify anything that interests him or perhaps just some random thing. In this way he can learn how to devise a classification ad hoc, ad libitum, or de novo. This architectural experience can equip him with a lasting insight into the genetic, heterotelic, autotelic, internal, human, and nomothetic meaning of all taxologic schemes and enterprises.

Show How Things Can Be Usefully Combined

Combining things is a large part of life, and in a sense it is all of life or the essence of life. This is true for the finite life of the individual and it is equally true for the infinite life of civilization. Indeed it also seems to be true for the universe itself, which increasingly stands revealed as a great combinatorial engine.

But a man shipwrecked and cast ashore upon a desert island could find himself surrounded by all the things he needs to build a happy if lonely life—the promiscuous goods that were torn from the hold of his ship and later beached by a contrite sea—and yet still be doomed to perish within a season because he is ignorant of how to combine the things so as to reconstruct civilization.

It needs to be remembered that man has advanced himself from the squalid cave to the technological opulence of present-day urban existence, not by adding to, but simply by ever more ingeniously recombining, nature's chessboard of basic elements.

Nature is a hierarchy, really, of infinitely complex combinations of combinations of combinations of things—or perhaps of nothing but combinations. Science seeks to decipher these endless but meaningful combinations; and technology, to exploit them for life's sake. A guide is needed to supervise the whole operation, and ideonomy is uniquely equipped to serve as that guide.

By studying natural combinations, the rules thereof can be extracted and subsequently reapplied to create new combinations. New combinations are ultimately found to be old combinations, not previously discovered, but in the meantime they bring to light other rules, and themselves engender rules, which in turn engender new combinations, and again ultimately prove to have been present in nature all along. We are beginning to figure out the exquisite ironies of this process, and the very laws of those ironies. Because ideonomy courts paradoxes, this, too, is an ideal job for it.

Note that the reverse process, of undoing natural combinations, must itself implicitly engender new combinations, and of a conservative complexity in the infinitely circular matrix of the whole. So we should also seek to master ways of virtually combining things through equivalent decombinations, of a simple, serial, or compound kind; of course some of these decombinations can themselves be virtual, or be produced by equivalent combinations of other things, or of the same things in nonequivalent series. Although the possibilities are endless, it is important to note that they are also paradoxically few, because of their severe equivalence or combinatorial degeneracy.

Ideonomy can show how to combine the etymological roots of words to create new words, how to combine words to create new concepts, how to combine concepts to create new theories, how to combine theories to create new sciences, and how to combine sciences to create new world views.

It can show how to combine the parts of dogs to create new dogs, how to combine the parts of faces to create new or old facial expressions, how to combine seemingly disparate mathematical techniques to get more powerful tools, how to combine phenomena to get novel emergent phenomena, how to combine nonexistent jobs that separately would not make sense to produce new groups of jobs that make conjoint sense, how to recombine the elements of known phenomena to reveal undiscovered phenomena that have been hiding within them—or of known entities to reveal undiscovered aspects of those entities.

Ideonomy can uncover and publicize all of the ways in which a thing can be combined with itself, a thing can be combined with things of its kind, or different kinds of things can be combined.

Increase Understanding of Complexity

When science is young—and no sciences, as yet, are truly old—it is forced to oversimplify its account of nature, to thrust aside the things that are too complex or difficult, and to concentrate upon those phenomena, questions, techniques, and topics that are—or seem to be—simple or the simplest. Inevitably, as a result, it takes a simplistic form and constructs a simplistic picture of reality.

The real problem is that this inceptive simplism, itself venial, then becomes deeply ingrained in the whole outlook of the scientific community, that the fact of its existence becomes forgotten about—or is never recognized in the first place, and that a simplistic habit of mind becomes perpetual and ineradicable.

Another common route to oversimplification in the history of science has been the uninterrupted employment of a single method or pursuit of a single concept or goal, without any experimental trying out or adopting of additional or novel possibilities. Eventually this single-minded devotion becomes anachronistic and pathological. Other flowers come up through the soil, only to be wastefully ignored.

Modern science is also beset by a difficulty that is of an antithetical nature: illusory complexity. Things appear to be, or are treated as being, complex where they are simple, or as more complex than they actually are.

With all of these problems in the understanding of complexity ideonomy promises to help.

It can be used to reconstruct the history of sciences and to recognize the crudities that were installed in the infancy of these subjects. It can diagnose simplistic thinking and techniques almost anywhere and all the time.

It brings to the study of nature a picture of phenomena and concepts as being vastly more complex than they have traditionally been assumed to be in general. It defines the morphological, behavioral, and other codes that are the sources of complexity, and provides means for the interpretation of these codes and their treatment along simpler lines.

It characterizes the welter of alternative methods, concepts, and goals that may severally or simultaneously apply in given cases.

As for the illusion of complexity, a primary thrust of ideonomy is upon the identification of things that recur, often unknowedly, in science after science and phenomenon after phenomenon: of laws, patterns, effects, relationships, concepts, etc that may be differently described, given different names, justified in different ways, or modified in various respects, and yet that everywhere are essentially identical.

Many of the excessive complexities in the operation of civilization, and in our theory of the universe, that were tolerable in the past are no longer tolerable today or at least will no longer be tolerable in the future. The increasingly integrated and technological nature of civilization can make certain forms of complexity that are not controlled or not understood perilous.

The unification of the world's economy, and the automation of the management of stocks on a large scale, may make the continuation of our ignorance of—or of our failure to allow for or control—chaotic phenomena arising from nonlinear dynamics, unacceptable in the future.

Reveal the Many Concauses of A Thing

Concauses, or causes that act together, are worth knowing about for a variety of reasons. Alone, or independently, they may be unable to cause or explain a thing; or a thing may be impossible without the coaction of arbitrarily many different causes.

Where many different concauses are necessary to produce an effect or thing, the existence, possibility, or character of same may be hidden or obscured.

Since just a few things, when combined with one another, are sufficient to produce an enormously large number of diverse things, there may be stupendous numbers of things, and of causes and possibilities of things, of which we are ignorant.

The concept that things tend to have simple and single causes prevails in science and may well be one of those grand misconceptions we spoke of above that in the infancy of science were expedient and necessary oversimplifications, but which have subsequently become deeply implanted in the conscious and unconscious world view of science, wherein and wherefrom they have done—and stoutly continue to do—great mischief.

The reality, or the measure of truth, does however require to be found out, and ideonomy can assist with this basic investigation. For ideonomy to play such a role is indeed only natural, for its central concern is with the discovery, measurement, clarification, and extension of all possible forms, degrees, and phenomena of universality—as well as with the limitation of universality.

We need to learn exactly and comprehensively which things do and do not depend upon a plurality of causes or the cooperation of concauses, what the interrelated and discriminable types of things and types of concauses are, what the deep modes and mechanisms of concausation are, what the limits, geneses, transformations, degrees of freedom, and laws of concauses are, what the relative importance of singular causes and concauses is, what characteristic and fundamental errors in scientific theory and belief are traceable to a neglect of concausation, how concausation may be masked and yet per se remain demonstrable, how different orders of concauses may fit together like nested Chinese boxes, how alternative groups of concauses—that are not themselves or mutually concausal—may be multiplexed in phenomena and events, and many other things.

Once we know these things, and only once we know them, the construction of a science of concauses will become feasible.

To what relative and absolute extent are the following things a product of concauses, rather than of causes that act alone and are omnipotent: human intelligence (in an encephalic or else in a general sense), biological evolution, the bursting of a dam, an economic depression, a volcanic eruption, a drought, a rumor, the victory of a football team, the onset of cosmic expansion, any single quantum event, the historical commencement of mathematical inquiry, miscarriage in embryogeny, or moral maldevelopment of one's child?

Knowing whether the disastrous failure of a dam had one or many causes could be important in the legal determination of responsibility and liability.

Is man's transanimalic intelligence mainly the result of a single circumscribed but all-important change in brain anatomy or physiology that happened in the course of primate evolution—perhaps discontinuous in time or isolated from other changes; or did it result on the contrary from many, diverse, holistic, intricate, or mutually necessary concauses?

It is important to know whether biological speciation is in any fundamental sense monogenic, or instead always tends to essentially be a product of the interplay of many concauses. If the latter is the case, this might, for example, imply that the stability of a species is greater, and the transformability of a species by man is perhaps less, than ordinarily assumed.

To what extent are absolute or changing pressure or temperature, or chemical transformations, of the magma in the central vent, or structural failures of the vent cap or plug, concausal of volcanic eruptions?

Until we can answer diverse and random questions of this sort, we will be unable to make predictions about the world's concausational patterns based on average or statistical knowledge. So much of human intelligence is based upon analogical reasoning that ultimately refers back to special types of knowledge or experience! Yet in the psychological community there is little awareness of this fact (or of the analogical phylogeny of knowledge).

Analyze Conflict

When one encounters a conflict one may find oneself asking questions such as these: What caused it, how did it originate, what is its history, how has it developed and changed, what is its mechanism, what is controlling it, what are its needs and requirements, what is maintaining it, what is directing it, where is it going or where might it go or how might it end up? What is it, what are its properties and dimensions, what are its laws, what are its amounts and rates, what are its capacities and limits, what are its hierarchies and levels, of what is it made up, what are its parts or what does it contain? What are its circumstances and the context or environment in which it exists, and how is it being affected by or in turn affecting or interacting with its environs? What is it producing or what might be its eventual products, effects, or corollaries? What is it analogous to, what is it different from, and how or why is it these things? What is its interest or importance? What do I know about it, what do I not know about it, what should I find out about it, how can I find it out? What thoughts about the thing can I have or should I pursue? What is ordinary and unusual about the conflict? What errors may I be making about the conflict, what illusions about or misconceptions of it may I have? What preceded it and what will follow it?

Ideonomy can both prompt one to ask these questions and help one to answer them.

The conflict that one wishes to analyze need not be between people or even between organisms. Instead it may represent strife, competition, contradictions, or battles between molecules, different geological processes, atmospheric winds, industries, machines, cellular automata, or physical forces. It may be a conflict within a thing or of a thing with itself, or even a conflict of the conflict with itself.

Deepen Conscience

By introducing one to all of the strange, subtle, indirect, complex, and self-propagating effects that one has—or could have—upon things, ideonomy can heighten moral awareness.

It can also do this by enumerating all of the major and minor types of evil and good, endlessly re-illustrating them in terms of all of the world's things and situations, systematically defining their characteristic causes, processes, and effects, and interweaving into this instructive picture every dimension of our humanity.

It can give a child a panoramic preview, and an adult an aerial overview, of the totality of life's distinctive and important events—both probable and possible. It can enable the life of the individual, and the life of society as a whole, to be modeled in innumerable ways, at every hierarchical level, and with respect to any aspect or theme. It allows life, in effect, to be lived and relived in advance and in an infinity of ways.

Such a wealth of virtual experiences, and mobile acquaintance with them, could instill the deepest possible understanding of what life is, encompasses, means, allows, and requires of each of us.

Ideonomy can be used to highlight the elusive threads of meaning, value, and purpose that wend their way continuously and essentially through all of human existence.

It explicitly names, explains, and justifies the entire spectrum of human responsibilities.

Show What Is and Is Not Conserved

This is a double devoir and yet half what it might seem. To search for the conserved portions of nature is to find along the way, almost incidentally, the nonconserved portions that complement, contrast with, belie, or hide aback the former, or that surface through the process of elimination (in a trivial sense being paradoxically conserved).

And vice versa: the search for that which is not conserved in the universe will exhume that which is conserved, much as the erosion of a geological surface will strip away the unconservable matrix of soil that obscures great underlying rock structures.

All conservation may be relative or illusory, but the illusion can be arbitrarily strong, subtle, embracive, and refractory, and when change or loss comes at last it may be discontinuous, abrupt, completely instantaneous, and instantaneously complete—a mere quantum event—even if preceded by an eon of fixity.

It is also possible that all nonconservation is relative or illusory, at least in a sense; but obviously, once again, the illusion can be almost undetectably—or incogitably—perfect. Species of organisms may be conserved after their apparent extinction in a variety of ways or senses: perhaps tiny populations survive in transitional refugia from which they are able to reemerge at a later date; or there can be massive, coordinated, and synchronous changes of the polymorphisms of a genospecies that permit one species to on occasion temporarily disguise itself as another; or the genome or genospecies is so polygenic as to be virtually holistic, and evolution is as a result reversible to the extent that at least some vanished species are more or less reevolvable from other congeneric or

distant species; or the heterodox lateral gene flow—not the orthodox lineal gene flow—is in fact the major mechanism of evolution and heredity, in the extreme sense that the collective genomes of the bios are interdetermined and that which mainly governs, originates, and specifies the diversity and individuality of all species, and this Gaian monad has an holistic ability to recreate extinct species; or we perceive species imperfectly, wrongly, or in terms of what is least essential or defining of 'species', and we should reconceive them in other ways or through other means—as higher-order and autonomous processes, via analogical transformations, via myrioramic re-combinations, holonomically, or the like—that would falsify or render irrelevant the picture we have of species being discrete, denumerable, transitory, and monomorphic things.

The quantum-mechanical wave function may not collapse, in which case 'our' universe may be splitting continually into an endlessly branching and nowhere anastomosing tree of other so-called parallel universes that collectively realize and conserve 'all possible' universes, futures, and things. Surely a reductio ad absurdum of the conservationist point of view.

Yet the Eleatic philosopher Parmenides (b. ~BC515) went even further, by absolutely denying the occurrence of change anywhere in nature. If there is no change, then all is conserved. On the other hand, he thought that all things are actually mere self-manifestations of a single self-identical, eternal and omnipresent, reality ("Being"): a notion that really altogether transcends the very concepts of conservation and nonconservation.

Ideonomy can be used to define, address, and remember all possible types of conservation and nonconservation.

Thus saying that a thing is not conserved could variously mean that it : does, could, must, or will : decay, age, change, transform, diminish, retrogress, evolve, grow, unite or coalesce with another thing, cease to be measurable, pass without or be lost 'to' some other thing, seem to vanish, acquire a different external status, temporarily quiesce or cease to exist, become inactive ('die'), cease to have (specific or any) virtual existence, change its universal significance, divide up into parts or emit any part of itself, become redundant, lose or violate some symmetry or law, cause some other thing to not be conserved, diffuse, lose specificity or exactness, cease to perform some function or to have some role, cease to be replaced, regenerated, or maintained, e/vc.

Conversely, to say that a thing is conserved could mean the opposite of these things, or that it : does, could, must, or will : NOT do any or all of those things. In other words, a conserved thing might: endure, be immortal, be indestructible, be immutable, be increate, be invariant, be everywhere or for everything the same, be definite, be discrete, be saved, be wearless, neither grow nor diminish, never evolve, be owned, be self-existent or sovereign, be fully known, be indivisible, be indiffusible, be completely symmetric, be irredundant, have a unique function or role, never change its relationships, be unabsorbable, e/vc.

Of course, a thing can be conserved in one way and not be conserved in some other way, or for some other thing, or in some other sense...

New forms of conservation are continually being found, and old forms of conservation proving violable; also, apart from the last, new nonconservative aspects of things are forever being discovered.

Ideonomy could be used to systematize and expedite this entire process.

A surprising discovery that occurs repeatedly is that things are conserved to some degree or in some form or sense, or things that are conserved exist that were not previously known to exist, in situations that one would have thought to be fatal to such, or perhaps to any, conservation. For example, things are conserved despite: chaos, extreme violence or temperature, attempts to randomize or destroy things, extreme transformation, negation of laws, translation to a wholly different medium, context, or regime, the passage of vast quantities of time, revolutions, extreme complexity or complication, injury or disasters, noise or entropy, great interference or distortion, extreme simplification, substitution of one phenomenon or science for another, recourse to a disparate method, conversion to a different system, reference to another person, or fanatical attempts to prevent conservation.

Illustrative examples of some of the discoveries that might be made in the future, regarding tendencies of things to be conserved, are: that no information can be lost from the universe, that memories undergo curious transformations in the brain but are never destroyed or never cease to be active, that many-body systems conserve 'memories' of their earlier states or history, that social problems are surprisingly conservative, that certain almost arbitrary patterns that accidentally developed in the extreme infancy of life on Earth persist to the present day and virtually permeate the bodily systems of every living organism, that the population of certain classes of singularities in the universe—or perhaps their spatial density—must be absolutely conserved, etc.

Examples of things that it might be discovered are not conserved are: truth (say its definition or state, over great time or sociogenesis, through scientific revolutions, or for all possible minds or artificial intelligences), undisturbed protons, life based upon nucleic acids or carbon (if there is life elsewhere in the cosmos), personal identity (or self-identity) over a lifetime, 'energy', the laws of nature that we look upon as fundamental, timeless, and universal, the meaning of a word between any two uses or over any two applications, the properties of seemingly identical classes of stars in different galaxies, molecular structure in different molecular environments, molecular structure throughout the lifetime of a molecule, certain ethical precepts or judgments that we would consider to be truly timeless or absolute, the morphogenetic tendencies or laws of the atmosphere—e.g. in the production of cloud patterns—over geological time (or vastly greater but still finite, and supposedly thermodynamically equivalent, time), etc.

To what extent is the "characteristic" structure of a cell actually conserved over the cell's whole life or that part of its life when it is supposed to be absolutely fixed? This is important to know because it might have implications for the nature, measure, causes, and effects of organismal aging, for example; even if the structure turns out to be extremely conservative, since then some small residual element that is not conserved, or that is extremely evolutionary or clocklike, may have disproportionate importance.

Uncover Content

Ideonomy may have a remarkable ability to predict the unknown or inaccessible content of things through indirect analogical reasoning combined with sophisticated statistical methods that are able to reveal surprising mathematical structures existing in the world of ideas or that are implicit in ordinary thought.

The ideonomic discovery that the most important or truly essential things in nature recur everywhere, in everything, all the time, in infinitely many ways, and in infinitely many forms, certainly must apply to the content, composition, and parts of things as well. One rather simple reason for this is that the notion of 'content' includes many things to which the enunciated principle does apply: e.g. shapes, properties, laws, and processes occur within things, often enough, and they always do so in certain senses; also, all examples of them of which we know are necessarily included within innumerable larger, or more inclusive, things. (Ideonomy derives much of its power from deceptively simple truths and reasonings of this sort, whose inconsequentiality is merely apparent.)

Content, it should be understood, includes both spatial and physical content, and content of a nonspatial or abstract nature.

We are largely or totally ignorant of the possible or actual content of many physical phenomena and conceptual objects. Often the reason for our ignorance is a matter of a present lack of tools or other means or ways for gaining access to content. This is one reason why it would be so delightful if the new science of ideas turned out to confer upon scientists and other intellectuals new and unique powers to examine that which things may or do contain, or the general system of containments of all things in the infinitely complex and strange fabric of reality.

In one sense it would be as if there were to be made available for research a universal x-ray machine for every sense of black box there is.

Generic questions worth asking and answering about the content of things include ones about: the order in which things are contained in the spatial, temporal, or qualitative content of things (e.g. the radial sequence of successively more internal layers or geospheres of the Earth, or the successive sub-plots or sub-symbols of a novel), classification of the content, total and virtual content, transformations (both physical and abstract) and equivalences of the content; clustering, mereology, and interdependences of the content, and contents at once shared with other things; hierarchic aspects of content, self-similar and self-dissimilar internal structure and composition, that in or of the content that is necessary or is instead accidental, fallacies and illusions regarding content, dispersion of content, variability of content; the causes, origins, geneses, histories, and dynamics of content; the effects, importances, interests, values, uses, and corollaries of content; addable, subtractable, and alternative content; related and unrelated subsets of content; non-content (nonexistent contents), etc.

Ideonomy can help discover, formulate, and perfect procedures, methods, tactics, and systems for treating the content of particular and general things.

The general phenomenon of containment is apt to give rise to various generic subphenomena of containment; or similarly, the general concept of containment should be associated with generic sub-concepts of containment.

Containment implies a limit and a boundary, for example, and things : such as exclusion, compression, fitting, compromise, local interaction, accomodative processes, internal organization and efficiency; distortion; stratification, compartmentation, and compartition; temporal cycles, organization, sequencing, specialization, development, and branching; formation of poles, gradients, channels, interfaces, gates, evaginations, and invaginations; symmetries, asymmetries, inequalities, equilibria, vergences, paths, etc : that may or may not be related to such a boundary and limit.

Containment may imply, among other things: energy, work, movement, maintenance, the possibility of failure, differentiation, ownership, individuation, induced patterns on smaller and smaller scales, extensive couplings of processes, tension, stress and strain, co-optation, homology, predestination, inversion or eversion, reciprocal exchange, discontinuity, autonomy, heteronomy, discriminatory mechanisms, containment elsewhere (and hence multicellularity), reciprocal containment, 'quantized' containment, progressive containment, simplification, network development, thresholds, dynamic feedback, etc.

For a variety of reasons it is important to know 'fine' content: it may be a source of trouble; it may perturb, distort, corrupt, or otherwise alter a thing; it may have disproportionate importance, be central, or take on an organizing role; it may represent a critical but unresolved background or continuum; it may be the beginning or end of the more gross content; it may be what interlinks two whole things that seem unconnected or unlike; etc.

The content of a thing may contain its: history, basic elements, surprises, raison d'etre, defined potentials or limitations, governing program, etc.

As an example of how the contents of one thing may have a heuristic power to suggest the contents of some different thing, the contents of a molecule and the contents of the atmosphere might be speculatively compared. Might a molecule contain any direct or subtle analogs of such atmospheric constituents or inclusions as: clouds, jet streams, meridional circulation cells, storm fronts, rainbows, tornadoes, lightning, clear air turbulence (CAT), regional climates, aerial blobs (discovered by Fritz Zwicky), geochemical cycles, precipitation phenomena, hot and cold air masses, Rossby waves, and Greenhouse Effects?

Conversely, might the atmosphere contain analogs of such molecular constituents or inclusions as: bonds, van der Waals forces, the mobile parts of fluxional molecules, electronic clouds, molecular branches and chains, rings, associated molecules, functional groups, electron pairs, and heavy-metal centers?

Where the contents of things include, or are arranged in, a sequence of mutually contained (e.g. spherically concentric) layers, there are often holes or tubes between or that cross the layers: witness the pores on the nucleus of a cell (and analogs on the plasmalemma itself), radial tubes that are revealed in the cross section of an apple or tree trunk, central volcanic conduits and plumes that (at minimum) cross Earth's crust, atmospheric sinks and convection cells that cross one or more layers, pores crossing several

layers of skin, etc. Might like elements be contained in, or characterize the layered contents of, things such as: atoms (their electron shells and/or nuclei), geodes, stalactites, stars, galaxies, or the ocean?

There might also be recurring sub-features of these holes or tubes among multiple layers that would have further predictive, heuristic, and directive value.

Identify Contradictions

One of the most important methods of thought is dialectical reasoning, which often postulates that things will give rise to their antitheses and these spontaneous or internal contradictions will then lead on to creative syntheses.

But contradictions and their identification are important for many reasons.

Inconsistencies in logic or procedure may be indicated that can vitiate results or needlessly complicate undertakings.

Contradictions may prove to be the source of problems; and knowledge of the classes of contradictions that occur universally can be translated into knowledge of problems, and of the possible classes of solutions to both contradictions and problems.

Where contradictions exist they are apt to be associated with certain existential signs and diagnostic clues, whose treatment ideonomy could formalize.

As with everything else in ideonomy, hypothetical and actual contradictions occur in elaborate hierarchies, networks, lattices, chains, progressions, vergences, idiomorphous manifolds, etc, and these meta-patterns can be isolated, described, explained, and applied in ever more universal, complete, and powerful ways.

Contradictions may be arbitrarily distant, diffuse, subtle, and abstract, and yet remain crucial. Ideonomy could help to call attention to the existence of such contradictions and assist, generally, with the working out of their consequences or with their actual resolution.

What are the fundamental reasons why contradictions arise?

Do things in general really tend to cause, attract, or be associated with their opposites—or perhaps things of an inconsistent, antagonistic, qualifying, moderating, subversive, incompatible, totally different, or transformative nature?

Does the start of a thing really contain the seeds of the thing's ultimate undoing?

Do things depend exquisitely on their pristine environment, so that the moment they originate they must paradoxically modify that environment and modify themselves, and hence create a problem for their own existence that is equivalent to a contradiction, or perhaps to the start of an infinite series of growing contradictions?

Do the symmetries and asymmetries that define things produce contradictory asymmetries and symmetries?

Is the natural world to be reconceived as a system controlled by the flow of some analog of information, with which, however, tiny errors or discrepancies are associated from which natural 'contradictions' continually and progressively evolve?

Are all things so much more complex or specific than believed that they are only naturally associated with contradictions, both in the physical world and in the human mind?

Or is it that all our ideas about things are so unsuspectedly complex, specific, and contradictory? Or that there are infinitely many ways in which things can be contradictory; that contradiction itself, in other words, is infinitely complex and multifarious?

The infinite universality and interconnectedness of phenomena that is revealed by ideonomy imply that whenever an apparent contradiction is discovered in nature or thought, an infinity of corollary contradictions must also have been discovered or must also exist, even in the most disparate fields.

Thus a discrepancy between the predictions of two economic theories or hypotheses, should it amount to a contradiction, may imply or require the existence of identical, analogous, or abstractly derivable contradiction in the theories, hypotheses, formulated laws, reported data, concepts, or postulates that exist within, at once: physics, mathematics, logic, chemistry, biology, astronomy, sociology, ethics, art, geology, psychology, etc.

To the extent that such universal contradictions, or contradictory universals, are not known, or are not possible within the framework of current science, science as we know it is empirically, theoretically, and logically imperfect.

Map the Structure of Controls

What are the ways in which one thing controls or governs another, or in which all things are mutually controlled and governed?

Ideonomy can be used to progressively map out such cybernetic structures; or, in other words, to universalize the science of government—a subject that should never have been restricted to the formal means by which people govern themselves, or to human beings at all. Organisms govern themselves, as also do machines, nature's inanimate phenomena, minds, and ideas in minds. One is tempted to say that political science is the most artificially restricted of sciences; but then one thinks of economics.

What are the general types—or genera—of things that can be controlled or governed, or that it would be especially interesting or important to discuss or investigate the control or government of? Probably such things as: growth, flow, self-maintenance, transformation, behavior, cooperation, processes, environments, hierarchies, networks, sequences, languages, evolution, interaction, conflict, mechanisms, events, phenomena, and communication.

On the other hand, some of the more specific or particular things whose actual or possible government or control would be worth treating are: human thought, perception, action, psychology, consciousness, values, or creativity; dog fights, plant movements, biochemical cycles, psychogenesis, ontogeny, sociogenesis, military battles, corporate management, the legal system, linguistic evolution, plot of a novel, meaning of a painting or sonata, operation of a television set, computer program, genesis or course of an earthquake, volcanic eruption, crystallogeny, disease course, football game, mob's riot, chemical kinetics, anthesis, planning and subsequent construction of a bridge, progress of a chess game, cosmogony, course of a storm, birth of a star, Brownian movement of a particle, rock exfoliation, flocculation, combustion, marine upwelling, and the structure and expression of the Mandelbrot set.

When a thing is governed or controlled, what are the generic : qualities, dimensions, parts, functions, levels, rates, subsets, relations, cycles, wholes, potentials, paths, ranges, domains, combinations, permutations, equilibria, nodes, forces, tendencies, errors, reactions, etc : that tend to be governed or controlled or that government or control tends to involve?

What are the kinds of ways in which such things may be controlled or in which government may involve them? What are the recurring combinations and systems of the things, or the ones that produce given types of effects or serve different classes of ends?

What are all the possible forms, senses, and degrees of government and control? Where are they applicable or exemplified? What are their systematic interrelations and interdependences?

What is ungoverned or uncontrolled, or such in various possible ways?

Where would diverse things fall if placed on scales of degrees of general or special government or control; or if the governed or controlled aspects and elements of those things were so placed?

What forms and systems of government and control do not exist?

What are all present and possible values and uses of governments and controls?

Science to date has successfully analyzed the government of things only in the most superficial ways. In connection with the government of virtually anything whatever there remain thousands of unanswered—and unasked—questions and thousands of unsolved and momentarily insoluble problems. There is a battlefield visible but the battle has not yet been fought, and one is almost tempted to add that a state of war has yet to be declared.

Yet mastery of the control and government of things is a supreme goal of all science and of all technology.

The system of serial and parallel controls whereby a plant's genome directs and monitors the blossoming of a flower is certainly at least as complex as the system of mechanical and electrical controls that regulate the flight of a plane or the production of various distillates from crude petroleum by a refinery.

If we can crack the problem of how an atomic nucleus or the Dirac vacuum governs itself, we will probably be able to tap stupendous latent energies and powers. The self-governing laws of the vacuum may be the key to at last understanding in a fundamental way the nature and origin of the universe.

Perhaps if we understood the self-governing laws of the individual neuron, comprehension of the brain's large-scale mental processes would be but a hop, skip, and jump away.

What are the universal paradoxes of government—such as that power can mean impotence, that what governs least may govern best, that what governs is governed in turn by what it governs and as a direct result of governing, that government may have the problem of being itself ungoverned or even ungovernable, that government may be a cause of anarchy, that freedom may be necessary for government (as government may be necessary for freedom), that the creation of government may presuppose government, that government may obviate itself, that government generates a need for more government, that the attempt to govern a thing disturbs and alters the nature of the thing and engenders a need for a new approach to governing, etc?

What are the different ways of achieving government, or the diverse things that mediate it, such as: information, communication of orders, general instructions, control over supply, laws, programs, plans, procedures, primary structure or substance, indirect influence, catalysts, habits, goals, incentives, interventions, supervision, training, force or compulsion, proxies, paths or channels, rewards, inhibitions or negations, answering, isolation, induction, mechanization, rigidification, reconstitution, distribution, cybernetics, delegation of responsibility, self-control, calculation, problem-solving, thought, etc?

What governments of governments of governments... (or controls of controls of controls...) are there? What are their meta-structures: hierarchies, networks, chains, etc?

To what extent can the control structure of one thing be mapped onto the control structures of any or all other things? How can different governments of different things be compared, and in what diapason of ways are they analogous, different, and orthogonal?

What are the limitations, errors, and defects of the controls and governments of things? What would the things be like without their controls and governments?

Suggest Creations

Ideonomy can be used to define or visualize all possible things and categories of things, all the uses and values of the things, all ways of constructing or achieving the things, and all human needs and wants.

It can look beyond what already exists or has been previously imagined to entirely new things wholly unexemplified in civilization or nature.

In particular, it could be used to suggest, schematize, or prefigure new works of art that might be of interest to artists who are searching for ideas concerning what to do next or who wish to 'shop around' and compare the various alternative possibilities.

Composers might use ideonomy to conceive of novel musical forms, sounds, instruments, combinations of instruments, melodies, themes, rhythms, procedures, relationships, systems, chord progressions, mathematics, qualities, effects, and 'probabilities'. Or inversely, composers who independently think of such things might subsequently turn to ideonomy to express or explore all possible variations upon them.

But consider the full spectrum of the genera of things whose creation ideonomy could stimulate or suggest, including new, novel, or revolutionary: institutions, laws and regulations, political programs and parties, human rights and values, building designs, styles or pieces of dress, book types and structures, mathematical graphs; words, word-forms, and linguistic systems; foods and tastes, smells, haptic textures, life events, industrial goods and services, taxons of molecules and chemical reactions, joke types and modes of humor, human character models, types of creations, political systems and mechanisms, life-styles and careers, logical arguments (sic), academic courses and curricula, teaching methods and goals, machine types, furniture types, recreations and games, rules of thumb and mnemonics, tests and experiments, research techniques and instruments, laboratories and professional teams, forms of interdisciplinary research, subfields of science and mathematics, drugs and medical therapies, appliances and other personal machines, computer architectures, media and divisions of art, names

for people and places, logograms, museums, philosophical systems, robots, organons and calculuses, human genomes, species and kingdoms of organisms, dimensionless numbers and physical constants, scientific laws, metaphors and symbols, business contracts, corporate and industrial structures, electronic circuitry and components, types of crime, colors, dance movements, forms of remark and conversation, neural nets, ways of raising children, types of fireworks, and forms of human progress.

In this role ideonomy could be spectacularly coupled with computer graphics, animation, simulation, and design—and with computer-aided manufacturing (CAM) and artificial intelligence—programs and systems.

Augment Creativity

Many methods for enhancing creativity have been identified and written about at length: juxtaposition of dissimilar things, free association, suspension of habits, reversal of normal behavior, substitution of one thing for another or simultaneous interchange, randomizing of actions or experience, epoche, exploration of one's ignorance, adopting another person's viewpoint or looking at matters from a fresh or unusual perspective, concoction of a new theory or hypothesis or then working out its consequences; examination of one's assumptions or of the theoretical, logical, or empirical bases for one's beliefs; asking of new questions, attempting to answer old questions in new ways, relaxation of criteria or experimental negation of one or more axioms or postulates, trying out of new models of things, contriving of gedankenexperiments to see where they might lead, disregarding authority or challenging received opinion, transference of some idea or method from one context to another, postulating intermediate or hybridal things, indulging one's fantasies or wishes, trusting logic over intuition or intuition over logic; trying out what is manifestly or presumably absurd, wrong, or bad 'just for the sheer hell of it'; imitating the methods, tactics, or style of some other individual; obviating a need, making one's expectations conscious or experimentally predicting things, pushing possibilities to extremes, introducing order into one's thinking; pursuing chains, trees, or networks of ideas; postulating some outcome or future state of affairs and then trying to imagine what sequences of events or logical steps could possibly or alternatively lead to it, changing the relationships between things to see what might happen or what it might mean, trying to define or explain things in new ways, attempting to synthesize many things or to get an overview of them, investigating new domains or categories of things, switching one's goals, seeing what happens—in imagination or fact—if one changes things, contemplating how one might improve or perfect things, scrutinizing the environment to see what is missing, needed, or possible; taking risks, exploring analogies or metaphors, looking for discrepancies or contradictions, constructing paradoxes, pushing arguments, reasoning dialectically or simply arguing heatedly with oneself, trying to classify or reclassify things, criticizing or laughing at things, attempting to describe things in the utmost detail, trying to maximize the rigor of one's assertions, trying to elaborately correlate different things, etc.

But such methods in themselves have limited value.

What they really require is something like ideonomy. Without it they are little more than shells, words, abstractions, undifferentiated methods, glimpses of what might be possible, unloaded trucks, unfueled airplanes, prayers, or a wordless grammar.

Ideonomy can supply them with a conceptual road map, with the grand architecture that defines all of the dimensions and describes the basic structure of everything that exists and of all that is possible, with a comprehensive and systematic library of universal concepts (of every higher and lower order), and with a public warehouse or cosmic entrepôt of eminently useful and combinable ideas.

Moreover, since most of the methods listed above for promoting creativity happen to correspond, either directly or indirectly, to divisions of ideonomy, it is almost as though the new science had been expressly fashioned to be the handmaid of creativity or the octopean servant of those methods—which in good part it was.

Many of the methods also correspond to the present or appropriate, either major or minor, methods of ideonomy itself.

In any case, ideonomy can and should be used to systematically clarify, improve upon, and further differentiate—as well as to interconnect—the set of all such methods. It is ideally suited to the Promethean task of discovering and constructing the 'ultimate periodic table' of methods, ways, devices, and other means that, alone or in combination, could: aid, diversify, perfect, maximize, and complete the personal, integral, and final creativity of the human race.

Many of the creative methods could be used together and would by no means be redundant; powerful, complex, and subtle synergisms can even now be foreseen. Here again ideonomy has a role to play, as a natural tool for discovering and exploiting possible, optimal, and paradoxical synergisms.

Refine Criteria

Criterions, which are little tools for judging or evaluating things, can be most valuable.

Ideonomy could help the human race discover maximally universal, few, fundamental, transcendental, interesting, powerful, simple, useful, uniform, comprehensible, scale-invariant, complementary, transdisciplinary (multidisciplinary), etc : but also maximally diverse, specific, complex, disparate, etc : criterions for things, or : standards, standards of reference, yardsticks, grounds, expressions, marks, or traits : for : evaluating, judging, or making decisions about : things' : differences, analogies, homologies, laws, capacities, potentials, relationships, defects, limitations, causes, behavior, roles, importances, states, properties, conditions, degrees of excellence, utilities, classifications, inclusions, exclusions, taxons of order, existence or nonexistence, validity or invalidity, probabilities, interdependences, essences, forms, mathematics, systems, mechanisms, coordinate systems, scales, products, proper treatment, needs, stresses or strains, progressions (or levels of advancement), successes or failures, transitions or thresholds, simplicities or complexities, convergences or divergences; equivalences, identities, equalities or inequalities, or commensurabilities; etc.

Ideonomy can likewise assist with the progressive discovery, development, and use of: criterions for judging, developing, recognizing, and comparing other criterions; sub-criterions; hierarchies, series, chains, networks, manifolds, generators, clusters, "groups", governments, combinatorics, transformations or intertransformations, etc of criterions; etc.

It can also help answer questions such as: What are the functions and roles of criterions? For what other things, or in what other ways, can criterions be used? What are all the things that are analogous to and yet different from a criterion, and all the relationships they bear to same—including all the ways in which they and criterions cooperate or could be made to cooperate? What have been the patterns of evolution of criterions over historical time, and how might they go on evolving in the course of the future? What are all of the different ways of defining criterion, all of the interrelations of these definitions, and all of the arguments for and against them?

What are all of the different dimensions for evaluating and criticizing any criterion? What are all of the ways, methods, and means for refining a criterion, through or in terms of such dimensions? What are all of the general and specific criterions that allow or require such refinement, and what are all of the direct or indirect changes and improvements that are apt to follow from such refinements—in terms of the various specific and general things to which the criterions apply or relate?

More narrow and specific examples of refinable criterions in a variety of fields, that might be worth mentioning here for illustrative purpose, are or would be criterions: of proof (of guilt or negligence, or of a mathematical assertion, scientific hypothesis or theory, etc—in law, mathematics, or science); for diagnosing or prognosing physical or mental diseases, of an adequate diet, or of toxicity (in medicine); for arranging compounds into groups or defining an acid (in chemistry); for recognizing or judging genius or greatness of character or assessing the identity of a sensation (in psychology and philosophy); for deciding whether a course of action or conduct is ethical or indecent (in philosophy); for telling whether a memory is correct, categorizing an unpleasant or mixed dream as a 'nightmare', or deciding whether a story is funny or constitutes a 'joke' (in psychology); for telling whether someone understands a formula or for distinguishing conics (in mathematics); for deciding upon the identity of a person (in psychology or sociology); for calling a star unstable (in astronomy); for (recognition of) achievement of 'true' (or human) artificial intelligence or of a self-sustaining controlled nuclear fusion reaction (in technology); for deciding that a stage in (an) ecological succession is a 'climax' community, placing an organism in one taxon or another, or categorizing a neuron as 'excitatory or inhibitory' (in biology); for deciding that a military engagement represented a real battle (in military science); or for classifying an ancient society as having been 'nomadic or agrarian' (in archaeology).

By identifying as many criterions for mathematical or other 'proof' as possible, or a far greater number than are ordinarily recognized or considered, ideonomy could promote the reign of a much more complete, comprehensive, certain, uniform, suggestive, and useful proof, a closer and more rapid approach to absolute truth everywhere in science, and higher standards of scholarship and human logic.

Better criterions, in general, could improve perception, intelligence, and action; lead to more healthy foods; make for more purposeful scientific and technological research; perfect psychometric and sociometric testing; conduce to more prudent international negotiations; result in less ambiguous and more enforceable legal contracts; aid efforts to mechanize intelligence; and facilitate the interplay and interconnection of the many divisions of ideonomy, and the diverse application of its methods and organons.

Heighten Critical Awareness

Criticism is vital to the development of civilization as a whole and, on the scale of individuals, to the achievement of a better life.

Surveying the role of criticism in our world, one finds it to be both great and meager.

Great because it is so widespread and continual, and a factor in so many types of things.

Meager because there is obviously so much more that it could and should include and do, so many opportunities for it that are wasted, and so many defects, shortcomings, and evils that are missed by its lovably cold eye and fiery voice.

Perhaps the keenest critical need that society has is for the educating of its members in the critical habit. For this task ideonomy has aureate promise. It can be focused upon a single and arbitrary thing to reveal the unexpectedly obvious, extreme, fundamental, endless, and important : flaws, errors, crudities, problems, lacks, costs, dangers, inconsistencies, misfeatures, failures, mediocrities, illegitimacies, arbitrary aspects or accidental character, abusability, disharmonies, obsolescence, stupidities, inconveniences, incapacities, fragilities, deceptiveness, inutilities, corruptions, etc : thereof. The lesson can be shocking, transforming, and permanent: a window to another world.

It can train individuals in the general alphabet and grammar of criticism, and at the same time accustom them to the language and idea of systematic improvement and attainable perfection.

It can prepare vast, diverse, universal, well-tested, and ingeniously meaningful scales of badness and goodness—encompassing the entire world of phenomena, things, events, and human values—and with these develop and perfect the awareness of mankind of what is wrong and right, and of what things are and are not. With scales such as this judgment and sensibility can be made razor-sharp, the critical faculty can be made quantitative and maximally multidimensional, the power to intuit and describe the real worth of things by means of analogy can be augmented, and the critical sense can paradoxically be made more absolute.

By discovering and exposing one to the totally universal nature of things, phenomena, and ideas—and of the criticisms thereof, when properly understood or suitably reconceived—ideonomy can equip individuals with a priceless new ability to consciously or unconsciously transfer criticisms of one thing to other and seemingly totally different things, or to all things, independently of the subject or situation in which the things occur.

As a result, ignorance of what is good, better, or best—or bad, worse, or worst—in the case of one thing can be corrected or clarified by existing or obtainable knowledge of the objective or considered virtues and vices of something else, that traditionally would have been thought of as having little analogy or no analogical value.

It needs to be stressed that the common defects—or evaluative dimensions and features—may not just be isomorphic; they may also have shared, complementary, identical, or profoundly interdependent laws, processes, mechanisms, structures, and essences, and they may even be homologous. Moreover, they may not just reflect or duplicate one another—in which case they would have practical value while remaining essentially tautologous—but instead may actually have something fundamentally irredundant, or even unique, irreplicable, and necessary, to say about one another's nature or mutually self-transcendent, worldly meaning.

Criticisms of any of the following things may therefore at the same time represent actual, potential, necessary, or kindred criticisms of any or all of the other things, or at least may be of surprising value in developing criticisms of those things: appliances, stars, poems, nations, mathematical formulas, ordure, clouds, fish, world currencies, faces, personalities, medical therapies, religions, and military strategies.

As ideonomy extracts and combines criticisms from different fields, it may discover powerful synergisms.

The new science of ideas will also lead to the discovery of various structured sets of criticisms and to the development of specialized organons based on these collections and combinations of criticisms that are ideally suited to broad and endless reuse in the systematic, intelligent, efficient, and productive criticism of particular things, narrow topics, or standard issues.

For example, organons for criticizing, say in a fixed format or conceptual framework, formulaically, in a certain sequence, via some type of ideogram, or in an interactive idea space on a computer, such things as: papers in microbiology, student assignments, new motion pictures, job applicants, legislative proposals, a person's manners, works of art, one's own ideas or behavior, or redundant suitors.

By heightening critical awareness, ideonomy might cause individuals to: improve their friends, embark on a different career than they would have, be more discriminating shoppers, read the weather better (as a result of being more critical of their own meteorological impressions and logic), decide to move to another neighborhood or a different city, learn faster from other people, compare the behavior of two supposedly interchangeable ants, read textbooks more analytically, or reflect more carefully upon each day's events.

As a result of the use of ideonomy: a company might notice a way to improve its product or an opportunity to introduce a new product, the dead hand of the past might have a weakened hold upon future generations, a composer might reduce the muddiness of her orchestration, mentally retarded individuals might acquire a greater ability to learn or adapt (thanks to an autocritical program or mnemonic), scholars would be able to be even more brutal in their reciprocal denunciations, court complainants might be more meaningful and precise, and humorists might be more uproarious.

Take Account of Cycles

Everything in the world is at least in some sense cyclic—waxing and waning, and doing so repeatedly and perhaps periodically. Things may be directly or intrinsically cyclic or they may be affected by or reflect the cyclic behavior of other things.

Nature may have an infinite number and an infinite variety, range, complexity, and even density of: cycles, cyclic aspects or dimensions, and cyclic phenomena.

The cyclicity of the universe may be so rich that it disguises itself as what appears not to be cyclic or not to exist at all.

Ideonomy can help with at once the discovery, analysis, explanation, and exploitation of such cyclicity.

Cycles can be far more complex, strange, and wonderful than has been assumed. Cycles can, for example, be N-dimensional and N can be arbitrarily large.

Successive cycles may have odd symmetries and asymmetries.

Cycles can be polyphasal and the number of phases arbitrarily high.

There can be arbitrarily complex spaces and manifolds of cycles, and simple or arbitrarily complex couplings of two or arbitrarily many separate spaces and manifolds.

There can be spaces of spaces of spaces... (and manifolds of manifolds of manifolds...) of cycles; there can also be cyclic spaces and manifolds.

Hierarchies, networks, plexures, lattices, clusters, trees, vergences, "groups", "categories", and other meta-structures and meta-patterns : of cycles can exist in principle, and probably must exist in fact. There can be cycles of higher and higher order and of lower and lower order.

There can be at once the following things of cycles and cycles of the following things: taxons of order, shapes, structures, changes, flows (sic), processes, etc.

There can be arbitrarily quasi-cyclic and crypto-cyclic things (things masquerading as cycles, that is, and cycles masquerading as things other than cycles).

Ideonomy can help us to discover and describe all of these things.

It can specify or suggest cycles': causes, controls, governments, morphogeneses, geneses, origins, ends, effects, roles, functions, implications, types, taxons, laws, relationships, correlations, interactions, conflicts, synergisms, self-relationships, spectrums, extremes, probabilities, opposites (sic), individualities (idiographic aspects), conservations and nonconservations, cybernetics, distributions, commonalities and similarities, differences, transformations, equivalences, random and chaotic aspects, processes, needs, morphisms, identities, histories, wholes, contents and parts, fields, etc.

It should be possible, over the future, to reduce more and more cycles to a hierarchy of ever more : fundamental, unified or dissociated, few or numerous, simple or complex, universal or special or local, eternal or brief, high- or low-frequency, biphasic or polyphasal, etc : cycles, and causes, laws, types, etc of cycles.

Ideonomy can be used to find and define all of the interrelationships between temporal cycles and spatial periodicities, including the ways in which they : cause, map onto, are analogous to, or are homologous with : one another.

The infinity of possible and actual types or measures of quantities of things can be progressively defined or discovered by ideonomy. All of these quantities can be cyclic, or things can be cyclic in terms of them all, and all can in turn be used to characterize cycles in general, and many, to characterize particular cycles and cycles of particular things.

Many, even infinitely many, cycles will be purely or partly relative, in respect to their qualities, quantitative aspects, and even existence. Infinite parallel worlds of independent modes of existence will diverge from one another, in the case of cycles—as with all other things.

Cycles essentially mean that things, variously: come and go, rise and fall, intensify and weaken, vary constantly; oscillate between extremes, states, or degrees; invert, reverse, disappear and recur, accelerate and decelerate, alternate, chain, abhor invariance, change symmetrically, are crypto-stable or quasi-unstable, are circular, involve positive or negative feedback, polarize and depolarize, involve interchange or reciprocity, require contrast to exist or be meaningful, are self-limiting, rotate or orbit, vibrate, vary incrementally, vary in stages, vary periodically, interfere with or complement one another, saltate, vary in a binary manner, pulsate, etc.

By studying known cycles carefully we can learn how to predict the existence of undiscovered cycles and undiscovered aspects of other known cycles.

Cycles can be 'woven' arbitrarily deeply 'into' one another and into the fabric of other things or of the world as a whole.

Ideonomy can enable the universe to be reseen in an infinity of ways —as it looks from the perspective of all possible cycles.

What is cyclic and what is not cyclic, and how are they interrelated?

If one negated or suppressed certain cycles, or certain cycles did not exist, what cycles—or noncyclic phenomena—would take their place?

How many cycles and types of cycles are there in: the human body, brain, or mind, or in life, society, or human history; a cell, the biosphere, or the evolution of life; music, chemistry, economics, physics, or mathematics; or geology, climatology, astronomy, or the universe as a whole?

What is the order of the relative importance of all of the different cycles that exist? Which cycles are cause or effect of which other cycles?

What do we not know about cycles and what do we most need to find out?

Arbitrarily complex cybernetic circuitry can be built up out of cycles, and even from absolutely identical and simple cycles.

There can be modular cycles.

There of course exist rings of cycles.

Some cycles may 'violate' time, by appearing to have retrotemporal or ex-nihilo arms.

Cycles can be diachronically discontinuous or quasi-discontinuous.

Cycles may be dispersional, diffuse, or holonomic. They can be noise-like and quasi-random.

They can breed, control, and compete with one another; they can also define one another.

They can evolve, even anamorphically. They can branch, divergently and anastomotically. They can form coaxial bundles.

They can undergo projective-geometric transformations; they can map onto, and off of, things and processes.

Cycles can be 'negative' (sensu being interstitial or defined by their isomorphous absence in a matrix, solid, or quasi-continuum); and they can evert.

The topology of cycles can be arbitrarily specific, strange, and/or complex. There can be differential-topologic cycles.

Diachronically, cycles can either be point-like or move in space. They can be or mimic solitons.

Cycles can be arbitrarily stable or arbitrarily metastable; they can be protean.

Cycles can be absorptive and ever-growing; even infinitely hypertrophic. They can also be (infinitely) efflorescent or chaotic.

Cycles can form tangles and knots with one another or themselves; and give rise, in these or other ways, to nodes and nodal networks. They can be aegagropilous. They can be turbulent—just as turbulence can more or less be made up of them in turn.

Cycles and 'crystallographic' patterns intergrade as a continuum, that is paradoxical in some ways.

Cycles also intergrade with all mathematical series (that is, the universe of cycles intergrades with the universe of series) and together they form a continuum with transfinite anastomoses.

Cycles can have a purely virtual existence (e.g. in future retrospect, as examples of 'purely a posteriori order').

Cycles need not be a merely linear function of time, or whatever; they can also be logarithmic, hyperbolic, or arbitrarily nonlinear. Indeed, they can exist in virtually any number system or set of such systems.

Cycles can be objective or quasi or wholly subjective (or intersubjective).

Cycles of course include the set of all (known or possible) types of waves.

Cycles can have : spatial, temporal, or abstract : periods ranging from infinitesimal to adinfinite; and from arbitrarily fixed, rigid, or delomorphic to arbitrarily complex, diversely recurrent, or idiomorphic.

Cycles can be nongeometric (purely topological), e.g. as fixed-point cycles.

Cycles can exist that occur only once or less than once (fractionally often).

Cycles can resemble—and they continuously intergrade with—spirals, helixes, helicoids, Peano curves, et alia.

The reason for presenting the above menagerie was to dramatize in the minds of readers the horrendous and yet little appreciated complexity and queerness of that future problem of civilization and science that is called reality. New instruments, or weapons, are needed to tame the intellectual and existential jungle that confronts us, and the potential importance of ideonomy should be seen in this, more realistic, light.

Improve Debate

Ideonomy can create new issues that have never before been debated or even conceived of, which can greatly and perpetually freshen debate.

Debate plays a role at all levels in our society: from the United Nations Security Council and General Assembly on down to the competition of candidates for political office, the boardrooms of corporations, the chambers of courts wherein wily lawyers lock horns for spoils, public fora, and the little dramas staged by forensic clubs in local high schools.

But no reason to stop there: spouses happily debate, even at impossible hours; motorists argue with traffic cops, and even with one another, in the wordless—or mostly wordless—debates represented by their lazy jockeyings for road space; teachers lecturing classrooms effectively debate with the minds of their students, even when there is no overt exchange or response; one debates, imaginatively, with the author of a book one is reading—and more constantly, with one's own id and superego; perhaps even neurons 'debate' with one another.

Nor there, if one thinks, in an ideonomic way, about the essential, decomposable, metaphoric, and generalizable meaning of this under-defined and misconceptualized thing we term 'debate': for birds debate with their neighbors over where the boundaries of their territories are or should be located; companies basically debate with one another over the setting of a proper price for the same products, and they 'debate' when they compete for finite customers; surely, even if unacclaimedly, alternative biochemical pathways or processes are engaged in uninterrupted and collective 'debate' as they compete for : priority, dominance, command, control, acquisition, retention, exclusivity, recognition, freedom, access, development, innovation, universality, perquisites, security, etc : with respect to or in terms of finite : 'commodities' (raw, processed, and synthetic materials and manufactured structures and devices), energies, sites, territories, space, scarce and advantageous information, attention or order-taking messengers, redundant (as well as irredundant) pathways, and systems, facilities, and services (for transportation, manufacture, building, communication, maintenance, inspection, government, storage, protection, or even analogs of aggression, publishing, data-processing, calculation, research and development, education, or recreation—the latter things for harmless or heuristic experimentation, library research ⟨say in the 'stacks' of the genome⟩, training and maintenance of skills, reschooling, coordinative and invigorative exercise, and challenging and life-simulating play) : throughout life, in ontogeny, and in phylogeny...

...In physical chemistry similar 'debates' may occur (one thinks of the complexities of chemical kinetics and opalescence); immunologically, the body often seems to 'debate' with itself, or among its subsystems or components, over the proper way to fight a disease or an invader, or even about how to treat or define itself; in the case of the dynamics of the Earth, the atmosphere's systems (storms, air masses, cyclones, jet streams, and convection cells) seem to 'debate' among themselves over the 'proper' (i.e. derivative) circulatory structure and climatic course of the atmosphere, the ocean's currents and systems may similarly 'debate' the circulatory course, structure, and 'climate' of the sea, and in the bowels of our planet a third such debate, or series of debates, may be conducted (with outcomes, quite literally, shifting the ground beneath our feet); and, after all this, might not humble air molecules, or entire galaxies, 'debate'?

Human history appears to be an endless 'debate' about innumerable issues, which, however, may be so interwoven and synthetic that they and the debate itself are really unitary.

Given that debate is all-pervasive—and that there may even be analogs, forms, or degrees of it in inanimate nature—the scientific study of it may be long overdue. Debate may be far more important than we have imagined.

If the phenomenon of debate is to be studied by science, then it is to ideonomy that we should turn for tools and guidance.

Ideonomy can survey and find analogies between debates of every kind and upon every subject.

It can discover the essential elements, dimensions, and processes that are found in—or that are necessary to describe, analyze, understand, and compare—debates.

It can develop an apparatus for systematically characterizing and classifying debates by means of: objective and subjective properties, evaluative scales, recurring or universal questions, typical comparisons, ideograms (ideonomic diagrams), a conceptual vocabulary and grammar, standard or programmatic procedures, decision trees, differentiative and integrative categories and taxons, laws, rules, consultable advice, ideonomic principles, checklists, interventional tests, relevant experiments, a model-building 'kit', gedankenexperiments, criticisms, criteria, etc.

It can show the possible transformations, and actual intertransformations, of different debates; or how the pieces of a given debate could be rearranged to create a completely different debate.

Help One Avoid Deception

Deception as used here encompasses such things as: misrepresentation, falsification, fraud, trickery, double-dealing, bad faith, false pretense, dissimulation, guile, cunning, cheating, subterfuge, or delusion. It refers to a willful act of deception, usually, and sometimes to unconscious or conscious self-deception.

The keys to avoiding such deception include experience, training, clear knowledge of the types and circumstances of deception, and the creation and maintenance of an aversion to being deceived.

The types, causes, circumstances, combinations, and permutations of human deception can be extremely diverse and complex. For this reason ideonomy can be of help by automatically generating, defining, and illustrating vast numbers of possibilities, both of a general and more specialized nature, or that are indicated to be, or naturally apt to be, associated with predefined, predetermined, or characteristic: situations, matters, issues, factors, events, processes, opportunities, problems, needs, subjects, etc.

But the forms of deception listed above ultimately represent a set of natural phenomena, and for ideonomy phenomena are fundamentally universal and possess universally identifiable and exploitable : related, convergent, and complementary : laws, properties, mechanisms, causes, effects, criteria, signs, niches, courses, analogies, differences, behaviors, functions, hierarchies, spectrums, clusters, elements, languages, networks, series, defects and limitations, solutions, relationships, rules, types and taxa, uses, etc.

Ideonomy should therefore be able to bring to light things of a similar and similarly helpful nature in the case of deceptions.

This could lead to the systematic avoidance, control, reduction, and transcendence of the finite or infinite set of deceptions to which we are subject and of which we are causative, or to which our increasingly intelligent machines might be subject and of which they, too, might be causative. This might or might not entrain new instances and types of deceptions, of lesser or equal number or importance. But at least the possibility exists that ideonomy could ultimately contribute to the emergence of a new civilized order that would be purged of many modern and ancient forms of deception and of the disagreeable consequences thereof.

Deception can cause: unwanted uncertainty and ambiguity, the added costs of means of protection against risks, chronic wastage of society's finite energies, unnecessary and inaesthetic strife, reduced power to predict and organize things, working of society against itself, flourishing of diverse derivative forms of evil, etc.

If ideonomy is correct, and deception is more natural, diverse, universal, and unitary than has traditionally been assumed, then conventional efforts to combat deception may be misguided: addressed to symptom rather than cause, part rather than whole, trivial and protean species rather than important and invariant genus, etc. Ideonomy could correct such erroneous conceptions, purposes, and methods, or supplant them with a more legitimate, complete, fundamental, and decisive effort.

If deceptions are natural phenomena, are they really limited to those practiced by mankind upon itself? The tendency in early ideonomic research has been to discover progressively extra-human or universal equivalents of phenomena that traditionally have been thought of as being peculiarly and exclusively human in their occurrence, or as being limited to biology, the Earth, technology, one science, or any other subject or sphere.

That deceptions are not limited to man, we already know, for they are found in all types, and probably at all levels and in all types of levels, of life (as in the various forms of camouflage and mimicry that have evolved through processes of natural selection); indeed, even diseases (or pathogenic microorganisms) appear to thus hide and disguise themselves. So intelligence and consciousness—at least in the ordinary sense, or in known forms—do not appear to be necessary for the occurrence of deception.

But if we set the world of organisms, and of their effects, aside, might we still find examples of true 'deception' in the realm of inanimate nature (or of what we like to think of as being inanimate nature)?

If processes of natural selection and evolution operate in the purely physical world, or extremely complex cybernetic phenomena exist there, or there are certain forms of information processing, then there might well be close or exact analogs of biotic or even human 'deception'. There are other possibilities as well.

As it happens, the exploration of such theoretical questions is a natural concern of ideonomy, seeking as it does to maximally extend, generalize, transform, and analogize phenomena, patterns, and dimensions describing things—and information, cybernetics, and government specifically.

Define Concepts

To define a thing is to : discover, set forth, formulate, precise, distinguish, describe, limit, illustrate, or prescribe : the : meaning, essential qualities, identity, or signification : of the thing.

Ideonomy can ascertain and indicate all of the many and diverse reasons for and functions of definition, both those that have been recognized or made use of to date, and those that have not been or that might or should be introduced in the future.

It can indicate all of the ways in which things have been or might be defined, and explain the nature, logic, and value thereof.

It can progressively develop an infinity of different dimensions, methods, and means for defining particular, specific, generic, and universal things, and for doing so under various circumstances, for various purposes, to various degrees, etc.

It can discover and describe all of the canonical combinations, permutations, and transformations of : elements, concepts, words, symbols, qualities, dimensions, methods, means, referents, definitions (sic), etc : that are or could be of use in defining things. And the spaces and manifolds thereof.

It can work out and exploit : connections, chains, series, hierarchies, networks, clusters, rings, etc : both special and universal : of definitions. It can also construct hierarchical definitions.

It can define, and show how to define, things that hitherto were never : defined, defined properly or adequately, definable, or definable in certain ways or for certain purposes : such as highly : esoteric, abstract, or specialized : mathematical, physical, economic, logical, legal, philosophic, musicological, technological, or psychological : concepts, terms, theories, methods, phenomena, relationships, etc.

For example, it can achieve, facilitate, or instigate the translation of the gamut of mathematical concepts into verbal definitions and into a form accessible to mathematical laymen, by making use of such things as : analogies, metaphors, universal dimensions, scales, diagrams, rules, classificatory systems, conceptual series and networks, hierarchies, multidisciplinary applications to disparate phenomena, differentiations, boundaries, combinations, permutations, transformations, extremes, chronological trees, ad hoc symbols, etc.

Ideonomy can redefine any or all concepts of one field in terms of the related, or unrelated, concepts of another field, or in terms of all concepts of all fields.

It can be used not only to automate the generation of concepts but to automatically define the concepts it so generates.

It can be used to construct infinite, or infinitely complex or specific, definitions of concepts.

It can define concepts in totally new and even opposite ways.

It can set new standards for the definition of things.

It can contrive special explanatory contexts for explaining concepts.

Given one definition of a thing, it can automatically convert it into another definition or transform the original definition into a whole series of definitions.

It can show how to define things recursively.

Ideonomy can be used to systematically evaluate or criticize any definition of any thing.

It can simplify a definition.

It can help to define the words of one language by means of the words of another—or make translation more universal, fundamental, faithful, meaningful, and ideonomic.

It can show how to define an entire or maximal set of concepts with minimal, the simplest, or identical means.

Ideonomy can train people to define for others the concepts they use, or complex cases or situations to which they refer. Or to define the words they use when suddenly asked by someone to do so in the course of a conversation—in ways appropriate for or requested by that individual, or that reflect the structure of the conversation or take advantage of the things in the environment or the general circumstances of the conversation.

It can help one to recognize things that may need to be defined in any circumstances whatever, or the appropriate form and content of the definition.

By drawing analogies to existing definitions of things, it can suggest how to define new things.

Aid Description

Ideonomy can help plan and execute a description of a thing.

It can enable one to see better the : nature, structure, content, nomothetic and idiographic aspects, symmetries and asymmetries, essential features, hierarchical and sequential aspects, basic properties and dimensions, existential circumstances, genetic or reductive rules, interest and importance, internal opportunities, autocorrelation, problems, special descriptive needs, simplicities and complexities, combinatorial or permutational aspects, analogical and cognitive aspects, 'linguistic' opportunities, quantitative characteristics, network aspects, vergences, classifications, excellences and defects, etc : of that which is to be described.

By studying the description, and compossible descriptions, of all actual and possible types of things, it can find maximally : simple, universal, basic, meaningful, and relevant : descriptions of arbitrary or specialized things, and an optimal descriptive language.

By studying the set of all past descriptions of things, it can learn and make known the best descriptions and types of descriptions of things in general and of particular things, and the methods, means, and elements by which those descriptions were achieved, or that explain the virtues, defects, and idiosyncrasies of the descriptions. It can also discover ways to improve and perfect the descriptions and descriptive means.

It can train one to be able to endlessly describe and redescribe a thing.

It can progressively discover and evolve all possible means for and ways of describing anything and everything.

As one proceeds with one's description of a thing, one can use ideonomy to critique and improve the description.

Ideonomy can be used to discover what is : missing, exaggerated, distorted, redundant, ineffective, inconsistent, contradictory, confused, irrelevant, inelegant, misleading, imperfect, wrongfully implicit, indefinite, false, or detrimental : in a description. Or what per contra is : necessary, central, veraciously or desirably implicit, fundamental, irredundant, successful, consistent, distinct, relevant, elegant, realistic, perfect, beneficial, original, optimal, insightful, etc : in the description.

By comparing myriad random pairs of maximally diverse photographs of maximally diverse scenes—to discover their similarities, analogies, and commonalities, on the one hand, and their differences, negative analogies, noncommonalities, divergences, and orthogonalities, on the other—it can derive a growing number of generic bases for comparing different scenes or describing single scenes; bases that are at once increasingly diverse and increasingly interrelated, unitary, and—from the standpoint of man's descriptive needs and capacities—comprehensive or complete.

The set of generic bases for description isolated in this way will include bases of both a purely objective nature and ones of an anthropomorphic or else anthropocentric character (reflecting man's psycho-physical constitution or supervenient habits or culture).

These bases, or other bases of a different but equivalent character, can be used to construct innumerable novel descriptive tools of a more or less general or specialized kind, and these can then function as powerful aids to description, perception, thought, and artistic fancy.

Such aids, or the cooperative set of all such aids, will inevitably be equivalent in a sense to a new language, and certainly they will reshape and guide the subsequent evolution of conventional languages.

A point worth mentioning, that bears on the reason for creating these aids and on how they will operate, is that whenever certain things, as opposed to others, are used to describe things, these change the needs that remain for other descriptive elements and methods. Sets of descriptive elements, in complex but characteristic ways, at once invite, obviate, modify, and conflict with other possible—in fact, with all possible—descriptive elements and sets thereof.

Obviously the combinatorial possibilities for ever : better, worse, different, and more specialized : descriptive elements, methods, aids, and purposes are virtually infinite. This explosive complexity need not be viewed as a problem, since it can also be thought of as an opportunity for unending future ideonomic explorations and progress in the development and refinement of mankind's descriptive arts.

The problem, moreover, is actually simpler than it sounds, since there are equally explosive laws, methods, and means for investigating and consolidating the space of combinatorial possibilities; things, once again, that are of the essence of ideonomy, and that vindicate its scientific status.

Ideonomy can progressively discover and construct : hierarchies, clusters, series, chains, series, networks, circuitries, trees, functions, processes, and other meta-structures and meta-patterns : of combinatorially descriptive elements and sets of elements in the giant idea spaces that are being imagined.

The use of such rigorously descriptive aids will result in, among other things: the discovery of new natural phenomena, entities, and laws, the recognition of overlooked arrangements and shapes of things, better classification of works of art, the more meaningful use of words, simpler and more elegant means for describing certain classes of things, new and more varied styles of writing, improved educational methods and materials, novel thoughts and modes of thought, and a clearer grasp of the mechanical bases of the human mind and cognitive bases of the human brain.

Ideonomy can take a single thing and redescribe it in a thousand different ways, even in ways that are so totally different that, in describing the same thing, they seem to be describing many totally different, unrelated, or opposite things—or perhaps a continuum or world of things.

Through exercises of this sort ideonomy could inculcate in individuals a deep appreciation of the miraculous inherent complexity of all things, even those things that appear absolutely simple. Subsequent encounters with simple or simplistic descriptions would be less apt to mislead persons who had had such training.

The deepest form of understanding seems to come from seeing things from many very different perspectives simultaneously, or via the 'mental parallax' afforded by a multitude of superficially divergent but fundamentally unitary descriptions.

Illuminate How A Thing Develops

Observing a thing in motion can give one far more insight into it than can acquaintance with it when it is immobile or from outside time, but even greater insight is apt to be associated with knowledge or experience of the thing when it is in the process of developing.

How does a thing develop? What comes first and last? What discrete or continuous stages are there? What constrains successive stages? What hierarchies of developmental causes, appearances, elements, and effects are there—or how is development hierarchical? How is it not hierarchical and anti-hierarchical—and how do the opposite tendencies meet, antisyzygially?

What are the paths a thing follows in its development, and what is their structure, interrelationship, causation, importance, and irrelevance? To what extent are they the cause or effect of development —or both?

What equilibria and disequilibria flow from, cause, or are associated with the genesis of a thing?

What things coevolve in development—homologically, cooperatively, or synergistically? What is the relative and absolute extent to which a thing's development is essentially coevolutionary, and the ratio thereof? What dispersion of these quantities characterizes the geneses of the world's range of things; and what are the determinative scaling laws?

What are all of the major and minor dimensions that describe or are exhibited in the development of all things, and what is the hierarchy— or set of hierarchies—of these dimensions? What are the simple and compound, or parametric, dimensions? What are the known and unknown dimensionless numbers—both intrinsic and universal; and what are the finite and infinite : structural and functional : interrelations thereof?

When a thing develops, what are all of the directions in which—or vectors along which—it develops; and what are all of the : curves, surfaces, structures, nonlinearities, mathematical series, laws, spaces, manifolds, etc : thereof?

To what extent is a thing's genesis 'forced' or instead 'relaxational'?

What are the cyclic and other periodic properties of development?

How is development self-regulatory, programmatic, exogenous, stochastic or deterministic, iterative, recursive, and/or the like?

How is it linear and exponential—or more generally, what are all or the infinity of mathematical functions that describe it?

How simple and/or complex is development, both overtly and covertly?

What is synchronous and what diachronous in development?

How does development itself develop—en route, ab initio or embryonically, and precursively?

How does development explore and exploit experience and its environment? Is development, in general or in certain cases, a process characterized by any form or degree of : learning, opportunism, experimentation, natural selection, adaptation, fractal or chaotic variation, information processing, memory, cybernetic homeostasis, generalization, competition, active control or adaptation of the environment, game-playing, vergence, prediction or anticipatory adaptation, catagenesis, gambling, pluripotent or plurivalent flexibility, multivariate analysis cum multidimensional scaling, multiplexing (in the sense of being ambiguous and simultaneously equivalent to, or incorporative of, many different 'alternative' forms or courses of development), etc?

Does develop really terminate or is it perpetual; is it merely abeyant when it appears to be complete and past?

How important is predevelopment or early development relative to later development or maturation, and what is the essential half-way point; does early genesis preplan or fix later (more overt) development? How consequential are chance events in developmental infancy?

How anomalous can development be—and how anomalous or individual is it?

What things are amplified by development, and what or which things are : transformed, diminished, moved, exchanged, permuted, combined, added, subtracted, multiplied, exponentiated, modulated, fused, fragmented, connected, isolated, reconstituted, recombined or re-associated, re-grouped, reorganized, etc?

What are all of the quantitative scalings of a thing's development, or how does its development occur, and what does its development consist of, at all the relevant levels of : time, energy, mass, velocity, population, size (length, area, volume, flatness, narrowness, hollowness, etc), self-curvature, pressure, energy, energy-flux, change, equilibrium, disequilibrium, entropy, probability, fractal-dimensionality, density, redundancy, irredundancy, correlation (autocorrelation and intercorrelation), ratios (of all such quantities as these), frequencies or periodicities, efficiencies, informations, distances, angles, powers, works, capacities, mass-flux (transport), risks and dangers, costs, uniformity or quantization, governances or dependencies, independencies, interdependencies, stress, violence, strain, strength, durability, hardness, noise, concinnity, isolation or insulation, concentration or

purity, normality, phase, hysteresis, 'inertia' (perseveration), synchrony and asynchrony, reactivity; reciprocity, contravariation, or complementarity; freedom, excellence, transmissivity, productivity, precision, 'induction', etc?

Moreover, what are all of the interdependences and interactions of all of these levels and types of levels—both in themselves and as resultants or constraints?

What are the extent, types, implications, and interdependences of both our knowledge and ignorance of all of these things, or as they bear upon the development of a thing or of all things?

What is the development of a thing in terms of the development of all things, and the development of all things in terms of the genesis of a single thing?

What does not develop? Can we be sure it does not develop? Does it develop in a limited degree or specialized way? What forms of development do not exist or occur or are impossible or unnecessary? What aspects of things do not develop, in what ways do they not develop, and what explains these things?

To what extent is development, from the standpoint of the whole universe, all of nature, or eternity: morphic, monomorphic, delomorphic, constant, orderly, simple, absolute, isotropic, homogeneous, symmetric, measured, convergent, parallel, self-similar, unique, necessary, equivalent, etc?

In what universal measure is development instead or simultaneously: amorphous, polymorphic, protean, inconstant, disorderly, complex, relative, anisotropic, inhomogeneous, asymmetric, divergent, vergent, self-dissimilar (or at least not self-similar), indeterminate, pluripotent, nonequivalent, etc?

Other questions about universal development that it is important to ask and answer are whether it is, more or less or strictly: universal or exceptional, cooperative or competitive, 'monophyletic or polyphyletic', local or holistic, 'from-the-top-down or from-the-bottom-up' (apical or basal), pluralistic or monistic, spatially continuous or discontinuous, spatially smoothed or rough, measurable or 'measure-less', finite or infinite, knowable a priori or merely or mainly a posteriori (in retrospect), transitive or intransitive, commutative or noncommutative, reflexive or irreflexive, associative or nonassociative, distributive or nondistributive, etc?

These questions are profoundly important and yet hideously difficult. Ideonomy has in part been designed to help with the answering of enigmatic questions of this very sort.

There are other aspects of development that are important and with whose investigation or treatment ideonomy can assist.

One needs to know what all the failures may be that occur, or that can occur, in the course of a thing's development. What causes them and are they in any way causally related? What effects do or could they have? Might they actually be desirable in some sense, or necessary for successful or efficient development (and if so, are they optimal or what would be optimal)? Is development itself a 'failure' in some sense—or what, really, is the difference between success and failure, in the case of development or in the most general sense?

What instances or aspects of development are harmonious or compatible, and which are instead disharmonious, incompatible, or even contradictory? What explains their sets and interrelations, in terms of the essence or laws of development?

What accounts for maldevelopment and pathogenesis? What are all of the generic causes, factors, conditions, and circumstances? What are all of the types, dimensions, properties, and effects of the former? How common are they? How different is the world, or are things, because of them? Is their status absolute or relative? Why do they fail to occur, or what constrains, limits, or bounds their occurrence? What do they contribute to the world in a positive sense?

How does the development of one thing, or one kind of thing, lead to the development of another thing or kind of thing, and so on, in finite and infinite chains, hierarchies, networks, chaotically deliquescing trees, globally summatory lattices or pseudo-continua, etc?

To what extent do the supposedly and apparently new or novel origins and geneses of things in reality represent partial, complete, or homoousian avatars or regenerations of those things?

Is the difference between 'change' and 'development' absolute or merely relative (relativistic)?

How multivious could the genesis of a thing be? Does a thing develop as the product of a thalweg?

Is the genesis of a thing, or of things in general, finitary or continuistic? Integrational or differentiational? Gradual or "catastrophic" (continuous or discontinuous)? Local or holistic? The child or manifestation of a tree or network (closed or open graph)? Of convergence, divergence, or vergence? Of a finite or infinite matrix? Of boundary conditions, organizing centers, attractors, singularities, poles, oscillations, cellular automata, knots, cycles, cells, etc?

Or of entirely different things, such as mathematical objects that have not yet been imagined by even the purest of mathematicians?

By causing the thought and experimentation of scientists to be expanded in such a way as to simultaneously attend to forms of development, and development of things, in every discipline and of every type, ideonomy can bring about the discovery of every more numerous, diverse, and powerful developmental analogies and laws.

The development of one thing can be used to model and interpret the development of a different thing. Sometimes developmental insights stand to be gained by comparing the very things whose development is the most dissimilar, divergent, orthogonal, unrelated, or opposite (whether in reality or superficially). Novelty of situation may remove the scales from one's eyes, or a better chance for the existence or discovery of an antisyzygy may obtain, or new constellations of facts or phenomena may be given an opportunity to testify or to contribute their special clues and leads.

An overspecialized form of development may be too narrow to give the experimentalist or theoretician the room they need to maneuver, to diversify, connect, and test their observations, to escape from the thing's distracting presence and irrelevant haecceity, to start over again on new ground or from a fresh perspective, or to grow mentally, and as a result it may stifle the achievement of insight into its own nature and into the universal nature of development.

One could turn to ideonomy, in the course of observing the development of a thing or phenomenon, for the ideas it might give one about what to look for, as perhaps being of special importance or interest; for the instructions it might provide about how to find these things or what to look for in connection with them, for the suggestions it might make as to how to think about these things, for the questions it might ask or cause one to ask oneself, leading to new answers or even more interesting questions; for the guidance it could provide as to how to classify the general type or detailed patterns of development observed, for the words, concepts, and grammar it might supply to enable one to describe the genetic event—and to articulate one's thoughts about it—to other persons, for the predictions it might make—or permit one to make—concerning the future course of development, for the sets or series of experiments it might inspire one to perform or whose conduct it might direct or criticize, for the warnings it might give about the errors one is liable to make—or illusions one is apt to encounter—in analyzing or observing development or in theorizing about it, etc.

Random examples of geneses—or of things whose development—ideonomy could be used to illuminate are: construction of a skyscraper from below the ground up, rainbow formation, evolution of societies (sociogenesis), ontogenesis of the human body, cell division (mitosis), crystal growth (crystallogeny), cosmogony or cosmic evolution, psychic or intellectual development (psychogenesis or noogenesis), idea formation (ideogeny), emergence or progress of a disease (pathogenesis), development of a musical theme, cringle-crangle criminogenesis, development of a medical diagnosis, development of a storm front (frontogenesis), formation of Saturn's ring system, growth of mountains (orogeny) or entire continents (epeirogeny), formation of the solar system, development of galaxies, process of tumor formation (oncogeny), historical development of language, evolution of the bios, construction of protein molecules by ribosomes, cave development (speleogenesis), development of a regional drainage system by erosive runoff and streams, creation of a statue by a sculptor chiseling a block of marble, evolution of the atmosphere, historical development of a nation's public ways, random walk of a particle undergoing Brownian movement, genesis of a war, development of schizophrenia, general evolution of mathematics, historical development of a national economy, immunity production (immunogenesis), development of atomic nuclei (nucleosynthesis), evolution of a chess game, development of old age (senescence), rock origin (petrogenesis), development of a fad, growth of a delusion, moral development, evolution of science, growth of a corporation, the historical development of radio, the pure morphogenesis of the Alexander horned sphere (in topology), or the future evolution of ideonomy (or of its subdivision Geneses and Plastology).

Ideonomy could extract the common—omnigenous and universal—genetic patterns of these things and systematically apply them elsewhere, eternally, and infinitely.

Diagrammatize Concepts

Human intelligence is defined by the amount of the brain's structure and function that is devoted to different types of mental function. As it happens, a great fraction of the brain concerns itself with vision. Yet the visual structure of alphanumeric characters, words, and numbers —in space and time—is only a part of what interests the visual brain, and a part that came so late in biological evolution that the only species known to be possessed of such an interest is ours. Instead much of the visual brain is devoted to recognizing, imagining, and creating 'pure' shapes and sequences thereof.

Many types of diagrams, maps, and graphs exist as aids to thought. But such things are forever evolving, and entirely new types of them appear now and again.

Ideonomy can be used to examine the universe of all possible types and instances of diagrams, maps, and graphs, and of all needs and uses therefor. It can create innumerable methods for developing such aids. It itself has great need for such innovations. Visual devices serving ideonomy that make exclusive or major use of 'pure' visual shapes, are generically styled ideograms.

Ideograms designed specifically with the needs and possibilities of a particular ideonomic division in mind will often be so different from other ideograms, and yet so consistent among themselves, that they will merit recognition as new types of ideograms, and these types will often deserve new names signaling their typological status.

Thus special ideograms can be developed that are especially suited, in either general or specific ways, for treating: causes (etiograms) or effects (anyograms), goods (agathograms) or bads (cacograms), chains of things (ormograms), the paths of things or ideas (hodograms), motions (kinograms), work (ergograms), decisions (legograms), controls and governments (cratograms), combinations of things (mixograms), networks (dictyograms), values (axiograms), ignorances (agnosograms), acts (pragmograms), relations (dochograms), properties (usiograms), stories (enograms), environments (periontograms), knowledges (epistemograms), origins (archograms), assumptions (lemmograms), errors (sphalmograms), probabilities (icograms), possibilities (prositograms), thoughts (phrontograms), quantities (posograms), processes (sisograms), the present (artiograms), generalizations (eurynograms), analogies (icelograms), vergences (chiazograms), taxons (taxograms), events (synantemograms), connections (desmograms), emergents (blastograms), contents (endograms), changes (tropograms), and hierarchies (klimograms).

By analogy, tree diagrams are already in widespread use and are termed dendrograms.

The first-mentioned ideograms—the etiograms depicting causes—could represent the causes in a variety of ways, including: as sequences of causes, as converging or diverging sequences or sets of causes, as clusters of causes, as causal hierarchies, as alternative causes, as parallel causes, as cyclical or recursive causes, as taxons of causes, for analogies among causes, as degrees of causes, for probabilities of causes, etc.

The values of ideograms are manifold, they can: give an overview, summarize much with little and quickly, accelerate thought, depict structure that is otherwise almost unrepresentable, focus on the essence of a thing or of a set of relationships, simultaneously show what many things are in terms of a single universal thing, facilitate parallel thinking and communication (à la the recently discovered importance of massively-parallel computer architectures), facilitate understanding of complexity; instantaneously show an entire sequence, course of events, or process of development; show how big or complex things are constructed out of or depend upon small, simple, or discrete elements; simultaneously depict many different dimensions or types of relations of things; break a matter up into a finite set of discrete but interdependent cells, operations, stages, steps, or concepts; dramatize the role of ideas in things, or in understanding things; serve as a mnemonic that can repeatedly be consulted, provide a foundation for a more elaborate treatment or discussion of a thing; serve as an organon for stimulating, generating, formulating, analyzing, transforming, or arranging ideas and thoughts; help to quantify ideas or qualitative relationships, simultaneously show the relationship of many different concepts or divisions of ideonomy to a single thing (or vice versa), show how to think about things in certain specialized ways, depict alternatives, etc.

Eventually ideonomy can be used to make the totality of developed ideograms accessible on a computer or computer-network in a maximally: efficient, interesting, complementary, and productive way. Powerful : indexes, tables, decision-trees, algorithms, classification schemes, principles and rules of thumb, procedures, methods; combinatorial, permutational, and transformational formulas and structures; analogical guides, graphics and animation techniques, artificial-intelligence programs, data-processing software, computer architectures and micro-architectures, computer languages and compiling software, search and experimentation programs, etc : will be created and interwoven systemically.

There are formal, canonical, and systematic ways of combining, synthesizing and mutually deriving all generic and particular ideograms that will be worked out and exploited.

Ideograms can be created, particularly with the help of computers, with the property that they have no unique description or form, but rather a capability for being continually adjusted in a multitude of dimensions and ways that makes them equivalent to an entire continuum or space of ideograms. Indeed, ideograms of even higher order, and of ever-higher order, are practical.

The size, complexity, sophistication, power, elegance, internal organization, specialization, generalization, automation, intelligence, self-development, width of application and reference, value, aesthetics, integration, mathematical structure, etc : of ideograms will evolve ad infinitum.

An infinite : tree, network, vergence, circuitry, space, hierarchy, etc : of general and particular ideograms will be bred into existence and serve the world community (and ultimately the community of intelligent machines).

In the : finite or infinite : set of (known) things that ideograms can incorporate or make use of are : arrows, boxes, balloons, Munsell color space, texture space (once it is discovered or worked out), form and cluster spaces; path, network, and cycles spaces; the spaces of all possible connections, relationships, combinations, permutations, and transformations; the space of all relevant parameters; boundaries, clusters, groups, codes, symbols, lines, pictographs, pictures, sub-ideograms, notes, lists, commentaries, instructions, curves, surfaces, solids, hyperspatial structures and motions, superimpositions, details, definitions, cross-references, ideonomic formulas and equations, scales, interpolations and extrapolations, types of brackets, isopleths, measures and indices, tables, matrices, models and simulations, keys, stochastic functions, standards, summaries, nodes, branches, centers, distributions, expansions, intercorrelations, coordinate systems, spirals, dots of all kinds (of every size, shape, color, etc), cells, regions, illusions, stories, rotations, angles, punctuation marks (both conventional and novel), nonce or universal jargon, radiations, blank spaces or gaps, fungible leaves, overlays and restructurings, displayed activities, interactive menus, etc.

Reconcile Differences

Many things that on the surface appear different are surprisingly reconcilable; they can be : made, shown to be, or treated as being : consistent, congruous, harmonious, integral, equivalent, convergent, mutually derivable, symmetric, complementary, homologous, interchangeable, coessential, congeneric or co-taxonic, etc.

Ideonomy can be used to : discover, define, describe, name, explain, and interrelate : all of the : actual or possible : differences of : any pair or set of things or of all things; and the : causes, dimensions, properties, laws, interrelations, effects, corollaries, importances, contents, types, taxons, instances, analogies, associations, etc : of these differences.

In this way it can : find differences to reconcile, find partial or optimal ways to reconcile arbitrary things, find reasons to reconcile things, find opportunities to reconcile things, find opportunities and needs to reconcile many things at the same time, find useful symmetries among differences, find out the relative importance of alternative and diverse reconciliations of things, find out what is irreconcilable, etc.

Reconciling differences may be important because : it can obviate things or prove them to be unnecessary, it can reduce needs or relax requirements, it can simplify and render more realistic the explanation or description of things, it can reveal unsuspected or all-important kinship or clarify the general relationship of things, it can pave the way for the useful combination or managerial coordination of things, it can obliterate irrelevant distractions, it can produce an éclaircissement, it can bring eclipsed differences to light, it can facilitate the fusion or synthesis of things, it can correct or refine a classification or classifying scheme, it can promote more universal theories, it can help account for the differences, it can make for a more accurate quantification of differences, it can improve the analogization or analogical use or exploration of differences, it can focus attention upon more fundamental things, it can redefine differences, etc.

By way of example:

Ideonomy could reconcile the apparent or actual difference between the predicted and actual form of an earthquake, so as to corroborate or exonerate a seismological theory;

Differences among various plant species could be reconciled so as to excuse, enforce, or enjoin their classification in the same botanical family;

Real or apparent theoretical or practical differences between communism and capitalism or democracy could be reconciled so as to make the rival systems tolerant of one another, cooperative, synergistic, fusible, dialectically synthetic, or equivalent;

Differences between two different planets (their magnetic fields, atmospheres, topographies, or internal structures) could be reconciled to support a particular theory of the origin of the solar system;

Differences among individuals in the symptoms or course of a supposedly identical disease could be reconciled to uphold the identity of the disease or to confirm or clarify a theory of its mechanism;

Reconciling spectral differences observed between or within classes of stars could eliminate the need for the introduction of a new stellar class, subclass, or superclass;

By reconciling disturbing phonological and morphological differences between two contemporary languages, paleolinguists could more confidently derive them from the same parental language;

Reconciling measured differences in the performance of students in different educational systems—by theorizing or demonstrating equivalence, nonequivalence, or equilibrial reciprocity of various indices or dimensions of performance—could throw doubt on the need for certain contemplated reforms and portentous observations; and

If observed differences in the mineralogy of two neighboring mountain ranges could be reconciled as being the two alternative manifestations of a particular petrogenetic process, an overall simplification of geophysical theory might be possible.

Ideonomy can propound principles that can assist and guide the reconciling of differences generally, such as principles to the effect that: a given thing or process can have many disparate manifestations, effects, or forms; big differences can result from tiny changes; so-called "chaotic" processes can easily give rise to deceptive complexity; differences often presuppose one another or one another's simultaneous existence or operation; there may be many different—and very different—ways of reconciling observed differences of things; the things that look similar are often in fact very different, even more different than the things that happen to look different; differences are often : variable, cyclical, protean, or dynamic; differences—even those that seem absolute—may be context-dependent, narrowly functional, relativistic, or holistic, or may be either purely local or purely external; where sets of differences are : extremely many, diverse, or complex, or are nonequivalent : it may be possible to : find, create, or exploit : combinations of subsets of certain differences that virtually : reconcile, nullify, erase, or invert : some of the other coexisting subsets of differences; differences may be specific to just one or a few : hierarchic or nonhierarchic : levels, and : invalid, redefined, or transcendable : at one or all other levels; differences may be metastable or nonequilibrial; apparent differences are often imaginary; differences are always finite or a matter of degree; etc.

Suggest the Fundamental Dimensions of Things

By such dimensions may be meant such things as any or all of the following:

Descriptive, generative, or explanatory : quantitative and/or qualitative : elements, properties, terms, concepts, operators, references, coordinates, etc : actually, hypothetically, or virtually : possessed of and/or specifying : a : finite, defined, and characteristic : extension, range, domain, magnitude, direction, and/or the like : and that are by nature : maximally or optimally : fundamental, universal, unique, elementary, defined, necessary, simple, few, limited and yet complete, important, separate, orthogonal, self-evident, sufficient, invariant, homogeneous, uniform, linear, isotropic, 'essential', etc;

Things to which all else is reducible or from which all else can be derived;

Those things that are maximally or infinitely : heterogeneous, diverse, divergent, opposite, polar, etc;

Those things that are maximally inclusive;

Those things that are maximally complementary or synergistic;

Things that specify degrees of freedom, maximize freedom, or define spaces and manifolds;

Those elements of nature, thought, or reality that directly or indirectly maximize information (in Claude Shannon's sense), or that minimize the need for additional information;

Those things that, more than anything else, allow the : simplest, clearest, and best : arrangement and coarrangement : of things universally;

Those things that allow other things to be described in the simplest possible way;

Quantities or qualities that, when combined, permit the possibilities of a thing to be exhaustively specified;

Ranges that, conjointly or when mapped upon one another in ordered ways, permit other ranges to be created or described;

Elements that are simultaneously qualities and quantities, or constants and variables;

The simplest parameters known or possible;

The most basic kinds or sources of order.

Actually the problem of what the nature of "dimension" is represents one of the greatest : scientific, philosophic, mathematical, logical, and noological : problems known to us, and it has yet to be solved.

Reality may be without any absolutely fundamental dimensions, but even if absolutely fundamental dimensions are mythical, it is vitally important that we continue our search for progressively more fundamental dimensions.

Ideonomy is a perfect instrument for identifying such dimensions, and in a sense the quest for them is its primary and special mission.

By exhaustively combining all manner of concepts and things—or comprehensively exploring, in effect, mental space—that vastly smaller subset of combinations of things or concepts that is nature as we know or think of it, becomes transcended by the operations of thought, and the ideonomist finds himself stumbling upon countless hitherto unrecognized and even inconceivable dimensions, and confronting a hierarchy of dimensions that are of ever higher and lower order.

In a sense ideonomy is, or represents an attempt to create, a set theory of all possible dimensions.

Special dimensions, and special structures of special clusters of dimensions, describe or are connected with different : objects, phenomena, processes, laws, realms, subjects, concepts, mathematics, tasks, logics, languages, etc. They need to be discovered, systematized, and generalized.

There also exist an infinity of special senses of dimension, and these, too, ideonomy seeks to identify, order, and exploit.

Despite the obvious importance of the fundamental dimensions of things, science has only recently shown signs of becoming aware of the need to determine what they are over the full range of phenomena it studies. Of course there are certain dimensions that are extremely difficult to discover, characterize, and comprehend, and nature undoubtably contains various infinite series of ever more strange, obscure, difficult, unexpected, and 'illogical' dimensions—paths that give even God a headache.

To illustrate some of the things whose fundamental dimensions it might be worth knowing, or what the importance and uses of such knowledge might be:

What are the fundamental dimensions that describe, define, or give rise to human intelligence?

What are all actual or possible dimensions of human perception?

What is the set of dimensions that is necessary to fully describe the meaning of musical melodies—or all musical qualities?

What are the canonical dimensions of the physical universe?

What are the qualitatively quantitative, and quantitatively qualitative, dimensions that might be necessary to depict or discover the most perfect human figure or face, or all existing—or possible—types or continua of faces and figures?

Similarly, what fundamental canine dimensions are necessary, or would suffice, to construct an abstract combinatorial space containing all possible types of nonexistent dogs that it might be interesting to breed for under the direction and inspiration of a prior vision?

What is the set of fundamental dimensions of molecules that is necessary to predict the properties of a family of, all (~55,000,000) known, or all possible chemical compounds?

What are the fundamental dimensions of the world, and of vocational and social skills, that need to be taught to schoolchildren if their education is to be complete or perfect?

What are the most universally investigable dimensions of scientific phenomena, upon which research could or should concentrate?

What set of fundamental 'biological' dimensions could describe all possible forms of life elsewhere in the universe?

What are the universal and fundamental dimensions of human ignorance, either in general or of particular things?

What are all the fundamental qualitative dimensions that are needed to describe the set of all observed chess strategies?

From what set of fundamental visual, tactile, or sensory dimensions could a classificatory scheme for all common or discernible textures be constructed?

What are all of the fundamental phenomenological or conceptual dimensions necessary to describe or explain the evolutionary course of life on Earth?

What are all of the fundamental logical dimensions upon which all of our conceptions and perceptions of fundamental physical dimensions depend?

What are all of the fundamental dimensions of, or that underlie, human emotions?

Even what are to be considered as being 'fundamental dimensions' need to have their connections and analogies explored; or perhaps they especially deserve this, given the importance of demonstrating, analyzing, and understanding their supposed or so-called fundamentality, or what we ourselves mean by fundamentality in general.

Define All Physical Dimensions

This is not just a task of interest to physicists. We have not as yet any idea as to how to circumscribe the subject matter of physics, or what the essential phenomenon is that that science studies—or will ultimately study. The focus has clearly changed over the centuries, and just as clearly it continues to change. Also concepts of the presumptive nature of physical being have encountered great problems, and questions have been raised about their accuracy, validity, and spirit. It is obvious that physicists have many prejudices of which they must one day divest themselves, in a painful metamorphosis.

A part of the problem is the eventual reducibility of other sciences to physics, or their transformability into subfields of physics. It is not merely astronomy, chemistry, geology, technology, and biology that may be physicalized in this way; the same fate may subsequently await psychology, sociology, historiology, economics, and even aesthetics, philosophy, mathematics, logic, and ideonomy. Of course by then, as was anticipated above, the nature and methods of physics may be almost unrecognizably different, for when the conqueror conquers something great he is apt to be transmuted by the battle and by the substance and form of what he ostentatiously assimilates.

In any case, in the set of fundamental dimensions thought necessary to describe a thing or process, the subset of physical dimensions have some right to be considered primary, or the most fundamental.

It may be possible to derive other dimensions, of a decreasingly fundamental nature, from them; and there should be a sustained effort to do this, no matter what the temporary difficulties of accomplishing this are. Of course, let it be said at once, that there should also be an ongoing parallel effort to derive all physical dimensions, or all dimensions in general, from increasingly fundamental mental and logical dimensions.

One of the reasons why it is important to define all physical dimensions is that a typology and taxology of physical dimensions and extremes, when constructed, simultaneously gives a typology and taxology of the future subfields of physics, and does so in the measure that it is complete.

A scheme identifying from the outset the branches of a science that are apt to, or that must, develop can have great value in subsequently steering the development of that science, or in increasing the efficiency, speed, directness, and intelligence of the process.

Conversely, ignorance of such branches can create unfortunate: redundancy, research with the character of aimless wandering, neglect of opportunities, failure to converge efforts that are fated to converge, trivialization of emphases, etc.

The structure leading to the development of the branches or to the isolation of the dimensions, or that the branches and dimensions will ultimately be found to define, will inevitably partake of many different but interconnected aspects, that in a universal sense all correspond to a set of things that are of the most central interest in all of ideonomic inquiry: convergences, divergences, trees, vergences, hierarchies, series, manifolds, lattices, circumplexes, networks, circuitries, "chaotic" patterns, fractals, etc.

An example of a physical dimension or phenomenon that can and must be diffracted into a multitude of discrete but interconnected forms, aspects, or elements is sound, whereof may be distinguished: frequency, amplitude, power, duration, spatial concentration, coherence, monochromaticity, constancy or variability, loudness and other subjective properties, wave number, wave shape, entropy, modulation or information content, divergence, convergence, velocity, complexity, isolation, autocorrelation, pressure, penetration, ranges (in space, frequency, amplitude, etc), evolution, hierarchy, differentiability, 'internal curvature', etc ad infinitum.

An ideonomic axiom requires that the sound must have an infinity of both potential and actual aspects or sub-dimensions, and ideonomy can assist with the theoretical isolation and subsequent experimental discovery and exploitation of this heterodox sonic infinitude. Also, as stated above, such things must have a complex, and indeed an infinitely complex, structure that likewise must be worked out.

Comparable investigations of all other physical phenomena need to be pursued with ideonomy's peculiar and irreplaceable assistance.

The list and structure of things that can pertain to sound generically, once worked out, will afterwards be applicable and reapplicable to an infinite number of things of which sound is an aspect, or to an infinite number of particular sounds.

Actually in the case of particular things and sounds, there are also infinitely-many finite subsets whose more specialized ideonomic lists and structures—or complex dimensionalities—need to be researched and defined, and the aggregate of these will also have broad utility.

It is not just the different types of dimensions, however, that will define future subfields of physical investigation. So also will the innumerable irredundant combinations and permutations of such types—as well as the nodal branch-points, limits, 'self-applications' and 'cycles', mutual interferences, subversions or reconditionings, virtualizations, and active structuring of the types.

What are all of the—actual or relevant—physical dimensions of such examples of things as: soap bubbles, stars, neurons, calving icebergs, lightning bolts, human speech, earthquakes, mechanical gears, electrons, auroras, Dirac-vacuum fluctuations, spinning tops, pollen grains, storm fronts, protein molecules, cellular microtubules, brain EEG waves, volcanic eruptions, the liquid-helium fountain effect, the physiology of tasting licorice, or the brain event effecting the summation 1 + 1 = 2?

Moreover, what are their interrelationships in terms of these phenomena viewed en bloc?

Accelerate Discoveries

Ideonomy can step up the pace of discovery by: suggesting new and critical scientific instruments, amplifying the flow of data and ideas throughout the scientific community, multiplying interconnections among all the different sciences, mapping out future fields of research, perpetually enriching the wealth of scientific techniques, aiding the design of experiments and originating new tests of hypotheses and theories, reconciling seemingly disparate ideas and approaches, increasing the mutual understanding and rapport of scientists, maximizing the generalization of scientific ideas and their transformation into other ideas, using discoveries to predict other discoveries; identifying and characterizing ignorance, problems, and important questions; simplying the requirements for discoveries, identifying other discoveries unrealizedly implicit in known discoveries, raising the efficiency with which data is analyzed; reducing the number of distracting and costly errors, illusions, and misconceptions; enlarging the amount of data extractable from any sample, specimen, event, situation, test, or domain—and the number of things deducible from that data; increasing the richness of scientific reasoning, helping to automate the process of discovery (both experimental and theoretical), augmenting the knownness—and intensity of use—of what is known, calling attention to the biggest possible clusters of discoveries that might be made, enabling phenomena to be modeled and simulated, maximizing the ideational content of science, making research more 'multiplexed' in its activities (or multipurpose), enhancing the ideonomic meta-structure of scientific knowledge and research (e.g. its network-like, tree-like, chain-like, hierarchy-like, and other qualities), extending the range of science or involving it in new domains and realms, expanding the guiding catalog of known or possible types and taxons of phenomena, making scientists more open to discoveries by training them in new modes of thought, magnifying the axiomatic machinery available to scientists and multiplying laws, isolating the larger-scale patterns of discovery over historical time or in abstract cognitive spaces, identifying universal phenomena that recur in all subjects and the habitual properties thereof, making science more planned and systematic, etc.

In such ways it could make the process of discovery—everywhere in science, mathematics, technology, and life—more: straightforward, efficient, powerful, scientific (sic), methodical, assured, meaningful, directable, encompassing, exhaustive, creative, beneficial, synergistic, etc.

Ideonomy can also speed research by identifying ahead of time the needs that exist in science and society for various discoveries, or the broad uses that could be made of discoveries. It can describe the special needs that exist for sets of discoveries to occur—because of the combined consequences or applications they would have, or because of the world's interdependent problems, ignorances, opportunities, or factors.

It can suggest, for either instructive or scientific purpose, the totality of different discoveries that might be simultaneously or alternatively possible concerning, or in connection with, one particular thing.

Facilitate Discussion

With ideonomy it is possible to have a computer generate a galaxy of diverse questions about an arbitrary topic, that can then initiate, fertilize, or guide a lively group discussion on the topic.

As the discussion develops, such a group can make further and more complex use of ideonomy. Ideonomic organons or computer programs can be consulted to answer or help answer the original questions or the group's own questions, to analyze or direct the discussion, to suggest alternative courses of the discussion, to synthesize new ideas, to suggest methods of discussion that the group might wish to experiment with, to criticize or help structure the discussion, to suggest related matters or concepts or series of subtopics, to promote argumentation or debate, to define the dimensions and elements of the discussion, to suggest illuminating analogies to other discussions that have occurred on the same or disparate topics, to determine the needs or possible goals of the discussion, to learn the possible values or outcomes of the discussion, to remake the discussion, to plan the future course of the discussion, to engage other ideonomic divisions in the discussion, etc.

Supreme brainstorming sessions can be triggered in this way, when experts in some field get together with an ideonomist for a day and use is made of diverse general and specialized ideonomic : lists, charts, books, computer software and printouts, and other tools and materials. Such sessions may variously treat the whole of the experts' field, that field in relation to some other, some topic or problem inside the experts' field, or some topic, problem, concept, or concern outside it.

But ideonomy can also be used to facilitate discussions of any type whatsoever: in elementary-school classrooms among pupils or with their teachers, among university students, at conferences and symposia, in a scientific community through publications or the network of telephone conversations held over the years, among the Joint Chiefs of Staff of the United States Armed Forces formulating long-term strategy, of academic committees reviewing day-to-day problems, of the youngsters of a family in playful bicker, of a husband and wife anticipating the day's events over breakfast, of an author—hunched over the manuscript of the book he is writing—with himself or others mentally, among the various actors in a courtroom or jurymen later deliberating the verdict they shall render, etc.

Ideonomy, in terms of its many divisions, can facilitate discussion of a thing by calling attention to or explicating the thing's: causes, effects, goods, bads, relations, history, future, analogies, differences, appearances, abilities, elements, implications, definition, changes, uses, etc; or by suggesting what is relevant to the thing, such as: principles, paradoxes, processes, knowledge, ignorances, controversies, values, assumptions, decisions, purposes, acts, events, etc.

Ideonomy can train individuals in the art and science of discussion. It can raise universal standards of discussion. Ordinarily—or without exception—discussions are defective or deficient in: purpose, direction, logic, skill, diversity, force, pace, structure, responsibility, range, breadth, depth, planning, method, self-understanding, relevance, value, development, completion, etc.

Distinguish Things

Often things that appear to be similar or identical are in reality different, opposite, or of an unrelated nature.

The costs of confusing things, or of their inadequate discrimination, can be considerable.

The number of ways in which two different things could differ—and the number of ways in which they do in fact differ—are apt to be surprisingly large. The harsh truth is that we are pathetically ignorant and naive about the real : variability, differentiation, range of variation, discriminability, individuality, complexity, separability, multidimensionality, specificity, discordance, and differential classification : of the world of things and of the things of that world.

By being unaware of the differences of things and ideas we suffer greatly, and are deprived of many advantages.

Unawareness can mean: mistaking what is bad for what is good, or what is good for what is bad; being the victim of many illusions and deceptions, wasted perceptual effort, retarded action and reaction, diminished acuity and subtlety of perception, reduced learning from experience, failure to recognize and exploit compresent or unfolding opportunities, inability to enjoy and partake of the full diversity of things, intellectual confinement, diminished and erroneous classification of things, overgeneralization, etc.

Put positively, discriminating things can mean: noticing changes and discontinuities, recognizing the relative—and hence also the absolute—degrees of things, seeing analogies between things that are a function of their differences, finding ways—and reasons—to differentiate them further, gaining clues as to their more exact or complete nature, etc.

Ideonomy can investigate the differences of things to learn how to predict the probable and possible differences of other things of a similar or quite different nature. It can also undertake to discover all of the possible advantages of differentiating, and disadvantages of not differentiating, things.

Diverse examples of how specific things may differ or can be differentiated—and of what they may differ in or with respect to—are: Lava flows by age, Poetry and prose via degree of concentration, breviloquence, complexity, figurativeness, or inspiration, Fabrics by roughness, texture, weave, or fiber, Social classes by manners, Planets by solar distance or density, Flags by symmetry, outline, or simplicity, Water wells by depth, potential or actual production, or pollutedness, Cliffs by slope, uninterruptedness, height, abruptness, or length, Falling leaves by stability, angular velocity, or brownness (loss of chlorophyll), Cats by hair length, coat density or smoothness, placidity, shyness, and quirkiness, Oceans by storminess, temperature, chemistry, and shallowness, Garbage by homogeneity or malodorousness, Glasses by heat tolerance or brittleness, Supernovae by expansional isotropy, Ocean waves by height or profile, Caves by slope, branchedness, filledness, or splendor, Coals by energy or sulphur content, hardness, density, color, or foliation, Translators by speed, accuracy, vocabulary, expressiveness, subtlety, simplicity, quality of voice, or endurance,

Handwriting styles by cursiveness, grandeur, stability, expressiveness, or legibility, Smells by muddiness, softness, or piquancy, Elementary particles by quantum number, mass, or stability, Clouds by height, orientation, flatness, solidity, puffiness, stability, energy, temperature, texture, asymmetry, or rarity, Dogs by barks, Jokes by color, Personalities by differentiability, Ideas by elementariness, clarity, universality, transcendentality, difficulty, correctness, power, extraordinariness, isolation, necessity, or modifiability, Sports by intellectuality, violence, rapidity, or simplicity, and Faces by mobility, symmetry, breadth, or closeness of features on the same face.

Ideonomy can be used to: accelerate the learning and teaching of differences and to emphasize those differences that are important and sufficient to learn and to de-emphasize those that are trivial, redundant, misleading, or unjustifiably hard to learn (i.e. that can only be learned inefficiently); to learn and teach how to produce or maximize desirable, generic, or arbitrary differences—or even differentiational processes, series, hierarchies, networks, etc;

To codify differences per their: causes, effects, measures, signatures, levels, concomitants, cooperations and interactions, thresholds, geneses, evolutions, capacities, potentials, limitations, transitions and transformations, rates, degrees, goodness and badness, corollaries and implications, populations, spectrums, disguises, senses, definitions, absoluteness, controls and governments, primacy or secondariness (or N-ariness), superordination or subordination, consistencies and inconsistencies, descriptive determinants, "group" memberships and intertransformations, idiosyncratic treatment by the mind (or cognitive laws), combinations and permutations, spaces and manifolds, boundaries, information-theoretic content, domains and loci, probabilities, roles, distributions, disjunctions, criterions and proofs, alternatives, dimensionalities, divergences, convergences, order types and taxons, behaviors, niches, interferences, morphisms, uses, connections and topologies, mathematics, 'languages', needs, individualizations, patterns, processual relationships, logical laws, analogies, analogical devolutions or degenerations, relationships to and occurrences in regna, unifications and syntheses, reciprocities, inversions, symmetries and asymmetries, holistic relationships and laws, conservations, properties, cybernetics, elements, etc;

To learn how to construct complicated things out of the differences between or among particular or generic things; to limit, extinguish, prevent, negate, compensate for, or obviate differences; to develop methods and means for measuring differences; to model or simulate given differences in a variety of interrelated and divergent ways; to work out an algebra for differences (so that they can be added, subtracted, multiplied, exponentiated, reduced to zero or less, "associated", etc —in both special and universal ways); etc.

Ideonomy can help to rectify the status quo. Today it often happens that when things are found to be different, or differences are found to exist between things, confusion arises and a paralysis of action; no one knows how to proceed, what the consequences of proceeding would be, or how to adapt to the situation. Alternatively, the differences may simply be disregarded—which may produce problems, errors, or misconceptions or an ignorant forfeiture of valuable opportunities.

The taste of a fruit such as a nectarine may—explicitly or implicitly—'contain' many separate and diverse taste components. These may not be differentiated. The failure to differentiate them may mean that opportunities for the extraction or development of special 'new' tastes are overlooked and unexploited.

Again, when nectarines are eaten upon successive occasions, subtle variations of taste may be overlooked or ignored. The variations may be objective and/or subjective. Perhaps different nectarines have individual tastes that vary or that can vary on certain occasions or in certain circumstances, but which are only poorly differentiated by eaters not ideonomically trained to note, analyze, or reflect upon the possible significance of differences among particular or all things. A largely timeless 'nectarine-taste gestalt' may be reappearing on each occasion when a nectarine is eaten and masking (relegating to the land of unimportance) convergent or divergent variations upon and away from the archetypal nectarine taste. Yet as we have seen, these nuances, subthemes, and discords could potentially be important. Not only could they lead to the development of new and novel tastes, but their isolation, improvement, and subsequent weaving back together—or recombination with the primary taste—could exalt the taste of a nectarine or even produce a flavor paradoxically closer to the quintessence of nectarine than the vulgar taste achieved in any actual nectarine.

In the course of eating a single nectarine, explicit or implicit kaleidoscopic or opalescence-like variations upon and complexities of—or different group-theoretic or myriorama-like interpretations of—'nectarine taste' may be actually and potentially encountered (there could even be a Gœdelian undecidability and/or a Heisenbergian uncertainty—and hence an infinite ambiguity and complexity—about tastes). Again, these may be essentially undifferentiated and yet variously important, from both a theoretical and applied point of view.

It may be that the universe of all possible or actual differences of things—especially of all kinds of things en bloc—consciously or unconsciously impresses people as being so infinite and amorphous that it intimidates them or discourages further or ataractic inquiry, or prompts the fallacious conclusion that the universe of differences, or even mere regions thereof, must be inherently anarchic, impenetrable, and unmanageable, or irreducible to any smaller set of universal types and laws of differences.

Yet if this is so, ideonomy could transform the situation by offering hope that a compact and universal calculus of qualitative differences can indeed be brought into being in the humble service of man and his needs, and that the future study of all the differences among things can be given the necessary paradoxically progressive-and-yet-growthless form.

Things whose existence would favor the idea that such an Elysian simplification is possible include: concauses of differences, common mental mechanisms for treating all differences, homologies of differences, universal analogies among differences and convergence of those analogies to a unique hierarchy and set of laws (possibly even with a role in physical causation), common measures of differences,

clusters—even perhaps hyperclusters—of differences, the occurrence of differences in—possibly even their generation by—meta-structures, an analog of the simplex method for treating differences, mathematical constants constraining qualitative or conceptual differences, convergent series and integrals in the case of such differences, a unitary structure of interdependent probabilities of all possible differences that is accessible via multivariate analysis cum multidimensional scaling, cellular automata able to simulate or reproduce whole families of different differences en masse, an equivalent simplification in the opposite but complementary—or inverse—study of analogies (icelology), etc.

Maximize Diversity

Life and the mind thrive on diversity, and ideonomy can be used to maximize such diversity. Diversity has great—and in the future will have even greater—industrial significance, in a cornucopian and kaleidoscopic world. Human diversity is almost another name for democracy. The evolution of biological life has depended upon progressive —orthogenetic and experimental—variegation and anamorphosis.

The secret to diversification is combinatorics, which lies at the heart of ideonomy.

Ideonomy aims at the production of a truly universal scheme and system of classification, and such things can be stood on their heads and used as omnificent machines.

All of the ways in which all things can and do change can be discovered, and these will indicate all of the ways in which things can be made to change.

Ideonomy can be used to learn and master the greatest sources of diversity, variation, and evolution that exist or are possible, be they: laws, processes, mechanisms, mathematics, systems, hierarchies, or whatever.

Among the types of things it could directly or indirectly help to variegate are: words, inventions or lines of invention, the world's plants and animals, microorganisms (which may be the foundation—the underlying regulatory machinery—of the bios), human recreations, the arts, jobs, industries, sciences, topics of conversation, ideas and thoughts, the basic form and interior design of houses, mankind's wardrobe, chemicals, scientific theories and speculations, colors (sic), odors, materials, drugs, laws of government, people, books, newspaper articles, laboratory techniques, military tactics, functions of things, solutions to problems, answers to questions, metaphors, story plots, secret codes, philosophies, societies, organizations, public services, and life's days.

At the same time it can be used to predict the good and bad effects of such diversification.

It could be used to cope with the problems that maximal diversity would cause or a protean world would experience.

Depict Dynamics

In nature everything is in motion, and part of infinite systems, subsystems, and supersystems of motions.

One of the great keys to the universe lies in this dance, or in its methodical and progressive decipherment. Things are moving: but whence, whither, how, and why? What grand system of interdependent and interramified movement moves reality forward?

What are motions relative to other motions? How do they differ qualitatively? How do they evolve?

What are the ultimate sources and the ultimate goals of motion? What are its primary, secondary, and N-ary costs?

What are the most extreme—the maximal or minimal—motions? What are all of the senses or dimensions thereof: e.g. velocity, flux or flux density (of mass, numbers of things, energies, informations, actions, interactions or reversals, changes, etc), distance, flux-distance, auto-rotation, curvilinear or helical motion, sum-of-all-types-of-motions, diversity of motion, virtual motion, complexity of motion, variability or stability of motion, acceleration, higher-order motion, change or oscillation of size (diametric, areal, or volumetric), duration, etc?

What general and specific effects result from what general or specific motions?

What general and specific motions result from what general or specific causes?

What dynamical meta-structures and meta-processes are there: e.g. cycles, series, networks, hierarchies, vergences, circuitries, etc?

What types of things stop motions? What types of things constrain or transform motions?

What are all possible transformations and intertransformations of all possible types of motions?

What combinations, syntheses, and branchings of motions are there?

What portion of all types, instances, and degrees of motion has man harnessed to date—and what portion remain unharnessed?

Is the amount and variety of motion in the universe finite or infinite—and, in either case, exactly how great is it?

How great is our ignorance—relative to our knowledge—of motion apt to be? What aspects of motion are we apt to be ignorant about?

What plans, priorities, and methods should shape man's future investigation of motion?

What are all possible uses of motions?

How should all known or possible motions be classified, in : relative and absolute, horizontal and vertical, special and general or universal, algebraic and topological, static and adaptive, descriptive and fundamental, differentiative and integrative, empirical and theoretical, analogical and homological or reductive, and other : ways?

What are all of the types and instances of equilibria and disequilibria of all of the types and instances of motions?

What are all known or discoverable laws of motion?

What things move synchronously or cooperatively, and how do they do so? What motions compete, or are independent of one another?

What are all of the known or possible : concrete or abstract : degrees of freedom of : general or specific : motions?

What paradoxes of motion—or paradoxical motions—are there?

Clarify Economics

The concepts of economics and of an economy allow and require great generalization in the future, for historically they have always been limited to overly specific, particular, and concrete things in a way that has tragically hobbled their development and application. Such relaxation, reconceptualization, universalization, transformation, and perfection of meaning—in the case of excessively restricted concepts, disciplines, entities, and phenomena—are major concerns of ideonomy and among the most important things that it can initially accomplish.

In the literal sense, economics is the science that studies the production, distribution, and consumption of commodities, or that focuses upon considerations of cost and return. These terms and concepts can be extended, redefined, treated analogically and metaphorically, or replaced by others.

Price, cost, supply and demand, money, the circulation of goods, exchanges of goods and services, investment and return, the organization of labor and production, credit and debt, the operation of interest—these and other economic phenomena can all take on a larger significance when reconceived from the perspective of a science of ideas.

Yet economic ideas also have a more conservative and conventional role to play in ideonomy, for there exist countless things that have never yet been fully or adequately treated by economics in the usual sense, and this is a neglect that ideonomy would correct. Put simply, the "gray science" needs to be treated far more imaginatively and intelligently than has been the case hitherto.

Already in biology—especially in physiology, ecology, and evolutionary theory—a metaphorical extension of the economist's world view has begun to occur and shown practical results. Computer and information scientists, physicists, chemists, neuroscientists, geochemists, and others have been flirting with similar ideas and approaches.

The biologist may be interested in the comparative energy cost of plants competing for the same ecological niche, or of alternative metabolic pathways competing for natural selection in the bodies of conspecific organisms. More literal examples of commerce and of other economic institutions may operate in the bios, where there may be the coevolution of barter systems, trade networks, and symbiotic industries, where genes may function in lateral gene flows in the manner of money, where various spatiotemporal forms and analogs of jungles and deserts may mimic business cycles, booms, and busts, etc.

The geologist may recognize analogs of money and of economic structures, processes, and laws in the planetary flows of energy and in the complex architecture and interactions of geochemical cycles.

A few quantum physicists have entertained the idea that physical information may be the most fundamental quantity in the universe and one that in some sense flows conservatively throughout nature, again *à la* money.

Economics remains one of the most primitive sciences, and ideonomy, which has the power to advance the scientific status of all sciences, could contribute to its structural and methodological evolution.

Define Effects

The character, elements, and circumstances of things to some extent allow the effects those things are apt to have to be foretold. Yet even after events have occurred, the effects things have caused often remain obscure or only partially defined.

Ideonomy can help to illuminate effects in both these cases.

In fact it can assist with the answering or investigation of many different questions about effects.

What are the limits of effects, and the boundaries between different sets or kinds of effects?

How predictable and unpredictable are effects? Why? What can predict the balance, and reciprocal forms, of the two cases?

From what do effects develop, how do they develop, what controls the development, and how can such controls in turn be usefully controlled —or redirected—by man?

What are all the effects that things do or could have—the instances, degrees, and types? On the other hand, what are all the effects that they do not or could not have, in general or in particular cases?

How can the effects that different things have be compared? How are they similar and different? How are they homologous and unrelated?

What amplifies and transforms effects?

How do different effects interact? Why? What effects are the result of interactions of effects?

How can apparent or hypothetical effects be proven, and how can they be disproven? What methods exist or could be developed for this purpose? What effects are the most and least important to prove, or in what order should effects in general be proved? What effects are contradictory or incompatible, and what other effects are equivalent or compatible?

How do different effects cooperate with, reinforce, or even presuppose one another?

Do things have finite or infinite effects, or both? Why? What kinds? What, where, and when are their manifestations?

What effects of things are useful and useless? What effects are irredundant and redundant? Why? How? In what relative measure?

How ambiguous, indeterminate, or undecidable are effects? How polysemous, complex, multidimensional, or relativistic? What are the virtual effects of things and the limits thereof? In what ways are the virtual effects infinite?

What standard questions need to be asked when analyzing or treating effects? What standard or specialized ways are there of answering these questions? In what order, or orders, should such questions and answers occur? Why? In what circumstances?

What problems do effects pose, are they apt to give rise to, or are related or relevant to them?

What methods and means are there for defining particular or general effects of particular or general things? What are all the different ways of defining effects, and the different values, interests, and aspects thereof?

What are all the different reasons for and importances of investigating effects?

What is the structure of an effect—including its complete spatial and temporal, and quantitative and qualitative, structure?

What are all the meta-structures of effects—or that they cause, from which they derive, that classify them or their possibilities, or in which they participate: networks, chains, series, hierarchies, vergences, clusters, rings, plexures, etc?

What are all the genera of the species of effects, and all the species of genera? What are all the major and minor interrelationships of these genera or species? What are all the higher and lower taxa of effects, and all possible related and unrelated classificatory schemes in which the taxa occur or are absent?

What effects should be taught? To whom? Why? How—with what methods and means?

What may be our errors and misconceptions regarding the actual or potential effects of things? What mistakes are treatments of effects prone or liable to make?

What types of defects and excellences may effects have? What causes them? How important are they? Where are they exemplified? In what senses and measures—and for what—are they good and bad?

What words exist—or what language needs to be or can be developed—for describing or cogitating effects?

What criteria are there for discriminating different, but perhaps easily confused, effects?

What systems of effects operate in nature?

How do different effects scale, and what are all the different possible ways of scaling them? Some of the ways in which effects can be scaled are per: probability, immediacy, importance, complexity, magnitude, multiplicity, goodness, duration, etc.

Which effects of a given thing diverge, which converge, and which proceed in parallel without interacting?

What are the different and common paths and courses that effects take?

What experiments are possible for discovering effects?

What has historically led to the discovery of various specific, or of general types of, effects?

What historical trends in the discovery of effects can be descried or might be extrapolated to the future?

What effects does a thing have upon itself? How do effects affect themselves?

What minute particulars can produce or modify effects, in a grossly disproportionate way?

What continuums of effects exist? What paradoxes may be associated with them?

What tendencies may effects have to hide or be hidden? What hidden effects may exist?

What effects, or types of effects, are so interwoven that they are difficult to separate from one another? By what means might they at last be separated?

Examples of effects that ideonomy could help to investigate or discover are: the malformation of an organ produced by a teratogen; the subsequent course of the universe that resulted from its initial conditions; the consequences for the continuation of civilization or the bios of a future all-out nuclear war; the effect upon the future course of the universe of any single quantum event; the effect upon the course of human history of various accidental events in the past; the effect upon the stability of the global ecosystem of the anthropogenic extinction of given species; the effect of the violence of American television upon the incidence of crime in the United States; the effect of a reward upon the subsequent behavior of an animal; the effect of a catalyst upon the course of a chemical reaction; the effects of the sunspot cycle upon agricultural production; the impact of a military tactic upon the course of a battle; or the effect upon the meaning of a sentence of altering one word.

By contributing to human understanding of effects ideonomy could: make for a more rational world, trigger inventions, lead to the discovery of new natural phenomena, increase the power of art, render the future more prognosticable, heighten understanding of causation as well, clarify history, raise the standards of industrial goods, etc.

Suggest the Effects of Human Nature

There are many ways in which ideonomy could help to clarify the effects of human nature: by suggesting the nature—and effects of the nature—of animals, and by constructing analogies to man and his world based thereon; by suggesting models, simulations, gedankenexperiments, and tests; by predicting the effects of human nature if it were different, and ways in which human nature could be different; by defining the canonical possibilities of man's actual nature; by systematically suggesting all of the things that human nature could affect, and all of the ways in which it could affect them; by aiding the construction of arguments for and against certain effects or interpretations of human nature; by suggesting analogies between man's nature and the natures of nonliving things, and between the effects of both; by identifying the flaws, limitations, idiosyncrasies, needs, and wants of human nature; by describing the general possibilities for action and behavior of things, and how they are applicable to man; etc.

There are a variety of reasons why learning the effects of human nature is important: the fundamental nature of physical entities may be obscured by or indissociable from human nature; cultural and biological contributions to human nature need to be distinguished and separated; limits and non-limits to man's plasticity, capacity, and potential need to be known; man's weaknesses, errors, and mischievous tendencies need to be defined and quantified precisely; unconscious anthropomorphism impairs human creativity, perception, freedom of thought, and technological innovation; and, since human nature mediates the exploration of all of physical and mental reality, greater understanding of it could lead to greater understanding of the latter things.

How—qualitatively and quantitatively—does human nature inhere in or affect human: logic, concepts, assumptions, evaluations, and intelligence; questions and answers; thoughts, mental imagery, and imagination; philosophies, world views, and beliefs; perceptions, awareness, and self-relationships; values and attitudes (or likes, prejudices, etc); goals, wants, needs, and interests; acts, behavior, events, and stories; reactions, interactions, conflicts, and cooperations; relationships and roles; aesthetics; pathology; abilities, capacities, possibilities, and degrees of freedom; languages, symbolism, models, and gestalts; decisions, methods, strategies, and styles; development; errors and illusions; psychodynamics and being; simplicities and complexities; knowledge, wisdom, and ignorance; creativity and discoveries; excellences; progress; problems and solutions; etc?

Aid Engineering

All branches of engineering share certain facets, with all of which ideonomy can help: conceptualization, invention, development, design, implementation, production, maintenance, modernization, systemic integration, use, control and management, education, etc.

Ideonomy can suggest some of the interactions among the parts of complex engineering systems that are apt to give rise to future, or account for present, problems. It can point out improbable but genuine analogies between systems that are seemingly of a wholly unrelated character that provide clues as to the source of, or solution to, a problem.

It can aid the identification of all of the possible canonical variations upon an engineering system's design.

By first indicating all of the fundamental performance and aesthetic dimensions of an automobile, it can increase the number of secondary properties—based on those dimensions—that are apt to be considered, and the rigor with which they are considered.

It can suggest neglected genera of processes that can be incorporated in, or form the basis of new types of, food or chemical engineering systems.

It can provide new types of graphics for depicting ideas about, or enabling evaluation of, petroleum or computer engineering systems.

It can furnish means for organizing powerful data bases for engineering instruction.

Show How A Thing Affects Its Environment

Things have more intricate, subtle, and important affects upon their environment than is ordinarily thought. Through illustrative examples, analogies, criteria, domain generalizations, etc, ideonomy can bring such effects to light.

For instance, shrubs are known to repel other plants in their immediate vicinity by releasing allelopathic substances; by analogy, equivalent substances might be expected to be generated and used by trees, animals, and microorganisms—or by all life. By further analogy, bodily organs, cells, and organelles might be capable of affecting their intra-organismal environment in this way, or might be engaged in a similar chemical warfare.

A few species are known to emit substances into the environment that instead act to attract organisms of the same or some arbitrarily distant species. Suitable random sampling of the Earth's taxa could test whether or not such substances are general or universal in the bios.

What had already been found to be the case for analogs of allelopathy between organs, cells, and organelles could suggest what to expect for forms or analogs of attractants in those situations.

In these and myriad other ways a generalized picture could be constructed for how biological 'things' can and are apt to affect their environment.

Similarly, if it is finally demonstrated that solar activity does couple to, and significantly affect, the Earth's weather or climate—despite the seemingly gross insufficiency of the solar forces in the vicinity of the Earth—large implications may follow. The existence or feasibility of equally improbable couplings may be implied or allowed : among other bodies and astronomic phenomena in the solar system, among stars and galaxies, and among entities and phenomena in all sciences : e.g. organisms or genes in biology, molecules in chemistry, earthquakes or seismic faults around the Earth in geology, seemingly unrelated industries in economics, cultures remote in time in historiography, features of a painting in art, disparate facts or experiences in education, etc.

In connection with how generic things affect their generic environments, ideonomy can progressively identify and explicate generic: paths, courses, processes, mechanisms, forces, effects, patterns, circumstances, events, elements, functions, interdependences, interactions, combinations, combinatorics, correlations, dimensions, dynamics, transformations, levels, hierarchies, networks, models, chains and series, shortcuts, surprises and anomalies, laws, mathematics, paradoxes, symmetries, asymmetries, antisyzygies, abilities, geneses, inversions, equalities, systems, phenomena, clusters, simplicities, resources, roles, spaces, transcendences, opportunities, order taxons, interferences, sensitivities, etc.

Specially and universally, ideonomy can help answer such questions as : whether, why, how, when, where, or how greatly : a thing affects its environment: continuously or interruptedly, statically or dynamically, uniformly or nonuniformly, identically or changingly, progressively or unprogressingly, destructively or nondestructively, directly or indirectly, instantaneously or delayedly, quickly or slowly, in many ways or one, by many means or one, in many respects or one; finitely, infinitely, or infinitesimally; temporarily or permanently, independently or dependently, deterministically or randomly, reversibly or irreversibly, absolutely or merely relatively, quantitatively or qualitatively, locally or universally, structurally or compositionally, confinedly or inter alia, with or without loss to itself, concentratedly or diffusely, proportionately or disproportionately, once or repeatedly, in the same way it affects some other environment, simply or complexly, cooperatively or antagonistically, really or illusorily, desirably or undesirably, partially or completely, connaturally or dissimilarly, 'correctly or incorrectly', irreducibly or reducibly, originatively, coevolutionarily, synergistically, etc.

Show How A Thing Is Affected By Its Environment

Not only do things affect their environment, their environment affects them—but once again ideonomy can be of help.

Ideonomy can: visualize and define all possible types and taxons of environments; suggest the properties and capacities of those environments and the ways in which they may or are likely to affect the things that they environ—be they of related or arbitrary kind; enumerate the relationships that are apt to develop between things and their surroundings; clarify the paths, media, agencies, objects, processes, modes, circumstances, etc through which environments may influence the things they contain or accompany; indicate the diverse elements and complex structure of things that are apt to mediate or receive the effects environment has on those things; provide tests and suggest experiments for determining the actual effects environments have had upon things; furnish means for exploring and exploiting analogies between the effects certain environments have on certain things and the effects various other environments may have upon various other—or given—things, or for using the former as models for differentiating the latter; trace the effects of an environment within the thing it affects, and also back into the originative environment; show the limits of an environment's effects upon a thing; suggest what a thing : receives from, requires in, reflects of, gains from, loses through, etc : its environment; and so forth.

Some specific examples of matters ideonomy could help investigate are: how an organ is affected by its bodily environment, a cell is influenced by the contiguity of other cells, or the activity of a mitochondrion varies as a function of its cytoplasmic distance from the cell nucleus; how the properties of a molecule vary as a function of nearby molecules; how the perception of an object depends on the spatiotemporal context of the object; whether Mach's principle is correct—or the local properties of matter depend upon the structure, content, or interrelationship of the entire universe; the extent to which—in the problem of text recognition in artificial intelligence—the meaning of individual words is, or should be, a function of prior and subsequent words; the transformations of state, appearance, and behavior that comets undergo when they enter the inner solar system and approach the Sun; how the physiology of a bacterial biont changes when the bacterium is inserted into diverse consortiums of microorganisms; how the operation or effect of a particular law are apt to vary if the law is introduced in different countries' legal systems; how the ethical status of a human act, and hence the various probabilities connected with that act, are altered by the geographic and historical culture in which the act occurs; how the admirability of a military tactic depends on the campaign in which the tactic is tried; how the validity, universality, or expression of fundamental physical laws and constants—so-called—may vary in radically different physical regimes; how the phenotypal expression of a species' genotype may change in minor or major ways in different physical and biological settings and circumstances; how a speaker's conception of the meaning of his own words may change in different conversational circumstances or in a way that depends on the particular persons with whom he is speaking; etc.

Demonstrate Equivalences Between Things

Equivalences are: virtual identities of meaning, effect, function, implication, state, e/vc of two or more different or unlike 'things' (be those identities unidimensional, multidimensional, or omnidimensional); properties, transformations, measures, or situations that make different things tantamount; mutually deducible, or reciprocally implied or entailed, things—or samenesses of truth value; isomorphies or isomorphisms of behavior, dynamics, treatment, cognition, practice, etc; convergently divergent things, processes, concepts, e/vc; pairs or sets of things that possess, or that can be treated as though possessing, one-to-one correspondence with one another—or the state or mechanism of such correspondence; or the like.

Analogs or analogies, per contra, refer to simple or necessary likeness—rather than to anything more or to anything less.

Therefore two things that are neither identical, analogous, equal, related, possessed of common elements, nor even (perhaps) interchangeable or 'symmetric', may nonetheless be equivalent.

The ways in which things are equivalent may variously be: overt or covert, deep or superficial, known or theoretical, simple or complex, fixed or protean, of fixed or variable degree, singular or plural, direct or indirect, intrinsic or extrinsic, separable or inseparable, of finite or infinite magnitude or character, presential or proleptic, etc.

Equivalences may be important for many reasons: they may obviate distinctions or efforts; they may allow the extension or generalization of laws, knowledge, or techniques; they may simplify description; they may belie apparent heterogeneity, disharmony, divergence, inconsistency, or contradiction; they may signalize the real structure of nature; they may indicate the primacy of relationships over things, or of processes over relationships; they may enable a problem to be solved via other routes, methods, or means; they may represent transformational invariants; their discovery may promote the more elegant organization of the mind; they may reveal what is irrelevant, nonessential, or redundant—and what is central; they may suggest universal paradoxes; etc.

Ideonomy could help to answer such illustrative questions about equivalences as: how equivalent the neuroglial cells and neurons of the brain are, say in their full or hidden functioning; whether different initial conditions of the universe will ultimately prove to have been equivalent, in the sense of equifinality; whether the industrial labor of men and women is truly equivalent, in general or in various cases; whether—or in what senses—the different branched-off universes of the Everett Many-Worlds Interpretation of Quantum Mechanics might actually be 'equivalent'; whether matter (koinomatter) and antimatter are opposite and yet otherwise fully 'equivalent'; how equivalent plants and animals —or microorganisms and macroorganisms—are in reality; how equivalent alternative treatments of a disease are; how equivalent different economic and political systems are over the long term in sustaining and advancing the weal of the societies that embrace them; which foraging methods employed by the different species of animals are energetically equivalent (while perhaps being at the same time optimal); etc.

Classify Human Errors

By errors are meant many things: fallacies, delusions, prejudices, evil conduct, acts of stupidity, omissions, and neglect (all of which are discussed elsewhere); as well as malfunctions, inadvertences, mistaken practices or acts, defective calculations or measurements, inaccuracies, failures, misunderstandings, misstatements, wrong decisions, etc.

All individual, specific, and generic errors need to be: sought out and exhumed, compiled, named, analyzed, described, defined, classified, differentiated, circumscribed, illustrated, explained, generalized, interrelated and synthesized, chronicled, operationalized, quantified, simulated and experimented upon, criticized, investigated for their actual and possible combinations, decomposed into their subtypes, extinguished, transvalued, transcended, etc.

What are the distinctive and shared errors that occur in different fields or in connection with different things: e.g. social relationships, scientific experimentation, theoretical science, artistic creation, language or communication, education and child-rearing, economics, historiography, ideonomy, military science, games and sports, criticism, medicine, engineering subfields, psychiatry, commerce, government, industry, taxology, journalism, mathematics, professional studies of the future, diplomacy, cooking, etiquette, ethics, perception, bodily movement, marriage, shopping, and debate?

What are their shared and distinct: causes, geneses, environments and circumstances, paths, courses, effects, costs, implications, elements, interactions, analogies, transformations, distributions, ranges, extremes, dimensions, fluctuations, statistics, clusters, hierarchies, networks, chains, levels and niveaus, disguises, interests and importances, probabilities, absences, thresholds, capacities and potentialities, laws and random aspects, signs, convergences and divergences, paradoxical benefits, appearances, essentials, connections, phenomena, abstract spaces, paradoxes, measures, paradoxical conservations, cybernetics, degrees of freedom, equivalences, self-effects, opposites, representations, etc?

What analogies and parallels are there between human errors and errors that occur elsewhere in nature? What might be learned from the errors that are made by other organisms or machines?

How do all errors scale in terms of necessity and avoidability?

What repetitive and unique aspects of errors are there?

What is it that we know about errors and of what are we ignorant? What are the things that we should find out first—and why, how, with what, and when?

What tools, methods, and other resources are there for investigating errors? What programs of research should there be? Who should be doing what? How might or should human research upon errors be planned? What things in ideonomy as a whole could help such research?

What errors have been made, discovered, or avoided historically—and what have been the consequences?

What scenarios should be constructed for errors that might occur now or in the future?

What errors are ambiguous, controversial, or uncertain? What excuses might be made for particular or generic errors, and how might those excuses be criticized?

If errors are to actually have bad effects, what other things are required or must happen?

How may we be mistaken about certain errors, and what errors may we be mistaken about?

What types of people make what types of errors? What in human psychology or experience, or in the organization of society, accounts for those errors?

What would the world be like without various classes of errors?

Are there bursts of errors? Are there conditions or circumstances that produce many and diverse errors; and if so, what are the reasons and mechanisms therefor? Can errors propagate and procreate; and if they can, how do they do so and how important may such phenomena be?

Are there errors that are obvious and yet unrecognized?

What errors are typically mistaken for other errors?

What are all the unknown errors that might be hypothesized to exist? Are errors more apt to be finite or infinite, in number and variety?

Possible reasons for or values of classifying errors are that: certain errors might turn out to be unexpectedly alike or identical—or on the contrary, different or unrelated; a classification scheme could enable other and future knowledge about the errors to be coordinated, accessed, and more rigorously applied; by codifying errors, classification can promote their universal discussion; classification aids discovery of the properties, laws, and possibilities of things; a scheme classifying errors universally can further the comparison of errors in separate disciplines and the transfer of relevant knowledge and insights based on the analogies, contrasts, homologies, and other relationships that are noted and explored; instruction about errors almost presupposes their classification; classifying things facilitates their perception and imaginative consideration; etc.

What are all of the errors that are made, or could be made, about a particular and random thing? Attempts to answer this question would be edifying and they would help train the mind.

What principles and advice should guide any treatment of error?

What errors are—or how are errors—caused by: defective assumptions, mistaken comparisons, active ignorance, human biases (or likes and dislikes), emotions, bad habits, flawed learning, miseducation, shared errors, poorly organized knowledge, haste, superficiality, carelessness, activities of the unconscious mind, other errors, the limitations of human nature, problems of theories or methods, inattention, defects of philosophies, institutions, misuse of things, bad concepts, fallacious reasoning, disharmonies or contradictions, misinterpretation, mortmain or perseveration, overgeneralization, chains of events, overreaching, missed opportunities, etc?

Random examples of particular errors with which ideonomy could help are: iatrogenic human ills, corporal punishment of children which could be obviated by unflinching reprobation or clever reproofs, both the neglect and abuse of historical analogies by military strategists, overdevotion to a single sense of a concept, overly literal construals of statements, overreaction, worship of a unique standard of excellence and an associated failure to cultivate a necessary diversity, failure to contemplate exceptions, oversimplification of an idea, misreading of a contingent thing as being fundamental, failure to anticipate opposition,

combining or mixing things that are incompatible or of a different nature, neglecting nonlinearities, failure to anticipate nonmonotonic developments, oblivions of past actions or modifications, failure to foresee overlaps or redundancies, unpreparedness, overselling by a salesman, overpreparation by a student before a test, excessive caution or candor in diplomacy, mutual mimicry or singularity of style or aspect of the different figures or objects in an artist's painting, technically perfect but aesthetically over-precise rendition of a score by a musician, excessive intervention of government in a nation's economy, neglect of extenuating circumstances by a jury, insufficient pauses or accentuation in elocution, failure to reproduce the result of an experiment in science, a critic's failure to recognize a novel method or objective in the literary work he is reviewing, failure to adapt a recipe to the peculiarities of one's momentary stock of food or to read between the lines of the recipe, failure of a golfer to properly compensate for the movements of his own body in teeing off, failure of one struck by Cupid's playful arrow to ascertain the actual availability and reciprocal captivation of the sudden idol, failure of the painter of a landscape to omit pointless detail or disharmonious features and to dramatize what is essential, use of simple analogy and unconcern with homology in proposing a new genus of plants, telling a joke to an audience not matched to the joke's particular brand of humor, etc.

Errors can also be classified better through the study of, or by analogies or comparisons to, things that are not strictly or at all errors: e.g. correct actions, truths, problems, acts in general, general contrasts, optimums, degrees of things, deviations, changes and transformations, surprises, anomalies, alternatives, decisions in general, disjunctions, opposites, inequalities, divergences, etc.

By reducing errors things can be made more: efficient, reliable, economical, predictable, plannable, consistent, complex (or simple), rational, understood and understandable, beautiful, safe, secure, perfect, moral, reproducible, controllable, etc.

Aid Evaluation

Ideonomy can help one to examine and judge concerning the worth, quality, significance, amount, degree, or condition of an arbitrary thing.

Specifically, it could aid evaluation of: new medical tools and techniques, candidate policemen, teachers in their classrooms, proposed or attempted social reforms, homes being considered for purchase by newlyweds, political trends, the health of a lot of plants in a nursery, one's own mental state, others' evaluations (sic), neologisms, rival hypotheses in science, the stability of countries in critical regions of the world, a contract drawn up by another party, the state of the sky by one who is contemplating taking his glider up, an abstract painting encountered in a museum gallery, the efficiency of interstellar absorption of different frequencies of photons by various hypothetical mechanisms, the meaning of a poem, the capacity of a stream to transport sediments, the effects of mouse growth hormone when introduced into a canary, the ecological stability of a grassland, the sanity of a person by a psychiatrist, prospective jurors, the severity of a drought, a mathematical proof, the economic health of an ancient town being exhumed at an archaeological site, or the structural integrity of a building.

It can suggest: new ways to evaluate old things, more complex evaluations of things, new needs for or uses of evaluations, things that have never been evaluated, stages in the evaluation of things, useful evaluative procedures, ways of evaluating things through a process of comparison, arguments for different evaluative approaches, things to evaluate in connection with one another, how to combine separate evaluations, evaluative criteria, optimal evaluations, errors to which types of evaluations are prone and how to avoid them, what to look for or what questions to ask when evaluating things, one's range of options when evaluating a thing, the progressively less and more important things that there are to evaluate in a given instance, what is wrong with one's own or someone else's evaluation, problems that are apt to be encountered when evaluating things and how to avoid or solve such difficulties, how to evaluate things that are encountered for the first time or that are unusual or obscure or about which little is known, surprises that are common when evaluating things, etc.

Ideonomy's value can lie: in increasing the amount that can be learned in evaluations, in making the results and scope of evaluations more complete, in standardizing evaluations, in making the evaluative process more conscious, methodical, and systematic, in making it easier for people to begin their evaluations, in increasing the applicability of the results of evaluations, in enlarging the number of things that have already been successfully evaluated (or the amount of evaluational data available to humanity), in improving evaluative habits and in training evaluative skills, etc.

Clarify Events

Things exist in time; when they change in time one speaks of events. The advance of scientific knowledge has taught us the importance of seeking out events everywhere and in everything. Physics would have us reduce all of physical reality to the relations and interrelations of discrete events, and developments in the mental sciences imply that a similar need may exist for reducing all of mental reality to a comparable web of discrete events; perhaps physicomental reality will ultimately prove monistic, and reducible to the dynamic relations and interrelations of pure and singular physicomental events. Would there then be a discretistic or a continuistic manifold of such event-like entities? It is impossible momentarily to say which of these alternatives is the more likely, but probably the dichotomy itself will eventually turn out to be mistaken.

The clarion call that is being sounded is plain, in any case. In all sciences and subjects we are being asked to: reduce all phenomena to events or to their event-like aspects; show how entities are always perforce event-like, and events entity-like (or how both are variously antisyzygial—or illustrative of meetings of opposites in the greater nature of things); isolate all of the individual events, and types of events, that occur in, as, and between phenomena; identify the smallest and largest events, and all of the levels and hierarchies of events; uncover all of the simplest, identical, and interchangeable events—and at the same time all of the most complex, disparate, and divergent, and least interchangeable, events; discover all of the ways in which events interact, combine, permute, transform, and evolve—or could be made to

do so; learn the paradoxical symmetries and asymmetries because of which seemingly different events or sets of events may turn out to be equivalent, or seemingly identical or equivalent events or sets of events different or nonequivalent; ascertain all of the necessary—and all of the arbitrary or contingent—temporal, spatial, and qualitative orderings of events; descry the rhythms, laws, and logics of events; find all of the systematic and paradoxical equivalences between events and nonoccurrences; reconstruct the past—and predict the future—history and evolution of events in their entirety; etc.

Ideonomy can survey and list all of the types of moments in life, both ordinary and extraordinary. It can then go on to investigate, discover, and publish all of their: ways of being scaled and actual scalings; degrees, manners, and means of occurrence, maturation, and transformation; likely and possible—or unlikely and impossible—chronologies or temporal chainings; singular and cyclical occurrences, and reexemplification in a variety of situations; mutual dependence, independence, and interdependence; causes, mechanisms, and processes; stories (all of the stories that they can occur in or give rise to, in connection with particular or generic things); diverse interrelationships with moments in the lives of other organisms, in the 'careers' of inanimate phenomena, or in the internal life of the mind itself; simple and complex effects and human meanings; internal elements and structures; subtypes and subvariations; discrete and continuous physical and mental boundaries; physical and abstract properties, dimensions, dimensionalities, and spaces; conditions, needs, problems, opportunities, uses, opposites, probabilities, criticisms, etc; defects and perfections; goods and bads; alternative definitions, descriptions, and representations; equilibria, disequilibria, and conservational aspects; finite and infinite aspects; competitive, antagonistic, and synergistic aspects; voluntary and involuntary aspects; clusters, interconnections, paths, networks, convergences, and divergences; essential and ambiguous qualities; redundancies and irredundancies; classification; etc.

Such a comprehensive canvas of actual and possible life moments can furnish both an overview and preview of life. Presented to small children, it could enable them to understand what human life is all about, to feel less intimidated by the unknown life that lies before them or by the greater living entity that is society, to explore all possible careers and discuss them among themselves or with their teachers and parents, to plan their subsequent careers, to anticipate and avoid problems, to comprehend the relative and correlative—or the conjoint—importance of life's events or of all that pertains thereto, to enjoy richer and more realistic fantasy-lives and playacting, to undergo quicker psychogenesis and greater individuation, to understand better all the subjects they are taught in which man or life is a dominant element (including history, literature, ethics, sociology, political science, psychology, and biology), etc.

But the imagined inventory and investigation of life's kaleidoscopic moments could also benefit adults, science, industry, and art.

For example, the analysis of how different people rank the same set of comprehensive life moments on a 'best to worst scale' could reveal previously unknown differences between human beings, clusters of types of personalities, different mental views of the world, ways of coping with life's problems, elusive life patterns, systems of attitudes, ways of organizing experience, divergent goals and concerns in life, etc.

Studies of life's range or constellation of special or typical moments would inevitably suggest moments that could occur but do not, or ways of expanding upon, variegating, and further evolving human existence on earth.

The ideonomic extension or generalization of the portrait of man's life moments to the lives of lower animals could variously occur: directly, analogically, gradationally, transformationally, adaptationally, set-theoretically, via logical analysis, predictively, experimentally, taxologically, recombinationally, via transelementation, interpolatively, group-theoretically, or in other ways. Great advances in ethology and zoopsychology could result as the human moments were used to imagine and decipher animals': situations, experiences, thoughts, purposes, psychologies, groupings, relationships, interactions, propensities, choices and decisions, logics, world views, psychological evolution, psychogeneses, societies, practices, behavioral schedules, etc. And there could be return benefits to 'anthropology'.

Ideonomy can identify events in different fields, or in all possible subjects, that are of a similar, identical, or conceptually related nature; and it can be used to redefine or reconceptualize recognized events in a more general, universal, timeless, fundamental, multiform, intercommunicative, manipulable, nomothetic, elementary, multidimensional, categoreal, syncategorematic, categorematic, synthetic, unitary, hierarchic, parallel, ideonomic, etc way.

Its point of view is that it is ultimately the same set of canonical events that is occurring and endlessly recurring in every subject there is and in every phenomenon; or that all known and imaginable events are really variations upon one another or mental variants of one another, albeit diffracted by circumstances, or by the curiosities of human language and custom, into different guises. Of course the absolute singularity of the set may be infinitely difficult to demonstrate.

Events that occur invite ideonomic clarification for many reasons or in many ways: their fine structure may be obscure, their identity may be unknown, their starts and finishes or total duration may be unresolved, their temporal orientation may seem or be ambiguous, their interrelations to other events may be vague, their circumstances may be but dimly perceived or undefined, their causes and effects may not be characterized, their direction or tendencies may require analysis, their interest or importance may be unknown, their novelty (or conventionality) may be unnoted, etc.

As the detail of description of events increases, other details—and other events—come to light, in a way that may be: concatenational, exponential, supplementary, completive, complementary, recursive, network-like, etc.

Random examples of particular events that ideonomy could help to clarify are: volcanic eruption, collapse of a cliff, assassination of a statesman by what a simpler era called a madman, cellular division, blink of an eye, pronunciation of word, transition to mathematical chaos, annihilation of particle and its antiparticle, entry added to ledger, echoing of a sound from cliff face, airplane crash, evaluation of painting, sowing of seeds, rite of passage, discovery of archaeological site, supersedure of one architectural era by another, eruption of solar prominence, conjugation of two bacteriums, biosynthesis of chlorophyll

molecule, learning new word, alteration of international exchange rate, electronic amplification of signal, start of cosmos (Big Bang), doing unto another what one would have him do unto oneself, invention of the safety pin, incandescing of lamp filament, star's death, birth of idea in mind or brain, fall of raindrop, drumbeat, factoring of equation, placement of notice in newspaper, oscillation of global sea level, tumor metastasis, envelopment of one army by another, rotation of ball bearing, interference of two photons, passing of law, nervous breakdown, mental block (transient amnesia), flocculation, submarine passage of turbidity current, declaration of war, collision of two continents, genesis of social strata, kissing, heartbeat, etc.

Examples of the generic things that such events may have 'in common' are: evolutionary curves, halting starts, coincidental concauses, autocatalysis, self-interference, 'false changes', rapid oscillations, amplification, interrupted progress, repetitive and diverse subevents, diachronic consistencies and inconsistencies, directions and indeterminations of direction, discontinuous endings, morphogeneses, spatial convergence and divergence, reversal, displacement, transposition, inversion, preparations or precursors, couplings, cooperative phenomena, reactions and reciprocities, linearities and nonlinearities, equilibria and disequilibria, general axes of movement, flow, regulatory conditions, limits, turbulence, central and peripheral parts, boundaries, emissions, transformations, permutations, combinations, syntheses, energies, forces, materials, processes, products and traces, fractal structure, hierarchy, 'inertia and momentum', homologs, analogs, taxons, opposites, matrices, passive and active elements, major and minor elements, dependent and independent elements, systems, fine structure, internal motions, equalities and inequalities, symmetries and asymmetries, topology, cybernetics, etc.

What illusions, fallacies, and paradoxes are connected with events?

How can events be experimented upon, reproduced, modeled, and simulated?

What do we know about generic and particular events, and of what are we ignorant? What is the value of our knowledge and cost of our ignorance?

How intricate, and important, may be nature's substructure of events?

How may events trigger events, that in turn trigger other events, and so on ad infinitum?

Ideonomy could help answer such specific questions about events as: How many different evolutionary events conspired to produce the banyan tree? How many distinct or complementary auditory events are discernible in applause or contribute to its mental structure? What body of serial, parallel, and diagonal events are preliminary to the catastrophic failure of a cliff or bridge? What set of atmospheric events are triggered by nightfall? What critical events are determinative of the essence of a literary plot? What sequence of events led up to the primordial explosion of the so-called universe? What sequence of events effected the evolution of Homo sapiens or of human intelligence? Of how many events—culminating in death—is biological senescence compounded? What chain of events completely describes the reaction of two heterospecific molecules? When an abscised tree leaf falls to the ground, how many distinct kinematic events—or dynamical discontinuities—does it experience en route?

Illuminate Evil

What is bad: either objectively or perceivedly, either absolutely or relatively, either universally or locally, either eternally or momentarily, either directly or indirectly, and either in a general or in a particular way?

From the standpoint of ideonomy, evils or bads are in no sense confined to the human sphere or to human acts, but rather are to be found illustrated throughout biology and in all of inanimate nature.

This generalization has many consequences: the same considerations, methods, and means that have been, or might be, applied to the study and treatment of human or anthropocentric bads can now be used in a much more embracive, energetic, and natural way; artificial features and fallacies that have been unrecognizedly resulting from the unnatural restriction of the investigation of what is wrong or harmful can henceforth be done away with; bads can now be treated in the spirit of any other scientific phenomenon and with respect to possible universal laws; and insights that will now be gained from the probing of nonanthropic bads can be expected to clarify merely or specially human evils.

Another thing that is necessary to properly grasp the nature and possibilities of human bads is that the breadth of their theoretical and actual types be defined in full, and that all such types and taxons be exhaustively compared and interrelated. Moreover, and related to this, the abstract space of all possible combinations, permutations, and transformations of bads must be progressively constructed and researched.

Unquestionably there are many major and minor kinds of human evils that sofar have never been conceived of or at least that have never been treated satisfactorily or in a way at all comparable to the treatment that has been given to more conventional bads. The ideonomist can make this prediction confidently because he has discovered what is equivalent to a universal law: that mankind has never treated anything whatever in an absolutely complete and final way.

A scheme of types of human evil and bads can function as a checklist and mnemonic whenever or wherever attention is to be payed to some form or instance of such bads. This can prevent problems that are commonplace: ignorant confusion of one type of bad with another, use of the wrong methods to scrutinize or cure a bad or some source of evil, a corruption of the apparatus for classifying and treating bads generally, inattention to bads as a result of frustration and cynicism, overattention to narrow or hackneyed aspects of particular bads, imprecise or ambiguous descriptions of types of bads, poor indexing and cross-referencing of bads in the literature on the subject, etc.

Many phenomena of wickedness or harm must be attributed to diverse bads acting either seriatim or in parallel with one another, to the iteration of the same bad, to the mistaking of a different degree for a different type of a bad, etc.

Many bads must go unrecognized for being latent or hidden, or for constituting anomalous forms or modifications of familiar bads.

How simple, and how complex, can bads be?

How pervasive? How variable or how lasting or conservative? How extreme?

What are the total effects and consequences, and how great may be the total costs, of types of bads or of bads in general? What phenomena and features of the world can be blamed on or explained via bads?

How do bads originate, develop, and evolve? How and why do they wither away, end, or fluctuate? What passively or actively regulates, counteracts, or limits bads? What are the paths and courses of evil?

In what ways and degrees may certain bads or bads in general be good, in either a relative or absolute sense? What do we know, and of what are we ignorant, here?

How, on the contrary, may that which is or appears to be good be bad in some general or specialized way?

How ambiguous, interactive, and interlocking may the totality of bads and goods be in the unknown system of nature?

What are the ranges, dimensions, properties, capacities, dynamics, processes, systems, hierarchies, networks, domains, realms, conflicts, clusters, recursions, transformational groups, rings, trees, sets, elements, etc of each of the given types of bads?

What questions have never been asked or answered about bads?

What recurring questions should or might be asked wherever badness is considered?

In what particular and systematic ways are all bads analogous and different, and what are the implications of such analogies and differences?

What are the uses, functions, roles, and importances of bads?

What bads are complementary or inverse?

What are all the known or possible bads in connection with some arbitrary thing?

What are all the different ways of measuring, quantifying, and describing bads?

How do existing bads tend to change over time, quantitatively and qualitatively? How have they changed historically?

What are the complex relationships between bads and their environments? How do bads in one area, or in connection with one phenomenon or thing, spill over into bads in another area or in connection with other things?

How should different bads be scaled, both absolutely and relatively?

How do different bads appear; what clues and signs of their existence are there?

What ways and means exist or might be developed for evaluating and criticizing bads?

What bads are nonexistent or impossible?

What illusions and paradoxes pertain to bad?

What principles should guide the treatment of bads?

Can bads be reduced or can they merely be delayed, redistributed, transformed, or substituted for one another?

In what ways should given bads be defined, or what constitutes their essence?

Why is it important to study or treat bads?

What controversies exist, or may yet emerge, concerning bads?

Specific examples of things that ideonomy could help to treat the bads of or connected with, or that are themselves examples of such bads as it could aid the treatment of: drug abuse, poor diet, human wars; wars between plants competing for the same territories, resources, or ecological niches; 'false' turns of biological evolution; forgetting of history by later generations; squandering of finite soil resources by physiologically or morphologically inefficient species of plants; internally corrosive reactants generated by the combustion of fuels in engines; connotations of old words used by ideonomy in a novel way; inefficiencies of chemical reactions paradoxically caused by excessive concentrations of the reactants relative to the nonreactants; economic growth or prosperity themselves; self-destabilizations of stars; calculational drift in a computer caused by repeated approximations, or by the accumulation and interaction of other types of errors; overly similar genes or effects of genes; the environmental noise represented by background nuclear radiation in the course of biological evolution; 'selfish' aspects of individual genes within a genome; utterly nonsensical but mischievous rumors arising constantly and insuppressibly in any society; uncontrollable semantic drift of a language over historical time; chaotic fluctuations of global stocks caused by 'pure' nonlinear dynamics; indirect problems induced throughout a musical composition by a single faulty section; opportunities for new crime created by the well-meaning passage of a law; contra-productive effects of a move in chess; etc.

Provide Examples

Particular or diverse examples of things are often needed: by students looking for themes for essays or dissertations, by novelists seeking colorful material, by debaters hoping to make their arguments more concrete or more meaningful to certain audiences, by ideonomists wishing to illustrate divisions of their subject or to test ideonomic principles or methods, by scientists wishing to demonstrate the universality of their laws—or per contra the limitations thereof, by composers wishing to extend the variations of their themes, by mathematicians trying to prove uniqueness (but therefore anxious to anticipate counterexamples), by ideonomists who would instantiate hypothetical genera of things, or by people idly thinking.

Ideonomy compiles and arranges maximally diverse examples of maximally diverse things, and such collections can be tapped whenever a need arises for a random or particular example of something.

Ideonomy can also suggest or actually generate examples of things. It can variously do this by: pointing to existing needs, wants, or opportunities; using a scheme of classification in reverse; showing how to combine or permute the elements of things; discovering whence things might develop; first differentiating and then 'interpolating' things; first analogizing and then extrapolating things; constructing abstract spaces of ideas or possibilities by intersecting the fundamental dimensions of things; showing how different sets of things logically overlap; defining nonexistent things; specifying the transformations that things undergo or could be made to undergo—or all of the lesser changes to which they can be subjected; first identifying the functions or roles of things; modeling things in new ways; giving criteria for the existence of things; etc.

Suggest Exceptions To Laws

There are a variety of reasons why scientific laws may have exceptions: the laws may be imprecise or ambiguous; they may be approximate rather than absolute; they may apply to a limited range of phenomena or to a restricted domain; they may contain hidden assumptions; they may be in error; some phenomena may be mistakable for the other kinds of phenomena to which they do indeed apply; certain conditions or regimes may nullify, weaken, or alter them; inconsistencies among different laws, or inconsiliences, may exist; all laws may fail at extremes, or in the vicinity—or case—of certain anomalous phenomena; etc.

Ignorance of such exceptions may entail many costs and risks: the flourishing of unbreakable dogmatic traditions; hubris; simplistic thought and conduct; existence of unsuspected frailties; missing of opportunities; an exaggerated concept of the nature and importance of scientific laws; failure to recognize that different laws have varying degrees of validity, and that laws per se intergrade with mere rules, habits, principles, tendencies, postulates, generalizations, etc; and so forth.

Ideonomy can compile, systematize, and study as many laws, in as many fields and about as many phenomena, as possible; seek to anticipate laws of the future that have not yet been formulated or discovered; and then seek all known or possible exceptions to such laws.

On the basis of such thoughtful research it can suggest: methods, rules, and principles for finding exceptions to arbitrary laws or laws in arbitrary cases; signs and clues indicating existence or nonexistence of exceptions; ways of creating exceptions to laws; generic causes and effects of exceptions to laws; different possible levels of exceptions to laws; the individual elements, aspects, and dimensions of laws that are apt to permit exceptions; ways of defining, describing, and bounding exceptions to laws; simultaneous exceptions to certain laws; questions to ask and answer when looking for or investigating exceptions to laws; the kinds of environments, conditions, and circumstances that are apt to give rise to exceptions to laws; conditions that are apt to mask the existence of exceptions; etc.

Consider Excuses

Excuses are of interest in part because of how commonly they are given in human life. Some fault, omission, neglect, or failure occurs but a justifying explanation is offered, or an extenuating circumstance is cited, for it.

If centuries of effort are devoted to the development of such a thing or activity as the making of excuses, its cumulative evolution and resulting sophistication can be considerable, and a fortiori if the thing happens to be central to civilization or mental life or if great motivation or rich opportunities exist for the thing's development. For these reasons the development of excuses has been extreme and casuistry has evolved into a high art. Ideonomy would push this evolution a step further and transform casuistry into a science.

Civilization can be viewed as a vast complexus of diverse and diversely interwoven, interconnected, interdependent, distinguished, and interactive excuses for countless like and unlike things.

The excusatory complexus needs to be put under the ideonomic microscope so that its components and processes can be isolated, identified, compared, classified, interrelated, and explained, so that its chains, series, and hierarchies of excuses can be noted and explored, so that the whole structure can be critiqued and improved, so that where appropriate the structure can either be retrenched or amplified, so that the functioning, use, and importance of the complexus in various fields or in connection with different phenomena or human concerns can be explicated, so that the operation or use of the excusatory machinery can one day be automated, so that the full meaning of excuses for human being can be investigated or anticipated, etc.

How do individual excuses, or excuses for individual things: emerge, progress, metamorphose, pass away, supersede one another, oscillate, branch, converge, constrain or reinforce one another, define one another, combine, substitute for one another, cluster, contradict one another, get confused with one another, parallel one another, etc?

For individual excuses, or excuses for or regarding particular things, what are the: types and taxons, causes, justifications, uses, roles, functions, purposes, interests, corollaries, implications, logics, theories, dimensions, elements, rules, definitions, levels, networks, cybernetics, goods, bads, defects, nuances, alternatives, degrees, interrelationships, trees, extensions, generalizations, analogies, complexities, conservations, symmetries, asymmetries, fundamentals, adaptations, exemplifications, distributions, ranges, scales, extremes, ambiguities, capacities, circumstances, combinatorics, constructions, conditions, commonalities, controversies, knowns, unknowns, states, governments, criteria, degrees of freedom, equilibria and disequilibria, informations and entropies, redundancies and irredundancies, dynamics, domains, ecologies, economics ('costs and prices'), probabilities and co-probabilities, epistemology, equalities, characteristic errors, equivalences, tests, games, gedankenexperiments, gestalten and wholes, transformation "groups", representations and representational mappings, illusions, inversions, kaleidoscopic invariants, languages and linguistic elements, sets, spaces, manifolds, stories, measurements, myriontology, needs, opposites, networks of consequences, nonexistences, noology and thoughts, operations, opportunities, desirable organons, paradigms, paradoxes, pathoses, paths, patterns, perfections, plans, tactics, strategies, possibilities, useful principles, problems and solutions, illuminating questions and appropriate answers, differentials, integrals, reciprocities, rings, simplifications, systems, topologies, transcendences, transvaluations, unifications, world views, etc?

What are all possible excuses for or regarding a single random, or a particular, thing?

What are all possible aspects of a single random, or a particular, excuse?

There may be species and genera of excuses for (or what species and genera of excuses may there be for): doing too much; doing nothing or too little; doing the wrong thing or doing something improperly; making certain uses of things; causes; effects (e.g. interferences); ignorances; answers; solutions; bads; defects or limitations; errors (e.g. misperceptions, misconceptions, misrepresentations, misactions, etc); behaviors, acts, or practices (e.g. traditions, 'irrational' rituals, some murders, etc); pathoses; nonexistences; methods, tactics,

or strategies; needs or wants; beliefs, prejudices, attitudes, or policies; alternatives; speculations; decisions; problems; elements or parts; assumptions; interpretations; economics or costs; relaxations, simplifications, or shortcuts; failures or disasters; etc.

Some examples of specific things for which there may be excuses are: instances of mistrust; an aleatory element in one's behavior; white lies; the fictions used in mathematical physics; casual upbringing of children or methods of teaching; diseases (since these may actually have unrecognized beneficial aspects); retention of old ways of doing things; "wrong" answers on intelligence tests; eccentricities of personal conduct; "vestigial" organs of the body; "malapropisms"; sloppy work; retrogressions or reversions; approximations; extravagant behavior; waste; inefficiencies; hybrids; importation of alien things; creative destruction; disloyalty or broken promises; arbitrary assumptions; oversimplifications; intentionally ambiguous or vague statements; deliberate leaks of political or military information to journalists; fevers; "disasters" in human affairs; economic recessions; human strife and contention; mutations and even biological "monsters"; socioeconomic inequalities; disinformation spread internationally by intelligence agencies; brutal competition among corporations; natural miscarriages; historical wars; medical placebos; favoritistic triage; eminent domain; slang expressions; caricatures; democratic "chaos"; genomic "inefficiencies"; life's difficulties; homosexuality; prostitution; gray markets; juvenile and adult play; token acts; compromises; 'benign neglect' in politics or elsewhere; "illogical" intuitions; "excessive" caution or precautions; etc.

What excuses are excessive or insufficient?

Is an excuse still relevant or passé?

What obviates a given excuse?

What things are and are not covered by an excuse?

What excuses should have their worth or assumptions tested?

What is inexcusable? What are the thresholds for the validity of excuses?

Ideonomy can help to answer these and other questions.

Suggest Experiments

New types of experiments are always being thought of, as well as new ways of testing things, and ideonomy can expedite this process.

Innumerable ingenious permutations, combinations, and transformations of scientific experiments can be suggested.

Ideonomy can help to systematize experiments': design, conduct, evaluation, modification, specialization, refinement, diversification, universalization, substitution, augmentation or abridgement, codification, comparison, exploitation, criticism, self-testing, automation, etc.

Ideonomy can assist with the answering of such questions about experiments as:

What experiments can and cannot answer certain questions, examine certain problems, validate procedures, add missing pieces to a picture, circumscribe a problem, suggest other experiments, advance a science as a whole, have useful negative results, quantify things, compare one thing with another, eliminate some undesirable ambiguity, provide

maximal data with minimal means, supply the highest-quality or most certain or absolute data, detect subtle features of a phenomenon, maximize the diversity of scientific inquiry, answer the most questions at once, penetrate most deeply into the heart of a question, settle old issues, etc?

What is wrong with existing experiments?

What 'obvious' or necessary experiments have somehow never been performed?

What experiments have failed and why have they failed? What could make them work?

What experiments should be performed in parallel—or seriatim?

What decisions can and should be made in the very course of an experiment?

What would be the consequences of all possible modifications of an experiment?

How are different experiments analogous and how do they differ?

What experiments can address different dimensions, elements, and levels of the same problem?

What experiments can be expected to bring the quickest results?

What errors are different types of experiments prone to and in what ways can they be avoided or rendered innocuous?

What are the current limits of scientific experimentation and how can they be surpassed?

What are the total interrelationships of the totality of scientific experiments that are being performed around the world today?

What canonical experiments recur in science after science or in connection with phenomenon after phenomenon?

What experiments can be designed to explore diverse ideonomic issues?

How can various experiments be consolidated?

How do different, and what different, experiments supplement and complement one another?

What are the longest individual or types of experiments that should be run, or what experiments should be run <u>in perpetuum</u>?

What are all of the experiments that can or should be performed upon a single, random or particular, thing? What might be the totality of results produced by these experiments?

How can a given experiment be endlessly varied or varied in the most diverse and complex way?

What is the most efficient or proper scheme for the comprehensive future evolution of all scientific experiments?

What criteria exist or can be devised for deciding what experiments should be performed in arbitrary cases?

What current experiments are redundant and irredundant, and what are all of the redundancies and irredundancies of contemporary experiments?

What types of experiments in one subject could be transferred, either directly or in an adapted form, to another subject so as to fill an unmet need in the latter?

What series or sets of experiments could or can be expected to produce certain types of results?

What are all actual and possible reasons for experiments in general or specific experiments? What are the actual, appropriate, and infinite combinations of these reasons? What meta-structures do these reasons form or involve: e.g. hierarchies, networks, rings, trees, useful lattices, dynamic matrices, etc?

What specific and generic infinite series of experiments 'are there' and in what directions do they go?

What are the total epistemological, noological, logical, mathematical, and even axiological bases and possibilities of experiments?

What are the recurrent or universal types of surprises that tend to occur when experiments in general or types of experiments are performed?

What types of : premature, fallacious, simplistic, misleading, exaggerated, backwards, unjustified, nugatory, presumptuous, etc : conclusions can be or are being drawn from an experiment?

How can the many divisible or elementary results of an experiment be ranked : unidimensionally and multidimensionally?

What are the infinitely-many independent, dependent, and interdependent statistical methods, tests, measures, and parameters that are applicable to the analysis, manipulation, synthesis, and representation of the data that experiments produce?

How can and should experiments whose design, methods, and course have traditionally been a priori and rigid be transformed by the introduction of feedback and other cybernetic principles and processes that will make them plastic, pluripotent, intelligent, creative, and self-evolving, or enable them to respond to, adapt to, and grow out of the ongoing course or emerging results of the actual and individual experiment?

What are the systematic and infinitely many and diverse analogies and differences between a single, particular or random, pair of supposedly related or unrelated experiments?

How can certain results or implications of an experiment be obscured by other—more obvious or first-noticed—results or implications of that experiment?

How do different experiments tend to imitate one another, in either good or bad ways?

How have certain types of experiments evolved historically, and how could their future evolution be extrapolated or augmented?

What are all of the ways in which the choice, performance, or apparatus of an experiment may paradoxically perturb, distort, or transform the phenomenon experimented upon, the conduct of the experiment, or the results or data of the experiment? Which such problems are and are not remediable, and how can they be avoided, minimized, or coped with?

What are the most unusual known or unknown ways and means of experimenting upon things, or types of experiments?

What opposite or complementary types of experiments can be performed, should they both be performed, and how do they or their results meet antisyzygially?

What experiments or experimental methods are and are not equivalent and what are their : various and complex : modes and degrees of : equivalence and nonequivalence?

What experiments, or genera of experiments, are the most important or critical to conduct or that might be conducted?

Types, analogs, or bases of experiments include: trials, tests, demonstrations, simple observations or measurements, acts, attempts, exercises, simulations, gedankenexperiments, manipulations, perturbations, additions or introductions, subtractions or omissions, repetitions or replications, reconceptualizations, constructions, disassembly followed by reconstructions, rearrangements, recombinations, substitutions or transpositions, restrictions, isolations, accelerations or decelerations, augmentations or diminutions, alterations, concentrations, protocol changes, resequencings, 'controlled' or double-blind experiments, attempts to prevent or exclude things, threshold-modifications, one-variable manipulation, many-variable manipulation, all-variables manipulation, reversals, inversions, manipulation of initial conditions, environmental manipulations, recyclings, forcings, creation of opportunities, introduction of types of dynamic feedback, catalyzations, relaxations, destabilizations, interventional guidance, destructions, interlinkages, interpositions, samplings, displacements, prolongations or postponements, improvements, transcendences, 'virtualizations', equalizations, etc.

Illustrative examples of specific things that might be experimentally investigated are: growth, health, and changes of organisms in zero gravity; neuronal plasticity and excitability in vitro or sans glial cells; whether bacteria learn or operant conditioning can modify their behavior; galaxy-galaxy collisions (simulated on a computer); effects upon the reactivity of a molecule caused by the addition of single atoms with different atomic numbers; effects of introducing foreign genes (transgenes) in organisms; interadjustments of the phenes of the phenotype of an organism caused by artificial discrete and systematic interadjustments of the genes of that organism's genome; simulated cosmogonies with various quantitative or qualitative alterations of the universe's initial conditions or 'constants'; consequences of introducing "free-enterprise zones" inside Communist countries; capacity of the U.S. general population to decide through referenda the sort of sophisticated questions that are now adjudged by the Supreme Court; equivalence of difference equations to differential equations in solving various problems in mathematical physics; the simulated course of world history had the Axis Powers and not the Allied Powers won World War Two; amount of laughter caused by showing various cartoons to different ethnic groups; effects of "streaming" schoolchildren per type of personality; effects upon the way people perceive and evaluate a famous painting such as da Vinci's "Mona Lisa" when a computer is used to selectively alter various discrete aspects of the painting (e.g. the identity or arrangement of certain background objects or scenery, textures, colors, lighting, contrasts, facial characteristics, etc); whether ethical nuances (or anlagen) exist in the social interactions of laboratory animals (using special tests and situations designed to detect them); the absolute or differential detectability by ordinary listeners of various types and degrees of discrete changes in the sounds present in the fabric of a symphony; etc.

Extend Things Elsewhere

Often what applies in one place also applies, or can be applied, elsewhere or to another thing.

Methods, procedures, tactics, strategies, philosophies, criteria, assumptions, logic, representations, knowledge, classificatory schemes, theories, hypotheses, concepts, definitions, criticisms, mathematics, thought experiments, coordinate systems, categories of discovery, doctrines, proofs, inventions, techniques for evaluating things, principles, laws, generalizations, specializations, purposes, uses, instruments, language, manifolds, metaphors, analogies, mechanisms, models, paradigms, perspectives, plans, practices, predictions, decisions, probabilities, questions, categories of answers, relations, resources, organons, series, hierarchies, simulations, solutions, spaces, stories, systems, technologies, things, transformations, syntheses, wisdoms, etc : found in, characteristic of, created in or for, or related, applicable, or referable to : one : science, topic, profession, realm, domain, world, undertaking, place, phenomenon, time, context, etc : may naturally or artificially extend or be extendible to one or more others.

Such extension may occur with or without some degree of modification of the extended thing and/or of the thing to which it is extended.

Such acts, processes, or states of extension differ in ideonomy from what is ordinarily meant by generalization in that subject. For ideonomy a thing's extension is like a word's static or increased denotation (or extension), whereas a thing's generalization is like a word's static or increased connotation (or intension); the former refer to application, the latter to meaning or essence.

Extension may have a discontinuous, occasional, voluntary, singular, narrow, or punctiform aspect: whereas generalization may have per contra a continuous, eternal, necessary, plural, or broad aspect.

Perhaps extension should be understood as the reference or application of a thing to what lies on the same or a lower level of meaning or generality: whereas generalization should indicate the reference or application of a thing to what lies on a higher level of meaning or generality.

At this point it must be confessed that at the present time the relative and absolute meaning of the words and concepts under discussion remains uncertain or undecided—a situation that should not be too surprising, in view of ideonomy's incunabular status.

Among the many reasons why a thing's extension may be important to perform or consider are: the thing may have other aspects, elements, or dimensions that are not illustrated or are but poorly illustrated by those that are known, conventionally or situationally referred to, or understood; novel or improved uses and functions of the thing may be possible; the extension of a thing may change or be different in certain situations or cases; the meaning or structure of a thing's extension may not be simple but instead complex, subtle, multilevel, etc; understanding a thing's extension can be critical to understanding the thing's meaning or essence; exploring the actual or hypothetical extensions of things in general can help to exercise, train, or evolve the mind's manifold powers—both rational and creative; extension of a

thing to one place or in one direction may imply or allow a fact or process of reciprocal extension (that is, if a thing is extended to another thing, the other thing may therefore extend or be extendible backwards, to the original thing); simple extensions may enable or be necessary for the discovery, occurrence, or creation of compound extensions or of finite or infinite chains, series, networks, trees, hierarchies, rings, manifolds, and other meta-structures of extensions; etc.

For generic or specific things, ideonomy can help one to : define, clarify, describe, treat, exploit, develop, interconnect, unify, etc : generic or specific : extensions': causes, needs, elements, mechanisms, laws, boundaries, interactions, interdependences, ranges, extremes, excellences and defects, effects, analogies and differences, alternatives, opposites and antisyzygies, clusters, corollaries and implications, conditions, capacities, possibilities, geneses, origins, transformations, goals, combinations, synergisms, contradictions, stoichiometries, cybernetics, cycles, probabilities, co-probabilities, evidences, states, distributions, controveries, convergences, divergences, vergences, disjunctions, emergents, equivalences, errors, examples, paths and flows, histories, problems and difficulties, nonexistences, logics, matrices, motions, opportunities, paradoxes, patterns, planning and management, psychology, self-effects and recursions, topologies, sets, etc.

Ideonomy can be used to suggest or investigate all of the extensions of a single, random or particular, thing to another—random or particular—thing, to many such things, or to all things; or conversely, all of the extensions to a single thing of another thing, other things, or all other things. It can do these things for illustrative, educational, scientific, technological, philosophical, or recreational reasons.

Examples of how things might be extended to other things, with or without ideonomic help: the definition of a thing in one language might be reused to define the same thing in some other or one's own language (which could, i.a., import a new sense of the thing or of the possibilities of the thing); similarly, the definition of a phenomenon in one science might be extended to the definition of the same, or of a different, phenomenon in another science; knowledge about the behavior of squirrels in deciduous forests might be 'extended' to squirrels in tropical or coniferous forests; the discovery that the human organism takes literally several months to detect a certain class of odors might be automatically or evidentially extended to the temporal limits of vision, taste, or even hearing; an industrial innovation in the United States might be extended to the Brazilian economy; the ratios of isotopes in Earth's crustal rocks have been extended to Lunar rocks to suggest what to look for and to check agreement and disagreement; the laws of thermodynamics might be extended to the mass behavior of entire societies; the general phenomena and functions of the plasmalemma might be extended—heuristically or analogically—to the capsular membrane of the mitochondrion; the techniques of chemical kinetics might be extended to the flow of coded pulse trains through sets of neurons; etc.

Point To Extreme Possibilities

Things often change or behave differently at extremes or in extreme regimes. Also, the extreme forms of things may be radically different from the normal, average, or moderate examples of same. Extreme possibilities in general can be instructive.

The kinds of changes that occur at extremes are characteristic and to some unknown extent universal. Knowledge of extremes can have predictive, heuristic, and descriptive value. It can suggest what changes to expect or how to create, prevent, modify, research, or exploit such changes.

Extremes or extremal phenomena that occur in one science or in connection with one phenomenon can be used to predict the occurrence, nature, and larger possibilities of extremes and their phenomena in another science or everywhere in science.

Given extremes are often relative rather than absolute—current rather than final—and yet can be used to anticipate the greater extremes, or entire series of extremes, that are or may be ulterior to them.

The types of things that may happen at extremes are multitudinous, and include: inversions; reversals; retrogressions; weakening or failure of laws, constants, and principles; division of a phenomenon (perhaps previously considered indivisible) into two or more distinct and novel phenomena; coalescence of a phenomenon with one or more other phenomena (that may have been viewed as incompatible, disparate, or unrelated); dissipation or extinction of normal phenomena and their replacement by new, novel, or revolutionary phenomena; emergence or relevance of new laws, constants, or principles; clarification and reconstruction of the foundations of things; advent of new regimes; mutual interactions and interferences of formerly isolated or compatible things; modifications of the accustomed probabilities, frequencies, numbers, ratios, and other relationships of things; antisyzygies; novel combinations of phenomena, entities, types of behavior, systems, processes, causes, effects, abilities, levels of things, forces, etc; destruction of equilibria, symmetries, equalities, equivalences, conservation laws, etc; appearance or proliferation of exceptions, anomalies, pathoses, defects, problems, stresses, strains, errors, paradoxes, etc; accelerations and decelerations; excitations and relaxations; complications and simplifications; transcendence of former limits and impossibilities; remaking of boundaries; the formerly impossible completion, culmination, perfection, or transformation of certain things; interactions of wholes and parts, and holistic changes; circumplexes; singularities; chaos; supersedure or usurpation of local by universal—or of universal by local—phenomena; diversification or homogenization; oscillations or random behavior; loss or invalidation of familiar perspectives; new general patterns of things; etc.

The interest of extremes, or importance of their study, also includes: that they are able to demonstrate or define the limits of one's or mankind's knowledge, understanding, techniques, powers, means, or theories—or the illusoriness of omniscience and omnipotence; that they exercise, challenge, develop, and liberate the mind; that

they establish boundary conditions; that they provide tests of the fundamentality, absoluteness, universality, comprehensiveness, rigor, robustness, exactness, finality, uniqueness, etc of one's theory and knowledge of normal phenomena or of the familiar world; that they supply a larger framework for thought; that they clarify the fundamental dimensions and structure of nature; that they diminish the arbitrary element in human perception and experience; that they point the way to the general advancement of the dimensions of human existence now and in the future; etc.

Ideonomy could help to determine or treat the most extreme degrees of or possibilities for such things as: volcanic eruptions or episodic volcanism in Earth's history, social fads and fashions, political ideas, human good or evil, storms or climatic changes, renderings of musical or other artistic ideas, chess strategies or styles, human poisons or diseases, statements of certain ideas, illusions (as of safety, absence, or necessity), Solar fluctuations (as of luminosity, volume, or spherical asymmetry), energies of elementary particles, performances in sport, oscillations of the global economy, types of chemical reactions or forms of molecules, rates of bioevolutionary innovation or change, fluctuations of the level or volume of the ocean over Earth's history, algorithmic shortcuts or powers, drugs, cellular automata, or engineering materials.

Illustrative general or universal dimensions of extremes, whose singular or plural maximums and minimums might be worth investigating, include: pressure, density, purity, velocity, rate, duration, energy, mass, temperature, frequency, size, population, accuracy of measurement, stability, complexity, orderedness, correlation, information, probability, control, disturbance, isolation, feedback, linearity, activity, reactivity, uniformity, integration, excitation, growth, reliability, symmetry, identity, universality, efficiency, violence, work, freedom or independence, synchrony, flux, potential, perfection, convergence, divergence, oscillation, creation, disappearance, redundancy, tolerance, importance, transformation, youth (or age), etc.

Unearth Fallacies

Human reason, frankly, is monstrously defective, more a caricature of the Logos than a hint of the real thing. But at least for the moment, it is all that we have, and per se sacred.

Yet look anywhere and you will find errors of thought: meagerly logic, excruciating non sequiturs, stark contradictions, moronic deductions, labyrinthine paralogism, institutionalized sophistry, beliefs arbitrary and almost random, Bacon's idola in unreduced rampancy...

So severe are the constraints imposed upon man's intellect by his habitual fallacies that they define the architecture of the mind. Transcend these fallacies in general, with whatever means, and you will transcend intelligence as we know or understand it.

And so the stage is set for ideonomy.

Though individual fallacies are innumerable, their essential diversity is not. The same types of fallacies occur everywhere and all the time; only their manifestations and treacheries are limitless. Fallacies combine, permute, and transform, and yet always are the same.

They encourage, serve, perpetuate, multiply with, and exponentiate one another. They unite and procreate in vicious rings and cycles, towering hierarchies, endless chains, inescapable and engulfing networks, etc.

They are a universal madness and the ultimate weed.

Here are some specific examples of known or possible fallacies to illustrate what in general is meant by a fallacy:

Should a tingling sensation be felt in the knee, it would be a fallacy to assume that the actual source of the tingling had to be there, since on the contrary the cause might be a focus of irritation in the nerves leading up to the brain or in the brain itself.

Of course the concern of ideonomy is to take excessively specific things like this and maximally abstract, generalize, and re-apply them. Generalized fallacies here might include that: Things must be located where they are perceived to be located; Things must be what they are perceived to be; Perception is a direct or unmediated act; Appearances of things are immanent in, or all or part of the essence of, those things; Consciousness and the mind generally are incapable of fundamental error; etc.

Often falling in love is stupid, but it would certainly be a fallacy to assume that it is always or even usually stupid. The generic fallacy is of course overgeneralization; there are myriad species of it.

Earth has been around for 4.6-billion years, and during that time the Sun has been sufficiently stable to permit life to evolve and our own species to originate. It might be a fallacy, however, to conclude from this that in the future the Sun will be equally stable or that the continuity of civilization is assured. Although the logic of the situation is exceedingly complex and somewhat uncertain, it is possible that the historical constancy of our star has largely been a product of chance, of a type, say, that guarantees that a few of the 10 exp 21 ± 2 stars in our cosmos will be stable long enough to give rise to so-called intelligent organisms such as ourselves, but that does not especially make continued constancy—beyond the epoch of complacent reflection—very likely. The fallacies in this case would be in disregarding the possible selectivity or self-selectivity of observers, and transience of special situations.

One of the most famous fallacies is the deduction that two analogous biological species must also be homologous, or closely related in an evolutionary sense. Bats and birds both fly, but not because they are or were in the past continuously linked by other flying animals. Like environments re-originate like forms, the universal self-similarity of the Earth as a whole re-originates given forms, and the universal or general self-similarity of the phenes and genes of the whole bios—or its unrecognized underdifferentiation—insures the endless re-invention of familiar organismal forms and functions.

Given fallacies should have all of their known and possible variants worked out, compared, and distinguished; they should be stated and restated in every possible or meaningful way.

Take the fallacy, that if a thing precedes another thing it must cause it. This could be called the fallacy of precursor as cause. Some of the related distinctions deserving to be made here would include: A precursor on but one occasion, a repeated precursor, or an invariant precursor. An immediate or distant precursor. A precursor connected or unconnected with the thing. Must, is apt to, must be able to. By itself cause, cause with help, help to cause, or is presupposed by occurrence of.

Hitherto only a relatively few fallacies have been isolated, named, defined, and discussed; few variations upon a given fallacy have been systematically distinguished; defects and inconsistencies in the language used to treat fallacies currently abound, having never been remedied or even really addressed; the diverse meanings of fallacies vis-à-vis the world's range of subjects and phenomena have gone unsurveyed; systematic solutions to fallacies have not been proposed; the universal logical and cognitive bases of fallacies have not been found and characterized; etc.

Fallacies have serial, clusteral, network-like, dendriform, and other relationships to one another, in a variety of senses and ways. For example, if one type of fallacy about a thing is corrected, certain other fallacies will naturally tend to take its place, and these in turn will lead on to other fallacies, depending on the circumstances and the set, order, and logic of decisions made.

About various types of problems and matters there will be canonical sets of co-alternative fallacies. There will also be standard tests for the existence, nature, interrelationship, and importance of relevant fallacies.

Ideonomy in general can help indicate, discover, or treat:

Which fallacies are identical and which are merely analogous.

Criteria and clues for identifying and distinguishing types of fallacies.

Different levels of fallacies that independently exist or that interact and cooperate in a given case.

Opposite fallacies that may exist or cooperate in different cases.

Fallacies that are apt to be confused with or mistaken for other fallacies.

Common or important fallacious: beliefs, philosophies, doctrines, attitudes, concepts, practices, tactics, strategies, methods, answers, questions, solutions, plans, systems, schemes of classification, representations, models and simulations, statements, investigations, analyses, syntheses, criticisms, evaluations, arguments, hypotheses, theories, mathematics, assumptions, combinations of things, innovations, decisions, definitions, explanations, descriptions, proofs and disproofs, perceptions, examples, principles, rules, laws, extensions, excuses, expectations and predictions, experiments and tests, gestalts, goals and purposes, language, imagery, measurements, paradigms, courses and paths, perspectives, reactions, shortcuts, simplifications, advances, revaluations, unifications, uses and applications, work, correlations, etc.

The 'algebra' of fallacies, or how they: add, multiply, exponentiate, distribute, grow and shrink, bound one another, etc.

The definitive dimensions and relative and absolute scalings of fallacies.

The 'complete' structure, causes, implications, content, effects, classification, etc of a single, random or particular, fallacy—or of all fallacies about a single, random or particular, thing.

The complete range of simplest known or possible through most complex known or possible fallacies, of a given type or of all types.

Ideonomy can work out all of the fallacies that exist in or apply to one area, and then figure out how they are interconnected, relate to one another, etc. It can then generalize the lessons, patterns, etc to totally different areas of knowledge or endeavor.

Consider the case of music, which includes composition, performance, the act or art of listening, theory, etc.

Musicians' fallacies include an overly literal rendering of a score, the assumption that the composer explicitly incorporated all of his intentions or mental states in his score, the belief that sufficient musical devices exist to score all musical ideas, treatment of a score as though its meaning or rendering should be time-invariant or insensitive to the circumstances of a given performance, the assumption that a musician is ever capable of exactly duplicating his earlier performance of a work or the particular conception of the work he has in his mind—or that each performance is not perforce and properly unique or that it should not represent an act of creation and self-discovery, the concept that any piece of music is less than infinitely complex, the view that a score is unambiguous, the notion that the composer had a perfect or unsurpassable concept of what the meaning, form, and interpretation of his composition should be, etc.

Composers' fallacies can be the belief that it is always necessary to observe familiar rules, that a musical idea requires to be stated completely in certain cases, that there are only certain ways of creating particular musical effects, that the visual aspects of a score will be apparent to listeners, that listeners are equally capable of feeling all emotions, that musical ideas can be properly grasped immediately or without being introduced and developed, that musical meaning is independent of musical form or context, that musical systems can be arbitrary or that they need not take account of human biology or of universal patterns in nature, that a new musical work is not or need not be an integral part of the historical evolution and contemporary 'ecosystem' of all music, etc.

What are the mutual and conjoint relationships and implications of these and other musical fallacies? And how can they clarify or suggest fallacies in other fields, such as painting, economics, or ethics?

Thus the fallacy that musical meaning is independent of musical form or context may be related to or reflect the fallacy that musical systems can be arbitrary or indifferent to human biology (anatomy, physiology, and genetics): e.g. musical form may reflect inherited acoustic structures or ways of processing sounds and sonic sequences.

The hypothetical relationship between these two musical fallacies could then carry over—mutatis mutandis, ceteris paribus—to painterly fallacies.

Originate New Fields of Research

Science and civilization evolve as entirely new fields of research and endeavor come into being. At any one moment the scope of human inquiry is to some extent artificially limited; fields are feasible or needed that have not been thought of. It would be desirable to have a device for visualizing in advance the entire range of fields that could or should exist, and the relative and absolute properties, potentials, and methods of those imaginary fields. Ideonomy is such a device.

The bases of ideonomy's power to suggest new and desirable subjects are sundry and various: comparisons of extant fields to see what they have and lack; studies of the structure and history of human endeavor, and extrapolations thereof; review of the known and unrecognized needs and desires of mankind; isolation of the fundamental dimensions of knowledge, natural phenomena, science, and thought; critique of existing disciplines; mental construction of imaginary fields by analogy to those that now exist; systematic and permuted combinations of things, including concepts, phenomena, processes, laws, methods, instruments, regimes, etc; surveys of what does not exist, of what is unknown, of unanswered or unasked questions, of unsolved problems, of defects and idiosyncrasies of human knowledge, of futuribles, of scientific anomalies, of possible categories of discoveries and surprises, of extreme and transcendent possibilities, etc; mapping out of the connections and interrelations of things or concepts; explorations of the possible meaningful transformations of things, sciences, tasks, methods, and ideas; investigations of what is possible based on pure logic; generalization and extension of existing fields and things; etc.

Sciences are unequally and differently developed and differentiated, and hence the divisions, subfields, and concerns of certain disciplines can be mapped onto other disciplines to suggest missing divisions, subfields, and concerns of the latter.

Certain new or imaginable mathematical discoveries may have universal exemplification or application, and by postulating or demonstrating same ideonomy can effectively suggest new subfields in all those fields to which the discoveries extend. Thus symplectic groups, catastrophes, chaos, fractals, and cellular automata, e.g., may originate new subfields in chemistry, psychology, physics, biology, technology, meteorology, cosmology, and economics.

Mathematical objects and methods in general can be combined with one another en masse, and these combinations can be applied to diverse disciplines to suggest future subfields thereof.

Ideonomy can show how to put those numerous fields that presently remain outside science on a truly scientific footing for the first time, and in this way it can add to the number of fields and subfields of science.

Many of the divisions and subdivisions of ideonomy itself will become new fields of research—even new sciences—as a result of ideonomy. Moreover, when these ideonomic divisions are applied to the treatment of other disciplines an even greater number of new fields of research will result: e.g. hierarchical chemistry, group-theoretic chemistry, and cybernetic chemistry; analogical biology (at all levels, or in all systems, of biology); or antisyzygial psychology.

Different forms, areas, and programs of research are always to some degree interrelated, and ideonomy has the ability to maximally interweave, and synergistically coordinate, a vast mosaic of investigations and other intellectual endeavors. By raising the efficiency and productivity, reducing the cost, optimizing the diversity or the organic differentiation, lessening the redundancy, improving the planning, and rationalizing the structure of research, ideonomy can make it possible for a greater total number of subjects to be pursued at any given time.

By explaining the reasons for or potential returns to society of research, ideonomy could enlarge the fraction of its income that the world is willing to allot to research, development, and innovation. This would multiply the number of areas of inquiry that could be funded.

Identify Flows

Many things flow, either in a literal or in a figurative sense. All things, in fact, may flow. Certainly all things, be they physical or mental, participate in, cause, and are affected by flows—flows that are infinitely many, diverse, ranging, intricate, and important.

About these flows we presently know very little. Only implicitly do we know of the existence or possibility of all but an infinitesimal part of these Heraclitean flows.

The importance of such flows, or of understanding or mastering them, may be many: They may undermine stability, or invalidate what consciously or unknowingly assumes—or frustrate what requires or would presuppose —stability, permanence, constancy, stationariness, cohesion, or rigidity; They may bound, or be necessary to bound or define, the identity and continuity of things; They are an energetic, active, mobile, or formative background or matrix against which the life of the world is defined or from which it is derived; They facilitate the convergence, divergence, interaction, and plexure of things; They add, subtract, and nourish things; They insure the perpetual mutual adjustment and adaptation of things; They transmit patterns and information; They induce the evolutionary transformation of nature; They maintain local and universal equilibrium; They endlessly map the universe onto itself, automorphically; Etc.

The properties of all or some flows include: Swift encirclement and passing of obstructions (purling or circumfluence); Undulation; Turning and eddying; Rolling; Agitation and turbulence; Vibration, pulsation, and quivering; Eruptiveness; Wandering and meandering; Overflowing; Elasticity; Perturbability and responsiveness; Amorphy or 'blob-likeness'; Twisting and spiraling; Corpuscular diffusion; Extension, spreading, diffluence, divergence, and dissipation; Confluence and compression; Interfluence and fusibility; Penetration, invasiveness, and permeation; Anarchy; Incompressibility or 'hydraulic' conservation of volume; Continuity and self-continuity; Cohesion; Viscocity; Direction, linearity, and collimation; Self-boundedness; Possession of discontinuous boundary and a smooth outer surface; Irrigidity, penetrability, and ductility; Running, coursing, streaming, and shooting; Scissility, discontinuous furcation (bifurcation and digitation), and sympodeal progression; Concentricity, stratification, tunication, fountaining, folding, and imbrication; Self-interaction,

self-organization, self-reorganization, self-government, self-stabilization, self-compartmentation, self-arborescence, and self-plexure; Vergence, anastomosis, and braiding; Eversion and evertibility; Isotropy; Surging; Homogeneity; Mixing and mixedness; Difformity and proteanness; Stretching and contraction; Lobation and radiation; Growth points; Fissionability; Curvature and roundedness; Passage; Movement, movability, and travel; Transportation and transmission; Dirigibility, deflectibility, and canalizability; Funneling; Swiftness; Accelerability; Instantaneous adjustment and self-interadjustment; Attrition; Self-facilitation; Bipolarity and possession of origin and destination; Uncontainability and unstoppability; Rectangular, cylindrical, ellipsoidal, cylindroidal, or fusiform outline; Graduality; Pushing, pressure, pulling, and suction; Development, quiescence, morphogenesis, and degeneration; Longness and narrowness; Possession of gradients; Finding and taking of shortest path or paths in space, time, energy, e/vc; Unpredictability, indeterminacy, and impulsiveness; Persistence ('momentum'); Closure or openness; Reversibility and bidirectionality; Etc.

Some dimensions of flows are or can be: Velocity; Distance; Rate; Capacity; Power; Instantaneous change; Stability; Rectilinearity; Importance; Isolation; Etc.

Types of flows include: Periodic and aperiodic; Circular, orbital, self-rotational, spiral, helicoidal, and annular; Lineal, surficial, and voluminal; Transverse and diagonal; Countercurrent; Direct and indirect; Normal and aberrant; Incoming and outgoing; Induced and spontaneous; Restrained and free; Parallel and antiparallel; Untwisted and twisted; Concrete and abstract; Simple and complex; Differentiable and undifferentiable; Continuous and discontinuous; Random and deterministic; Local and universal; Real and illusory; Actual and virtual; Fluidal and solid; Individual and integral; Specific and general; Finite and "singular"; Radial; Interlaminar; Isomorphic; Laminar and turbulent; Horocycle; Harmonic; Ergodic; Homentropic; Measurable; Etc.

Examples of specific things that contain flows or that themselves flow internally - and of the things that flow within such things - are: Human body (in which flows blood, food molecules circulating in the blood, lymph, respiratory gases, transmembrane ions, alimentary canal's smorgasbord, growing bone, etc); World economy (in which flows dollars, credit, raw materials, manufactured goods, orders, workers, innovations, rumors, turmoil, etc); Earth's 'solid' (in which flows core and mantle currents, volcanic magma, geomagnetic field's structure and photons, circulating waters, escaping gases, crustal plates, extruding mountains, etc); Sea (wherein flow waters of unequal temperature and salinity, soil particles, geochemicals, fish, phytoplankton, giant eddies, internal waves, icebergs, etc); Atmosphere (with its flowing water molecules and droplets, dust, clouds, storm systems, volumes of air, electrons, ions, birds, sound waves, leaves, pollen grains, bacteria, viruses, aircraft, parachutists, photons, body and surface gravity waves, etc); Bios (in which one witnesses the fluid dance of bees, plant species chasing one another in ecological successions, demic bionts, organisms' appendages, predators hunting prey, competing biomes, laterally flowing genes, new species, etc); Man's brain-mind system (wherein flows genomic instructions, EEG waves, neural impulses and information, meandering dendrites and synapses, axoplasmic fluid and vesicles, thoughts, sensa, orders, concepts, correlations between parts of the brain, symbols, gestalten,

inspired oxygen atoms, unconscious psychogeneses, neurohormones, etc); Milky Way galaxy (where one could spot flowing planets, stars, dust and molecular clouds, young atoms, magnetic field lines, ultra-deep sounds in the galactic atmosphere, galactic arms, cosmic rays, boulders, exotic particles, etc); The "universe" (in which flows galaxies, free intergalactic stars and dust clouds, cosmic-ray matter and photons, neutrinos, gravitons, clusters and hyperclusters of galaxies, cosmic strings and magnetic monopoles perhaps, etc); Civilization (wherein flows migrants, works of art, techniques, news, governments, cultures, wars, ethical changes and innovations, books, religions, mass adventures, life-styles, words, habits of mind, standards, opinions, debates, facts, logical arguments, inventions, and so forth).

Among the causes of flows are: Contagions; Chain reactions; Growth; Aggression; Locomotion; Attraction; Repulsion; Inequalities; Decomposition or disintegration; Ingestion or absorption; Waste or elimination; Production; Suction; Pushing; Disequilibria; Lawful tendency for entropy to increase; Procreation; Stress and strain; Spontaneous assortation; Spontaneous morphogenesis or evolution; Random background fluctuations (from the tiniest to the vastest scale of the universe); All time-asymmetric processes; Energy fluctuations; Waves; Transportation; All stochastic processes; Diffusional processes; Turbulence; Perpetual motion; Other flows and cessation of other flows (sic); Changes in spaces and manifolds (their metric, curvature, or structure); Combination; Transformation; New connections and encounters; Reversal, inversion, or eversion; Differentiation, diversification, and divergence; Cycling; Perturbation; Triggering; Liberation or dissociation; Innovation; Antagonism; Change of state; Etc.

Ideonomy can help to identify flows by: Analogizing one flow to another; Analogizing one thing to another; Distinguishing one flow (or thing) from another; Grouping, categorizing, and classifying any and all types of flows; Considering the ways in which things other than flows, or things in general, can be identified; Exploring ways of combining different or elementary flows; Investigating ways in which one flow can transform into another or into a different flow or genus of flow, or in which flows can be derived from one another; Classifying, noticing, and analogizing the causes and geneses of flows; Identifying, classifying, and understanding the larger things and systems of things of which given flows are a part or in which they occur; Recognizing, systematizing, and correlating characteristic signs, features, properties, and effects of flows; Differentiating flows' possible or characteristic subtypes; Isolating the laws of or that govern flows; Giving standardized names and descriptions to the types of flows, and popularizing same; Defining the basic or canonical types of flows and relating all other types thereto in a strict way; Using the theories of information and probability to classify flows; Determining the subsets of things that types of flows apply to or are exemplified by; Refining the general systems and means of measurement—and mathematics for describing—flows; Clarifying and enriching the fundamental concept of flow itself; Critiquing existing identifications—and means of identifying—flows; Extrapolating or interpolating flows; Recalling and criticizing alternative identifications of a flow; Maximizing the criteria for given types of flows; Furnishing the principles that should guide identification; Etc.

Ideonomy can assist learning and use of all of the above.

At the same time it can help answer such questions about flows as:

How do different scales, or all scales, scale—on all possible or important scales?

What are all the ways in which flow in general, or particular types or instances of flow, can be put to use, now or in the future?

What are all of the meta-structures of flows or to which flows contribute or that are relevant to flows: the trees, hierarchies, networks, series, lattices, rings, clusters, etc?

What flows and types of flows do not exist (per contra those that do exist)? What explains their nonexistence or nonexemplification?

What is the total abstract and cosmic hierarchy of all increasingly and decreasingly important flows—and what accounts for their relative and absolute placement on this scale?

What is the manifold of all possible quantitative and qualitative dimensions of flow—and what is its structure?

What is the algebra of—or interlinking—all possible flows?

What are the opposites of all flows and types of flows—and the antisyzygies thereof?

What has been the history of flow in the universe; what is the contemporary system of flows; and what is the presumptive or possible future history of flow?

What are all of the possible things that might lie beyond, or that conceptually transcend, 'flow'?

What is the extent and structure of our ignorance of flow—and what per contra is our knowledge?

What paradoxes of flow—and paradoxical flows—are there? What anomalous flows occur or are possible—and what might they mean?

What set of questions would be the most useful to ask when setting out to analyze or investigate a flow?

What general program of research should guide present and future investigation of flow? What should the priorities be?

What answers to questions—and solutions to problems—about flow would be most apt to resolve or clarify any or all other rheological questions and problems?

What are all of the significant analogies and other relationships between or among flows in different areas or sciences or involving different phenomena—and all of the things that mankind might stand to gain by exploring and exploiting them?

What are all of the flows and types of flows of or in any way associated with or related to a single, random or particular, thing?

Conversely, what are all of the things that exhibit or that are in any way connected with a single, random or particular, flow or type of flow?

What types of flow are equivalent—and why are they equivalent?

What has been the history of research into and discoveries about flow—and what historiographic dendrogram describes both?

What speculative discoveries may be made about flow in the future —and what theoretical implications and practical applications would they have?

What are the limits of different types of flow—and what are their consequences?

Point To All the Forms Things Can Have

Things can have various shapes. What are they?

When they have those shapes, they are likely to have them for certain reasons. What are they?

If they have the shapes for certain reasons, there are apt to be typical corollaries or implications. What are the types? What explains them in turn?

Even if the reasons for the possession of the forms are unknown, the mere having—or existence—of the forms can imply certain effects or consequences. What effects are implied by what forms?

Where the actual forms had, or that might be had, by things are not known, forms that are probable or at least possible—and forms that are unlikely or impossible—may be indicated by the circumstances or environments that exist, or by the nature of the things themselves. What are such suggestive relationships and the laws thereof?

Yet at the same time many characteristic illusions, fallacies, errors, paradoxes, problems, limitations, etc are apt to be associated with morphology, or with forms' causes, corollaries, effects, types, circumstances, exhibitors, laws, habits, etc. What might they be?

Ideonomy can help with these and all other morphological questions and tasks. Only when knowledge and skills develop in connection with all of them will the science of form begin to display real power and utility. It is clear that we have a long way to go.

One of the first things that needs to be universally investigated is what types—or species and genera—of forms are to be found exhibited in the different phenomena and entities of different sciences, or the range of sciences that exhibit them. What, in terms of those different sciences, are the relative and absolute frequencies, importances, manifestations, clusters, meta-structures, interrelationships, etc of those forms? And, fundamentally, how do those forms, by occurring in those sciences, help to determine what those sciences are and the very nature of their phenomena (rather than, or in addition to, the other way around)?

A second thing to be learned in the broadest possible way is what the dimensionless occurrence of types of forms is on various fundamental scales of nature: e.g. size (length), time, velocity, energy, mass, entropy, etc. How, for example, do such basic shapes as trees, rings, helices, knots, spheres, and cones recur on every size scale in nature —say from that of quantum-mechanical vacuum fluctuations at a mere 10 exp -35 meters to the supposed radius of the entire 'universe' at 10 exp 26 meters—a range of 61 powers of ten = 203 powers of two?

Moreover, why do the shapes recur over that momentous range? How might their occurrences at the different levels of scale be interconnected, by chance or necessity? What dimensionless law or laws might operate? What scale-invariant and scale-sensitive phenomena might obtain? How are the different types of forms distributed and interconnected over all of the levels? Does the universe need to be reseen from the 'internal perspective' of these forms or their all-scale meta-patterns?

An ideonomic principle requires that, when given types of forms are simultaneously studied for their exemplification over the entire range of nature's sciences, phenomena, dimensions, and levels, a much greater understanding will be gained of the real nature, possibilities, and applications of those forms, as well as of the things that exemplify them.

Conversely, when the same forms are studied in a restricted way, there will inevitably be great defects and limitations in our knowledge about them, and the logic and theory of the scientist will be rich with fallacies. The development of specific things, such as models of morphogenesis, will be made far more difficult.

There are many other ways in which ideonomy can aid the study or treatment of forms:

It can relate external form to internal form, or vice versa; both abstractly and in terms of actual things.

It can suggest the set of canonical questions to ask when researching forms, and the canonical or alternative ways to answer those questions.

It can survey the kinds of forms that tend to occur together, or point to their co-functions or simple interplay and interactions.

It can suggest conflicts or contradictions between different types or modes of form, or describe a conflict when one is encountered.

It can suggest how forms are or may be combined with other forms, to produce other forms or different patterns, processes, or phenomena.

It can suggest what the limits are of the morphological (pure) development or physical manifestation of types of forms, including what those forms are and mean in a minimal and maximal sense.

It can depict the networks of forms that occur in and as nature, and the activity that occurs within and among those networks.

It can work out the finite or infinite scale that links the simplest forms to the most complex of all forms, or to the integral form of reality itself.

It can isolate the rules wherewith generic or specific forms can be discovered, constructed, or managed.

It can determine and depict the different quantitative and qualitative ways in which all possible forms can develop, transform, and intertransform.

It can develop a language for describing and discussing forms more efficiently, fundamentally, and meaningfully, and it can name and help to define forms.

It can improve the quantitative and mathematical description of forms, and it can help to quantify the conceptual distance between different types of forms. It can assist the construction or discovery of mathematical and qualitative spaces and manifolds for studying the generation, behavior, and interrelation of all forms and all morphic elements, concepts, and phenomena.

It can characterize the relationships between forms and all of those types of things that are similar or related to forms: e.g. patterns, kinds of order, textures, appearances, sequences, images, structures, configurations, combinations of things, distributions, representations, perspectives, measures, morphisms, relations, sets, symmetries, etc.

It can suggest all pure and physical opposites of types of forms—and their antisyzygies.

It can show all the ways in which different forms can and should be distinguished from one another.

It can depict the totality of morphological aspects and possibilities of a single, random or particular, thing.

It can suggest the many different phases that given types of forms may have in nature, among which they—or the things that exhibit them—are prone to oscillate.

Advance the Foundations of A Subject

Our knowledge of the logical and natural foundations of many fields is slight, or at least dubious or imperfect. Certainly subjects differ drastically in the relative strength of their foundations, or in the apparent fundamentality of their concepts, methods, principles, theories, achievements, research, language, logic, etc.

Ideonomy can compare the foundations of different disciplines to discover analogies, differences, commonalities, interdependences, contradictions, redundancies, interpenetrations, convergences, common goals and needs, unities, etc. It can use these to suggest omissions, errors, common opportunities for research or discovery, ways to redescribe the foundations of one subject in terms of the foundations of another, reciprocal problems and fallacies, equivalent principles and entities, joint ignorance, new tests and experiments, higher standards, useful priorities, strategies of theory, etc.

It can suggest ways in which to combine or transform certain concepts or dimensions so as to generate or define 'all' possible or important concepts or things, or the spaces and manifolds thereof. Contained or implicit within such sets, spaces, and manifolds may be concepts or other things that can supplement or deepen the foundations of the subject to which they pertain.

Moreover, examining or merely experiencing such enlarged perspectives upon what is possible may lead to the realization that what has been taken to be fundamental within a subject is not really fundamental; or at least, that the foundations—or supposed foundations—of the subject are not as free of assumptions, problems, inelegant features, superfluous elements, discrepancies, idiosyncratic aspects, etc as has been thought.

Since ideonomy seeks to discover all of those natural concepts, dimensions, representations, entities, phenomena, laws, principles, relationships, etc that are supremely universal, fundamental, important, essential, minimal, logical, generative, necessary, transcendental, and pantological, it is in a privileged position to advance the foundations of arbitrary fields.

It is in fact a principal goal of ideonomy to make all sciences more scientific, and among the best ways of doing this are by rectifying, enlarging, and extending the foundations of these subjects.

There is a hint that ideonomy may be on the verge of discovering some unsuspected category of being that is more fundamental than either ideas or things, or that transcends what is meant by both the "mental" and "physical" aspects of reality.

By placing all of the things and phenomena in a subject upon basic scales—as of duration, time, population, importance, complexity, or entropy—ideonomy can call the mind's attention to what is only naturally the most and least fundamental in a subject, to the way in which things derive their greater or lesser fundamentality from one another, to the direction in which that which is truly or most fundamental is apt to be found, or to the properties that fundamentals or foundations are likely to or must have.

Knowledge or theory of the foundations of many subjects is impaired by a conscious or unconscious failure to identify, define, characterize, or emphasize the most fundamental, central, or final topic, concept, phenomenon, substance, law, entity, goal, or the like of the subject (or the set of such things). Then again, the supreme topic or whatever may have some terrible unsolved problem or difficulty associated with it.

Thus the supreme concern of physics is no longer clear, the arch concern of sociology is in dispute, the goal of psychology is in flux, the essential nature or defining properties of life are unknown to the science of life (or to biology), and even the basic object of study of mathematics (it cannot be number, though the nature of number is an enigma in any case), cosmology (what is the described or effable 'universe' itself a part of?), and ideonomy (ideas, as hinted above, may not be sufficiently fundamental) is mysterious.

Ideonomy can be used to define concepts in new and ever more fundamental ways, and it has already been used to define life, or to reduce it to a set of ninety-two fundamental properties. The set of 8,464 possible dyadic combinations of the primary properties have demonstrated such extraordinary interest that they promise to revolutionize theoretical biology, something which at once illustrates the importance of clarifying fundamentals and suggests that the traits that were used to define the phenomenon of "life" were indeed fundamental.

On the other hand, the same bit of ideonomic research also highlighted the problems that plague all efforts to resolve fundamentals or to get at the genuine foundations of a subject; for it was found that the same set of ninety-two basic properties of "life" have either analogs or exact equivalents in the supposedly inanimate phenomena of subjects other than biology. Thus forms or analogs of procreation, natural selection, and evolution either may or do exist in fields such as physical chemistry, geology, psychology, and cosmology. The implication may variously be that life is not limited or peculiar to biology, that life must be otherwise defined or defined via other properties, that the essential phenomena of biology should include more than organisms, or that biology should be recast into a superscience incorporating many other sciences or that—like mathematics—applies to all science.

An old way of advancing the foundations of a subject is by improving, formalizing, or axiomatizing its logic; and a new or just now emerging way, by giving the subject cognitive form, which means the form of thought itself. Ideonomy can help with both of these approaches, particularly in conjunction with computer software and hardware.

Erect Frameworks For Thought

To think about anything one needs some manner of conceptual framework, a schema upon which to hang ideas or in which to develop, interweave, and experiment upon different concepts.

Ideonomy, in effect, can enable such conceptual schemes, structures, and systems to be mass produced; it can widen their scope, diversify them, enhance their power, increase their connectivity or interrelatedness, greaten their mobility within and between fields, enlarge their rationality or make their logic more explicit, give the individual the power to freely manipulate them, etc.

The concept of mental frameworks is so important to ideonomy that it needs to be expanded upon. By it we mean an open-ended set of : schemes, structures, systems, and 'machines' of : ideas, relations, principles, presuppositions, facts, arguments, thoughts, beliefs, values, purposes, perspectives, methods, strategies, gestalts, analyses, attitudes, percepts, images, definitions, explanations, dimensions, symbols, criteria, representations, models, heuristics, postulates, generalizations, theories, procedures, wisdoms, stories, memories, analogies, rules, mental associations, etc : serving or for furthering thought.

Such mental schematizations of : experience, the environment, reality, behavior, human existence, or possibility : can be : conscious or unconscious : formal or informal : specific, general, or universal : ad hoc or perpetual (evolutionary) : deductive or inductive : empirical or theoretical : categorical or experimental : developing or inert : etc.

The diverse values and uses of cognitive frameworks include: mental simplification; clustering, grouping, and classifying of ideas and facts; explication and coordination of different purposes and goals; structuring of memories in hierarchies, series, networks, trees, vergences, rings or cycles, foliations, meta-stories, etc—that are especially dynamic, powerful, natural, efficient, dense, optimal, etc; recursive, self-developing, nucleative, and self-correcting properties or effects; the multidimensional mental parallax given by a multitude of such frameworks; provision of a stable apparatus for developing and maintaining mental skills; standardization within the mind (à la worldwide industrial and scientific standardization); provision of bases for tests, evaluations, investigations, and experiments; limitation of thought to what is necessary and obviation of trivial and repetitive thought and creativity; bases for communication among different minds and for comparisons of their contents; enabling of more precise and rigorous thought; codification of thoughts; acceleration of thought; enabling of overviews of experience, the world, one's conduct, and the mind; greater mental flexibility and self-control; readier learning; quick or more powerful structuring of materials, subjects, problems, or situations; automation of mental habits and of ideation; heightened clarity of mind; etc.

Frameworks for thought can enable a topic to be taught, mastered, or treated more deeply or completely. They can provide clues for probing the nature of a thing. They can enable more imaginative or less prejudiced thought. They can help one to prepare for a more serious intellectual endeavor. They can help one relate one perspective to another, or permit one to grasp a new thing by analogy to an old or familiar thing.

Enumerate the Functions of A Thing

Things may, and usually do, have far more numerous and diverse functions, roles, and importances than people realize or would even imagine. If this is true, it has great significance:

Features of our world may be carelessly eliminated or altered by the ignorant march of progress or change; All existing things may have a web of ecological relationships that merit study and respect; Things may all be beneficiaries of many more things than has been thought; There may be an unsuspectedly great number of ways to change and improve the world or its things; etc.

Among the possible generic functions of things are: Mediation; Prevention; Protection; Connection; Transportation; Communication; Symbolization; Testing; Facilitation; Amplification; Imitation or substitution; Extension; Generalization; Specialization; Correction; Improvement; Balancing; Sublimation or domestication; Counteraction; Elimination; Supplementation; Complementation; Exploitation; Coping; Hiding or deception; Showing; Production; Concentration or confinement; Combination or integration; Separation, division, or liberation; Ordering; Maintenance or supply; Storage, holding, preservation, or conservation; Preparation; Initiation; Control or management; Adjustment or modulation; Transcendence, circumvention, or obviation; Orientation; Reduction or economization (enhancement of efficiency); Transformation; Etc.

Ideonomy can help answer such questions about functions as:

How do functions overlap?

What functions are competitive? What functions are cooperative, complementary, or synergistic?

What functions are illusory, misleading, or ambiguous?

What are all of the degrees of functions of things? What are the maximal, minimal, and optimal functions of things? What are all of the intermediate functions of things?

What functions are absolute or relative? What makes them absolute or relative? What are all of the ways in which they are absolute and relative? What are all of the absolute and relative functions of a thing?

What functions conflict with, contradict, or negate what other functions?

How do things acquire—and lose—their functions? How do or could functions originate, develop, evolve, diminish, or disappear?

How do different functions compare? What are all of the ways of comparing all functions? What functions are identical, equivalent, analogous, or related to what other functions? What functions differ or diverge from, or are opposite to, what other functions? What are all of the degrees, bases, circumstances, and implications of these things?

What are not the functions of things, and what functions do not exist or are impossible?

What are all of the generic and specific : properties, dimensions, elements, mechanisms, effects, signs, manifestations, criteria, etc : of all generic and specific functions?

What functions are arbitrary or necessary? What functions are artificial or natural? What are the degrees and causes of these things?

How can the : prediction, classification, recognition, examination, evaluation, explanation, creation, development, application or use, intercorrelation, synthesis, differentiation, description, definition, modification, control or government, etc : of the functions of arbitrary things be mechanized and automated in the future, when the needed technology and methodology emerges?

How can different functions, and different species and genera of functions, be combined to synthesize novel, desirable, or arbitrary functions—or systems of functions—or to enlarge, transform, or relocate old functions?

What functions of familiar or known things have been neglected, forgotten about, or overlooked? What are the idiosyncrasies of the ways in which people in general, or certain groups of people, classify, perceive, rank, or utilize the classes of functions of classes of things? What is good, bad, or simply significant about these idiosyncrasies?

What are the characteristic and comparative ratios of our ignorance about to our knowledge about different (key or comprehensive) functions of different (key or comprehensive) things in different (key or comprehensive) situations?

What are all possible or important categories of ignorance and knowledge about functions? What are the actual extent, qualities, and forms of our ignorance, knowledge, and skills within each of these vergent categories? What are the total—known or hypothesizable—costs, values, consequences, and implications thereof?

In what meta-structures : series, networks, hierarchies, trees, lattices, rings, circuitries, vergences, knots, line-clumps, 'crystals' (e.g. of intersecting hyperdimensional planes or curved surfaces), plexures, 'soils', matrixes, clusters, 'blobs', conoids, helicoids, aegagropilas or Peano curves, 'onions', fractals, chaoses, paths, 'catastrophes', tessellations or 'jigsaw puzzles', topological monsters, etc : do or could functions : exist, originate, operate, interact, develop, metamorphose, vanish, combine, coalesce, reproduce, cooriginate, coevolve, invert, exhibit singularities, etc?

How do such meta-structures themselves: behave, associate, interact, evolve, originate, function, etc?

How could or must the meta-structures of functions be used to : describe, explain, discover, manipulate, create, alter, etc : particular or arbitrary functions?

What are all the particular or recurrent : goods, bads, defects, imperfections, limitations, etc: of all functions of all things?

What are all known or possible functions of a single, particular or random, thing—and how are they structured inter se?

Conversely, what are all of the actual or possible things that have or could have a single, random or specific, function? What do they have or not have in common, that explains or relates to their shared function—or that does not do so?

What are all of the self-functions of things?

What set of questions should be asked when treating functions? How should they be ranked in relative importance? In what order should they be asked—or set of orders, depending on particular circumstances? What explains their diverse importance? Which of these questions are and are not currently asked; or how efficient is the asking and answering of these questions? What decision-tree should govern the use of these questions, and what are its proper and possible anastomoses? What are the ways in which some of the questions can and should be iterated?

As results piled up worldwide from the habitual, ubiquitous, and standardized use of such an encyclopedic, all-purpose, or universal questionary, how could they be systematically and efficiently compiled, collated, colligated, promulgated, and exploited?

Illustrative examples of functions include the function or functions of: Telephones in creating commercial nexuses; Human skin microflora in (hypothetically) preempting sites upon which pathogens can establish themselves and from which the pathogens can invade the macrosymbiontic body; Ball bearings in minimizing frictional contacts of overpassing surfaces; Lightning in maintaining biogeochemical cycles and (by deflagrating forests and prairies) ecological successions; Clowns in lighting up the hearts of children; Taverns in sublimating life's horrors; Axons of neurons in shuttling and multiplying data in the brain; Grammar in inducing neural impulses, data, or patterns to organize themselves into vergent hierarchies in the brain; Expletives in dissipating, condensing, or civilizing excessive emotions; Sidewalks in keeping pedestrians and children off streets—and cars off the former; Marriage in stabilizing, reproducing, and subdividing society; Rugs in simulating grass, creating thermal barriers (conserving heat or coolness), and stopping sound (perfecting privacy); Buildings' foundations in stabilizing and economizing frames; Spiders' webs in trapping flying, hopping, and climbing insects who do not notice them or who mistake them for stems, giving their creators midair nests inaccessible by lumbrous predators, and telegraphically or resonantly forewarning their seismoceptive occupants of the approach of more funambulatory enemies; Cloud cover in regulating terrestrial insolation and Earth's albedo—and hence in stabilizing climate to the advantage, or conceivably in the Gaian service, of the bios; Money in mediating, stabilizing, equalizing, universalizing, codifying, recording, rationalizing, virtualizing, coordinating, lubricating, temporally broadening, quantizing, algebraizing (sensu making more perfectly distributive, associative, transitive, commutative, etc), institutionalizing, formalizing, unifying, mechanizing, 'vocalizing', 'intellectualizing', etc the exchange of goods and services; Cosmetics in role-playing, seduction, intrasexual competition, feminization, and beautification of the social landscape; Maps in collation, abstraction, and communication of geographic data; Roots in recovering rainwater from the sponge-like soil; Stars in manufacturing larger atoms and animating planets (or at least one planet); Windows in half-admitting the outdoors into buildings; Rulers in quantizing the dimensions of objects; Dolls in preparing children for adult life, as surrogate parents, and as mirrors enabling kids to look upon themselves or to explore the worlds of intersubjectivity; Glue as an ersatz nail (at once cheap, nondestructive, hammer-less, all-size, always-singular, etc); Genes in remembering, immortalizing, transmuting, and 'generalizing' organisms; Etc.

Many things can be done to functions; they can be: Enlarged or diminished; Multiplied and diversified—or the reverse; Created or or ended; Broadened or narrowed; Sophisticated or simplified; Connected or disconnected; Integrated or unified; Differentiated within or from other functions; Obviated; Temporarily suspended; Redirected or realigned; Molded or modified; Replaced by others; Relocated or rearranged with respect to other functions; Extended to include other things; Combined; Permuted; Transelemented; Redefined; Facilitated; Perpetuated; Perfected; Fixed (frozen); Slowed or quickened; Elevated or reduced in importance —or made central or peripheral; Modulated; Etc.

Foster Wisdom About the Future

There are many ways in which one could be wise or wiser about the future: e.g. one could simply attend to it more closely, or appreciate better the fleeting nature of the present or of things as they now are; one could systematically examine the range of future possibilities; one could visualize the various alternative courses the world might take in the future, and the things apt to determine which particular set of courses the world will actually follow; one could identify the world's needs in advancing into the future, and endeavor to provide for those needs and wants; one could help to educate all present and future humanity to deal with the future; one could attempt to influence the actual course the world will take tomorrow, or to push it toward what would be good and away from what would be evil or inferior; one could labor to produce general methods for foreseeing or altering the future; etc.

Of course the future being referred to need not be that of the world as a whole or represented by the future in its entirety, but on the contrary might be arbitrarily modest: one's own future lifetime, perhaps, or tomorrow's events or the events of the next minute, or the momentary or instantaneous outcome of a scientific experiment that someone is performing or whose performance is simply being contemplated.

Becoming wiser about the future might mean nothing more than divesting oneself of prejudicial ideas, attitudes, beliefs, or world views, becoming friendlier—or more hostile—to innovation, reducing the irrational inertia of institutions, or paying more attention to the patterns and lessons of history that might be analogous or relevant to the future.

Among the fallacies that diminish wisdom about the future, and that ideonomy could help to combat, are that: the future will simply repeat the past; the course of the future is predetermined and inalterable; the world of the present represents the best of all possible worlds; human knowledge and wisdom are nearly complete and perfect—and our ignorance small and unimportant; the future is too complex or esoteric for us to anticipate its character or possibilities—and past failures and inability to correctly foresee the future were unavoidable, and should be looked upon as a warning that all prophecy is folly; etc.

Ideonomy could be used to: devise new, or suggest all possible, methods for studying future possibilities; survey, describe, compare, evaluate, criticize, correct, extend, integrate, and transcend all past and present prophetic methods, endeavors, and results; identify the totality of things that can or should have their future possibilities considered; predict the future interrelationships and interactions of these things; indicate the future's most fundamental dimensions, structure, forces, elements, patterns, laws, etc; formulate principles for treating the future; develop novel means for representing and dramatizing the future's possibilities (e.g. diagrams, organons, computer software and simulations, new types of books, special language and idea spaces, artificial intelligence programs, etc); suggest all possible causes, effects, and conditions of future possibilities; rank the relative and absolute probability and importance of all future possibilities; indicate the different roles and functions that things are apt to have in the future; and so forth.

Some of the specific questions and other issues that ideonomy could help to address are: What should be maximized and minimized in the future? What new rights may become political issues in the future? What human freedoms must ultimately be restrained for the good of all? What present concerns of government will be retired and what new concerns will take their place? What means are there for maximizing the future diversity and complexity of civilization? What were the laws of history, insofar as they apply to the future as well? How ambiguous is the future or are its possibilities? What meta-structures are applicable to the study of the future or will actually describe its possibilities: incl. chains, series, trees, networks, hierarchies, vergences, etc? What elements of the present will disappear or endure in the future? What new discoveries, inventions, creations, and other innovations are possible, probable, or certain in the future? What developments can continue ad infinitum and which must have limits? In what ways is the future apt to surprise us? What are all the future possibilities of a single, random or particular, thing? What future possibilities would be synergistic or antagonistic? In what order must different things happen?

Illustrative examples of specific future possibilities are: Elimination of the need for sleep; Chinese democratic revolution; Life discovered elsewhere in the cosmos; Legalization of prostitution; Replacement of stores by teleshopping and robotized delivery of goods to homes; Evolution of a single panhuman language; Reduction of physics to 'pure' logic; New age of dirigibles; Exploration of a single cave 'pushed' to 100,000 kilometers (using miniature humanoid teleoperators); Mechanical pets and computer-simulated plants more popular than biological organisms; Family car replaced by a flying equivalent; Irrefutable scientific proof of the existence of 'God'; Temporal metric system adopted; War fought using beams of elementary particles so exotic that they have not yet been imagined; Time's apparently unique and irreversible flow shown to be a physical illusion; Mining of Earth's mantle; Every organism on Earth transformed into a different species; New human sexes added to the traditional two; Complete obsolescence of the family; Lamps made to last centuries; Immortality made compulsory; Ethics remade into an exact science; Deliberate suicide of the human race, subjectively rendered irrelevant by its own transhuman mechanical creations; Ideonomy taught at all grade levels in all schools; War everywhere ended by the introduction of "peace pills" (irenic psychopharmaceuticals); Etc.

Generalize Notions

One can use ideonomy to help to generalize or even universalize any and all notions and things.

Over time things often prove to be insufficiently generalized. That is, the essential idea or set of ideas associated with them turn out to have greater meaning, scope, or application than what is initially —or perhaps than is ever at any finite moment—thought to be the case.

Actually it is probably true that in some sense the generality of all concepts, and all concepts of things, must always be at once inadequate and excessive.

But according to an ideonomic principle it is of the utmost importance that the generality of all concepts constantly be enlarged over time, or advanced toward infinity. Naturally in the course of such progressive generalization the concepts will undergo fundamental metamorphoses, yet a form of semantic continuity may be apparent in retrospect that was prospectively invisible or even meaningless.

It could be said that all concepts are inherently infinite in meaning, and even that this infinite aspect is close to their essence.

To generalize - according to the dictionary - is to make general : reduce to general laws : give a general form to; to derive or induce (a general conception or principle) from particulars; to derive or induce a general conception, principle, or inference from; to make general (as by existential or universal qualification) : render applicable to a wider class; to give general applicability to; to modify or eliminate (nonessential details) for emphasizing some particular feature; to portray or emphasize general rather than particular features and characteristics of.

Illustrative examples of generalizations of ideas and things: Historically, the generalization of the legal concept of a person to include corporations and other organizations, even though these contain many human beings; Energy has been generalized to include mass; Some quantum physicists would generalize the concept of a physical phenomenon to include the apparatus used to measure the phenomenon, the observer, or even the observational or mensurational act; A few physicists would go even further, and define any phenomenon as perforce including the whole universe or all of spacetime; Certain modern composers generalize the notion of musical scale to include any systematic or recurrent arrangement of notes on which a composition is based; The concept of intelligence has been generalized to include animals that were formerly regarded as mindless; Skeletal and muscular systems have been generalized to include the cytoskeleton and other purely intracellular systems and structures; Analogous generalization of the nervous system to include equivalents in unicellular organisms—and perhaps plants—may be imminent; Concepts of star and galaxy should perhaps be generalized to include one another—since stars (as superstars) may equal or exceed (dwarf) galaxies in size; The progressive generalization of the concept of number in the history of mathematics to ever more abstract, strange, numerous, and 'less number-like' things (imaginary numbers being one of the more famous products of this process); Over history the concept of evolution has become ever more generalized—to embrace not only biology (life; the phylogeny of species, ontogeny of bionts, and life-long biosynthesis

of molecules, organelles, etc) but geology (Earth and other planets; the evolution of continents, mountains, geospheres, etc), astronomy (stars, galaxies perhaps, and the universe as a whole), physics (matter, energy, space, time, physical laws and constants perhaps, etc), society, industry, economies, the mind, ethics, the arts, etc; Mental illness has been generalized to include normal mental states and individuals (on the belief that the difference is only one of degree, perspective, or concern)—and mental normality has been generalized to include mental illness (e.g. based on the belief that the latter may be rational, coherent, or productive when viewed internally, from a different or larger perspective, or with an awareness that society is universally illogical and insane); Learning might be generalized to include selective forgetting, unlearning, and progressive inhibition; The concepts of publishing, book, and magazine can be generalized to include novel forms and products of electronic publishing; The concept of color might be generalized to include the static and dynamic meanings of pseudocolors in different or all possible situations—or simply to perceptual and cognitive patterns apparent in temporal successions and combinations of regular colors; Over the course of history the concept or subject of science has broadened unremittingly, to the extent that it now includes the study of: art qua aesthetics, musicology, philology, etc; money, wealth, and economic systems qua economics; governments and governance qua political science; reasoning and intelligence qua logic and cognitive science; battle and peace qua military science; techniques and engineering qua technology; society qua sociology; history qua historiology; the psyche qua psychology; ideas qua ideonomy; administration qua management science; language and languages qua linguistics; forms qua morphology; chance qua stochastics; science itself qua metascience; farming qua agriculture; etc; Etc.

Examples of things that may have been inadequately generalized or that may be generalized in the future:

Humor: If precursors, rudiments, theriomorphic variants, or analogs of laughter or a risibles are eventually found in animals other than man, generalization of the concept or phenomenon of humor (its origin, functions, mechanisms, types, properties, referents, states, logics, degrees, scope, etc) may turn out to be desirable or necessary;

Machine: The concept of a machine may have to be generalized so as to include biological phenomena (e.g. genomes, protein molecules, micelles, organelles, cells, organs, biochemical networks and processes, bodily macro-systems such as the nervous and immune systems, organisms, ecosystems, and the hypothetically Gaian bios), various phenomena and entities in pure and applied mathematics—or even logic, chemical reactions, crystals, diversely intelligent computers; models, simulations, and even scientific theories; human languages and computer programs; geological and meteorological phenomena such as volcanoes and storms, the 'universe', man's mind or society, pure or real-world ideas, physical laws, statistical and quantum phenomena in physics, economic systems, political ideologies, ethical systems, and symphonies;

Food: This should include 'nutritive' atmospheric gases; conceivably organisms get some genes or genic influences directly from food (via "lateral gene flow"); the body is forever 'consuming itself' (in strange and little-known senses); even inanimate phenomena 'eat' or require 'nutrition' from their environment; conceivably the seemingly stable and

self-existent macroscopic world, with its delomorphic baryons and leptons, is in reality being dynamically maintained and replenished from below, or by chains, fountains, singularities, plexiform or vergent hierarchies, or the like ascending from the ultramicroscopic level of zero-point, Borel, Dirac-vacuum, Wheeler-prespace, or Bohm-implicate order fluctuations; and the mind 'eats' ideas;

House: This concept should be generalized to include the diverse homes (nests, burrows, cavities, interstices, webs, mounds, hollow trees, logs, host exteriors and interiors, atmospheric dust and cloud particles, etc) of all organisms; shells, exoskeletons, skin, bodies, the skull and blood-brain barrier, etc; cells, plasmalemmas, misc. membranes, etc; ecological niches, ecosystems, and the bios; as well as the 'houses' of inanimate phenomena: atmospheres, planets, the heliosphere, the galactic atmosphere, the universe, factories, etc;

Universe: Generalizing this terribly presumptuous concept might be appropriate if there are other universes or quasi-external parts of our universe, Everett's Many-Worlds Cosmology is real, most of the mass of the universe is invisible and exotic stuff, there is an infinite microcosm, Bohm's Implicate Order exists, etc; or to take account of Wheeler's Superspace, the omniverse (all of spacetime), physicomental "reality", and the Ideocosm.

Important genera of generalizable things, or of things whose treatment it will often be important to generalize, include: Effects; Causes; Laws; Analogies; Differences; Criteria; Definitions; Criticisms; Decisions; Beliefs; Answers; Questions; Assumptions; Acts; Abilities; Bads; Goods; Appearances; Concepts; Corollaries; States; Governments; Arguments; Discoveries; Doctrines; Domains; Errors; Events; Fields; Functions; Fundamentals; Generalizations (sic); Goals; Hierarchies; Dimensions and properties; Histories; Hypotheses; Ignorances; Illusions; Individuals; Instances; Instruments; Interactions; Interests; Inventions; Knowledge; Languages; Levels; Limitations; Mathematics; Mechanisms; Metaphors; Methods; Models; Forms; Motions; Needs; Negations; Networks; Niches; Nonexistences; Responsibilities; Opportunities; Order types; Origins; Paradoxes; Paths; Patterns; Plans; Possibilities; Predictions; Principles; Probabilities; Problems; Processes; Proofs; Purposes; Quantities; Relations; Representations; Resources; Roles; Rules; Scenarios; Senses; Series; Shortcuts; Simplifications; Solutions; Spaces; Speculations; Stories; Strategies; Systems; Taxons; Theories; Things; Transcendences; Trees; Unifications; Uncertainties; Uses; Values; Virtuals; Wants; Wisdoms; Behaviors; Combinations; Commonalities; Complexities; Conflicts; Cooperations; Correlations; Cybernetics; Geneses; Disjunctions; Alternatives; Circumstances; Perspectives; Analyses; Clusters; Chains of consequences; Changes; Chances; Chaoses; Economics; Elements; Equivalences; Essentials; Excuses; Experiments; Extensions; Futuribles; "Groups"; Equalities and inequalities; Equilibria; Manifolds; Connections; Practices; Norms; Statistics; Mappings; Centers; Tendencies, trends, and directions; Standards; Cycles; Symmetries and asymmetries; Invariants and conservations; Convergences and divergences; Measures; Etc.

Senses, methods, and types of generalization are:

Things, concepts, methods, resources, etc that are ordinarily used in only a limited way can be tentatively or permanently applied elsewhere, to other things, domains, elements, tasks, subjects, etc, or universally;

Words, concepts, things, loci, structures, operations, functions, etc can be added to, combined with, included within, subsumed or treated under, identified with, etc something: one or a set of : things, concepts, words, functions, subjects, concerns, investigations, etc;

Other forms of a thing, concept, or whatever can be created, discovered, postulated, treated, used, etc: one, many, or all;

Something can be transformed into something else, of a similar or dissimilar nature, or something else can be derived from it;

Finite boundaries of what a thing is, can be, applies to, etc can be precisely discovered, investigated, described, referred to, defined, assumed, or imposed - and arbitrary or false boundaries or limits can be invalidated, removed, or transcended;

Larger meanings or implications of a thing or concept can be added, sought, hypothesized, found, researched, described, referred to, made use of it, etc;

Other examples or instances of a thing, concept, etc can be found, described, validated, indicated, etc: one, many, or all;

Something : supposedly or actually : particular, individual, concrete, derivative, virtual, unique, anomalous, accidental, conditional, dependent, transitory, minor, indeterminate, meaningless, peripheral, etc : can be : transformed into, imagined as, or treated as : what is instead instead : general, plural, abstract, nomothetic, primary, fundamental, real, variable, universal, normal, categoreal, necessary, absolute, independent, enduring or eternal, major, determinate, meaningful, essential, central, cognitive or ideonomic, etc;

Taxon or category : can be : given, treated as having, virtually given, found to have, or postulated to have : higher : taxological, existential, or cognitive : status or nature - e.g. a species may be turned into a genus;

Thing may be assigned to a higher taxon or category;

More and more relationships of a : thing, concept, etc : to more and more : things, concepts, parts of the world or reality, etc : may be : discovered, postulated, described, treated as existing, implied, sought, differentiated, created, etc;

Analogs, equivalents, homologs, associates, etc : of a thing, concept, or whatever can be : discovered, conceived of, postulated, surveyed, grouped quantitatively and qualitatively relative to the 'thing', connected thereto, investigated, unified or synthesized with or treated as being identical to the 'thing', treated conjointly with the 'thing', etc;

In a larger and larger way just one or a few : dimensions, properties, aspects, elements, relationships, types, examples, etc : of a thing, concept, or whatever may be : investigated, discovered, described, created, perfected, extended, postulated, or otherwise treated;

Etc.

Questions about generalization that ideonomy can help to ask and answer include:

What are the meta-structures of, connected with, and relevant to generalization overall or specific generalizations: e.g. hierarchies, networks, trees, series, vergences, rings, lattices, matrices, circuitries, plexures, differential-topologic structures, fractals, chaos, Peano curves, tessellations or 'jigsaw puzzles', spheroids, convergences, divergences, etc? And all canonical sub-types thereof?

What are all : reciprocities, interrelationships, interdependences, intertransformations, symmetries, asymmetries, co-probabilities, sets, equilibria, antisyzygies, redundancies and irredundancies, mereologies, cycles, interoperations, combinations and combinatorics, algebras, laws, interrepresentations, morphisms, myrioramic patterns, coevolutions, 'cellular-automaton logics', logics, etc : of all or particular sets of generalizations?

For all or particular : specific or generic : generalizations of : all or particular : specific or generic : things, what are all : generic and specific: Limits; Infinities; Goods and bads; Rules and errors; Questions; Principles; Concepts; Mechanisms; Analogies and differences; Possibilities; Data; Tests, experiments, and proofs; Alternatives; Spectrums, ranges, quantities, measures, and scalings; Mathematics; Probabilities; Dimensions and properties; States, spaces, conditions, and environments; Events, processes, procedures, methods, operations, and strategies; Contents; Assumptions; Gedankenexperiments; Decisions; Problems and solutions; Names, definitions, classifications, and descriptions; Neural correlates and bases; Paradoxes; Emergents; Elements; Essentials; Evaluations; Extremes; Fields; Paths, courses, flows, motions, behaviors, changes, and transformations; Functions, roles, purposes, uses, goals, and values; Corollaries, interests, and implications; Geneses; Games; Futuribles; "Groups"; Histories; Knowledges and ignorances; Illusions; Appearances; Complexities and simplicities; Harmonies and disharmonies; Languages; Negations; Opposites; Networks of consequences; Levels and niveaus; Nonexistences; Order taxons; Origins; Paradigms; Achievements and failures; Pathoses; Requirements; Possibilities; Sub-types; Realms; Recursions; Chances; Representations and ideograms; Resources (instruments and materials); Sets; Shortcuts; Stories; Surprises and discontinuities; Linearities and nonlinearities; Nonmonotonic manipulations; Systems; Theories; Transcendences; Wholes and gestalts; Wisdoms; Research programs; Interdisciplinary relationships; Etc?

What are all possible, all nonequivalent, all specialized, and all hierarchical generalizations of or regarding a single, random or particular, thing?

How can or should all things, or all sets of types of things, be progressively generalized into, with respect to, or on the basis of one another?

What are all human motivations for generalizing and not generalizing any and all things in any and all ways in any and all circumstances; and what are all of the psychodynamics thereof? What are the total ideonomic interests of these things?

What are the current frontiers of generalization of things by mankind?

Suggest Goals

Many enterprises are launched, conducted, and even consummated with almost no attention paid to their possible, actual, or appropriate goals.

Yet this can cause many problems and have many costs, e.g.: Inefficiency; Failure to make adequate or correct provision or preparation; Inability to notice and rectify a faulty course; Taking of excessive or unnecessary risks, perhaps unconsciously; Blindness to opportunities; Indecision and inaction in crises; Indirection and aimless wandering; Lack of plans and priorities; Inability to optimize the use—and mindless wastage—of finite resources; Anarchy; Distractibility; Inaction; Anomie and tedium; Lack of motivation; Inconsistencies, contradictions, and disharmonies; Impossibility of cooperative endeavor; Inability to structure existence; Fragility of an enterprise and a tendency for it to degenerate and fragment; Inability to discriminate good from bad—or to recognize what is best and worst, vital and unimportant, central and peripheral, significant and irrelevant, etc; Anonymity to the world at large or external confusion and misreaction; Etc.

Ideonomy can be used to suggest goals that are: new, alternative, contrasting, successional or progressive, maximal or optimal, safe, certain, transcendent or revolutionary, unconsidered or overlooked, realistic, easy, expedient, productive, ultimate or supreme, simpler or more complex, indirect, contingent, secondary or tertiary, suited to oneself, complementary to situations or circumstances, compatible, synergistic, logical, less costly, multidimensional or multipurpose, subtle, definable, proportionate to one's resources, unorthodox, contra-intuitive, irredundant, finite or infinite, equivalent or analogous, specific or general, universal, etc.

Goals are often pursued that are the wrong ones, but they are not abandoned because they have never been made explicit. When some goal is made explicit it becomes possible to study its real meaning and importance and the relationships it has to other things that are being done or that might be done. The things that are required for the goal to be achieved can be investigated, decided upon, and implemented.

Ideonomy by its nature encourages the comparative study of every sort of goal in every sort of field, and profitable knowledge can be derived from this of the larger and more efficient ways and means of pursuing arbitrary or all goals. Mistakes that are apt to be made in selecting and achieving goals can be identified, along with ways of avoiding those mistakes or of dealing with them when they occur.

Other characteristic problems that are associated with the pursuit of goals include an overdramatization of the importance of a single goal, token attention to the goal, a tendency for a goal to be misformulated or misinterpreted, failure to appreciate that a goal is apt to be more than a simple name or definition and may embrace the simple insights that are apt to accrue in planning for and advancing toward the goal, the error of relying upon a single method or path for achieving the goal, etc.

Illustrative examples of goals are: Putting the first men on the Moon; Target in an enemy country of an intercontinental ballistic missile; Downing and eating of a gazelle as the goal of a lion that is stalking it; Student's goal of passing an exam; Finding a needle in a haystack; Landing someone as one's spouse; Solving some great unsolved problem in mathematics, as by finding a proof of Fermat's last theorem; Breaking an Olympic record in poll vaulting; 'Pineapple's goal' of reaching the standard size specified by the genome of the pineapple plant; Zinc atoms' 'goal' to deposit themselves on the cathode in the electrolysis of zinc chloride solution; Break-even point in research to achieve controlled thermonuclear fusion for industry; 'Goal' of a column of magma ascending through Earth's crust to reach the atmosphere and erupt lava on the Earth's surface; Goal of a company to recover its investment in developing a new product; Puppy's goal of reaching its mother's teat while fighting its littermates for the same objective; Goal of a detective to discover the identity of a murderer; 'Goal' of the disturbed surface of a pond to settle back into hydrostatic (gravitational) equilibrium; Etc.

Although the concept of a goal in the realm of inanimate nature is momentarily discountenanced, several fundamental questions are in fact begged by this exclusion, and—certainly with revision—the concept may one day be be resurrected. At the very least it may be decided that the word should be redefined so that it can function in this more embracive way, since dead matter can be observed to behave in ways that by analogy suggest the pursuit and satisfaction of goals by organisms or minds. The 'goal' may simply be the thermodynamic end-state of a physical process that is relaxing toward equilibrium—regardless of whether that end-state is known, specifiable, or even meaningful in advance, or of whether it is uniquely implicit in some set of mathematical equations. It is also true that it is premature to absolutely exclude the possibility of teleological phenomena or of "final causes" from physical nature. Excluded possibilities in science have a funny way of reentering the picture years later in radically different dress, although this is a lesson that scientists have been slow to learn.

Show Paths To Goals

It is possible to know, or even to prove, that a goal is attainable while at the same time remaining ignorant of how to actually achieve it. Even if all of the necessary resources and methods are at one's disposal, a critical sequence of steps or concatenation of things may elude one. An objective may hover an instant, layer, cell, operation, or decision away and yet be impossible to reach simply because the path to it is not known, well-defined, or available.

Ideonomy can teach general and specific ways to discover or create paths to specific and generic goals, and train the relevant skills.

It can also suggest: Whether a desired or imagined path exists or not or would or would not be feasible; Costs and requirements of finding, constructing, altering, or using paths; Things paths should avoid or their general hazards; Different types of paths that are possible or appropriate; Likely and proper quantitative dimensions of paths; Consequences or side effects of using different paths; Etc.

Clarify Good

To clarify good it may be convenient, desirable, or necessary to first or eventually consult, define, investigate, portray, or even create bad. Bads and goods are both primary concerns of ideonomy.

Basic classes of goods are: Helps and assistance; 'Net goods'; Virtues; Excellences; Benefits; Advantages; Ideals; Wishes and aims (desired things and conditions); Needed and useful resources; Good luck; Pleasures and pleasurable things; and 'Non-bads' (absences of bad; everything that is not actually bad).

The goods that interest ideonomy need not have anything to do with human beings or human values. Inanimate phenomena and entities—and 'pure ideas', whatever they are—have their own agathokakological orders. All goods of all things should be inquired into, systematized, and reduced to ever more universal laws.

How can good be served, maximized, and evolved if we are ignorant of its kinds, possibilities, and laws? If we do not understand its complexities, problems, contradictions, and illusions? If its elements, fundamentals, needs, mechanisms, processes, and manifold relationships to the other things of the universe are unknown?

One way to begin the scientific study of good would be to examine the nature, circumstances, and existence of a single—random or particular—thing in an effort to discover all goods of or connected with the thing, or every way and degree in which any or every thing is or is not 'good' for the thing or 'from the thing's perspective'.

Were the thing to be given such comprehensive agathological scrutiny an ant, for example, one might ask and try to answer these questions: Is the presence of a minimum amount of water in the soil important to the ant's hive? Which traces of chemical elements are good for the ant's diet, even though they are not essential nutrients? Are there diseases of other soil organisms that benefit the ant when they occur? What polymorphisms are good or best for the species of ant? What wind velocity at the mouth of an ant's nest is optimal for the colony, in good weather? Are there certain early life experiences that are good for an ant to have, say because they trigger the emergence of latent instincts, orient the ant for life to the peculiarities of its environment, or institute certain skills in the then-plastic nervous system of the ant?

Lessons here could be carried over experimentally to the possible goods for other animal species. Discrepancies, adaptations, and supplementations noted through such series, networks, and hierarchies of comparisons could lead to an even more powerful generalization of agathological knowledge, methods, and skills, and eventually make possible the treatment of arbitrary goods of arbitrary things.

Another valuable ideonomic exercise would be to construct a diagram with the names of a random set of related or maximally diverse things scattered about but enclosed in ellipses. Arrows would be drawn between certain ellipses to indicate which things are or might be, in some sense or degree, good for which other things. Arrows could be: one-way or two-way, simple or branched, connected only to ellipses or also referent to or from other arrows (à la vergences, networks, circuitries, hierarchies, or other meta-structures), weighted by being thickened, colored to signify senses of good or goodness, etc.

Complementary sets or suites of the diagram could be created to exhibit or investigate the difference that various arguments, circumstances, or perspectives make for the possible or actual relationships, incremental but rational and natural changes in various directions (e.g. that of scaled time or probability), how different people would render the same diagram, etc.

Such an agathological diagram - or agathogram - could be programmed on a computer in a matric or dynamic form. Multivariate analysis, multidimensional scaling, cluster analysis, artificial intelligence techniques and programs, etc could be used to discover and explore an agathological universe - or agathocosm - of : meaningful, contrasting, interdependent, orthogonal, nonexistent, evolutionary, anamorphic, circular, cyclic, autopoietic, mathematically diverse, arborescent, stochastic, chaotic, aesthetically appealing, "implicate" (in David Bohm's sense), etc : idea spaces, permutations, combinations, clusters, chains, series, "rotations", inversions, representations, games, systems of motions and transformations, morphogeneses, other types of ideograms, etc.

All of the : senses, categories, types, subtypes, taxons, and natural taxological systems : of special or universal goods need to be : identified, described, named, evaluated, reduced to operations and logic and transformations, etc. They should be used to : discover, imagine, investigate, characterize, compare, interrelate, synthesize, criticize, perfect, exploit, transcend, teach, etc : all goods of all things.

What are all known or possible dimensions for scaling goods or the goodness of things, and all actual scalings and co-scalings of all abstract and concrete goods, e.g. per: closeness, redundancy, co-representability or comparability, orthogonality, oppositeness, cost, frequency of exemplification, typological diversity, confinement to man (anthropomorphism) or contrary exemplification throughout nature, human importance, human agreement about, degree of clustering, logical containment or hierarchy, universal symmetry, conceptual simplicity, etc?

How does the same type of good vary when it is exemplified in different phenomena or sciences?

What are all of the goods and bads that converge in and/or diverge from single events?

What transvaluations of goods, or of the goodness of things, are possible, desirable, or inevitable?

Some illustrative genera of good are: order, harmony, efficiency, simplicity, reliability, strength, success, improvement, wealth, balance or proportion, security, freedom, opportunity, utility, diversity, transcendence, wisdom, power, control, productivity, flourishing, peace, 'health', problemlessness, salubrity, wholeness, meaning, challenge, consummation, certainty, purpose, direction, preservation, beauty, challenge, responsibility, 'fairness', good fortune, cleanliness, clarity, sophistication, assistance, synergism, truth, self-mastery, etc.

All causes of good need to be discovered, defined, distinguished, quantified, explained, synthesized, systematized, mastered (technologically and methodologically), etc. Yet the causes of both specific and generic goods are often esoteric.

Some possible or known causes of good are: one or more other goods; universal laws and relationships; nature's pervasive or absolute self-similarity; the subjectivity of 'goods' and the spatiotemporal invariances of human minds; striving for good; plans; methods; cooperative and coevolutionary tendencies of natural phenomena; evolution—incl. self-evolution and cosmic evolution—of things and goods; the pervasive tendency of the universe to order and organize itself; moral and legal laws; the sense of beauty; fractal, harmonic, hierarchic, vergent, cyclic, and other meta-patterns and meta-structures; man's habits of collecting, preserving, nursing, and combining goods or good things; early agathology; etc.

Some illustrative species or narrow examples of good are: humility, honesty, sanity, kindness, reverence, trust, stability, civilization, good habits, tolerance, gentleness, magnanimity, eloquence or mastery of language, longevity, altruism, grace, happiness, comfort, leisure, community, scientific and technological progress, economic growth, wit, family strength, quiet, nonpollution of the environment, learning, teaching, husbandry of human resources, thrift, military peace, good government, manners, integrity, refinement of taste, and the doing of good.

Ideonomy might be used to investigate what is good for, in, about, or otherwise in connection with such diverse particular things as: soil, the family, enzymes, the human voice, an enemy, a friend, spiders, a spider's web, grape flavor, starlight, yard sales, religion, atheism, the Golgi apparatus (dictyosomes), war (sic), bads (sic), virtue, the crossword puzzle, seed dispersal, the honeybee waggle dance, filter feeding, Earth's winds, cosmic gravity waves, binary star systems, beaches, time, Reynold's number ($R_e = \rho v L/\eta$), the alga, earth tides, psychoanalytic transference, intelligence tests, oneself, the unconscious mind, heat diffusion, proton precession, striations in electrical discharge, radioactivity, adjoint groups, paracompact space, exterior algebras of linear spaces, Fourier transforms, saddle points, overteaching, ring whizzers and other fluxional molecules, monomolecular films, certain choices of starting materials in chemistry, marine upwelling, the sea's internal waves, ocean spray, a falling birth rate, acculturation (intercultural borrowing), twinned crystals, the semicolon, taxation, the Swiss system of government, German character, boldness in war, military night operations, astronomy, historiographic periodization, goodwill in commerce, expressionist painting, the design of a safety pin, one person's handwriting, leveraged buyouts, corporate disclosure, FM (frequency modulation) radio transmission, the gear, formal education, the metaphor, crying, touristry to the Third World, divinities, the universe, the mathematical point, play, birds' nests, the chair, the theater, the Dirac quantum-mechanical vacuum, competition, philosophy, the pinna, examples, music, continental drift, ultramicrophysical strings, etc.

The ideonomic treatment of good and bad can be pandisciplinary in two senses: not only can ideonomy help to treat the content or phenomena of all subjects, but it can at the same time be used to evaluate, criticize, and improve the work, organization, and structure of entire disciplines.

Thus it could be used to answer the question: what in the methods, research programs, tools, goals, foundations, concepts and theories, language, research foci, institutions, pedagogy, publications, etc of present-day biology is good and bad?

Help Treat the Hardest Things

At any moment in a given field certain problems, tasks, questions, methods, phenomena, domains, unmet needs, goals, concepts, subfields, etc explicitly or implicitly exist that are the most difficult ones of all in that field; and a subset of these things will be the hardest things in human knowledge and endeavor as a whole.

Breakthroughs in these cases are apt to cause the greatest excitement, have the largest consequences for those fields or for civilization, shift paradigms or upend cherished beliefs, reorient or revolutionize theoretical or experimental inquiry, initiate new fields of investigation, conclude or commence the longest-lived and most emotional squabbles, etc.

In an abstract and generic sense the hardest things are apt to be or relate to: Demonstrations that a postulated or implied entity or relationship exists or does not exist, or is possible or impossible; Firm proofs or disproofs of a proposition or hypothesis; Unifications of an entire field or theory; Proofs of the equivalence or nonequivalence of two fundamental things; Universality of some concept, law, relation, or phenomenon; Demonstration that a certain thing is truly fundamental or more fundamental than anything else known or possible; Falsification or modification of what are assumed to be universal or absolute laws, constants, theories, etc; Gaining of absolute or overriding control over some system, process, or phenomenon; Obtaining complete knowledge or understanding of a thing; Advances involving extremely complex or chaotic phenomena; Matters that require breakthroughs in pure or applied logic; Etc.

For a variety of reasons ideonomy may in the future play an important role in the treatment of the hardest things: It may be a fallacy that the hardness of solving certain classes of problems is fundamental, intrinsic, and irreducible—and ideonomy may help challenge this highly influential fallacy; It may be a fallacy that there is only one way to solve certain problems or answer certain questions—and ideonomy may have a peculiar power to bring to light the actual richness of possibilities; One of the spurs for the creation of ideonomy in the first place was the attempt to furnish the human mind with some universally more powerful instrument in the treatment of extreme difficulty and complexity, and in the handling of the special problems being created by the explosive growth of human knowledge, technology, and endeavor; Unexpected analogies may exist between the hardest things in different sciences, the concepts and methods pertinent thereto, the importances thereof, and even the basic solutions to the problems

represented by such things—analogies that ideonomy can help to reveal and treat; Ideonomy can be used to ascertain and dramatize the absolute and relative need, importance, and consequences of achieving the hardest things; Ideonomy can systematize, coordinate, accelerate, and maximize the imagination and discovery of the totality of hardest things; Usually few people know of the existence, nature, and implications of the hardest things, and ideonomy can make such knowledge more broadly available, both within the relevant field and outside it; Etc.

Some illustrative examples of the hardest things are: Whether, in mathematics, there are fractional alefs, or whether alef one is or is not equivalent to the power of the continuum; Nature of measurement in quantum theory; Fundamental relationship between quantum and relativity physics; How our brain thinks or computers can be made to think as well or better; Fundamental relationship between the physical and mental aspects of nature; Basic nature of mathematical truth; Question as to the ultimate safety of scientific and technological progress, or of how to insure its safety; Many-body problems in mathematical physics; What the essential nature of life is; Whether actual infinities exist in nature or nature is wholly finite and discrete; Why nature itself exists in the first place; Extent to which our picture of nature is reducible to one or a few things (e.g. laws, forces, entities, sciences, theories, representations, phenomena, relationships, processes, principles, substances, problems, concepts, etc); Unification of gravitation with the other known fundamental physical forces; Isolation of the fundamental, quantitative, and predictive laws of society or of social behavior and development; Automation of artistic creation; Creation of a fully consistent, or comprehensive, theory of probability; Logical foundations of physics; Nature of randomness or its contribution to the physical world; Scientific basis of ethics; Why physical space is—or seems—tridimensional; Structure and dynamics of Dirac's quantum-mechanical vacuum; Ergodic theory; Information theory; Prediction of patterns given cellular automata will produce, or of the cellular automata that can generate desired or noted patterns; Initial conditions of 'the universe'; Long-term future of civilization; Measurement of gravitation's fundamental velocity or coupling constant to other basic forces, or detection of gravity waves or gravitons; Basic nature of time, or whether reversible travel backwards and forwards in time is feasible; How life began, and a priori probability of its origin or repeated origin (around the universe); Basic structure of the universe; How to civilize human nature or the earth—or extinguish war and crime; How much of the human mind is inherited from the human genome; What the quantity of nonsense in the world is; Etc.

What are all of the hardest problems and possibilities that are connected with a single, random or particular, thing?

Where would all of the examples of hardest things that were mentioned above fall on a universal scale of degrees of hardness? Which of the things would be most ambiguous or hard to place on such a scale?

What hierarchies of hardest things are there? Also what series, networks, trees, rings (sic), clusters, etc?

Which of the things listed above should be tackled first and last - and why?

Are there things that are by definition, or that can be proven in advance to be, infinitely hard to accomplish or know?

Where would the examples of hardest things above all fall on a scale giving the imagined quantity of future time that will or must elapse before that which they speak of becomes known or is achieved?

What are the basic reasons for the hardness of each of those things?

Which of those apparent or supposed hardnesses may in fact be illusory?

On the other hand, which of all those things that would seem to us easy to accomplish or know in the future, may actually turn out to be hard or among the hardest of possibilities?

What were the hardest problems historically and how were they solved? Moreover, what resulted from their solution or explanation—and what lessons may there be for us now as we confront those things that for ourselves are the hardest to come to terms with?

Describe Hierarchies

From the point of view of ideonomy, an infinite number and variety of hierarchies may well exist in and as nature, and all things, in some sense, may be hierarchical or possess hierarchical aspects, elements, and relationships.

The foreseen task is to find and define the totality of such hierarchies and hierarchical relationships, to identify the laws thereof, and to progressively exploit the opportunities implicit in such things.

Of course hierarchy represents just one of the basic genera of so-called meta-structures that presumably pervade the universe or 'reality', but the exemplifications, meanings, and possibilities of each such genus must be thoroughly investigated and elaborated. The case of hierarchy can serve as a general example of what must be done and of what is apt to follow upon the doing of it.

What is meant by the word or concept of hierarchy? One way to answer this question is by seeing what hierarchy could mean—or what hierarchies may in fact, or could in theory, exist—in connection with a variety of things. For example:

Could there be a hierarchy of snowflakes? Actually there could be many such hierarchies: Presumably there is a probability spectrum for different flake shapes; Formative mechanisms may be plural or subject to complication or external influences, in which case either the causes or their effects may canonically progress in chains and branch in—chronological or nomological—trees; Probability or existence of certain flake forms may be a function of the set-theoretic statistics or combinatorial clustering of other flake forms; Etc.

A hierarchy of winters? Perhaps winters can be multidimensionally described and there are certain types of winters that are only likely to to occur after, or somewhere in the middle of, certain sequences of other types of winters; Perhaps there is a hierarchy of descriptions or of descriptive elements, such that certain descriptions or elements are more fundamental or at least simpler than others, and it is appropriate or necessary to 'move along' the hierarchy in attempting to characterize winters; Etc.

A hierarchy of stars? Certain stars generate chemical elements and isotopes that are then recycled in other stars and without which those other types and generations of stars are impossible; Similar stellar hierarchy may exist thanks to the production, recycling, multistage transformation, or control of different molecular species by generations —or perhaps by synchronic hierarchies—of stars; Hierarchical sets of stars may create different physical conditions at a variety of levels (e.g. of stellar density) that induce special types of stars, or of stellar behavior, at those levels; Etc.

Possible or actual properties, dimensions, or features of hierarchies or of their contents include: Elements; Sets, subsets, and supersets; Levels; Degrees; Layers; Ranges; Intervals; Gaps; Folia; Partitions; Stages; Chains or sequences; Series; Harmonics or powers; Units and multiples; Domination and subordination; Supreme commander; Tops, apexes, vertexes, etc; Bottoms, bases, roots, foundations, etc; Starts, origins, first things, a single beginner, etc; Stops, finishes, last things, etc; Greatest or maximal thing; Least or minimal things or thing; Thresholds; Transformations; Rhythms, cycles, iterations, reappearances, etc; Poles, orientations, etc; Inversions; Transitivity; Asymmetry; Antisymmetry; Control, government, or regulation; Ranks; Superiority; One-many relationships; Trees or arborescence; Direction; Unidirectional action; Dependences, independences, and interdependences; Monotonic progression; Emergence; Equivalent and nonequivalent elements; Simplicity; Internal structure and external form; Completeness and all-inclusiveness; Horizontal and vertical relationships; Rules; Defined or exact relationships; Continuity; Universality; Pyramidality; Discrete and continuous aspects; Opposites, antipolarity, and antisyzygies; Uniqueness or singularity; Unity-in-diversity; Spectrums; Convergence, divergence, and vergence; Orthogonality; Etc.

Possible effects, values, or uses of hierarchies include: Arbitrarily large sets of things or elements can be connected, reduced, related, or traced back to, or derived from, just a single thing, element, point, event, law, etc—via a path that is at once maximally short, powerful, comprehensive, logical, necessary, central, self-similar, ubiquitous, etc; Causation, perturbation, government, etc can be shown to be, or treated as being, completely unidirectional and an incremental and comprehensive flow over an arbitrarily large set of identical or diverse things, processes, phenomena, domains, effects, changes, events, etc; Time-asymmetric evolution of an entire system or universe; Flows in two opposite and paired directions can be enabled or defined—flows of an opposite, complementary, reciprocal, or independent nature or content; Things or processes of every possible size, number, or complexity can all be 'reduced' to the dimidiations, doublings, bifurcations, partitionings, iterations, recursions, fractal structure, or the like of a single thing, process, pattern, or the like—so that the smallest and largest scales or sets, first and last things, whole and parts, e/vc of the hierarchy are mutually derived, antisyzygially, in an exact or approximate way; Generalization, specialization, and their interdetermination; Alternative descriptions, classifications, or treatments of things can be rigorously excluded; Possibilities can be constrained; Different and disjunct trees of possibilities can be differentiated and selected; Things can be described or controlled via the simplest language, code, logic, or information-theoretic structure;

Operations or actions can be reduced to uniquely consecutive and finite decisions; Variables can be treated as constants, and constants as variables, at successive 'levels'; Those degrees of freedom that enable the self-organization of a phenomenon or realm can be increased or maximized; Potential or actual self-interaction, self-government, self-connection, autocorrelation, self-description, complexity, heterogeneity, proteanness, e/vc of a thing or phenomenon can be maximized; Use of resources can be optimized, or need for resources minimized; Redundancy can be minimized, irredundancy maximized (and vice versa, paradoxically); Etc.

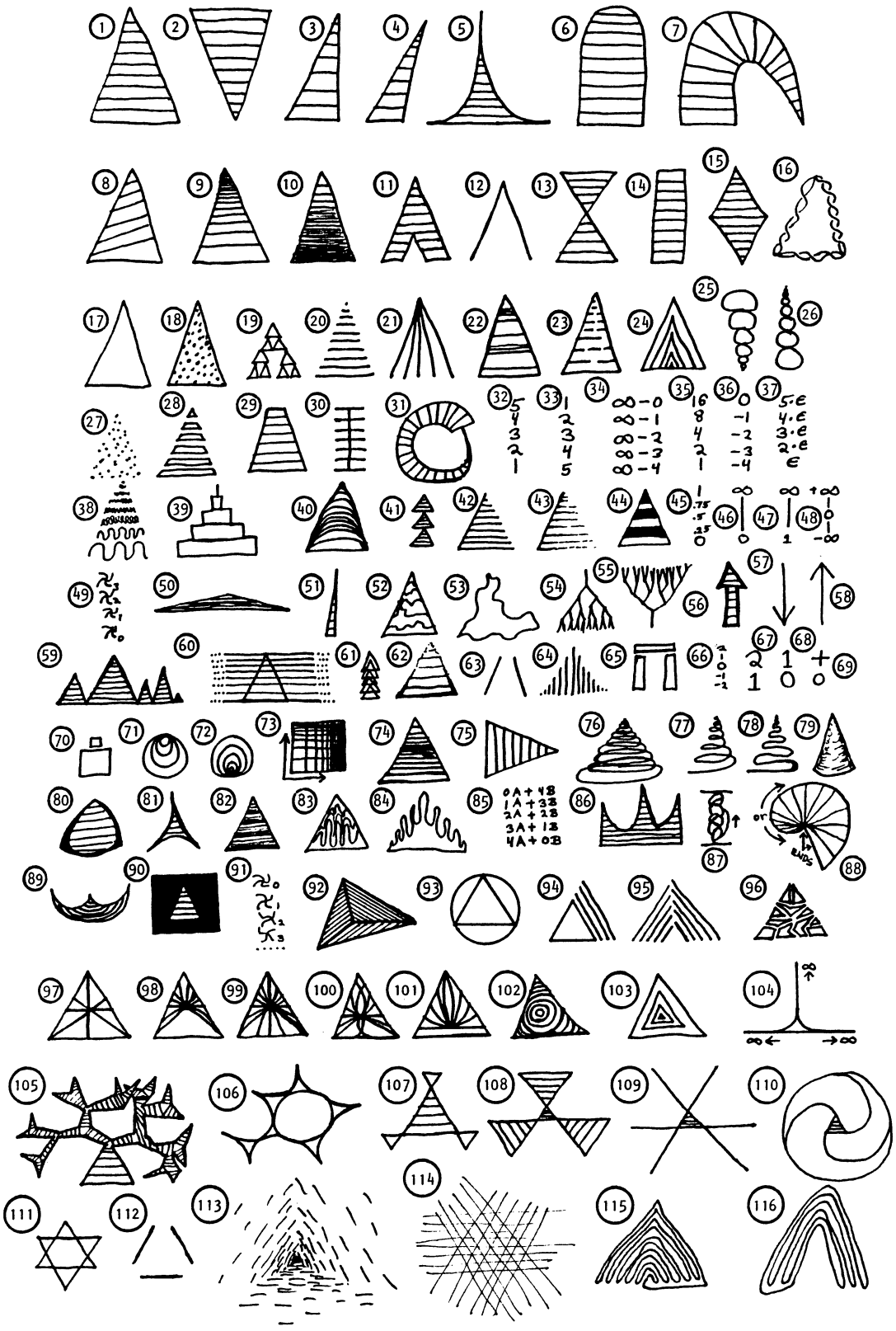
In a simpler way, hierarchies or hierarchization can serve, i.a.: classification, description, definition, development, morphogenesis, evolution, transformation, revolution, generalization, specialization, integration, isolation, amplification, analogization, distinguishing, specification, individuation, universalization, organization, self-organization, control, government, meetings of opposites, simplification, complexification, randomization, localization, innovation, distribution, centralization, decentralization, self-reference, operationalization or processualization, conservation, conceptualization, mechanization, simulation or modeling, proceduralization, stratification, cooperation, diversification, nomogenesis (sensu either the discovery of laws or their emergence and evolution), systemization, correction or adjustment, adaptation, stabilization, selection, search, checking, supervision, coordination, communication, compilation, colligation, assimilation, convergence, divergence, 'parsing', counting, etc.

More specifically, hierarchy or hierarchization serve or are exemplified in or by: e.g. memory (or memorization and recall), recognition, thought, bodily action, feeling, psychogenesis, social evolution, biosynthesis, the evolution of life, cosmogony, parallel computation, industrialization, human government, military organization and strategy, nervous systems and artificial neural nets, computer hardware and software, evolution and classification of mathematical ideas, the process or result of painting, accounting, language translation, literary analysis (as of a novel), family relationships, the immunal system or immunogenesis, ecological structure and processes, genomic structure and function, ontogenesis, social stratification, structure and traffic dynamics of a nation's road system, etc.

Universal genera of hierarchies include hierarchies of: abilities, acts, alternatives, AMBIGUITIES, analogies, ANSWERS, ANTISYZYGIES, appearances, assumptions, bads, beauties, behaviors, beliefs, causes, CHAINS, CHANCES, CHANGES, CHAOSES, circumstances, clusters, coevolutions, COMBINATIONS, COMPLEXITIES, CONCEPTS, conflicts, connections, CONSERVATIONS, contents, controls, CONVERGENCES, cooperations, COPROBABILITIES, corollaries, COURSES, criterions, CRITICISMS, CYCLES, decisions, defects, definitions, descriptions, differences, discoveries, disequilibriums, disjunctions, DISTRIBUTIONS, DIVERGENCES, doctrines, domains, ecological things, ECONOMIC THINGS, EFFECTS, elements, emergents, ENVIRONMENTS, EQUALITIES, equilibriums, EQUIVALENCES, errors, essentials, EVALUATIONS, events, examples, EXCELLENCES, excuses, expectations, EXPERIENCES, EXPERIMENTS,

"116 TYPES OF HIERARCHIES"

(SUGGESTIVE DIAGRAMS)



EXTREMES, fields, FIRST PRINCIPLES, FLOWS, forms, functions, FUNDAMENTALS, FUTURES, FUTURIBLES, games, GENERALIZATIONS, geneses, goals, goods, "GROUPS", hardest things, heuristics, HIGHER REALITIES, histories, HYPOTHESES, IDENTITIES, IGNORANCES, ILLUSIONS, IMAGES, implications, IMPOSSIBILITIES, INDIVIDUALS (sic), INEQUALITIES, INFINITIES (and INFINITESIMALS), INFORMATION-THEORETIC THINGS AND ENTROPIES, instances, INSTRUMENTS, interdependences and reciprocities, interests, inventions, INVERSIONS, KNOWLEDGES, languages and linguistic things, LAWS, limitations, LOGICAL THINGS, MANIFOLDS, mathematical things, MATRICES, MEASUREMENTS, MEASURES AND DIMENSIONS, mechanisms, METAPHORS, methods, MINDS AND INTELLIGENCE, MODELS, MOTIONS, needs, NEGATIONS, NETWORKS NETWORKS OF CONSEQUENCES, NICHES, NONEXISTENCES, operations, OPPORTUNITIES, ORDER TAXONS, ORIGINS, PARADIGMS, paradoxes, pathoses, PATHS, patterns, PERSPECTIVES, phenomenons, plans, possibilities, practices, PREDICTIONS, preparations, THE PRESENT, principles, PROBABILITIES, PROBLEMS, PROCESSES, proofs, PROPERTIES, psychological things, PURPOSES, quantities, QUESTIONS, REACTIONS, realms, RECURSIONS, relations, RELAXATIONS, representations, resources, responsibilities, RINGS, roles, rules, SELF-EFFECTS, SERIES, sets, SHORTCUTS, SIMPLICITIES AND SIMPLIFICATIONS, SIMULATIONS, SOLUTIONS, SPACES, speculations, STATES AND CONDITIONS, STORIES, strategies, SURPRISES, systems, tactics, taxons, TECHNOLOGICAL THINGS, THALWEGS, THEORIES, things, THOUGHTS, TOPOLOGICAL THINGS, transcendences, TRANSFORMATIONS, TREES, types, ULTIMATES AND ENDS, ULTRAFUNDAMENTALS, uncertainties and doubts, unifications, the 'universe', uses, VALUES, VERGENCES, virtuals, wants, wholes and GESTALTS, wisdoms, and WORK.

Particularly or peculiarly interesting genera of hierarchies in this list are in upper case. Many suggest fascinating problems, questions, and possibilities—which ideonomy will eventually address.

Actually many things need to be learned about all of those genera. Thus what are all of their: exemplifications, specializations, causes, effects, roles, interrelations and interactions, laws, activities, structures, transformations, histories, futures, evolutions and retrogressions, fine structure, etc?

Hierarchy can be defined in many different ways. The dictionary distinguishes: (1) The arrangement of objects, elements, or values in a graduated series; (2) A series of objects, elements, or values so arranged; (3) In logic, a series the members of which are grouped in accordance with a principle (as of importance, perfection, or priority); (4) The stratification so achieved; specifically, a table of statistical correlations having a constant proportional relationship and graded from high to low; (5) A body of persons or things ranked in grades, orders, or classes, one above another; a system or series of terms of successive rank, used in classification (as in biology).

Additionally, of the adjective "hierarchical" it says: (6) Having the power to control; influential.

A more ideonomic characterization of **hierarchy:** (7) At the top or upward is the thing or set of things that controls, dominates, influences, limits, expresses, indicates, facilitates, e/vc the meaning, importance, behavior, degrees of freedom, changes, possibilities, relationships, aspects, costs, needs, outputs, e/vc of that below or downward.

Unveil Higher Realities

A philosophical conjecture in ideonomy is that often or always there exist 'higher realities' and "ultra-real things". In other words, no matter what the thing - or what the perception of truth - there may (or must) exist things that are more real and truths that are greater, or higher levels of reality accessible eventually to some appropriately equipped and sufficiently powerful form of intelligence, or to an investigation sufficiently determined and inspired. Put still another way, the evolution of being may be destined to continue without any known or possible limit.

The implication may be that all perceived or extant things, or contemplated truths, are obscured and distorted by innumerable or infinite layers of illusion.

More specifically, the actual : unity, regularity, patternedness, determinism, accidentality, beauty, grandeur, complexity, stratification, simplicity, queerness, self-interaction, perfection, imperfection, meaningfulness, richness of possibilities, paradoxy, richness of detail, evolutionariness, subjectivity, self-hiddenness, deceivingness, ambiguity, multiplexedness, hierarchicality, multidimensionality, activity, internality, controllability, knowability, exploitability, organicity, reconceptualizability, 'brilliance of design', etc : of the world, things, or phenomena may transcend - to an arbitrarily great degree - what is conventionally assumed or imagined or what is momentarily cognizable.

Overlooked may be all sorts of higher: systems, mechanisms, relationships, laws, entities, phenomena, processes, trends, capacities, potentialities, causes, interactions, effects, structures, types of order, senses, behaviors, changes, transformations, forces, concepts, functions, goals, events, combinations, analogies, differences, trees, problems, needs, resources, opportunities, uses, values, goods, bads, kinds, origins, circumstances, environments, conflicts, corollaries, geneses, futuribles, histories, knowledge or modes of cognition, chains and series, solutions, stories, strategies, cycles, descriptions, convergences, divergences, essences, flows, networks and other meta-structures, connections, paths, perfections, shortcuts, spectrums, sets, simplifications, theories, synergisms, evidences, forms of work, equilibria and disequilibria, equalities and inequalities, symmetries and asymmetries, equivalences and virtuals, opposites and antisyzygies, 'games', generalizations or extensions, matrices, measures, properties and dimensions, niches, paradoxes, perspectives, appearances, types and elements of probability, reactions, spaces and manifolds, transcendences, alternatives, calculi, coevolutions, conservations, cybernetics, degrees of freedom, domains, emergents, impossibilities, pathoses, reciprocities, representations, principles, self-effects, forms and topologies, coordinate systems, co-probabilities, "groups", gestalten, wholes, ecological systems, inversions, negations, recursions, relaxations, tertium quids, vergences, etc.

Ideonomy can help to discover and exploit all of them.

Higher realities often elude detection for such reasons as that they: are nontraditional, are too abstract, are too specific or general, presuppose highly original thought, presuppose an accumulation of knowledge or experience, are too subtle, require extreme logic or mental rigor, are too disturbing to easily contemplate, would be anything but popular, assume great self-knowledge, are too easily confused with more familiar things, are easily misunderstood, demand a long sequence of thought or argumentation, lack some way to be proven or tested, at first seem trivial or meaningless, require relearning, presuppose transformations of one's ideas, demand special awareness of one's assumptions, appear self-contradictory, involve new categories of feeling or intuition, presuppose extraordinary imagination, are too fundamental, are holistic or synthetic, demand excessively broad or interdisciplinary knowledge or competence, are in fact too obvious to be seen, require an excessively open world view, have no defined interest, involve too many assumptions, demand too much objectivity or honesty, demand great mental clarity, depend on a free manipulation of all of one's ideas, involve the substitution of new concepts for old, involve assumptions that are too vast or concepts that are too large, require new learning, presuppose epoche (suspension of judgment), require deliberation or calculation, imply a reconstruction of perception or apperception, involve a reintegration of knowledge or new combinations of ideas and things, require great powers of memory; seem too random, chaotic, amorphous, or vague; qualify certainty, condition necessity, free impossibility, outrage common sense, unite opposites, complicate simplicity, relativize absolutes, pluralize truth, substantiate paradoxes, seem to subvert 'reality', outrange expression, bespeak new worlds, or require such things as greatness of spirit, untrammeled curiosity, boldness of mind, dedication to truth, a sense of beauty, etc.

Diverse illustrative examples of higher realities that have been previously discovered or considered or that may yet be discovered are: A supraconscious mind; Gaia, or all of life and much of geology as manifestations of a single all-comprehensive superorganism; A human soul or a spiritual realm; Deity; Society or civilization as a superorganism or supermind; Human or even natural history as a dialectical process; A regnant or superessential "Ideocosm"; Cosmological superspace; The "Prespace" and "Implicate Order" of physicists Wheeler and Bohm; The "Collective Unconscious" of psychologist Jung (when this is not taken as, on the contrary, a lower species of consciousness); The infinite hierarchy of higher infinities of mathematician Cantor; Nature as reconceived per the Banach-Tarski Paradox; The curved spacetime of physicist Einstein; Cosmology—or anthropology—as dictated by the Whorf-Sapir Metalinguistic Hypothesis; The history of Western Music as manifesting the set of maximally compact variations upon certain initial—special or nonspecial themes—in a 'universal' thematic (or idea) space; Various macrohistorical conceptions of human history (incl. ones viewing it as spiral, helical, cyclic, closed, unilineal, evolutionary, orthogenetic, etc); All so-called fundamental particles reduced to a scattering matrix, intertransformational processes, a

vergence, an infinite hierarchy of matrices, or the like; The human mind or physical universe reduced to the recursional progression of a cellular automaton; All of mathematics reduced to the evolutionary and recursive life of a closed or open (finite or infinite) set of categories, functors, and morphisms per Category Theory; 'Our' cosmos or spacetime reduced to a fractal structure or phenomenon; All of nature reduced to complex numbers—or to one of various other number systems; All of nature reconceived as being entirely static (free of change) à la the philosophic cosmology of Parmenides; The 'universe' itself reconceived as a single superorganism or supermind; Etc.

Help One Think About the History of A Thing

For a variety of reasons the ways in which we study history now are inadequate: There is too much phenomenology and focus upon sheer trivia; Too little attention is paid to concepts; Processes, geneses, origins, and mechanisms—particularly fundamental ones—are neglected or never identified, or themselves go unexplained; Treatment of historical material is not in terms of the comprehensive, fundamental, orthogonal, and combinatorial dimensions of all historical phenomena; Accounts, analyses, and syntheses of the actual course history took are bereft of the parallactic dimension that would be conferred upon them if they were accompanied by or interwoven with parallel studies of the other canonical courses that history could have taken instead; Paradigms governing existing historical description and theory, and the styles of different historians, are not explicitly and comprehensively investigated, identified, interrelated, and illustrated for their roles and effects in actual historical writing; The universe of all possible approaches to history is not explored; The study of history is deficient in an aleatory element—for chance is not used to choose methods, concepts, dimensions, themes, periods, places, interpretations, things to be associated, etc, in a way that would maximize the scope, playfulness, independence, originality, richness, spontaneity, and space —and minimize the redundancy, conventionality, narrowness, faddishness, arbitrariness, unnatural clumpiness, and ossification—of historical inquiry; The study of human history is overemphasized relative to the study of the histories of nonhuman and inanimate things, or of purely physical phenomena—and human and nonhuman history are not used to illuminate one another, either superficially or fundamentally, and certainly not in an ideonomic sense; History is not dealt with in terms of the total set of ideonomic subdivisions and the historiographic synergisms thereof; As is unfortunately true in all fields, the amount, importance, and sophistication of criticism—by historians of one another, of themselves, of historical phenomena, and of historical criticism itself—is anything but what it should be; History is neither depicted nor explained in terms of the fundamental meta-structures and meta-processes—e.g. trees, networks, hierarchies, chains, series, rings, vergences, plexures, circuitries, clusters, matrices, fractals, "chaoses", etc—of things, events, phenomena, causes, effects, etc; Historical anomalies are understudied and undervalued; The possible or full role of chance in history is poorly illuminated; There is far too little modeling and computer simulation of history (or of the fanciful histories of fanciful things); The body of historical knowledge is not

used to perform predictive experiments that could test and refine the powers, methods, and theories of historical science, and aid the evaluation of different historical writers, writings, and schools; The infinite hierarchy of alternating ever-higher-order (and ever-lower-order) time-symmetric and time-asymmetric aspects of history has been little ascended (and descended); Studies of the past, present, and future are seldom compared and have never been unified in an ideonomic sense (that is, reduced to the same set of phenomena, laws, possibilities, etc); Etc.

Ideonomy has the power to radically and irreversibly transform the treatment of history, and the status and stature of historical science. By amplifying the standards, scope, depth, rate of advance, breadth of application, challenge, intellectual vitality, and human importance of historiology, ideonomy could make it into what it has never been in recent memory: a magnet for some of the brightest students and scholars.

The importance of studying history or the history of a thing is: To clarify and temporalize the present; To better understand the future (e.g. by analogy, extrapolation, and knowledge of fundamentals); To identify the eternal or time-invariant aspects of the world; To enlarge or maximize one's perspectives; To learn how things began and developed; To discover the causes of things; To perceive the actual or potential variability of the world or of the present, and the true breadth of possibilities; To learn what elements of the present are trivial, nonessential, or irrelevant; To identify the convergent, divergent, and vergent aspects of the present; To learn what the necessary and unnecessary elements of nature are; To characterize the paths that past things followed or current things are following; To discover the 'conversational or dialectical' elements of the world over time, and the great 'stories' that are being told in and as nature; To increase humility and strip one of prejudices; To acquire wisdom; To learn how to create or shape the future; To acquire a more practical, naturalistic, and multidimensional view of things; Etc.

Illustrative examples of histories that ideonomy could be used to elucidate are the histories of: The chemical reaction of two molecules on the scale of picoseconds or nanoseconds; A thought emerging, maturing, acting, and vanishing in the mind on a scale of milliseconds or seconds; An extinct species of crab; The idea of human equality or of infinity; The American Civil War; The soil in a region; A storm system tracking its way across a continent; A man's life (his biography); Historiography itself; The dialectical changes of the English language; The Sun since its origin or the planets were formed; A nation's economy; A mineral inside the Earth; A volcano that has been spasmodically active for countless millennia; A heart over the lifetime of an individual; A hearth fire burning itself out in a few hours; The ocean over geological time; The Impressionist school in painting; How a symphony came to be written in the course of a year; That seen through a microscope in a drop of swamp water observed for one hour; The day's events in a city council; The wear of a machine gear from installation until its failure; The course of a chess game; Groundwater retained in an aquifer for two centuries; A single leaf from its formation until its abscission or disintegration on the ground; The repeated improvements and modifications of the telephone since its invention; A lightning flash lasting one-fifth of a second; Etc.

Ideonomy can define the fundamental set of questions that can and should be asked about the history of anything whatever, e.g.: When, how, and why did the thing originate? Can the history of the thing be circumscribed, or divorced from the history of other things? Has there been some force, process, tendency, circumstance, law, relationship, weakness or strength, need, goal, capability, or the like that has dominated the thing's history? What factors have constrained and perturbed the history of the thing? Was the thing's history shaped by chance or necessity? What other historical courses could the thing have taken—that it did not take? What is most characteristic, essential, or peculiar about the thing's history? What things are most and least clear about its history? What about its history is familiar or normal? What factors could have altered the thing's historical course—factors that might have occurred or operated naturally, or factors representing the arbitrary assumptions or artificial modifications of gedankenexperiments? What chains of causes and effects, or simple sequences of phenomena, have characterized the history of the thing? What has been the rate at which things have occurred, and what has controlled that rate?

Expand Horizons

An horizon is defined as the fullest range or widest limit of perception, interest, appreciation, knowledge, or experience. In another sense it is the range or limit of hope or expectation or a visible and seemingly attainable end or object lying within or upon it—a goal or prospect.

How can ideonomy expand horizons of perception?

One can look at a picture of a landscape that contains a peculiar object and not notice the presence of that object—even in a case where it should be conspicuous—simply because the type of object is totally unfamiliar. Perception is, in short, a kind of cryptanalysis, and presupposes acquaintance with those 'natural' codes that define the appearance, behavior, properties, or 'being' of things—or cryptological skills. The everyday world unquestionably contains a welter of perceptible-but-unperceived phenomena. Ideonomy can be used to educate and train perception so as to make people aware of radically new and greater things present everywhere about them, and of myriad overlooked aspects and dimensions of familiar objects. It can do this for every sense and in all domains of—direct or indirect—experience. Moreover, it can do this progressively because the new sensa and percepts will recursively extend the possibilities for further perception; in other words, the process can evolve and revolutionize itself.

Ideonomy can indicate, systematize, transform, perfect, generalize, and specialize the vocabulary, grammar, and syntax of color, form, structure, texture, arrangement, perspective, motion, change, temporal succession, etc. It can create and lead the mind through all possible abstract perceptual spaces, manifolds, transformations, processes, and 'realities'.

It can take a scene or other perceptual experience and randomly, or in various ordered or interactive ways, vary or reconstruct it, or exhibit its effective perceptual distance to other actual or potential scenes or perceptual experiences. In such ways it can increase the mind's

perceptual: compactness, efficiency, flexibility, power, self-control, 'wisdom', speed, robustness, simplicity, universality, logicality, etc.

It can expose the mind to all possible combinations, permutations, transformations, and evolutions of sensa and percepts. It can reveal all the synergisms, antagonisms, and logics of sensa and percepts when they succeed one another in time or are compresent in space.

It can synthesize or analyze percepts on the basis of the natural morphogeneses and morphodynamics of real-world objects, processes, phenomena, and systems.

It can filter-out those elements of perceptual experience—say of a scene—that are familiar, average, irrelevant, trivial, redundant, convergent, divergent, unwanted, variable, invariant, random, or the like, and leave or emphasize those elements that are of an opposite nature—that are unfamiliar, atypical, relevant, vital, irredundant, or the like. Initially it will do this simply by training and guiding human perception, but ultimately it will do it by coupling to artificial intelligence or through the automation of perception.

How can ideonomy extend man's interests and appreciations?

Interest in another subject can often be excited by indicating an analogy, complementarity, homomorphy, homology, contrast, or direct link of the other subject to a subject that is more familiar or already of interest. Ideonomy can systematically and comprehensively discover and dramatize all such relationships among all subjects, or between subjects possessed of and lacking prior interest to one. It can show all the ways in which different subjects fit into and illuminate one another, and all the interdependences and possible interactions of topics.

It can discover all of the ways in which things can be interesting, and all the causes, sources, and bases of actual or potential human interests. It can identify and extrapolate the dimensions and trends of interests. It can learn and teach how interests grow, develop, and transform—or can be purposefully or freely transformed—into other interests and other types and realms of interests.

It can maximize a thing's interest—or the pure human capacity for being interested in things.

It can be used to anticipate what would be of interest or of greater interest.

It can heighten the felt or perceived interest of other things by inhibiting the tendency of old interests to get in the way of potential new interests or to be confused with them.

It can reveal the pattern of co-interests that things have—or should have.

It can systematize and comprehend all beauties, values, meanings, uses, functions, roles, goods, bads, duties, needs, wants, evaluations, problems, purposes, goals, ideals, virtuals, possibilities, criticisms, implications, etc.

It can anticipate, visualize, and proliferate new fields and pursuits.

It can show how sets of many interests can and should be simultaneously superseded by other sets of interests.

It can expand the range of application or of applicability of existing methods, tools, and materials.

It can vastly increase the range of considerations bearing upon any given thing, or the conceptual complexity of man's view of the world.

It can transcend the present and explore the interest of future things.

How can ideonomy expand horizons of knowledge?

There are infinitely many routes to knowledge. We know of and use a few, but of an infinity we make no use or are wholly ignorant. We have discovered and developed new routes, historically, by a casual and accidental process. The explicit or implicit assumption has been that anything more efficient, systematic, or methodical than this is impossible, unnecessary, and perhaps even undesirable. Probably there have been thoughts of the sort: 'Tradition has worked well enough; why try to improve upon it? ... Had something more been possible it would long since have been realized. ... There can be too many routes to knowledge, and too much knowledge, at one time.'

Yet at the dawn of ideonomy this situation may be about to change. The new science-that-is-a-servant-to-science can be used to generate new routes to knowledge en masse, to map out the future landscape of research and the most efficient and desirable pathways through this unfamiliar territory, to discover ways in which to combine multiple related and unrelated lines of inquiry economically and synergistically, and to direct the flow of resources over the road system.

In a certain sense the knowledge mankind possesses at any one moment has an internal infinitude; its relationships to itself—which are progressively definable—are infinitely complex and valuable. But hitherto almost no interest has been shown in the exploration, characterization, and exploitation of these possibilities; science has operated like a mindless bureaucracy, endlessly accumulating new data at the periphery or in the external world, while giving little thought to the intensive meaning of what it already knows. Yet it is a platitude that unorganized data is practically worthless. To be made truly meaningful and important it needs to be given the geometrical perfection, the lawful regularity, the intelligent and definitive elegance of a crystal or gemstone.

Ideonomy promises to vastly extend these internal horizons of human knowledge.

Finally, how can ideonomy expand horizons of experience?

If you want to have a lively night-on-the-town you have to know where to go. The science of the laws of ideas can suggest where the most fun is apt to be had, or the rounds to make if it is a new experience that one yearns for.

By expanding the horizons of one's perception, interest, and appreciation, it will also automatically expand one's experiential horizons—both directly and indirectly.

By defining the basic structure of the world or of possibility itself —and universally—it will make the opportunities for thought, meaning, action, and accomplishment plain.

It will expand horizons by increasing the diversity and excellence of all human beings, in whose community horizons are defined.

Develop An Idea

To develop an idea one needs to know the dimensions it has or in which it can be developed, and these dimensions are to a certain degree universal. Even where they are not universal, their discovery can be facilitated by more or less universal clues, methods, and other means.

Certainly reason and the life of the mind generally have their basic and universal rules, operations, structures, patterns, systems, problems, and peculiarities. Consciousness and mastery of these things can promote the having, exploration, perfection, and transformation of ideas.

All ideas are in various senses and ways generic, and their nature and possibilities can therefore be clarified by consulting the vertical and horizontal relationships they have to other taxons of ideas within systems that undertake to classify ideas, broadly or universally. Such systematic relationships can directly and indirectly suggest the : causes, effects, assumptions, functions, uses, values, events, tactics, wisdoms, meta-structures, other concepts, circumstances, resources, principles, phenomena, errors, etc : that are apt to pertain to any idea whatever, to the things that do pertain to that idea, or to the possible or proper development of that idea.

Ideonomy can suggest universal questions to ask in developing an idea, e.g.: What do I need to know to develop the idea? What is the present state of the idea? How important is this idea as opposed to some other idea? What ideas are similar to this idea, how are they similar, why are they similar, and in what measure are they similar? What ideas, on the contrary, are in some sense or degree different from, or opposite or contradictory to, this idea? What are the different ways or directions in which I might develop this idea, and what would be the contrasting values and consequences thereof? Is the idea, now or in essence, simple or has it instead many levels, elements, or dimensions? Where, when, how, and why did the idea originate—whether in the minds of other individuals or in my own mind? What is good and bad about the idea, or how can it be improved upon, corrected, tested, or evaluated? What do I know about this idea and what is my visible or potential ignorance of it? In developing this idea, what should come first—or what plan should I adopt? How easy will it be to develop this idea or how readily is it developing? What is typical and unusual about the idea? What is the basic and complete structure of the idea? How will this idea be received by other persons, or what must I do to communicate, explain, defend, or sell the idea? How might other people help me to develop the idea? How far can or should the idea be developed? Into what other ideas does this idea branch or diverge, and what other ideas branch or converge into this idea? What is the total network of ideas of which this idea is a part or in the static or living matrix of which this idea has meaning? What set of hierarchies of higher and lower ideas does this idea belong to? What other ideas can this idea be transformed into (or be produced by transformations of), and what are the rules for effecting such transformations or derivations? What is the 'theory' behind this idea —what assumptions or postulates does it make, what axioms does it use, what are its constraints, etc? What other questions do I need to ask and answer in developing this idea?

Advance Ideals

What are all of the generic and specific ways in which any and all ideals and goods can or might be, are being, or have been: served, maximized, evolved, infinitized, or corrected?

Some of the generic ways in which a specific ideal (the ideal of democracy in America) could be advanced are, for example, by: Strengthening its foundations; Encouraging its development; Eliminating its defects; Inhibiting or modifying its antagonists; Clarifying its nature or developing its theory; Increasing its breadth of exemplification; Facilitating its effects; Etc.

By ideals may simply be meant human goods, or potential states of perfection of same.

Among the many ways in which ideonomy might advance such ideals are by: Reconciling them; Combining or unifying their pursuit; Helping to determine or develop the material things that do, will, or can advance them; Dramatizing their richness of meaning and centrality; Evolving man's image or understanding of them; Optimally channeling their expression or pursuit; Envisioning their progressive and ultimate realization; Systematically creating and promoting all possible or necessary methods for their achievement; Learning how to actually simulate the ideals—or their possible worldly realizations—on a computer, and then enabling experimentation upon them; Etc.

Dramatize Ideas and Facts

Ideas and facts in themselves can often seem rather dull or even meaningless. Their implications need to be pointed out, the ways in which they originated need to be indicated, they need to be compared and contrasted with other ideas and facts, emphasizing their very limitations may paradoxically heighten their interest, describing their actual or potential dynamics or life in the world can increase their apparent meaning enormously, showing the great chains of ideas or facts that converge to or diverge from them can show the stories that are unfolding in, as, or through them, their possible importance for man should be highlighted, how they function within the mind can be profitably suggested, the great and even infinite meta-structures of all ideas and facts—or of all things—to which they belong should be determined or implied, they can be depicted within divergent scenarios of events, etc. The dramatization of ideas and facts can be accomplished in these and other ways, and ideonomy can greatly contribute to the process.

What is it that is surprising about given ideas or facts? What is more and less important about them—and why? What do they do—or could they do?

What are the most dramatic ways to define or explain ideas or facts —and why are they the most dramatic?

What are all of the reasons for dramatizing ideas and facts? What are all of the costs of not dramatizing them, or of dramatizing them wrongly?

What are the best and most exemplary dramatizations that already exist or in intellectual history?

What graphics, ideograms, mental technology, etc exist or could be developed to serve or maximize the dramatization of facts and ideas or the infinite drama of thought?

Reduce Ignorance

Ignorance can have many bad effects: It can lessen caution or breed hubris; It can give rise to or perpetuate blind spots; It can mean that thought or conduct are riddled with faulty and dangerous assumptions; It can generate other ignorance or protect itself; It can blunt the appetite for discovery and innovation; It can produce premature closure of, and an overreliance upon, scientific theories; It can trigger defective models in other areas based upon analogies; It can cause problems to be underestimated or misdiagnosed; It can warp the foci of research; It can make shallow knowledge seem deep and deep knowledge seem shallow; It can lead to many errors and misconceptions; Etc.

If the structure and basic functioning of the human mind can be determined, brilliant light will immediately be thrown on the kingdom of ignorance in which we all reside, and notice will be served to the obscurantic foolocracy that has ruled the world since the dawn of civilization—often in the guise of civilization. For ignorance is at bottom not a static or finite thing, but rather a living entity that maintains itself, propagates, evolves, and competes with knowledge. Ideonomy is one of several new sciences that together may lead to such a revolutionary reconceptualization and clarification of ignorance, even in our day. In other words, we need to build comprehensive computer models, or mechanical equivalents, not only of the human mind and human knowledge but of human (or organic) ignorance and stupidity; we must come to know **unknowing**.

Ideonomy can ultimately be used to define the structure—at once architectural and cellular—of all possible knowledge, and implicit in that structure will also be the structure of all possible and actual ignorance.

The new science of ideas can help more generally with the systematic asking and answering of such fundamental questions about ignorance as: How identical or analogous—and different or divergent—in form, elements, or behavior is the ignorance of different persons? What is the cascade of ignorance that is fundamentally inextinguishable and universal? Where ignorance obtains, what characteristic clues are there of its existence? What are all of the types and sums of costs of all forms of ignorance? What is the best way, or what might be alternative ways, to define given types of ignorance? What little accidents or errors can cause effective ignorance to grow very rapidly? What factors can indirectly amplify or compensate for the effects of ignorance? Are there instances where 'ignorance' has to do something equivalent to—transitively or intransitively—'percolating through and out of a matrix'; and if so, what are some examples of this phenomenon? How can different types of ignorance be exchanged for one another in solving a problem? Where one's ignorance of something is irreducible, what are the best ways of arranging or treating that ignorance in solving given or generic problems or in accomplishing tasks?

What is the totality of our ignorance about a specific thing? What is the totality of our ignorance about our ignorance? What bad habits perpetuate ignorance and how can they be stopped? How can we study ignorance that obtains in one field in order to discover, understand, and oust ignorance in some other field that may or may not be related to it? What ignorance do we regularly teach or adhere to with the worst dogmatism? Which types of ignorance can we eliminate now or could we hasten the extinction of, and which per contra would resist or prove indifferent to our impatience? In what segments of society, or institutions, are various forms of ignorance ensconced? Which forms or portions of ignorance are enculturated and which are enorganic? What hierarchies, networks, rings, cycles, fractals, trees, convergences, and other meta-structures of ignorance are there? Etc.

Illustrative ways of defining almost any type or instance of ignorance are by: Elimination (systematically excluding the things it is not or it does not involve); Its effects; Its causes; Context; Assimilating or contrasting it to other ignorance; Referring to its separate or related elements; Discussing or imagining extreme or the most perfect forms of it; Mentioning its essence; Characterizing its opposite; Limning its range of occurrence; Etc.

Examples of universal genera of ignorance include GENERIC IGNORANCE OF: Age, Definition, Defect; Value, use, or importance; Law, Ending, Essential nature, Change, Paradox, Mechanism, Etc.

Under each of these genera various sub-generic taxons of ignorance await identification, and once identified they will have great value in further differentiating, defining, anticipating, and removing ignorance through the whole of physico-mental reality.

Thus under "generic ignorance about AGE" one might recognize sub-generic ignorance of or about: Absolute age, Relative age; Quantitative age, Qualitative age; Actual age, Virtual age; Ages of parts, Ages of aspects, Ages of functions; Etc. Or about: Meaning of age, Importance of age; How to measure, learn, investigate, or define age; Manifestations of age; Etc.

Notice that many of these so-called sub-genera of ignorance occur as natural pairs; as co-sub-genera, if you will, or as sub-sub-genera.

Moreover, other distinctions regarding such taxons need to be specified and discussed. For "sub-generic ignorance about relative age", for example, one could distinguish AGE RELATIVE TO: Natural or predicted life-span or half-life; Other things of the thing's type, species, genus, or analogical group (or relative to the norms); Time remaining until 'death' or termination; Time remaining or that must lapse before some future event, date, or point; Etc.

What exist under or in connection with each such genus of ignorance, in other words, and what need to be discovered, named, defined, investigated, mapped, exploited, etc, are : various finite and infinite series, chains, hierarchies, networks, circuitries, trees, constellations, etc of : sub-dimensions and co-dimensions of ignorance, groups of concepts, decisions, operations, representations, examples, criteria, advice, problems, needs, etc.

Among the regularly recurring bases, sources, and causes of ignorance are: Prejudice; Miseducation; Unbreakable desire; Confounding of different or unrelated things; Mischievous assumptions; Fallacies; Lack of appropriate experience; Unconcern with reality—absence of incentives for discovering truths, proving things, or investigating facts or phenomena; Ignorance of the bases, sources, and causes of ignorance (sic); Ignorance of what is already known; Self-ignorance; Ignorance of the possible or actual extent of ignorance; Ignorance of the many different forms of knowledge that are possible, in general or about specific things; Imperfect differentiation or understanding of the realm of concepts; Etc.

We need to survey all that we may be ignorant of. By way of illustration, examples of ignorance or of things about which we are profoundly ignorant include: Disease, Any inherited knowledge, and Age of the primate family Hominidae, to which man and his ancestors belong (in BIOLOGY); Existence in nature of fractional electrical charges, Whether protons ultimately undergo spontaneous radioactive decay, and How to solve N-body problems for any value of N (in PHYSICS); Degree of unconscious human communication, Psychogenetic laws, and Absolute inefficiency of the human mind (in PSYCHOLOGY); Truth of Fermat's Last Theorem, Absolute overcomplexity and simplifiability of mathematics, and Whether the irrational number pi ultimately repeats itself (in MATHEMATICS); What the biggest endogenous earthquakes (megaloseisms) have been in the history of Earth, Motor of continental drift, and What the mechanism of booming dunes is (in GEOLOGY); Whether the universe as a whole is rotating, What the nature of most matter in the universe is, and How stable the Sun has been over the history of the Solar System (in ASTRONOMY); Whether the social sciences can be transformed into predictive disciplines, Whether capital punishment is right or wrong, and Whether mathematical "chaos" contributes in a major way to global economic fluctuations (in the SOCIAL SCIENCES); Etc.

We also need to analyze all such examples of ignorance into their components of related and unrelated ignorance, for many or all of them are apt to prove complex, and confusion will inevitably arise if the parts, cofactors, senses, sub-dimensions, etc of the ignorance are not ferreted out and confronted.

Thus man's ignorance of disease includes ignorance about: What the smallest and largest diseases are, What the fastest and slowest diseases are, What the biological and geographic reservoirs of contagions are (over secular time), What the most and least specific diseases are, What good diseases do or whether there are essentially good diseases or these are as numerous and important as the bad ones, What the ultimate extinguishability or inextinguishability of human diseases are, What the gamut of the body's mechanisms for fighting disease is, Extent to which human individuals have their 'own' diseases or kinds of 'health', Etc.

Similarly, ignorance about "any inherited knowledge" at the very least includes ignorance of or about its: Reality, Probability; Absolute degree, Relative degree, and Limitation; Bases and Non-bases; Roles and Non-roles (behavioral, perceptual, mental, psychic, etc); Content and Non-content; Generality and Specificity; Diversity; Structure, Simplicity, and Complexity; Implications and Non-implications;

Proper representations and Misrepresentations; Ambiguities and Deterministic effects; Stabilities, Variabilities, Transspecificity (transcendence of biological species), and Evolutionary tree; Etc.

Such breakdowns for specific examples of ignorance can, through analogy, have heuristic and pedagogic value in connection with any and all other instances of ignorance.

A profoundly similar thing that needs to be done for all examples of ignorance is that all relevant hypotheses and speculations about them need to be systematically and canonically advanced. That is, once we cease to be ignorant about such things, what diverse forms might our transcendent knowledge have? Such ideas can be valuable in many ways, e.g.: They can begin to 'soften up' our ignorance, or give us a better appreciation of what it does and does not mean, or of what it requires for its resolution; They can dramatize the absolute and comparative value of eliminating the ignorance; They can give us criteria for knowledge about the things; They can help with the discover of other, subordinate or related, forms of ignorance; They can prevent mistakes having to do with the unconscious simultaneous or substitutive pursuit of different forms of ignorance; They can give us questions to ask and problems to solve, by way of resolving the ignorance; Etc.

Take, for instance, our ignorance about what Earth's "smallest organism" may be. It forces us to speculate about: Whether there can be 'fractional organisms', and what they might mean; Whether the genome itself may in some sense be an organism, and what corollaries that would have; Whether, similarly, the compresent chromosomes of a genome are likewise biontic, and might per se compete; Whether pure protein molecules (à la the imagined "prion") can be self-reproducing and organismal; Whether in any sense there are 'virtual bionts' that 'exist or are alive' merely implicitly within the population of a species or the bios (a decidedly weird, but not impossible, thought); Whether something equivalent to an organism or life can exist in a rather immaterial sense, or as dynamical patterns or 'pure' information sent, flowing, or held between orthodox organisms; Etc.

Merely imagining what our ignorance may be can expand the human mind; it can lead to heuristic imagery, new modes of thought, and revealing gedankenexperiments; and it can quicken the appetite for discovery in both young and old. Moreover, it can breed that humility which is so important to the opening up, and the opening out, of reality.

Take ignorance about unheard sounds. The universe must be full of types of sounds that have never been heard by the human race. Such sounds might be extremely important and interesting, and it is worth considering what might be the totality of the noises, what their sources might range over, and what we would hear if we could, in some sense, perceive them: as technological intelligence presumably one day will indeed be able to. After all, the inconceivably vast or even infinite symphony or orchestra that nature represents may never really be altogether understood until we discern all of its notes, instruments, and passages in their collective singularity. For these and other reasons the ideonomist seeks to imagine all possible sensa, percepts, and forms of existence, and to lay the theoretical and technical bases for their ultimate perceptibility.

What, then, might the following unheard sounds be like? What might they tell us about the universe—and ourselves? What role might they play in nature? Of course, some of the would-be sounds may be negligible or nonexistent. But even that negative information may be of interest. Also, non-sonic analogs of the naughts may exist; and there can of course be value in gedankenexperiments involving impossible things.

Unheard sounds of: A collision of two galaxies (or the susurrus of the entire universe of colliding and flowing galaxies and fermenting hyperclusters of galaxies); Feeding bacterium; Growing plant (the chittering stomata have already been tuned into by ever-inquisitive man, who has found them of immediate value to agricultural science and technology); Aurora; Fissioning of an atom; Dissolution of a cirrus cloud; Interior of the atomic nucleus (wherein the equivalent of sounds has indeed recently been discovered); Pollen grains returning at last to Earth's surface; From other stars, propagating to our planet through the almost infinitely tenuous galactic atmosphere; Cosmic Big Bang (the universe may still be resonating); Growth of a crystal; Blood in capillaries; Lunar tides; Orogeny (the sounds of whole mountain ranges abuilding); Macromolecule's resonance timbre; Electrical current in a wire; Pulsar; Locomoting snail; Chemical reaction (say a very quiet one, very locally, or at extreme frequencies); Falling raindrop (in transit); Drifting dandelion seed; Drying mud; 23rd harmonics (of diverse things); Sun's interior; The deepest sounds in the cosmos; Infinitely complex sounds; Ocular microsaccades; Man's body expanding on a hot day; Ants spelunking in their nest; Atmospheric boom caused by a cosmic-ray shower; Disintegrating sand grain; Floodwaters percolating deep into the earth; Popping noises made by photons crashing into objects at dawn; Sounds emerging from aerial interferences of sounds, where superposition fails; Occasional sounds resulting from the mightiest quantum-mechanical vacuum fluctuations anywhere in the universe at a given moment; Etc.

An ideonomic analysis of such a list of unheard sounds could in turn suggest diverse: unseen sights, unfelt emotions, unsmelled odors, untasted tastes, unsuspected sensa of unsuspected human or 'subhuman' senses, nonbiological sensory technology, obscure aspects of human cognition and ideation, exotic natural phenomena and processes, etc.

Attempts to survey all of the specific examples of things that we are ignorant of IN THE SENSE OF A PARTICULAR GENUS OF IGNORANCE can be stimulating and enlightening in no less complex a way.

Thus our "generic ignorance of the smallest things" includes an ignorance of the smallest: Organism (in the proper or cellular sense); Virus, viroid, pathogen, or 'genome'; Star, or stars in different stellar classes; Biological species—population or biont, now or ever (in various taxonomic groups, e.g. birds, insects, plants, and bacteria); Planet in the Solar System; Comets (cometesimals); Nebulas; Galaxies; Cosmic photons (i.e. the most energetic; record as of ~1986 = 10 exp 34.4Hz ≡ 10 exp -26m ≡ 10 exp 20eV); 'Particle' of 'matter'—or physical quantum; Occurrence of ball lightning (pea-size balls are on record, but they are not apt to be the smallest of all); Possible molecules in certain molecular classes; Sunspots; Etc.

Of course the list will be much vaster if small is taken to refer not just to size (length) but to figurative senses of small as well.

The smallest versions of things may be of interest for a variety of reasons: They may relate to the evolutionary or developmental origins of the thing; They may suggest the essence of the thing—in part by eliminating redundancy, confusing complexity, and unnecessary elements; They may offer the revealing behavior that often appears at extremes—e.g. in extreme forms of things, at extreme internal or external dimensions, or in extreme regimes; They may exhibit the thing when it is behaving at an extreme rate; They may show what the thing is like when it is so reduced that the environment can easily perturb it, or even its spontaneous internal fluctuations or events are able to noticeably perturb it; They may enable the nature of the thing to be manifested when the thing is at the limits of its stability, and displays a tendency to become other things, to intergrade with what it is not, or to oscillate out of existence and back in again; They may involve or suggest the unitary elements or phenomena out of which the larger versions of the thing are built up by multiplication, combination, specialization, cooperative interaction, etc; They may test hypothetical criteria for the thing's existence that in turn test, or discriminate between, different theories as to the thing's nature, mechanisms, or possibilities; They may show what the thing is when it is a hybrid with, or overlaps, something else; They may clarify the thing by bounding its quantitative range; Etc.

A few of the many types of ignorance that are possible should be mentioned: Complex ignorance; Co-ignorance (ignorance that is a function of, or that can only exist interdependently with, other ignorance); Iso-ignorance (ignorance that is identical to other ignorance); Homo-ignorance (ignorance that, though not identical to other ignorance, is nonetheless similar, analogous, equivalent, homologous, or 'related' to it); Post-ignorance (ignorance that persists beyond—or comes or can only come to light after—the resolution of other ignorance); Meta-ignorance (ignorance about ignorance itself); Super-ignorance (higher types of ignorance that include or 'correspond to' particular or lower types of ignorance); Sub-ignorance (ignorance contained in, part of, or reducible to other ignorance); Mero-ignorance (ignorance of a part or of part of a thing); Quasi-ignorance (ignorance that is unnecessary or illusory because the required knowledge already unknowedly exists somewhere, is implicit in or easily derived from existing knowledge, principles, or laws, or is self-evident); Pseudo-ignorance (supposed, apparent, or imaginable ignorance that is spurious because the thing of which knowledge is assumed to be possible is in reality unknowable, nonexistent, impossible, vacuous, meaningless, or simply misrepresented or absent); Pre-ignorance (ignorance that is known, or that can be known, to exist even before one actually knows or examines a thing); Para-ignorance (ignorance that is, can be, or often is mistaken for other ignorance that is similar, quasi-similar, near, or related to it—often harmfully); Etc.

Ideonomy can help to develop the appropriate vocabulary for such types of ignorance and for treating ignorance generally.

Let one of those types of ignorance referred to - namely "Complex ignorance" - be illustrated by various interrelated examples of "ignorance of the primary force of biological evolution", or by ignorance of: The meaning of, or what is meant by, "force"; What the "force" includes; What the "force" excludes; What is meant here by "ignorance"; What is meant here by, or what should be the meaning of, "the"; The total number of 'forces'; What is intended by, or the possible meanings of, "primary"; The direction in which the force must be moving life; The direction or origin from which the force must be moving life; The presumptive hierarchy of forces; All the actual and possible different hierarchies of forces—and their relations to 'the' hierarchy; How the primary force presumably operates; How to sum infinitesimal force components; How one could test the existence of the force; How to test the primacy of the force; The force's causes; The force's effects; Etc.

Pierce Illusions

Life is ringed, overlain, underlain, pervaded, driven, distorted, needlessly complicated, and limited by illusions. Ideonomy can help one shatter all of them.

To understand the extent of illusions in life and the world, consider the case of a man who awakes from his dreams in the early morning and gazes about his room as he lies in bed.

In his supinity he notices his shadowed closet opposite, and succumbs to the illusion that its darkness is absolute, whereas in fact all of its contents framed by the door would appear brilliantly illuminated if only the man were equipped with a device for amplifying the light and imagery that are there.

The privacy of his bedroom seems total, and yet in reality sounds and vibrations from neighboring apartments flood his own, and the sounds of his own first stirrings are radiating into those quarters in turn.

The ceiling above and the walls around give the illusion that the room exhausts and represents the entire universe. The room's quiet and stillness masks the noisy bustle of the external city, and also gives the illusion that time is frozen in the present moment.

The apparent uniqueness of the man's room is belied by the fact that the subjacent and superjacent apartments are identical in architectural design.

Similarly the uniqueness of the moment is a deception, for over the cycles of the days the man has endlessly reawoken in the same position, at the same time, and with the same thoughts.

Moreover, apart from superficial differences, people all over the Earth have woken up to the same illusion since the beginning of time, are doing so that very morning, and will continue to do so for mornings beyond number. Indeed, much the same may be true across the entire universe, or in other universes or infinite cycles of universes.

The man looks up and left and right, and thinks of all of these directions as absolute and universal, when actually they are just relative and local.

The poor man likewise suffers from the illusion that what appears to be happening must certainly be happening, when it is perfectly possible that he has not yet emerged from a particularly realistic dream.

Ideonomy can suggest the vast number of possible sources and forms of evidence, truth, and experience; and these in turn can indirectly be used to suggest the vast number of possible and actual sources and forms of illusion, since the latter can spring from aberrations and defects of, and misunderstandings about, the former.

Before one can pierce illusions, one must take into account—or discover and analyze—all of the illusions that may or do exist, in general or in a particular situation.

Among the various ways of doing this are: By considering the finite and recurring types of causes, bases, and sources of illusion; By elaborating the detailed processes and mechanisms of types of illusion deemed relevant; By consulting schemes that classify, distinguish, define, and characterize all types and taxa of illusions; By comparing a given situation with other situations that may be associated with illusions, and seeking analogies and differences that might throw light on the kind of illusion to expect; Etc.

Illusions are very persistent: they reinforce one another and disguise each other's existence; by their existence they can weaken the very mechanism that would detect them; when they exist they are apt to exist many times over or in great multiplicity, which can make their recognition and treatment much more difficult; because illusions are usually thought of as being 'negative' things, attention to them is discounted, or their resolution is apt to be given low priority by the community of scientists and scholars; illusions may be complex, compound, or subject to 'uncertainty principles', and attempts to come to terms with them may induce their seeming or actual mutation or encounter other paradoxical effects; the fundamental problem may not be the illusions themselves but the fundamental mechanisms that give rise to them in the first place, and these may be extraordinarily resistant to treatment or understanding; etc.

Discipline Imagination

Imagination can be valuable, but it is apt to be much less valuable, or even detrimental, if it lacks discipline or appropriate discipline. Much of the criticism of imagination that one encounters in fact probably does not refer to what is intrinsically wrong with imagination itself but rather to errors and shortcomings of imaginative practice.

Commonly imagination is: unmethodical, unsystematic, undirected, aimless and planless, superficial, incomplete, uninformed, random, perfunctory (sic), irrational, inefficient and wasteful, misdirected, frivolous, desultory, static, naive, primitive, too narrow, idiosyncratic, self-ignorant (ignorant of its own source, mechanism, products, possibilities, or powers), wrongly antagonistic to or neglectful of other forms of cognition (or of itself), etc.

To really free or discipline imagination, to give it its full potential power, to perfect its role in the world, to train it to the ultimate, etc, something like ideonomy may be necessary.

Often what is meant by imagination is simply unconscious, casual, or accidental exploration of idea-spaces or of the universe of ideas (ideocosm); or a mere hint or glimpse of the latter things. But the actual revolution promised by the thorough harnessing of imagination has yet to begin and remains largely unanticipated.

Ideonomy can aid imagination by: Helping one to visualize new or alien situations; Anticipating surprises and predefining possible anomalies; Indicating and systematizing all possible bases for analogies; Facilitating the modeling and simulation of things; Triggering gedankenexperiments; Releasing the power of paradoxes; Challenging orthodoxy; Increasing the basic elements available for the generation of ideas through the combination, permutation, transformation, and interaction of such elements; Rigorously defining and interrelating the canonical dimensions of and for thought; Defining and characterizing the diapason of human needs, wants, abilities, phenomena, and possibilities; Furnishing new methods, tools, materials, and other resources for the discovery, invention, development, perfection, transformation, combination, management, and exploitation of any and all things; Asking questions, raising problems, and stimulating thoughts that are new and important; Falsifying our notions about what is and is not possible; Amplifying man's curiosity about and appetite for something more and higher; Enriching awareness of the infinite interrelations and interconnections of things; Intensifying the public discussion of what is possible; Training the human mind to control and enlarge itself in every way; Illustrating via specific cases the extremes to which imagination, or the imaginative treatment of things, can go; Etc.

Help One Know What Is Important

Ideonomy can help one to know what is important, or most important, wherever there are many: needs, wants, values, alternatives, ideals, possibilities, philosophies, methods, practices, actors, conflicts or contradictions, senses or types of things, abilities, uses of things, systems, concepts, combinations of things, permutations of things, facts or ignorances, goals or purposes, courses or paths, beliefs, arguments, problems, dimensions or factors, interdependences, stages, transformations, paradoxes, rules, fundamentals, resources, different representations of or perspectives upon things, alternative circumstances, etc.

It can do this by: Systematizing all of the diverse and universal senses, ways, and degrees in which things are or may be important; Correlating, or showing how to correlate, all forms of importance with one another; Depicting the ways in which the importance of things can or may originate, develop, consummate, change or be modulated, fade, and end; Showing all the different courses things could take or outcomes they could have; Enabling one to look at arbitrary things in maximally different ways or from all possible perspectives; Maximizing the number of different considerations that can figure in the analysis of a thing, or the largeness of one's perspective upon it; Showing how to distinguish, separate, and partition different factors and aspects when analyzing a thing or its situation; Suggesting all of the different things that things may be important for or in terms of; Criticizing the supposed importance of things, say by highlighting their defects, limitations, and fallacies; Elaborating and comparing arguments for the importance of things; Simplifying or cutting through complex situations to reveal that which is fundamental or essential; Etc.

Imaginary illustrations of the determinable importance of specific things: Topological patterns or transitions to mathematical chaos might turn out to be that which is critical to the onset of a heart attack; Previous cycles of the universe might prove to be critical to the current form of the universe, if the latter is oscillatory; Certain childhood experiences might turn out to be necessary for the development in the adult of even certain organic forms of schizophrenia; Probably only a tiny subset of the innumerable things that have been hypothesized to cause or influence the occurrence of earthquakes will ultimately be shown to actually be important; Certain sets of changes in the course (fabric) of a musical composition may prove to be that which is critical to its meaning or simple musicality; Frequent touching of a baby's body by an external agent during a stage of the infant's development may turn out to be decisive for the attainment of physical and mental health and maturity in later life; The stability of an entire ecosystem might turn out to be overwhelmingly dependent upon the reciprocal fluctuations of the populations of just two species; The evolutionary augmentation of animalian to human intelligence might be found to have largely been the result of the sudden emergence of a new neurotransmitter system; The sunspot cycle might turn out to be the product of an unsuspected form of behavior or interaction of elementary particles; Life may have started on Earth only because there was immense prior evolution of organic molecules in interstellar space; The course of international affairs may be extraordinarily sensitive to uxorial views and ukase; Abnormal abundance of a particular radioisotope in the interior of the Earth may have made our planet unusually active and rich geologically; Etc.

The importance of knowing what is important includes: Further costly search for what is important may be unnecessary; One need no longer feel anxiety over the possibility that one is in fact ignorant of or mistaken about what is important or critical; Resources may be concentrated upon what is important; Priorities may be established; Lesser matters may be subordinated to, or arranged around, what is important; Other things may be compared with, and interpreted in terms of, what is important; Often everything else may be ignored altogether; Etc.

Things may be important in a variety of senses and ways, or as: causes, concauses or cofactors, constraints, limits, triggers, organizers, clues, precursors, sources of continuity, transformers, sources of energy, material needs; sources of problems, errors, or defects; bases of stability; destroyers; models; links or bridges; nodes or centers; boundaries, measures, reserves, criterions, tests, laws or essences, sources of disturbance, matrices or niches, origins, destinations, basic patterns, equilibria, etc.

Much of science remains purely phenomenological or descriptive, ignorant of or uninterested in causes, mechanisms, fundamentals, laws, invariants, universals, processes, necessities, raisons d'etre, forces, evolutionary tendencies, syntheses, etc.

As knowledge accumulates or even grows exponentially, the world becomes ever more complex and integrated, the interests of science and man multiply, civilization becomes more artificial and fragile, etc, the need to know what is most and truly important—and to know it at once, certainly, and comprehensively—soars.

Help Describe the Individuality of A Thing

Science, scholarship, people in general, and the entire course of civilization might all be said to exhibit a biphasic tendency or cycle: at first they are sophomoric (like wise morons) and then they graduate to being morosophic (like moronic wisemen). (The difference is academic.)

Thus initially science and individual scientists discount, disregard, neglect, or deny the possible or actual individuality of the phenomena, entities, and even systems they treat. That is, differences between and peculiarities of things are forgotten about and the things are treated, conceived, or even perceived as being: similar, analogous, or identical, homogeneous, universal, abstract, perfect, interchangeable, symmetric, equivalent, simple, time-invariant, uniform, average, individually uninteresting, convergent or at least nondivergent, etc.

There are many reasons why this is done: The treatment gives great and undeniable power. It approximates to the truth. It simplifies methods, procedures, thought, teaching, communication, and the set of investigations being conducted by different scientists elsewhere in space and time. It leads to remarkable insights. General patterns, laws, and phenomena can be discerned. Science is able to profit from complex standardization. Important facts can be extracted or separated from those which are relatively trivial. A heartwarming illusion of absolute certainty, understanding, universality, perfection and finality of knowledge, unity and simplicity of topic, community of labors, etc can be and is created.

But there are hazards, costs, and fallacies to this dismissal of individuality: Things may possess at once nomothetic and idiographic aspects. Both may be important or necessary for understanding - or for that wisdom which is higher than knowledge or even understanding. Both may have their separate interest, meaning, and value. Research into both may not have to be competitive or antagonistic; combined and multipurpose approaches may be possible, or - if determinedly sought - a slow development of parallel tools, methods, inquiries, and theories, even ones that, if they involve tradeoffs at all, nonetheless gain in the net from synergisms. If the simultaneous pursuit of both aspects of the world or its phenomena is not efficient, then perhaps what would be most efficient of all would be some sort of regular or opportunistic alternation over time between what are really not so much opposite as complementary approaches. Research purely into individuality or purely into universality may give rise to invidious half-truths or to progressive, and perhaps ultimately fatal, fallacies; conceivably half-truths are not even truths at all, or are more in the nature of negative truths - of nonsense, quasi-truths, inversions of truth, antitheses of truth, or evil truths. Perhaps opposites meet and the universality and individuality of things are in some higher sense equivalent or interdetermined: to find and describe what is universal about a given thing one may have to, implicitly or explicitly, find and describe what makes it unique or distinct from others of its kind; and, paradoxically, to find and describe what makes it special one may have to uncover, comprehend, and integrate its syncategorematic universality or 'selflessness'. Certainly consciousness of both aspects of things may be mentally stimulating and sanifying, or what is ideal for the mind's long-term development and fullness of power.

Even if the actual individuality of a thing is minimal, and perhaps even if it is something that with the progress of science must endlessly diminish, it may in a residual form or sense remain critical to what the thing is, to how the thing behaves, to the problem for science that the thing represents, or to the definition or description of the thing's universality.

Certain scientists may find it easier to describe, understand, and work with the idiosyncrasies of things rather than with the large-scale and transcendent regularities of phenomena; whereas other scientists may be the opposite way. Attempting to force all scientists into a single, procrustean mold of any type could be fallacious and sacrificial of mankind's supreme talent - for diversity.

Likewise the surveyal of nature brings to light classes of phenomena for which diversity and individuality is the rule rather than the exception - just as for other broad classes of phenomena the opposite habit seems to prevail, as though individuality were irrelevant, unwelcome, or impossible. More precisely, there is a spectrum of all degrees of favor for either individuality or universality.

On the other hand, there may be a fundamental fallacy in the reduction or conceptualization of individuality and universality in terms of a single index or dimension or in a single sense. Thus a thing might be universal or lacking in individuality in one sense, and yet be riotously individual in some other, related or quite orthogonal, sense. The number of possible or actual senses and dimensions, that are relevant or essential to the description of the "individuality and universality" of things in nature, may be infinite or inexhaustible, and a source of many intellectual errors.

By enumerating the ways in which conspecific things differ individually or inter se, not only may limits be imposed upon scientific laws and rules that have the paradoxical effect of strengthening them by excluding or systematizing their exceptions, but new and additional laws and rules may be discovered that are defined or intimated by the very universalities and regularities of the noted individualities, oddities, irregularities, and variabilities of things. Conversely, inattention to the latter can mask the additional laws and rules.

Sometimes it is precisely the individuality and diversity of things that the scientist, technologist, scholar, or artist wishes to find, create, or exploit - or that he should aim for.

Particle physicists may recreate a single type of particle or particle interaction unnumbered times for no other reason than to see if they can flush out a corpuscular "black sheep" that indicates the existence of a novel phenomenon, force, relationship, or entity.

A mathematician may seek to conceive of a forbidden object whose existence within a class of objects would supply a counterexample able to confute a rival mathematician's theory.

A sufficiently 'individualistic' gene may perhaps be one that is also fertile for bioengineering.

The most individualistic men and women may constitute that set of persons who are the most apt to have or develop genius; where individualism flourishes genius may flourish, and prosperity of the former may prosper the latter. If individualism is the key to genius, what then is the key to individualism, or the set of ways in which it might be maximized?

Medicine and psychiatry try to heal individual human beings - but not as individuals. Rather they postulate and seek to treat a fictional 'universal man'—some sort of normal (or normally abnormal), mean, modal, standard, archetypical, idealized, frequent, or abstract human being who has few or no counterparts in the real world and who differs radically from a random person.

Despite the profound limitations of present-day biological and medical knowledge, we already know that two persons drawn at random from a milling crowd will differ greatly in the size, shape, location, and function of their respective internal organs, in the operation, dynamics, and interdependences of their major and minor bodily systems, in their biochemical pathways, processes, and indexes, in their physiological needs and capacities, and in their reactions to drugs, foods, and therapies.

Even diseases themselves have different forms and expressions in each and every individual.

The enormous variability of human bodies and minds makes diagnosis imprecise, treatments crude and chancy—and apt to backfire, learning from practice difficult, and the progress of public health slow.

By studying health and disease in individual human beings much of value to medicine and biology might be learned. Persons more than ordinarily, or who are maximally, susceptible to particular diseases might provide superior clues to just exactly what it is that the diseases do, or to what their mechanisms and effects are or are in toto. Why after all study disease in relatively resistant or immune persons where the powers and manifestations of the disease are reduced, obscured, or hard to know? On the other hand, individuals less than normally, or minimally, suspectible to a disease might furnish the best clues to what fights and limits the abnormality, and to potential methods and means for medically combating it. Then again, persons responding to diseases in qualitatively unusual or unique ways could be a veritable gold mine of hints about how the disease will change and evolve in mankind over future years, to the past history and evolutionary homologies (or general origin) of the ailment, to the essence and physiology of the disease, to its marginal pathology (or symptomatology), to the possible therapeutic weaknesses of the malady, etc.

Moreover, it might be discovered that there are types of diseases that are limited in their incidence to but a single human being. Perhaps a person simultaneously has many such idiosyncratic diseases, and they must be considered in defining his basal health. Then again, diseases of this sort might actually constitute latent epidemic diseases and per se supply hints about diseases that will or could emerge on a societal scale in years to come or if environmentally triggered.

If the abstract space of all possible, or of all actual, diseases can be filled in by comprehensive surveys of the individual diseases and pathology of individuals, then there might be surprising benefits: theoretical insights into the nature of all disease; recognition that the bases and patterns of diseases are of a profoundly overlapping, concinnous, complementary, symmetric, interdependent, or convergent nature—or even holistically simple, systematic, lawful, canonical, rational, or predictable; and discovery and exploitation of methods, means, and rules for treating whole sets of diseases at once or cooperatively.

If understanding can be arrived at as to how a single person—or that vast society of organs, cells, systems, processes, functions, and events that the body of an individual represents—is constantly and inevitably becoming ill, and then becoming well, in myriad ways and senses, this might lead to a much fuller, clearer, truer, and more useful grasp of human disease.

As for individuality in still other fields: how do we know that our galaxy, the Milky Way, is really as normal or typical as we assume it to be? To answer the question we must study the individuality both of it and of other galaxies, including those galaxies that convention would assume are of the same type or maximally alike to it. We must actually demonstrate, or get a comprehensive and deep measure, of the absolute —and relative—similarity.

Perhaps the same situation obtains with galaxies as now appears to with human bodies, and galaxies are in reality, so to say, typically atypical, or at least are so much more diverse and individual than has hitherto been assumed that all talk about "a normal galaxy" or "normal (much less universal) behavior of a galaxy" is absurdly premature or misleading. The more appropriate and humble first step may be to simply determine the degree and form of the typical atypicality of galaxies, or the set of standard types of atypicality.

The history of science is replete with examples of cases where that which is most familiar, local, contemporary, accessible, traditional, oneself or like oneself (or judged to be like oneself), etc is ex officio wrongly and harmfully assumed to also be: average, normal, archetypical, necessary, universal, representative, eternal, known, 'random', healthy, all-sufficient, or the like.

It was said above that science and so much else repeatedly go from a sophomoric phase of wise moronity to an enantiomorphically equivalent morosophic phase of moronic sagacity. What that means in the present case is essentially that the scholar starts with a brash ignorance of the individuality of things and concludes his professional career with a cowardly or habitual ignorance of that same individuality.

Diverse examples of things that might be treated individually or idiographically include: organisms (bionts), persons, minds, human acts, cells, organelles, molecules (as opposed to entire molecular species), universes (sic), industrial goods, scientific instruments, natural phenomena, physical events, sensa, life 'moments' or instants, performances of musical works; genes, genomes, phenes, or phenotypes; sentences, photons, pathogens, readings of the same book (by the same or different individuals), stars, galaxies, repeated havings of the same disease (such as influenza) by the same individual, physical injuries (medically), tellings of a story, single data points (sic), days of a lifetime, neuronal events or action potentials, single means, agricultural crops, 'pieces' of fruit (e.g. individual apples), learning ('events of'), musical notes (soundings of), etc.

By studying these diverse examples many typical surprises about the individuality of things generally would automatically be found, and ever afterwards these could play a role in investigations into individuality. Powerful associations, and complex but specific modes of reasoning, would build up around the primary concepts they would represent.

Improve Industrial Goods

The potential applications of ideonomy to industry are many and various, and its long-term industrial impact will be enormous.

Some of the ways in which industrial goods can be improved, and will in fact be improved by ideonomy, are: Their standards can be raised and made more uniform; They can be made more individual and unique; They can be stripped of superfluous, redundant, inessential, contradictory, accidental, and other unwanted elements; They can be made safer and less harmful; They can be made more beneficial, useful, desirable, convenient, appropriate, multipurpose, etc; They can be made more efficient, economical, and productive; They can be made simpler, more elegant, and easier to use; They can be made more charming, beautiful, and inspired; Their design can be freed of errors and fallacies; They can be made less destructible, more enduring, and more reliable; They can be made more encompassing and diverse; They can be made more complex and multidimensional; They can be made more evolved qua themselves or per their function or promise; They can be integrated better with some or all other goods; They can be made to realize to a greater degree the full possibilities of life, civilization, science, and technology; They can reflect deeper insights into human nature; Etc.

To understand how ideonomy would go to work here, consider as a representative industrial good the automobile:

Ideonomy could generate ideas by looking at the historic variation and evolution of the car in an unprecedently comprehensive, broad, precise, fundamental, imaginative, critical, classificatory and comparisonal, conceptual and cognitive, complex, synthetic, heterodox, etiological, matric, vergent, processual, hierarchical, decompositional, etc way.

It could identify all of the present and possible future functions, roles, uses, elements, and aspects of a 'car'. It could suggest all of the ways to perfect, extend, extrapolate, generalize, transform, combine, synergize, and supplement them.

It could examine all of the meaningful, contrasting, and revelatory ways to define, describe, logicize, and reconceptualize the automobile. "What are all the good and bad things about a car?" it might ask. "What are all automotive problems, defects, and limitations, and all possible solutions and answers thereto?"

"What diapason of other industrial goods and services could be pointfully hybridized with the 'car'?"

"What are all recognized and unrecognized quantitative and qualitative dimensions for evaluating cars?"

"How can all actual and possible automotive properties, features, concepts, and dimensions be systematically and rigorously interlinked to generate and explore the infinite canonical idea space of all possible 'cars' and future automotive scenarios? What gaps and truncated ranges in that Pegasean space correspond to the existential and imaginative poverty of the present?"

Inevitably it would draw on its systematic and encyclopedic knowledge of generic and specific principles, paradoxes, and other bits of wisdom.

For example, the principle that so-called or apparent progress is often illusory or retrogressive—if applied to automotive progress—might elicit the thought that the quest for ever greater speed could be mistaken, or bad in a net sense, because the enjoyment of scenery is inversely proportional to one's rate of travel through the scenery.

Another principle applicable here is that a monotonic function is often fallaciously assumed to have an infinite range, when in fact its range is finite, and the actual relationship between the things in question is nonmonotonic beyond that range: the point being that above a certain speed the enjoyability of scenery with additional speed may remain flat or even increase (although with the sense in which the environment can be enjoyed being very different), or sit at zero.

A further paradoxical principle that might be relevant would be to the effect that often what a thing mainly is, or is mainly celebrated for being, is not what the thing really ought to be or ought to be thought of as being; and that the former may be hiding the latter. Then again, what a thing is celebrated for being may not actually be what the thing mainly is, involves, or allows. So much of the time and effort that is spent in driving a car, for example, may be boringly repetitive, and perhaps there should be comprehensive research to think of ways to reduce the repetition or its boring character, say by introducing technology that deliberately varies the parametric characteristics of driving over time and thereby reintroduces the elements of novelty and challenge that have been lost. Possibly most time spent in cars is passenger rather than driver time—certainly a large part of it is—and for that reason the automobile should be redesigned to serve mainly the needs, interests, and possibilities of passengers, and to insure that their time on Earth is not wasted.

Point To Infinities

Infinities—whether real or merely apparent—occur throughout science or abstract thought, and their systematic discovery and characterization is profoundly important. If there are no limits, or no known limits, to things, then that should be known—if just because the erroneous supposition of limits can inhibit inquiry, imagination, and the funding of research, and can misdirect investigations. Then again, ignorance of limits that do in fact exist may not be discoverable until after we have become aware that the existence of infinities has long been unconsciously—though unjustifiably—assumed.

Human and intellectual progress often consist of a march in the direction of some sort of infinity. But this fact, or the nature of the direction, is frequently lost sight of. Whatever reminds mankind of its infinite quests, or facilitates those quests, may therefore be valuable to civilization or to the realization of its destiny and larger possibilities. The image of infinity is a complex—perhaps an infinitely complex—one and hence requires constant elaboration.

Many things are irreducibly coinfinite, in the sense that their infinitude ceases to be perceptible or meaningful whenever they are not considered mutually, reciprocally, or synergistically. On the other hand, many things are of an exactly opposite nature, or irreducibly co-finite, in that they involve limitations that are imperceptible or meaningless when the things are not simultaneously considered or active.

Ideonomy can be used to divide up the set of all actual or possible infinities into fundamental and defined categories, types, and taxons. Things can be put more accurately and meaningfully into their unique or multiple modes, kinds, and domains of infinity. Means can be developed for predicting, explaining, and criticizing such assignments.

Certain things can be shown to be infinite only in a sense, or to be at once finite and infinite in different senses.

Where things belong to the same infinity, this can be used to predict things about, or to draw analogies between, those things.

Different infinities can be derived from one another.

Other undiscovered members of a genus of infinity can be anticipated. Things logically excluded from a genus of infinity can be indicated.

Ways to test or promote the infinitude of things can be devised.

The relative importance of, and best order in which to investigate, different infinities can be suggested.

Sometimes things are 'infinite', not in an absolute, but in a relative sense. Yet indicating such relative infinities can be equally important.

The properties and behavior of things may change enormously or infinitely on the road to infinity. Certain traits may predictably fail or predictably arise, and these circumstances may be important. It may even be possible to characterize the complex nature of the negative and positive changes that are foreseeable as some quantity or quality tends to become infinite.

Ideonomy could be used to suggest bases for, or consequences of, various human goods or resources tending to become infinite, e.g.: knowledge, wisdom, intelligence, physical power, energy, creativity, sanity, safety, beauty, self-understanding, self-mastery, life, morality, industrial efficiency, human evolution, etc.

It might also help to suggest ways in which the universe may be infinitely: extended in time or space, diverse, complex, accomodating, bizarre, paradoxical, many-dimensioned, dense, hierarchical, etc.

It could be used to suggest what will happen as the future evolution of various sciences - chemistry, biology, physics, mathematics, logic, psychology, geology, etc - continues toward infinity.

Attention to infinity has great power to inspire human beings; it is for the infinite that Eros yearns.

Help Extract Maximum Information From A Single Datum

How much can be learned from a single thing or fact? No one knows! But finding out is important.

No finite limit may exist. The amount deducible from single clues may vary enormously, depending on what the particular clue is and on the nature of that which would be deduced. The value of the clue will also be a function of its context, and it may be fundamentally impossible to circumscribe the context of a thing.

Conceivably with the historical passage of time—or endless progress of science, technology, mathematics, logic, and ideonomy—it will become possible to say more and more, about more and more, on the basis of a finite amount of, or even of less and less, data, knowledge, or matter.

Certainly this has been the trend in the past. Vast things can now be learned from tiny things in archaeology, biology, physics, mathematics, chemistry, geology, astronomy, and elsewhere. The disproportion is actually a measure of the relative and absolute development of a given area of science or technology. Probably a direct way to force the evolution of a field is to purposefully accelerate the growth of that disproportion. It is a task to which ideonomy by nature lends itself.

What measurements, quantities, experiments, parts or aspects of things, relationships, interactions, mathematics, methods, instruments, phenomena, etc—either alone or in combination—are appropriate for getting maximal information from a single datum? What imperfections of these things presently exist, and how are they remediable? What is our ignorance of such things, and how can we determine and remove it? How can the foregoing things be maximally extended and generalized?

Among the many reasons for wishing to derive maximal information from a single or given datum, or for being able to, are: Research needs might be minimized; Experimentation, analysis, and synthesis might be shortened; Simpler theory might be possible; Different investigations might be made less redundant; Overall scientific progress might be accelerated; Research less disturbing to the phenomenon, specimen, world, or itself might be possible; Scientific instruments might be made more sensitive; Etc.

Illustrative examples of things from which—and for which—it might be desirable to maximize extracted or extractable information: Recovered stone parts of the tools of man's earliest ancestors (to reconstruct the diet, skills, modes of thought, and mores of the latter); Set of thousands or millions of minor molecular species produced as by-products of a chemical reaction (to more fully understand the complete chemical kinetics of that reaction); One-letter sample of a man's handwriting (to graphologically predict his character); Genome of one biont of a species (to predict the totality of realized or possible polymorphisms of that species, or even the evolutionary course of the species); A man's face (to deduce his character physiognomically); Earth (to deduce from its bios the range of life-forms that might have evolved elsewhere in the universe); The present moment (to predict the future, and retrodict the past, course of human history); A midden (to reconstruct the archaeology of an entire culture, perhaps that vanished without leaving any other surviving trace); Fundamental physical laws and constants (as clues from which to decipher the initial conditions or possible earlier epochs of the universe); Etc.

One reason why it might be possible to deduce an altogether unexpected amount from a single datum is that the datum might have, or else reflect what does have, a fractal, holonomic, recursive, or 'similar' relationship to the whole of a thing or system, so that the apparent complexity of the latter is illusory or the product of some simple but powerful state, operation, law, or the like.

It is desirable to find or produce the most extreme cases of maximal information extractable from a single datum. By studying such extreme cases it may be possible to learn methods and rules for the universal production of maximal knowledge from minimal clues. Also such studies may stimulate the discovery of other and even more extreme cases.

Propose Innovations

There are presumably always new ways of doing things and new things that might be done. Might there be more efficient ways to think of them?

To illustrate the sort of innovations that are possible:

Dates might be written, not in the conventional order "May 15, 1988", but in the most logical order (for a number system that ascends leftward and is notationally irreversible) "1988 May 15" (of millennium, century, decade, year, month, tenth day, day).

Many American holidays have recently been shifted by a few days so as to combine with weekends and minimize disruption of the workweek.

The spelling and pronunciation of English words might be rationalized by making the two wholly consistent. There might be an even grander reform: the across-the-board elimination of redundant letters (and even sounds).

The validity of one's ballot in an election might depend on one's simultaneous ability to answer correctly a minimum number of questions discriminating the views of the different candidates (the qualifying questions being randomly varied for different voters to prevent the bias of organized preparations).

Recently the longevity and spectral excellence of lightbulbs have been reduced in favor of greater energy efficiency. The excellence of lightbulbs involves many competitive dimensions, and innovations are possible in the priority given to the different dimensions.

Ideonomy can enhance the entertainment and adoption of innovations of every kind by identifying all of the actual and possible major and minor dimensions, properties, elements, and laws of things; all of the possible combinations, permutations, substitutions, inversions, transformations, systems, and structures thereof; and all of the actual and possible reasons and functions therefor. Obviously nothing like this has ever been done before, and it itself would represent a stupendous innovation.

The mere occurrence of innovations stimulates innovations. Should ideonomy stimulate widespread innovation it will cause much innovation simply as a result of such chain reactions. Innovations are clues to other possible innovations, they necessitate complementary and adjustive innovations, and they demonstrate the important fact that the world is not as old as it perhaps thinks and that it still has room and need for changes, novelties, and revolutions.

From the ideonomic and 'combinatorial' perspective nature, civilization, and the mind are flabbergastingly young and unformed, and permit an infinity of alterations, transformations, and improvements—of discoveries, creations, substitutions, rearrangements, reorderings, transvaluations, enrichments, syntheses, reconceptualizations, supplementations, intercalations, inversions, redirections, augmentations, superimpositions, transcendences, derivations, simplifications, corrections, inspirations, sophistications, inventions, and inceptions—of experiments, explorations, and adventures.

If ideonomy can not only make mankind believe this but actually show that this is so, then it may parent a new age unprecedented in the history of the world for the universality, extremity, reach, enlightenment, purposefulness, ease, and eternality of its innovation.

Accentuate Intelligence

Human intelligence depends far more greatly upon experience than has been suggested, but in a way, and for a reason, that has never been imagined.

The great interest of ideonomy is to discover those supremely fundamental, simple, irredundant, comprehensive, and consequential elements of nature, existence, and the mind whose 'divine' interplay gives rise to and explains all else or might be used to create infinities or remake the universe or assumed reality.

What are the elements and elementary processes with which we think, perceive, feel, communicate, and act? What are they in their ultimate decomposition or when perfectly systematized? What are they, stripped of all else that is secondary and derived?

If we can discover and grasp such things we can employ them to utterly remake the mind, to increase its efficiency and powers beyond calculation, and perhaps to create a world teeming with geniuses.

Such a thing will be possible because knowledge of the elements and elementary processes underlying physical and mental reality will enable us to fundamentally, totally, systematically, and purposefully reconstruct human experience and the environments in which we live and develop.

By thus recasting the matrix of existence, and by differentiating it in a variety of directions, we will gain access to the infinite inherent plasticity and pluripotentiality of the mind; by synthesizing new environments and experiences we will be able to synthesize new, higher, and endlessly variegated minds.

The point is that until now the universal experience of mankind has been so fantastically rigid, arbitrary, monotonous, accidental, and, above all, unintelligent—all unknown to ourselves, since we have been its blighted and blind product—that a potentially infinite intelligence has been constrained to a random walk upon a pinhead.

Enter ideonomy in the role of Prometheus.

Ideonomy can serve as an amplifier and catalyst of human intelligence in ways innumerable:

It can make us systematically aware of the recurring types of ignorance, errors of reasoning, and illusions that, synergistically and accumulatingly, so impair our individual and collective intellectual functioning;

It can further the analysis of intelligence into its many different parts, and then insure that those parts are maximally developed, both separately and interdependently;

It can aid the discovery and characterization of all actual and possible mental processes;

It can show us how the many parts and forms of intelligence operate, or should operate, in powerful hierarchies (and in other so-called meta-structures);

It can highlight the myriad needs and opportunities for intelligence that exist, but that in many instances have gone unnoticed;

It can devise a more powerful language for thought, both in its unconscious operations and in its public expressions and communications;

It can uncover and publish important principles of thought;

Etc.

Enable One To Plot the Successive Interactions of Two Things

When two or a few things are put together how do they interact? This is a major question throughout science and in other fields.

What are the causes of interactions and what are the effects of interactions? What types of interactions are there?

What interactional : levels, events, processes, mechanisms, combinations, limitations, errors, bads, goods, goals, functions, needs, origins, problems, solutions, surprises, differences, similarities, conflicts, cooperations, courses, extremes, dimensions, properties, geneses, transformations, flows, motions, opportunities, realms, domains, series, strategies, capacities, complexities, simplicities, cycles, convergences, divergences, vergences, paths, conditions, experiments, mathematics, descriptions, laws, networks, spectrums, uncertainties, knowledges, ignorances, distributions, matrices, illusions, elements, appearances, methods, relations, probabilities, equilibria, disequilibria, games, hierarchies, niches, paradoxes, rings, spaces, manifolds, perfections, evolutions, conservations, cybernetics, degrees of freedom, emergents, equalities, inequalities, order taxa, representations, pathology, topologies, virtuals, relaxations, etc : exist or are possible, of either a universal or special nature?

What needs to be found out about such things? What questions should be asked? What is the importance of knowing such things? What kinds of experiments should be conducted?

Among the many things that interactions can tell one are: What things have in common; What things do not have in common; What the essence of things is; What things do, or might do, to one another; Whether, and how, things are competitive; What the capacities, abilities, and potentials of things are; How sensitive, or insensitive, things are to one another; Novel purposes that things might be used for, or novel ways in which things might be used; How things interact normally or in nature, or would interact under extreme or special conditions; How the interactions of things could be controlled, amplified, changed, or redirected; What interactions actually are not or do not involve; What the hidden nature of things may be; The interactions of different interactions, either in a descriptive or in a dynamical sense; The extent to which the nature of a thing actually depends on or expresses its interactions; What the potential self-interactions of things are; How different interactions can exist side-by-side without interference; What things exchange and how they reciprocate; What the relative importance of different interactions is, both quantitatively and qualitatively; What the longevity, history, and future of interactions is; How the whole of nature can be described as an infinite and integral system of interactions; How the interactions of different phenomena, and of different subjects, differ or are the same; How interactions may derive from, or give rise to, other interactions—both individual interactions and great systems of interactions; Etc.

The two things interacting (if they are just two) may variously be: Two like or identical things; Two different or opposite things; Two things of equal or unequal size, power, activity, etc; Two things of disparate category, such as a process and an object; Two things whose mode of acting upon one another is the same or different; Simple or complex; Etc.

The interaction of two (or more) things may variously be: Static or progressive; Alterative (of the things) or not; Antagonistic, neutral, or reinforcing; Direct or indirect; Linear or nonlinear; Synchronous or diachronous; Minimal, maximal, or optimal; A closed or open system; Productive or product-less; Etc.

Examples of things whose interactions might be studied are: The populations of a predator species and of its prey species; Two stars coorbiting in a binary system; Two passing or colliding galaxies; Two ions of identical or opposite charge, either in free space or in a material; Two opposite mental impressions, in the mind or brain; Two cellullar automatons; Two rival scientific theories over historical time; Two different industries in the same economy; Two ancient cultures whose lifetimes overlapped; Two characters in an animated cartoon; Opposite geological processes simultaneously acting to destroy and maintain the same landscape; Pupils in the same classroom; Different rumors simultaneously afoot; Two contiguous cells in a tissue; Water droplets suspended together in a cloud; Two different but compatible customs in a society; Two themes within a symphony; Different tides or tidal components in the ocean; Two lifelong friends; Two soil horizons or soil components; Two branches of a lightning stroke; Etc.

Scalable quantitative dimensions of interactions include: Rate; Velocity; Rate of exchange; Rate of compensation; Flux rate; Maturity; Totalness; Completeness or finality; Intensity or energy; Violence; Consistency; Symmetry or asymmetry; Density; Volume or spatial range; Mass, number, or diversity of things involved; Duration; Efficiency; Productivity; Variability; Orderliness or chaoticness; Probability; Etc.

Generic causes of interactions include: Simultaneity; Proximity, contiguity, overlap, superimposition, and mixing; Interconnection; Convergence, collision, and coalescence; Mutual affinity; Antagonism; Competition; Interdependence or unilateral dependence; Mutual or unilateral catalysis; Complementarity, synergism, and resonance; Interadjustment and interadaptation; Equality and commensurability; Homology (giving virtual interaction); Etc.

Generic effects of interactions include: Creation of a stable or metastable system involving the interactants; Search for, and discovery or creation of, some new form, level, mechanism, system, or law of mutual, reciprocal, or differential stability on the part of the interactants; Convergence of the behavior, form, or nature of the interactants to some sort of average, common denominator, or compromise; Divergence of the behavior, form, nature, tendencies, locations, or motions of the interactants; Exchanges or transpositions; Vitiation, change, dedifferentiation, distortion, disintegration, or extinction of one or more of the interactants or of their interactional system; Addition or hierarchic superimposition of new minor or major forms of behavior, phenomena, structure, e/vc; Inefficiency or waste; Linkage, integration, or merger of the interactants; Creation and substitution of new interactants; Evolution of the interactants or their joint or greater systems; Release from the interactants or their system of matter, noise, energy, information, processes, sub-interactants, subsystems, or the like;

Cooperative or synergistic phenomena; Acceleration or deceleration, or excitation or energetic depression, of one or more of the interactants or their system; Obscuration or deemphasization of the interactants themselves; Random, wandering, or chaotic behavior; Generation of boundaries; Inversion of properties or reversal of normal behavior; Extreme behavior; Stratification of behavior; Synchronization or desynchronization of the interactants' behavior; Sequential, alternating, and cyclic behavior; Induction of other interactions; Mutual dependence and government of the interactants; Telltale and consequential traces; Narrowing or specialization of the behavior of the interactants; Etc.

Possible surprising discoveries—of a GENERIC nature—that may occur about various interactions in the future: That two mutually remote, isolated, or seemingly unrelated, opposite, or incommensurate things are able to interact, perhaps through a novel mechanism; That two things that interact in the most active, intimate, violent, complex, enduring, large-scale, direct, fundamental, crude, or multifold way actually have little affect upon one another or leave one another unchanged; That two things thought to be engaged in intense interaction do not in fact interact at all or are somehow queerly isolated from one another; That seemingly tiny, rudimentary, or noise-like interactions —or means or mechanisms of interactions—can have giant effects or be more important than giant interactional events, mechanisms, or means; That things may interact in an unexpectedly delayed (hysteretic) or instantaneous way; That different interactions, or interactions of different things, may in many instances subserve, piggyback, or depend upon one another, or form synergistic, complexly differentiated, and irreducible systems; That two seemingly different or unrelated interactions or types of interactions are actually identical, equivalent, or homologous; That disparate interactions can produce identical effects—and vice versa, that practically indistinguishable or in fact completely identical interactions can paradoxically cause the most divergent or seemingly unrelated effects; That a multitude of diverse and powerful interactions occurring side-by-side or involving the self-same objects need not interfere with one another and may be virtually multiplexed; That the very existence of certain things may be impossible sans their mutual interaction; That things that appear to be interacting on a single level or in a single way may in fact be simultaneously interacting on many levels or in many different or separate ways; That certain interactions of things that appear to be progressive may in fact be static—and other interactions that give the opposite illusion of being static are truly progressive; Etc.

Recurring questions to ask about arbitrary interactions of arbitrary things include: Is this the right interaction to study, or are there other interactions? When and how did this interaction begin? When, how, and why may the interaction end? Why did the interaction begin; what factor or cofactors caused or enabled it? What principles should be brought to bear in analyzing or treating the interaction? How can I exercise or develop my mental faculties by approaching an interaction differently on this occasion—or by asking novel questions about it?

How broad—or restricted—is the interaction? How does the process of interaction perturb or govern itself? What is the content and structure of this interaction? What would be the best way to describe the interaction, or my ideas about it, to another person? What errors of observation, or logic, may I be making about the interaction? How does the interaction resemble and differ from those forms and instances of interaction I have examined before? What are the various quantitative dimensions of this interaction? Is this a natural or an artificial interaction; if it is natural, could it be produced artificially; or if on the contrary it is artificial, might it also occur in nature? Apart from its simple cause, what function or role might it have? What might the best example of the interaction be like? Where should I look to find other examples, or suggestive analogs, of the interaction? Which aspects of this interaction are clear, and which other aspects are vague, ambiguous, or perplexing? What predictions can I make to test the interaction or my ideas about it? What other interactions could this interaction be combined with in interesting ways or to produce interesting effects? What quantitative and qualitative aspects of the interaction could probably be changed without destroying the interaction or its essential character? What narrow and broad reasons do I have for attending to the interaction? What are the most—and successively less —primary aspects of the interaction?

Examples of various particular interactions of things that were discovered or investigated historically are: Interference of light waves; Gravitational tides among astronomic bodies; Psychosomatic (mind-body) interactions; Interactions of subatomic particles via the nuclear Strong and Weak forces; Interactions of normal air currents in the upper atmosphere; Interactions of the various semiautonomous subcortical nuclei of the vertebrate brain; Synergistic and antagonistic interactions of drugs taken simultaneously; Mother-child interactions in human development; Interactions of "virtual" phenomena ceaselessly 'emerging from' and 'reuniting with' Dirac's infra-cosmic sea; Queer 'interactions' that appear in the combinatorial theory of interdependent probabilities (co-probabilities); Etc.

Of course the subject of interactions is one that is naturally close to the heart of ideonomy or to what might be referred to as the ideonomic world view.

To gain a sense of how this division INTERACTIONS would work—and of its power to give insights to, to inspire, fecundate, and guide, the human (and mechanical) mind—try to apply the eleven successive organons above, and their series of items, to imaginary theoretical and experimental investigations of three phenomena that would each be expected to appeal to the student of interactions: different memories (in the cortical neuropile or in artificial neural nets, say as possessed, processed, or reflected by connected pairs of neurons), territorially cobounded ant nests, or neighboring convection cells (such as atmospheric thermals or Bernard cells in a kettle of boiling water)::

In the case of MEMORIES, for example, should there be interactional : levels, events, processes, combinations, errors, differences, extremes, cycles, games, hierarchies, niches, rings, conservations, and inequalities : that exist and that pose challenging questions or offer opportunities for major discoveries in the quest to understand the cerebral and abstract bases of memorization, engrams, remembrance, and mnemes? ...

Proceeding to the next organon: Might mnestic interactions tell us what the memories do and do not have in common? What the essence of the phenomenon of memory is? What memories do to one another? Whether —or how—memories compete? What the capacities, abilities, and potentials of memories are? How sensitive different memories, or mnestic traces or processes, are to one another? ...

And the organon after that: Might two interacting memories be alike or identical? Or different or opposite—in content, pattern, law, mechanism, function, or other important respects? ...

Could some interactions of memories be: Static or progressive? Alterative (of themselves or one another—the interactions or memories; or of mnestic or neuronal processes or structures) or not? Antagonistic, neutral, and reinforcing? Closed or open systems (themselves or as a part of same)? ...

Again: Might the ecological interactions of the populations of predator and prey species be worth studying for the light they might throw—through simple or complex analogism—upon the prima facie disparate and unrelated interactions of memories? ...

Could mnestic interactions be scaled for their: Rate (in any sense)? Velocity? Rate of exchange (of anything)? Rate of compensation? ...

Do interactions of memories include among their possible or actual generic causes or concauses: Simultaneity? Proximity, contiguity, overlap, superimposition, or mixing? Interconnection? Convergence, collision, or coalescence? Mutual affinity? ...

Do the diverse effects of such interactions embrace: Creation of a stable or metastable system involving the interactants? ...

Might the surprising discovery one day be made about the interactions of memories: That two mutually remote, isolated, or seemingly unrelated, opposite, or incommensurate things (e.g. memories or mnestic interactions) are able to interact, say via a novel (psychic or neural) mechanism? ...

Might a scientist sitting down to investigate memories' interactions find himself asking, or stand to profit from asking: "Is this the right interaction to study (say an excitatory or inhibitory interaction between memorial cells or circuits mediated by norepinephrine, GABA, acetylcholine, or some other neurotransmitter), or are there other interactions?" "When and how did this interaction begin?" "When, how, and why may this memory-memory interaction end?" "Why did the interaction begin; what factor or cofactors caused or enabled it?" "What principles should be brought to bear in analyzing or treating the interaction?" ...

Might (seemingly unrelated) interactions of (related or seemingly unrelated) things that were discovered or investigated HISTORICALLY have some analogical or other ideonomic power to clarify or define the multifarious interactions of memories; e.g. the historically discovered, probed, or described: Interference of light waves? Gravitational tides among astronomic bodies? Psychosomatic (mind-body) interactions? Interactions of subatomic particles via the nuclear Strong and Weak forces? Interactions of normal air currents in the upper atmosphere? ...

An appendant and superordinate question is: Might all of these questions, and the answers to all of these questions, have mutual implications and importances?

The answer in every case - I can say as a neuropsychologist - appears to be: **Yes!**

Show the Interdependences of Ideas

Interdependences of ideas may variously be: Natural or artificial; Real or hypothetical; Superficial or fundamental; Eternal or transitory; Minimal, maximal, or optimal; Finite or infinite; Positive, nil, or negative; Complete or partial (integral or fractional); Absolute or relative; Intrinsic or else extrinsic or virtual; Singular or plural; One-one, one-many, or many-many; Univalent or polyvalent; Homotypal or heterotypal; Unidirectional or bidirectional; Reversible or irreversible; Invertible or noninvertible; Uni-level or multilevel; Linear or nonlinear; Quantitative or qualitative; Separable or inseparable—or independent, dependent, or interdependent; Direct or indirect; Symmetric or asymmetric; Transitive or intransitive; Associative or nonassociative; Distributive or nondistributive; Fixed or variable—or static, progressive, regressive, or cyclic; Simple or complex; Divisible or indivisible; Hierarchic or not; Good, bad, or neutral; Dynamical or statical; Relevant or irrelevant; Genuine or illusory; Known or unknown—or definable or indefinable; Universal or local; Redundant or irredundant; Abstract or concrete; Useful or merely aesthetic; Transformationally invariant or not; Paradoxic or not; Structural or not; Finitely or infinitely interactional; Contradictory or not; Antithetical or not; Etc.

Things one can do to or with all or some interdependences of ideas: Define them (or things); Explain them (or things); Use them to find others; Strengthen or weaken them; Extend or generalize them; Test, prove, or refute (them, others, or other things); Transform them; Describe (them, others, or things); Bound or constrain them; Discover their laws, relationships, properties, analogies, identities, differences, covariations, meta-structures, raisons d'etre, etc; Combine them and construct things; Criticize their defects; Identify their virtues, uses, and values; Classify and systematize them; Circumvent or transcend them; Redescribe or redefine them; Formalize, axiomatize, operationalize, or simulate them; Document their histories; Quantify them or things; Use them to develop either simpler or more complex pictures of things; Connect, synthesize, or mutually derive them; Discover, explore, or experiment upon them; Weight their differential probabilities; Elucubrate their infinite corollaries and implications; Etc.

Illustrative examples of ideas that are or may be interdependent: Peace and war; Truth and proof; Thought and consciousness; Motion and position; Height (geographic) and topography; Play and amusement; Life and homeostasis (in biology); Work and transformation (in chemistry); Convection and disequilibrium (in meteorology); Etc.

Possible causes of interdependences of ideas include: Similarity of form or aspect; Similarity of nature; Similarity of origin or cause; Similarity of function, role, or value; Similarity of relationships; Homology of origin or cause; Hidden equivalence or identity; Mutual implication; Oppositeness; Antisyzygialism; Etc.

Suggest New Interests

Of what possible or actual interest are the things that exist or that might exist? Answering this question is an important concern of ideonomy. But no less important, and in fact of a complementary nature, are the set of passive and active interests—in anything and everything and of every type—that individuals have or might have.

Suggesting new interests is one of the relatively narrow purposes of ideonomy that can directly and indirectly profit from its much more comprehensive approach to things.

Thus ideonomy addresses the interests that things, ideas, persons, organizations, creatures, and subjects have from the standpoint of those interests': causes, origins, histories, mechanisms, alternatives, alternative histories, ambiguities, analogies, analyses, anomalies, antisyzygies, appearances, assumptions, bads, behaviors, capacities, abilities, chains of consequences, clusters, chance elements, circumstances, coderivations and coevolutions, combinations, commonalities, complexities, concepts, conditions and states, conflicts, connections, conservations, contents and parts, controversies or controversial aspects, convergences, synergisms, correlations, courses, co-probabilities, criterions, criticism, cybernetics, cycles, evidences, decisions or decisional bases, defects, definitions, degrees of freedom, descriptions, geneses, differences, dimensions and properties, discoveries, equilibria and disequilibria, disjunctions, distributions, divergences, domains, ecological aspects, 'economic' aspects, effects, elements, emergents, engineering, equalities and inequalities, symmetries and asymmetries, errors, essentials, evaluations, events, examples, excellences and perfections, experiences, expectations, experimental possibilities, extensions, extremes, first principles, functions, fundamentals, futuribles, game-like or -related aspects, generalizations, wholes and gestalts, changes and transformations, goals, goods, 'group-theoretic' aspects, heuristic possibilities, hierarchies, higher realities, identities, ignorances and knowledges, illusions, implications, impossibilities, individual instances, infinite and finite aspects, instruments and relevant methods, interactions and interdependences, interpretations, interrepresentations, inversions, kaleidoscopic invariants, 'languages' or 'linguistic' aspects, laws, levels, limitations, logicizations, manifolds, mathematics, matrices, measurements and measures, quantities, meta-dimensions, models, morphisms, morphogeneses (sic), morphology or meta-structures, motions (sic), myriontology, needs, negations, networks, niches, evolutions and niveaux, nonexistences, noology, responsibilities (or deontological aspects), opportunities, opposites, order taxons (and aspects thereof), organons, ideograms, orthodox and heterodox aspects, paradigms, paradoxes, pathoses, paths, patterns, perspectives, phenomena, philosophies, planning, possibilities, practices and habits, predictable aspects, prejudices, preparations, probabilities, problems and solutions, processes, psychology, random aspects, ranges, reactions, realms, reciprocities, reconstructions, recursions, relations, relaxations and simplifications, rings, roles, rules, scenarios, self-relationships, senses, series, simulations,

spaces, spectrums, speculative possibilities, story-related possibilities, strategies, surprises, systems, classifications, technological possibilities, transcendences, transvaluations, trees, uncertainties, unifications, uses, values, vergences, virtuals, 'relevant' questions and answers, etc.

The supposed interests that things have are highly conventionalized, and often the greatest potential interest of those things is unnoted. Ideonomy has the ability to circumvent the accidental, conventional, and trivial interest of things and to describe a vast range of additional possibilities.

It can systematically transform given interests, or sets of interests, into other interests and sets of interests of novel and greater—related or unrelated—nature.

It can show how different interests interlock or have the potential of illuminating, heightening, or serving one another.

It can take given interests and show what is wrong with them: How they do not reflect the needs or peculiarities of an individual; How they lack the ability to develop the talents of a person; How they ignore special opportunities; That they are redundant; That they exist unknown to the individual; That they are too rigid; That the person approaches them with no method or strategy; That the individual developed or inherited them unthinkingly; Etc.

To illustrate the larger interest that things have or can have: Molds can suggest the ways in which things in general can or do spread; The surface of the sea can suggest the comprehensive fluidity and adaptability of all things; The accidental dropping of a glass can suggest the larger contingencies and hazards of human life; Libraries provide a chance to find out what interests other people; Jokes can furnish clues as to the prejudices of people; Deserts in their shocking emptiness afford opportunities to see oneself better; Birdsong heard one morning can speak volumes about the aesthetic contribution to life of little things; Etc.

Invert Things

The normal or assumed relationship between two things can sometimes be inverted or be shown to be inverted. Even if this is only rarely the case, it can have profound consequences. Hence consideration should always be given to possibilities of this kind.

Examples of generically invertible or reversible relationships include: That of a (supposed) cause and its (supposed) effect; That of antecedent and postcedent (or of temporal or spatial priority); That of governor and governed; That of two things interpreted or functioning as opposites of any type (e.g. as 'big and small'); That of things that come first and second in relative order of importance or urgency of treatment; That of two things that are viewed as logically including, and included in, one another respectively; Etc.

Where an inversion is discovered it may simply be in the nevertheless important sense that unsuspected reciprocity, interdetermination, or symmetry exists between things formerly viewed in a rigidly hierarchic or one-sided way.

A wonderful example of a possible revolutionary inversion of an assumed relationship, that might occur in science in the future, is to be found in biology. The traditional paradigm has always held that, relative to the macroorganisms, the Earth's microorganisms (viruses, bacteria, algae, fungi, ciliates, etc) are, i.a.: simpler, less evolved, less diverse, less interesting, older, redundant; and perhaps also stabler, less important, of peripheral interest, even unnecessary to "higher" life. Recent theory and experimental evidence suggests that the relationship in all of these respects may be more nearly one of equality, antisyzygy, or inversion of tradition. Conceivably the tiny organisms are more complex (morphologically and physiologically), more evolved and sophisticated, more diverse (biontically and taxologically), more interesting, older (in a partial but surprising sense), irredundant, more variable (genotypally and phenotypally protean), of more central or even of supreme interest, and necessary or even all-important to (what hitherto have been thought of as being "higher") life-forms. Indeed, the so-called microorganisms may even be 'bigger', if recent evidence favoring the revisualization of bacteria as multicellular, finitely extended colonial, or infinitely extended Gaian organisms (possibly functioning via lateral gene flow as a single gigantic genome for the entire bios) continues to accumulate!

Modern physics offers many possibilities for revolutionary inversions of things and world views: Perhaps what we think of as real matter and physical phenomena are merely epiphenomena and negative: holes, defects, perturbations, or side-effects in a vastly or infinitely more complex, fundamental, differentiated, powerful, and interesting Dirac quantum-mechanical sea or plenum of so-called "vacuum" or "virtual" interactions. Perhaps the 'universe' is not expanding outwards but collapsing inwards, sensu progressive miniaturization of all of its systems. Perhaps our natural view of time is logically topsy-turvy, and a truer picture of time would show the universe as running in a direction that we, in our present prejudiced stupidity, would misperceive as backwards. Perhaps what we term "order" is chance, and "chance" order.

Similarly, in psychology what is celebrated as the "conscious mind" may in fact be inferior, in actual degree of consciousness, to the so-called "unconscious mind" (at least in part).

Possibilities such as these involve extremely difficult questions that are largely unanswerable by the surprisingly feeble powers and microscopic knowledge of contemporary science.

A more mundane inversion that has occasionally been suggested is that wives are the covert masters of their husbands; that it is the distaff that governs American husbands and society, albeit in ways that are almost inscrutably subtle, indirect, diffuse, disguised, and 'negative'.

Are words or instead the silences between words (e.g. chronosemically) the primary element or agency of human communication? Again, is verbal language or are accompanying microkinesic, facial, or phatic messages relatively primary in face-to-face communication?

Are neurons or glias the cells of the brain that are the most active or important in human memory or cognition?

Is the highest role in the production of human intelligence played by the cortex—the traditional view—or instead by the brain's subcortical regions?

Give One Greater Access To Existing Knowledge

Vast knowledge has accumulated over the history of civilization, and is now kept in the world's libraries. But the use that is made of the potential resource it represents is negligible. Men have discovered the enormous value of systematizing what they know and learn in books, and of combining and systematizing those books as libraries, but that is for the most part the furthest stage to which they have gone to date in the infinite evolution of the modes and means of representation and synthesis of general knowledge.

Ideonomy can help us to foresee countless other steps in this vitally important progression, and it can expedite their achievement. Indeed, ideonomic science and technology will constitute the essence of many of those steps, in part because ideas could be said to represent the highest form of knowledge (so far known, unless the laws of ideas are a still higher form).

Ideonomy seeks to discover the totality of those principles and categories that are necessary to organize knowledge in a maximally meaningful, elegant, comprehensive, and powerful way. In fact it reaches for the essence of order itself.

It attempts to fashion ever more ingenious and diverse cognitive frameworks. It is only when knowledge is placed in such frameworks that it comes alive or begins to exhibit its full significance.

It can aid the automation of the storage and retrieval of data and knowledge. Ideonomic divisions and organons—and the tendentially infinite, orthogonal, universal, and combinatorial dimensions of all meaningful concepts, things, and possibilities that ideonomy seeks to discover, systematize, and exploit—represent virtually ideal means for and ways of organizing all knowledge that should be sought or that would be recorded or recalled. Knowledge is always amplified, implicitly, by other knowledge—regardless, in a sense, of the nature of that other knowledge. But the amplification is not self-evident or automatic—at least on the basis of present methods and means for handling knowledge. Those subjects that are critical for the future revolutionary transformation and resultant amplification of knowledge are noology, artificial intelligence, and ideonomy.

Knowledge needs to be expressed via the most natural and synergistic meta-structures in idea spaces, or via certain : trees, chains, series, networks, hierarchies, radiations, vergences, lattices, matrices, rings, circuitries, fractals, plexures, aegagropilas, Peano curves, "chaoses", etc : and their adinfinite homogeneous and heterogeneous: combinations, permutations, evolutions, recursions, cellular automata, myrioramas, dualities, asymmetries, 'linguistic possibilities', etc.

Of fantastic importance as humanity enters the twenty-first century of the Christian era is that the great dream of the visionary H.G. Wells, of what he spoke of as a "World Brain", be realized at last. This was to be a gigantic and unending enterprise to reorganize all human knowledge as one vast encyclopedia.

The sum wordage in all of the world's different books, today, is five powers of ten greater than that found in the largest encyclopedia. This immense and absurd gap symbolizes the need and opportunity that Wells' recognized. In effect, we should immediately undertake to plug the little-appreciated gap by creating a series of encyclopedias, or a single electronic encyclopedia with hierarchical levels, each an order of magnitude greater than one another. The representation of all knowledge would become telescopic in this way.

Such an encyclopedic 'telescope' would miraculously augment mankind's access to its own self-hidden knowledge. Extant knowledge would become equivalent to a much greater fund of knowledge.

But the hierarchic design of such an encyclopedia almost presupposes ideonomy for the creation of its categories within categories within categories of data, meaning, wisdom, and intelligence.

Yet greater access can be given by ideonomy even to the fragment of knowledge represented by a single book or article, or to the knowledge existing obscurely in the shadowland of one's own mind.

Help Bring the Totality of Human Knowledge Into Play In the Treatment of A Single Thing

Not only can ideonomy help one to extract maximum information from a single datum, but it can facilitate the simultaneous and synergistic application of all knowledge to one, arbitrary thing. Of course both desiderata and both functions are profoundly complementary; indeed they are mutually essential.

By demonstrating the unsuspectedly great, and in certain respects infinite, complexity that is explicitly or implicitly possessed by, or that relates to, anything whatever, ideonomy calls attention to a multitude of additional dimensions that are correlative of the thing with other things and to which the totality of existing knowledge can be referred. Ideonomic and cognitive methods that are valuable with respect to other knowledge and things, in this way also become valuable in the treatment of the given thing and of our knowledge of it.

The intercorrelation of total knowledge being increased ad infinitum by ideonomy, each and every bit of knowledge inevitably becomes applicable—and ever more applicable—to random things. The contextual meaning of things—their consignification—can be raised exponentially and without cogitable limit, apparently.

When in the future ideonomy is united with artificial intelligence, it will become possible for computers to automatically and instantly reconstruct something like the sum of human knowledge so that it centers on, and has the form of, any given thing that would momentarily be illuminated. In other words, all knowledge will be representable as a a single universal wheel whose spokes radiate from, and converge to, a particular matter of interest, or any element of the world of nature or the world of thought. There will be some analogy to the optical effects produced by a hand lens moved over a page of print, to phantasmagoria, to anamorphosis, or to the crazy imagery seen over a man's body when he steps before a motion-picture projector and becomes a living screen.

Here the relevant ideonomic principle is that all things are interrepresentable and intertransformable. Also, all things can be viewed from the perspective of all other things (even if the latter are inanimate, since the mathematical basis of such projections is absolutely universal). Moreover, all things may well have a monadic character, as is implied by certain recent theories in mathematical physics.

The key to much of this would be for the totality of knowledge to be given an integral and conoidal structure; also a certain elasticity, and mobility of its parts. Other things that come to mind—analogically and suggestively—are Fourier analysis, statistically self-similar and self-dissimilar curves (fractals and the Mandelbrot set), projective geometry... In fact, the list is perfectly endless.

There is no known or imaginable limit to the unifiability, reducibility, and simplifiability of knowledge. No matter how much of a sprawling welter it may seem nowadays, it will always be possible to miniaturize it arbitrarily much. The effect of all such changes will once again be to enlarge man's ability to bring the totality of his knowledge into play in the treatment of a single thing.

Ideonomy can show the universe of analogies that all types and realms of things have to the given thing, and also all of the meaningful differences that obtain. It can tap the infinite intercorrelations that both analogies and analogs have among themselves: correlations variously having to do with appearance, behavior, kind, composition, structure, laws, causes, effects, circumstances, probabilities, etc.

If one is naturally curious about things and takes a trip into the wilderness, the meaning of what one finds there will be enhanced if one is accompanied by <u>all sorts</u> of experts: pedologists, geomorphologists, mineralogists, hydrologists, geographers, geochemists, meteorologists, historians, botanists, mammalogists, ornithologists, herpetologists, entomologists, microbiologists, ecologists, astronomers—even artists, poets, lexicologists, philosophers, psychologists, mathematicians, and ideonomists.

The proper approach to anything is pantological.

Improve the Use of Human Knowledge

If one has knowledge, what are all of the things that one can and should do with it? This is a profoundly important question that we can confront better if assisted by ideonomy.

<u>Actual and possible uses of knowledge include</u>: To clarify the meaning and nature of knowledge; To learn the sources and mechanisms of knowledge—both actual and possible—and the methods and means of its production; To compare one type of knowledge with another, so as to learn about the diversity and possible forms of knowledge; To suggest where knowledge is defective or absent; To gain insights into one's own mind; To derive other knowledge from it; To educate and train minds; To generate new inventions, innovations, goods, services, industries, and ideas of every type; To make predictions that test its validity, or to design experiments that can reveal its values and uses directly; Etc.

Specific examples of hypothetical or definite needs for, or uses or values of, knowledge are: Knowledge of how the human brain works could enable us to rectify the brain's maladies and to give intelligence to machines; Knowledge of the geophysical, geochemical, and geomorphologic mechanisms that have produced bodies of ore over Earth's history would expedite our discovery and extraction of valuable minerals; Knowledge of the causes or laws of business cycles might help us to prevent unwanted economic fluctuations; Knowledge of the idiosyncratic educational needs and talents of individual children would allow teaching and learning to be more efficient and productive; Greater knowledge of the degree, causes, and forms of genetic variation in the general population would improve the identification, treatment, and prevention of many diseases; Knowledge of the actual mechanismic origins and geneses of our motivations might enable us to exercise greater control over those motivations and to become more self-determined; Etc.

The utility of knowledge depends upon the form into which it is put, and the quantity, rate, and excellence of the use that is actually made of it will reflect the overall diversity, ingenuity, suitability, manipulability, knowability, completeness, perfection, synergism, and convenience of its representations. The development of such representations of knowledge over the course of time is at once a science, a technology, and an art—and ideonomy can assist with all three phases. Eventually ideonomy will even combine with artificial intelligence to automate, eternalize, and maximize the major and minor evolution of the universe of epistemic representations.

Each new bit of knowledge that man acquires has natural relationships to, and corollaries and implications for or in terms of, myriad other bits of knowledge already in existence. In the future ideonomy will help man to consolidate the totality of human knowledge in a single worldwide electronic (and photonic) network; and once the network exists, the science of ideas will facilitate the instantaneous propagation of new data, and subsequent ramification and interadjustment of meaning, throughout the omniscient network. The ideonomically orchestrated process of association of information and ideas in the mind-like network will represent a chain reaction that, once begun, will continue uninterruptedly from picosecond to picosecond, around the clock, beyond the human lifetime, and forever.

Ultimately all human minds will constantly, intimately, and progressively interact with this network; humanity will shape it, as a result, and it will shape and transform humanity. A vast mental coalescence will occur. Knowledge, thought, wisdom, intelligence, consciousness, and inquiry will be organized, interwoven, and multiplied to infinity.

Knowledge of where and how to use particular forms of knowledge will continually increase.

For example, knowledge will evolve about where and how to use new knowledge about, or relevant to, the stomata of leaves. New data about the mechanism that controls the opening and closing of stomata may have a natural tendency to relate to knowledge about, or research involving: Plant diseases caused by tiny organisms that gain access to the interior of the plants via stomata; The phylogeny or systematics of stomata; Effects of ambient moisture or CO_2 levels upon stomatal cycles; Genomic regulation

of the ontogenesis and repair of stomata; Biochemical pathways of plants; Herbicides; More primitive structures from which stomata may have been evolutionarily derived; Other organelles that in the course of evolution may have begun as but diverged from stomata; Etc.

Moreover, what is learned about the machinery of stomata may have implications for the biomorphogenesis of all sorts of opening-like organelles and microstructures in the membranes of plants and other organisms; and indeed, for the morphogenesis and mechanics of pit-like and hole-like structures and phenomena throughout nature or in all sciences.

The acquisition, indication, coordination, characterization, extension, integration, and exploitation of knowledge of all such relationships and interrelationships—whether of leaf stomata or of other things—could be guided by ideonomy.

Advance Language

Ideonomy can help with the creation of new and novel languages and with the investigation and improvement of old languages. It can aid the use of all languages.

The 'linguistic' problems, questions, and possibilities with which it could help are in fact innumerable:

We still do not know what language fundamentally is or does;

The earliest historical origins and forms of language—and languages—are unknown;

The total degrees and forms of imperfection of the languages we use are not known;

It is not known whether language—in the verbal sense—derived in the course of evolution from other biological codes—or a whole series or hierarchy of such codes—of a nonverbal nature (e.g. microkinesic, electroencephalographic, biochemical, ontogenetic, or phylogenetic);

The ultimate evolutionary possibilities and capabilities of language (the room for improvement in the role it could play in thought, communication, or art, for example) are a mystery;

The laws that have governed, and that still govern, the historical evolution of language have not been discovered;

Linguistic intelligence has not yet been created in a machine (save in a minimal sense);

Words and etyma can be systematically and canonically combined, permuted, and transformed to generate new and better words, concepts, and propositions;

The physical universe itself may be pervaded with languages of a sort, whose decipherment and use may be necessary to fully understand and controlsome or all natural phenomena;

Etc.

All existing languages are primitive and deeply flawed, and it will be possible to use ideonomy to rationalize them.

Thus there are far too many words that refer or relate to certain concepts or things in our language, and far too few—or no—words that serve or can be made to serve certain other concepts, things, or purposes. The distribution and specialization of words are often hard to justify in any way, and our reason and creativity, in particular, must be unavoidably diminished by them.

Grammatical and other linguistic rules should be altered or replaced to give far greater communicative, aesthetic, and cognitive flexibility, scope, and power to languages; or an entirely new language should be created on the basis of the most perfect rules imaginable.

Myriad new languages could also be the specialized vehicles of myriad new modes of thought. They could be insightfully concreated by ideonomists to maximize the intellectual, psychic, and professional diversity of the human race, or to foresightfully canalize civilization in the most desirable set of directions.

Of course language especially evolves through the empirical process of innovation, experimentation, exploration, modification, and natural selection on the part of innumerable persons in innumerable situations, interacting with one another over time.

Yet there are ways in which ideonomy could be made to simulate, or to be equivalent to, this grand natural process; indeed it could probably be made to improve upon it, and it could certainly serve and supplement it.

The ways in which words regularly change, or have been steadily evolving over time, could all be made systematically explicit to mankind, as the collective architect of, and ultimate authority about, language. Further verbal innovations, both deliberate and spontaneous, could thereafter be guided and hastened by this evolutionary and methodological awareness. Moreover, the process could be equipped with critical feedback loops that it never benefited from historically.

Of greatest value, however, would be ideonomy's ability to create—and facilitate the comprehensive, swift, and purposeful exploration of—that stupendous and yet elegantly structured idea space progressively approximating to the abstract universes of all possible words, languages, and statements, and of all concepts requiring or useful to same.

The endless solitary and cooperative mental play of persons within this - at once all-permitting and all-defining - realm would enable society to know in advance the infinite possibilities, tendencies, needs, wants, uses, meanings, and transformations of language, and to gain that partial control over the evolutionary process that is halved by paradox.

Mankind's mental movements within this prescient space, and over the course of time, could also be plotted and extrapolated by ideonomy making automated use of multivariate analysis, multidimensional scaling, and related statistical techniques. The space, in effect, could be given its own organic and self-extending intelligence.

Just as a trivial example, imagine that one wishes to say something - say because the problem of saying it has been posed to one, or because one would like to describe a phenomenon. An ideonomically programmed computer could instantaneously formulate and put before one, side-by-side, the various alternative or canonically defined ways of saying it. One could then examine this spectrum or group: to confront the nuances, ambiguities, divergences, contradictions, and other verbal, semantic, and cognitive complexities, baldly and from the outset. One might then proceed to make one's choice from among the possibilities, and use it in one's discourse. Or perhaps the exercise would simply have been a valuable experience that widened one's linguistic, intellectual, or spiritual horizons - or a pleasant diversion on an otherwise dull day or during an unoccupied moment (with subtler benefits).

Identify Laws

By laws are meant the tendencies that things, phenomena, ideas, and data have to display characteristic and identifiable patterns of behavior—and sets of relationships—that are fixed, fundamental, and universal.

Then again, one could say that laws are those patterns of being that are by definition MAXIMALLY: universal, simple, fundamental, eternal, invariant, reliable, necessary, predictive, useful, differentiative, unifying, verifiable, consequential, meaningful, distinct, synergistic, logical, systematic, governing, 'natural', unalterable, axiomatic, tested and proven, e/vc.

The word laws also refers to attempts to formulate such natural patterns with the simplest means and in the most elegant, and correct, way.

Rules are relaxed equivalents, or artificial mimics, of laws; laws and rules intergrade on a continuum (of many dimensions).

Ideonomy questions the prevailing assumption that at least some laws are absolute; e.g. absolutely: universal, fundamental, simple, invariant, increate, eternal (final), true or proven, monomorphic, underived (primary), transcendental, assumption-less, etc.

That is, ideonomy constantly asks us to entertain the opposite possibility, that all (known or discoverable) laws 'are': artificial, subjective (psychomorphistic), refutable or unproven, temporary, evolutionary, expedient, relativistic, circumventable, local, partial, partially inconsistent or contradictory, complex, presumptuous, illusory, misleading, subordinate to other laws, evolutionary, variable, e/vc.

Ideonomy can assist the treatment of laws in many ways, or the discovery, investigation, description, or exploitation of their: causes, effects, interrelationships and relationships to other things, behavior, histories, futures, dimensions, properties, degrees, ranges, structures and meta-structures, merits and defects or limitations, predictions, proofs and checks, exceptions and anomalies, uses, exemplifications, transformations, analogies, differences, cooperations, conflicts, mathematics, implications, classifications, problems and errors of use, explanatory powers when combined, elements, complexities, levels and hierarchies, extensions and generalizations, mutual derivations, convergences and divergences, paradoxes, 'operational spaces', methods of use, etc.

It can suggest future laws that will be discovered or that should be sought; ways to seek them; and consequences of their existence.

It can restate old laws in new, significant, and irredundant ways.

It can help answer the profound question: are there infinitely or finitely many natural laws, are there just a few laws, or is there but a single, supreme and universal, law that (discoverably or undiscoverably) governs the whole universe or the whole of reality?

It can help us to define what a law is in the first place, or the totality of different things that a law may be or might be viewed as being.

It can correct whatever is defective in our formulation of a law or increase a law's: universality of use, frequency of use, consistency of use, breadth of validation, approximation to the truth, precision of prediction, logical necessity, complexity of development, importance throughout science or society, etc.

It can survey the set of all things whose laws have not yet been discovered.

Laws have many values and uses; they can: Discourage lines of research that are futile or wrongheaded; Direct research along efficient, logical, fundamental, inevitable, and complementary channels; Simplify the teaching, learning, use, and corroboration of knowledge; Concentrate and define the essence of knowledge; Simplify our perception of nature and reduce phenomena and systems to their canonical possibilities; Facilitate—and render more truthful—the classification of phenomena; Accelerate thought and enhance our intelligence; Increase the interconnectedness of human knowledge; Stabilize the internal meanings of science; Vastly reduce the redundancy of scientific investigations; Facilitate the quantification, calculation, modeling, simulation, symbolic treatment, and automation of things; Etc.

At the present time we are presumably ignorant of most or all of the laws governing: Psychogenesis; Psychodynamics; Society; Sociogenesis or human history; Morality (or what is right and wrong in a fundamental sense); Art or the sense of beauty; The history of mathematics as a whole; Ontogenesis; Physiology; Human health and pathogenesis; Animal behavior; Animal communications; Ecosystems and the bios; Biological evolution; Intellectual development and thought; Sunspot cycles; The occurrence of earthquakes; Atmospheric and climatic dynamics; Chemical evolution and reactions; Economic relationships and fluctuations; The lives of galaxies; Cosmic evolution; Laws in general and their development (noogenesis); The general relationship between Quantum Theory and Relativity; Language use (in any deep sense); The structure and interpretation of the brain's electrical waves (or EEG); The total interrelationships of all possible ideas; The interrelationship of physical and mental reality; Our perception of time; Probabilities; Mosquito flight; Visual perception; Classification of knots; Morphogenesis of pure or physical forms; Games; Jokes; Melodic development; Human happiness; Etc.

Illustrative examples of known (or assumed) laws include: Ohm's law ($V = RI$); Stefan-Boltzmann law (total energy radiated from a hot body increases with the fourth power of the body's temperature); Dalton's law (of additive pressures; total pressure a mixture of gases exerts equals the sum of the separate pressures each of the gases would exert if it alone occupied the whole volume); Joule's law ($H = RI^2$); Avogadro's law (equal volumes of all gases and vapors at the same temperature and pressure contain equal numbers of molecules); Mendel's law of segregation (in genetics; paired hereditary units representing alternate characters separate during gamete formation so that every gamete receives but one member of a pair); Law of mass action (in chemistry; reaction rate is directly proportional to the molecular concentrations of the reacting substances); Kepler's law of areas (in celestial mechanics; a radius vector joining any planet to the Sun sweeps out equal areas in equal lengths of time); Second law of thermodynamics (mechanical work can be derived from a body's heat only when the body is able to communicate with another at a lower temperature; or all actual spontaneous processes result in an increase of total entropy); Law of large numbers (in

statistics; the probability that the mean of a random sample differs from the mean of the population from which the sample is drawn by more than a given amount approaches zero as the size of the sample approaches infinity); Law of superposition (in geology; where there has been no subsequent disturbance, sedimentary strata were deposited in ascending order with younger beds successively overlying older); Law of supply and demand (in economics; the competitive price that clears the market for a commodity is determined through the interaction of offers and demands); Law of constant angles (in crystallography; the angles between the various faces of a crystal remain unchanged throughout its growth); Law of the minimum (in physiology; when a process is conditioned by several factors its rate is limited by the factor present in the minimum); Law of tangents (in plane trigonometry; in any plane triangle the tangent of one half the difference of any two angles is to the tangent of one half their sum as the difference of the sides opposite the respective angles is to the sum of those sides); Etc.

The notion that quantitative laws are naturally superior to qualitative laws is a harmful fallacy that simply springs from scientists' long-term preoccupation with the former class of laws and with their progressive neglect of the latter class; it reflects the differential amount and standard of development of quantitative reasoning. In reality qualitative logic and laws are capable—and will always be capable—of attaining whatever levels of power and sophistication are open to the narrowly quantitative approach to nature.

The imbalance that presently exists between quantitative and qualitative thought is probably at once dangerous to civilization and a drag upon all intellectual progress. Ideonomy promises to play a critical role in restoring balance and in releasing the synergism that is implicit in the combination of two naturally complementary views of reality.

Aid Learning

One can learn faster if one explicitly understands the bases and goals of all learning, and is able to play a fundamental role in the learning process, rather than being relegated to the role of a passive spectator or an obedient student.

A major lesson of ideonomy is that the primary value of the knowledge one acquires in the course of learning lies in the combinatorial possibilities of that knowledge rather than in the static form it initially has when it arrives from the outer world as simple data.

Learning can be amplified by increasing the explicit and discoverable connectivity of knowledge and ideas. The options for the thoughts of the individual, for the sources he can turn to to learn more, for the interpretation of data in variant ways, for the uses of knowledge and ideas, and for the individualization of learning so as to bring it into accord with the peculiar talents, knowledge, and inclinations of each learner at a given moment and in a given situation, can all be expanded productively by adding to the connectivity and connectability of facts and possibilities.

Enabling the very process of learning—its map and dynamics—to be seen can be of benefit.

So also can methods and means for revealing what knowledge, ideas, and learning are not: the myriad structured and contextual things they neglect, skirt, or omit. Perhaps something else that could or should be learned can be pointed out, and plans for its future treatment can be encouraged.

Learning can be made more powerful by synthesizing different lessons and displaying their synergism.

Reveal the Limitations of Things

Before one can improve upon things, or have any inclination to do so, one may have to be conscious of their shortcomings.

One also has to know what things are, or the set of properties that define the quantitative dimensions along which the being of a thing may be positive and yet less than perfect or infinite.

The limitations of things can in fact be revealed, with the aid of ideonomy, in many different ways: By analogies among things suggesting their kindred limitations; By clusters of things; By classifications of things and of their modes of limitation; By comparisons of things aimed at revealing their differences, and hence their differential limitations; By principles guiding the discovery of natural limitations of things in various situations and circumstances; By clearer definitions of what limitations are or mean; By demonstrations that the practical limitations of things can be exceeded or are unnecessary, or that there are unmet needs, wants, or possibilities; By revelations of the sources, causes, and mechanisms of the limitation of things; By exhibition of the fact that things may exist and have consequences at many levels simultaneously, and that their limitations at those levels may differ greatly in degree and type and vary nonmonotonically; Etc.

Among the possible generic limitations of things are limitations of: form, size, magnitude, strength, perfection, completeness, diversity, resources, clarity, importance, efficiency, effect, productivity, utility, simplicity or complexity, individuality, stability, existence, activity, generalization, specialization, correctness, fundamentality, number or availability, etc.

Possible causes of limitations include: Underutilization; Underproduction; Underdevelopment; Self-limitation or negative feedback; Masking; Abortion; Suppression; Underactivity or inactivity; Lack of assistance or facilitation; Mismanagement or malfunctioning; Disharmony or conflict among things; Retrogression; Absence of biological or mental design; Deficient resources; Etc.

Particular examples of limitations are: Mouse's mental limitations; Finite mass or size of the universe (hypothetical); Limited psychic diversity of humanity; Finite power of biological life to adapt to hostile environments; Radio receiver's limited bandwidth; Imperfect instructional skills of a teacher; Limited felicity of a metaphor; Finite or quasi-finite diameter of an elementary particle; Limited artistic range of a given genre; Finite range of intermolecular forces; Limits to the variability of human history; Polymorphic limitations of the mammalian genome; Bounded capacity of biogeochemical cycles to cope with global industrial pollution; Limited authority of the laws of government to deal with unusual situations; Etc.

Questions ideonomy could help ask and answer include: How do different limitations of things interact? What limitations derive from limitations, or give rise to other limitations? Which limitations are desirable and which are undesirable? What controls the actual expression of limitations? What are the virtual—as opposed to actual—limitations of things? Of what limitations and types of limitations are we knowledgeable? What is our ignorance about limitations of things? What limitations need most to be investigated? What are all methods, means, and ways of researching limitations?

Enhance Logical Rigor

To think logically one needs or may need to know, or might profit from knowing: Comprehensive fallacies to which reasoning is prone, or that naturally occur in certain situations or in connection with certain things or ideas; The goals and purposes of logic; Practical ways to avoid common errors of reasoning; What the most perfect reasoning known to man to date is or is like; Assumptions that are continually being made—either explicitly or implicitly—or that would be useful in the gamut of generic cases; What degrees and criteria of 'logical rigor' and proof are—or one would deem—necessary, acceptable, or optimal in a given instance; The equilibrial interadjustability of various alternative or interdependent facts, probabilities, possibilities, representations, ideas, methods, arguments, postulates, relationships, things, etc; Cost/benefit ratios of various alternative logical treatments of the matter; Both the consistent and the novel meaning of what is logical—or of things—at various hierarchical levels; Things' exact properties, qualities, relationships, structures, and processes; Recurrent paradoxes; Things' sets, laws, and transformations; One's knowledge and ignorance; Things' classifications; Useful checks, tests, and experiments throughout the course of reasoning; Spaces and manifolds in which the different relevant things can be moved about, rearranged, combined, transformed, substituted for one another, explored, etc in the mind; All possible, interrelated, relevant, or important logical: terms, concepts, operations, relationships, entities, principles, representations, strategies, products, propositions, etc (of a 'universal' nature); Possible interferences, discordances, contradictions, inconsistencies, and complex interactions (as well as co-probabilities and synergisms) of different facts, ideas, evidence, arguments, hypotheses, etc; How to synthesize reasons or unify reasoning; The generic and specific problems and solutions; Possible ambiguities and alternative perspectives; The complexities and simplicities of a matter; Universal or apposite logical meta-structures (chains, series, inductive-deductive vergences, networks, trees, radiations, knots, rings, cycles, matrixes, clusters, 'topological tessellations', etc); Universal and special questions to ask (relevant to the logic of a situation); Generic and specific corollaries and implications; Peculiarities of one's own mental processes and the logical variations of mankind (including the logic of another person who produced something that one would logically analyze or use); One's options, and the decisions one must make, in reasoning; What one's mental abilities and limits are; The stage of completion or development of a logical or cognitive task at the time one receives or encounters it; How to reason

with imperfect, inadequate, or flawed knowledge—of the facts or of the nature of the problem—or in an uncertain, approximate, expedient, ad hoc, heuristic, fragmentary, or speculative way; What the weak and strong nodes and links in one's own—or in all—reasoning are; Canonical criticisms of, and excuses for, different reasonings or elements of logic; How to combine data or arguments so as to maximize logic and proof or the appearance thereof; How best or alternatively to reverse or reconstruct one's reasoning when mistakes are made or discovered or other forms or objects of proof are required; How to abstract and formalize the logic of things; How different types of things have been reasoned about or were demonstrated through logic historically; Logical and epistemological bases and presuppositions of one's diverse and random beliefs, knowledge, perceptions, methods, words, grounds, etc; How to qualify or condition truth; Why ultimately all arguments are refutable or all logic can be shown to be imperfect; What false reasoning or mispredictions would mean; Etc.

The goals, purposes, powers, and values of ratiocination include: To predict things; To check things; To prove things; To challenge or refute things; To criticize or evaluate things; To explore, understand, or or explain things; To discover things; To generate, develop, or perfect ideas; To help order, systematize, or manage things; To constrain and circumscribe things; To communicate or explain things to—or to interest or persuade—other persons; To teach things; To simplify things; To discover general laws—or deduce consequences—of things; To heighten certainty or security; To identify the antecedents or foundations of things; To vindicate intuitions; To enlarge and train intelligence; To universalize things (or enable them to be put in a universal form or to be consistent with a universal system or with universal standards); To sharpen the description or characterization of things; To connect, interrelate, synthesize, or unify things; To reconstruct the thoughts or situations of other persons; To retrace the path—or foresee the future —of things; To quantify things or facilitate their measurement; To aid the visualization or modeling of things; Etc.

Logic is not equally developed or equally applied in different sciences or fields of endeavor, or in terms of all phenomena, problems, concepts, etc. Not only do the standards differ but the very style, nature, and language of the logic varies. Ideonomy can be used to improve the standards of reasoning everywhere, and should help to make logic at once more uniform and more diverse. The greater uniformity will mean that reasoning and results in one science or one area will be more quickly, efficiently, exactly, and powerfully translatable into the logic and knowledge of some other science or area of endeavor. The logics of all fields and things will illuminate, supplement, and correct one another. Man will be introduced to the general logic of nature.

Ideonomy can help re-wed science to logic and logic to science. It is tragic that these two complementary activities of the human mind ever became divorced, or that mankind ever lost sight of the fact and necessity of their duality and synergism. The truth is that the foundations of modern science are riddled with logical problems that could not be more stupendous, and that the manifold experimental capacities of science are things that logic itself must tap in order to be revolutionized as a science in its own right.

By systematizing, in effect, the logical problems of science and the scientific problems of logic, ideonomy may provide many important clues for how these two subjects can at last be reunited.

Aid Mastery of A Subject

By dealing with universal concepts and cognitive universals ideonomy can give a privileged insight into any subject or matter and reduce the labor that is required to develop mastery of same. From a certain perspective every subject is the same subject; its structure and content, its methods and purposes, are general. What has been learned or mastered in one subject can apply elsewhere if it is properly translated and generalized and if the new domain is introduced in an appropriate way. Similar laws, relationships, probabilities, contexts, circumstances, phenomena, behavior, strategies, etc will be found to obtain; the truly novel, irredundant, inconsistent, and contradictory elements will be minor, or can be shown to be minor even in the face of conventional wisdom.

Ideonomy can help one to know in advance what it is that one does and does not know about a subject, and such knowledge about one's knowledge can lead to more efficient roads to learning.

Moreover, by giving one a better idea as to what the different things are that one might learn about a subject, ideonomy may render the subject more 'personal', and this can heighten the amount that one eventually learns about the field and the intensity of one's mental involvement in it.

Ideonomy can reveal what it is that is most fundamental about a subject, or the things upon which so much else depends. Conversely, it can underline what in the subject is relatively superficial, unimportant, derivative, and redundant. Since much that is commonly taught to be important and fundamental in subjects actually is not, ideonomy can aid mastery of the subject relative to norms.

One may learn a subject more quickly and thoroughly if in the course of learning one is able to view it critically, and with ideonomy it is possible to criticize something even with minimal knowledge of it, if only because there are more or less universal defects that things tend to have.

Similarly, one can better understand a subject if one is aware of the ways in which the subject has been developing over historical time, or aware of the probable future development of the field from the imperfect thing that it is now or that it is at the time when one tries to master it.

Learning of a subject may be made easier if one becomes conscious of the uses to which all of the things within it may be put.

One may learn a subject better if one is able to define its concepts more readily or completely or in arbitrary ways.

Awareness of the assumptions that one brings to the study of a subject, or that permeate the subject itself, can be helpful.

Ideonomy can also enable one to ask basic questions about anything, and call one's attention to generic answers to these questions or to questions in general. Moreover, it can equip one with the ability to pursue powerful chains or series of questions, and even entire hierarchies and networks of questions.

Stimulate the Advance of Pure and Applied Mathematics

The value of mathematics in itself is limited; its real value lies in its infinite applicability (both to other things and to itself). Ideonomy - the natural sister to mathematics - can enormously accelerate the discovery of that infinite pertinency and utility.

The meaning of mathematical concepts is not finite in the sense that a particular representation can exhaust it. On the contrary, diverse and ever new representations of both old and new concepts in that subject are apparently able to enlarge the meaning of those concepts - and of mathematics as a whole - without limit. And ideonomy is inter alia a science of all possible representations (of all possible things in all all possible ways via all possible means); it even embraces the infinite complexes and series of representations OF representations.

Mathematical concepts in general are representable by other and divergent - indeed by arbitrary - mathematical concepts. Numbers are obviously not necessary - there is "abstract" algebra, for example - but neither are the other notational forms of mathematics. Mathematicians may be shocked, but the truth is that mathematics can be fully translated into words, that no mathematical concept will ultimately prove impervious to verbalization. Moreover, mathematical concepts can be given a form that immediately transcends mathematics and that enlarges them into the still more manifestly universal realm of ideonomy. The guts of mathematical concepts - if descried - would mean little to today's (fundamentally obsolete) mathematicans, and not merely because those guts are infinitely complex and strange.

Mathematics can also be translated - or reconstructed - purely as shapes, shifting imagery, music, logic (sic), games, metaphors, etc. Placed in each of these forms it will acquire greater meaning than when it is 'artificially' limited to a single form or medium. Of course people will have to be trained to appreciate and use mathematics in these new and unexpected embodiments; and we will have to discover how to train them. But these are preeminently tasks for the ideonomist. Partly ideonomy may simply break down the ingrained habits of mind that hold us in their blinding and paralytic grip; the fearful conviction that the interplay of abstract visual patterns, say, could never serve as a vehicle for concepts in the same vocabular, grammatical, and semantic way that the language of words, for example, does normally and with staggering power and ease. Growth of the mind is more than anything growth of the tolerance of the mind (for queer reality).

One of the greatest benefits of ideonomy to mathematics should come from its tendency to relieve the latter of its arbitrary features, notably its idiosyncratic self-restrictions. If one examines almost any area of mathematics it becomes obvious at once that the terms, conditions, assumptions, variations, ranges, topics, operations, and so forth are overly constrained; in fact the constraints abort immensities with their crudity and lack of necessity. Why in the world should the links and nodes of graph theory, for example, be limited to the structures and phenomena producible and treatable by 'dimensionless' edges and vertices? Allow the links and nodes width and volume and a door is opened to a new universe of the imagination. The same opportunity exists for knot theory and helixes. Presently in mathematics extensions and generalizations of these kinds are being tentatively explored, already with remarkable pure and applied results.

Mathematical concepts need not, and very often do not, originate within mathematics itself. In fact, some of the most revolutionary innovations and departures have resulted from physical, technological, and philosophical inquiries - occasionally even in the complete absence of mathematical methods in the usual sense. In part this has to do with the obscurity, intuitiveness, bizarreness, or nonexistence of the foundations of mathematics. Metamathematics is really a subject that transcends or lies outside mathematics; or put otherwise, the mathematical arises from something pre-mathematical, in its purity or primacy of experience and thought. What we call mathematics is merely the simplest, best known, most formalized, most unified and standardized, or momentarily most useful part of mathematics; and extant mathematics is almost certainly an infinitesimal - and least interesting and essential - part of the full world of potential mathematics.

As a result, the development and use of pure and applied ideonomy - with and without a conscious concern for the mathematical possibilities - can lead to breakthroughs in mathematical theory and methods, and even to a rebuilding of the basic structure of mathematics and a reformation of mathematical research. It can propose new problems and suggest new solutions. It can make explicit mathematical ignorance and needs. It can better define the capacities and limits of the elements of mathematics. It can show how forms of mathematics that have been developed and profitably used in one area of science have been needlessly and sacrificially confined to that area, rather than having been exploited elsewhere or everywhere. It can be used to improve the classification of mathematical concepts. It can awaken a consciousness in mathematics of the larger realm of human values, ideals, and possibilities. It can transform the systematic planning of the future evolution and use of mathematics. It can maximize the interwovenness of mathematics with other fields of inquiry and endeavor. It can clarify the ideonomic meta-structures that invest and constrain mathematics as they do all other subjects. It can assist the automation of pure and applied mathematics, and the explication of their cognitive bases.

Enhance Meaning

We live life little mindful of its meaning, and of the structure, scope, and fundamentality of that meaning. Things are done by rote, custom, imitation, formula, expedience, chance - anything but reason and understanding. People are in a hurry; they are superficial, rigid, ignorant, and uncaring.

Civilization suffers as a consequence. Its spirituality is diminished. Coherence, purpose, and passion are lost. The actual, much less potential, interconnectedness of human beings is never imagined. Tragedy occurs but is never recognized for what it is. Opportunities pass unseen. Risks, costs, and consequences of actions and situations are ignored. What is had is not appreciated or is wrongly appreciated. Things are taught but not their importance; the role of character in the direction of the world goes unmentioned.

Ideonomy can enlarge human meaning by celebrating the manifold and synergistic functions, roles, causes, purposes, values, interests, and possibilities of everything that we know and experience: the reasons for marriage, the functions of good food, the roles of the clergy in the rediscovery of human truths, the causes of play and of social change, the purposes of human acts and actions, the values of social harmony, human diversity, aphorisms, and chance, the interest of recreational games and of cosmological discoveries, and the greater possibilities of thought, art, science, and industry.

Improve the Use and Understanding of Metaphor

What is meant by metaphor, especially by distinction to what is meant by analogy?

A metaphor is a statement: that uses conventional means to say something unconventional; whose truth is not literal or exact, but rather substitutional, indirect, and allusive; whose power to command attention, and to inform, may not be immediately obvious; whose meaning may be inordinately diffuse and multidimensional; whose validity may be unusually uncertain, because the statement is a high gamble justified by the great payoff should it turn out to be true; whose importance may be that of a half-truth, or of a flawed truth momentarily communicable in no other way, or in no other way with such economy or fractional power; whose ambition may be greater than its actual capacity; whose value lies in its expedient ability to move the mind in a proper or intelligent direction, without itself necessarily being true or having any lasting value; whose merit may lie in its tendency to be associated with the truth, without actually being the truth; that operates on some unorthodox level of meaning; etc.

Of course in good part the difference between metaphor and analogy is purely definitional, or a matter of the senses that one would care to assign to the words or that may have been assigned by those who have used the words, individually or in combination, in the past.

An important point that should be stressed in connection with both terms is that they relate together to a far larger range of complex and distinctive concepts than has ever before been made explicit, and that this medley of concepts has always been the cause of much confusion, vagueness, and error. There is an urgent need for the many different recognized and merely implicit possibilities to be prized apart, distinguished, defined, and re-related in a comprehensive, organized, and prescient whole. Otherwise systematic thought in this area will remain impossible and even meaningless.

The most obvious, albeit trivial, difference between an analogy and a metaphor is that the first often involves a direct comparison between two simultaneously present things.

A metaphor may be more abstract, an analogy more concrete. A metaphor may not involve a simile of extant things, but rather a figurative use of language to illuminate a real thing by a fictional thing or a mere concept. Sometimes a metaphor differs from an analogy in that it asks one to imagine that the whole of a thing, or even the whole of one's ideas about or ways of treating a thing, can be applied to understanding another thing; whereas with an analogy that which is to actually be assimilated may be more limited or specific.

If a metaphor is sometimes a higher-level analogy, one could speak of it as an analogy between or among analogies; whereas a simple analogy is merely a likeness of things.

The purpose of a metaphor may be, not to actually indicate an analogy, but rather a difference between two things, or some other—even more complex—relationship or pattern.

For Aristotle metaphoric thinking was of the essence of genius or the highest form of thought.

It is easy to appreciate why rigid adherence to the conventional meanings of words and concepts, and strict avoidance of unconventional and more daring modes of thought, would hobble the free play, and ultimately limit the scope, of intelligence. The world is just too big for such condensation, and the language we use for its description is far too idiosyncratic and approximate. Moreover, the invariant use of terms cannot help being inconsistent with the true energy of the human mind.

If nature approximates to something infinitely complex, then the meaning of words—and of concepts themselves—must constantly change and evolve; or to put it another way, new and greater opportunities for the use of words and concepts must be brought into being each time they are employed.

Words and concepts may have an infinite hierarchy of higher and lower meanings and relationships—a hierarchy fundamentally irreducible to any finite and final interpretation. The exploration of this hierarchy may be necessarily metaphorical.

The treatment of metaphor to date has remained prescientific for many reasons: it has eschewed any effort to be systematic and comprehensive, and to identify and classify the types of metaphor that operate or might operate in every area or in connection with every possible concept and mental endeavor; it has disdained to distinguish between what is extraneous and what is fundamental in metaphors; it has failed to identify laws controlling the genesis, analysis, and use of metaphors; it has made no attempt to develop methods, tools, and materials for generating metaphors en masse; it has made no effort to describe specific metaphors exactly and completely, or as natural phenomena; it has failed to fit metaphor into a general theory of cognition; it has never rigorously explored the possible combinations, permutations, and transformations of metaphors, or the meta-structures and idea spaces they define or in which they operate or reside; it has never canvassed the many reasons why the use—or study—of metaphors is or might be important; it has never explored the limits—or the full possibilities—of metaphorical thinking; it has never undertaken any systematic criticism of the contemporary and historical use and study of metaphor; it has left unplanned the future scientific investigation of metaphor; it has made no effort to perfect the teaching—or the literature upon—metaphor; it has avoided quantifying metaphors; it has not tried to decompose metaphors into their parts, elements, and dimensions; it has seldom conducted scientific experiments upon the nature of metaphor; etc.

Various questions need to be asked and answered about metaphor, including: How complex—and simple—have metaphors been (e.g. in the works of Shakespeare)? Do metaphors often do as much damage as they do good (e.g. because of their tendency to inflame the ambiguity of a situation, or to seem to relate things that in fact are disparate or unrelated)? To what covert degree is supposedly nonmetaphorical language itself metaphorical or equivalent to metaphor? To what relative extent do metaphors say genuinely new things, or merely recall the mind's attention to old meanings or to things that it already knows? How do metaphors contribute to the appreciation of other metaphors? Is metaphorical reasoning special or is it really just another form of reasoning or an old and ordinary form of reasoning disguised? Might metaphorical reasoning be inherently incapable of being made systematic? Is the power of metaphor more aesthetic than rational? What have been the most important and productive metaphors historically, and what specific benefits resulted from them? What metaphorical alternatives are there for given metaphors? What metaphors are underdeveloped and how might they be perfected? What are all of the types of risks and costs of metaphors? How have given metaphors changed and evolved over time? What types and senses of metaphor should be distinguished by being given new names (and what should those names be)? What metaphors, speculatively, should be invented for particular things? What are the totality of metaphors that would be applicable to the treatment of a particular, random thing?

Some of the things for which "ocean" is a metaphor, or for which it could serve as a metaphor, include: peace, Heaven, mother, woman, God, adventure, the irrational, wisdom, flux, destiny, human knowledge or wisdom, the hypothetical Collective Unconscious of mankind, the bios, civilization, eternity, our planet, the unconscious mind, life, illusion, entropy, the Eros, the atmosphere, the cosmos, the Dirac quantum vacuum, the blood system, intercellular space, the creative imagination, infinity, the electron bath in which molecular matter is immersed, the cytoplasm, the prairie, the semifluid contents of the stomach, dreaming, etc. (Some of these things could in turn serve as metaphors of the sea, although the general relationship is not strictly symmetric, by any means.)

Things that, more or less speculatively, may one day turn out to have been metaphors include: fundamental particle, time, causality, IQ, soul, God, universe, truth, objective reality, number, mathematical equality, the Big Bang, speed of light, life (biological), love, infinity, nothingness, randomness, physical law, and mathematical point.

And that, again, means that it may be demonstrated that they are or were: invalid, misleading, trivial, half-truths, oversimplifications, relative, inelegant, superficial or metaphenomenal, meaningless, opposites of the truth, symbolic of something else, purely definitional, or the like.

Among other things, ideonomy can be used to: Show how everything is a metaphor for everything else; Clarify the psychological and cognitive forces that have given rise to, or that condition, particular metaphors; Exhaustively compare one metaphor with another; Predict the relationships among different metaphors; Illustrate the ways in which the meaning of metaphors varies with context; Make precise the boundaries between different metaphors; Etc.

Develop Methodologies

Methodologies are groups, systems, or combinations of methods, of a like or unlike nature. Or more generally, methodology refers to a body of methods, procedures, working concepts, rules, and postulates employed by a science, art, or discipline; or to the processes, techniques, or approaches employed in the solution of a problem or in doing something.

Up until now the development of a methodology has been more of an art than a science, and has usually occurred via the historical and often hodgepodge accretion of different methods or through borrowing from other fields or circumstances. The novel promise of ideonomy is to rationalize, systematize, and perfect the creation of methodologies in every area. The process should be made more direct, painless, and insightful, and methodological standards will presumably be elevated universally.

And of course ideonomy itself is a universal methodology.

Since the development of methodologies would essentially mean synthesizing in various ways the many different things that are being discussed here generally, comments on this topic are almost unnecessary.

Of course methodologies can have many purposes and values: They can permit recourse to alternative methods when one method has become dull through overuse; They can enable one to examine in advance a menu of optional methods and to select the best method or set of methods for a given case or one's own needs, ends, means, style, or expertise; They can help one to plan and manage the use of methods; They can facilitate appropriate adjustments, adaptations, specializations, and generalizations of methods in diverse situations; They can enable great numbers of methods to be made use of simultaneously and harmoniously in complex programs of research and endeavor; They can facilitate the teaching and learning of the many methods pertinent to a given area; They can enable a more universal, standardized, and objective comparison and evaluation of different methods, procedures, tactics, concepts, etc—and of what results from their use; They can facilitate the long-term evolution of a subject or undertaking; They can increase flexibility and preparation for contingencies; They can heighten the style and intelligence of an endeavor; Etc.

Random examples of situations in which methodologies normally exist or would be apposite include: Chemical engineering laboratories, Diplomatic corps, Defensive planning for possible world wars, Management of an economy by the national government, Coaching of a football team, Psychological counseling services, Institutes (or think tanks) researching public policy, Governmental agencies protecting the environment, Etc.

Ideonomy can discover and dramatize how equivalent and contrasting methodologies have worked in different fields or in the treatment of disparate problems. It can analyze the virtues and vices of different methodologies, and their powers for achieving different things in different ways. It can depict the costs and requirements for developing and using various methodologies. It can describe efficient and inefficient ways of using and managing them. It can show how to perfect their ideonomic character. It can render covert methodologies explicit, or help to formalize and codify them.

Help Model Things

Healthy science seems to combine several key and complementary activities: philosophizing, theorizing, modeling, experimenting, practical application, and criticizing.

Models enable one to: Rediscover reality; Test predictions, corollaries, and assumptions; Simplify and rectify one's calculations; Uncover limits and boundaries; Gradually adapt theory to reality; Extend theory; Explore complex and nonlinear relationships; Demonstrate one's ideas to others; Justify further pursuit and funding of one's work; Visualize better what one means; Interconnect what one is doing with what is already known elsewhere; Notice omissions and defects—or increase the organic wholeness—of theory; Think in a more practical way; Compare different theories, hypotheses, and assumptions; Establish proportional relationships; Economize (by freeing one from the cost and trouble of real-world experiments or full-scale constructions); Directly and fully manipulate the phenomenon that interests one; Examine a more extreme or complete version of a thing, phenomenon, or process than exists or is accessible to one—or subject something to extremes, conditions, or events unknown, rare, or poorly observable in nature; Experiment upon a thing without destroying the original; Re-create what no longer exists; Explore what is nonexistent, impractical, or impossible; Examine directly alternatives to a thing; Observe a thing in isolation from other things; Repeat an experiment endlessly and exactly; Explore dynamics, processes, and mechanisms; Examine the very origin and history—or the ultimate fate—of a thing; View a thing partially—or with certain of its features abstracted or others 'frozen' or disconnected; Examine a thing outside of time and unhurriedly; Expedite an experiment—or accelerate a phenomenon; Experiment upon the same phenomenon or event in endlessly many ways; Investigate a thing in a perfect, archetypal, or ideal form; Experience a prototype of a thing that one is planning to construct; Etc.

Models may variously be: mathematical, statistical, verbal, imaginary, graphical, analogue (say in which a selected process is used to represent some other process), scaled, logical, etc.

Among the things that have been modeled are: the universe (its start, present, and future), epidemics, pathogenesis, human thought, the psyche, social interaction, business cycles, nuclear war and its climatic aftermath, chemical reactions, biochemical cycles, ecological relations and interactions, events in the life of stars, galactic encounters, hurricanes, elementary particle interactions, nuclear reactor malfunctions, baseball games, earthquake genesis, computer architectures and programs, bridges, the spread and decay of civilizations, mathematical equations themselves, brain processes, fires, tree morphogenesis, and manufacturing processes.

There are infinities of parameters by which to alternatively represent simulated phenomena, and infinities of ways in which to represent those parameters and their values. In addition, there are infinities of alternative phenomena that one might wish to represent, and infinities of aspects thereof. Presumably the possible purposes, values, and human aspects of representations likewise encompass infinities.

The power of computers to model phenomena is increasing exponentially. As models are created they are stored for future use. Models lead to other models that are more sophisticated and complex. Models combine to generate compound and different models. Models of models and modeling itself evolve. Audiovisual technology relevant to modeling improves. Software, mathematical techniques, the form of scientific theory in general, logic, artificial intelligence, cognitive science, aesthetics, data storage and retrieval techniques - all of these things evolve in their ability to help man model and simulate things.

Although human knowledge is already mountainous, it continues to grow and differentiate explosively. It is this knowledge that can be used in the models we make. We need these models to reduce this knowledge to simpler, more essential, more powerful, and more useful forms. Yet the use of the models will itself give rise, both directly and indirectly, to more knowledge.

The infinite kaleidoscope of modeling possibilities presents an extraordinary challenge: to turn the present chaotic practice of modeling into an organized, fundamental, and universal science, under the tutelage or within the framework of ideonomy.

Among the things that need to be discovered are: What are all of the canonical ways of representing things? What are all of the ways of mapping things—both quantitatively and qualitatively—onto, into, and via all things? What are all of the relevant needs, idiosyncrasies, and possibilities of human neurology and psychology? What are all ways of presenting data to the brain in sensory space and time, or via sensorimotor interaction and evolution? How much can be communicated, known, and done at once? What is the maximal possible multiplexing of symbols, sensa, languages, percepts, thoughts, memories, and human purposes? Is the human mind capable of infinite, or only of finite and modest, abstraction? What meta-structures (hierarchies, series, networks, vergences, cycles, rings, trees, etc) can serve models, and what are the optimal ways in which they can serve modeling? In what infinities of ways can models—and the things they model, within those models—be combined, permuted, and transformed? What are the most powerful—and optimal—models of things we can create? The most realistic, elegant, energetic, complex, fundamental, informative, ingenious, clear or comprehensible, multilevel, encompassing, multidisciplinary, beautiful, exciting, etc? What is the capacity of the individual human mind and of mankind as a whole to be educated and trained to understand, appreciate, use, and create ever more diverse, specialized, generalized, abstract, and 'intelligent' models of things, ideas, and processes? What are all of the possible and best—or simply specialized—ways of combining, permuting, and transforming all familiar and possible sensa and percepts; and what are all the laws, paradoxes, interactions, paths, structures, systems, traces, spaces, manifolds, taxa, "groups", "categories", mathematics, matrices, contingent possibilities, etc thereof? What are all of the symbols, grammars, notational operators and forms, codes, ideographs, textures, shapes, color schemes, graphs, 'choreographies', etc that can be invented, discovered, and organized to serve models and modeling? What are the best and most important phenomena, laws, processes, things, concepts, relationships, experiences, events, etc to model?

Some of the most important GENERIC aspects and elements of things to model are: morphogeneses, analogies, differences, opposites and antisyzygies, paths, flows, order taxons, stories, motions, patterns, complexities, scales and ranges, bads, goods, commonalities, contents, functions, changes, conflicts, ambiguities, opportunities, problems and solutions, disequilibria and equilibria, symmetries and asymmetries, probabilities, games, perspectives, illusions, chains of consequences, and interdependences (apart from those things that were mentioned earlier).

The development and use of models on the scale imagined here should lead to the improvement and diversification of human intelligence, perception, learning, creativity, and work; the probable degree in which it should do this, and the maximal degree in which it might do this, are, however, uncertain.

Lessen Mortmain
Or the Stifling Effect of Habit, Tradition, and Orthodoxy

What already exists, what already is known, gets in the way of everything that would come after. This is a staggering problem. But because we identify with what we have, and can hardly see a thing that is not already familiar or a relatively trivial variation upon the old, we have almost no ability to recognize the problem or the harm that is done. The status quo looks just fine.

A prime cause of the problem lies in the hierarchical nature of our knowledge: the questionability of what we know is relative, and varies over an astronomical scale. Relative to certain things, some things are - or appear to be - virtually certain. But what if the simplest and seemingly most absolute and unquestionable things actually themselves have problems, albeit perhaps ones of - or regarded as of - a vastly less urgent or tractable nature? The result is apt to be that over the long term the subtler puzzles and imperfections are completely forgotten and the humility that ought to be associated with an awarenesss of them is lost. And that is exactly what has happened! We have lost sight of the fundamentally infinite and irreducible complexity of reality, or of the ground of reality above which all that we 'think and know and perceive' shimmers like some cosmic mirage.

How, then, to disengage ourselves from our grand (or petty) illusions and our microscopic appreciation of the Creation? How to dig deeper into the real nature of things and the limitless possibilities that knowledge obscures and achievement, ironically, asphyxiates?

One way would be to develop means that would re-enable, or perhaps permit for the first time, the free play of ideas and the progressive self-liberation of the human mind and spirit.

Ideonomy promises to provide such means. By getting at the (relatively) fundamental combinatorial elements that can generate or approximate the possibilities of existence in their systematic totality, ideonomy can give us a range of experiences that manifestly transcend the accidental and irrelevant restrictions of present-day life and of civilization's current intellectual norms, and that takes us far closer to the processual or dynamic essence of being.

Old habits of mind that deny the possibility of there being anything other or more than what we see, are taught, and believe can be dissolved away by exposure to the full participatory complexity of existence, to the mechanisms that everywhere give rise to the illusions of simplicity and uniqueness, to the paths untrodden that lead everywhere (save to where we have already been), to the interdependences both of ideas and of facts that are the sources of our complacency, to the ideonomic meta-structures against which any given vision of the world is as nothing, to the linguistic codifications of nature that at once give civilization its power and its stupidity, etc.

Ideonomy can help to combat habit, tradition, and orthodoxy in many ordinary ways.

Multivariate analysis, multidimensional scaling, and other statistical techniques can be incorporated into computer programs that will reveal, and both quantitatively and qualitatively describe, the many different and important idiosyncrasies of one's mind and mental habits, and of the ways in which one uses—by contrast to how other people use—concepts and words to say and perceive things and to create ideas. By making one aware of the fact and particulars of one's mental structure and processes—in both an absolute and comparative sense—these programs and methods will give people the ability to criticize, reshape, and transcend their rational and irrational habits.

Ideonomy can document the historical origins, course, and fate of transient intellectual traditions. The mesmeric effect, poverty, and cost of these traditions can be dramatized. A synopsis of these things can be included in the academic curriculum, but the larger results of such research can be made available to curious individuals working in different fields so that those individuals can clarify the nature of their own investigations within the framework of their own knowledge and ideas.

Ideonomy can comprehensively survey contemporary and historical theories, doctrines, hypotheses, investigations, and attitudes of a heterodox nature, and place these beside what orthodoxy has espoused. The true variation of beliefs, and range of thought, can be made better known in this way, and tolerance, freethinking, and imagination encouraged. The length, complexity, profundity, bitterness, and human comedy of these disputes will be instructive, and will surprise many persons who would have thought the resolution of the nature of things to be a simpler and more inevitable process than it was, or than it could ever be.

Even long-accepted doctrines often continue to have deep problems associated with them. They may have theoretical or methodological inconsistencies or contradictions, arbitrary and dubious features, unproven or disproven corollaries, limitations of scope, etc, that should be better known, or most closely attended to, than they are. Often such blemishes are never made explicit, or are hidden away in the secret lore of a discipline rather than being made known at once to those who are first learning the field at the time when they are forming what will be their most basic and enduring images of it.

Identify Needs

Examples of questions about specific needs that ideonomy could help to ask and answer are: What does an ordinary violin need to equal the instrumental excellence of a Stradivarius? What nonessential dietary needs does man have that have not yet been noted? What generic needs does a molecule have, for it to taste like a pineapple (that is, properties that encompass all actual alternative bases for pineapple flavor in their descriptive or causal universality)? What are all of the needs and criteria that an artificial (prosthetic) blood must meet to be successful (as a perfect substitute)? What conditions are needed to maximize the probability that life will begin on a lifeless planet? What initial properties must a 'universe' have to develop along the lines of our own? What needs of civilization have not yet been met - or realized to exist? What events are necessary for an elementary particle to decay in a certain direction? What is necessary for a symphony to be great, in the historical sense? What conditions must be fulfilled before magma deep within the earth will progress to the surface and erupt as a volcano?

Universal genera of things that may be needed include: knowledge, acts, proof, examples, models, theories, exceptions, generalizations, predictions, justifications, goals, precedents, instruments, efforts, etc; physical materials, energy, opportunity, conditions, circumstances, catalysts, sequences of events, thresholds, perturbations, constancies, connections, interactions or cooperations, controls, contingencies, limits, conflicts, beginnings, paths, differences, similarities, capacities, changes or transformations, combinations, groups of things, varieties, isolations, simplicities, adjustments, adaptations, competition, etc.

More specifically, there may be a need for something to: be present or absent, behave in a certain way, have a certain age, have had a certain history or be mature in some way, be guided over a certain course, be subject to a set of constraints, affect or interact with itself in some way, occur at a unique location or instant, be repaired or have its errors corrected, etc.

Possible generic effects of (absolute or unmet) needs include: drift, striving, stress, competition, malformation or misdirected development, underdevelopment or overdevelopment, aborted development, lack of strength or stability, cannibalism, self-consumption, retrogression, misbehavior or constricted behavior, underactivity or overactivity, impoverished appearance, inefficiency or waste, impaired evolution (as opposed to development), continuing growth, etc.

Different types or aspects of needs include: Ongoing, temporary, or periodic; Absolute, relative, or conditional; Synchronous or asynchronous (including sequential); Interdependent or independent; Progressive, regressive, or invariant; Quantitative or qualitative; Good, bad, or neutral; Generic or specific; Higher or lower; Partial or complete; Central or peripheral; 'Primary or secondary'; Intrinsic or extrinsic; Simple or complex; Etc.

Recurring questions in treating needs are: What will happen if a certain need is met? What will happen if a need is not met? What will happen if a need is only partially met? Is a need met, met fully, or met properly? How is a need met? Can a need be met in unconventional ways? What caused a need, or how did it originate or develop? Is the need growing or is it static? Is the need essential or can it be ignored? What other needs might the thing have? In what order should different needs be met? What tradeoffs are there between different needs? How can I discover what the needs of a thing are? How can I experiment upon the properties of various needs and upon their relationships to the thing that possesses them? How is one need similar to or different from another? How do the needs of a thing intergrade with other aspects of the thing, of a decreasingly or increasingly related or analogous nature? Might I be mistaking certain needs for certain other needs? Are there sub-needs or super-needs that are related to given needs? What systems of needs might there be? Apart from how it can be met, how can a need be controlled or altered? What do I not know, or do I need to know, about a need, and how can I find it out? What are the structure, elements, and laws of a need? What concepts underlie a need and how should the need be defined? Is a need real or merely apparent? How do the needs of one thing resemble or differ from the needs of other kinds of things? What are all of the consequencies, corollaries, and implications of a need? What is the full extent of what is known about a particular need?

The importance of ideonomic research into needs includes: Future recognition of needs may as a result be made more immediate, automatic, efficient, and comprehensive; Knowledge of given needs, or of other matters related to needs, can be used to predict the existence and nature of undiscovered needs—even in very different domains; Future needs can be anticipated and met in advance; Ways can be discovered or developed for meeting a multitude of needs at once, with the same means or measures and hence more economically; The world's scope, wealth, and scale can be augmented by retiring and answering needs en masse; Unsuspected needs must be the source of many unexplained problems; The essence or real importance or promise of many things may not be realizable or recognizable until many or all obstructive and inhibitory needs are met; Needs of things, generally, are apt to be far more diverse, complex, and subtle than has hitherto been assumed; Many needs may be answerable in surprisingly simple ways; Many needs can probably be obviated; Knowledge of needs is required if many other divisions of ideonomy, or ideonomy as a whole, are to function effectively or fully; Etc.

What progress was made historically in answering genera and species of needs? How were the needs discovered, explored, and met? What benefits accrued? Were the needs met only partially? What needs are growing larger, more urgent, or more dangerous at the present time? What needs reinforce other needs? What myths, fictions, fallacies, and illusions exist regarding needs? What mathematical relationships and patterns are characteristic of needs in general? What are the most extreme or anomalous types of needs? What theories might be developed to explain certain classes or sets of needs?

Depict Networks

The networks that things, events, and ideas are, contain, are contained in, are controlled by, or may otherwise involve or interact with, represent a vast, fascinating, and yet poorly studied subject and a major interest of ideonomy. The network is one of the most fundamental and universal genera of structure - or meta-structures - found in nature. Networks must be explicitly or implicitly present in any description of reality.

Networks might loosely be defined as self-connected and anastomosed multiply-branched patterns or systems. Yet the definition is neither comprehensive nor exclusive in any absolute way - if only because the universe is too complex, subtle, and paradoxical to dignify any humanly conceived or conceivable absolute, or to conform to the artificial simplicities and umbrageous metaphors of human language.

Illustrative known networks include: Gel microstructure; Electrical circuits and electronic microchips; Road networks; Body's circulatory system; Networks of human associations; Telephonic networks; Intracellular cytoskeleton; Microstructure of the Dirac quantum-mechanical vacuum; Networks of ecological interactions and relationships; Computational networks in massively parallel computers or in neural nets; Neuropile of the cerebral cortex; Crystal lattices; Networks of economic transactions and industrial flows; Clay microstructure; Crosshatched earthquake fault systems; Cave labyrinths; Mazes; Joint systems; Haptic and visual textures; Networks of strings of hyperclusters of galaxies, or the like; Braided river channels, say on a deltaic plain or in an estuary; Interconnected and interwoven biochemical pathways; Textile fabrics; Tessellations (tile patterns); Arrays of convection cells; Honeycomb; Protein molecule (anastomosed via bonds, fields, or systems of motions); Porous microstructure of topsoils or aquifers; Cellular networks represented by tissues; Interference patterns; Foam; Certain mathematical groups and matrices; Semantic networks in artificial intelligence; Explicit or implicit networks of cross references in a dictionary or encyclopedia; Mental structure and interactions; Polygonal crack systems of patterned ground; Obscure dynamical networks represented by (or at least known to be present in) turbulence; Etc.

Possible effects, values, or uses of networks include: They can model or explicitly define and show the complex interrelations and interactions of multitudinous things, concepts, processes, and domains; They can provide an instant overview of the whole of something; They can facilitate the dispersed or central coordination, control, and government of an entire subject or thing; They can serve the flow and interflow throughout a thing of energy, information, matter, resources, effects, products, events, agents, adjustments, ideas, innovations, etc; They enable the simultaneous, synchronous, and synergistic combination of a maximal number of different—related or unrelated—things; They maximize the possible or coactive redundant or irredundant—and homogeneous or heterogeneous—paths that things are able to take between or among things; They can maximize the descriptive or existential dimensionality of the relationships between or among things; They can assist the teaching, planning, construction, or further evolution of a thing; They can

facilitate the quick, efficient, and repeated growth and contraction of a system or of a thing qua system; They can facilitate the interactions or define the interrelations of a thing with itself; They permit the multiplexing of flows and interflows—or the minimization of their mutual interference and confusion, and the maximization of their separation and concentration; They enable the simultaneous comparison of a maximal number of things; They enable a single thing to control or communicate with many or all things, or many or all things to control or communicate with a single thing; They can facilitate the maximally fast transformation or reorientation of a thing; They can minimize the path between arbitrary pairs or sets of things; They can simultaneously define all of the possibilities of things inter se; They can help with the treatment of maximally complex things; Etc.

General or possible elements, properties, or dimensions of networks include: Nodes, centers, intersections, points, vertices, joints, poles, knots, singularities, etc; Links, edges, lines, paths, intervals, branches, etc; Reflections, refractions, diffractions, etc; Convergences, divergences, decussations, vergences, radiations, trees, etc; Domains, neighborhoods, faces, holes, etc; Loops and cycles; Transmissions, traffic, flows, signals, noise, messages, etc; Combinations, permutations, transformations, inversions, rotations, oscillations, translations, etc; Maxima, minima, and optima; Linearities, nonlinearities, functions, operands, operators, dimensions, manifolds, symmetries and asymmetries, transitivities and intransitivities, sources and sinks, sequences and trajectories, subgraphs, gates, occupants, games, weightings, probabilities, obstacles, partitions, rules, etc.

Possible genera of network relationships and/or of things connected in and as a network include: choices, decisions, possibilities, alternatives, probabilities, facts, evidence, ideas, dependences, independences, interdependences, relevances, importances, applications, origins, destinations, flows, motions, interests, corollaries, hypotheses, needs, causes, effects, consequences, products, adaptations, sequences, series, degrees of freedom, aspects, structures, examples, taxons, definitions, analogies, equivalences, measures, times, places, components, antagonism, synergism, events, topics, systems, phenomena, differences, conditions, qualifications, changes and transformations, tactics, questions, answers, generalizations, specializations, means, numbers, mathematical relations, problems, niches, assumptions, bads, goods, combinations, complexities, simplicities, conservations, nonconservations or losses, correlations, extensions, discoveries, individuals, groups, laws, levels, mechanisms, opportunities, functions, etc.

Questions about networks that ideonomy can help to ask or answer include: What is a network—as opposed to those classes of things that resemble or differ from networks? How does or could a network start, develop, evolve, regress, or vanish? How do networks facilitate their own development? How do networks govern or interact with themselves? What are the most complex—and the simplest—actual or possible networks? What networks coexist? How do different networks ignore, interact with, cooperate with, interfere with, govern, compete with or oppose, alter, and give rise to one another? What is the incidence—and the full range and diversity—of networks of every possible and actual type? Are there both finite and infinite networks? How many different networks do

particular or random things—phenomena, realms, processes, concepts, etc—involve? Are networks absolute or relative; or what perspectives may they depend on or belong to? How multiplexed are networks, internally and mutually? What are all of the signs of the existence, nature, effect, or importance of a network? How could or should networks be studied or otherwise treated? What undiscovered uses might networks have? What networks do not yet exist but ought to be created? What are the most important networks to study, in connection with different fields, phenomena, and problems? What methods, means, and materials could facilitate the universal study of networks? What are the most difficult problems, questions, or aspects of or connected with networks? How do those things that traverse networks actually traverse them; what routes do they take, what governs their travels, and what experiences do they have along the way—or changes do they undergo? What is the relative extent—and the integral anatomy—of our knowledge and ignorance of networks and network phenomena? What research has and has not hitherto been—explicitly or implicitly—conducted upon networks? How should all networks be classed in terms of all other networks? What are all known or as yet undiscovered concepts that are relevant to the consideration, investigation, or use of networks? What universal laws of networks need to be, and can be, developed; and how might such laws function or be used?

Illustrative unknown or speculative networks include: The infinite —and perhaps infinitely strange—network of interrelationships and interdependences that must exist within the total structure of mathematics; Hereditary and evolutionary networks belonging to lateral gene flows across the bios; Networks of relationships and interactions—within or even beyond our universe—of various exotic physical entities that have been hypothesized (incl. tachyons, negative mass, advanced potentials, dark matter, cosmic strings, etc); Whatever networks might arise from or be associated with Carl Jung's concept of synchronicity ("an acausal connecting principle" hypothesized to lie behind the most extraordinary coincidences of life and the cosmos); Panhuman and all-historical networks of linguistic, folkloric, musical, or other cultural interaction, diffusion, or coevolution; Various heterodox flows of information or control that could be theorized to occur within the human body or among its distant and manifold parts (e.g. flows of extreme velocity, flux, power, efficiency, or complexity); Etc.

What are all of the relationships of networks to other meta-structures and of those other meta-structures to networks? For example, what networks of hierarchies—and hierarchies of networks—exist or are possible; and what properties, dimensions, paradoxes, forms of behavior, powers, and opportunities pertain to them? Similar questions deserve to be asked about: Networks of trees and trees of networks; Series of networks and networks of series; Etc.

The potential size and intricacy of some networks may be suggested by the example of the human mind. The mental structure of the brain could conceivably represent a network whose full description would require roughly the number of bits of information that would be contained in 10 exp. 14 sets of the Encyclopaedia Britannica.

Suggest Higher Niveaus

Ideonomy can suggest one or more—or infinitely many—higher levels or plateaus of existence, achievement, or transformation—past, present, or future—in an evolutionary progression.

More generally, in connection with such niveaus it can suggest or assist with the treatment of: minima, maxima, and optima; conditions, circumstances, properties, laws, cycles, contingencies, perturbations, thresholds, transitions, transformations, emergents, relaxations, continuities, discontinuities, causes, forces, effects, origins and ends, resources, opportunities, losses and gains, states, configurations, stochastic and deterministic processes, illusions, paradoxes; flows, courses, and paths; convergences, divergences, and vergences; games, processes, and events; ranges, hierarchies, generalizations, elements, relations, analogies, differences, types and taxons, sets, defects, perfections, unknowns, needs, fundamentals, interferences and cooperations, predictions, theories, transvaluations, principles, strategies, goals, interests, appearances, questions and answers, economics, inversions, interdependences, opposites, manifolds, reciprocities, symmetries and asymmetries, etc.

By chance or necessity, the past evolution of life on Earth has arguably passed through a series of niveaus, which makes it likely that it will exhibit a future sequence of niveaus as well. Ideonomy could help biologists to define or speculate upon the latter possibilities, and this could benefit their science in many ways. For example, simulations of future biological niveaus could clarify historical niveaus.

Those who exist at a given niveau often suffer from illusions of its specialness, finality, or even eternality. Momentarily a multitude of things may all converge to a single state or in a common direction, making subsequent divergence seem highly improbable. Diverse phenomena often have a tendency to relax, stall, or reverse synchronously—owing to such things as the rich and queer interconnectedness of the world's phenomena, exponential multiplications and propagations of effects, superabundance of natural symmetries and asymmetries, competitive forces in the cosmic background, etc—which again can give rise to an illusion of an irreversible law. Thus we in the present may be blinded by the present to possibilities for social change and evolution in quite other directions than those with which alone we are familiar.

The overwhelming tendency of biological evolution could be toward specialization confined to a plateau or within certain limits; the course of life on Earth since its (relatively) indeterminate beginning may therefore mask vastly greater—and altogether strange—evolutionary possibilities. Life created in the laboratory, and perhaps patterned on no life known to us now, might give access to transcendent biological niveaus.

It may be possible to advance physical phenomena to higher niveaus by drastically increasing either the disconnection or the integration of the (so-called) elementary constituents of those phenomena—at extremely high or low pressures, temperatures, energies, etc.

It is possible that man's spectacular transanimalian intelligence represents nothing more than the modest ascent from one mental pleateau to another that resulted from a few intrinsically minor changes in the brain, and that vastly higher intellectual niveaus are attainable through additional minor but appropriate neural alterations.

Ideonomy could lead to the discernment of possible higher niveaus of such diverse things as: Genomes (which might be given far more powerful, efficient, and adaptive self-regulatory systems); Foods (whose taste components - not designed by nature with the human palate in mind - could suddenly be adapted en masse, so as to perfect mankind's 'gustatory' existence); Diseases (such as might one day result from revolutionary pathogens—caused by naturally or artificially punctuated evolutionary equilibria or by biological engineering); Languages (which through sets of scientifically guided rule changes might be capable of a much higher level of functioning—or of much greater precision, scope, suggestiveness, etc); Earth's interior (which might be capable of evolving into 'higher' geophysical regimes—or of becoming geophysically more active, more complex, "chaotic", radically different, or the like); Mathematics (which might one day admit of an enormous—pure or applied—simplification); Chemistry (which in the future might, for example, come to be based almost entirely upon the chemical reactions and states of minimally stable molecular species); Etc.

Treat Obscurity and Ambiguity

Things may be said to be "obscure" if their appearance, form, type, basis, nature, content, relations, nature, essence, behavior, implications, boundary, worth, interest, existence, or the like are not readily, fully, or at all understood. "Ambiguity" can refer to duality, multiplicity, diffuseness, inconstancy, or indeterminacy of meaning, significance, reference, nature, state, course, potential, form, etc (whether real or supposed).

Distance in time or space, ignorance, obscurantism, interferences or perturbations of things, obstructions to or distortions of perception, inattention or disinterest, poor conceptualization, complexity, the inherent difficulty of things, inconsistencies, meagerness of acquaintance, unresolved issues, and indeed ambiguities: can all cause, or be the cause, of obscurity.

Things that can cause or contribute to ambiguity are: Incompleteness of development, formation, evolution, transformation, reaction, or adaptation; Chaotic state; Multistage existence; Polymorphism or pluripotentiality; General or universal character; Unfamiliarity of type, or defect in schemes of classification; Ambitendency; Mimicry or natural analogy to other things; Conflicting forces or circumstances; Divergent perspectives, representations, or uses; Inexact or undefined boundaries, or failure to exclude alternatives or to distinguish other things; Indecision; Design, or multiplicity of function; Obscurity; Etc (also see the above definition of ambiguity).

Among the reasons why ideonomy can help with the treatment of obscurity and ambiguity are: Their types can be categorized, classified, described, and systematized—and they recur over and over again in characteristic ways; Their types and instances can be treated and resolved—and much more efficiently—en masse; They may depend upon or be a function of—or invite treatment by—other divisions of ideonomy; Ideonomy can be used to develop and perfect methods, principles, concepts, and procedures for the treatment of anything whatsoever; Ideonomy enables things to be conceived of and expressed in much more subtle, complex, and rigorous ways; The long-term effect of ideonomy should be to maximize the logical, combinatorial, and spatiotemporal integration of all forms, methods, and themes of research (both scientific and cultural); Obscurity and ambiguity are often superficial—much of the difficulty in treating them derives from the scarcity of starts in treating them or of clues as to how to begin, and is not intrinsic or proportionate to the real task, which may be elementary—and ideonomy can catalyze, as well as motivate, the solution to almost any problem; Etc.

Among the many things that are or can be ambiguous or obscure are: The sky's aspect or changes in the weather; The good and evil of public charity; Facial expressions of one's spouse; Newspaper headlines; Facts or statistical data; Musical chords and themes; The overall course of biological evolution; Cosmogonic 'initial conditions'; Life's meaning and purpose (actual or so-called); Beauty—as of a painting or person; State of the economy; One's feelings or inclinations; Success or tragedy; Proofs; Humor; Trade routes of vanished civilizations; Social trends or civilization's grand course; Course of a battle; Causes of a marine algal bloom; Outcome of experiment designed to test the Einstein-Rosen-Podolsky paradox (or for nonlocal effects of one distant quantum particle on another); Etc.

The costs and other effects of ambiguity and obscurity can be many: Understanding and teaching things may be made far more difficult; Generalizations may be or seem more hazardous or dubious; Corollaries and implications that would otherwise be automatic may be precluded; Research that is in a hurry—which is most research—is liable to rush off to other matters; Evaluating the value of research or endeavor, either in advance or retrospect, may be much harder; An otherwise masterful proof may be rendered worthless; Every step in an endeavor—even the most trivial—may be entangled in difficulties; Mysticism and charlatanry may thrive in the murk; Attempts to automate the treatment of a problem that require flawless computer programming at every point in a sequence or network may be futile; Intolerable need for safeguards, redundancy, and compensations may be created; Mischievous illusions of novelty, complexity, difficulty, profundity, etc may be engendered—or useful and desirable illusions of a similar kind, say whose value derives from their suggestiveness or their ability to stimulate or guide the mind; Defective communication and unilateral or bilateral ignorance of same; Unavoidable reduction of the simplicity, fundamentality, and universality of statements or information; Etc.

Help Circumvent Obstacles

Many people are unable to solve problems because, quite simply, they do not know how to solve problems. They may not even know what it means to solve problems.

It is important to give people the widest possible exposure to problems and their ways of being solved; and to dramatize the extent to which problems have been and are being solved. But how might this be done? What can be done to radically improve upon the existing situation?

Some individuals will object that there is only so much that can be taught, that students can easily be overwhelmed with too many problems and methods, that if what is presented is too diverse it will lead to overgeneralization, superficiality, and a chaos of the mind.

Yet is there necessarily a limit to the amount that we can be taught? Might not the amount ultimately depend upon the ways in which things are taught or upon our capacity to innovate? Can we speak of overgeneralization without knowing the degree of generality that is intrinsic to nature or that the universe demands of mankind?

Traditional answers to these questions may be corrupted by fallacies and preconceptions. Many are the great questions that have long since been answered - erroneously.

Few problems - if any - are truly elementary. Most can be decomposed into two or more component problems or sub-problems, which may be analyzable in turn into series, clusters, and networks of problems of lesser and lesser order or of ever greater number, diversity, specialization, or disconnection.

Problems seemingly or truly insoluble at one level may be soluble at some quite different level; or they may require solutions at many levels simultaneously and cooperatively. They may require one to work back and forth between a set of levels sequentially and perhaps improvisatorially.

Problems can likewise be decomposed into elements that would not ordinarily be described as problems. The number of these elements may be finite or virtually infinite. In the latter case there may exist subsets whose discovery and exploitation permits one or more, often subtle and surprising solutions to the problem. But in either case the problem may be solvable via few or many combinations, permutations, or transformations of the elements or subsets of the elements; indeed the problem may have originated from, or be a matter of, the combinations or their kith.

Many problems are in an analogous way presided over or derived from larger or higher-order problems, or systems or series thereof. Their alternative, best, or necessary solution may likewise be vicarious or conjoint, or involve the solving or curtailment of the super-problem or meta-problem.

Many apparent problems are really pseudo-problems: an illusion of a problem produced through ignorance, misunderstanding, one's own designedly constructive or innocent actions, a misrepresentation of the problem or situation, or a simple failure to treat the problem as inconsequential or interchangeable with equivalent or quasi-equivalent problems.

Many problems are in fact but reincarnations of oneself, or unconscious externalizations and anamorphoses of one's internal problems; for being such they can seem all the more real and at once special and specially important (which they may not be). Problems of this sort may require one to investigate and alter oneself.

Problems of a purely relative nature are common. Their appearance, essence, importance, or very existence may depend upon or derive from the appearance, essence, structure, tendencies, complementarities, or effective prejudices of the environment, circumstances, or larger context in which the problems are encountered or which one shares with the problems.

Most of the time problems are understood and solved only in the most superficial, expedient, elementary, formal, and supposititious way; that there are deeper problems and solutions may not even be realized. Possible consequences of this are many: Bad habits form that could be avoided; Collective knowledge becomes less integral, fundamental, and reliable; Revolutionary possibilities are overlooked or discounted; Existence - ways of doing things - become needlessly complex; Problems are mailed to others; Mental skills are left undeveloped; Cowardice becomes institutionalized; Etc.

Ideonomy can take a random or particular problem and reveal the scope, complexity, and profundity - the universal grandeur - of that didactic problem in a fantastic and unforgettable way. Nothing rivals the instructive power of a memorable example.

Problems can be transformed into other problems and other types of problems, and back into themselves. Knowledge of the local and universal transformations of problems - which can be cultivated, systematized, and taught - can aid the classification, analysis, synthesis, and reduction of problems and even enable them to be exploited. No form of knowledge is more powerful than dynamical knowledge of a thing, which affords true mastery.

If one knows about all of the possible transformations of problems, those problems or their equivalents can be recognized whenever and wherever they occur in nature or human experience; and all that one knows about those problems from their occurrence or feasibility in other contexts and domains can potentially be imported and made use of in specific situations.

General types (and causes) of problems include: Excess, redundancy, oversupply, or overproduction; Deficiency, underproduction, lack of redundancy, limitation, or boundaries; Absence of boundaries, constraints, rules, order, control, or government; Blindness, inattention, ignorance, lack of feedback, etc; Stupidity, poor planning, fallacies, etc; Error; Conflict, contradiction, antagonism, opposition, friction, obstacles, or interference; Accidents, surprise, or disaster; Damage, loss, wear, or failure; Instability, change, or deviation; Bad timing; Crisis; Pathology; Contamination; Confusion among things; Overreaction; Disrepair or maladjustment; Isolation; Overburdened condition; Haste; Stagnation; Indecision; Overdependence; Congestion; Undesirable or excessive feedback; Etc.

Recurring types of solutions to problems include: compromise, prevention, mitigation, ignoration or hiding of the problem, approximation, containment, revisualization, restructuring of a situation, etc.

Bring To Light Important Omissions and Neglects

What does not exist? What is it that things are not? What in human history or existence has been omitted or neglected?

What most certainly has been neglected is this very set of negative questions, or attempts to answer these questions in any serious, comprehensive, and systematic way.

Yet negative things are not necessarily inferior in importance to positive ones, and in many respects both are profoundly complementary to one another.

Attempts to define what is nonexistent often lead to the discovery of things whose existence was neither known nor suspected and that may not even have been imagined. And on the other hand, research that seeks to discover, map, and understand the existence of things frequently reveals the surprising or unsurprising absence, invalidity, or partiality of various things, of a related or different nature.

Yet if things—even nonexistent things—are not deliberately sought they may never be found or they may only be found belatedly.

The things that are missing or neglected may be essential to human reason or purpose, or to the plenitude of the universe: some piece of a theory, some corollary of a postulate, some proper element of human nature or of civilization, some variation within a musical composition without which its statement of an aesthetic idea will remain incomplete or disturbingly self-ignorant, some residual physical particle needed to complete and vindicate a group-theoretic scheme, some link in a lengthy mathematical proof, some exception to a rule or relationship, etc.

A surprise may be that the set of things that are nonexistent is larger than the set of existent things; in which case it may actually be more important. Then again, an important discovery may be made that there is nothing that is nonexistent, either because other things are fundamentally impossible or meaningless, or because all possible things have a surprisingly great tendency to exist, or factually coexist for some surprising or unknown reason.

The existence, discovery, or achievement of things characteristically blinds one to the entire realm of the nonexistent; and what is worse, it blinds one to the fact of one's blindness, or even to the knowledge of what it would be mean to be sighted.

We have discovered vitamins, organic substances a small quantity of which is essential to the nutrition—to the survival or health—of certain species of organisms, although as nutrients they contribute neither energy nor building units. Yet attention to this class of indispensable nutrients has probably diverted science from the parallel discovery, investigation, and exploitation of a class of analogous but not strictly—or at all—essential nutrients: e.g. organic substances merely contributory to the vitality of the species, or key to a subpopulation within the species, or part of various substituent groups or groups of substituents collectively encompassing masked nutritional needs.

Years of research and tremendous ingenuity may go into the development of a sealant for the cylindric parts of a rocket, yet the possible effects of frigid weather upon that sealant may be overlooked, and this omission or neglect may eventually lead to a disaster.

For decades ever more powerful serial computers may be developed, but single-minded concentration upon the evolution of such computers, and spectacular accomplishments ensuant upon their use, may perpetuate and solidify ignorance of alternative, non-serial (massively parallel) architectures for computers and of the unique powers and possibilities they might have.

Historically the tree of science has shown a tragic tendency to rashly branch and grow in only one direction, to the neglect—or without any apparent awareness—of complementary or synergistic alternatives, and science has needlessly wasted much time in backtracking and rebalancing itself. Moreover, many great imbalances have probably gone uncorrected to the present day and done incalculable harm.

We think of human reason as pure and general, and yet it is quite likely that the neurological evolution of animals has ultimately equipped Homo sapiens with a brain that is very specialized and idiosyncratic, and for which many forms of logic—needed to understand different facets of nature—are difficult or impossible. This chance and conceivably grotesque brain of ours, moreover, may preclude the future emergence of dimensions of human behavior and character that are of the utmost importance to the perfection of civilization. Yet it might be necessary for one to possess such dimensions to fully appreciate their importance.

Ideonomy permits one to know many things indirectly that cannot be known directly or in conventional ways. It enables one's knowledge of what one knows to be transformed into knowledge about what one does not know. It allows knowledge to be amplified in a variety of ways. Through it one can acquire vital prior knowledge about the fundamental possibilities for knowledge.

Possible separate and combined reasons for the nonexistence of things include: mutual exclusion, past extinction, abortion, chance, lack of preparation, untimeliness, inadequate resources, lack of a proper environment or regime, enemies or antagonistic conditions, excluded paths or directions or irreversible evolution, illusory nonexistence (mere hiddenness), lack of a trigger or of a 'seed' or beginning, contradictoriness, past transmutation, virtual nonexistence within a limited frame of reference, self-destructiveness, oversight, etc.

Some recurring questions when treating omissions and neglects are: What else was neglected—or was anything else neglected? If the thing was formerly neglected, should it be neglected now or in the future? Should something else be (or have been) neglected instead? What were all of the costs and risks of the omission or neglect? What good is associated with the neglect? What kind, or kinds, of neglect did the neglect represent? What causes a neglect? What are all of the effects or corollaries of a neglect? What are the least and most important

things that have been neglected? What can and should be learned from the study of a neglect? What is and is not known about a neglect? Can a neglect or omission be corrected, and what are all methods and means for repairing same? What are all ways and dimensions by which to quantify a neglect? What is the best way to define or describe a neglect? How is a given neglect similar to or different from other neglects?

Among the things that may not exist (or occur) are: beginnings of the universe, earlier universes or things preceding the universe, ends of the universe (in time or space), other universes, other biological or intelligent life—or other technological civilizations—in the universe, divinities, universal purposes or 'meanings for existence', the fundamental flow of time (which could be an illusion), fundamental physical forces (beyond the four known), exotic physical particles (such as magnetic monopoles, subquarks, or mere gravitons), a transuranic "island of stability", a supreme universal physical force, absolute laws of nature—or ways around those universal laws that have been postulated, etc.

Help Explore and Exploit the Omniverse

The dictionary defines "omniverse" as a universe that is spatio-temporally four-dimensional. The word could be used to refer to the totality of spacetime—to all that is, has been, or will be. In ideonomy the Omniverse—capitalized—is the universe of all real things and real possibilities.

The Ideocosm, on the other hand, is the universe of all possible things and ideas. This is conceived of as having a universal, unique, and necessary structure that can be systematically and progressively explored, mapped, and exploited. It is supposed to have its own laws, phenomena, and even forces.

However, ideonomy is a science, not a school of philosophy, and for this reason it itself takes no stand on many deep philosophical questions in connection with the interrelations of the Omniverse and Ideocosm that remain troublesome and unanswered: the question, for example, as to whether the Omniverse and Ideocosm are identical. Of course ideonomy can, and no doubt eventually will, make an important and special contribution to the effort to clarify and resolve these supreme problems.

Clues as to the possible interrelationship of the Omniverse and Ideocosm may be gotten from mathematics, a science that is very similar to ideonomy and in certain respects is synonymous. The universe that is represented by all of the known and as yet undiscovered elements of mathematics has, it has been remarked, a profound unity and self-connectedness. Moreover, it appears to have a queer isomorphism to the physical universe, and to exercise either a partial or absolute power over the latter. The logic of mathematics, that is, seems a cousin—perhaps a twin—to physical logic. Mathematical ideas—ideas rooted in mathematics—transcend mathematics.

The stuff of the Ideocosm—its laws, phenomena, relationships, and processes—would appear, at this early stage in the development of ideonomy, to exercise an analogous power over physical reality.

Perhaps the patterns that define reality are simply the common property of mathematics, ideonomy, and physics.

There are a variety of ways in which ideonomy can enable the exploration of the Omniverse and Ideocosm.

It could begin anywhere—or with any topic, problem, or concept—and search for things of an analogous or related nature that must coexist. It could then define the class or classes represented thereby, or to which the things in question simultaneously belong. It might then seek a few higher and lower taxons that in some sense contain or are contained in that class or those classes. Using these taxons as 'seeds', it could then define their range, structure, and raisons d'etre more precisely. Perhaps it would seek the principles, relationships, or patterns that generate these taxons. In any case, it would attempt to identify, based on the foregoing, the general taxological scheme—with all of its many levels, elements, meanings, and extensions—that pertained to the situation.

Transformations of this scheme into other taxological schemes able to classify other kinds of things in more or less analogous ways might be found. These classificatory schemes could then be adapted so that they would also be able to function as schemes defining what should or must coexist as or in connection with the new things. Further adaptations might reveal things that must coexist within the framework, or in terms of the joint requirements, of all or many of the different schemes simultaneously.

Many things would have to coexist simply because they are unexpectedly tautologous.

The evolving enterprise could also require, or be made to require, simple existence—not just the more demanding coexistence—of things.

This hints at an all-important principle: that the development of of such an ideonomic structure or system can and should be deliberately 'pushed' in many different directions, or forced to take on desired properties, to achieve certain goals, and to undergo maximal or optimal growth and evolution. Bases for exponential progress of the whole, for example, are especially important.

Such a structure or apparatus requiring in a progressive way the existence of more and more things might only naturally point to the existence of things of every greater diversity or range of properties; or in other words, come to require things related to more and more of the world as we know it.

The enterprise here envisioned would not only explore a finite part of the Omniverse, but provide infinitely reusable machinery for the further exploration of the Omniverse in all future times. Moreover, it would inevitably enable the creation of other and more powerful ideonomic machinery for the same purpose but on a larger and more diverse scale.

Furthermore, in the course of time the ideonomic machinery developed for the investigation of the Omniverse would continually increase in efficiency, flexibility, intelligibility, automation, etc.

And of course comparable machinery could be developed for the systematic exploration of the Ideocosm.

Suggest Opportunities

The feasibility, importance, and appropriateness of things vary profoundly as a function of time or in various situations and circumstances.

Opportunities arise that did not previously exist, that are better than others, that can only coexist or that inevitably coexist, that derive from earlier—or permit subsequent—opportunities, that are incompatible or antagonistic, that are similar or equivalent, that are different or opposite, that are orthogonal, that are related or connected on lower or higher levels, that pertain to entire systems or infinite chains or networks of opportunities, that are part of exponential series of increasingly numerous, diverse, large, or better opportunities; that are two-edged opportunities for both or either good or bad things to happen; that if overlooked—or not exploited or appropriated—by onself or by one thing, are liable to be used by some competitive or inimical party, thing, phenomenon, or tendency; that are essential or decisive for the development, course, or transformation of a thing; that do not always exist or that are rare, unique, or supreme; that will not persist or that are literally instantaneous; etc.

Recurring and general causes of opportunities include: coincidences or combinations of things, drift of circumstances, anomalous events, deliberate or spontaneous removal of obstacles, inversions or reversals of situations, emergence of new things, maturation or evolution of things or consummation of plans, triggers, precedents or anlages, chaos, settled conditions, attainment or crossing of thresholds, forks in the road, search for or discovery of opportunities, intersections of paths or convergences, errors, interruptions, collapse of the status quo, mathematical singularities, arrival at a step or point in a sequence, abatement of an antagonist or of opposition, other opportunities, beneficial forces; sudden knowledge, insight, or disillusionment; appearance or acquisition of new methods, means, or resources; disappearances of other things or the abandonment or creation of niches, oscillations of things or cyclic events, gaining of control over things, synergisms or 'resonances'; regeneration, repair, or correction; external help or guidance, usefully 'analogous' situations or factors, reorientations or redirections, changes in the environment, changes of location, trains or chains of events, adjustments or adaptations, surprises, conflicts or other problems, etc.

The possible range, diversity, and extremity of opportunities needs to be speculated upon systematically. For example, might there be opportunities for: Chemical reactions to change in mid-course or initially take very different courses; Our universe to have taken disparate courses in the beginning; Reinforcement and conditioning of brain states, animal behavior, or even alternative ontogeneses of plants; Sudden establishment of a lasting world peace; Unrecognized types of interstitial businesses; Geochemical cycles to become "chaotic"; Telephone systems to fail in thousands of different ways; Any wrestler to defeat any wrestler in any wrestling match; Etc?

More generally, there are constant and pervasive opportunities for: Being heard (paid attention to); Catalysis or triggering of things; Closing deals; Making points; Escape; Error or failure; Accidents; Catastrophe; Testing, checking, or verifying things or performing experiments; Business enterprise; Seizing control; Theft; Taking rest; Putting plans into effect; Correcting problems; Effecting repairs; Deceiving people; Giving or getting misimpressions; Explaining things; Saving money; Finishing tasks; Changing one's mind; Aborting or reversing actions or processes; Making announcements; Altering, rearranging, or redirecting things; Innovation, starting, or introducing things; Learning or finding things out; Making observations or noticing things; Acquiring things; Thinking about something; Losing things; Doing harm or destruction; Occurrence of problems; Repeating something; Getting rid of things; Getting behind (slippage); Catching up; Asking questions; Misunderstandings; Things falling out of adjustment; Occurrence of chaos; Comparing one or more things; Improving, advancing, or benefiting things; Replacing, substituting, or exchanging things; Leakage; Enjoyment; Using things; Gaining insight into things; Conflict; Movement; Occurrence of things; Negation or invalidation of things; Emergence of new species; Synthesis or unification; Transitions or transformation; Emergence or development of things; Cooperation; Interaction; Reactions or responses; Interference or disturbance; Etc.

Opportunities may cause or have as their effect, consequence, or postcedent: No change (the status quo ante); Competition; Innovation; Conflict; Learning; Interadjustment; Self-adjustment; Assimilation; Growth; Improvement or evolution; Movement or relocation; Transformation; Counteractions or suppression; Other opportunities; Continued survival; Negotiation or exchange; Ecological adaptation or revolution; Flight; Complacency; Neglect of the opportunities; Struggle, stress, strain, or failure; Cogitation, debate, or experimentation; Generalization or specialization of the opportunities; Actions that secure or reinforce the opportunities; Changing of priorities or rescheduling of things; Reinforcement or amplification of an existent thing or situation; Reorganization or redistribution of resources; Separation or division; Oscillations; Extension, formation of connections, or integration; Disequilibrium; Energetic behavior; Illusion; Differentiation or dedifferentiation (relaxation); Costs, wastes, or risks; 'Winners and losers'; Freedom from constraints or liberation; Restratification; Changes of role, function, use, value, meaning, goal, or mechanism; Etc.

Possible descriptive or other properties or dimensions of opportunities include: age or recency, probability, reliability, availability, simplicity or complexity, genericness or specificity, breadth, depth, clarity or obscurity, amplifiability, interest, importance, stability, variability, competitiveness, optimality or imperfection, controllability and manipulability, multiplicity of significance, rarity or frequency, analogizability or uniqueness, essentiality, persistence, priority, exploitability, purity, proximity, imminence, magnitude, number, fungibility, investigability, range and diversity, reducibility and separability, etc.

Point To the Ways In Which Opposites Meet and Merge

When things of an opposite or seemingly antithetical nature meet, intersect, unite, mimic one another, or exhibit interdependence, complementarity, or synergism, this is termed antisyzygy or an example of antisyzygy.

The inevitability, ubiquity, endless recurrence, fundamentality, universality, infinite diversity, essentiality, and complexity of antisyzygies—throughout nature and in every dimension of our lives—makes the subject one of the most profound and important in all of ideonomy.

The relevant questions are: What are all known and possible opposites to all known and possible phenomena, concepts, entities, quantities, terms, principles, processes, etc? What are all of the known and possible ways, senses, and degrees in which all such opposites 'meet'? What are all of the known and possible effects, corollaries, importances, and implications of antisyzygies? What are all of the ways in which, and reasons for which, opposites do not meet? What are all known and possible direct and indirect causes, mechanisms, and geneses of antisyzygies? What are the laws and principles of antisyzygies? How can antisyzygies be usefully exploited? How do different antisyzygies interact, cooperate, and conflict? What are all possible levels, dimensions, and meta-structures of antisyzygies? How can all antisyzygies be classified in terms of one another, and what are their analogies, differences, and complete relationships? What are all of the properties, forms of behavior, and transformations of antisyzygies? What do we know and what do we not know—or what must we learn and what might we discover—about antisyzygies? What practical and fundamental problems are associated with antisyzygies?

Some of the reasons why, or ways in which, opposites meet include: Coessentially or essentially they may be the same; They may differ only by a trivial enantiomorphism or the equivalent; They may be complementary or co-necessary (e.g. as contrasts); They may be 'dialectically' interlacing, contrapuntal, intersecting, or oscillatory; They may be cut across by orthogonal dimensions; They may be ambiguous, or not be fundamental or real; They may be more complex than they would be if they were, say, 1-dimensionally bipolar or antithetical; They may be continuously or partially intergraded; They themselves may not be the maximal or true extremes or antitheses; They may be coinfinite and hence subject to the many paradoxes of infinity; They may be equivalent, identical, or nonexistent from the standpoint of infinite complexity (or the Greek apeiron); They may have an infinity of different related and unrelated senses; They may co-occur or associate; They may be convergent; Etc.

Illustrative examples of opposites that meet include: Laughing and crying (one may cry because one is so happy; or laugh because crying or sadness seems so ridiculous or disaster so total; or be at once happy and sad owing to a janus-faced event, such as the marital loss of one's daughter); Giving and receiving (giving brings joy—the joy of giving; giving may have selfish motives; and giving involves or maintains reciprocity and equilibrium); Honesty and mendacity (as with an honest lier, dishonest or misleading candor, or the dishonest honest man—so honest as to approach dishonesty); Problem and opportunity (all problems

are also opportunities—to learn, enjoy life, gain advantages over the lax, or find out about oneself; and all opportunities, in turn, create or involve many problems); Poverty and riches (wealth can impoverish, poverty can amplify the meaning and joy of tiny things); Perfection and imperfection (perfection bares imperfection and gives rise to new problems and flaws; imperfection creates and reveals possibilities for perfection); Etc.

Reveal Underlying Order

By "order", here, is not simply meant pattern, sequence, form, law, manifold, control, relationships, or the like, but something more fundamental that is hard to define, either to other persons or to oneself. Although a more satisfying definition will have to remain a problem for the future, a partial characterization of order is possible now, or at least there are things that can be said that will point the reader's mind in the right direction.

Order, then, might be understood to represent an especially, or perhaps maximally, fundamental level, type, or sense of structure; or whatever kinds or concepts of structure are most apt to transcend place, time, detail, variation, discoveries of new phenomena, substitutions of one class of phenomenon for another, movement from one science or subject to another, or even changes of perspective or logic. In a crude sense order refers to the actual or possible arrangements of things in nature or the mind. It might also be said to designate the generic or specific structure of any physical or abstract space; or the essence of any spatial, temporal, logical's or semantic manifold. It signifies the interrelation of the deepest categories of reality, and the derivation of lesser order therefrom.

The basic problem in defining order is that it is so fundamental that all the terms that we are compelled to rely upon in an effort to define it are necessarily less fundamental, and the opportunistic employment of such gross means warps and cheapens the reality. A somewhat similar difficulty is encountered in quantum physics, in the attempt to use quantum entities or terms to characterize themselves.

A sense of the supreme importance of order may be gotten from the fact that mathematics has been defined as the science of order (as has ideonomy itself, for that matter).

Clarifying the nature, kinds, and processes of order can clarify all else, indirectly or directly, because in a sense everything else depends upon order and simply expresses its manifold possibilities.

If science benefits from research into its foundations, and order represents the foundations of all foundations, then the scientific investigation of order cannot help but improve science.

If the topic of order has hitherto been neglected, however, that could only have been because of the special difficulty of the subject. Or possibly the blame must be shared by the fanatical specialization of science, since the subject of order, being the most universal, demands for its advancement an opposite cast of mind, or a willingness to think in the most generalized terms.

No doubt the pathetic cleavage between the mathematician and the scientist has also frustrated progress in understanding and exploiting order.

Order either stands or operates at the crossroads of the mind and physical or external reality. Research, discoveries, and possibilities in the three complementary fields of neurology, noology, and artificial intelligence have therefore a deep interest to the student of order, as also must the profound contribution that ideonomy can make to the furtherance of those subjects.

There is a chance that reality is infinitely complex, and if it is infinitely complex, then the study of order is infinitely important, for order must be the source of that complexity, as well as the key to its mental simplification. Power, both cognitive and practical, springs from mastery of order.

Order might be described as the language of nature. It is a language that should be progressively deciphered and taught to the newest and youngest minds. Arguably it should be taught before all other subjects, given its purity, elementariness, universality, and fertility, and the relative superficiality of all else. If other subjects and things are taught first they will permanently blind, prejudice, and cruden the mind, whereas if the mind awakens to a clear vision of order itself it will commence life with a stupendous advantage.

The objective of ideonomy is to gradually identify all species, genera, and taxons of order, to classify them into a pyramid of levels, and to interrelate them as a continuum at once infinitely complex and infinitely simple and specific; or negatively expressed, it is to avoid any illusorily truncated treatment of these things.

Up until now, the scientist and mathematician have almost always been content merely to discriminate different classes of order, and have rarely made the additional effort to link and synthesize them, qua complementary, synergistic, and coessential aspects of the same, or some greater, reality.

The ideonomist, per contra, is interested in working out, not just all the types of order, but the system of all their combinations, permutations, transformations, and equivalences. What, for example, are all of the ways in which one type of order can combine with itself, or with any and all other types of order? How can all types of order be derived from any single type of order?

The different types of order can be mapped into a common space. Such mapping can reveal their redundancy and irredundancy, clustering and overlapping, differential generality, dimensions and dimensionality, interconnectivity, behavior, completeness and incompleteness, boundaries, metastructures, homology, interoperation, oppositeness and antisyzygies, etc.

Among the questions about order that ideonomy can help us to address are: What causes particular types of order to exist in particular cases or situations? What contradictions and conflicts exist among different types of order? How ordered are things? Why are types of order absent at times? What are the immediate and long-term consequences of given types of order? What finite and infinite groups of order are there? What methods and means are there for determining the existence of types of order? What is essential and extraneous to forms of order? How does order grade off into things that are not actually order but that are related or analogous to it? What means and ways are there for representing

different types of order? What illusions, fallacies, and errors pertain to different types of order? What are the extremes of, and in connection with, all forms of order? How knowledgeable and ignorant are we about order? Is order relative or absolute? What are the dynamics or temporal patterns associated with types of order? What are the potential uses of various forms of order, and what are the functions and roles of order in nature and civilization? What methods can be devised for investigating order, and what is it that is important for us to find out about it? What rules and principles are there for working with forms of order? What are the costs and penalties of various forms of order?

Ideonomy could help one espy underlying order in such things as: Brain waves (the EEG), Neural networks (no general theory of which exists at present), Patterns of human behavior, Genetic control or evolution of the phenotype, Statistical data sets, Music, Surface waves of the sun, So-called elementary particles, Patterns of clouds in Earth's atmosphere, Economic fluctuations, Cosmic structure and dynamics, Esoteric patterns in number theory, Idea-maps created via MDS (multidimensional scaling), The visual structure of scenes, Etc.

There are probably many things that are not perceivable, conceivable, or doable in the absence of knowledge of relevant order.

Things can appear completely different when reseen from the perspective of an alternative form of order.

The content, relationships, and meanings of things or sensory experiences may be much more diverse than can be imagined when one relies upon the logic of a narrow form or spectrum of order.

New types of order, or greater knowledge of order, can permit one to do things far more efficiently, appropriately, confidently, systematically, thoroughly, flexibly, authentically, etc.

Much of what seems to be random, amorphous, accidental, chaotic, indeterminate, meaningless, inconsistent, directionless, illogical, complex, or the like may turn out to be quite the contrary when it is viewed in an appropriately ordered way.

There can be many different types-of-types of order, or at least different schematizations of order.

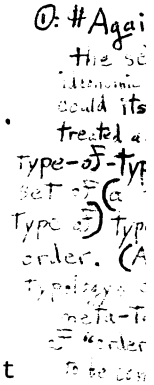
Thus one type-of-type of order might include: recurrence, identity, concinnity, continuity, isochrony, etc.

Whereas in another type-of-type, or scheme, of order there might be such natural, named, or convenient types of order as: automorphistic, holomorphic, holonomic, meromorphic, symplectic, renormalizational, etc. (Many of the latter correspond to mathematical groups.)①

Scientific revolutions have often been a direct or indirect result of the discovery of a new type of order, extension or generalization of an old form of order, or working out of the theory of some type of order. Certainly any of the latter things will often trigger major and minor revolutions in science, technology, and society.

Yet ideonomy has the potential to bring about deliberate and mass discovery of new types of order, or to drastically accelerate human exploration, discovery, and utilization of new or all possible types and schemes of order.

The remarkable thing about the discovery of some fundamentally new class of order is that it can simultaneously entrain breakthroughs almost everywhere in science. Today we are witnessing such transdisciplinary rashes of discoveries in connection with chaotic, fractal, cellular-automaton, spin-glass, and other types of order.



Explicate Origin

By origin is meant the start of a thing: the fact, how, why, or possibilities of any beginning. In the vocabulary of ideonomy, origins are not synonymous with geneses, histories, causes, or emergents.

But even in this restricted sense, origins are a primary concern of every science and of practically every area of scholarship.

Ideonomy is a universal science that is at once capable of facilitating inquiry into the origins of things as diverse as: A biont, Great religions, A lightning bolt, Albert Einstein's relativity concepts (in his childhood development), Animal trails (in the forest; in time, in space, or starting species), Aristotelian two-valued logic (the process of logical or dichotomic affirmation and negation; in evolution, human history, or psychogenesis), Brain waves, Gambling (in the history of civilization), Cancer, Matter (baryons and leptons), the Mississippi River, Mathematics (say the concept of number), Or one's marriage.

Where in a symphony can one theme properly be said to originate from another? From what did all that we term the universe itself originate? When in life did the most rudimentary form of one's self originate; what was the moment before and after which one existed?

Among the systematic ways in which ideonomy will be able to clarify origin are: By reducing origins to general or universal taxons; By encouraging analogies between seemingly unrelated origins and types of origins of seemingly unrelated things; By highlighting the differences among origins; By defining the finite ways in which, alone, things can originate; By distinguishing the different stages and degrees of origins; By demonstrating how things cooriginate; By proving the necessity for things to originate in certain ways; By describing the relationships, environments, and circumstances associated with origins; By enlarging the meaning of origin; By bounding, limiting, and qualifying origin; By rigorously illustrating how combinations of elements can originate different or like things; By revealing characteristic convergences and divergences of things; By identifying paradoxes connected with origins; By revealing the true complexity and simplicity of origination, Etc.

The importance of origins or of their study includes: Their value in defining things; Classificatory power; The utility of precising the temporal range of things; Identification of lineages and affiliations; Exclusion of confusable and erroneous origins; Enablement of predictions; Confirmation of theories and hypotheses; Specification of the substantial nature of things; Indexing of the quantity (population, frequency, probability, dominance, etc) of things; Mapping things into a general framework; Etc.

What is all that we know, or do not know, about the origin of a single, random thing?

With what priority should the origin of different things be inquired into?

What origins are interdependent and independent?

What is the relative contribution of chance and law to different origins and types of origins?

What are the chained, hierarchic, and reticular relationships among different origins?

The generic causes of origins of things are, for example: Maturation of an underlying productive process; Temporary or permanent disappearance or inhibition of whatever has been preventing something from originating; Development of a need or requirement for the thing; Conjunction of 'mutually' necessary factors or events; Simultaneous origin of something else; Transformation from one regime or epoch to another; Transformation of a thing into a new thing; Simple recognition of the preexistence of a thing (producing a virtual origin); Attainment of some relative criterion for a thing's existence or origin (representing another instance of virtual origin); Etc.

Exploit Paradoxes

Discovery, explanation, application, generalization, and transcendence of paradox accounts for a great deal of human progress. Anything that can contribute to the process can help advance civilization.

The reasons for this are many: Paradox checks arrogance; Paradox can reveal and index unsuspected underlying complexity; Paradox may also indicate the possibility of some peculiar simplification in a difficult situation; Many paradoxes spring from antisyzygies (meetings of opposites in the greater nature of things); Paradoxes can afford at least partial freedom to escape from rigid laws, limitations of situations, and supposed absolutes; Confronting paradox can lead to a reformation of one's mind or a greater wisdom; Paradox is often associated with the emergence of novel categories of things; Etc.

There are many general forms of paradox that occur over and over again: Augmentation leading to diminution, Self-annihilating existence, Self-generation, Equivalence or meeting of opposites, Self-contradiction, Self-divergence, Self-avoidance, Ignorance or incapacity produced by knowledge, Bad associated with or engendering good, Good associated with or engendering bad, Simultaneous existence of a thing at many levels (of space, time, etc), Disproportionate importance of seemingly insignificant things, Coexistence of contrafactuals, Fundamental immeasurability or indeterminacy, Self-containment, Nonlinearities, Etc.

Paradox is defined in five ways by Webster's III: A tenet or proposition contrary to received opinion; A statement or sentiment that is seemingly contradictory or opposed to common sense and yet perhaps true in fact; A statement that is actually self-contradictory and hence false even though its true character is not immediately apparent; An argument that apparently derives self-contradictory conclusions by valid deduction from acceptable premises; and Something (as a human being, phenomenon, state of affairs, or action) with seemingly contradictory qualities or phases.

Hence orthodoxy can be challenged and often errs, what seems obvious and entirely logical may be wrong, a valid proposition may invalidate itself on another, higher, or lower conceptual level, a proposition may be covertly self-inconsistent, and an entity may transcend in its complexity any conventional harmony of its elements.

Conventional concepts and words are in their simplicity and familiarity chronically confused with the different, stranger, and greater things and realities to which they lamely point, which gives rise to discoveries that are much of what we mean by paradox.

The awkwardness of reason is another parent of paradox. Reason looses itself in its own complexity and forgets the truncation of its analysis that is perpetually necessary. Logic has a life of its own: an organic evolution and a continuity of curious idiosyncrasies, prejudices, and errors; its recursive essence is forever overlooked. As reason adapts to receive truth it distorts it.

Clarify Pathology

The tentative view of the ideonomist is that 'disease' (or what ideonomy prefers to refer to, generically, as pathosis) is fundamentally an altogether universal phenomenon that completely transcends biology, organisms, or the realm of life, a phenomenon whose infinite analogical diversity is exemplified by, in, or through all entities, relationships, processes, and systems in all sciences and subjects.

By pathosis is meant an abnormal state or condition that develops progressively, is complex, specific, and characteristic, has a certain autonomy, has a transformative effect, mimics some of the properties of biological organisms (say by seeming to propagate or adapt), and/or the like.

Already diseases of the psyche and a society are recognized, and the term is applied to some phenomena in technology (in materials, computer, and food science, for example). What is termed pathological in mathematics is not unrelated to this generalized concept of disease.

Often what are otherwise normal or characteristic behaviors, laws, or properties become so extreme that we say they are pathological. In special regimes or circumstances what is otherwise normal becomes pathological. Pathology can arise suddenly and seemingly spontaneously from random or very subtle causes.

Pathological behavior may result when the burden upon things is too great, or when too much is asked of them.

Other generic causes of pathosis include: aging, decay, obsolescence, misuse, conflict, self-interference, isolation, excessive feedback (either positive or negative), overcomplexity, overspecialization, hurry, over-connectedness, inflexibility, indeterminacy, mimicry or self-mimicry, resonant coupling, oscillation, "chaotic" behavior, excessive threshold dependence, pluralism, resource shortages, inconsistent 'programs', growth, etc.

Many such causes may conspire to produce a pathosis.

Remaking pathology into a theoretical and transdisciplinary science is vital in our increasingly complex, abstract, and integrated world.

Confronting pathology will afford us a chance to remove many of the infirmities of nature and civilization that hitherto we have had to take for granted.

Also, the truly pathological or "bad" character of pathoses is relative, and as science and technology become more sophisticated it will be possible to find virtues in and exploit ever more, and ever more diverse, pathoses.

Moreover, ideonomy has led to the conjecture that in biology both "good" and bad diseases may exist, with the former being as common and important as the latter.

To the extent that bad pathosis is universal, 'good pathosis' may play an equally general, but even less recognized, role in nature.

Some purely fanciful examples of pathoses in various fields are: Supernova epidemics in galaxies (though actually astronomers have often proposed the operation of such contagions), Terrestrial epochs of catastrophic volcanism (say of idiopathic character), Rashes of propagative defects in crystals, 'Conspiracies' of message errors in the brain's interneuronal traffic, Self-destructive cycles of the universe (if it is oscillatory) or self-destructive universes (if there are many cosmoses), Sudden and inexplicable transformation of good weather or climate into bad, "Chaotic" oscillations of the stock market or world economy, Contradictions (or simple indeterminacies) in a noble ethic degenerating it to sordor in the course of time, Debilitating changes of a language occurring historically in a multiplicative cascade, Purely chemical 'infections' destroying the taste of wine or some other stored food, Etc.

Abiotic pathoses are such an unexplored territory that it is exceedingly hard to even imagine the possibilities.

But with respect to universal pathoses ideonomy can systematically work out the generic: causes, mechanisms, effects, types, components, properties, indications, interactions, rules, abilities, hierarchies, sequences, solutions (or 'therapies'), questions, problems, theories, implications, etc.

By aiding the treatment of pathoses, ideonomy should have the effect of gradually raising levels of: efficiency, excellence, economy, health, longevity, conservation, safety, stability, power, capacity, precision, control, evolution, simulation, etc.

Biological and abiotic pathology will progressively clarify one another.

Deeper, broader, analogous, and divergent causes and effects of pathology will be recognized thanks to ideonomic research.

Many medical diseases are probably related, identical, or virtually identical after a simple ideonomic transformation; and many others, on the other hand, are probably divisible into various separate and unrelated diseases. Many such diseases probably have simple mathematical or physical causes and solutions that are abundantly illustrated in inanimate nature and that can only be obscured by a narrowly or essentially biological approach. A single disease thought to have a few forms may in fact have a thousand different forms and manifestations or be distinct in all of its occurrences. A few powerful laws may give rise to virtually all diseases.

These questions and matters are the sort that ideonomy is designed to illuminate.

Ideonomy can clarify the basic dimensions of all pathology, including those suggested by such questions as: What are the slowest, most persistent, or longest-lived, and the fastest, most ephemeral, or most fragile, of all pathoses? What pathoses are rarest or the most ubiquitous? What are the most hidden pathoses? Are pathoses of finite or infinite diversity? Are pathoses linked or independent? What, spatially or massively, are the smallest, and what are the largest, pathoses? What are the simplest and most complex pathoses? What are the most extreme pathoses? What basic categories of pathosis can be imagined but do not exist in nature?

Help One Discern Patterns

There are countless senses, types, and examples of pattern: Style or law of behavior; Typical or apparent course of development; Internal, external, comparative, or reciprocal structure; Configuration, distribution, or grouping; Cluster of traits, acts, properties, elements, or tendencies; Habit, tendency, or history; Systematic quality; Analogical character; Quiddity; Holistic character; Higher-level, abstract, or final pattern; Etc.

The ideonomist is especially interested in patterns that represent meta-phenomena, archetypal phenomena, and phenomena nearly of the status of entities but that are not quite entities. Meta-phenomena are higher-order phenomena or phenomenon-like patterns-of-patterns. Archetypal phenomena are that quasi-finite set of physical or mental phenomena that are, or that are treated as being, the most universal, fundamental, important, characteristic, necessary, explanatory, simple, regular, multiform, etc, or to which all other known or discoverable phenomena can in some sense be reduced. Some phenomena naturally approximate to entities without quite being entities; their resemblance to entities being due to their imperfect: individuality, persisting and characteristic effects, organizing and self-organizing tendencies, qualitative distinctness, meaningfulness, e/vc.

Recognizing patterns is important because they can indicate things': forms, laws, histories, courses, activities, relationships, causes, effects, origins, destinations, present status, quantitative properties, differences, internal content or structure, mechanisms, methods, problems, needs, values, 'languages', forces, etc.

Patterns are present all the time, everywhere, and in everything, but often they are overlooked because of their subtlety or because the mind is ignorant of the language that is necessary for perceiving or even imagining them. The density and diversity of natural patterns may even be infinite.

Ideonomy may be the ultimate key to making sense of this ocean of patterns, for it is essentially a qualitative universe defined by and defining an infinite interweaving of ideas. Patterns lead to other patterns because there are lawful transformations of ideas.

Aid Perception

Perception, whether sensory perception or perception in general, is conditioned by many things, including: expectation; training; previous experiences; goals and motivations associated with perceptual acts and activity; sophistication about the various types of illusion that exist and about ways to avoid them; perceptual methods and devices that may perhaps be made use of; capacity to assimilate what is perceived and to make room for further perceptions; logical analysis, synthesis, and imagination that may accompany simple perception.

It is profoundly true that we see what we expect to see. Ideonomy can reveal that human perceptual expectations and habits are really embarrassingly limited and orthodox, because in fact there is so much more to perceive, discover, and contemplate in experience and as the structure of reality and possibility. It can not only show that this

is so, but train or retrain the mind to seek out, apprehend, and exploit this far greater magnitude of things. Indeed, it may even make us aware that physicomental reality forever opens out and has no absolute limits whatsoever.

It is a great irony that perception acts as a barrier to further perception, that what we see blocks our sight of anything else. This, too, is a problem that ideonomy can relieve, by defining more precisely and explicitly what it is that we see, and the interrelation of what we have already seen to characterizable immensities beyond it.

Ideonomic technology, or technology based on ideonomy, can be designed with a fantastic power to transcend the boundaries of normal sensory, motor, and mental experience, to remake, transform, and clarify experience, and to provide wholly artificial experiences.

To give insight into experience its basic dimensions, ranges, quantities, formulas, entities, relationships, processes, events, phenomena, data, structures, etc, must all be discovered, investigated, and characterized.

Technology that enabled man to systematically and exhaustively manipulate all of these aspects and bases of experience could ultimately revolutionize his perceptual faculty. He might as a result learn of the existence of unsuspected forms of order, patterns of events, laws of causation, levels of being, significances of occurrences, etc. He might gain greater understanding of his own nature. He might suddenly find himself able to cultivate new forms of logic and intelligence. And over time the sum diversity of the human race might be increased immeasurably.

Describe the Present

To any honest person the fundamental nature of the present, of that unique moment dividing all past from all future time, stands as an enigma. The now is immensely important, it is almost synonymous with being and becoming, it imprisons us, and yet at bottom it is strange, unknown, and seemingly contradictory.

Is the present relative or absolute? Is it truly singular or is it plural? Is it simple or complex? Has it one level or levels that are multiple or innumerable? Has it finite, infinitesimal, or infinite temporal duration or spatial range or richness of content or structure? Is it in itself static or does it evolve, and if it evolves, is its capacity for such development limited or unlimited? Has it a discrete edge or does it merely degrade into a continuum? Is it altogether free of the past and future, or do past, present, and future in some degree, sense, or way coexist?

Such questions are not purely philosophical; they harry physicist, neuropsychologist, mathematician, and logician. But of course the real problem is the nature of time.

The systematic study, development, and exploitation of the present has merely begun, and such endeavor has only recently shown signs of acquiring a scientific footing.

It is crucial that interest in the present not be divorced from interest in history, the future, and eternity; their proper interrelation is not merely supplementary but complementary, for each is logically subservient to some greater and transcendent whole.

The reasons for studying the present are diverse and include: The need to inventory resources; The importance of anticipating problems, and of excluding problems at or before their birth; The wish to recognize fresh opportunities; The intellectual and experiential fascination of the present (of its novelty, scope, detail, structure); The immediate challenge of the present; The infinite possibilities and consequences of the present; The value of the present as a mirror, analog, and model whereby to study moments past or future that are otherwise necessarily inaccessible and conjectural; To discover its fundamental and transcendental processes, phenomena, and laws; To completely explore and map its topography; To improve our technology and methodology for responding to and operating within the present; To expel false notions about the present; To better know the boundary between the past, present, and future; To ascertain what is no longer true, actual, or possible; To enlarge and enrich the present; To evaluate and criticize the present, or describe its virtues, defects, limitations, and errors; To intensify human awareness of and about the present; The need and opportunity to understand oneself, and all that pertains to oneself, better; Etc.

More specifically: Business wishes to know about public trends, fads, and fashions; Scientists need to know what other scientists know, believe or no longer believe, reason, have need of, and are doing; Those who govern need to keep abreast of the state of society and of changes in public attitudes, opinions, needs, and wishes; We all have reason to know of and be exposed to the richness of contemporary culture, both locally and universally; Meteorologists need to monitor the instantaneous

conditions and variations of the atmosphere planet-wide; Particle physicists are interested in simultaneous and sequential events whose 'present' is a trillionth-of-a-trillionth ours; One's physician would like to know as much as possible about one's body at the time he examines us or from moment-to-moment across our lives; A teacher in a classroom needs to know about the instantaneous knowledge, ignorance, thoughts, errors, questions, needs, understanding, and interests of her students, individually and collectively; A microbiologist may need to know about the coinstantaneous status or interaction of two or more different biochemical pathways or organelles within a unicellular individual; Cosmologists are desirous of discovering epochal correlations over the sky of galaxies visible at the same Hubble distance and time; Future developers and users of massively parallel computers will want to know with exactitude the simultaneous relative states of all their computer's parts and 'computations'; During a concert every member of the orchestra needs to know what every other member of the orchestra sounds like at the same instant, to enable the organic coordination and coevolution of all of the parts of the composition being performed—mostly via a massive number of nearly instantaneous unconscious intercommunications among the assembled musicians (it may be conjectured); An archeologist may seek to discover the totality of climatic, geologic, botanical, economic, technologic, linguistic, social, political, religious, and other factors that concreated the 'historical present' of some extinct civilization; And so on.