IDEONOMY:

THE SCIENCE OF IDEAS

Introduction, Foundations, and Applications

by

Patrick Michael Gunkel

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PREFACE: This is a contents table for a 2-volume (36%) sample of the est. 1,200 pages of the Ideonomy ms., as it existed at the start of 1994. The symbol ☞ indicates possible logical 'parts' of the book for insertion or use of the item.

(A) ORANGE VOLUME (19 pieces; 177+37 = 214 pp.):

(B) GREEN VOLUME: *What Ideonomy Can Do.* • A massive but specialized part of the book. 132 sections (only 71% of the planned 186). 214+2pp. ☞ *INTRODUCTION* |or?| *DIVISIONS.*

• SUM OF ORANGE + GREEN VOLUMES: 391+39 = 430pp.

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ORIGINAL!

INTRODUCTION
Project History

TO: Alan McHenry, President
The Lounsbery Foundation

THE IDEONOMY PROJECT
Progress Report and Plan For the Remainder of the Project

Patrick Gunkel

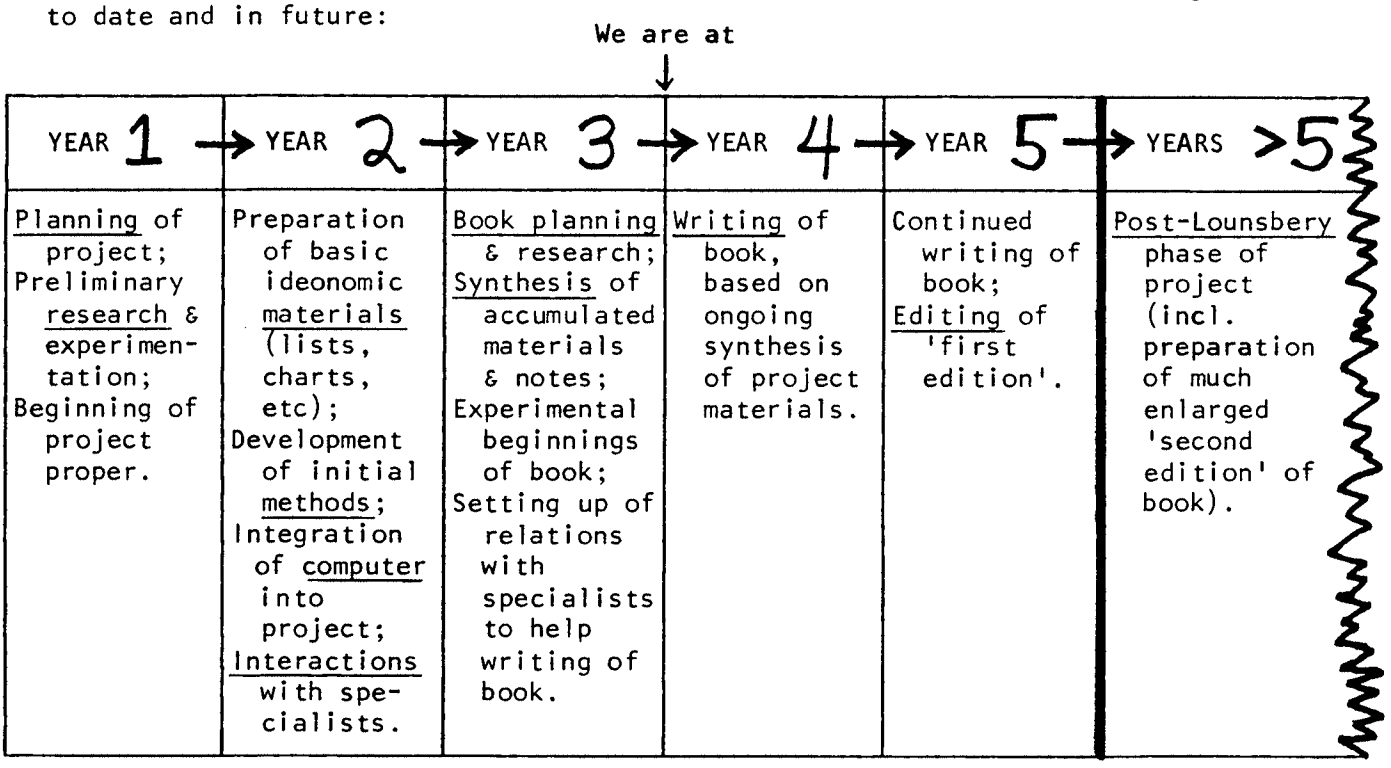
1987 January 12

Dear Alan:

You asked me to prepare a progress report on my project, to be sent along with a photocopy of part of the manuscript of my book on ideonomy, so that when you and the other trustees of the Lounsbery Foundation met later this month you would be able to make your decision on the funding of the final two years of my project, concerned with laying foundations for ideonomy as a possible new field of science.

This is that report, accompanied by the manuscript.

I will begin with a figure that roughly outlines the course of the project to date and in future:



I will now comment on this course of years by means of six subsections.

FIRST YEAR

Planning of Project;
Preliminary Research and Experimentation;
Beginning of Project Proper

Owing to the lack of precedent for anything like ideonomy, and the fact that I had not applied to the Lounsbery Foundation for backing for this project and hence was utterly surprised when such backing was generously offered, it was wholly appropriate for me to devote part of the first year to planning the project, conducting some preliminary research and experimentation, and simply getting my bearings.

I experimented with dividing what was evidently destined to be an enormous subject into various parts. I tentatively arrived at a scheme with some 200 major divisions encompassing 320 subdivisions. These parts of the field had to be named, assigned topics, compared with and distinguished from one another, defined and explained in a preliminary way, and made conveniently accessible by means of decision trees and other devices.

It was during this first year that I discovered the method of treating ideas that has become the backbone of the project: the combinatorics of various dimensions of ideas represented by ordered lists and hierarchic sets.

The basic task of the ideonomist I decided to characterize in this way: the progressive discovery of all of nature's fundamental, universal, and orthogonal combinatorial dimensions; the identification of all of the continuous bases and discrete elements of these dimensions; and the formulation of these elements, bases, and dimensions in ways allowing the exploration, generation, and use of all possible ideas with respect to any subject, problem, phenomenon, thing, or possibility.

I began to suspect something that I am now certain of: that ideonomy promises to join mathematics as the two most universal and powerful servants of science, technology, thought, and civilization—the second as the science of the quantitative laws of the universe, the first in the role of a new and complementary science of the qualitative laws of same.

Toward the end of this year I realized the need for the introduction of a computer into the project, and special funds were immediately made available by the foundation for its purchase.

SECOND YEAR

Preparation of Basic Ideonomic Materials;
Development of Initial Methods;
Integration of Computer Into Project;
Interactions With Specialists

In my opinion it would be almost pointless to merely philosophize about the possibility of a science of ideas, or to simply paint a picture of what it might do and mean if only it existed.

In order to convince anyone—in order to convince oneself—it is necessary to go further and to actually begin to establish and use such a science. This attitude shaped the second year of the project and was responsible for what resulted from it.

What resulted was an extremely crude but clearly functioning science, and one capable of vigorous development.

To operate the new science would have to be equipped with a vast amount of special materials—lists, charts, computer programs, and so forth, or what I began to refer to generically as "organons". Each division of the field would have to have its own organons, treating different facets, and serving different applications, of the subject.

I began to prepare these organons en masse. The task was enormous, but God is kind to the industrious. Ideonomy, even when young, I found can be used to assist with its own creation and development.

Different organons, and organons prepared for different divisions, proved to have simple and complex regularities—repetitive and formulaic aspects, and commonalities in the methods and spirit of their production—that could be extracted, characterized, transformed systematically, and generalized, so as to enable the increasingly quick, easy, and routine production of increasingly good, large, and diverse organons in all divisions.

I identified sixty key types of organons that recur in division after division. I then described these organons in terms of their possible alternative forms and modes of preparation, their value and uses, their pure and applied interrelationships, their redundancies, and how they rank in terms of comparative importance and universality.

One reason I mention these details is so that you can understand the sheer amount of work that has occurred—that has been and continues to be necessary—in this project. Ideonomy will only be feasible to the extent that this sort of work is done; if not by myself, now, then by someone eventually. My attitude is that as the would-be founder of the field I must set an example, not only in the sense that I must provide others with concrete illustrations of what can and should be created as the working materials of ideonomy, but in the simpler sense that I must personally demonstrate the hard work, the human labor, care, and devotion, without which a science of ideas will never be anything more than the dream, the inspired somniloquy, that it has remained for hundreds of years.

I only wish that my own abilities were far greater in this utterly humbling task.

A second reason for my mention of the details above is that such organons demonstrate, by the very fact of their being possible, that ideonomy itself is possible. The organons are the cells from which the tissues, the organs, and the systems of the science will be constructed; and just as an organism develops by the progressive fission, coorganization, and differentiation of cells, so ideonomy may emerge epigenetically by the democratic ontogenesis of its interdetermined organons.

If one can build simple electrical circuits, one can use them to construct the most complicated and diverse circuits and devices.

The simplest organon for the various divisions is a list of examples of things that repeatedly embody the basic concept of the division or to which that concept may be applicable; such as a list of examples of ignorance for the division "IGNORANCES".

By studying this primary organon it is possible to isolate types of exemplifications of the division's central concept and to use these to form a second organon: "Types of X". With the latter one can reexamine the first organon, "Examples of X", and probably find ways to improve and enlarge it.

This second organon can also be used to create a third organon, "Genera of X", that is especially important to ideonomy.

Other organons can be derived in this way: "Interrelations of the Genera of X", "Congeneric Species of X", "Families (of the Genera) of X", "Coexemplifications of the Genera of X", "Dimensions and Properties of the Genera of X", and so forth.

And there are endless series of organons that pullulate in this way: by the combination, permutation, transformation, generalization, specialization, intersection, interaction, reapplication, recursive use, etc of existing organons.

I have created many hundreds of ideonomic lists and charts in the project so far, and there is no question but that the process is self-facilitating.

Many other types of ideonomic methods and devices were developed during this second year, including: ideogenetic formulas (with their canonical variants), intuitive weightings and statistical analyses thereof, automated composite definitions of mechanically created ideonomic concepts, permutations of concepts, conceptual atlases, systematic redefinitions of concepts, chaining methods, systematic reconstructions of words, and ideonomic templates.

"Ideonomic templates" are essentially little computer programs that enable arbitrary things, or particular types of things, to be treated by a dynamical chart that can be used over and over again. The template may treat whatever is specified in many different ways simultaneously by incorporating it in diverse but complementary or interrelated ideonomic sentences, by using groups of ideogenetic formulas, by representing it at many levels of a hierarchy, etc. The empirically developed template may embed the thing of interest in a structure, diagram, map, taxonomy, chain, etc. It may accompany its treatment of any matter with various lists pertinent to it, including lists explanatory of the nature and use of the template.

Individuals who repeatedly use such a template in connection with successive matters, or in a variety of ways, build up in their minds a powerful set and structure of mental associations that come into play, and further evolve, each time the template is used.

In the course of ideonomy's future development innumerable templates will inevitably be discovered, created, and refined. Some will be fantastically sophisticated, complex, and powerful. The evolution and widespread use of these ideonomic templates will progressively transform the way mankind thinks and effectively enlarge human intelligence. To some extent they will constitute a new language and a new form of art. They will be of immense educational importance.

During the course of the year I learned how to use the computer I had been given in the production, manipulation, and exploration of ideonomic materials. Its effect was to revolutionize the project. In retrospect, it is almost impossible to imagine ideonomy without a computer. Even so, the severe limitations of my time, funds, and expertise have meant that I have merely scratched the surface of what computers can mean for ideonomy, both in its development and in its use.

A final feature of the second year was the interaction I had with specialists in various fields. Contact was by phone, letter, or personal meeting. I wanted to know their reactions to ideonomy, both as a concept and in terms of its methods and materials. I was interested in criticisms, suggestions, and counsel. I wished to learn more about their fields—the methods, materials, problems, aims, concepts, needs, and possibilities thereof, the accomplishments and limitations.

I contacted people in artificial intelligence and cognitive science. I spoke and met with botanists, geomorphologists, seismologists, astronomers, microbiologists, linguists, psychologists, physical chemists and taxonomic chemists, geneticists, historians, artists, educators, physicists, engineers, meteorologists, a pomologist, a museographer, and a myrmecologist; with cinematographers, businessmen, science journalists, students of public policy, doctors, logicians, philosophers, anthropologists, musicologists, paleontologists, neuroscientists, architects, geographers, nutritionists, materials-scientists, a research anesthesiologist, futurists, and an expert on the Radiolaria. My constant conversations with mathematicians were especially exciting and useful. I did not meet with any ideonomists.

THIRD YEAR

Book Planning and Research;
Synthesis of Accumulated Materials;
Experimental Beginnings of Book;
Setting Up of Relations With Specialists To Help Writing of Book

To be frank, the third year of the project was marred by a few problems and distractions: I fell in love under inauspicious circumstances, I had to bounce five miles across country before the writing of my book took off, and I moved to Austin, Texas, and then had to relocate across town.

Nevertheless, it was as productive a year as had been the previous two, in terms of quantity, compass, quality, and importance of work done.

Throughout the project there has been a great need for books, periodicals, and related materials, and after I spoke of this need toward the beginning of the year the foundation graciously granted an additional $3,000 to help me to obtain them.

I began to plan my book.

My original idea at the start of the project was to produce a work of three volumes: the first introductory, the second foundational, and the third applicational.

That seemed logical, but of course it was merely an initial concept. The problem with it, as I have subsequently come to realize, is that it could create an artificial and in many ways inconvenient divorce—in space and time, and for writer and reader both—between the theory, method, and demonstration of ideonomy, or of the 200-300 divisions of the subject.

This disconnection would impair memory, reduce unity, sacrifice propinquity, create a severe and unnecessary redundancy, recreate the familiar infelicity where a reader must jump back and forth between volumes, and risk encouraging a lasting and mischievous divorce between the pure and applied halves of the subject or between ideonomists "pure" and "applied" (à la the horrific split between pure and applied mathematicians).

Moreover, materials I have produced in the course of the project exhibit an impossible ambiguity when attempts are made to allocate them to the pure or applied sides of the house.

For these many reasons I have largely abandoned my original tripartition of the book, and have gone on to consider other schemes.

The notion of an introductory first volume also has its problems, insofar as that volume is supposed to be written first.

How is it possible to introduce a subject that is still inchoate; or volumes that are not yet written? Moreover, a superficial treatment would annoy me at a time when I was trying to go deep, and it might reduce my later impulsion to go deep or crudify my thinking.

The introductory volume was perhaps to be written in a popular style, but I know myself, and it is virtually impossible for me to write simply or comfortably when I am not yet the master of my topic, or when my curiosity for what lies below is aflame. It is furthermore true that I do not really know how to write simply, popularly, or with artificial constraints—and that I have never in my life been able to write that way. Minds, after all, specialize; and civilization flourishes via this very division of labor.

But I also know from experience that, once I have explored—and described to my satisfaction—the deeper side of my subject, it will be comparatively easy to write an introduction and overview.

Many thoughts of this sort passed through my mind as I planned my book in the course of the third year, and I will speak in the following section of this report of what plans gelled—and now direct my work.

The writer's block that I at first experienced in sitting down to actually write my long-awaited book must have been due in large part to the intimidating immensity and bewildering novelty of the still only half-formed subject that I was expected to reduce to paper. How different it is, and how difficult, to discourse upon a subject without the normal freedom of being able to turn to the shelves of one's library for the archetypal example represented by another random book on that subject; without being able to gain an overview from the encyclopedia or a definition from the dictionary; without being able to seek the advice of a specialist in the subject by telephone!

To pioneer a field—and a new science at that—is almost unreal; it is harrowing, it is brutal, and frankly it is hell. There is nothing heroic about it.

To introduce you to one of the problems: I have been continually aware that, in establishing ideonomy, the original structure, methods, ideas, and aims I impose are all liable to become perpetual, and to carry with them any errors in their construction, composition, or selection.

Consciousness of this has made me especially cautious.

The book I was to write was supposed to be largely a recapitulation of the ground I had covered in the first years of the project; and in particular, a tour, analysis, and synthesis of—and a final. transcendent reflection upon—the mass of primary, secondary, and tertiary ideonomic materials I had produced, partly by myself and partly in collaboration (as I think of it) with my computer.

Yet that mass of materials encompasses thousands of pages and stacks over a meter high!

A major task of the past year has inevitably been reviewing this archive of mine and coming to terms with the problem of how to synthesize it in the book. I have had to edit, annotate, winnow, and in some cases transform, redo, or supplement it. In a relative sense, the process has been slow. But as I say, much has been done, and at this point I feel that the essential problem has been solved.

Also in the course of the year I sought to establish certain special relationships with scientists, scholars, and engineers whom I hoped would be willing to examine and evaluate portions of the book pertinent to their fields as these came to be written.

I would need to know whether what I said in my book was intelligible, accurate, apposite, adequate, original, interesting, enlightening, persuasive, and enjoyably written; both in itself and as an account of ideonomy.

One of the reasons why I moved to Texas was the suspicion that a change of scene might end the problem I was having in getting my book underway. Whether the move was responsible I cannot say, but immediately afterwards my writing began in earnest under these sunny Texan skies. I can now report that the progress of my book is smooth, rapid, and accelerating; and since November I actually like what I turn out (moderately).

In turning to the writing of my book an exciting transition has occurred in the project from a basically formal phase to a second phase where ideonomy is actually applied to the phenomena and problems of the real world.

Moreover, my character is such that I find the process of synthesis uniquely enjoyable.

One concern I had has proved to be unfounded. I had feared that when I entered the writing phase of my project the production of the primary materials of ideonomy—the organons—would have to cease; which would virtually mean that the actual building of ideonomy would have to be suspended. But what has happened on the contrary is that the process of writing the book has greatly expedited the making of organons. Each evening, after I have added to my book, I find myself making list after list expanding divisions of ideonomy that I have already treated and initiating the treatment of those that I have neglected.

This dual creativity, I can tell you, is most satisfying.

The book is now writing itself. As I proceed with a given chapter the chapter defines itself and expands by the embellishment, extension, and intercorrelation of the preceding matter.

Moreover, the structure of each of those chapters that is devoted to a single subdivision—and this includes most of the chapters in the book—is evidently a recurring structure that becomes more conscious, complete, and alive with possibilities with each successive chapter; hence the process of writing this suite of analogous chapters becomes at once more routine and more intense as I proceed. The net effect is to drive the book along at an ever faster clip and with ascending creative energy.

I should mention that this is always the way it has been with me. I begin a new task slowly, awkwardly, almost imbecilely; gradually I acquire a sense of mastery and purpose; and in the end I am propelled forward effortlessly and explosively in a creative process that seems to have no natural limit.

You had asked me to make some comments, Alan, on certain things that occurred in the course of the year.

The University of Texas at Austin—the Graduate School of Library and Information Science there in particular—has shown great interest in my work. I have in fact just been given the honorary title of Visiting Scholar at the university, which confers certain privileges. The dean of the graduate school, Prof. Ronald E. Wyllys, asked me to give a talk late last year on ideonomy. He would also like me to give a small series of talks in the spring term. In addition he has said that he would like the university to give me a teaching position after my project has ended, so that I can report my results; and that the university might be willing to collaborate on the production of the first textbook on ideonomy! Dr. Wyllys has been very kind.

Prof. Bruce Porter, in the Department of Computer Science, is another person at this university who has shown the greatest interest in my work.

It was thanks to Bruce that I had a chance last month to introduce Douglas Lenat, of Microelectronics and Computer Technology Corporation (MCC) here in Austin, to ideonomy. I have long admired Lenat's work, which I regard as the closest thing in artificial intelligence—or in any field—to ideonomy (s.l.). Lenat is widely regarded as the brightest star in his discipline.

It was therefore of great interest to me when Lenat himself remarked, after I finished my presentation on ideonomy, that "ideonomy is the closest thing to my own work that I know of." Of course, in Doug's work the emphasis is upon the automation of ideonomic and cognitive skills. But I think that he and I both understand the perfect complementarity—the potential synergism—of the two fields.

These encounters with Bruce Porter and Douglas Lenat have been amazing to me because with them I have ceased to feel like a voice in the wilderness or at least an absolute stranger to this world. We were three people who thought the same way, saw the world in the same way, and spoke the same language. After all this time, how queer!

Maybe through the artificial intelligence community ideonomy will have the chance it needs to take root—to be appreciated, used, and added to by others.

There is hope yet.

FOURTH YEAR

Writing of Book, Based On Ongoing Synthesis of Project Materials

The plans I have at this time for the writing of my book are as follows. Other plans will of course develop as the writing proceeds and they become necessary.

You may wish to consult a very partial and tentative Table of Contents—really a mere list of chapters—that I have included with the copy of the manuscript sample.

The book will indeed be in many volumes, unless it can somehow be compressed into one giant volume of encyclopedia size; but I cannot as yet tell you how these presumptive volumes will be specialized.

My intention is to write as many chapters as possible within the remaining two years of the Lounsbery-supported part of the project, and then, at the end, to arrange these in as sensible an order as possible, and supplement them with such chapters and other matter as may be necessary to simulate continuity and articulate the superstructure.

For certain reasons this approach is apt to be less chaotic than you might imagine. The fact that most of the book's chapters will be devoted to single ideonomic subdivisions means that they will always automatically have the intrinsic order of this set of subjects, and hence that it will be possible to instantly arrange them either alphabetically or by the alternative linear clusterings of the divisions dictated by their semantic relationships or cognitive possibilities. Also, everything in ideonomy is so exquisitely systematic that —as I have already found—the logical ordering of any of its materials can always be achieved in a trice, practically without effort.

How large the first edition of the book will be—let us speak of it by the nonce title Ideonomy—I cannot as yet say, for it depends too much on my unknown powers of creation as I enter my fifth decade of life, on self-facilitative factors peculiar to ideonomy in general and this book in particular, and on the imponderabilia of ideonomy.

There should be several hundred chapters, and if my energies are sufficient, perhaps 1,200 pages of such single-spaced, "elite" typescript as this.

This might seem far too big a book, the sort of monstrosity that no one but an eccentric scholar would ever read, but I do not think so.

Remember that the purpose of the book is to found, and in a beginning way create, an entire science; for which purpose it may, however, be much too small. More to the point, the systematic properties of ideonomy referred to earlier, and its subdivision into possibly 320 parts, allow my book to function as a large and encyclopedic reference book. I visualize the user as periodically hauling the reference from his shelf to consult whichever chapter is devoted to the subdivision—or particular ideonomic method—that especially interests him at that moment. The chapter might be read in full—being only five to twenty pages, say—or the user might confine his attention to certain subsections listed in the outline prefacing each chapter of the book. →Some early versions of such outlines are included in the copy of the manuscript you have received, where they are headed "IDEAL CHAPTER STRUCTURE (Sequence of Subsections)".

Since ideonomy speaks to the essence of what we do all the time—is, in a way, the most universal science of all—I foresee that same user returning again and again to his reference book to consult the other and complementary chapters and subsections of Ideonomy that treat the other and complementary divisions and methods of ideonomy.

It would be a serious error to think of the book that I am writing as a conventional book. Rather, like one of ideonomy's organons, it is really a tool that can be used and reused infinitely-many times and in infinitely-many ways.

Some of the standard features that I am contemplating including in each of those chapters which presents an entire subdivision, are as follows (most of these will correspond to a subsection of a chapter):

1. A prologue—often philosophic, apothegmatic, anecdotal, rhetorical, quotational, historical, quotidian, interrogatory, contextual, or preparatory in its flavor or thrust.
2. Definitions of key words or concepts—including comparisonal, contextual, and stipulative definitions.
3. Remarks on the reasons for studying the subdivision—its purposes, uses, values, etc.
4. Mention of those subdivisions that are similar or related—and of why they are such.
5. Division of the subdivision into its named subfields—with comments on their interrelations.
6. Listing and discussion of some of the organons that would be most appropriate for treating the subdivision and for applying it to some matter.
7. Discussion of various ways to use the subdivision to treat things.
8. Examples illustrating the theme of the subdivision or the kinds of things it can be used to treat.
9. Lengthy application of the subdivision to the treatment of but a single thing.
10. A classification of the above examples into types—with explanations.
11. A generalization of the examples and types into universal genera.
12. Discussion of the interrelations of these genera.
13. Analysis of the basic dimensions and properties that characterize, or otherwise pertain, to the theme of the subdivision.

14. Consideration of the general ways in which these dimensions and properties combine or otherwise relate to one another.
15. Discussion of scales and scalings of the subdivision or of its parts, and of the things it treats.
16. Comments upon the maxima, minima, and other extremes of the subdivision.
17. Exposition of the causes and effects that pertain to the subdivision.
18. Treatment of the subdivision by a hierarchy.
19. Discussion of special diagrams pertinent to the subdivision or applicable to its treatment of things.
20. Exploration of the set of concepts that are germane to the subdivision.
21. General discussion of abstract structures (so-called "meta-structures") that are relevant to the subdivision or to the representation, analysis, and manipulation of its elements: chains, sequences, series, networks, hierarchies, convergences, divergences, etc.
22. Remarks upon the logic and algebra of the subdivision.
23. Suggestions as to what our ignorance of the subdivision or its theme may be.
24. Speculative examples that serve to illustrate the theme of the subdivision.
25. Discussion of the most difficult aspects and possibilities of the subdivision (its so-called "mogology").
26. A universal questionary for treating things by the subdivision.
27. Presentation of various ideogenetic formulas for the generation of ideas within the subdivision or for treating things by it.
28. Demonstration of these formulas by their application to various fields, phenomena, and tasks—and discussion of the results and implications.
29. Summary of the chapter and concluding remarks.
30. Student exercises—designed to teach experientially and to involve readers in the actual use and creation of ideonomy.

I may write the chapters in such a way that these subsections or features 'converse with one another'.

I have not yet decided whether in the course of the book, and especially in the course of the divisional chapters, I will focus ideonomy upon a few recurring subjects and themes—such as biology or diseases—or will instead illustrate it by referring to the greatest possible diversity of subjects, phenomena, and themes. There are good arguments for either approach, but the two approaches would result in very different books.

Applying ideonomy to just a few things would give greater coherence to the book, enable it to be more self-referential and mentally compact, and serve to illustrate what ideonomy can mean when it is applied to a matter in depth and insistently. On the other hand, applying ideonomy to as many things and subjects as possible would dramatize its absolute universality, relate it to a greater number of specialists and specialties, enable it to demonstrate its immense synthetic powers, and elicit—at least in one sense—a wider display of its skills, principles, and concepts.

Partly based upon my experience to date, I expect each chapter to be liberally peppered with fascinating original ideas produced in situ by ideonomy, in a variety of fields. These may capture the imaginations of specialists, and represent predictions confirmatory or infirmatory of ideonomy's asserted powers and scientific status.

I hope to include many diverse lists and charts within each chapter and woven into its text. Whether these and other graphic devices, and that heavy use of color that is so appropriate with ideonomy, will cause every publisher to raise his hackles, bare his teeth, and scream his unwillingness to 'play ball', I do not know.

FIFTH YEAR

Continued Writing of Book; Editing of 'First Edition'

During this final year of the Lounsbery project I will concentrate especially upon the writing of those chapters of my book that treat those divisions and methods of ideonomy that presuppose the prior treatment of other divisions and methods of a more basic or elementary sort, and upon chapters that connect and integrate other chapters, topics, and matters, summarize and evaluate in various ways the book and project as a whole, and devote themselves to the possible future course and needs of my subject.

One final chapter, for example, will summarize all of the best scientific ideas that were generated in the rest of the book by the application of ideonomy to various fields.

As the quinquennium draws to its end the emphasis will turn from the continued writing of my book to its editing.

Having written as many chapters and chapter subsections, and treated as many subdivisions and issues, as time permitted, I will take such material as exists and arrange and edit it into a 'first edition' of my book, for submission to a publisher.

Mrs. Geraldine Van Doren has generously offered to read and help edit my book (though I doubt that she fully realizes what this is apt to mean!). I also hope to have help from elsewhere.

Presumably I will actually begin to look for a publisher near the start of the year, and perhaps I will have the benefit of his editorial assistance even before the writing of the book is done and the situation is irrecoverable.

YEARS > FIVE

Post-Lounsbery Phase of Project, Including Preparation of Much Enlarged 'Second Edition' of Book

This sixth stage of the project is a device for enabling me to continue with the writing of the Ideonomy book that is to be arbitrarily interrupted in the previous year to permit a 'first edition' to be prepared and placed on a publisher's desk before the end of the five-year period of support of my project by the Lounsbery Foundation.

Funding for the continuation of the project would come from elsewhere.

Envisaged is the preparation of a greatly enlarged 'second edition' of the book that would include: (1) deeper and more complete chapters and subsections; (2) more ideonomic subdivisions; (3) more results; (4) readers' criticisms and suggestions; (5) discussion, and results of use, of other methods; (6) greater integration of divisions and methods; (7) more elaborate ideogenetic formulas; (8) many more lists and charts; (9) organons that are more hierarchic and that have a greater number of levels; (10) ideonomy produced by individuals other than myself; (11) greater emphasis on principles and cognition; (12) and further development of an ideonomic language.

I would also collaborate during this stage of the project with individuals in artificial intelligence and cognitive science.

FRUITS OF PROJECT

I have gone over half the way. What are the things that I seem (in retrospect) to be doing in this pathbreaking project? What, stated and viewed simply, is really going on, resulting—materially and significantly—from whatever it is I am doing?

The major things that come to my mind are:

1. Modernizing, improving, and enlarging Peter Mark Roget's "Thesaurus".

The book that the English physiologist Roget published in 1852 was not just another dictionary, but was based instead upon a revolutionary principle: the grouping of words according to ideas. Words exist in abundance, but the value of an amorphous mass of words must be far less than the value those same words possess when mutually organized in a way that permits the mind to see, master, and speak the language of their most fundamental and universal cognitive relationships, or of their actual and potential functions in thought. Roget's purposes transcended lexicography or language; he actually sought to classify ideas for their own sake. In the language of ideonomy, he was concerned with ideography (means for describing ideas), ideotaxy (classification of ideas), ideonomy (s.s., laws of ideas), and the structure of the ideocosm (universe of ideas). Roget was an interesting fellow. He was a Fellow of the Royal Society and served as its secretary for more than twenty years. He tried to perfect a calculating machine. He helped establish the University of London and, most notably, he cofounded the Society for the Diffusion of Knowledge.

The edition of the Thesaurus I own (the word originates from a Greek word meaning "treasury" or "storehouse", incidentally) arranges its words in a seven-category taxonomy; in effect there are: 8 classes w 43 orders w ~203 families w ~1,155 genera w ~9,240 species w ~250,000 individuals (words).

But the ideonomic merits of all extant thesauri are limited and their demerits great. The taxonomies used are inappropriately simple and truncated, ideonomic function-words are few, words and not ideas are clearly the chief inspiration and the ultimate concern of the schemes, the organization does not reveal as much learning and intelligence as it should, there is too much emphasis upon synonyms and upon trivial, particular, concrete, and linguistic things—and far too little upon nomothetic, philosophic, logical, cognitive, and metaphorical things; the arrangement is purely formal (neither it, nor the words, nor the concepts behind the words are explained in any way); abstruse words and concepts play no role.

So unintendedly, my project is laying the basis for a revolutionary new edition of Roget's ubiquitous book.

2. Developing a dictionary of concepts.

There is no universal dictionary of concepts and one is long overdue. The thesaurus is half the book it would be for skipping definitions. The regular dictionary is a dictionary of concepts; but also of everything else, and the conceptual and cognitive elegance is lost! Moreover, nowhere are concepts, universal concepts, and ideonomic concepts explained with anything approaching the necessary ideonomic richness, depth, precision, and insight. In my project I am beginning to overcome this deficiency that darkens the intellect of mankind.

3. Anticipating an encyclopedia of concepts.

Concepts also allow, and also require, a more elaborate treatment: not just definition but explanation, contextual correlation, illustrative application, and the sort of things, generally, that one finds in the better encyclopedias.

Once again, the ideonomy project is furnishing a necessary basis for the future creation of a work of great importance to civilization. It is evolving the classification scheme, vocabulary, methods, principles, sets of concepts, illustrations, and theoretical justifications that are needed to spur and facilitate the production of such an encyclopedia.

The book I am now writing may even be the encyclopedia. Its scope, size, level of organization, and approach will certainly make it the first encyclopedia of ideonomy.

4. Fashioning a language of concepts or a cognitive language.

One way to define ideonomy is to simply equate it to such a language.

It is in any case clear that the popular languages of the world, such as English, are at best crude instruments for thought and the representation and communication of thought. Among other things, their idiosyncrasies, corrupted and generally imprecise usages, misdirected vocabularies, arbitrary grammars, and implicit overall structures all combine to greatly impair their cognitive utility.

Presently there is emerging in ideonomy a new vocabulary—based largely in Ancient Greek—with new rules for the formation, modification, and use of words. The purpose of this new language I am constructing is to make it far easier to think clearly about things and to do so in the most universal, fundamental, rigorous, creative, and evolutionary way.

Synthetic languages are nothing new and those constructed in the past have found little acceptance and gone nowhere. For a variety of reasons one can afford to be more optimistic in the present instance. The goal is not to produce an interlanguage linking the world's languages or their users (through a mixture of languages, hybrid words and grammars, or a smaller language representing some least or greatest common divisor); nor is it necessarily to produce a language that would supersede these other languages. The goal is simply to furnish a language more apt to lead to the perfection of reason, and more able to serve reason throughout science and in technology, culture, and education; or more precisely, to facilitate the development and use of ideonomy.

The new language is founded upon, and is springing almost spontaneously from, a separate and prior universal inquiry into the fundamental categories of ideas and bases of intelligence, and into the taxonomy and future possibilities of same. Just as ideonomy is without precedent, a language based upon it can be unprecedented, and with prospects largely unrelated to what has gone before.

5. Building a universal taxonomy of ideas, and extending the pyramid of ideas infinitely upwards, downwards, and sidewise.

I am finding great gaps in man's inventory or repertoire of concepts, and I am repairing those gaps.

I am furnishing a system wherewith all known and possible concepts can be given rational names and discussed or treated within a single unified framework.

I am uncovering bases for the axiomatization both of ideas and their use; as well as of nature's phenomena, when treated with respect to same.

The first object is in effect Linnaean: to merely compile and classify the universe of ideas via analogical or arbitrary (expedient) nomenclature; the second object is more Darwinian: to classify and explain that universe by reference to what is homological, evolutionary, and necessary.

11. Finding 'all' of nature's general and universal terms.

I have already referred to this.

12. Furnishing a basis for a new world view (philosophy of nature and reality).

This is a profound and old concern of mine, the importance of which may be suggested by the fact that the ideonomy project itself derives from the "Efflorescent World View" I fashioned earlier in a homonymous book.

Students of the histories of science and philosophy are well aware of the tendency that major developments in science have to precipitate new world views; and of the opposite tendency of developments in science to on occasion spring from revolutions in philosophy.

It is already clear that ideonomy requires drastic changes in our world view. Should ideonomy develop into a successful science, great alterations in mankind's philosophies and ideologies should follow automatically.

There are also certain things having to do with science in general that I appear to be doing in the ideonomy project:

13. Advancing the 'science of science' ("metascience").

Metascience embraces the general methods, principles, instruments, materials, institutions, lines of inquiry, organons, etc that further theoretical and experimental research in science.

It is not merely the results of science that evolve but the very methods and means with which scientific investigations are pursued. Advances here can even be especially important, and unique in the breadth of their consequences in science. Under the circumstances, it is surprising that greater effort has not been made to directly improve metascience.

This is something that ideonomy promises to do; in fact, it is almost a synonym for metascience.

14. Developing an interlanguage for the sciences.

Ideonomy discovers and treats phenomena, laws, principles, processes, problems, methods, concepts, dimensions, and the like whose nature is such that they are common, in whole or part, to all of the sciences.

And once again, it promises a new language of exceptional universality and cognitive power.

The imagined interlanguage should give the sciences a common, simpler, more rational, and more teachable language than any they have now.

It will probably foster the equivalent of a 'concept export and import industry' among the sciences.

15. Reconnecting and unifying sciences.

Ideonomy would appear to give rise to a vision of the sciences as really being but one science. It indicates the existence of an infinity of unsuspected connections between and among all sciences and all things within these sciences. It provides novel means for effecting the unification of sciences.

16. Mapping the sciences onto one another abstractly.

What this means is that in the course of my project I have found that there exist surprising commonalities in the structure of different sciences, and indeed of arbitrary sciences. It is almost as if it was a single structure in the human mind itself that was being summoned forth and put to work again and again in each of these subjects, a structure comprised of much of what we are accustomed to think of as the actual content of the sciences.

This intermapping of the sciences can enable them to benefit from one anothers' concepts, internal relationships, methods, and lessons. It can reduce their present and future redundancy and enhance their individual and collective power.

17. Increasing the reciprocity and interdependence of all scientific concepts and investigations.

One consequence of doing this is that whenever advances are made or possibilities are considered that have to do with one thing in science, necessary ramifications or possible corollaries for many—even millions—of things elsewhere in science can automatically be shown.

Moreover, reciprocal constraints imposed by the other things upon would-be innovations or discoveries can be indicated.

18. Mapping possible and necessary future paths of research.

The project is generating means and methods for the doing of such mapping, but it is also doing a considerable bit of it.

It is providing syllabuses, and suggesting coordinated programs, for future investigations throughout science.

It is surveying ignorance, remaining problems, 'higher needs', etc.

19. Reducing the arbitrary idiosyncrasies of scientific subfields.

The historical origins of the sciences impose upon them vocabulary, methods, aims, concepts, researches, systems, and so forth that are rank with the ignorance, prejudices, and juvenilities of the past. This mortmain, or dead hand of the past, is not even recognized as existing in many cases. Yet it imposes an unnecessary burden and does great harm.

Ideonomy has the potential to work a great cleansing magic by stripping science of such vestigial nonsense.

20. Re-wedding science to logic, and logic to science.

It is tragic that these two complementary activities of the human mind ever became divorced, or that man ever lost sight of the fact and necessity of their complementarity 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 is providing many important clues for how these two subjects may at last be reunited.

21. Discovering the fundamental bases and directions of science's evolution; indeed of all human progress.

One way that the ideonomy project is doing this is by bringing to light the fundamental dimensions that characterize scientific phenomena in the first place, and the universally recurring bases of discoveries. Clearly the actual evolution of science must be defined in terms of these things, even though for the most part this has never been done.

But ideonomy promises to be helpful in countless other ways.

Of course, I should emphasize, my project is merely contributing to the above things.

MANUSCRIPT SENT

I have sent to you a copy of most of the manuscript of the book that exists now. Considerable other matter exists in note form, and then of course there are the lists.

What you have received includes parts of twelve chapters. Only one of these chapters is complete (since I have been trying to write the book 'horizontally' —representative breadth first, flexible depth last).

The quality varies greatly, especially owing to the inclusion of what I had written some months ago, when I had not yet gotten into the saddle (and in fact was being dragged by my horse).

Ideonomy, by its very nature, requires an especially complex text; and there are structural problems of this sort that I am still trying to solve.

Perhaps the most perfect chapter to date is that on the division Ignorances, but even it has many flaws, and you will notice from the prefatory table of chapter subsections that what you have is merely a fragment of the projected chapter. Somehow I must learn to condense what I have to say, although doing that will not be easy in a book of this pandectual and foundational sort; I must learn to be "compendious", in the precise sense of the word.

I find it easy to write the chapters by referring to my sectional outlines. The problem is that there is simply so much to say that the textual explication of even a small 'guiding list' quickly becomes as protuberant as a mountain!

However, as I mentioned earlier, it is clear that such problems as exist are now all rapidly being solved.

As for the cognitive side of the book's production, and of its product, I am fascinated by what is going on. It is obvious that ideonomy is introducing us into a new world, and that the science will have a great impact on things if it has the opportunity to develop.

Thus I cannot imagine going back to work again in my old field of the neurosciences without having the advantage of being able to tap ideonomy at the same time, much as one would tap mathematics for the formulation and solution of problems.

Simply arranging the phenomena of the world in terms of their systematic analogies could make a big difference to thinking throughout science. Yet how much more is implicit in ideonomy!

I think that when the book that I am writing is finally published it will cause a great deal of excitement in the intellectual world and kindle a very searching and consequential discussion.

However, we shall see.

A HESITANT CONFESSION

As you will have guessed, the topic is money.

My gratitude to the Lounsbery Foundation for the support it has given me in this project—which surely no one else would fund—is unlimited, and it will persist until the day I die. I am even in awe of the fact that you decided to support my hilariously Promethean project in the first place.

I would, however, like you to know that, should you resolve to go ahead with the final two years of funding, any minor increment to the level of financial support you have rendered in the past—to $15,000 per annum, in other words—would not be unwelcome in this project or frowned upon by the grantee.

Inflation over these five years, even with compounding, will be modest in its erosion of the real value of $15,000.[α] Nevertheless I confess, that without living in luxury, I have found myself being painfully reminded on occasion of the relative and absolute limitations of an existence conducted to the tune of $1,250 per mensem. At the moment there is also the $4,000 debt (to friends) that I am trying to retire. Personally I do not mind the austerity that much; but I am bothered by its tendency to cramp my project in certain nonminor ways.

α: I don't know what the average inflation rate of the general economy has been over the past three years. But a 3% p.a. rate will reduce the real value of $15000 to $13337 four years later.

CLOSE

Well, Alan, I can't really think of anything else to throw at you. I think I've covered the map!

The move to Austin appears to have been very wise. I feel and look much better than I did in loathsome Cambridge. I have a beautiful limestone canyon with a river shooting through it where I can go to walk when I feel the inclination (entrance to this canyon is a stone's throw from my apartment).

The Texan is a friendly bird and he cheers me up just to be around.

The neighborhood IQ may have dropped a bit, but then you can't have everything. I have always led a rather solitary existence anyway.

The important thing is that the project is at white heat and the chapters of my book are beginning to pile up.

I apologize for the size of this report. I wrote it in such a way that I would be able to grind it up afterwards and reuse it in my book! (Most of it, anyway.)

I have been reading a life of Thomas Edison with great interest because of the parallels I see between his career as an inventor and the manner in which ideonomy is developing in this project! There is the same tinkering, the same centrality of analogy, the same arborescence of ideas, the same resynthesis of heterogeneous elements into novel wholes, the same basic process of constructing devices, the same consciousness of the infinitude of possibilities—and even the very same sense of creating a revolution, of stealing fire from the gods, of domesticating light, of learning how to mechanize the organic, of planting the seeds of future industries!

I claim that Edison was an ideonomist!

Cordially,

Patrick Gunkel

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"THE SUBDIVISIONS OF IDEONOMY"

FOREWORD: Typographic variations signify the *preliminarily* estimated relative importance of divisions on a 6-point scale. Divisions are identified by their binomens, which first name the category or province of ideas the division treats (*e.g.* "abilities") and then name, using Ancient Greek roots exclusively, the field of study itself ("anystology"). Each division has its own theory, methods, organons, and ideas. The total number of ideonomic subdivisions is not fixed, but instead depends upon circumstances and needs; 235 are recognized here. Ideonomy can also be partitioned *in other ways*, or have *other sorts of divisions*; these, however, will not be equivalent—certainly not in taxonic level—to what are here termed "subdivisions". Since the new science is still *in statu nascendi*, its proper or final structure, and the terminology pertinent thereto, can at present only be discussed in a highly tentative or purely speculative way. Just as with other sciences, ideonomy might 'be divided' into philosophical, foundational, thematic, terminological, theoretical, methodological, experimental, technological, and applied parts. In this nonagonic scheme, the things listed below could be said to comprise the *thematic superdivision* of the subject.

ABILITIES: Anystology
ACTS: Pragmology
ALTERNATIVE HISTORIES: Nehistorology
ALTERNATIVES: Allagology
AMBIGUITIES: Amphibology
ANADESCRIPTIONS: Anagraphology
ANALOGIES: Icelology
ANALYSES: Merismology
ANOMALIES: Xenology
ANSWERS: Chresmology
ANTISYZYGIES: Antisyzygology
APPEARANCES: Phenology
ASSUMPTIONS: Lemmology
BADS: Cacology
BEAUTIES: Calology
BEHAVIORS: Ethology
BELIEFS: Pistology
BINARY BEING: Catadyology
CAPACITIES: Hicanology
CAUSES: Etiology
CHAINS: Ormology
CHAINS-OF-CONSEQUENCES: Anyormology
CHANCES: Tychology
CHANGES: Tropology
CHAOSES: Chaology
CIRCUMSTANCES: Symphorology
CLUSTERS: Botryology
COEVOLUTIONS: Syndiatyxology
COMBINATIONS: Mixology
COMMONALITIES: Metochology
COMPLEXITIES: Symplocology
CONCEPTS: Ennoology
CONFLICTS: Syrrhagmology
CONNECTIONS: Desmology
CONSERVATIONS: Menology
CONTENTS AND PARTS: Endology
CONTROLS AND GOVERNMENTS: Cratology
CONTROVERSIES: Erismology
CONVERGENCES: Syrrhology
COOPERATIONS: Synergology
COORDINATE SYSTEMS: Pantothenology
CO-PROBABILITIES: Synicology
COROLLARIES: Diocology
COURSES: Dromology
CRITERIONS: Criteriology
CRITICISMS: Momology
CYCLES: Nostology
DEBATES AND ARGUMENTS: Agonology
DECISIONS: Legology
DEFECTS: Atcleology
DEFINITIONS: Orismology
DESCRIPTIONS: Graphology
DIFFERENCES: Heterology
DISCOVERIES: Cyreology
DISEQUILIBRIUMS: Astatology
DISJUNCTIONS: Clastology
DISPROOFS: Catadictology
DISTRIBUTIONS: Strotology
DIVERGENCES: Dichology
DOCTRINES: Dogmology
DOMAINS: Temenology
ECOLOGIC THINGS: Ecology
ECONOMIC THINGS: Oniology
EFFECTS: Anyology
ELEMENTS: Stoichiology
EMERGENTS: Blastology
ENVIRONMENTS: Periontology
EPOCHES: Epochology
EQUALITIES: Isology
EQUILIBRIUMS: Statology
EQUIVALENCES: Isaxiology
ERRORS: Sphalmology
EVALUATIONS: Crinology
EVENTS: Synantemology
EXAMPLES: Tisology
EXCELLENCES: Aristology
EXCUSES: Skepsology
EXPECTATIONS: Elpology
EXPERIENCES: Idrology
EXPERIMENTS: Pirology
EXTENSIONS: Ectatology
EXTREMES: Malistology
FIELDS: Gunology
FIRST PRINCIPLES: Archelogy
FLOWS: Rheology
FORMS: Morphology
FUNCTIONS: Draology
FUNDAMENTALS: Thelymology
FUTURIBLES: Mellology
GAMES: Condacology
GEDANKENEXPERIMENTS: Phronopirology
GENERALIZATIONS: Eurynology
GENESES: Plastology
GOALS: Balbology
GOODS: Agathology
'GROUPS': Stellology
HARDEST THINGS: Mogistology
HETERODOXIES: Heterodoxology
HIERARCHIES: Climology
HIGHER REALITIES: Anohyparology
HISTORIES: Historology
HYPOTHESES: Thesology
IDENTITIES: Tautology
IGNORANCES: Agnosology
ILLUSIONS: Apatology
IMAGES: Idology
IMPLICATIONS: Semasiology
IMPOSSIBILITIES: Bymology
INDIVIDUALS: Idiology
INEQUALITIES: Anisology
INFINITE COMPLEXITIES: Apironology
INFINITIES: Apirology
INFORMATION-THEORETIC AND ENTROPIC THINGS: Menymology
INSTANCES: Mericology
INSTRUMENTS: Labology
INTERACTIONS: Alleloanyology
INTERDEPENDENCES AND RECIPROCITIES: Allelology
INTERESTS: Kedology
INTERPRETATIONS: Hermenuology
INTERREPRESENTATIONS: Alleloschemology
INVENTIONS: Porizology
INVERSIONS: Simomology
KNOWLEDGES: Epistemology
LANGUAGES: Semonamology
LAWS: Nomology
LEARNING AND TEACHING: Didagmolo
LEFTOVERS: Lipsanology
LEVELS: Blethrology
LIMITATIONS: Horology
LOGICAL THINGS: Synetology

MANIFOLDS: Choremology
MATHEMATICAL THINGS: Matology
MATRICES: Hysterology
MEASUREMENTS: Metrology
MECHANISMS: Mechanology
METAPHORS: Tropeology
METHODS: Methodology
MINDS: Noology
MODELS: Plasmology
MONADS: Monadology
MONISMS: Henology
MOTIONS: Kinology
NAUGHTS: Anontology
NEEDS: Chreology
NEGATIONS: Arnesology
NEGATIVE ANALOGIES: Anticelology
NEGATIVES: Hypudamology
NETWORKS: Dictyology
NETWORKS-OF-CONSEQUENCES: Anyodictyology
NICHES: Kenology
NIVEAUS: Anabathmology
OPPORTUNITIES: Caerology
OPPOSITES: Enantiology
ORDERS: Cybelology
ORIGINS: Archology
ORTHODOXIES: Orthodoxology
OUGHTS: Deontology
PARADIGMS: Paradigmology
PARADOXES: Paradoxology
PATHOSES: Pathology
PATHS: Hodology
PATTERNS: Digmology
PERFECTIONS: Enteiology
PERIODICITIES: Encliology
PERSPECTIVES: Apopsology
PHENOMENONS: Enargmology
PLANS: Medology
POSSIBILITIES: Prositology
PRACTICES: Praxology
PREDICTIONS: Stochology
PREPARATIONS: Stolizology
PRESENT (THE PRESENT): Artiology
PRINCIPLES: Axiomology
PROBABILITIES: Icology
PROBLEMS: Aporology
PROCESSES: Sisology
PROJECTIONS: Sciology
PROOFS: Dictology
PROPERTIES AND DIMENSIONS: Usiology
'PSYCHIC' THINGS: Psychology
PURPOSES: Bulemology
QUANTITIES: Posology
QUESTIONS: Pysmology
RANGES: Lichology
REACTIONS: Anabolology
REALMS: Epirology
RECURSIONS: Apsology
RELATIONS: Dochology
RELAXATIONS: Anetology
REPRESENTATIONS: Schemology
RESOURCES: Plutology
ROLES: Morology
RULES: Canology
SELF-EFFECTS: Autanyology
SELF-RELATIONSHIPS: Autodochology
SELF-TRANSCENDENCES: Autopereology
SERIES: Irmology
SETS: Thetology
SHORTCUTS AND THALWEGS: Brachistology
SIMPLICITIES: Litology
SIMULATIONS: Pirohyparology
SOLUTIONS: Acology
SPACES: Chorology
SPECTRUMS: Iridology
SPECULATIONS: Scemmology
STATES AND CONDITIONS: Phasology
STORIES: Enology
STRATEGIES: Strategology
SUPREMES: Acrology
SURPRISES: Adocetology
SYSTEMS: Systemology
TACTICS: Apatemology
TAXONS: Taxology
TERTIUM QUIDS: Triontology
THEORIES: Theorology
THINGS (ENTITIES): Ontology
THOUGHTS: Phrontology
TOPOLOGIC THINGS: Topology
TRANSCENDENCES: Pereology
TRANSFINITES: Hyperapirology
TRANSFORMATIONS: Diaplastology
TYPES: Typology
ULTIMATES AND ENDS: Eschatology
ULTRAFUNDAMENTALS: Catohyparology
UNCERTAINTIES AND DOUBTS: Aoristology
UNIFICATIONS (INTEGRATIONS): Harmozolog
UNIVERSES: Cosmology
USES: Chraology
VALUES: Axiology
VERGENCES: Chiazology
VIRTUALS: Mimology
WANTS: Himerology
WHOLES AND GESTALTS: Hololog
WISDOMS: Sophology
WORKS: Ergology

EDIT: Assimilate!

INTRODUCTION

"Ideonomy: Founding A 'Science of Ideas' "

Patrick M. Gunkel

This talk concerns a ~~five~~ nine-year effort to lay foundations for what may eventually develop into an important, and rather surprising, new field of science referred to as "ideonomy".

Ideonomy may be distinguished from those existing subjects to which it is most closely related.

Whereas the field of artificial intelligence is primarily aimed at the automation of mind, cognitive science at the modeling of human intelligence and thought, and logic at the formalization of reasoning: ideonomy is preoccupied with the discovery, classification, and systematization of universal ideas, with aiding and abetting man's use of ideas, and with automating the generation of ideas.

The ideonomist holds that inattention to the latter things has hobbled the development, and limited the success, of the other fields; and that properly all four subjects should be developed simultaneously and in close coordination, for being mutually necessary and synergistic.

At present ideonomy is divided into some 320 subdivisions, a few of which are: The study of ignorance, The study of analogies, The study of form, The study of causes, The study of questions, The study of answers, The study of processes, and The study of cognitive and heuristic principles.

In each of these cases it seeks to identify: The types (of these things), Higher and lower taxa, Examples, Interrelationships, Causes, Effects, Reasons for studying, Needed materials and methods, Fundamental dimensions and properties, Questions to ask when treating, Related concepts, Abstract and practical relations to other ideonomic divisions, and the like.

"How can such divisions, and such elements thereof," it asks, "be applied to the treatment of any subject, idea, or thing whatever?"

Mathematics is a superscience of the quantitative laws of nature. Work in ideonomy would suggest that the creation of another, essentially complementary superscience may ultimately be possible: one centered instead upon the qualitative laws of the universe.

And there are yet other ways to characterize ideonomy:

The study of how elementary ideas can be combined, permuted, and transformed as exhaustive groups of ideas;

A new language designed to facilitate thought and creativity;

An attempt to make all sciences more scientific and more unified.

The origin of modern science can be traced to the proposals of Sir Francis Bacon that science be refounded upon the basis of universal experimentation and induction, and that such research be pursued systematically in special institutions.

In a book published in 1620, Bacon also urged that the new science have the equivalent of an ideonomic character. Unfortunately this second great suggestion of Bacon's was largely ignored in the subsequent history of science.

This lecture will discuss the origins of ideonomy, its relationship to existing fields, its promise, its structure, its methods and materials, and its early accomplishments when applied to the topics and problems of a variety of fields.

1991 August 2

Mr. Bob Inman, Chairman of the Executive Committee
SAIC
9442 Capital of Texas Highway North
Arboretum Plaza 1, Suite 685
Austin, TX 78759

Dear Mr. Inman:

Woody Bledsoe told me of the conversation he had with you recently about my work and the funds I need to continue it. He urged that I send you a brief description of both.

Since 1983, supported until late last year by the Richard Lounsbery Foundation, of New York City, I have been engaged in a large-scale and systematic effort to lay the theoretical and practical foundations for what in the not-so-distant future could conceivably become an important new scientific specialty.

What Is Ideonomy?

Ideonomy, as the new field is called, is to be distinguished at once from two closely allied fields: *cognitive science*, whose goal is to model mind, and *artificial intelligence*, which seeks to mechanize it. Ideonomy is simply the pure and applied science of *ideas*; or of the *laws*—or significant regularities—of ideas that can be discovered and used, in a progressive fashion, to classify, manipulate, and create concepts in general, when treating particular (or *arbitrary*) things.

The basic value of ideonomy is twofold: it can aid and abet human reason and facilitate the automation of ideation.

Of course, anything that managed to do these things in a *major way* would have large consequences for society. Research, discovery, and invention—in *all* of science and technology—might be rationalized and accelerated, for example, and there could be broad benefits to industry and culture.

How Ideonomy Is Being Developed

Now let me describe how I have proceeded to construct ideonomy, and what have been the results of my efforts to date.

I have divided the subject (or the world of ideas) into ~ 250 *subdivisions*, each of which I have named and defined. A few such divisions are: **Acts, Alternatives, Analogies, Answers, Appearances, Assumptions, Causes, Changes, Controls, Criticisms, Differences, Effects, Errors, Events, Forms**, and **Functions**. (The things named are actually the basic *themes* [essential concepts] of those divisions.)

All ideonomic divisions are developed in much the same way.

Various *sets of ideas* that tend to be critical to the treatment of the divisional theme are identified and listed.

A multitude of so-called *organons* are created under each division. In general, an organon is *any* tool of thought (*e.g.*, a dictionary or the multiplication table). *Ideonomic* organons tend to be special sets, lists, tables, diagrams, maps, or formulas for treating ideas. For the moment, just think of an organon as a list.

It turns out that there are certain general types of (or *generic*) organons that recur in virtually every division, or that it is appropriate to recreate *in specialized form* for each division's theme. This particular set of ~ 100 generic organons is of supreme importance to ideonomy, since it provides something of a universal model for the construction of the total

set of divisions, addresses what are generally the major issues within each division, and can be used to prefigure, systematize, expedite, and standardize the necessary future creation of those myriads of specific organons which, in cooperation with one another, are to serve as much of ideonomy's machinery.

What I am saying is that for the theme, †, of *each* division it is necessary to construct a set of complementary organons specializing in the description of: Species of †, Genera of †, Known examples of †, Speculative examples of †, Properties of †, Elements of †, Questions to ask about †, Relationships among †'s, Causes of †, Effects of †, Degrees of †, Transformations of †, Behavior of †, Principles for treating †, Methods for treating †, Problems re †, Possible assumptions re †, Reasons for treating †, Concepts related to †, *Etc* .

Naturally, all of this more or less assumes that there are *general types* of ideas of this sort—that ideas can be discovered and described of so general and fundamental a character that, in principle, they are simultaneously applicable to *all* things and subjects. Yet that is precisely what I have found to be the case in the course of my ideonomic research.

For ideonomy to develop into an efficient science in the future, *all* of the tens of thousands of organons alluded to above will have to be brought into existence; and *that* will clearly require the—formal or informal—collaboration of hundreds of persons over many years.

Moreover, such a community of individuals will have to do more than just create the mass of organons. It will also have to discover, through painstaking experience, how best to represent and coordinate the organons on a common computer network. Empirical rules for using the organons will have to be worked out. The optimal—general and specialized—combinations of different organons will have to be characterized, along with the methods for combining them (both simultaneously and sequentially). The computerized system should also furnish illustrative examples of how the organons were used in the past.

Actually, the sets of ideas and organons I just discussed, and the things I said should be done with them, are but a very small part of all that needs to be created and done in ideonomy.

Once a natural set of ideas has been conceived of and the various ideas that are members of it compiled, for example, it becomes necessary, in addition, to determine and depict the various important sets of interrelationships, structures, and qualities of that group of ideas. The ideas should be *ranked*, in one or more ways, for their relative and absolute importance. They should be mutually *classified* by their meanings, analogies, properties, functions, *etc.* The different [types, sets, and systems] of *connections* among them should be made explicit. *Each* of the ideas should be *defined* and its properties set forth and *explained. And so on.*

A science of ideas must, by definition, encompass *all* methods for treating ideas. The more such methods are identified, and the more they are interwoven into the theoretical and practical fabric of ideonomy, the more *scientific* ideonomy will be.

Accordingly, in establishing ideonomy I have attempted to anticipate, define, demonstrate, and synthesize literally hundreds of different techniques.

One such method is that of *combining ideas to generate or suggest other ideas.* A pertinent problem is that of identifying the particular ideas, and sets of ideas, whose combination is apt to be the most meaningful, necessary, and productive. Another problem is that of defining the various ways in which such combinations can occur, and the techniques and data that ought to govern or guide such combination, either in general or for specific purposes or needs. Such investigations are critical to the worth of the combinatorial method.

There are sets of ideas whose every combination is valid, insightful, and special. Other ideas can only be usefully combined with the help of sophisticated statistical methods or the like. Special mathematical and quasi-mathematical *formulas* can be devised for steering the combination of ideas and their subsequent reduction.

The *production, use, and coupling of cognitive and heuristic principles* is another important ideonomic method. A simple ideonomic principle is that opposites meet. But

ideonomy also elaborates upon the set of **alternative ways** in which opposites can meet, the **types of opposites** that can meet, and the **types of effects** such meetings can have.

I have shown that every set of ideas corresponds to one or more *spaces of ideas*. If the ideas contained in a set of ideas are generic, coherent, and complete, the corresponding spaces may be of transcendent interest and importance. Methods exist, such as nonmetric multidimensional scaling, for discovering such ideonomic spaces.

Such a space can be mapped—in highly meaningful and diverse ways—upon other spaces corresponding to different but related sets of ideas. Again, to the degree that the ideas, sets of ideas, spaces, and mappings are **generic**, the results can be of deep, broad, and enduring interest to the life of the mind and in the exploration of nature.

Such spaces can also be mapped onto *time*, incidentally, enabling a computer to show semantic time series or a veritable ballet of ideas.

A further ideonomic method consists of *finding the most general scientific phenomena*—patterns, structures, relationships, processes, or the like, which recur, in endless ways, in science after science. Fractals, chaotic attractors, and solitons are three such entities about which we have heard much of late. But ideonomy can define and investigate **the system of all classes of maximally general entities**, and make their exploitation more straightforward.

That Achieved To Date

This work, which I have pursued for over seven years now, has been nothing if not productive, productive beyond my wildest anticipations; almost *too* productive! The last because of the burden it has placed on my hours, energies, and intellect as a result of its explosive, nearly automatic, ever-ramifying, and intolerably fascinating development. I have given everything to this incredibly demanding project (for which I have no regrets whatsover).

What do I *mean* by productive? When I use that word I am thinking of the thousands of pages of material which ideonomy has enabled a computer to produce, virtually unaided, and the literally millions of artificial ideas and logical propositions which fill those pages; of the >540,000 words of description of ideonomy in my unfinished book; and of the >2,000 different organons that I have constructed.

But I am also remembering what has been the strange phenomenon of a subject bootstrapping its own growth and evolution; the unexpected validity and independent vitality of all of those hundreds of projected subdivisions of ideonomy; the elegance, power, and richness of its methods, which also number in the hundreds; the luxuriance of insights and new horizons which are poured like molten gold into the mind of the long-term user of ideonomy; and the plenitude of ideonomy's further promise.

Let me re-emphasize that *there are over 2,000 ideonomic organons lying about in my home here and available for viewing by any interested party*.

There are, for example, lists of the 76 generic causes of illusions; tables of the 159 most basic, universal, and exhaustive analogs of things, which also sublist the properties and sub-analogs of those analogs; maps of the interrelatedness of the various things paths (of any type) do; a box of pennanted pins showing in real 3-D space the structure of the abstract space of all possible types of criticisms of things; dendrograms recording how new concepts in food technology were grown from one another, starting with a single primitive idea; charts four ft^2 in area picturing hundreds of specific variations upon the possible generic shapes of things; maps of all the kinds of stories that can be told about things, or that things can themselves embody; a scale ranking from best to worst all of life's 370 types of events, both ordinary and extraordinary; and a huge table of 535 major examples of human ignorance, in science, technology, and society.

Project Needs

I need financial backing to continue my efforts to build ideonomy and to complete the writing of my book on the subject. The publication of a first book on ideonomy is of course vital to its emergence as a science and profession. No one can evaluate ideonomy without the availability of a large fund of material on its parts, methods, and results, which the book would supply. And until ideonomy is evaluated, no one will take it very seriously.

Since mine is essentially a one-man project, the amount of funding required is relatively small. Funding for three years (1991-1994), at $20,000 *p.a.*, would be more than adequate, and would advance ideonomy substantially.

I realize that my letter only gives a meager idea of what ideonomy *is*. Producing a fully plausible introductory *precis* of such a novel, complex, and largely nascent field is, as perhaps you can appreciate, a virtually impossible task. Saying more at this point might have been both presumptuous and nugatory. My hope was that a minimal vignette would at least supply you with an initial sense of the uniqueness, purpose, methods, and potential of the subject and my own endeavor, and so stimulate your further interest.

Perhaps if we had the opportunity to meet I could show you some of the actual materials that have been produced by the ideonomy project in such abundance and, more importantly, answer such questions as you might have about it in a direct and decisive way.

Sincerely yours,

Patrick Gunkel

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Postscript

• I thought perhaps that, given the unfamiliarity of my work, and the ambition and longevity of my project, you might wish to have a few **personal references**. Each of these individuals knows me well and has considerable knowledge of ideonomy or my present endeavor.

Robert Clark, who is Harvard Law School's new dean and my oldest friend, can speak with authority of my character and history.

Prof. Frederick Seitz is an eminent solid state physicist, past president of Rockefeller University and of the National Academy of Sciences, a Lounsbery Foundation trustee, and an old friend. It was Seitz who instigated Lounsbery to award me the unsolicited grant which initiated the ideonomy project in 1983, and whose assessment of the progress and additional needs of the endeavor led to several other grants from that foundation (which I must say has certainly shown courage and imagination). Seitz has read or seen almost everything of importance that I have produced so far. So his valuation of the past, present, and future of ideonomy might be of greatest value to you. I think you would find his support of my work keen and undimmed.

Woody Bledsoe suggested I also add his name to the list, in case you wanted to consult with him further. Since he is a prominent figure in the history of artificial intelligence, his view of the validity and promise of ideonomy has particular interest.

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(2) **Prof. Frederick Seitz**
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518-656-9684 (NY), 305-296-8490 (FL).

(3) **Prof. Woodrow Wilson Bledsoe**
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Austin, TX

Telephone: *Home,* 512-453-1101.

• **I have enclosed** a number of things which, as discussions or products of ideonomy, may make the subject more tangible and your picture of it more complete—or faithful to the original! They are *not* an integral part of this letter—being a *nearly* random sample of the things I could have sent—and ***you may wish to disregard them.***

August 12

"WHAT IS IDEONOMY?"

Patrick Gunkel

In the narrowest sense, the word "ideonomy" could be said to refer to the set of efforts I have made over the past eight years to find methods that would permit *general ideas* to be dealt with after the manner in which the methods of any existing science enable the phenomena of that science to be dealt with, and to demonstrate these methods at work. That is, it designates a systematic and determined attempt to demonstrate the possible nature and the actual practicality of a science *of ideas themselves.*

It is unfortunate that what many people would desire most at this point, a definition of "ideas", cannot honestly be provided. But too much could easily be made of this inability. Thus it is also true of many other sciences that they name their central theme but never define it, or at least, never define it in any *fundamental* sense. Biology studies "life", but what *is* life? All sciences deal in the most crucial way with concepts; but again, a fundamental definition of "concept", one that would reduce it precisely to some sort of generic natural phenomenon, is not available at present. Finally, our loose intuitive appreciation of what we mean by "ideas" is sufficient to give us a first sense of what a science of them might be and do.

Perhaps it would help if I recalled the circumstances in my life that caused me to conceive of ideonomy in the first place.

I have long been interested in the scientific study of the future, which is a field complementary to history, as the study of the past. Since it is impossible to predict the future as a whole, or the unique course it will take, the best investigations of the future are usually those which attempt nothing more than to systematically characterize its [range or 'matrix'] of possibilities. A science of "the future", then, would necessarily comprise general methods for [identifying and surveying] the characteristic possibilities of arbitrary things.

The work I once did as a neuroscientist was primarily concerned with understanding the general nature of intelligence. But this problem led me to study the systematic content of human experience and systematic structure of the external world. As a result, I discovered that all of reality is underlain by a single language of basic types of order. I realized that the transformations, interactions, and combinations of these universal elements of order are governed by certain laws, whose identification could lead to the development of a general science of order.

I happen to be a polymath with an intense desire to know and understand as much as possible, not only about what is known to the human race at the present time, but about what is *not* known. This literally universal interest has caused me to imagine special methods, technology, and concepts that might be created to integrate and augment *all* of human knowledge and inquiry.

An old interest of mine has been the future of artificial intelligence. One of the key things this field will eventually automate will be ideation, or the creation and life of ideas.

My past association with so-called think tanks acquainted me with the existence of general patterns, methods, and concepts that cut across many or all disciplines and allow novel forms of insight and creativity. This experience led me to wonder if it might be possible to fashion a veritable science of such general relationships and techniques.

Each of the things I have mentioned, then, played a role in the conception and development of ideonomy.

I began by saying that ideonomy represents an effort to find and demonstrate methods for treating ideas scientifically. *Here are some of the major ideonomic methods I have developed to date.*

Combination of Ideas

Certain ideas can be combined with certain other ideas in certain ways—ones that may be unusually meaningful, necessary, or productive.

This sounds like a platitude, but I mean it in a sense and degree so extreme that it would surprise most people.

Such purposeful and selective combinations can stimulate new patterns of thought, reveal unsuspected relationships among or processes involving things, generate new ideas directly, or give one valuable insights into oneself. Combinations can help one to understand how the world is really put together or how it really operates.

The successful development of this ideonomic method hinges on the discovery of: the most diverse, powerful, and natural ways of combining concepts generally, the most appropriate ideas and sets of ideas to combine for various purposes, the best uses of such combinations—or applications of the ideas and insights they result in, the strategies for employing combinatorial methods in concert, continually, and progressively, and the ways of combining this ideonomic method with other techniques of ideonomy.

Devising and Modifying Ideonomic Formulas

Ideonomic formulas are analogous to those formulas, or analogs of 'formulas', which are found, and which often play a crucial role, in so many other disciplines—*including* mathematics, logic, linguistics, chemistry, particle and quantum physics, and computer science.

They are notational devices which define in a [simple or lawful] way how two or more particular [ideas, ideonomic referents, or sets thereof] [do, can, do hypothetically, are to, or are not to] mutually [relate, combine, chain, interact, or cooperate] in [nature, the human mind, or the operation of a machine].

Such a formula may incorporate logical, computational, word-like, grammatical, mathematical, esthetic, and other kinds of elements—including arrows, brackets, branches, lists, *etc.*

The commonest functions of ideonomic formulas are to:

Generate new ideas;

Show the <actual *and/or* possible> <limitable or infinite> **<variations and modifications>** of given <ideas or sets of ideas>;

Reveal the **<components, properties,** variables, constants, and dimensions> of an idea;

<Discover, describe, or classify> the <finite or infinite> <logical, mathematical, cognitive, or ideonomic> **<structure, interrelations, or interactions>** of an <idea, set of ideas, or set *of sets* of ideas>;

Elucidate the **homology** of an idea from other ideas;

Suggest the **laws** of an idea;

<Characterize or stimulate> <actual or possibe> <general or specific> **<thoughts** or systems of thoughts> about an <idea or set of ideas>;

Suggest the possible **<extensions, generalizations, and evolutions>** of an <idea or set of ideas>;

<Facilitate or optimize> the mutual **<interaction, combination, operation, or development>** of various <specific *and/or* generic> ideas;

Induce the **<asking *and/or* answering>** of various <specific or canonical> **questions** about an <idea, set of ideas, or matter>—or suggest the set of relevant <ideonomic or general> <themes, concepts, or researches> which it is <possible or important> to pursue;

Enable more of the <great, diverse, and exhaustive> set of all <alternative, supplementary, and complementary> ideonomic **<divisions, organons, and methods>** to be brought to bear upon the <idea, problem, or matter> of interest—or, in fact, to suggest all ways of doing *that*.

Identification of Natural Sets of Ideas

There are certain *clusters* of ideas which are especially important, universal, and fundamental. Awareness of them can steer all of thought and render it far more efficient, deep, creative, and meaningful.

It is essential that all of the ideas which are the basic members of such a set be known.

Classification of Ideas

The universe of all possible ideas is divisible into certain most [natural, useful, or meaningful] domains.

Also, although but few [things and types of things] have been *systematically* classified to date, novel [schemes and methods] can be devised which will permit *all* things to be classified, and classified, moreover, in *all* [natural or useful] *ways*—at least, in the course of time.

[Generation, Modification, and Explanation] of Words

Countless words are needed which do not as yet exist. Ideonomy can help to anticipate the need for, create, explain, and exploit such words.

It can also clarify the definition, etymology, and possibilities of *existing* words.

Extension and Generalization of Ideas

Old ideas can often be modified to apply to things other than those to which their application was formerly limited, or to apply to things in new *ways*.

They can also be given a more general or universal form, or can be made to transcend their traditional narrow, specialized, or finite interpretations. They can be shown to [express or relate to] *increasingly general* [phenomena, processes, relationships, or properties].

Mathematizing Ideas

Concepts in general can be shown to have an unexpected mathematical side, or to have or involve mathematical [elements, measures, relations, operations, mappings, *etc*].

Also, many supposedly *purely mathematical* concepts, do in fact have mathematical analogs or homologs; and many mathematical concepts which traditionally have been thought of as being wholly mathematical, can be defined or translated into non-numerical form (*via* words, graphs, maps, complex and kinetic images, abstract sound patterns, sensorimotor 'games' of a *scholarly* nature, *etc*).

Mapping of Ideas Onto Spaces

Any idea can be mapped onto a variety of spaces, in terms of a variety of relationships, and by a variety of methods.

Moreover, all natural sets of ideas *themselves define* manifold spaces, which they can be used to uncover.

Such spaces can also be mapped *onto other types of spaces*, or onto spaces corresponding to related-but-different sets of ideas. *Intermappings* of this sort can be made to give rise to

[novel and higher-order] maps, and can reveal [new, more complex, or more specific] [logical, cognitive, and practical] [relations, functions, patterns, and possibilities] among ideas.

All mappings of ideas ultimately tend to converge upon the same unitary structure: the universe of all possible ideas, which evidently is a thing at once infinitely complex and infinitely simple.

Deriving New Ideas From Old By Building Structures of Ideas

A given idea can be transformed into, or made to lead to, other ideas, by means of a homological structure.

Interactions, combinations, and permutations of ideas can also be guided—and recorded—via such an "idea structure".

Analogies

There are general [rules, relationships, concepts, methods, *etc*] that can be used to [reveal, characterize, and exploit] all analogies between all ideas (or things).

All analogs and analogies have generic [properties and corollaries] that can be [isolated and systematized].

Construction of Organons

Organon is a very old word with a simple meaning. It refers to any tool of thought. Dictionaries, books in general, the multiplication table, and symbolic logic are all organons.

In ideonomy an effort is to made to imagine and create *every conceivable category* of organon.

However, *some* types of organons are especially important to ideonomy's development and operation. For example, there are certain so-called universal generic organons that ought to be *recreated in specialized forms* for many or all of the hundreds of disciplinary divisions of ideonomy.

To understand what this implies, please appreciate that each ideonomic division is essentially concerned with *one* general conceptual theme: with shapes, for example, or analogies, or problems, or events, or whatever. And that each of the universal organons referred to is likewise basically concerned with *one* general theme: with types (of any given division's theme), for instance, or properties (of that theme), or causes, or effects, or whatever.

Visualize, then, the creation of a comprehensive two-dimensional table of possible ideonomic organons, based on the intersection of the set of all of the divisional themes with the set of all of the organonic themes. The bipartite themes of some of the binary organons suggested by such a table include: Types of shapes, Properties of analogies, and Causes of problems.

These organons might typically represent a list or map identifying all of the canonical examples of the bi-thematic genus of [thing or idea], organized in some [classificatory, explanatory, or other useful] way.

Of course, in the actual future development of ideonomy, not only would all of these binary organons have been created, but a great deal of useful information would have been recorded in conjunction with each—*about* [how the organon should be used, what its particular powers and applications are, what other organons it goes best with, characteristic problems of the organon and how to avoid them, illustrative previous uses of the organon and results thereof, further specializations of the organon whichare possible and appropriate, *etc*].

All of this helpful data, advice, and documentation would always be instantly available to any user of ideonomy, via computer, in efficiently organized form.

OBJECTIONS TO IDEONOMY AND ANSWERS THERETO

The proposal that there could be something like ideonomy—either pure or applied—is bound to prove controversial. Questions will be raised about its feasibility, importance, nature, or aspirations.

Some of the objections that have been, will be, or might be raised will now be discussed, and an effort will be made to answer these criticisms. Let it be admitted in advance, however, that at least a few of these objections probably do possess some conditional or absolute validity. That is, it will be unlikely that what initially develops as ideonomy will be unflawed or free of the kinds of problems anticipated by these objections; and certainly it will be hard to rid the young field of all of these difficulties, defects, and limitations, whether initially or in the course of its maturation.

If possible objections to ideonomy are identified at the outset, and indeed at the very moment when the field is first proposed and by the very person who 'first' proposed it, this may make for their early retirement and for a less defensive attitude within the field.

Objection 1: Ideas do not have or obey "laws" per se. Perhaps the concept of law can only apply to things that are less amorphous, complex, abstract, open-ended, or mental, such as physical phenomena or machines; ideas per contra may be sui generis, infinite, spiritual, holistic, mercurial, quintessentially lawless or the antithesis of laws.

Possible answers: We know too little about the nature and possibilities of "law" and "idea", at this time, to say what either of them may or may not have, be, or permit. Although it is possible to articulate objections of this sort which sound mighty impressive, their main effect is apt to be sonorous. Ideas are a function of mental processes, mental processes are neural and therefore physical processes, and neural and physical processes almost surely have or obey laws; hence mental processes and ideas should also have or obey laws, even if hitherto these have never been found and seldom been sought. The objection might spring from a misconception if the laws of ideas, or those initially sought by ideonomy, happen to differ in form or degree from laws in the usual, or an extreme, sense; and in fact, accepted laws do differ enormously in their rigor and form. Moreover, there is no universally recognized and inexpandible definition of a scientific law. What is normally meant by an ideonomic law may simply be a useful regularity or universal feature of ideas. The laws upon which ideonomy rests need not be explicit, known, or directly used; possibly they are merely implicit, their existence necessary only in the indirect sense of insuring the validity, efficiency, fundamentality, universality, empiricality, transcendentality, or unity of the principles, relations, sets, concepts, methods, or other elements that are used by ideonomy—in an explicit, known, or direct way. Laws of ideas may be possible, or isolable, iff something like the actual and complete set of their proper terms is known first; and it may be that such knowledge is about to exist for the first time.

Objection 2: The laws of ideas are not discoverable by man. Again, the human mind may lack the specialized faculty or the precision or power that are necessary to uncover or rigorously formulate ideas' laws; a discrepancy that may be either marginal or stupendous. Perhaps, somewhat mystically, the laws of ideas may indeed exist in nature but have a character such as to be almost or absolutely undiscoverable, as suggested above.

Possible answers: There may be laws that are undiscoverable until their generic nature has been properly formulated, whereupon their progressive discovery may be ready and uninterrupted. A dogmatic bias against the possibility of there being laws of ideas or of such laws being discoverable may have been all that hitherto has stood in the way of their widespread recognition. Proof of the discovery of ideonomic laws may ironically presuppose the simultaneous discovery of a sufficient number of interrelated laws that their peculiar context defines and enables the possibility of proof, or provides the necessary meaning to the very concept of such laws. Certain concurrent developments in present-day science, technology, and mathematics—in computer science, artificial intelligence, and neurology for example—may now or soon be what at last or for the first time enables the discovery and use of ideonomic laws. Once again, it is hard to imagine that ideas represent some strange and unique category of natural phenomena that will not yield up its laws to the evolving methods of experimental science and to the seemingly illimitable ingenuity of the mind of man; that success in this matter is not simply a matter of time and visionary perseverance.

Objection 3: Although ideonomy may one day be feasible, that will not be for decades or centuries. Or ideonomy may take that long to mature. Ideonomy may be vastly more difficult to create than other sciences and hence its development may take correspondingly longer. Or all major sciences may require centuries to emerge. Ideonomy may presuppose the scientific explanation of the human brain and mind, or the achievement of true artificial intelligence or of a theory of same, and these developments may be decades or centuries off. Perhaps ideonomy, as something of a universal and culminating science, will presuppose the maturation, completion, and integration of all of the other sciences; the many diverse pieces of the jigsaw puzzle may have to be discovered before the puzzle itself can be assembled and the universal pattern finally identified.

Possible answers: The incubation of sciences may be concurrent, and the sciences that may be necessary for the creation of ideonomy have already existed for hundreds of years. History in general and the development of science and its possibilities and powers in particular are patently exponential. Ours may well be a uniquely or certainly a supremely swift, self-accelerating, convergent, and synergistic age—certainly in respect to science and technology. One can perhaps identify the precursors of ideonomy in the last few centuries and decades, and what may have been its anlaga and embryogeny. He who pretends to foresee the next few centuries or even decades is indeed a bold prophet; and negative prophecy has always been the most hazardous and the least successful. It seems inappropriate, in any case, for those who have not specifically contemplated the possibilities and developmental requirements of something like ideonomy to speculate with assumed authority on its infeasibility or on the length of time needed for its gestation or earliest creation. Delays such as those imagined in the achievement by neurology and artificial intelligence of their major goals, are decidedly pessimistic; certainly centuries will not be required. Moreover, it is not clear that ideonomy presupposes comprehension of the brain or intelligence; its requirements are surely simpler. It could more easily be argued that those other fields presuppose ideonomy. Again, ideonomy may be what the perfection of other sciences presupposes, rather than vice versa.

Objection 4: Although something like ideonomy is possible in principle, its actual creation would be impossible for being too difficult.

Ideonomy, at least in the form envisaged by the madman Patrick Gunkel, would require such an enormous number of divisions, methods, concepts, dimensions, and organons that it would take forever to create them and it would always be impossible to integrate them in a meaningful and functioning whole. The tasks and concerns of ideonomy have a tendency to increase exponentially so that the very attempt to complete ideonomy paradoxically leaves the field ever less complete and less convincing. Simpler forms of ideonomy, on the other hand, would lack the critical complexity and comprehensiveness that is necessary for the new science—by its peculiar nature—to work. As the number of organons increased, their terms would have to be made ever more specific so that each organon would remain sufficiently differentiable from all other organons; but in fact the powers of language—not to mention the powers of human memory, thought, and learning—would soon be exceeded. The resources needed to develop ideonomy would be so great that they could be better invested elsewhere.

Possible answers: Creating ideonomy, on the contrary, will be especially easy, since the field has a unique ability to guide, facilitate, and accelerate its own development. Also, ideonomy evolves convergently, synergistically, and vergently. Gunkel's conception of what ideonomy will or should be like is merely intended to serve as a first, tentative model of what is possible; the model is subject to extreme revision and might even be almost completely superseded, or replaced by a framework devised later by another person or a group. It is already apparent that the many different divisions, methods, concepts, organons, etc of ideonomy can be created in an ever easier, quicker, and more straightforward way: by analogy to one another, by serial, dendriform, hierarchic, and plexiform derivation and coderivation, by an automatic discovery and evolution of both explicit and implicit rules, paradigms, interrelationships, categories, clusters, groups of transformations, procedures, criteria, patterns, and modulatory terminology, and in other ways. The more complex and complete ideonomy is, paradoxically, the simpler it is: in form, meaning, and perhaps use. The meanings of the proliferating elements of ideonomy themselves proliferate and remain implicit in the field's developing structure and parts. The use of ideonomy develops a pattern of mental associations and ways of thinking that automatically defines its terms and illuminates, internally and inter se, the meaning of its innumerable organons. Any initial costs of developing ideonomy are apt to be repaid many times over by the later benefits accruing in every field of human endeavor.

Objection 5: Even if ideonomy were successfully created, man's intellectual limitations might preclude its efficient employment.

Thus few people can or do understand and use, or use efficiently, mathematics in general or some of its parts, symbolic logic, or—despite their extraordinary power and promise—advanced computer languages. It would be easy to imagine an extraterrestrial civilization a million years more advanced than ourselves visiting the earth and making a gift of a fantastically powerful calculus, that would however remain useless to man because of the basic feebility of his primitive brain. Abstract or heuristic principles might enable the largely uncomprehending construction of a thing like ideonomy, without man having the intellect to actually use it afterwards. Also, it took many centuries for men to learn the full use and possibilities of some of the earlier discoveries of the first mathematicians.

Man may lack the necessary powers of memory, imagination, abstract reasoning, and mental concentration to realize the wonderful new powers inherent in such an innovation as ideonomy. His efforts may at first be purely metaphysical.

Possible answers: This is an objection that is best answered experimentally—by creating or attempting to create ideonomy, and seeing whether mankind has the ability to make much use of it. It is pointless to speculate in advance. It is just conceivable that the human brain has been waiting for ideonomy as a tool that is easier to master and more generally useful than something as limited, specialized, and abstruse as mathematics or quantitative reasoning.

Objection 6: Just another name for philosophy. Why reinvent the subject, especially when it is already so ancient and developed?

Possible answers: Philosophy had its chance. At this moment in history its development has been arrested. It lacks drive, excitement, brilliance, and relevance. It has become precious and abstract. It is out of date, caught up in traditional and often passé concepts and problems, and hopelessly out of touch with the big and fundamental problems in science, technology, mathematics, and society. Something far more scientific than philosophy is necessary, and perhaps its name is ideonomy. Or perhaps ideonomy is philosophy's chance to once again become relevant to the world's immediate and future problems and possibilities.

Objection 7: Just another name for logic. And what has logic ever achieved? Certainly nothing on the scale of what is promised by ideonomy.

Logic demonstrates the nonformalizability of reason or the triviality of its universal elements. Logic is as old as mathematics, but what has it accomplished that is in any way comparable—or in any way significant? That it has never evolved into ideonomy suggests that the development of both is impossible.

Possible answers: Whereas logic (formal logic) is sterile, unproductive, finite, and stagnant; too abstract, formalistic, self-centered; too undeveloped or small; and dull: ideonomy by contrast is creative, powerful, applicable, evolutionary, and infinite in its ultimate promise. Ideonomy delights in immersing itself in all other fields and in the details of their knowledge, theories, and methods, their hopes and aspirations. Basic to its philosophy is the belief that without them it is nothing.

Objection 8: Just another name for the field of artificial intelligence, or its subfield of "expert systems" or "knowledge engineering". And per se, probably premature.

Is not the computer central to both? Is not ideation the real test of intelligence? Does not ideonomy ultimately aspire to automate the production of ideas?

Possible answers: Whereas for artificial intelligence the immediate and main goal is the mechanization of mind, for ideonomy it is the aiding and abetting of the totality of ideation in man, or perhaps more generally, the formalization, systematization, intensification, and evolution of ideation or of the world of ideas. Although ideonomy could conceivably be treated as, and may one day become, a proprietary subfield of the former, at the present time at least there is little research in artificial intelligence that is truly ideonomic, and nothing in that field that suggests the natural breadth of ideonomy. If the computer is central to ideonomy, it is less as an end than as a means.

Objection 9: Feasible, but only in part.

Ideonomy is a great dream, but only the creation of some of its divisions, methods, or organons may be feasible. Some may be meaningless or impossible, or merely sound interesting. Are there few ideogenetic formulas of real interest?

Possible answers: Which parts of modern mathematics, science, or technology would have been considered "feasible" 300 years ago? Even 'part' of something like ideonomy could be extremely valuable. Who really is to say which part of ideonomy is or is not practical? Some of the parts of ideonomy that seem the least probable or the most esoteric may eventually prove to be the most important. Knowing for a fact that certain things that ideonomy aspired to achieve are absolutely infeasible could be of major importance to science in general.

Objection 10: Feasible, but its promise far less than asserted.

For example, perhaps the analogies between things in general are not as deep, extensive, or important as ideonomy at first supposes. Perhaps the ability of ideas (or things) to combine with other ideas (or things) is not as great as ideonomy assumes; perhaps useful or illuminating combinations are rare, or combinations are largely redundant, meaningless, or incomprehensible. Perhaps the many different divisions of ideonomy will always have little to say to one another or defy synthesis. Perhaps ideonomy will always be inferior in its powers to unaided but intuitive and original thought.

Possible answers: Again, its promise is so great that the realization of but a portion of that promise would justify its existence or creation. The objection, in any case, is hypothetical, where it might also be argued that ideonomy is special in that it promises to become one of the most—or even the most—fundamental, powerful, universal, and useful of man's sciences. The more fundamental and universal a thing is, the more powerful and useful it may have a tendency to be. The history of science has not only been one of the creation of additional sciences but of increasingly more powerful sciences. Certainly the establishment of what was truly a science of ideas could be expected to have extraordinary consequences.

Objection 11: Its name is pretentious or otherwise objectionable.

It sounds like the science of idiocy to certain ears! Or perhaps cultic or pseudoscientific.

Possible answers: It might be dryly remarked that, on the contrary, "ideonomy" represents one of the few properly formed, wholly Greek-derived terms of late. It has a precise and elegant Ancient Greek meaning. The confusion with idiocy is superficial, transient, and ridiculous. The suffix -nomy is identical to that in astronomy and is approximated in economics; the dictionary defines it as referring to "the science or study of (a subject)"; the 'laws' implied need only mean regular or productive generalities, patterns, methods, or principles. Few persons realize that many currently accepted or admired words were condemned at the time they were coined for being ugly or outlandish. Ideonomy it is and ideonomy it will stay! The preexisting and partially synonymous word ideology would be preferred were it not for its having been fatally preempted by its other senses.

Objection 12: Perhaps feasible, but the probability is low.

Why waste money on something so dubious or uncertain? Perhaps it would be better to spend it on something that has already given results or that would be more important—such as artificial intelligence—or that promises something more fundamental—as do cognitive science or neuropsychology (to wit, the explanation of the human mind or thought itself)?

Possible answers: The probability may or may not be low, but the payoff would certainly be extreme! Bets like this can make good sense. The concept of ideonomy can at first seem flabbergasting, but that does not mean that the probability of ideonomy being feasible is low. Further examination of the idea may be appropriate. Is ideonomy intrinsically less probable than mathematics? Many great mathematicians still find their science highly improbable, and with good reason.

Objection 13: As projected, will be too vast or complex.

Discussion of this objection has to some extent been anticipated in the discussions of Objections 4, 5, and 9 above.

Possible answers: Again, ideonomy has a remarkably simple internal structure that is initially invisible but that becomes progressively apparent to the student or user of ideonomy. That ideonomy has 320 subdivisions or may acquire 10 to 100 thousand organons should not really be a source of anxiety since, for example, the number of subdivisions is in a sense arbitrary, a function of whatever level in the pyramid of possible subgroupings of partitions of the total subject one might wish to declare the "subdivisional level"; and since in practice one would consult a hierarchic menu or dendrogram to expeditiously select a small cluster of organons that appeared to be the most interesting, relevant, or useful—or the selection of the relatively tiny subset would be done semiautomatically by the computer or a man-machine conversation. Ideonomy is indeed vast and complex, and yet it is also—or it is these things only because it is also—simple, elegant, fundamentally small, and well-structured. The size and complexity are deceptive because the science is so exquisitely hierarchic, self-referential or cross-connected, rational or 'natural', self-derived, and anthropomorphically mind-like.

Objection 14: Although it would be important if it were enthusiastically embraced, used, and perfected, in reality it is far more likely to be ignored, rejected, misunderstood, or used inefficiently.

Intellectuals are far too dogmatic, rigid, reactionary, cautious, or cynical in their ways or outlook. The young are unlikely to receive the critical education in its use, possibilities, and importance that its adoption would presuppose. History is rife with bright inventions and ideas that languished, were inhumed by neglect, or finally won acceptance only after the most improbable delay. The specialists in various fields that ought to welcome it will dismiss it as [allochthonous, meddlesome, presumptuous, superfluous, visionary, faddish, recreational or merely amusing, cumbersome, contrived, obtuse or barbaric, unnatural, contra-intuitive, recondite, bizarre, formalistic, naive, metaphysical, deterministic, unassimilable, vacuous, cosmological or megalomaniacal, untested or uncelebrated, ideological, too upsetting, distracting, dangerous, dereistic, or irreferable to familiar categories]. The concept, and many of the methods and products, of ideonomy fairly invite ridicule and ridicule is blinding, contagious, and deadly. By its very nature ideonomy will trigger multifarious misunderstandings and a refractory polarization of the scientific community. Many persons will automatically oppose ideonomy for its assumed arrogance, imperialism, bureaucratizing tendencies, or antiempiricism. Would ideonomy really be worth it, under the circumstances?

Possible answers: Experience to date suggests that the exact opposite is apt to be the case. The reaction to ideonomy, among laymen and specialists alike, has been almost uniformly friendly. When first introduced to the

concept most people are admittedly astonished and skeptical. But if ideonomy is properly explained, they become excited, sympathetic, and curious. It would appear that there is something universally and deeply appealing about the whole notion of a science of ideas; it resonates with some element of human nature or in our contemporary culture. Of course people's interest in ideonomy and their willingness to take it seriously has been primed by the recent emergence and celebration of artificial intelligence. Then too, our whole culture—or at least American culture—expects the extraordinary and embraces the new and revolutionary. Most scientists are willing to give ideonomy the benefit of the doubt or to suspend judgment until the fledgling discipline has had a chance to be examined, tried, and tested by the general community. Many younger scientists and engineers seem, if anything, overeager to believe in, embrace, and exploit the new field; they often see it as inevitable, "long overdue", the wave of the future and a panacea. How differently the future of a field can seem to its struggling and agonizing founder! Because ideonomy is a science and technology, it has the power to test, demonstrate, and publicize itself: it will make predictions, run experiments upon itself, and produce results. These things will automatically confirm or infirm its authenticity, and if they validate the field, they will also earn it attention, respect, acceptance, and support; if the results are extraordinary—as with ideonomy they often should be—they will bestow upon it renown. In this case the uproar caused by ideonomy will not matter. Finally, whatever the reaction of scientists at large to ideonomy, the field may find the parental protection and succour it requires to establish itself in the allied and themselves controversial disciplines of artificial intelligence and cognitive science.

Objection 15: Ideonomy might be feasible, but not on the basis of the methods, and in the form, presently being proposed or attempted.

Already alluded to, this objection questions the choice, quality, or necessity of the elements of ideonomy that are offered in this book. Perhaps coessential, superior, or improved ideonomic dimensions, methods, divisions, concepts, materials, etc have been omitted. Perhaps all the ingredients necessary for ideonomy appear in this book, but they are undercooked or have been misprepared. Perhaps the gestation of ideonomy should continue a while longer; even the book may be premature or abortive. Mayhap the creation or mere founding of ideonomy demands nothing less than a team effort. Possibly the requisite inspiration, intelligence, or expertise are wanting here; or simply the proper touch or promulgative flair. Conceivably this presentation of ideonomy should be shorn of its philosophic embellishments, or replace its eloquence with examples and sustained argumentation, or be more mindful of its readership. Perhaps there should be more of artificial intelligence, more of computer programming, more of statistical or mathematical methods, or more of cognitive modeling in the book. Perhaps there should be more ideogenetic formulas and fewer lists. Perhaps the different divisions need to be better coordinated than they are. Perhaps there should be more higher-level terms or greater explication of procedures, processes, operations, rules, or criteria. Perhaps the discussion should be less abstract and more concrete. Perhaps ideonomy should be explained, or even developed, by its sustained application to particular things or solvable problems or conventional tasks.

Possible answers: Granted. But others are welcome to essay their own!

Objection 16: Ideonomy may remain the successful but idiosyncratic creation of its individual creator, something incapable of being understood or efficiently used by other individuals, perhaps apart from a small and controversial elite group.

Either perforce or perchance. The style, methods, concerns, ideas, terms of reference, or purposes may remain too atypical or too characteristic of the founder of the field alone. Perhaps the apparent success and power of the field to date has been due to the deceptive selectivity of its application or an unconscious avoidance of its weaknesses, defects, or ultimate impossibilities. Or perhaps it has depended upon exceptional, unique, or irreproducible skills, insights, or other qualities of its creator; indeed, perhaps the formal structure of ideonomy, or the science as described, is largely epiphenomenal and irrelevant, merely a mnemonic, talisman, or conduit for the native, intuitive, special powers or point of view of the would-be founder; perhaps the psychic infrastructure is so vast and inscrutable that it will never be communicable or formalizable. Of those who study ideonomy in the hopes of making it their career, only a very few may succeed.

Possible answers: Ideonomy has to some extent already been successfully tested for general learnability, usability, and creatability or extendibility. Per contra it is perhaps apt to become the most universal—in applicability and use—and least idiosyncratic of all sciences. Many valuable subfields of mathematics are created, used, and understood by only a few, "elite" people. Who knows but that it might even be only natural that the 'most abstract of sciences'—as ideonomy in one sense could be described—should turn out to depend upon the attention—to be the special interest and responsibility—of humanity's few, finest minds? Because it deals only with what we are all always and everywhere doing, ideonomy may turn out to be the most elementary of the sciences, and the most intuitive. It may even be the subject that can and should be taught the earliest in life or to toddlers. Since ideonomy had its 'grandfather', Fritz Zwicky, the objection that ideonomy might be wholly idiosyncratic has already been falsified. Moreover, to some extent the present writer got his 'cue' from Zwicky; so evidently ideonomy—through books like Zwicky's—is transmissible.

Objection 17: Ideonomy may merely offer to make explicit activities and methods that are already in common, albeit unadmitted or purely intuitive, use.

Perhaps we are all ideonomists in the first place, and the practice of ideonomy can no more be trained than the art of love?

Possible answers: Some of its methods and preoccupations are indeed already "common", but ideonomy can be expected to enormously increase the intensity, efficiency, methodicalness, ease, astucity, productivity, and breadth of use of those and related methods and concerns, as well as to bring into play umpteen others. Perhaps even mathematics—the highest, greatest, and most central of extant sciences—was in intuitive use everywhere—as a qualitative sense or instinctive mastery of number—before the advent of formal or notational mathematics? Many books—entire libraries, really—have been written on the art of love! Every art has its science—the sort of science that Beethoven spoke of in connection with music. Even human perception can be exalted via scientific training and management.

Objection 18: It may be possible for single individuals to use some of ideonomy's divisions or methods in a specialized way, but the dream of a universal and integral tool may be excessive.

Perhaps ideonomy can be invented and operate within each of the sciences —autochthonously, if you will—but what is produced or fashioned within one field is apt to be little exportable to another, or little combinable with the results of the scores of different, homegrown ideonomies. Just as the philosophy of physics, philosophy of biology, and philosophy of geology have seldom found much common ground or had many lessons to teach one another. So what if leaf stomata, skin pimples, and sunspots are all analogs of the geological volcano; can the botanist, medical researcher, or solar physicist really be expected to learn some new tricks or gain important insights if they ring the doorbell of the neighborhood volcanologist to learn about possible corollary similarities or about "meta-phenomena" reexpressed in their primordially orthogonal sciences?

Possible answers: It is not yet clear to what extent even something as old and familiar as mathematics may be useful to the common man or usable by the totality of the human race. The degree of universality that is theoretically possible may be a function of the ingenuity of the methods and technology with which it is taught and used, and present-day ingenuity may be arbitrarily short of maximal; indeed, there are already indications that technology and complementary methods now on the horizon may enormously increase the use of mathematics. In any case, there are no obvious reasons for believing that Objection 18 is correct. Should every science require, in effect, its own form of ideonomy, the total forms of ideonomy could still have great importance.

Objection 19: Fields of knowledge have become far too diverse, specialized, separated, complex, and sophisticated to ever again permit the development of such a universal aid, methodology, or science as "ideonomy".

Ideonomy may or may not have been possible quite a bit earlier in the history of science, but the spectacular growth of knowledge has now made such a superscience impractical and perhaps unnecessary. Or perhaps had ideonomy been established when science itself began it would have remained viable now and in the future, but its actual failure to have developed along with the whole of science has now precluded its late introduction. At some point in history the methods, tools, terms, concepts, purposes, programs, institutions, data, and researches of different sciences may become so alien as to produce interdisciplinary ruptures that are fundamental, self-extending, and irrevocable; whereafter the discontinuous sciences may diverge progressively forever.

Possible answers: It does not matter that for 100 years or 500 years the large-scale pattern in all of science has mimiced a thermodynamic law in the progressive and almost monotonic increase of the divergence and specialization of the subdivisions of science and of the activities conducted therein. It is perfectly possible that this has occurred as a net trend because there has been no comparable effort in the opposite direction, that might have favored or coenabled the progressive convergence, consolidation, unification, and generalization of all sciences and scientific activities. Nor does the extraordinary measure of success of modern science and technology confirm the necessity and rightness of the way in which they have developed or of the form they now have; an aberrant or incomplete trend of the kind alluded to could achieve great power, without providing the contrast that would be needed to indicate the possible superiority of an opposite or complementary trend.

Technology that is just materializing may open the way to a new kind of science distinguished by the absence of any net tendency toward specialization or the ceaseless multiplication of apparently unrelated terms, concepts, problems, phenomena, methods, and specialties. Computer simulations, networks, languages, algorithms, parallel architectures, etc—and computers themselves—that are of ever greater power, and of a peculiar nature, promise the counterrevolution. Ideonomy may be the final element needed to effect this vast change in the character of science. Also worth considering is that if science has been as imbalanced or one-sided as suggested here, then many of the problems in or caused by modern science may ultimately find their explanation in its long-term, excessive, and avoidable specialization and self-divergence. It is always a surprise to discover the extent, and the apparently magical way, in which a great number of diverse and seemingly unrelated things can be subsumed in one another hierarchically or via appropriate covering relations or operations, whether in the abstract or concretely. There is every reason to believe that this process of subsumption and unification has been exhibited only in its most elementary forms by extant science and technology; and no absolute limits to what is possible are presently known or seriously imagined. The only thing that is certain is that science as we know it is far too complex, and ignorant of the key to its simplicity.

Objection 20: Ideonomy rests on the fallacious assumption that there are—or are enough, or are truly fundamental—"universal ideas".

Actually the universe of all ideas is a non-hierarchical sea of largely unrelated and essentially specialized ideas, with trivial exceptions. This objection is reminiscent of some of the earlier ones.

Possible answers: Science and the human mind depend upon the assumption that there are, and indeed involve the progressive discovery and use of, universal things and ideas—in fact ones of ever greater and higher universality. The existence and power of these universals is astonishing and remains an abiding mystery (as to cause, ultimate degree, and implications). No one knows whether these universals have to do with the nature of the human brain, with the methods or prejudices of science, with the universe as it is accidentally, or with some more fundamental aspect of reality; but almost everyone accepts their power and potential. Nevertheless, had people realized earlier the kind and extent of universal ideas that exist or are possible, ideonomy would already have been created; so the present proposal that such a science is possible really rests upon the empirical discovery of an unglimpsed and unexploited order of universal ideas and ideational universals, a discovery which it is the aim and purpose of this book to share with society. Examination of the material offered in these pages will hopefully answer Objection 20.

Objection 21: Were it practical to create such a marvelous science it would have been done a long time ago.

The concept of ideonomy is at least half a millennium old; perhaps it is even as old as logic. There must have been any number of opportunities for individuals to attempt to create or start the field.

Possible answers: The existence of the computer, recent computer software, and artificial intelligence make ideonomy more timely and feasible. It can be argued that there are two major kinds of opportunities for innovations—opportunities that are basically internal to or implicit in the total structure of actual historical innovations, and opportunities largely external to and omitted in same—and that whereas the former are convergent,

deterministic, and therefore highly probable, the latter are less probable or at least harder to predict. The reason why ideonomy does not already exist may be that it is an ideal product of the latter sort of opportunity. Realistically, however, one can think of many discoveries, inventions, and achievements that could have predated or postdated their actual time of occurrence by many centuries. It often takes the longest time to do the most obvious things. Perhaps too many of those who might have created ideonomy were afraid of being laughed at, and abstained from the attempt. Certainly Fritz Zwicky's prototype of ideonomy, Morphological Research, attests to the feasibility and potential power of a science of ideas.

INVESTIGABLE DIMENSIONS OF PHENOMENA

Scientists investigating phenomena might wish to consult lists indicating in advance the probable and possible 'dimensions' of those phenomena. The problem at present is that little effort has been made to identify, compile, and publish such investigable dimensions; reference books treating of such dimensions simply do not exist.

Researchers no doubt have recourse to something equivalent to these lists but existing within their own minds. The trouble is that the informal, subjective, and virtual substitutes are apt to be crude and unreliable. Moreover, the 'lists' of different investigators will not be the same in what they include and exclude, and in what the content of the various lists is understood—personally and interpersonally—to mean.

Two ideonomic enterprises should therefore be launched: the one to collect, analyze, and make known the relatively special dimensions of given phenomena in given sciences, and the other to do the same but for the relatively general or universal dimensions of all phenomena in all sciences (or subjects).

As these undertakings progress they will prove to be self-facilitating. Dimensions will suggest other dimensions, which in turn will suggest still other dimensions. Special dimensions will come to suggest extensions and generalizations; general dimensions, various specializations. General dimensions will give rise to more, and special dimensions to less, general dimensions. Combinations, permutations, and transformations of dimensions will suggest further dimensions. Rules for the generation of arbitrary and particular dimensions will first be recognized intuitively and then given explicit and operational form; rules for generating rules themselves will become known.

This progressive enumeration of the investigable dimensions of phenomena will be both theoretical and empirical. The testing and application of dimensions will lead to the discovery of new distinctions, categories, and patterns, and hence to additional dimensions.

The multiplication and exploitation of these dimensions, it should be added, will also foster the discovery of new phenomena; in fact dimensions will lead to phenomena, and phenomena to dimensions, in infinite and ever more embracive and astonishing chains of discoveries.

Associated with this increase in the sheer number, diversity, and range of dimensions of phenomena investigable by science will be an ever greater understanding of the total meaning of the dimensions, both in themselves and vis-à-vis the phenomena—or more generally, things—to which they are applicable.

There will be progress—possibly incessant—in the definition, explanation, exemplification, autocorrelation, intercorrelation, axiomatization, proceduralization, specification, synergistic coordination, classification, etc of the recognized dimensions.

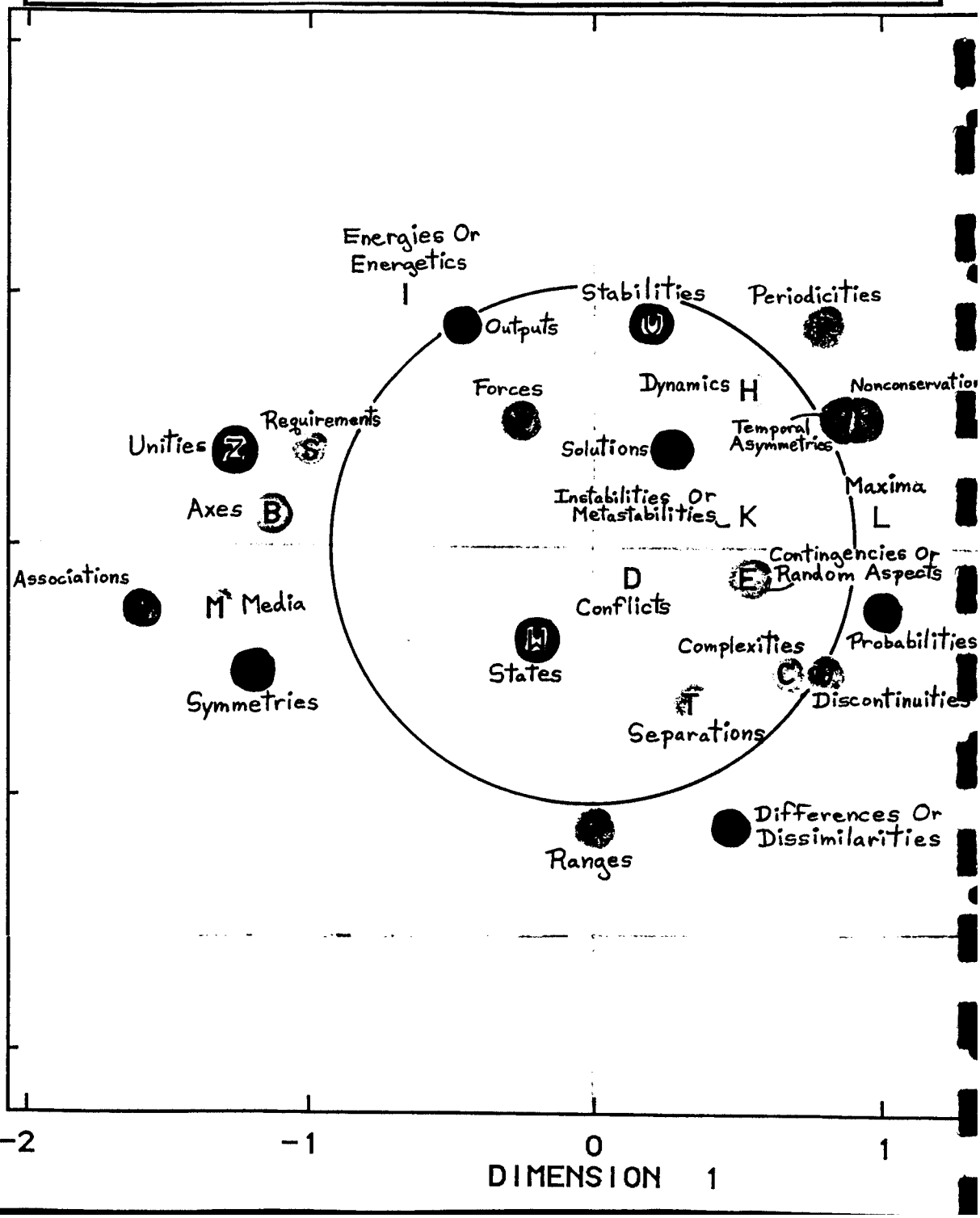
Abstract and working relationships between these dimensions and the totality of ideonomy's divisions and methods will be explicated.

ILLUSTRATIVE DISCUSSION OF SOME DIMENSIONS

We will now consider the enclosed "Table of '208 Universally Investigable Dimensions of Scientific Phenomena'" (please see). I have made extensive use of this organon in my ideonomic research and the remarks I make about it will reflect this breadth of experience and experimentation.

INTUITED OVERALL MUTUAL *'RELATEDNESS'* OF
"26 (of 208) UNIVERSALLY INVESTIGABLE DIMENSIONS OF SCIENTIFIC PHENOMENA".

- Ideomap Created By Triadic Method of nMDS.
- Ideonomic Division: 'PROPERTIES-&-DIMENSIONS AND USIOLOGY'.



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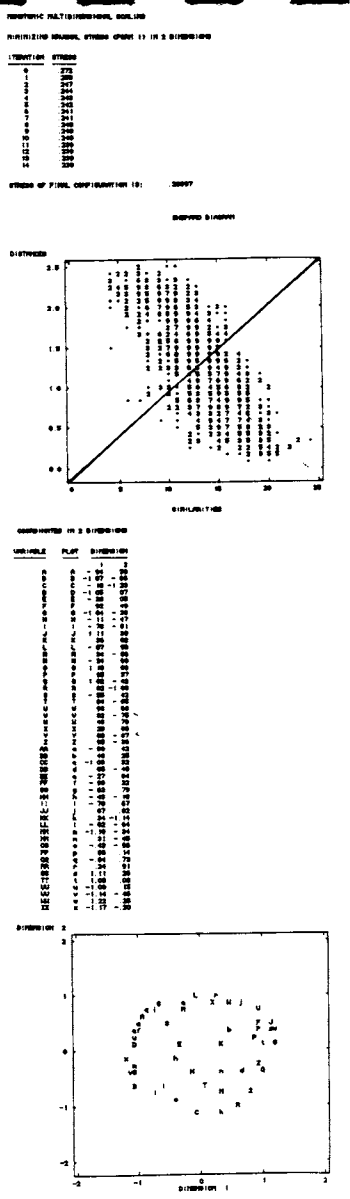
(N_I=26)



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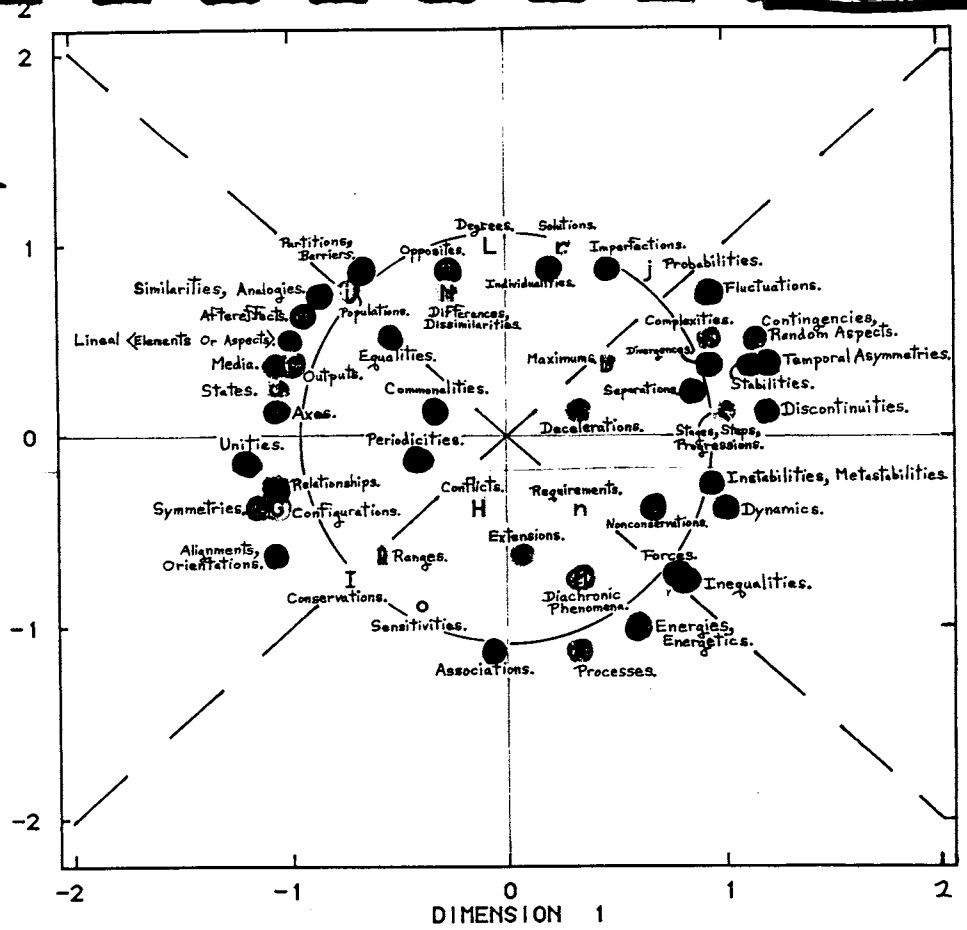
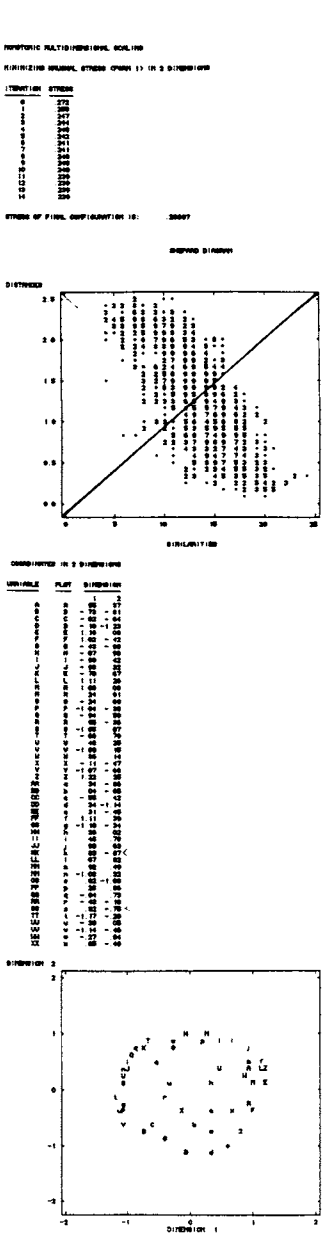


• • • FIRST SET OF 50 DIMENSIONS • • •

INTUITED OVERALL MUTUAL *'RELATEDNESS'* OF
"50 (of 208) UNIVERSALLY INVESTIGABLE DIMENSIONS OF SCIENTIFIC PHENOMENA".

- Ideomap Created By SCALEE-SCALOR INVERSION of Earlier nMDS Triadic Method Table Via 26 *Ersatz* Scalors (Inverted Ex-Scalees).
- EXERCISE #57,260 • 1991 November 17
- Ideonomic Division: 'PROPERTIES, DIMENSIONS, & Usiology.



PROPERTIES

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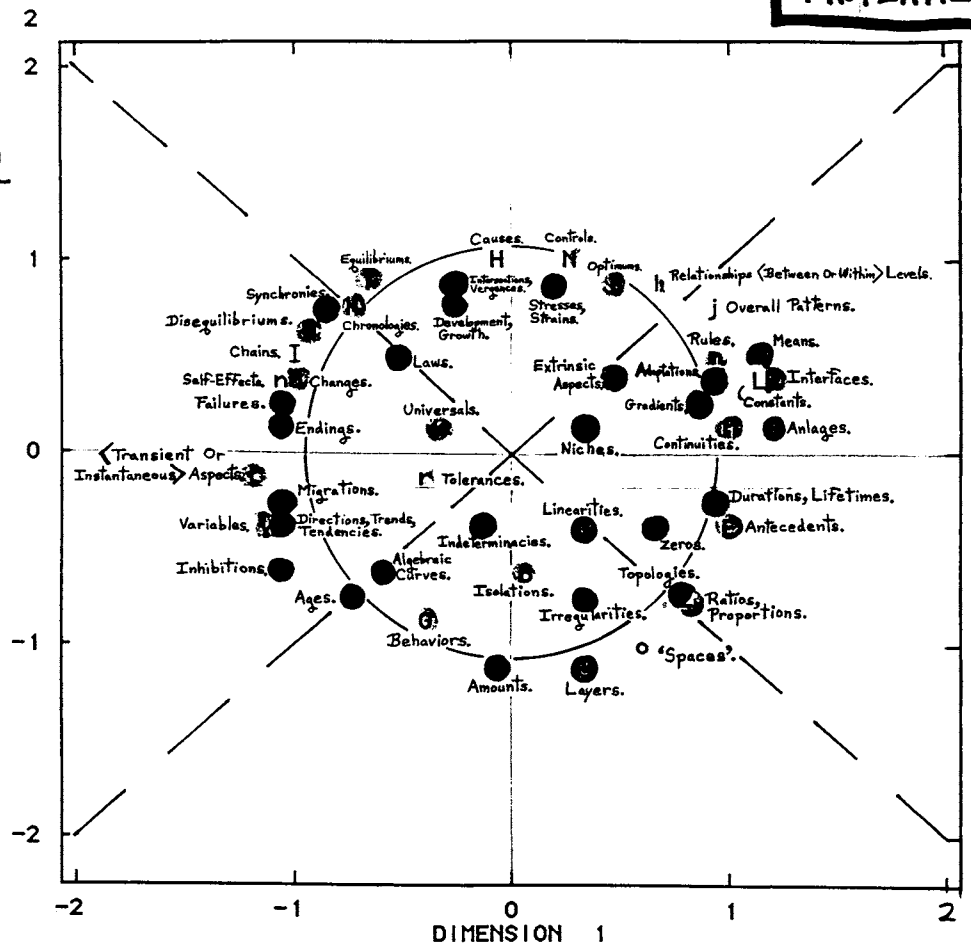


• • • SECOND SET OF 50 DIMENSIONS • • •

INTUITED OVERALL MUTUAL *'RELATEDNESS'* OF
"50 (of 208) UNIVERSALLY INVESTIGABLE DIMENSIONS OF SCIENTIFIC PHENOMENA".

- Ideomap Created By SCALEE-SCALOR INVERSION of Earlier nMDS Triadic Method Table Via 26 *Ersatz* Scalors (Inverted Ex-Scalees).
- EXERCISE #91,665 • 1991 November 17
- Ideonomic Division: 'PROPERTIES, DIMENSIONS, & Usiology.

TABLE OF
'208 UNIVERSALLY INVESTIGABLE DIMENSIONS OF SCIENTIFIC PHENOMENA'

1. Absolutes.
2. [Accelerations or decelerations].
3. Accuracies.
4. Achievements.
5. Activities.
6. Adaptations.
7. Aftereffects.
8. Ages.
9. 'Algebraic aspects'.
10. Algebraic curves.
11. [Alignments or orientations].
12. Amounts.
13. Anamorphoses.
14. [Angles or vertices].
15. Anisotropies.
16. Anlages.
17. Antecedents.
18. Antisynergisms.
19. Arbitrary aspects.
20. Associations.
21. Asymmetries.
22. Autonomies.
23. [Averages or norms].
24. [Avoidances, exclusions, preclusions, or inhibitions].
25. Axes.
26. Behaviors.
27. Causes.
28. Chains.
29. Changes.
30. Chronologies.
31. Coefficients.
32. Coherences.
33. [Collimations or parallels].
34. Commonalities.
35. Complexities.
36. [Compresences or combinations].
37. [Concauses or cofactors].
38. Conditions.
39. Configurations.
40. Conflicts.
41. Conservations.
42. Consignifications.
43. Consiliences.
44. Constants.
45. Constraints.
46. [Contents or parts].
47. [Contingencies or random aspects].
48. Continuities.
49. Controls.
50. Convergences.
51. Convolutions.
52. [Cooperative phenomena or synergisms].
53. Covariations.
54. Cycles.
55. Cycle-hierarchies.
56. [Decays, disintegrations, or deaths].
57. Degrees.
58. Degrees of freedom.
59. [Destinations or starts (possible inceptions)].
60. Details.
61. [Development or geneses].
62. Diachronic phenomena.
63. [Differences or dissimilarities].
64. [Directions, trends, or tendencies].
65. Discontinuities.
66. Disequilibria.
67. Divergences.
68. [Durations or lifetimes].
69. Dynamics.
70. [Enemies, antagonisms, or challenges].
71. [Energies or energetics].
72. Equalities.
73. Equations.
74. Equilibria.
75. Exchanges.
76. Exponential intricacies.
77. Expressions.
78. Extensions.
79. External [form or forms].
80. Extrinsic aspects.
81. Failures.
82. Fields.
83. Fluctuations.
84. Forces.
85. Gradients.

(CONT.)

(CONTINUATION OF TABLE)

86. [Growth or evolutions].
87. Habits.
88. Heterogeneities.
89. Imperfections.
90. Importances.
91. Indeterminacies.
92. [Indexes or parameters].
93. Individualities.
94. Inequalities.
95. Infinite aspects.
96. Inputs.
97. Instabilities.
98. Integrals.
99. Interdependences.
100. Interfaces.
101. [Interferences, disturbances, or perturbations].
102. Internal structures.
103. Interoperations.
104. Interpretations.
105. Intrinsic aspects.
106. Irregularities.
107. Irrelevant [aspects or elements].
108. Isolations.
109. Languages [functional, interpretive, or controlling].
110. Laws.
111. Layers.
112. [Limits or boundaries].
113. Lineal [elements or aspects].
114. Linearities.
115. [Locations, loci, or points].
116. Magnitudes.
117. [Maintenances or homeostases].
118. Margins.
119. Mathematical complexities.
120. Mathematical moments.
121. Matrices.
122. Maxima.
123. Measures.
124. Mechanisms.
125. [Media, means, intermediates, or vehicles].
126. [Mergers or coalescences].
127. Metastabilities.
128. [Metrics or units].
129. Migrations.
130. Minima.
131. Modalities.
129. Migrations.
130. Minima.
131. Modalities.
132. Modes.
133. [Modules or cells].
134. Negative values.
135. Niches.
136. Nodes.
137. Nonconservations.
138. Nonlinearities.
139. [Null, nonexistent, or absent] aspects.
140. Number of parts.
141. Opportunities.
142. Opposites.
143. Optima or pessima.
144. Orders (in sequences).
145. Outputs.
146. Overall patterns.
147. [Partitions or barriers].
148. Periodicities.
149. Populations.
150. 'Potentials'.
151. Preconditions.
152. [Probabilities or certainties].
153. Problems.
154. Processes.
155. Products.
156. Propagations.
157. Ranges.
158. [Rates or tempi].
159. [Ratios or proportions].
160. Reactions.
161. [Reciprocal, conjugate, or complementary] relata.
162. [Redundancies or irredundancies].
163. Regularities.
164. Relationships.
165. Relationships [between and within] levels.
166. Relativities.
167. Requirements.
168. Resources.
169. [Reverses or antiphases].
170. Risks.
171. [Rotations, circularities, or rings].
172. [Routes or paths].

(CONT.)

(CONTINUATION OF TABLE)

173. Rules.
174. Scales.
175. Self-effects.
176. Sensitivities.
177. Separations.
178. Signs.
179. [Similarities or analogies].
180. Simplicities.
181. Solutions.
182. 'Spaces'.
183. Stabilities.
184. [Stages, steps, or progressions].
185. States.
186. Statics.
187. [Stresses or strains].
188. Successes.
189. Surfaces.
190. Symmetries.
191. Synchronies.
192. Temporal asymmetries.
193. Textures.
194. 'Things that contain'.
195. Thresholds.
196. Tolerances.
197. Topologies.
198. [Transformations or transmutations].
199. [Transient or instantaneous] aspects.
200. Turbulences.
201. Unities.
202. Universals.
203. Variabilities.
204. Variables.
205. Vectors.
206. [Vergences or intersections].
207. ['Work' or ergodic aspects].
208. Zeros.

"91 Subjects and Representative Phenomena"

ESSENTIAL CONCERN:		SUBJECT:	REPRESENTATIVE PHENOMENON:
sounds	1.	ACOUSTICS:	Musical echoes ("analyzed sound").
flight	2.	AERONAUTICS:	Stall flutter.
beauty	3.	AESTHETICS:	Symbolism.
farms	4.	AGRICULTURE:	Irrigation.
man	5.	ANTHROPOLOGY:	Myth.
ancient man	6.	ARCHAEOLOGY:	Archaeological site.
buildings	7.	ARCHITECTURE:	Moldings.
smart computers	8.	ARTIFICIAL INTELLIGENCE:	Semantic networks.
non-earth geology	9.	ASTROGEOLOGY:	The Martian polar caps.
cosmic phenomena	10.	ASTRONOMY:	Cosmic rays.
bacteria	11.	BACTERIOLOGY:	Bacterial acellular stalks.
life chemistry	12.	BIOCHEMISTRY:	The Krebs cycle.
organisms	13.	BIOLOGY:	Ant slavery.
plants	14.	BOTANY:	Stomatal transpiration.
commerce	15.	BUSINESS:	Goodwill.
industrial chemistry	16.	CHEMICAL ENGINEERING:	Steam distillation.
molecules	17.	CHEMISTRY:	Bonding.
movies	18.	CINEMATOGRAPHY:	Superimposition.
bodies of taxa	19.	COMPARATIVE ANATOMY:	Allometric primate evolution of the Papez circuit.
whole cosmos	20.	COSMOLOGY:	The cosmological principle.
crime	21.	CRIMINOLOGY:	Slum criminogenesis.
crystals	22.	CRYSTALLOGRAPHY:	Nucleation.
ultracold	23.	CRYOGENICS:	Superconductivity.
cells	24.	CYTOLOGY:	Cytokinesis.
ecosystems	25.	ECOLOGY:	The nitrogen biogeochemical cycle.
economies	26.	ECONOMICS:	Economic depression.
teaching	27.	EDUCATION:	Emulation.
electricity	28.	ELECTRONICS:	Electromagnetic induction.
embryos	29.	EMBRYOLOGY:	Neurulation.
insects	30.	ENTOMOLOGY:	Epizootics.
morality	31.	ETHICS:	Respect for human dignity.
animal behavior	32.	ETHOLOGY:	Courtship rituals.
evolution	33.	EVOLUTIONARY BIOLOGY:	Natural selection.
foods	34.	FOOD ENGINEERING:	Freeze-drying of foods.
genes	35.	GENETICS:	Recessive genes.
earth chemistry	36.	GEOCHEMISTRY:	Metamictization.
places	37.	GEOGRAPHY:	The Republic of Senegal.
earth	38.	GEOLOGY:	Crustal warping.
landforms	39.	GEOMORPHOLOGY:	Badlands.
earth physics	40.	GEOPHYSICS:	Earthquakes.
the past	41.	HISTORY:	The signing of the Magna Carta in 1215 A.D.
waters	42.	HYDROLOGY:	Waterfalls.
ideas	43.	IDEONOMY:	Co-probabilities.
lighting	44.	ILLUMINATION ENGINEERING:	Coarrangement of luminaires.
disease-resistance	45.	IMMUNOLOGY:	Antigens.
industry	46.	INDUSTRIAL PROCESSES:	Electroplating of metals.
news	47.	JOURNALISM:	Reporting errors.
law	48.	LAW:	Alienability of shares.
language	49.	LINGUISTICS:	Inflection.
literature	50.	LITERARY CRITICISM:	Plot inconsistency.
books	51.	LITERATURE:	Styles.
reason	52.	LOGIC:	Axiomatization.
administration	53.	MANAGEMENT SCIENCE:	Unidirectional communication.
materials	54.	MATERIALS SCIENCE:	Embrittlement.
number	55.	MATHEMATICS:	Fibonacci sequence.
health	56.	MEDICINE:	Allergic reactions.
weather	57.	METEOROLOGY:	Atmospheric circulation.
small things	58.	MICROSCOPY:	Interference microscopy.
war	59.	MILITARY SCIENCE:	Flank attacks.
minerals	60.	MINERALOGY:	Vermiculite.
form	61.	MORPHOLOGY:	Instellations.
music	62.	MUSICOLOGY:	Counterpoint.
brain	63.	NEUROSCIENCE:	Cortical evoked potentials.
ocean	64.	OCEANOGRAPHY:	Detached giant ocean eddies.
light	65.	OPTICS:	Diffraction.
past weather	66.	PALEOCLIMATOLOGY:	Paleoclimatic cycles.
early life	67.	PALEONTOLOGY:	The earliest life.
parasites	68.	PARASITOLOGY:	Host debilitation.
soil	69.	PEDOLOGY:	Soil horizons.
stamps	70.	PHILATELY:	Commemorative stamp.
wisdom	71.	PHILOSOPHY:	Concrescence (per Alfred N. Whitehead).
photos	72.	PHOTOGRAPHY:	Latent images.
physical phenomena	73.	PHYSICS:	Radioactivity.
plant distribution	74.	PHYTOGEOGRAPHY:	Grasslands.
policy	75.	POLICY RESEARCH:	Scenario writing.
government	76.	POLITICAL SCIENCE:	Democratic revolutions.
waste disposal	77.	POLLUTION ENGINEERING:	Particulate scrubbing.
psyche	78.	PSYCHOLOGY:	Falling in love.
insanity	79.	PSYCHOPATHOLOGY:	Persecution complex.
safety pins	80.	SAFETY PIN DESIGN:	Shaft-clasp disalignment.
sediments	81.	SEDIMENTOLOGY:	Fossitextura figurativa.
society	82.	SOCIOLOGY:	Differential mobility.
sports	83.	SPORTS:	Runners' second wind.
breeding	84.	STIRPICULTURE:	Heterosis.
fabrics	85.	TEXTILE MANUFACTURE:	Carding.
heat	86.	THERMODYNAMICS:	Entropy.
animal health	87.	VETERINARY SCIENCE:	Zoonoses.
viruses	88.	VIROLOGY:	Bacteriophages.
painting	89.	VISUAL ARTS:	Impressionist painting.
volcanos	90.	VOLCANOLOGY:	Glowing avalanches (nuées ardentes).
artificial weather	91.	WEATHER CONTROL:	Cloud seeding.

Not all of the tabulated dimensions correspond to the familiar definitions of the terms that have been chosen to designate them, and many terms need to be explicitly redefined if they are to be understood correctly or at all.

Although many of the different dimensions are analogous and intimately related, none are strictly redundant from an ideonomic point of view.

Ideally, any phenomenon in any science is describable in terms of each of these many dimensions, or requires all of the dimensions to be fully—or at least 'minimally'—characterized qua phenomenon.

The application of these dimensions to any given phenomenon should have implications for all other phenomena; and all phenomena should in turn have implications for the phenomenon through the dimensions. The set of dimensions can therefore function as a device that forces the recognition of ever more meaningful and broad analogies, laws, and relationships within the entire universe of 'scientific phenomena'.

What qualifies as a "phenomenon" is in principle any object, concept, or thing whatever. But what I have found in practice is that phenomena possessed of a processual or dynamic aspect or character are especially suited for treatment by the table.

The word "dimensions" as it is used in the title of the table refers to qualities or properties that ordinarily, but not always, have a quantitative range or aspect.

The set of dimensions included in the list may be mutually orthogonal, adjunct, or the like. They have been chosen, or are meant, to be maximally orthogonal, ranging, comprehensive, complementary, synergistic, exhaustive, mutually and reciprocally bounding and determining, universal, clear, simple, heuristically and taxonomically powerful, ideogenic, fundamental, necessary, canonical, invariant, scale-equivalent, etc (or at least this statement is true as a first approximation).

Some of the items that are supposed to correspond to dimensions actually contain opposites or cognates.

Some of the dimensions are similar, analogous, or merely related—in meaning—to other dimensions; some—logically or semantically—are wholly or largely included in others as part, specialization, or sub-taxon thereof. Some dimensions should be distinguished from, or not confused with, other dimensions. Some dimensions have co-opposite meanings. Finally, some dimensions partially overlap, in some sense, other dimensions. All of these things should eventually be specified as precisely as possible.

The table's set of dimensions are tentative; some may later be dropped, replaced, or renamed—and new dimensions may be added to the list.

What I have found to be the case, as so often with ideonomy, is that typically certain dimensions initially appear to be inapplicable to certain phenomena, but reveal themselves to be relevant upon further consideration or as one's general acquaintance with the dimensions, or experience with their possible meanings in connection with diverse phenomena, grows.

What deserves to be emphasized and reemphasized is that what the table offers is not just an alphabet of descriptive or existential dimensions of physical and mental phenomena but a supposedly optimal framework for the accumulation, organization, and growth of mental associations and conceptual insights in the course of the table's endless and ubiquitous reuse.

To some extent the table is also meant to be self-defining and self-perfecting: a vocabulary and grammar given meaning and function by experience and advanced by skill alone.

It should be understood that the table in itself merely represents the first and most superficial level or step in the actual treatment of these dimensions.

In the future there will be accessible upon a computer entire hierarchies and networks of organons directly serving this minimal but rather central organon.

Thus beneath each of the table's dimensions will be lists of subdimensions upon various sublevels, or representing different orders—and hierarchic branches—of subdimensions. A given dimension might be subdivided into as many as five or twenty sublevels (of subdimensions of subdimensions of subdimensions...).

Certain terms or subdimensions might be reused at successive levels or in lateral branches of the defined structure; or occasional rules might allow the finite or infinite : lower, higher, sidewise, or arbitrary : reuse of arbitrary or defined parts of, or even of whole, levels or branches.

The option of various alternative levels, branches, or hierarchies (or of various kinds of dimensions, dimensionalities, spaces, or manifolds) might be provided at some nodes (with or without explicit criteria, rules, advice, instructions, explanations, weightings, etc).

Nodes, links, levels, dimensions, etc might be invisibly but accessibly annotated by successive users of the structured system, who could indicate in an adinfinitely and anamorphically evolving, or coevolutionary, way what they had tried, found, or considered when applying the integral system to all fields and ever more diverse phenomena (of every order).

Such notes—themselves structured for efficient and rational exhumation, or for cooperative use—could multidimensionally encompass: illustrative examples and canonical cases, results or finds, search-maps, discriminants, comparisons of phenomena, questions and answers, supplementary organons generated and appended—or called for—by users, ideogenetic formulas, etc.

A hierarchy of subdimensions might be presented entirely in the form of rules or procedures for arriving at appropriate subdimensions—or for exploring branches or other substructures of subdimensions—simply by making a series of decisions (the corresponding subdimensions, though always compresent, would remain hidden until the completion of the decision-making process).

Perhaps what would be offered at some of the descending nodes would be sublists, not of subdimensions per se, but of other related properties, concepts, codimensions, etc.

Access to these levels, sublists, topographic loci, archival notes, etc could be had via the elegant device of hierarchic touch-screen menus or the like. That is, touching an item of interest shown upon the computer screen would instantaneously replace the introductory menu, say, with some exploded treatment of that item: touching one listed dimension could cause its immediate subdimensions to be sublisted, or displayed upon the screen instead.

Perhaps "pseudo-controls" (virtual buttons, keyboards, dials, sliding switches, toggles, etc) would be projected upon one or more side-screens simultaneously with the primary screen displaying and enabling hierarchic menu choices, with these pseudo-controls enabling more complex and subtle modifications and programming of the operating ideonomic program or "world".

In this case a third screen could simultaneously display a bank of corresponding "pseudo-indicators" (simulated meters, cathode-ray tube wave forms, gauges, balances, arrows, graphs, pie-charts, scales, etc) telling of multifarious constant, varying, coordinate, reciprocal, orthogonal, and past-, present-, or future-oriented ideonomic aspects and dimensions of the ideas and ideation.

But for each of the primary "universally investigable dimensions of scientific phenomena" there would be things other than hierarchies of subdimensions available for display and that the user would be able to interact with, manipulate, and operate upon.

These would include constellations, maps, networks, and concatenations of analogous, contrasting, complementary, convergent, divergent, co-applicable, combinable, methodological, strategic, etc concepts. Also the ways in which the so-called primary dimensions can be subsumed in pyramidal hierarchies, or reduced to ever-smaller sets of super-dimensions; and those sets and structures of meta-dimensions that occur, and apply, throughout ideonomy.

All of the 208 primary dimensions, for example, would be mapped in such a way as to show their diverse, complex, and specific relationships to one another. The computer would contain an ideocartographic atlas that might be thought of as a set of 208 maps, one for each canonically investigable dimension of phenomena.

The user of this electronic atlas would first confront a menu listing the 208 maps corresponding to the 208 dimensions. The menu might variously have the form of a columnar alphabetized list, spiral or onion-like list, or a two-dimensional space that might variously be : geometric, topological, monotonic, nonmonotonic, clusteral, sequential, network-like, an abstract hyperspace, radiational, centrosymmetric, homogeneous or not, partitioned or not, hierarchic or not, etc. Colors, arrows, familiar and novel symbols, textures, etc might be used.

Actually this basic menu might be preceded or accessibly accompanied by an over-menu, and be plural: comprised of various alternative versions and forms to which the over-menu would give singular access.

With the phenomenon of interest to him in mind, the user would touch upon the screen whatever dimension he first wished to consider in connection with that phenomenon, and this would instantly cause the basic menu to be replaced by the map depicting the classes, types, and degrees of interrelationships of the particular dimension to its 207 cousins.

The many diverse forms and devices of the basic menu considered above—spaces, metrics, arrows, colors, symbols, etc—likewise illustrate the alternative and compossible structural and representational possibilities of this map. The problem of the excessive size (content) of the map could be solved in at least three different ways: via a mobile over-window that the user could slide aerially over an irreducible landscape of fixed scale, via a freely variable scale (enabling a user to zoom in and out, from the whole of the map to its details), or via a hierarchic menu accessing a suite of simplest-to-complexest isomorphic maps—or the like.

Visualize a map, then, in which the thematic dimension is named in a center balloon in largest letters. Surrounding this center in all directions —possibly but not necessarily at random radial and mutual distances—might be the 207 other dimensions, housed in their own, secondary ellipses.

Radiating from the thematic balloon might be, like the arms of an octopus, 207 - N lines of various widths, colors, and designs (where N would = 0-206, as the number of dimensions judged unrelated to the thematic dimension, in any sense recognized by the map's key).

Certain remarks might be printed in tiny type alongside some of these lines linking the thematic dimension to those dimensions having defined relationships to it; these might specify nuances of meaning missed by the more artistic symbolism.

ILLUSTRATIVE APPLICATIONS OF THE DIMENSIONS

We will now try some experiments with the use of the 208 dimensions in connection with representative phenomena in 79 fields.

The dimensions and fields considered will be selected by means of random numbers. Of course limitations of space will forbid more than a few of the dimensions and fields from being looked at.

First Exercise: "Randomly Varying Dimensions In Randomly Varying Fields"

Rather than being made formally explicit, our ideogenetic formula will be left implicit in the ideonomic sentences generated by it. The formula is too simple to require more.

1. What are the investigable [a]CHAINS of the [b]GEOPHYSICAL phenomenon [c]EARTHQUAKES? -

Among the possible senses and examples of such hypothetical chains that occur to me immediately are: [1]Temporal chains of sub-quakes that might occur seriatim in the course of a "single earthquake", [2]Or representing the series of pulsations or waves shown upon the seismograph (or given seismographs), [3]Or representing possible secular concatenations of supposedly discrete and different earthquakes in the same area (say in the course of months, centuries, or whatever); [4]Possible spatiotemporal chains representing the propagation of energy pulses, pulse trains, or stresses and strains (during, after, or before quakes) over large areas [5]Or down a fault [6]Or fault system (branched or merely parallel); [7]Genetic or functional concatenatedness of various faults or fault systems, [8]Or like chaining of phenomena causing earthquakes, other than the faults themselves.

2. What are the investigable [a]DISEQUILIBRIA of the [b]PALEOCLIMATOLOGICAL phenomenon [c]PALEOCLIMATIC CYCLES? -

Obviously there can be and are a multitude of senses and forms of both disequilibria and cycles in this case.

Among the [1]possible intersections of both are: [1]Spatial disequilibria of the cycles, [2]Disequilibrium of the very mechanisms that do or can give rise to disequilibria, [3]Disequilibria as between independent but similar or related (as to cause, period, phase, effect, or system) cycles, [4]Disequilibria as between different multiples, clusters, or harmonics of cycles within their vast frequency spectrums, [5]Disequilibria [6](in anything and of any type) potentially inducible by paleoclimatic cycles [6]Or by disequilibria thereof; [7]Disequilibrium between many different concausal or co-regulatory mechanisms or forces (cf. 2.2), [8]Paleoclimatic-cycle disequilibria that, qua disequilibria, are the source of other paleoclimatic cycles.

3. What are the investigable [a]MARGINS of the [b]PALEONTOLOGICAL phenomenon [c]THE EARLIEST LIFE? -

How might the dimension "margins" be understood here? It could variously refer to: (1) That which lies at or just beyond the intrinsic [morphological, functional, or abstract] [edges or limits] of a thing (here "earliest life"), (2) Something that is [over and above] what is strictly necessary and that is designed to provide for emergencies; a spare [amount or measure or degree] [allowed or given] for [contingencies or special situations]; a [factor or group of factors] making for [ready opportunity or ample scope or personal choice in proceeding freely], (3) A bare minimum below which or an extreme

limit beyond which something is no longer desirable or becomes impossible, (4) A narrow range (of some property, parameter, or condition) to which something is especially or critically sensitive, or (5) Measure or degree of difference.

At this point in the development of ideonomy I have not yet decided which of these senses should be included and excluded in the official definition of the term. However, some are obviously in competition with reasonable definitions of some of the 207 other dimensions.

Among possible senses and examples of such hypothetical margins of the earliest life are: [1]Marginal barriers to transitions between or among nearby compartments, states, or processes (e.g. of bionts, genomes, taxa, or biological communities), [2]Per contra, marginal interfaces among the latter, [3]The very earliest and most primitive or eccentric properties and ranges upon which natural selection could and did operate—or the marginal feedback loops, cycles, and bifurcations, [4]Marginal self-definitions and evolutionary predestinations (of the earliest life), [5]The set of relatively small but disproportionately important—or all-important—ranges, phenomena, or elements that controlled and shaped the first organisms or 'bits of life' (through some sort of 'marginal economics' or the like), [6]Marginal transitions between the most primitive, proximal, tangential, protean, fragile, sensitive, or polygenic phenes, [7]Maximally convergent competitions of different organisms for domination of marginally discriminable or existent niches.

4. What are the investigable [a]IRREGULARITIES of the [b]CRYOGENIC phenomenon [c]SUPERCONDUCTIVITY? -

Possible senses and examples of such include: [1]Irregularities (as opposed to regularities) of distribution or of grouping of superconductive nuclear or chemical species or materials over periodic tables or sequences, [2]Irregularities of behavior or structure exhibited by materials making transitions to or from superconductivity, [3]Noise or nonquantized phenomena always limiting or distorting the absoluteness of real-world superconductivity, [4]Contra-theoretical or trans-theoretical irregularities of form or behavior exhibited by sub-phenomena occurring as part of or during superconductivity.

5. What are the investigable [a]MEASURES of the [b]EMBRYOLOGICAL phenomenon [c]NEURULATION? -

The stage of embryonic development during which the neural folds of the neural plate rise dorsad and merge at the midline, forming from this confluence of opposed ectodermal ridges the hollow neural tube, which pinches off below and differentiates rearward from the tail bud, and which ultimately gives rise to the spinal cord and brain, is termed the neurula; and neurulation refers to the set of neurular processes, per se, that form the vertebrate neural tube.

Measures might variously be understood in any of these dictionary senses: (1) Something used as a standard in measuring, (2) A system of standard units of measure, (3) Acts or processes of measuring, (4) Quantitative relation (as of identity, equivalence, correspondence, or balance) among elements or parts, (5) A basis of comparison, or denominator, (6) A standard by which something intangible is determined or regulated, a criterion, (7) A directly observable quantity from which the value of another related quantity may be obtained, or (8) A means of measuring or indicating something that cannot be directly measured, observed, or represented; a test.

Possible senses of what the ideonomic sentence means or points to that come to mind are: [1]Measures of inevitability, [2]Measures of control, [3]Measures of completion, [4]Measures of goodness (or correctness), [5]Measures of badness (or misdirection, maldevelopment, inefficiency, mistiming, etc), [6]Measures of rate, [7]Measures of internal interrelations (of the neurula or of neurular structure, cells, chemicals, or functions), [8]Measures of dependence upon external phenomena, [9]Measures of dependence upon miscellaneous quantities, [10]Measures of autonomy.

6. What are the investigable [a]ROUTES OR PATHS of the [b]CHEMICAL phenomenon [c]ABSORPTION? -

The dictionary defines chemical absorption as: any process by which one substance penetrates into the interior of another substance that is in solid or liquid form.

Since at the time of writing the ideonomic division PATHS is relatively well developed it is easy to treat the subject here, and countless things could be said about routes or paths of chemical absorption. A sampling of the possible pure or applicable meanings of the ideonomic sentence, or forms of things to which it might refer: [1]Gigantic surfaces and entranceways preceding but facilitating absorption within an object, [2]Pores or pore-spaces serving absorption in an object or material, [3]Surficial or internal 'textures' assisting or modifying absorption via path-like aspects, [4]Latticial and other microscopic defects (holes, substitutions or intrusions; linear, screw, planar, warp, shear, or other dislocations; absent, irregular, or anomalous molecular bonds or bonding structures; etc), [5]Path-like or path-related structural or energetic consequences of either past or contemporary absorptions (of like or unlike kind) facilitating, discouraging, or modifying present (path-like or not-path-like) absorptions, [6]Discrete, diffuse, or integrated : positive, negative, or 'transformational' : direct or indirect : temporary or permanent : homogeneous or heterogeneous : changeless or variable : minimal, maximal, or optimal : actually or describably : path-like features, [7]Autonomous or heteronomous paths, [8]Evolutionary paths, [9]Stochastic or deterministic paths, [10]Mutually or reciprocally interfering or independent paths, [11]Scale-confined or scale-invariant paths, [12]Lineal ('dimensionless'), surface-like, solid-like, or fractal paths, [13]Paths reducible or irreducible to part of an object or material (in their description or determination), [14]Internally walled, layered, or radially gradient-like paths, [15]Extant or permissibly-creatable paths, [16]Morphogenetic or morphodynamical paths, [17]Progressive or countercurrent paths, [18]Branched or branchless paths, [19]Anastomotic or nonanastomosing paths, [20]Inosculating or separated paths, [21]Major or minor paths, [22]Paths of unique or multiple diameters (cross sections).

7. What are the investigable [a]EXCHANGES of the [b]ASTRONOMICAL phenomenon [c]COSMIC RAYS? -

Possible meanings: [1]Exchanges of the original heavy or highest-energy cosmic-ray particle with atmospheric atoms, in the release of a cascade of lighter or at least lower-energy secondary particles [actually a primary cosmic ray may be lighter than some of the particles it causes to be released in a shower], [2]Similar exchanges involved in further cascades triggered by the original cascade, [3]'Exchanges' of charges in ions undergoing recombination, [4]Such exchanges as may have preceded the primary cosmic-ray particle in processes that in a star or other astronomical object distant in space and time originally generated the particle, [5]Actual reciprocal exchanges

of massive particles of cosmic-ray energy between nearby interacting astronomical bodies or regions characterized by extraordinarily violent physical processes, [6]Arbitrarily delayed return of cosmic-ray nuclei from stars, say, into which the cosmic rays have fallen, by high-energy processes in those stars or receiving bodies causing the re-ejection of the particles.

8. What are the investigable [a]SYNCHRONIES of the [b]METEOROLOGICAL phenomenon [c]GENERAL ATMOSPHERIC CIRCULATION? -

Possible meaning or references: [1]Phenomena of opposite or derivative nature occurring synchronously in the northern and southern hemispheres, [2]Synchronous countercurrent winds, jet streams, etc (horizontal, vertical, or between latitudes), [3]Synchronous counterrotating eddies or vortices, [4]Synchronous causes and their effects, [5]Synchronous concauses, [6]Synchronous co-effects, [7]Synchronous phenomena on extremely diverse scales (of length, energy, complexity, entropy, or the like), [8]Partial or complete synchronies of various and sundry cycles, [9]Synchronies with solar phenomena, [10]Synchronous reversals, inversions, starts, stops, pauses, perturbations, transformations, inflection points, increases, decreases, or the like of trends, phenomena, events, or systems.

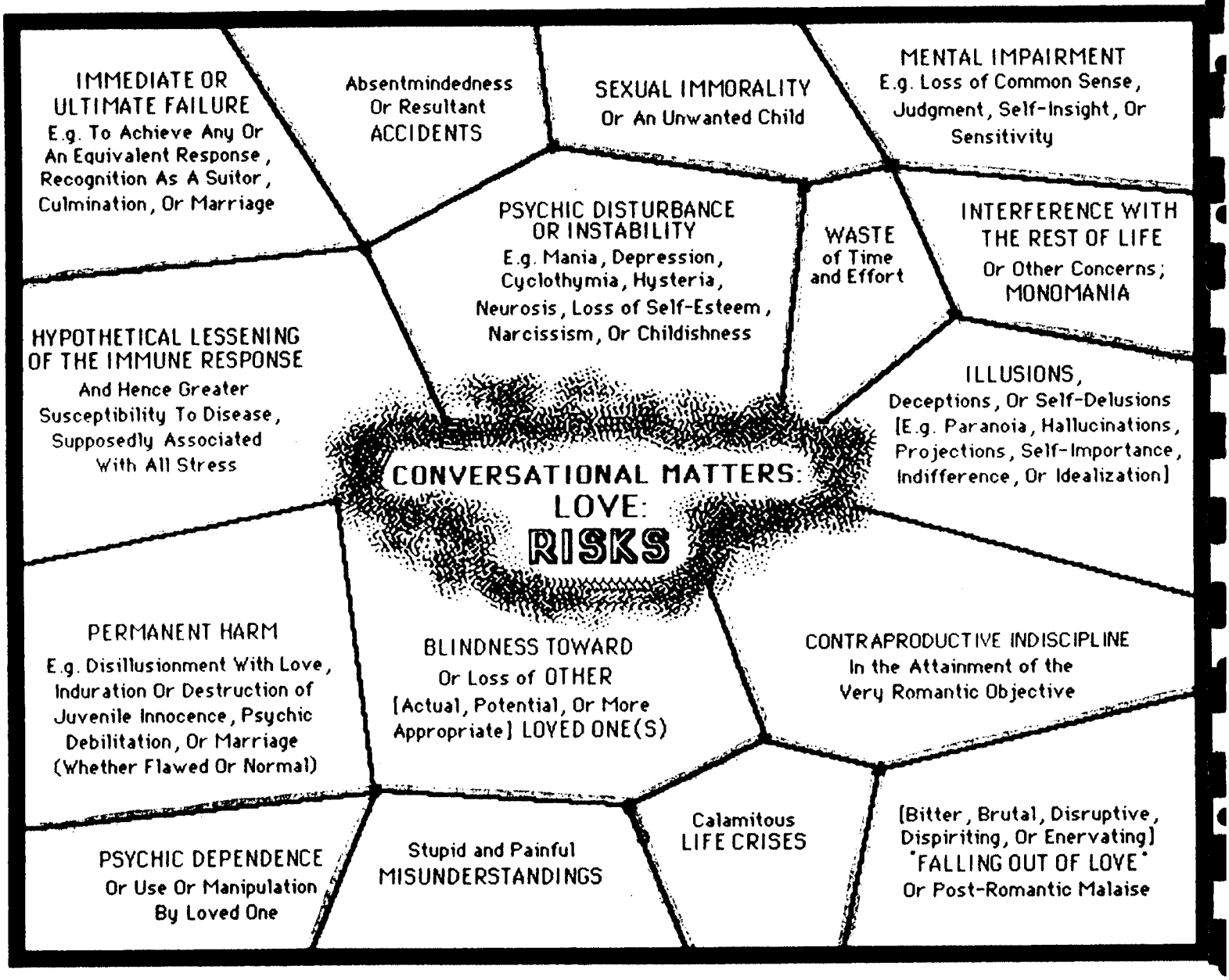
9. What are the investigable [a]ENEMIES, ANTAGONISMS, OR CHALLENGES of the [b]PARASITOLOGICAL phenomenon [c]HOST DEBILITATION? -

By "enemies, antagonisms, or challenges" here may be meant things very different than what are usually so named in biology, for the words refer to a supposedly pan-disciplinary dimension of all scientific phenomena.

Possible meanings or references: [1]How do hosts [<detect, measure, examine, analyze, categorize, identify, monitor, test, experiment upon>, fight, limit, isolate, compensate for, subvert, redirect, induce the self-destruction of, or exploit] their debilitation by parasites, [2]How do hosts do similar things in terms of their parasites directly, [3]In what ways may host debilitations or parasites be self-inimical, self-antagonistic, or self-challenging, [4]What enemies, antagonisms, or challenges of or to parasites may exist or arise in expressed or latent populational polymorphisms of the host species [5]Or in the larger biological environment or total bios [6]Or in the physical environment, [7]What artificial enemies, etc could be created to parasites [8]Or the debilitations they cause hosts?

10. What are the investigable [a]INDETERMINACIES of the [b]BOTANICAL phenomenon [c]STOMATAL TRANSPIRATION? -

Possible meanings or references: [1]Puzzling independences—say of stomatal opening and closing—of such obvious phenomena as the diurnal insolation cycle, changes in environmental humidity, leaf turgor, the seasonal thermal cycle, health of the plant, plant stress, plant needs, atmospheric gas concentrations, etc, [2]Apparent independences of the behavior of different stomata on the same leaf, different leaves of the same plant, or leaves of different plants of the same or different species, [3]Independences of stomatal transpiration of stomatal opening and closure itself, [4]Stochastic processes regulating or influencing the transpirations of stomata, [5]Residual indeterminacies purposefully instituted in stomatal behavior by natural selection itself, [6]Descriptive or explanatory indeterminacies resulting from flaws or imperfections in current theories of stomatal transpiration, [7]Seeming indeterminacies reflecting the sheer complexity of processes compresent without man's knowledge in such transpiration, [8]Contemporary or persisting evolutionary indeterminacies in the design and control of such transpiration or the stomata, [9]Indeterminacies as to the possible larger biological—or even ideonomic—implications of stomatal transpiration.


IMMEDIATE OR ULTIMATE FAILURE
E.g. To Achieve Any Or An Equivalent Response, Recognition As A Suitor, Culmination, Or Marriage
Absentmindedness Or Resultant ACCIDENTS
SEXUAL IMMORALITY
Or An Unwanted Child
MENTAL IMPAIRMENT
E.g. Loss of Common Sense, Judgment, Self-Insight, Or Sensitivity
PSYCHIC DISTURBANCE OR INSTABILITY
E.g. Mania, Depression, Cyclothymia, Hysteria, Neurosis, Loss of Self-Esteem, Narcissism, Or Childishness
WASTE of Time and Effort
INTERFERENCE WITH THE REST OF LIFE
Or Other Concerns; MONOMANIA
HYPOTHETICAL LESSENING OF THE IMMUNE RESPONSE
And Hence Greater Susceptibility To Disease, Supposedly Associated With All Stress
CONVERSATIONAL MATTERS:
LOVE:
RISKS
ILLUSIONS,
Deceptions, Or Self-Delusions [E.g. Paranoia, Hallucinations, Projections, Self-Importance, Indifference, Or Idealization]
PERMANENT HARM
E.g. Disillusionment With Love, Induration Or Destruction of Juvenile Innocence, Psychic Debilitation, Or Marriage (Whether Flawed Or Normal)
BLINDNESS TOWARD
Or Loss of OTHER [Actual, Potential, Or More Appropriate] LOVED ONE(S)
CONTRAPRODUCTIVE INDISCIPLINE
In the Attainment of the Very Romantic Objective
PSYCHIC DEPENDENCE
Or Use Or Manipulation By Loved One
Stupid and Painful MISUNDERSTANDINGS
Calamitous LIFE CRISES
[Bitter, Brutal, Disruptive, Dispiriting, Or Enervating] "FALLING OUT OF LOVE"
Or Post-Romantic Malaise

11. What are the investigable [a]RISKS of the [b]PSYCHOLOGICAL phenomenon [c]FALLING IN LOVE? -

Possible meanings or references: [1]Immediate or ultimate failure [e.g. to achieve any or an equivalent response, recognition as a suitor, culmination, or marriage], [2]Psychic disturbance or instability [e.g. mania, insomnia, depression, cyclothymia, hysteria, neurosis, loss of self-esteem, narcissism, or childishness], [3]Mental impairment [e.g. loss of common sense, judgment, self-insight, or sensitivity], [4]Waste of time and effort, [5]Psychic dependence or use or manipulation by loved one, [6]Interference with the rest of life or other concerns; monomania, [7]Illusions, deceptions, or self-delusions [e.g. paranoia, hallucinations, projections, self-importance, indifference, or idealization], [8]Blindness toward or loss of other [actual, potential, or more appropriate] loved one(s), [9]Absentmindedness or resultant accidents, [10]Contraproductive indiscipline in the attainment of the very romantic objective, [11]Sexual immorality or an unwanted child, [12]Stupid and painful misunderstandings, [13]Calamitous life-crises, [14][Bitter, brutal, disruptive, dispiriting, or enervating] 'falling out of love' or post-romantic malaise, [15]Permanent harm [e.g. disillusionment with love, induration or destruction of juvenile innocence, psychic debilitation, or marriage (whether flawed or normal)], [16]Hypothetical lessening of the immune response, and hence greater susceptibility to disease, supposedly associated with all stress.

Here one could usefully consult other ideonomic divisions, such as BADS and ILLUSIONS. Thus "A Table of 152 Evils" lists among other pertinent things: [1]Aggression, [2]Anxiety, [3]Bad habits, [4]Bad manners or gracelessness, [5]Bad or nonexistent models, [6]Chaos, [7]Complacency, [8]Compromise, [9]Cowardice, [10]Cruelty (conscious or unconscious), [11]Denial of rights, [12]Discrepant values, [13]Distrust, [14]Ecological disruption, [15]Escapism, [16]Excessive haste, [17]Extremism, [18]Fakery or hypocrisy, [19]Fantasy, [20]Frustration, futility, or impotence, [21]Hatred, [22]Hubris, [23]Human emotionality, [24]Hypersensitivity, [25]Imbalance, [26]Indecision, [27]Inequality, [28]Infidelity, [29]Injustice, [30]Intolerance, [31]Irrationality, [32]Jealousy, [33]Lack of organization, planning, or provision, [34]Loneliness, [35]Lovelessness, [36]Lying, [37]Machination, [38]Maladjustment, [39]Materialism, [40]Mortality, [41]Neglect, [42]Irresponsibility, [43]Nihilism, [44]Obsessions or compulsions, [45]Overcomplexity, [46]Pettiness, [47]Phobias, [48]Pollution (soiling of one's linen, for example?), [49]Poor use of language, [50]Poverty, [51]Presumption, [52]Psychomachy, [53]Purposelessness, [54]Reasonless action or lack of Socratic self-examination, self-knowledge, or self-mastery, [55]Resource shortages or 'any' form of scarcity (such as of demonstrable virtues or witty things to say?), [56]Selfishness, [57]Sensory limits or defects (e.g. being unable to see or overhear the beloved's thoughts or wishes, or 'to get them right'?), [58]Simplism, [59]Socioeconomic dislocation, [60]Stereotypy, [61]Stupidity or foolishness, [62]Superstition, [63]Thanklessness, [64]Ugliness of person (self-imagined!), [65]Uncontrolled growth (at least as a result of the amours of the general population!), and [66]War (most notoriously!).

Similarly "A Table of the 435 Primary Dimensions of Illusions" names: [1]Abnormality, [2]Absoluteness, [3]Abundance, [4]Acceptance, [5]Accidentalness, [6]Activity, [7]Agreement, [8]All-awareness, [9]Animism (for is it not true that in love the very trees, rocks, and clouds seem to become alive or personal?), [10]Approval, [11]Association (e.g. of happy surroundings with the beloved), [12]Attributability (say of all one's good fortune to the act or will of the adored), [13]Availability—and so on down the alphabet.

12. What are the investigable [a]INDIVIDUALITIES of the [b]SOCIOLOGICAL phenomenon [c]DIFFERENTIAL MOBILITY? -

The preposition "of" here could variously be taken to mean: [1]Characteristic of, [2]Peculiar to, [3]Displayed or displayable by, [4]Associated with, [5]Related to, [6]Caused by, [7]Correlable with, [8]Applicable to the treatment of, [9]ETC.

The investigable dimension "INDIVIDUALITIES" could be understood to refer to: [1]The idiographic (things relating to, [2]involving, [3]or dealing with the individual, [4]concrete, [5]or unique); [6]Individual variations, [7]forms, [8]types, [9]aspects, [10]dimensions, [11]or laws [of] features, [12]things, [13]processes, [14]sub-phenomena, [15]super-phenomena, [16]systems, [17]events, [18]or examples; [19]Individualities of a total, [20]holistic, [21]unified, [22]'society-like', [23]or 'organismal' nature; [24]Individuating tendencies, [25]Anomalies, [26]ETC.

HUMAN KALEIDOSCOPE

Vulgar ideonomy is a pet name for a pet peeve.

Although ideonomy is ordinarily meant to work with high-level concepts and fundamental dimensions of things—and to function in a sober, systematic, and directed way—it can also produce interesting results by using crude methods, concrete things or low-level concepts, and chance.

What annoys me is that this sort of vulgar ideonomy, as I call it, is sometimes spectacularly successful, if just in the sense that its products may be more sensational and popular than those of what by distinction could be termed scientific ideonomy.

Yet the ideonomist is not alone in having reason to complain about this phenomenon. The possible extinction of dinosaurs by asteroids deflected into the Earth by an invisible Death or Nemesis Star or of the human race by a future Nuclear Winter, or the sexual mutability of certain lizards and fish, or the speculative lurking of immense black holes in quasars, are all examples of the susceptibility of any science to popular fads, or of the incomparable thrills of vulgar science.

As for chance, it would be more honest to admit that even in the highest and most sophisticated forms of ideonomy, stochastic methods and serendipitous discoveries play a major role.

Thus the particular sets of terms or organons, and structures of ideogenetic formulas, that produce by combinations of concepts, modifiers, and relationships the most fascinating, useful, surprising, fundamental, and important ideonomic propositions, exercises, and idea spaces are often stumbled upon quite by accident, by casual experimentation, or by mindless dalliance. Even an occasional weakness for the surreal or absurd may help.

One of the most interesting examples to date of vulgar ideonomy discovered serendipitously is as follows.

Reproduced here are two tables that were prepared within the ideonomic division Psychic Things and Psychology. "145 Emotions" was, in 1984, the first of these organons to be constructed.

It had been meant to function independently by self-intersection. Two versions of the list were created, one with the emotions in nounal form and the other with the same emotions and same basic words in adjectival form. The 145 squared or 21,025 dyads (dyadic virtual propositions) generated in this 'two-dimensional' way - e.g. "suspicious guilt" and "sad amusement" (both dyads being combinations of familiar feelings) - turned out to be at once puzzling, entertaining, and informative.

Although many of the 21,025 dyads seemed illogical and meaningless on first inspection, closer study over a period of time revealed a wholly unexpected tendency of these dubious dyads to prove meaningful after all. Often they turned out to be among the most interesting dyads. Moreover, even when careful consideration failed to validate, or at least to precise or explain the meaning, of these questionable dyads, they frequently seemed to confront the mind with stimulating problems and possibilities or to be possessed of anomalous worth.

In fact the 21,025-dyad Emotional Space defined by these rudimentary propositions awakened in my mind the image of a great crystal with 21,025 largely or wholly irredundant cells. It almost seemed as if the totality of the dyads would have to exist through simple necessity, in order to accomodate the full actual or potential range of man's emotional life; or in fulfillment of some transcendental structure.

I was taught another lesson while exploring this finite space. Although the space was explicitly comprised of 145 primary emotions and 21,025 emotional dyads, prolonged experience with these finite elements had the effect of revolutionizing the way in which one saw these discrete elements. In fact, paradoxically, they seemed to progressively fade away, to surrender their specialness and individuality, their very finitude and importance. They suddenly appeared in a different and rather bizarre light, that of temporarily necessary fictions by means of which the mind can ultimately arrive at the more fundamental insight: that although the emotions seem discrete, divisible, and denumerable, in reality they are merely protean nuances of continuous and holistic processes.

Put simply, all (named) emotions are functions of all other (named) emotions. Only by examining the totality of mutual combinatorial possibilities of these (named) emotions can the arbitrariness of such emotional categories be recognized and transcended by the mind. It is a rite of passage.

Perhaps every human being should experience this particular ideonomic exercise for the bit of psychological enlightenment, or human wisdom, it alone may be able to afford.

One thing more should be touched on in passing from the topic of the self-intersection of the list of 145 emotions.

By rendering either the first, adjectival term, or else the second, nounal term, of the dyadic ideogenetic formula invariant—in other words, by choosing and installing in either adjectival or nounal form a single emotion—a set of 144 (or 145, should an apparent tautology be illusory) variations upon that emotion can be created. In the second case one might define (or tend to define) all of the 144-5 seemingly canonical forms or modifications of love, say, or of fear; and in the first case, all of the 144-5 different emotions that can be modified by love or fear. (Please see the two tables "145 Canonical Forms Or Modifications of 'Love'" and "145 Emotions As Modified By 'Love'".)

Even if one did the last pair of exercises just once, one would thereafter view any emotion in a more complex, subtle, embracive, and holistic way.

The second primary list I alluded to earlier was "638 Personality Traits".

My original reason for creating this enormous list (or set) was to learn whether the methods of combinatorial ideonomy could prove helpful in opening up, specifying, nominating, distinguishing, ordering, legislating, indexing, communicating, reducing, and otherwise investigating the universe of all actual and possible traits, types, and processes of human character and behavior.

I was interested in gaining insight into such questions as:

Can the universe of personality traits be circumscribed? Has it some sort of characterizable and consequential boundary? Are there limits or no limits to human variability, diversity, and psychogenesis? Are there polar tendencies or attractors?

Do character traits have analogical, hierarchical, or even homological sets, subsets, and supersets; or to what extent do they reduce to general or independent series, trees, hierarchies, clusters, mosaics, matrixes, networks, cycles, recursions, groups, or other so-called meta-structures and meta-processes?

Is—or to what extent is—existing language adequate to analyze and express man's character or psychology?

How redundant are names, concepts, and manifestations of character traits? How similar, different, overlapping, orthogonal, inconsistent, etc?

To what extent does our knowledge of such traits—or of human nature—obstruct further knowledge of same?

What are the essences, internal structures, descriptive and ontic coordinates, compositions, dynamics, ambiguities and other misleading aspects, ecological relationships, corollaries, causes, combinations, permutations, transformations, evolutions, symmetries and asymmetries, incompatibilities and synergisms, etc of the traits?

Are traits well or poorly defined or well or poorly known?

How correlated and interdependent are traits? Does knowledge, description, or investigation of individual traits presuppose such knowledge et cetera of certain or all other traits; and are traits fundamentally divisible or indivisible? Are traits of character field-like or insular; molar or atomic; continuous or discrete; structural or functional; primary or secondary (derivative); etc?

If traits (or their names) are combined with other traits: do novel traits arise, are old (primary) traits simply reidentified, are lesser-order or instead higher-order traits identified, do the old traits take on new meaning, are certain relationships conserved, are old traits interlinked or mutually derived, are possible variants and properties exhausted, etc?

And more specifically, I wanted to see whether the exponentially enlarging sets of characterological dyads ($10^{5.6}$), triads ($10^{8.4}$), tetrads (10^{11}), pentads (10^{14}), etc would: degenerate, remain meaningful, stay comprehensible, continue to be useful, etc.

I wished to learn whether the bare combinations of character traits would be sufficient to describe the possibilities, or whether instead the addition of one or more modifying or grammatical elements would be necessary to make the combinations (ideonomic propositions) meaningful, precise, univocal, useful, optimal, universal, interrelatable, etc.

Would the order (permutation) of the terms matter? What types of orders would produce what different and disparate meanings and opportunities? What would be the causes and implications of these ordinal sensitivities (or sensitivities to either temporal or intrinsic order)?

My investigations of these questions, though perforce severely limited because of the much wider scope of the ideonomy project, certainly did produce many relevant insights and discoveries, and the great potential value of combinatorial ideonomy was clearly demonstrated.

One day I became curious to see what might result if the separate lists of emotions and personality traits were intersected, or their different but related types of items were combined.

I could have combined the emotions as antecedent adjectives with the personality traits as postcedent nouns, which would have generated such clearly meaningful and often interesting dyads as "defensive eloquence", "wondering loyalty", and "happy brutality".

But I decided to focus my attention instead upon dyads having the two sets of terms in the reverse order.

When I programmed a computer to assemble and display these character trait-emotion dyads in a swift and seemingly interminable stream, and then commanded it to begin, I suddenly found myself introduced into a fantastic and fascinating world of psychological possibilities. In a way it was as if I had gained direct access to the zoo of the human psyche, or been given a prism for diffracting the iridescent light of the soul.

Hyperbole? Judge for yourself. See "A Kaleidoscope of Human Emotions, Emotional Situations, Reactions, and Attitudes: 168-Dyad (0.2%) Sample of 92,510-Dyad Idea Space : '638 Personality Traits' x '145 Emotions'". The table is basically a random and unwinnowed 1/500th sample of the giant master space, but within it the items have been partitioned into five subsets to illustrate the heterogeneity of the table's interests and potential uses.

A sensation of gazing upon the face of a new world, I should mention, is a frequent experience in ideonomy. It happens so often, in fact, that the familiar world ultimately itself comes to seem peculiar, new, unlikely, and as yet unexplored. Perhaps that is its nature sub specie aeternitatis.

The complexity of the table's title evinces my persisting uncertainty about what the dyads mean exactly or may mean in full. Ideonomy takes one down some strange corridors and into strange rooms, and makes one think at times that one has been led, purposefully and mischievously, into a house of mirrors, or that the world has been made to stand on its head.

The full impact of the idea space that we are sampling cannot possibly be gotten by viewing the tiny piece of it that was all that could be fitted into this chapter. Readers can easily program their microcomputers to create, in a printout or upon a spreadsheet that can be traveled over electronically at will, the entire 92,510-dyad space.

The real importance of confronting the whole of this space does not lie in the grandeur of the experience, however. For - and here we touch on a principle of general ideonomic importance - when an ideonomic space, list, or set is "essentially everywhere rich or self-irredundant" (to use without explaining some of the jargon of the field), the meaning of each part of the space, list, or set grows or is amplified (sometimes even exponentially) as more and more of the whole is examined. The whole provides a magnifying context. (The same remark could be made about ideonomy in its totality.)

The five partitions of the 168-dyad sample, and the percentages of the total sample they represented, were (in order of size):

"Funny" (44%). Dyads such as "placid self-pity", "bland love", "glamorous acceptance", "sarcastic desire", "innovative submissiveness", and "sage despair" struck me as being humorous or especially amusing, often through paradox or absurdity. Naturally these represented my own personal reactions—or my own reactions at the time. No doubt other persons would disagree with my reactions and have their own favorites. But I would predict that statistical studies would reveal that people in general fall into certain groups, clusters, distributions, and meta-structures. Once these statistical patterns were identified, moreover, I am certain that they could be used to predict, not only preferences of these and other people within the sample, but reactions throughout the entire 92,510-dyad space; and indeed, the sense of humor and personality of people in general, or beyond the space. Actually I have already found that my choice of items as supposedly humorous roughly fits what others see as funny, though of course they may laugh at the items for reasons supposedly or in reality somewhat different from my own.

"145 EMOTIONS"

1. Absurdity
2. Acceptance
3. Admiration
4. Adoration
5. Adventure
6. Affection
7. Affirmation
8. Amazement
9. Ambition
10. Amusement
11. Anger
12. Anguish
13. Anticipation
14. Anxiety
15. Apathy
16. Approval
17. Awe
18. Bewilderment
19. Bitterness
20. Boredom
21. Calm
22. Caution
23. Charity
24. Charm
25. Combativeness
26. Complacency
27. Confidence
28. Confusion
29. Courage
30. Cowardice
31. Cruelty
32. Curiosity
33. Deceit
34. Defensiveness
35. Defiance
36. Desire
37. Despair
38. Detachment
39. Determination
40. Devotion
41. Dignity
42. Disgust
43. Dislike
44. Dullness
45. Eagerness
46. Enchantment
47. Enthusiasm
48. Envy
49. Expectancy
50. Fear
51. Ferocity
52. Fraternity
53. Friendliness
54. Frustration
55. Futility
56. Gaiety
57. Gentleness
58. Gravity
59. Grief
60. Guilt
61. Happiness
62. Hollowness
63. Honor
64. Hope
65. Horror
66. Hostility
67. Humiliation
68. Hurry
69. Iciness
70. Impatience
71. Incredulity
72. Indignation
73. Innocence
74. Intolerance
75. Irony
76. Irritation
77. Jealousy
78. Kindness
79. Loneliness
80. Love
81. Loyalty
82. Lust
83. Meanness
84. Mischievousness
85. Modesty
86. Mystery
87. Naughtiness
88. Nausea
89. Obedience
90. Pain
91. Passion
92. Pity
93. Playfulness
94. Poetry
95. Possessiveness
96. Pride
97. Protectiveness
98. Queerness
99. Rejection
100. Relaxation
101. Remorse
102. Repentance
103. Resentment
104. Respect
105. Responsibility
106. Sadness
107. Satisfaction
108. Secretiveness
109. Security
110. Selfishness
111. Self-pity
112. Sentimentality
113. Serenity
114. Servility
115. Shame
116. Shock
117. Shyness
118. Sincerity
119. Skepticism
120. Sociability
121. Solemnity
122. Solicitude
123. Sorrow
124. Stubbornness
125. Submissiveness
126. Surliness
127. Surprise
128. Suspicion
129. Sympathy
130. Tenderness
131. Tension
132. Terror
133. Thoughtfulness
134. Timidity
135. Tolerance
136. Tragedy
137. Urgency
138. Virtuousness
139. Vulgarity
140. Vulnerability
141. Weariness
142. Whimsicality
143. Wonder
144. Worry
145. Worship

"145 CANONICAL FORMS OR MODIFICATIONS OF 'LOVE'"

Absurd love
Acceptant love
Admiring love
Adoring love
Adventurous love
Affectionate love
Affirmative love
Amazed love
Ambitious love
Amused love
Angry love
Anguished love
Anticipative love
Anxious love
Apathetic love
Approving love
Awed love
Bewildered love
Bitter love
Brave love
Calm love
Cautious love
Charitable love
Charmed love
Combative love
Complacent love
Confident love
Confused love
Courageous love
Cowardly love
Cruel love
Curious love
Deceitful love
Defensive love
Defiant love
Desirous love
Despairing love
Detached love
Determined love
Devoted love
Dignified love
Disgusted love
Dismissive love
Dull love
Eager love
Enchanted love
Enthusiastic love
Envious love
Expectant love
Fearful love
Ferocious love
Fraternal love
Friendly love
Frustrated love
Futile love
Gay love
Gentle love
Grave love
Grieving love
Guilty love
Happy love
Hollow love
Honorable love
Hopeful love
Horrified love
Hostile love
Humiliated love
Hurried love
Icy love
Impatient love
Incredulous love
Indignant love
Innocent love
Intolerant love
Ironic love
Irritable love
Jealous love
Kind love
Lonely love
Loving love
Loyal love
Lustful love
Mean love
Mischievous love
Modest love
Mysterious love
Naughty love
Nauseated love
Obedient love
Pained love
Passionate love
Pitying love
Playful love
Poetic love
Possessive love
Protective love
Proud love
Queer love
Rejective love
Relaxed love
Remorseful love
Repentant love
Resentful love
Respectful love
Responsible love
Sad love
Satisfied love
Secretive love
Secure love
Selfish love
Self-pitying love
Sentimental love
Serene love
Servile love
Shameful love
Shocked love
Shy love
Sincere love
Skeptical love
Sociable love
Solemn love
Solicitous love
Sorrowful love
Stubborn love
Submissive love
Surly love
Surprised love
Suspicious love
Sympathetic love
Tender love
Tense love
Terrified love
Thoughtful love
Timid love
Tolerant love
Tragic love
Urgent love
Virtuous love
Vulgar love
Vulnerable love
Weary love
Whimsical love
Wondrous love
Worried love
Worshipful love

"145 EMOTIONS AS MODIFIED BY 'LOVE'"

Loving absurdity
Loving acceptance
Loving admiration
Loving adoration
Loving adventure
Loving affection
Loving affirmation
Loving amazement
Loving ambition
Loving amusement
Loving anger
Loving anguish
Loving anticipation
Loving anxiety
Loving apathy
Loving approval
Loving awe
Loving bewilderment
Loving bitterness
Loving boredom
Loving calm
Loving caution
Loving charity
Loving charm
Loving combativeness
Loving complacency
Loving confidence
Loving confusion
Loving courage
Loving cowardice
Loving cruelty
Loving curiosity
Loving deceit
Loving defensiveness
Loving defiance
Loving desire
Loving despair
Loving detachment
Loving determination
Loving devotion
Loving dignity
Loving disgust
Loving dislike
Loving dullness
Loving eagerness
Loving enchantment
Loving enthusiasm
Loving envy
Loving expectancy
Loving fear
Loving ferocity
Loving fraternity
Loving friendliness
Loving frustration
Loving futility
Loving gaiety
Loving gentleness
Loving gravity
Loving grief
Loving guilt
Loving happiness
Loving hollowness
Loving honor
Loving hope
Loving horror
Loving hostility
Loving humiliation
Loving hurry
Loving iciness
Loving impatience
Loving incredulity
Loving indignation
Loving innocence
Loving intolerance
Loving irony
Loving irritation
Loving jealousy
Loving kindness
Loving loneliness
Loving love
Loving loyalty
Loving lust
Loving meanness
Loving mischievousness
Loving modesty
Loving mystery
Loving naughtiness
Loving nausea
Loving obedience
Loving pain
Loving passion
Loving pity
Loving playfulness
Loving poetry
Loving possessiveness
Loving pride
Loving protectiveness
Loving queerness
Loving rejection
Loving relaxation
Loving remorse
Loving repentance
Loving resentment
Loving respect
Loving responsibility
Loving sadness
Loving satisfaction
Loving secretiveness
Loving security
Loving selfishness
Loving self-pity
Loving sentimentality
Loving serenity
Loving servility
Loving shame
Loving shock
Loving shyness
Loving sincerity
Loving skepticism
Loving sociability
Loving solemnity
Loving solicitude
Loving sorrow
Loving stubbornness
Loving submissiveness
Loving surliness
Loving surprise
Loving suspicion
Loving sympathy
Loving tenderness
Loving tension
Loving terror
Loving thoughtfulness
Loving timidity
Loving tolerance
Loving tragedy
Loving urgency
Loving virtuousness
Loving vulgarity
Loving vulnerability
Loving weariness
Loving whimsicality
Loving wonder
Loving worry
Loving worship

"638 PRIMARY PERSONALITY TRAITS"
As Adjectives

'POSITIVE' TRAITS
(234 = 37%)

1. Accessible
2. Active
3. Adaptable
4. Admirable
5. Adventurous
6. Agreeable
7. Alert
8. Allocentric
9. Amiable
10. Anticipative
11. Appreciative
12. Articulate
13. Aspiring
14. Athletic
15. Attractive
16. Balanced
17. Benevolent
18. Brilliant
19. Calm
20. Capable
21. Captivating
22. Caring
23. Challenging
24. Charismatic
25. Charming
26. Cheerful
27. Clean
28. Clear-headed
29. Clever
30. Colorful
31. Companionly
32. Compassionate
33. Conciliatory
34. Confident
35. Conscientious
36. Considerate
37. Constant
38. Contemplative
39. Cooperative
40. Courageous
41. Courteous
42. Creative
43. Cultured
44. Curious
45. Daring
46. Debonair
47. Decent
48. Decisive
49. Dedicated
50. Deep
51. Dignified
52. Directed
53. Disciplined
54. Discreet
55. Dramatic
56. Dutiful
57. Dynamic
58. Earnest
59. Ebullient
60. Educated
61. Efficient
62. Elegant
63. Eloquent
64. Empathetic
65. Energetic
66. Enthusiastic
67. Esthetic
68. Exciting
69. Extraordinary
70. Fair
71. Faithful
72. Farsighted
73. Felicific
74. Firm
75. Flexible
76. Focused
77. Forceful
78. Forgiving
79. Forthright
80. Freethinking
81. Friendly
82. Fun-loving
83. Gallant
84. Generous
85. Gentle
86. Genuine
87. Good-natured
88. Gracious
89. Hardworking
90. Healthy
91. Hearty
92. Helpful
93. Heroic
94. High-minded
95. Honest
96. Honorable
97. Humble
98. Humorous
99. Idealistic
100. Imaginative
101. Impressive
102. Incisive
103. Incorruptible
104. Independent
105. Individualistic
106. Innovative
107. Inoffensive
108. Insightful
109. Insouciant
110. Intelligent
111. Intuitive
112. Invulnerable
113. Kind
114. Knowledgable
115. Leaderly
116. Leisurely
117. Liberal
118. Logical
119. Lovable
120. Loyal
121. Lyrical
122. Magnanimous
123. Many-sided
124. Masculine or manly
125. Mature
126. Methodical
127. Meticulous
128. Moderate
129. Modest
130. Multi-leveled
131. Neat
132. Nonauthoritarian
133. Objective
134. Observant
135. Open
136. Optimistic
137. Orderly
138. Organized
139. Original
140. Painstaking
141. Passionate
142. Patient
143. Patriotic
144. Peaceful
145. Perceptive
146. Perfectionist
147. Personable
148. Persuasive
149. Planful
150. Playful
151. Polished
152. Popular
153. Practical
154. Precise
155. Principled
156. Profound
157. Protean
158. Protective
159. Providential
160. Prudent
161. Punctual
162. Purposeful
163. Rational
164. Realistic
165. Reflective
166. Relaxed
167. Reliable
168. Resourceful
169. Respectful
170. Responsible
171. Responsive
172. Reverential
173. Romantic
174. Rustic
175. Sage
176. Sane
177. Scholarly
178. Scrupulous
179. Secure
180. Selfless
181. Self-critical
182. Self-defacing
183. Self-denying
184. Self-reliant
185. Self-sufficient
186. Sensitive
187. Sentimental
188. Seraphic
189. Serious
190. Sexy
191. Sharing
192. Shrewd
193. Simple
194. Skillful
195. Sober
196. Sociable
197. Solid
198. Sophisticated
199. Spontaneous
200. Sporting
201. Stable
202. Steadfast
203. Steady
204. Stoic
205. Strong
206. Studious
207. Suave
208. Subtle
209. Sweet
210. Sympathetic
211. Systematic
212. Tasteful
213. Teacherly
214. Thorough
215. Tidy
216. Tolerant
217. Tractable
218. Trusting
219. Uncomplaining
220. Understanding
221. Undogmatic
222. Unfoolable
223. Upright
224. Urbane
225. Venturesome
226. Vivacious
227. Warm
228. Well-bred
229. Well-read
230. Well-rounded
231. Winning
232. Wise
233. Witty
234. Youthful

'NEUTRAL' TRAITS
(112 = 18%)

235. Absentminded
236. Aggressive
237. Ambitious
238. Amusing
239. Artful
240. Ascetic
241. Authoritarian
242. Big-thinking
243. Boyish
244. Breezy
245. Businesslike
246. Busy
247. Casual
248. Cerebral
249. Chummy
250. Circumspect
251. Competitive
252. Complex
253. Confidential
254. Conservative
255. Contradictory
256. Crisp
257. Cute
258. Deceptive
259. Determined
260. Dominating
261. Dreamy
262. Driving
263. Droll
264. Dry
265. Earthy
266. Effeminate
267. Emotional
268. Enigmatic
269. Experimental
270. Familial
271. Folksy
272. Formal
273. Freewheeling
274. Frugal
275. Glamorous
276. Guileless
277. High-spirited
278. Hurried
279. Hypnotic
280. Iconoclastic
281. Idiosyncratic
282. Impassive
283. Impersonal
284. Impressionable
285. Intense
286. Invisible
287. Irreligious
288. Irreverent
289. Maternal
290. Mellow
291. Modern
292. Moralistic
293. Mystical
294. Neutral
295. Noncommittal
296. Noncompetitive
297. Obedient
298. Old-fashioned
299. Ordinary
300. Outspoken
301. Paternalistic
302. Physical
303. Placid
304. Political
305. Predictable
306. Preoccupied
307. Private
308. Progressive
309. Proud
310. Pure
311. Questioning
312. Quiet
313. Religious
314. Reserved
315. Restrained
316. Retiring
317. Sarcastic
318. Self-conscious
319. Sensual
320. Skeptical
321. Smooth
322. Soft
323. Solemn
324. Solitary
325. Stern
326. Stolid
327. Strict
328. Stubborn
329. Stylish
330. Subjective
331. Surprising
332. Taciturn
333. Tough
334. Unaggressive
335. Unambitious
336. Unceremonious
337. Unchanging
338. Undemanding
339. Unfathomable
340. Unhurried
341. Uninhibited
342. Unpatriotic
343. Unpredictable
344. Unreligious
345. Unsentimental
346. Whimsical

'NEGATIVE' TRAITS
(292 = 46%)

347. Abrasive
348. Abrupt
349. Agonizing
350. Aimless
351. Airy
352. Aloof
353. Amoral
354. Angry
355. Anxious
356. Apathetic
357. Arbitrary
358. Argumentative
359. Arrogant
360. Artificial
361. Asocial
362. Assertive
363. Astigmatic
364. Barbaric
365. Bewildered
366. Bizarre
367. Bland
368. Blunt
369. Boisterous
370. Brittle
371. Brutal
372. Calculating
373. Callous
374. Cantankerous
375. Careless
376. Cautious
377. Charmless
378. Childish
379. Clumsy
380. Coarse
381. Cold
382. Colorless
383. Complacent
384. Complaintive
385. Compulsive
386. Conceited
387. Condemnatory
388. Conformist
389. Confused
390. Contemptible
391. Conventional
392. Cowardly
393. Crafty
394. Crass
395. Crazy
396. Criminal
397. Critical
398. Crude
399. Cruel
400. Cynical
401. Decadent
402. Deceitful
403. Delicate
404. Demanding
405. Dependent
406. Desperate
407. Destructive
408. Devious
409. Difficult
410. Dirty
411. Disconcerting
412. Discontented
413. Discouraging
414. Discourteous
415. Dishonest
416. Disloyal
417. Disobedient
418. Disorderly
419. Disorganized
420. Disputatious
421. Disrespectful
422. Disruptive
423. Dissolute
424. Dissonant
425. Distractible
426. Disturbing
427. Dogmatic
428. Domineering
429. Dull
430. Easily discouraged
431. Egocentric
432. Enervated
433. Envious
434. Erratic
435. Escapist
436. Excitable
437. Expedient
438. Extravagant
439. Extreme
440. Faithless
441. False
443. Fanatical
444. Fanciful
445. Fatalistic
446. Fawning
446. Fearful
447. Fickle
448. Fiery
449. Fixed
450. Flamboyant
451. Foolish
452. Forgetful
453. Fraudulent
454. Frightening
455. Frivolous
456. Gloomy
457. Graceless
458. Grand
459. Greedy
460. Grim
461. Gullible
462. Hateful
463. Haughty
464. Hedonistic
465. Hesitant
466. Hidebound
467. High-handed
468. Hostile
469. Ignorant
470. Imitative
471. Impatient
472. Impractical
473. Imprudent
474. Impulsive
475. Inconsiderate
476. Incurious
477. Indecisive
478. Indulgent
479. Inert
480. Inhibited
481. Insecure
482. Insensitive
483. Insincere
484. Insulting
485. Intolerant
486. Irascible
487. Irrational
488. Irresponsible
489. Irritable
490. Lazy
491. Libidinous
492. Loquacious
493. Malicious
494. Mannered
495. Mannerless
496. Mawkish
497. Mealymouthed
498. Mechanical
499. Meddlesome
500. Melancholic
501. Meretricious
502. Messy
503. Miserable
504. Miserly
505. Misguided
506. Mistaken
507. Money-minded
508. Monstrous
509. Moody
510. Morbid
511. Muddle-headed
512. Naive
513. Narcissistic
514. Narrow
515. Narrow-minded
516. Natty
517. Negativistic
518. Neglectful
519. Neurotic
520. Nihilistic
521. Obnoxious
522. Obsessive
523. Obvious
524. Odd
525. Offhand
526. One-dimensional
527. One-sided
528. Opinionated
529. Opportunistic
530. Oppressed
531. Outrageous
532. Overimaginative
533. Paranoid
534. Passive
535. Pedantic
536. Perverse
537. Petty
538. Pharisaical
539. Phlegmatic
540. Plodding
541. Pompous
542. Possessive
543. Power-hungry
544. Predatory
545. Prejudiced
546. Presumptuous
547. Pretentious
548. Prim
549. Procrastinating
550. Profligate
551. Provocative
552. Pugnacious
553. Puritanical
554. Quirky
555. Reactionary
556. Reactive
557. Regimental
558. Regretful
559. Repentant
560. Repressed
561. Resentful
562. Ridiculous
563. Rigid
564. Ritualistic
565. Rowdy
566. Ruined
567. Sadistic
568. Sanctimonious
569. Scheming
570. Scornful
571. Secretive
572. Sedentary
573. Selfish
574. Self-indulgent
575. Shallow
576. Shortsighted
577. Shy
578. Silly
579. Single-minded
580. Sloppy
581. Slow
582. Sly
583. Small-thinking
584. Softheaded
585. Sordid
586. Steely
587. Stiff
588. Strong-willed
589. Stupid
590. Submissive
591. Superficial
592. Superstitious
593. Suspicious
594. Tactless
595. Tasteless
596. Tense
597. Thievish
598. Thoughtless
599. Timid
600. Transparent
601. Treacherous
602. Trendy
603. Troublesome
604. Unappreciative
605. Uncaring
606. Uncharitable
607. Unconvincing
608. Uncooperative
609. Uncreative
610. Uncritical
611. Unctuous
612. Undisciplined
613. Unfriendly
614. Ungrateful
615. Unhealthy
616. Unimaginative
617. Unimpressive
618. Unlovable
619. Unpolished
620. Unprincipled
621. Unrealistic
622. Unreflective
623. Unreliable
624. Unrestrained
625. Unself-critical
626. Unstable
627. Vacuous
628. Vague
629. Venal
630. Venomous
631. Vindictive
632. Vulnerable
633. Weak
634. Weak-willed
635. Well-meaning
636. Willful
637. Wishful
638. Zany

"A KALEIDOSCOPE OF HUMAN EMOTIONS, EMOTIONAL SITUATIONS, REACTIONS, AND ATTITUDES"
168-Dyad (0.2%) Sample of 92,510-Dyad Idea Space : '638 Personality Traits' x '145 Emotions'

"FUNNY"
(44%)

Anticipative innocence.
Artful affection.
Big-thinking secretiveness.
Bland love.
Boyish boredom.
Captivating queerness.
Cerebral humiliation.
Circumspect hope.
Competitive detachment.
Considerate irony.
Cultured defensiveness.
Desperate bitterness.
Dirty eagerness.
Discontented apathy.
Earnest nausea.
Easily discouraged security.
Enigmatic boredom.
Fatalistic repentance.
Forgetful servility.
Glamorous acceptance.
Grand mischievousness.
Helpful absurdity.
Hypnotic irritation.
Idiosyncratic playfulness.
Impressionable dullness.
Impressive nausea.
Inert defensiveness.
Inhibited selfishness.
Innovative submissiveness.
Irreligious solicitude.
Knowledgable terror.
Meddlesome weariness.
Meretricious horror.
Monstrous possessiveness.
Muddle-headed jealousy.
Obnoxious anguish.
Optimistic passion.
Original cowardice.
Outrageous poetry.
Painstaking satisfaction.
Perfectionist remorse.
Placid self-pity.
Power-hungry sympathy.
Predictable detachment.
Providential iciness.
Punctual loneliness.
Reserved whimsicality.
Retiring terror.
Rowdy fear.
Sage despair.
Sarcastic desire.
Sedentary intolerance.
Sharing shock.
Small-thinking admiration.
Steadfast enchantment.
Steely repentance.
Strict hopelessness.
Stubborn hopelessness.
Tasteless horror.
Tense apathy.
Transparent combativeness.
Unappreciative servility.
Unchanging amazement.
Uncharitable obedience.
Understanding dignity.
Unhurried resentment.
Uninhibited hopelessness.
Unpredictable obedience.
Urbane nausea.
Venomous protectiveness.
Weak-willed hollowness.
Well-meaning hollowness.
Whimsical sincerity.
Wise tension.

"INTERESTING, OFTEN PARADOXICAL"
(19%)

Absentminded irony.
Amoral devotion.
Casual determination.
Chummy wonder.
Coarse frustration.
Complaintive eagerness.
Devious ferocity.
Dry calm.
Faithless gravity.
Freewheeling meanness.
Grim sincerity.
Irrational cowardice.
Mystical hostility.
Opinionated sadness.
Personable serenity.
Pharisaical vulnerability.
Procrastinating pain.
Regretful dignity.
Sane loneliness.
Secretive cruelty.
Secure friendliness.
Shallow secretiveness.
Shy surliness.
Skeptical respect.
Sly playfulness.
Soft evil.
Stiff mystery.
Tidy kindness.
Timid poetry.
Treacherous gravity.
Unfriendly defensiveness.
Warm gravity.

"POSSESSED OF LITTLE OR NO MEANING OR MERIT, OR TAUTOLOGOUS"
(10%)

Abrupt anxiety.
Challenging humiliation.
Conciliatory guilt.
Deceitful humiliation.
Difficult shyness.
Irascible mystery.
Modern deceit.
Objective guilt.
Progressive wonder.
Puritanical cruelty.
Sanctimonious complacency.
Self-reliant fraternity.
Trendy bitterness.
Unliked timidity.
Unreliable cruelty.
Upright honor.

"TRITE"
(5%)

Gullible acceptance.
False servility.
Honorable disgust.
Intolerant virtuousness.
Naive charm.
Old-fashioned anger.
Ordinary tenderness.
Preoccupied anxiety.
Solid affection.

"WELL-SAID BUT SEMANTICALLY ORDINARY"
(22%)

Ascetic gentleness.
Brutal virtuousness.
Calculating bewilderment.
Calm responsibility.
Cold caution.
Complacent pride.
Complex worry.
Contemptible indignation.
Crazy gaiety.
Dishonest bewilderment.
Disloyal selfishness.
Emotional hurry.
Gallant rejection.
Gracious anxiety.
Hearty loyalty.
Impulsive love.
Incorruptible sympathy.
Intuitive anticipation.
Masculine or manly pain.
Mellow combativeness.
Miserable shyness.
Offhand fraternity.
Paternalistic sympathy.
Private disgust.
Profound timidity.
Purposeful courage.
Reliable thoughtfulness.
Ridiculous tension.
Romantic irony.
Selfless rejection.
Sober approval.
Suave disbelief.
Sympathetic anger.
Tolerant thoughtfulness.
Tractable modesty.
Unhealthy resentment.
Vacuous charity.

Studies of such subsets of humorous reactions, and of their raisons d'etre, could serve to clarify the nature of humor and of its processes, types, dimensions, relationships, etc.

Let me speculate, in a necessarily brief and superficial way, about why I may find those six dyads amusing.

"Placid self-pity" speaks to the fact that even self-pity can be refined into a condition of some tranquillity and complacency; the tearful soul may find it more comfortable to recline on his arms even in his puddle of woe.

"Bland love" tickles me because it sticks a pin in the pretension that love must always be keen and earnest, that to speak of love of a marginal nature must be a contradiction. The reality is that love can be perfectly prosaic, as well as entirely hypocritical, and that even where love is tiny it may remain sincere.

"Glamorous acceptance" probably reminds us of how apt we are to exaggerate the importance of the acts of persons whom we see as glamorous, and also that even something as simple as acceptance can be made glamorous or can be done glamorously. Moreover, perhaps the glamour of a film star accepting the reward of an academy has bathetic echoes (humorous direct or metaphoric analogies) in our own ordinary, day-to-day lives.

The charm of "sarcastic desire" could lodge in the fact that acid wit often masks bitter frustration over being denied some pleasure, or even simple envy. It may affect to ridicule an advantage that it secretely covets, being a form of sublimation. The humorist may seek to diminish what looms largest on his orectic horizon.

The ludicrous extremes to which servility and meekness may go are invoked by "innovative submissiveness". We are reminded that one can be flexible without being pliant, and that even when it is necessary to yield to the inevitable one can do so with dignity.

Finally, "sage despair" may give words to what cant would hide: that on occasion it is wise to despair. Some situations are irrecoverably bad, and their immediate abandonment may be called for. The phrase also points to the psychological independence of wisdom and temperament: a sage may be by nature either a pessimist or an optimist; a man may be uncommonly wise and yet prone to irrational fits of despair.

"Well-Said But Semantically Ordinary" (22%). The next-largest subjective partition includes dyads that I felt to be unusually expressive, even eloquent, and yet rather ordinary in their meaning; of an interest, in other words, more literary than philosophic or psychological. Examples are "emotional hurry", "gallant rejection", "suave disbelief", "crazy gaiety", "cold caution", and even "mellow combativeness" and "purposeful courage".

The percentages of the sample represented by the five partitions have been found to closely correspond to the percentages of the full idea space that equivalent partitions would represent. It is therefore implied that about 20,000 eloquent dyads—equivalent to these—obtain in the space. Both litterateurs and people in general might spend time examining this huge set of 143 x 143 dyads for the ideas it might give for the polishing or modification of their style of writing or speech, or for the light it could throw upon the style of other writers and writings.

"Interesting, Often Paradoxical" (19%). Dyads in this partition, equivalent to 17,577 items in the total space, may variously be any of the following: especially interesting; often productive of an important insight, clue, paradox, new idea, or chain of thoughts; appealing as metaphor, figure, analog, synecdoche, half-truth, ellipsis, oxymoron or antiphrasis, hypallage, phrase, meiosis, or metonymy; instructively catachrestic, provocative, iconoclastic, or suggestive of a new taxon (of feeling or attitude, say); queerly, absurdly meaningful; or simply tentatively interesting.

The scientist might be drawn to this subset. In it he might find revelations about human nature, or hints of important new research to pursue—or of ways of pursuing it.

Inspecting and pondering these dyads, one may gain insights into oneself. Old thoughts and interests may be revived. The actual complexity of the world may suddenly be brought home to one. Assumptions about what is impossible or nonexistent may be shed. Queer relationships among people may come to mind. Rich and illuminating images of what people are and say and do may parade before one. Human motivations, motives, and feelings that one had never before considered—or been able to consider—may occur to one. Imaginary stories of lives may flood the mind. The sources and meaning of virtue and vice may be clarified.

Examples of dyads in this partition are: "chummy wonder", "sane loneliness", "warm gravity", "skeptical respect", "devious ferocity", and "amoral devotion".

Among the things that one might learn from these few dyads are: that some feelings of wonder may not spring from objective observation of the intrinsic properties of external phenomena but rather from the intersubjective dynamics of a human relationship; that sometimes aloneness may be born of a greater sanity, or solitude may be healthy; that a subtle and special warmth may be discoverable in a grave person, and that warmth and gravity are by no means incompatible emotions; that one may respect a person about whom one is skeptical, or be skeptical about a person one respects; that ferocity can paradoxically express itself slowly, disguisedly, and cunningly; and that it is possible to be devout about the amoral, or amorally religious, or a virtuous servant of an abomination.

What one learns about some of the dyads can enhance or combine with what one learns about the other dyads. Dyads that have already been examined may be worth examining again.

"Possessed Of Little Or No Meaning Or Merit, Or Tautologous" (10%). What is meant by a tautologous dyad here is a dyad whose first and second terms are more or less synonymous, so that the dyad is malformed and nugatory: "upright honor" being an example. Of course such a dyad may still have some validity.

Dyads such as "progressive wonder" and "modern deceit" fail (in my eyes) because they lack interest and specificity.

"Trite" (5%). "Old-fashioned anger", "solid affection", and "preoccupied anxiety" are both semantically and literarily ordinary, even though they are clearly meaningful. This and the foregoing subset are so similar or poorly distinguished that they should probably be united.

Obviously the five partitions or subsets intergrade. Many of the dyads are such that they could be assigned to two or more of the subsets. This is especially true of some of the "funny" and "interesting" dyads, many of which are both humorous and interesting in a more general way. Moreover, the partitioning of the 168 dyads was done quickly, and in retrospect I would say that a number of errors were made. The original assignments have however been retained, for no other reason than that there has been insufficient time to correct all known and unknown, or arguable, errors, at least in the first edition of this book.

The 92,510 dyads are interesting in part simply because of the fact that, having been generated mechanically, they are guaranteed to be fresh. They did not originate in—they were not fashioned and they have not been winnowed or reshaped by—any human mind. They do not come to us thanks to great chains of human beings that have passed them along with continual changes and numberless errors. They have not as yet been analyzed, categorized, and interpreted by anyone. They do not represent anyone's experiences, theories, preferences, or prejudices. Hence they more nearly partake of the character of natural phenomena, and to this extent are like primary entities.

Some crucial questions are:

Granted that the dyads created by our 'human kaleidoscope' are thrilling the first time one encounters them. But do they go on being thrilling? Do such dyads lose much of their excitement when the kaleidoscope is experienced again the next day? And the day after that?

The answer is that new dyads produced by the human kaleidoscope, or encountered for the first time, show no tendency to have diminished interest. New dyads have new interest or impress the mind as being genuinely novel. They do not seem to lose interest through some essential and cumulative redundancy, or because the initial interest of the kaleidoscope was that of a novelty, or owing to mental fatigue, or because mental generalization leads to virtual convergence or exhausts possibilities, or because of the relatively small size and constant reuse of the two primary lists (organons), or because in effect there is only so much that the human mind wishes to know (about human psychology).

If anything, on the contrary, successive encounters with the kaleidoscope, or experience with more and more dyads, leads to a growing interest in the dyads and greater curiosity about those dyads that remain.

Another question has to do with the graph or curve representing the total number of dyads, in the set of all dyads, possessed of different degrees of interest. - Are there dyads of ever greater interest? If one took the 10% (9,251) most interesting dyads, then the 1% (925) most interesting dyads, then the 0.1% (93) most interesting, followed by the 10^{-4} (9) most interesting, and finally the 10^{-5} or single most interesting dyad: would the degree of interest of the successive subsets grow in inverse proportion to their diminishing size?

Again the answer seems to be yes, at least as a first approximation. The longer one searches the 92,510-dyad idea space, the more interesting are the most interesting dyads that come to light. Although of course the process will end once the finite space has been exhausted.

There are several different ways of locating the best dyads in the full space. Here "best" can mean indefinitely many alternative things, depending on the criterion or combined criteria that interest one or that may operate in a given instance or with respect to some purpose. It might, for example, mean highest-ranking in personally or 'universally' perceived comicality, meaningfulness, expressive power or elegance, archetypal human meaning, ideogenetic effect, inexplicable fascination, revelatory quality, familiarity, unusualness, semantic complexity, absurdity, or even ugliness.

Obviously the simplest way to locate the best dyads is to peruse the entire 92,510-item list. In a general sense, this could also be described as the best possible approach. Certainly it is the one method that insures direct inspection of every candidate, or of every named locus in the space. But it has its defects, including the long and hard mental task it imposes, the strains it places upon human memory, and the errors it must result in owing to the diachronic instability of the perusing mind. Moreover, its executional inelegance will—given human nature—diminish the inspiration and profitable excitement of the user. The absolute need for such thoroughness might also be questioned.

Yet the examination of almost 100,000 items is not necessarily as big a chore as it might seem on first consideration. In an eight-hour workday there are 28,800 work-seconds, and so, if the big list could be read at 120 words per minute, say, or about the speed the average person reads a book, then 25.7 work-hours—or a bit over 3 workdays—would suffice to acquaint one with the total set of dyads. Of course this is ideal, and it makes no allowance for the time required to winnow any favored item, for backtracking, or for periodically 'clearing the mind' or reminding oneself of the basic task and criteria. Let us say therefore that the task of perusing and winnowing a 92,510-dyad (or 185,020-word) list might demand something in the range of 1-3 work-weeks to be done properly.

The initial winnow or 'skimming of the scream' might cull the 10% (or 9,251) of the dyads judged best. Successive 10% winnows could yield the diminishing series of 925 (or 1%) overall best, 93 (or 0.1%) overall best, 9 (or 1/10,000) overall best, and 1 supremely best dyads. This would enlarge the total worktime required (to perform 102,788 dyadic winnowings) by a factor of 1.1. The result would be the scaling of the 92,510 dyads on a 6-point logarithmic scale of degrees of 'goodness' (by some criterion).

Of course 6 degrees can hardly be compared with the 92,510-degree scale that would, in effect, be produced by the superhumanly laborious complete linear ordering of the entire set of kaleidoscopic dyads.

Another way to locate the best dyads would cause one to initially sample a small portion of the full idea space. One would winnow the best dyads in this sample and then use a computer to rank the terms that figured in the best dyads according to their relative frequency of occurrence (with separate rankings for the first and second dyadic terms). An alternative approach here would be to directly rank (or, say, to scale cardinally) the perceived individual or universal (combinatorial) goodness of the first and second terms. In either case, the resultant rankings would then to used to predict the best dyads, or the goodness of dyads, not just in the small sample subset but throughout the entire 92,510-dyad space (or table).

This method has been demonstrated to work by experiments with other idea spaces, but, despite its economies, it has its drawbacks. The gravest defect of the method is that it tends to be insensitive to dyads whose source of interest is sui generis, or poorly characterized by the criteria that operated in the sample or that distinguished the sample's dyads. The particular type and degree of problems the method has will depend upon which of its sub-methods are actually used.

A third way to locate the best dyads in the full space is by employing some form of multidimensional scaling. This might mean that one would rank all the first and second terms of all the dyads in a sample of the space for their perceived degree of similarity or analogy to a few (say 5%-10%) of those first or second terms (once again with the first and second terms being treated separately, or ranked only with respect to other first and second terms). As has been shown repeatedly elsewhere, these very fractional rankings or weightings can be used by a computer to predict scaling (say for 'goodness') in the larger set of ideonomic propositions. Such multidimensional scaling, moreover, can also predict multiple types of 'goodness', or complex locational clustering of propositions in a multidimensional 'goodness' space (convolvedly implicit in one's—naive or nonmetric—intuitive rankings beforehand).

Without looking at the total space I can nonetheless scan a part of it a few times larger than the 168-dyad sample we have already considered for the sake of identifying one or two dyads correspondingly 'better' than the best dyads apt to occur in the lesser sample and for enabling readers to understand the predicted growth in goodness of dyads of higher and higher rank. Two such higher dyads might be "busy boredom" and "suave adoration".

That predicted by the second method that was discussed above can easily be tested by taking "busy" as the first term of the first dyad and "adoration" as the second term of the second dyad and checking to see the breadth of interest possessed by those new dyads that can be formed by substituting these floating first and second terms for the existing first or second terms, respectively, of the dyads that happen to be represented in the 168-dyad sample.

My own impression when doing this is that the dyads that are produced by this indicated transformation are indeed generally superior and rather in the proportion, and measure, that one would expect. Thus the substitution of "busy" as a first term yields such interesting dyads as "busy innocence", "busy defensiveness", "busy playfulness", "busy remorse", "busy terror", and "busy adoration". And the substitution of "adoration" as a universal second term fills our arms at once with such felicitous dyads as "artful adoration", "big-thinking adoration", "captivating adoration", "cerebral adoration", "desperate adoration", "dirty adoration", "forgetful adoration", "grand adoration", "helpful adoration", "inert adoration", and "painstaking adoration".

What is the value or interest, or the possible use, of the dyads that the Human Kaleidoscope creates? I will touch on a few of the possibilities.

I have found over the past several years that dyads like these, and sometimes these very dyads, occur in the writings of the great: in Shakespeare, Dickens, and others. Often it is the great metaphors of the latter that reduce to such dyads. And often it is precisely the most striking elements of the text of these individuals that are these dyads. Even the absurdity and unexpectedness that is so typical of the dyads of the Human Kaleidoscope will be found in the like dyads of great literature as a frequent and explanatory feature.

Do the dyads there act as nuclei upon which, and from which, the crystallization of the whole masterpiece occurs? Or do the dyads precipitate out of the great work as crystallizations of its essence - or perhaps symbols for the memory? Or possibly as seeds from which other great literature may subsequently arise, or as nodes interconnecting all great works in synoptic networks? Do monads, dyads, triads, and other simplest elements capture the fundamental, orthogonal, and universal combinatorial, permutational, transformational, and evolutionary dimensions of a work, reflect and re-reflect them throughout a work, and define its living architecture? Are they the most powerful alchemical agents, in a psychological sense? Are they the simplest (most compact or intermediate means) for the intertransformation of remote or general things? Again, is there any sense in which they might be said to be cellular automata from which a literary work - in the measure to which it is artistic - develops by recursion?

Are there hints here that creative genius is in essence ideonomic?

Might art be ideonomic propositions rendered fractally?

IDEAS IN BIOLOGY
That Resulted From the Ideonomy Project

Of all of the major sciences, it was in biology that the Ideonomy Project managed to generate the greatest number of ideas. The reasons for this concentration were probably several. The subfield about which I happen to have the most specialist knowledge is the neurosciences, which is essentially a part of biology. The general science that I know the most about is biology. The one friend that helped me most in the course of my project, and that showed the greatest enthusiasm for it, was a biologist (Betsey Dyer-Obar). I thought it would make good sense to choose one subject in which to display ideonomy's power to the fullest extent, and biology became that subject (especially its subfield pathology, or the study of disease).

Biology is also a subject in which the general development of theory, at least by comparison with general experimentation, has lagged. Certainly there is nothing comparable to the theoretical maturity of physics.

Perhaps the biological community will be taken aback by this assertion. Yet to fully understand my point it would have to be aware of the situation in physics—which its specialization of course prevents it from being.

I myself may be in an especially advantageous position to judge the extent of the disparity—or of the overall theoretical immaturity of biology—owing to my nearly equal interest in physics and biology, my strong interest in all sciences, my long-term interest in judging the total structure and accomplishments of present-day science and in foreseeing the future of science, my efforts to reconstruct the foundations of biology and to correct its inadequacies of theory, and my work as an ideonomist.

It is true that for over a decade now a fairly general revolution has been underway in biology: embracing instrumentation, experimentation, organization and scale of research, methodology, mathematics and computation, terminology, diversity and largeness of goals, publications, excellence of individual researchers, and even what calls itself "theory".

But realistically, it is a terribly young revolution. It is only half aware of itself and it has not yet decided where it would like to go.

As for theoretical biology, that is especially pathetic. There has been no effort to survey and characterize the fundamental dimensions of biology. The prime phenomenon of the field—life—has never been defined in any real way. Biological entities, forces, processes, relationships, laws, structures, and concepts continue to be thought of only as concrete and particular things, and have never been generalized into the universal, fundamental, abstract, necessary, mutually derived, and holistic things that they must ultimately be reconceived as being. The logical and formal foundations of biology remain almost untouched; there is no axiomatic biology by analogy to axiomatic physics. The things of biology remain narrowly biological; their equivalents in other sciences have not even been sought. Only a few (truly universal) categories of biological causes and effects have been considered. What the full complexity of life might be like has never been looked into. The general fabric of fallacies and illusions that must obtain in biology, just as it obtains in any other science, has never been confronted. Few of the sophisticated mathematical ideas and methods that the physicist employs have been tapped by the biologist.

"IDEAS IN BIOLOGY THAT RESULTED FROM THE IDEONOMY PROJECT"

1. All life (the bios) as one great self-contagion.
2. Anosogens; displacive and cancellative counter-contagions and counter-diseases; finite, quantic, and saturable 'pathogenic niches'; noncontagious and non-nucleic anosogens.
3. Antipathogenes (disease-fighting or disease-countering genes).
4. Captured contagions; organelles (such as mitochondria) as captured ancient contagions.
5. Constant evolution, reconstruction, and/or restabilization of the bios via "lateral gene flows" (or informational contagions) ascending from the tiniest-scale organisms up to the biggest organisms and biological phenomena.
6. Constant evolution, reevolution, and/or redifferentiation of the bios via "lateral gene flows" (or informational contagions) descending from the greatest spatiotemporal scales and organisms down to the least.
7. Constant inter-evolution and intercoordination of the bios (all life) via countercurrent "lateral gene flows" (or informational contagions) ascending and descending between the least and greatest biological scales and organisms and reversing at the antipolar extremes.
8. Creation and release of artificial 'sosogens, anosogens, and antinosogens' by future medical, agricultural, and ecological technology.
9. Cutaneous, oral, and intestinal microflora as 'sosogens' (good diseases).
10. Danger that future medical extirpation of diseases will simultaneously extirpate 'proseases' that are necessary for human health.
11. Diseases as grossly misunderstood phenomena that are really normal, beneficial, and even necessary to all life.
12. Diseases peculiar to single cells (cytodiseases and cytopathology).
13. Do the bodily microflorae of the world's people, or of all creatures, migrate slowly but inexorably everywhere, as a vast blanket-like pandemic that is a paradoxically indissociable continuum of 'good and bad diseases'?
14. Epidemic diseases as microorganismal migrations (nature's fastest and most massive migrations).
15. Good diseases (proseases and sosogens).
16. Improving the 'sosology' of bowel 'proseases' to reduce digestive system diseases and discomforts.
17. Lineal evolution as but an internalized by-product of predominant 'lateral evolution'—or "lateral gene flows"; all species and taxa as simply dynamic equilibria in such flows, and quasi-autonomous; 'rheo-systematics'.
18. Micro-contagions between and within the body's elements, as the smallest epidemiologic scale.
19. Neutral or asymptomatic disease-like or pathogen-like entities, say existing ubiquitously in nature as a background sea; diseases and 'proseases' may originate from such a sea by chance or evolution; negative fluctuations in this sea, or in the inland seas of individual organisms, may occasionally cause pathogenic niches to be vacated <u>en masse</u> and a contagious or noncontagious disease may be the opportunistic result.
20. Noncontagious 'proseases' (analogous to noncontagious diseases).
21. Ontogenetic or intra-organismal analogs of phylogenetic mutations or demographic polymorphismic changes; at once pathogenic, 'sosogenic', and 'neutral' ones.
22. Pathogenic microorganisms, parasites, predators, and (e.g.) entire ecosystems inhospitable to squirrels : as essentially synonymous scale-invariant phenomena (e.g., 'scale-invariant pathoses').
23. Possible fundamental biological importance of the velocity ~167 angstroms/s [e.g., cytokinesis (anaphase movement) 167Å/s : stentor elongation 167Å/s : cilium length growth 167Å/s : human PNS nerve fiber regeneration 174Å/s : slow (axoplasmic) axonal transport 145Å/s : eucaryotic flagellum length max growth 107Å/s].
24. Recognized (standard) contagions as mere pieces of a continuous hierarchic cascade of contagions ("lateral gene flows"), representing information under pressure exploding from level to level or metamorphosing into endless new forms and manifestations.
25. Redesigned or artificial digestive microflora enabling men and agricultural animals to synthesize their own vitamins.
26. Single 'laterally flowing genes' as the tiniest contagions.
27. Sympathogens (pathogens that can or must act in concert with other pathogens to produce, amplify, or transform a disease or epidemic).

③: See "interference phenomena" "cell-blocking phenomena" —Web. III!!

⑨: could the constant increase & action in recent history already be a result of overly sanitary (and healthy?) existence?

"8 OTHER IDEAS IN BIOLOGY THAT RESULTED FROM IDEONOMY PROJECT"

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1. Analogs of animal territoriality throughout biology (e.g., private, organized, and competitive domains, and domainal behavior, of plants, bacteria, organs, cells [such as neurons], biomolecules, and genes).
2. Analogs of plant allelopathy and 'allelophily' throughout biology (e.g., in animals or protists, intra-organismally between or within organs, cells [such as neurons], organelles, or biomolecules, or in evolution or ontogeny).
3. Asthma as due to mechanisms evolved by plants to repel groups of animals from their territories.
4. Autopathy and autophily (or self-allelopathy and self-'allelophily'), as a relaxed or reflexive analog and counter-analog of allelopathy.
5. Geochemical differences among soils, and even some ore deposits, as caused by cumulative sequestration of chemical elements and species by plants over their ranges in the course of geological time—e.g., for their own nutrition, for evolving certain soil textures, as a result of long-range mass-allelopathy or mass-'allelophily', to 'toxically repel' unwanted animals (pests) from their territories gradually over countless generations, etc.
6. Nonstandard 'pecking orders', and devolutionary analogs of pecking orders, in animals (e.g., 'pecking circles', variable and multiplexed 'pecking orders', etc).
7. 'Pecking order' analogs in plants and microbes.
8. Plant allelophily (as a counter-analog of allelopathy).

Perhaps the best index for the state of theory in a field is the richness of imagination in that field or the field's speculative freedom and reach. Here the juxtaposition of biology to physics is indeed instructive. The wildest notions that have been entertained by the physics community to date are many orders of magnitude more bizarre than the most outré speculation in the life sciences. In biology there exists nothing like the journal Foundations of Physics.

So the theoretical and scientific underdevelopment of biology made it a perfect science to focus on in the Ideonomy Project, by way of demonstrating the difference that the new science of ideas could be expected to produce when introduced as an adjunct in the other sciences.

I will now list and comment upon some of the best biological ideas and possibilities that resulted in the course of the six-year project. I will also discuss some of the ideonomic and circumstantial origins of these conjectures, hypotheses, theories, concepts, and proposals.

(1) Good diseases (proseases and sosogens).

In the course of a discussion one afternoon among two microbiologists and myself, we suddenly realized that, in addition to the conventional diseases whose net effect is harm to whatever organisms succumb to them, there should probably exist 'diseases' of an opposite, albeit paradoxical character, whose basic or net effect is an improvement in the organisms that experience them.

Though admittedly this was an outrageous idea, elementary ideonomic reasoning forced us to see that common sense would make the existence of such 'good diseases' more probable than their nonexistence:

First, what are diseases? Basically they are contagions produced by parasitic microsymbionts (or at least, this is what the particular class of biogenic diseases that we had in mind initially are). You could simply say that they are examples of symbionts.

Now symbiosis is one of the major phenomena that biology studies, but ordinarily the symbionts that are discussed are quite a bit larger than pathogenic viruses, bacteria and other protists, etc. In other words, they are macrosymbionts such as parasitic lice, tapeworms, and vines (although this traditional macroorganismal focus is now changing).

And there are generally three types of macrosymbionts: bad, neutral, and good ones (looked at from the standpoint of the symbiotic partner). That is, there is usually a complete spectrum.

Back down to the scale of microsymbionts. The bad guys are familiar enough: medicine is obsessed with them. But where on earth are the good and neutral 'pathogenic' microsymbiontic analogs of the good and neutral macrosymbionts! Are we supposed to imagine that the microorganismal and macroorganismal worlds are fundamentally asymmetric in this preposterous way, and that the macroscopically tripartite symbiotic spectrum is merely unipartite for, say, the contagious microorganisms? Now that would be a surprise (not the predicted heterodox symmetry).

So conservative biology and medicine are unwittingly defying common sense. That they are doing so is not, however, surprising. Biology historically sprang from medicine and : psychologically, philosophically, and institutionally : is still largely subservient to medicine. And the central concern of medicine remains disease and the treatment of disease.

Words, moreover, have a tendency to enslave people by replacing concepts and thinking with the mechanical and fixed definitions of those words and with encrusted connotations. Conventional logic teaches us to define a thing by the exclusion of its opposite: a mental habit that makes a 'good disease' seem like a contradiction in terms and therefore impossible. Disease is defined as a primary or primitive concept and it is not supposed to be possible to reach into such a concept and discover a new concept as a result; certainly no one expects one to be able to find another concept within a concept that is as just as big as the original concept. Medicine and medical funding are dedicated to the bad and the somber, because of which they are apt to react to a proposal that there might be good diseases with indifference, anger or contempt over what is seen as frivolous, incomprehension, or fear or hostility over what is regarded as an opposite, antagonistic, or subversive concept.

Typically, if one is to find something one must actively seek it, or believe in the possibility of the thing's existence, or be acquainted in advance with the general or specific concept of the thing, or believe that the existence of the thing would not contradict something else or be self-contradictory. Otherwise the thing may be staring one in the face and yet one may be blind to its reality.

Could people be 'victims' of good diseases and not know it or never have noticed it? Maybe people ignore their good diseases because they are not disruptive and require no treatment or attention? Maybe good diseases are so diverse that few people have the same disease? Maybe certain good diseases recur annually during certain seasons, such as spring, but are then attributed to the effects of the weather or other things? Maybe we have a tradition of attributing the effects of good diseases to changes of diet, personal relationships, mood swings or attitude changes, etc? Maybe psychological or physiological improvements are simply thought of as returns to normalcy? Maybe on average the effects of good and bad diseases cancel one another out or mask one another? Maybe the brain was evolutionarily programmed to only note or react to bodily dysfunction? Maybe no one has ever bothered to look for synchronous upward fluctuations of the mood, vigor, performance, or health of large numbers of people, locally or globally? Maybe good diseases and their effects, just like bad diseases and their effects, are transient, and they tend to follow one another as cyclic antiphases?[5]

In the healthy cells of healthy bodies there always exist viruses that have no known function and that are not known to cause any disease. These could be examples of the neutral or commensal microsymbionts that were spoken of above and/or the agents of the unrecognized good diseases. They are largely ignored because of their apparent lack of connection with the ills of man or of the lower organisms.

To avoid confusion, it may be appropriate to coin some new words to designate "beneficial disease" and "beneficial pathogen" and their "pathology". Prosease[α] (from the Greek prefix pros-: near, toward; + ease), for the first; eunosogen (Greek prefix eu-: good; + Greek nosos: disease, sickness; + Greek suffix -gen: one that generates) or else sosogen[β] (Greek sos: safe, sound, well; + -gen), for the second; and therefore either eunosology or sosology for the third. These proposed neologisms take into account other concepts of a somewhat different but related nature that have also been conceived of with the assistance of ideonomy.

α: \prōzēz\

β: \sōsəjən\

Clearly if the predicted good diseases (or proseases) do in fact exist, then they are apt to be of immense importance, and they may almost double the 'size' of future medicine (by adding eunosology or sosology to pathology). Even if they do not exist naturally, biological engineering can almost certainly bring such entities (and phenomena) into existence, and it would presumably have every reason for doing so.

Natural proseases could be sought and collected everywhere in nature and their properties improved or transformed through breeding or more radical bioengineering. Natural and artificial proseases could be made to infect human beings, animals, and plants so as to enhance their health and vitality and extend their qualities.

A more exact and comprehensive definition of the eunosogens (or sosogens) is in order: hypothetical beneficial disease-like or pathogen-like organisms[a]; contagious, eusymbiotic, or non-self-reproductively-spreading : organisms that tend to improve : in limited ways, in the net, or sans any bad effects : the health, vigor, evolutionary survivability, or coevolutionary value : of one or more species or higher taxa, either by making extant biological systems normal or supernormal or by inducing novel phenes; that may variously be : inter-organismally or intra-organismally : contagious or non-contagious.

[a]: or quasi-organismal agents[c]

Do we know of the existence of any proseases and sosogens (to use the shortest of the two proposed synonyms for the nonce) at the present time, or do the concepts remain purely speculative? Certainly when my friends and I conceived these ideas in 1984, none of us were aware of any discoveries of this sort having been made. Of course the biological literature is vast and our knowledge of it was (and is) insignificant. No attempt was made to search the literature.

But in the years since I have kept my eyes and ears open, and queried a score of biologists. Things have come to my attention that probably exemplify, and that definitely suggest, the postulated 'genus' of entities. Undoubtably a part of the problem is that biologists have not yet coined words to distinguish things of the sort that I have proposed here, and what is innominate is almost incogitable and incommunicable. Also, revolutionary concepts and phenomena frequently emerge incrementally, disguised as older and more familiar things, and without the fact of their emergence being celebrated or even noted. The strange new phenomenon may be there, truly enough, but until it is explicitly conceptualized as distinct, special, and important—as a conceptual discontinuity and a glorious challenge to the theorist and experimentalist—it is apt to remain a virtual nonentity. The existence and novelty of the thing may be obvious enough, and yet the obvious is that which should be said at least once.

Botanists seem to be ahead of zoologists in recognizing good diseases. Agriculturalists have found it possible to infect soils with beneficial fungi; as these fungi reproduce and spread areally in the soil they improve the health and vigor of various crops raised upon it. The symbiotic association of the mycelium of a fungus with the roots of seed plants that is known as a mycorrhiza provides one basis for such inoculation.

Acremonium is a genus of fungi that inhabits grass; an endosymbiont, it resides in the very tissue of the larger plant. It produces alkaloids that make the plant unpalatable to insects that would otherwise devour the grass, and there is also an indication that it aids the plant's fecundity. It may well benefit the grass in many other ways.

To the extent that such a symbiotic relationship is normal, stable, ancient, universal, or even necessary, sheer custom discourages us from thinking of it as illustrative of infection, much less of a prosease. Yet such arbitrary habits of language and thought shackle the mind, and to the ideonomist they are a scourge that should be fought everywhere until they are extinguished.

One of the fundamental dimensions that characterize the phenomenon of disease is that of the range of degrees of permanency of disease, and at the limit the permanency of a contagion, say, can be absolute (eternal). If such organelles as mitochondria are the genetically assimilated or semi-assimilated fossils of ancient endosymbionts, it is still legitimate to describe them as a captured contagion whose period of residence, or of manifestation, is infinite (or semi-infinite, to be more precise).

That organisms and the disease organisms that infect them can ultimately coalesce, in a phylogenetic sense, is important. It calls to mind the current iconoclastic suggestion that among the divergent branches of the evolutionary tree of all life, cross-currents may exist as the phenomenon of lateral gene flow that has been demonstrated to exist in at least a minimal sense, but whose possible upper bounds are unknown. Whether these interfluent genes circulate within the crown of evolution's tree on their own or are ferried to and fro within bacteriophages that are like bees diffusing pollen, they are in any case contagions.

A fundamental dimension characterizing the phenomenon of contagion is the range of the number of contagious organisms. At the opposite limits of this range may be all the genes that flow or have flowed laterally treated as a single absolutely comprehensive contagion that is spatiotemporally endless and that makes the bios its own disease; and the tiniest contagion—which may be less than a single organism, if the laterally flowing genes are each to be treated as individual, one-particle contagions.

Within this picture the possibility arises that all life represents nothing more than one great self-contagion. Conceivably the lesser contagions within this contagion or the immense interflow of genes are the real wheel of evolution, and productive of the phenistic or even cladistic differentiation of all the Earth's species: lineal evolution might even be simply an internalized by-product of predominant 'lateral' evolution.

Might the bios be continually evolving, reconstructing, or restabilizing itself from the bottom upwards, via informational contagions ascending in either a turbulent or organized way from the tiniest organisms or fragments of organisms to the most giant organisms? Or on the contrary, might the bios be constantly evolving, reevolving, or redifferentiating itself from the top downwards, via similar informational contagions descending from the largest organisms and spatiotemporal scales to the tiniest organisms and bits of organisms? Or might the process proceed forever in both directions and reverse at the antipolar extremes?

Should either of these three alternatives obtain, might those contagions that are known to us simply be pieces of a continuous hierarchic cascade of contagions that represent information under pressure exploding from level to level or metamorphosing into endless new forms and manifestations?

If a pathogenic organism is a significant fraction of the size of the organism it 'infects' we traditionally describe it as a parasite rather than as a pathogen. If it is bigger yet and comparable in size to the 'infected' organism we say that it is a predator and the 'infected' organism is its prey (although if one or both of the organisms happens to be a plant we stupidly have recourse to a totally different set of terms). If the 'pathogenic organism' is so terribly big that it is a clonal or nonclonal forest, say, that creates by its excessive shade or chemical exudates conditions that are unfavorable or harmful to the organism, a squirrel, say, that it 'infects', we do not even think in terms of pathology or pathological analogs any longer, and we simply say that the 'infected' squirrel is maladjusted or ecologically misplaced.

Yet through all of these examples, from the transcendent standpoint of ideonomy, the same basic set of phenomena persist: including analogs of pathogens and diseased organisms.

The concept of "good disease", then, must be recreated on all of these levels, and all of them should exemplify it.

An extreme case of the size or mass inversion of the pathogen-pathic relationship is the giant baleen whale who filter-feeds upon the microzooplanktonic krill, a trillionth his bulk and certainly overmatched. Yet the relatively planetoidal whale is the virtual pathogen of the shrimp. Instead of the pathic being beset by millions of pathogens, a single pathogen instantaneously attacks and destroys millions of pathics; a cloud-like contagion is consolidated as a single organism's quadrillions of cells. Instead of the shrimp catching whale disease it is caught by the whale.

Man has many beneficial exosymbionts and endosymbionts: notably the cutaneous, oral, and intestinal microflora. All of these are really good diseases, at least in part. Only poor habits cause us to think of them as being otherwise.

Their infection may seem permanent, but how do we know that it really is? Perhaps the taxonic, varietal, and polymorphismic composition of these florae changes slowly, cyclically, or "catastrophically" through life. When an odd food or dish is eaten there may be a sudden opportunistic explosion of some bacterium that previously only inhabited a microniche or a microscopic refugium. Perhaps people continually infect one another with different microflora; the contagions that we recognize, and think of simply as bad, may simply be those contagions—or microfloral exchanges, mass migrations, or population explosions—that are so extreme that they become conspicuous, sensorially incompensable, or disruptive of daily life.

The ocean is so big that, apart from its obvious surface movements, we think of it as static, yet in reality its waters forever and at all levels migrate at 1-10 kilometers per hour, and hence eventually circumnavigate the globe or sail everywhere (and sail they do, supinely blown by the overrushing wind—which also moves everywhere incessantly). Likewise do the Earth's soil and crust, and the heavenly stars, seem to the blindly fast human eye immobile when in reality they drift slowly and migrate everywhere.

By analogy, the bodily microflorae of the world's people may slowly but inexorably migrate everywhere: a vast blanket-like pandemic that represents a paradoxically indissociable continuum of 'good and bad diseases'. And let it be emphasized: there may be currents, eddies, turbulence, etc.

When ideonomy is employed to resee, or to see more extensively and systematically, the wealth of possibilities that normally exist in connection with any topic, such as diseases or good diseases, it can be assumed that only a small fraction of the resulting proposals and concepts will actually be valid or exemplified by real things.

(1) Or to be more precise, only a tiny minority will presumably correspond in an : absolute, exact, essential, necessary and certain, comprehensive, one-to-one, unmodified, sufficient, inter-predictive (so that model and thing are reciprocally predictive), multilevel, 'beginning-to-end', critical, more-than-analogical, intricate, quantitative, 'wholly meaningful', infinite, universal, mechanical, truly elegant, e/vc : way.

(2) A much larger fraction of the possibilities that are generated will be: partly valid, partly true, merely stimulating, merely heuristic, clues to something else that may still have value or interest, things that must be considered (imagined, examined, tested, juxtaposed to other possibilities, elucubrated, criticized, e/vc) and then dismissed, necessary transitional ideas, fallacious or misleading, trivial, analogically or metaphorically true, minimally or approximately correct, useful as fictions, e/vc.

(3) Finally, a third fraction of the ideonomically derived possibilities can be expected to be: antithetical in nature to the first group of possibilities that were characterized above, and hence absolutely : false, irrelevant, unrelated, opposite to the reality, sterile, inutile, absurd, impossible, separable from the truth, uninteresting, exclusible, falsifiable, misleading, e/vc.

Actually there is a tentative ideonomic principle that would require the antipolar first and third groups—at least in their 'absolute' senses—to be null sets or vacuous (or at least to the extent that is possible without there being a contradiction). This would mean, for example, that no matter what ideas may be conceived of with the help of ideonomy, none will ever be either totally right or totally wrong.

However, the original point that I wished to make is that even though few of the ideas that are created en masse by ideonomy in exercises or analyses such as this will be right or wholly right—at least during the infancy of the new science or before it begins to partake of the nature of artificial intelligence or noology—they may still be comprehensively valid in a second and very important sense: as practical options and potentialities for the future.

In other words, even if the ideas are not valid descriptions of natural phenomena or of present realities, they may nevertheless have value as descriptions and hints of things that might be developed, achieved, created, done, attempted, or exploited—or that may spontaneously come about—in the future. This includes technological, artistic, industrial, social, and other things. Ideonomy is not a tool for the scientist only.

In the case of technology, for example, there is an important principle to note here, which is that as civilization progresses its appetite and capacity for the realization of possibilities seems to expand exponentially and almost comprehensively. Ultimately it seems to have a use or need for everything in some sense, form, or degree; if just owing to the infinite and infinitely diverse possibilities for the meaningful combination, permutation, and transformation of all things, be they new or old. It appears to love variegation, differentiation, assimilation, supplementation, complementation, construction, synergism, extension, renewal, and the grandeur of the meadow.

What all of this means in terms of good diseases is that virtually every possibility imagined here may find some application in future biotechnology.

New and novel intestinal, oral, and skin microflora might be created to improve human health and the body's abilities and efficiencies.

Such ecological engineering or reengineering of the alimentary canals of the human race could help to solve global food problems. The efficiency with which old foods are digested could be greatly increased, if just because at the present time so little of the potential caloric and other nutritional value of what we eat is successfully extracted by the digestive tract (most of the value is lost; we feed our sewers better than we feed ourselves).

People could be given the ability to digest new foods, which would make more foods acceptable on the dinner table and enlarge the range of crops that might be grown, or the number of cultivable plants. People in different bioclimatic regions could be enabled to make better use of the native fauna and flora.

Artificial and redesigned digestive flora could enable the 'in vivo' production of vitamins and obviate their presence or supplementation in the diet, which would relax agricultural requirements and literally insure a balanced diet the world over.

The same array of methods could be exploited in animal husbandry. This could relax the foraging requirements and improve the grazing efficiency of cattle, and create new opportunities for rangelands while simultaneously lessening their maintenance and management costs. By improving the ability of farm animals to synthesize vitamins and proteins, or to chemically process their foods generally, the quality of meat and dairy products—in both the gastronomic and nutritive sense—could be raised substantially.

Food animals could be given the ability to be nourished by, or to process, a wider range of industrial wastes.

Collectively and even individually, these innovations could contribute profoundly to the physical and economic welfare of mankind. They are wonderful illustrations of how diseases can be domesticated—and be not only good but beneficent.

Improving the goodness, or the "sosology", of the "proseases" that dwell in man's bowels, and that are therefore his closest friends, would also be a way of reducing our manifold gastrointestinal diseases and discomforts. Many of these ailments, such as indigestion, are probably manifestations of the delicate balance or perpetual warfare of native and invasive proseases and diseases (or of their sosogens and pathogens). Occasionally a prosease may suffer a blight or extinction, either as a victim of some disease of its own or spontaneously (as a 'bad remission'), and the result may be a stomach ache.

Another reason why people may have good diseases without noticing the fact—that was omitted in the list earlier—is that such proseases, unlike bad diseases, or diseases in the ordinary sense, may not activate the immune system when they enter the body or are contracted, and we may mainly or only be conscious of infections that do trigger the immune system, whose work when fighting disease is so noisy, disruptive, magnified, and conspicuous (through the fever, inflammation, etc that it induces).

Then again, even if proseases do in fact generally cause some sort of an immune reaction, that reaction may differ from the reaction to diseases in being slower in onset, of much longer or shorter duration, subtler, of a different form or characteristic manifestation, one that involves some other part of the immune system (perhaps not yet discovered) or another bodily system altogether that responds to infections, etc.

Here something that was merely alluded to above needs to be emphasized: that, just as bad diseases come in both contagious and noncontagious forms, proseases should probably be defined to include possible analogs of noncontagious bad diseases.

In other words, occasionally—by 'chance' or as a result of some more deterministic process in the body of an organism—there may appear in that body some improvement of its condition or functioning, either abruptly or in a seemingly or truly discontinuous way, or else as a result of a gradual evolution, change, or preparation, involving but a single stage or any number of stages. Perhaps some new dynamical configuration emerges in the complex dynamical system that the body of any organism represents. The body might learn a new way of doing something, or solve a 'problem' upon which it had long been 'working', or transform, relax, or become excited into a different general or local state, etc. Perhaps there are ontogenetic or intra-organismal analogs of phylogenetic mutations or demographic polymorphismic changes, not only of a bad but of a good or neutral kind.

If the body is an intricate informational and cybernetic system of a heterodox kind—such that its many organs, tissues, cells, regions, organelles, biochemical processes, cellular genomes, proteins, etc are constantly exchanging enormous quantities of data, orders, requests, 'ideas', conversation, 'votes', and effects—then the things being imagined could quite easily occur.

One reason why proseases are important to know about if they exist is that in the future means may be discovered or developed for virtually extinguishing all diseases or disease-like entities, or that simply—albeit in a drastic way—interfere with the normal functioning of classes of 'disease'. Man's application of such potent means might then proceed with naive folly, because of a traditional but erroneous assumption that diseases and analogs of diseases, by definition, can only be bad or undesirable. This illusorily self-evident dogma might even blind researchers and doctors to paradoxical indications to the contrary during the initial development and implementation of such overgeneralized therapies and preventatives. After all, things not incomparable to this have happened before in the history of technology.

I will end my discussion of good diseases by referring to some of the elements and methods of ideonomy that played a role in the origination of the concept of such diseases and in the explication of its many possibilities and implications.

First, the ideonomic division Definitions and Orismology prompted consideration of how disease has been defined in the past or might be defined in the future. This quickly led to the realization that no adequate or truly fundamental definition existed.

One way to define or understand something is to identify and compare it with its opposite, and so the division Opposites and Enantiology was considered. Also considered was Taxons and Taxology, in an effort to classify disease in relation to other things inside and outside biology.

It was realized that a disease reduces to a pathogen and a pathogen to a bad tiny symbiont. The opposite of bad is good. This called attention to an asymmetry, since no known good contagion was known to exist or to have been theorized. A principle taken from the division Principles and Axiomology declares that the existence of total asymmetries, in the case of generic dimensions of natural phenomena, is improbable; and another principle, that the opposite of a thing, though often not noticed at first, will ordinarily be found to exist upon further investigation.

Thought was given, in terms of Errors and Sphalmology, to relevant common fallacies; such as the tendency of a concept to obscure the perception of other concepts, and especially ones, paradoxically, that are in fact too closely related to the concept.

A further relevant principle was that nature tends to include physical realizations of the set of abstract possibilities implicit in all of her symmetries.

The principle that opposites meet suggested that, in one or more ways, bad and good diseases should also meet; and from this came the idea, in terms of the division Equilibriums and Statology, that in diverse biological systems there may typically coexist good and bad diseases that are in dynamic equilibrium and sensitive to disruption, and that such disruption may even cause good disease to parade as bad and bad disease as good, in line with a principle of antisyzygial inversion (that links Paradoxes and Paradoxology with the division Inversions and Simomology), as well as other pertinent ideonomic principles.

An ideonomic principle asserts that a continuum tends to exist over a hierarchy or range, whereas a common fallacy overlooks or denies the possibility of such a continuum, and a related fallacy involves the historical tendency for a hierarchy or range to become artificially subdivided by the human imagination and for there to be a proliferation of meaningless terminological and conceptual distinctions over that hierarchy or range.

Equivalents for diseases and pathogens were therefore sought for the entire range of possible sizes of same, and when these were found it was argued that these and other biological concepts and phenomena have never been properly generalized and unified. The implication was that this has greatly impoverished theoretical, descriptive, and experimental biology, at the same time as it has needlessly complicated the biologist's picture of nature and the teaching of biology.

The division Languages and Semonamology became relevant when words were coined to designate the new or opposite entities (proseases and sosogens). In forming these words attention was called to different actual and potential nuances of meaning, and to the fundamental and combined dimensions, of both the new concepts and the old concepts from which they derived. The existence of the new words made for much quicker and more efficient use of the new concepts. And the exercise of coining the words triggered the discovery of other important concepts of a related nature, while at the same time suggesting new words for those in turn, and etymological bases and rules for making the natural interrelations of the words reflect the set of cognitive interrelations of the phenomena they were meant to denote.

With respect to the ideonomic division Ignorances and Agnology, things not known about or in connection with disease, or related to the negative concept of prosease, were continually sought out, emphasized, or brought to light. Various new avenues of research were suggested in this way.

The organons "Causes, Origins, and Bases of Illusions" and "Genera of Illusions", from the division Illusions and Apatology, aided the drawing up of the large and critically important list of reasons why people may have good diseases without having recognized any such category of disease in the past.

A number of potential implications of the division Extremes and Malistology were explored. Some of the extreme possibilities considered were that contagions might be the major mechanism of evolution, that all so-called taxa of organisms simply represent dynamic equilibria in lateral gene flows (qua contagions), that the bios might simply represent the biggest of all contagions or a self-contagion, that all people or even all animals slowly and continually exchange their symbiotic microflorae and that the recognized forms of human epidemics simply represent the most extreme (fast, conspicuous, disruptive, etc) forms of these background interchanges, that contagious diseases simply represent nature's fastest and most massive migrations (and the migrations of her tiniest organisms), that on the smallest epidemiological scale and range there may be contagions that occur between and within the manifold parts of a single biont, etc.

(2) Anosogens; and pathogenic niches that are quantic and saturable.

No one knows how many different and distinct disease-fighting systems and mechanisms there may be, either in the totality of species or simply in a single species such as man. The dogma has held that in our own species there is but one major system and that, whatever the number of mechanisms serving that system, most are presumably known by now. This presumption seems extremely questionable to an ideonomist (if for no other reason than that the standard concept of disease is obviously much too narrow and simplistic).

Just as there should be a determined effort to define all canonical possibilities for diseases and disease mechanisms, there should be a similar and complementary effort to define all canonical possibilities for means by which bionts and species may fight disease.

One such possibility is that when a species population or subpopulation experiences an epidemic caused by some communicable disease or pathogenic microorganism it may in certain instances have an ability to modify the virulent form of the microorganism so as to produce an avirulent, or more or less benign, variant capable of spreading inside and among the bodies of bionts of that species and of preemptively or substitutionally displacing the virulent form of the pathogen from a finite set of one or a few types of 'pathogenic niches' that are obligately or facultatively occupiable by the pathogen and its variants in the bodies of the bionts or the polymorphs of the species (to produce or not produce the finite and characteristic symptoms, or bad effects, of the disease).

The relatively or absolutely avirulent agent of such a displacive and cancellative counter-contagion or counter-disease[1], regardless of whether it is purposefully engineered by the afflicted species or arises spontaneously within—or even outside—that species, I term an anosogen.

[1] {cf. p. 13}

α: \ənōsəjən\

The word anosogen[α] is coined from the Ancient Greek roots a- (without, not, negative) + nosos (disease, sickness) : or anosos (healthy, sound) : + -gen (one that generates).[1]

[1]: Perhaps a b... neo... here would combine noso- with an antonymous suffix that m... [destroyer, fighter, evicter, etc].

The definition of anosogen should probably be generalized to include the possibility {not only of contagious but of 'non-contagious' forms; and perhaps also of both nucleic (DNA- or RNA-based) and 'non-nucleic' forms} (given the extent of our present biological ignorance).

By "quantic" in the original heading was meant discrete, à la the phenomena of physical quanta, quantum transitions, and quantum numbers (or the discretistic subset or aspects of the latter).

Although presumably the hypothetical "pathogenic niches" should be kept simple and few in type or variability in a given disease, there might not have to be any limit whatever to the number of a given type that exist in a cell, body, or species, since {a biont may be capable of producing or inducing any number of copies and the copies may themselves be capable of procreating self-reproducing copies}.

In recent years evidence has accumulated that such finite pathogenic niches as those imagined do exist and are common.[β] What is not yet clear is how common they are and how important, in both an absolute and relative sense.

β: {1993:} It has now been found that the (apparently benign) HHV-7 virus & the HIV virus use the same site on the CD-4 cell (a critical immune cell and the chief target of the HIV virus); and that HHV-7 blocks entry of the HIV virus into that cell.

We are isolating in organisms more and more cellular receptors. Their variety, range of properties, range of taxons, range of mechanisms, range of ⟨derived or exploitive⟩ systems, range of loci, range of functions, ⟨seriation and systemic complexity⟩, and set of ⟨perturbations and interactions⟩ are found to be greater and greater. We know that these receptors can be blocked or their function ⟨modified or modulated⟩, both artificially and naturally. We are discovering that many diseases act through receptors.

My concept of anosogenic defense has been left qualitative. If it exists at all, then the questions become {how many species make use of it, at what stage and how quickly it comes into play, what its absolute and relative importance is, what diversity of types and mechanisms it may involve, what will demonstrate its existence, and what its potential may be when ultimately included in the medical armamentarium}.

Once again, it may not matter overly much to future medical, agricultural, or ecological technology whether anosogens actually exist in nature in the first place, since it may be possible to create them, and to introduce them into nature, wholly artificially.

'Neutral or asymptomatic disease-like or pathogen-like entities' may ordinarily exist everywhere in the bios, even as a background sea of some sort (bad and good diseases might originate from this sea, through chance or evolution). Negative fluctuations in this sea, or within organisms, may occasionally vacate pathogenic niches en masse that are normally protected by weak or organismally controlled occupancy of the niches, and when this happens it may lead to the sudden opportunistic outbreak of a bad contagion or to some form of noncontagious disease.

Neutral need not mean the same as asymptomatic entities here. Entities that in a net sense are evidently neither bad nor good for the 'pathic' in which they are active may, for this, be termed neutral; but such neutral entities may be of two different types: {'symptomatic neutrals that produce clearly perceptible (gross) changes in the appearance or behavior of their 'pathics', and asymptomatic neutrals that only produce subtle or hidden changes}. That the latter do produce some changes means, of course, that the name I have given them is partly a misnomer.

(3) Antinosogens, antidiseases, and anticontagions.

Pathogens (diseases) often have their own pathogens (diseases). Such pathogens-of-pathogens (or diseases-of-diseases) might be termed pathopathogens (or pathopathoses). At present we have no way of knowing what the number, diversity, complexity, and importance of such entities may be. There may also be pathogens of pathogens of pathogens...; in arbitrarily large, intricate, interdependent, and mysterious : hierarchies, series, networks, matrixes, etc.

Naturally, symbionts and symbioses in general may exhibit comparable complexity.

When a species is afflicted by a disease it may, at least in certain instances, have an ability to counterattack by afflicting some disease upon the disease itself. It might do this in a variety of ways: By creating a modified variant, or a wholly artificial mimic, of the original pathogenic microorganism that subsequently propagates back into the normal population of the latter, causing the original pathogen or disease to malfunction, misbehave, or self-destruct; By encouraging the flourishing of equivalent variants of the pathogen or disease that preexist in nature, so as to have the same effect; Or by afflicting the original pathogen or disease with modified or unmodified natural, or wholly artificial (novel), pathopathogens or pathopathoses, that are homologically or analogically unrelated to the original entity.

As for the idea of encouraging (say by enormously amplifying the numbers of) some natural pathogen of the pathogen, there may be a natural tendency for such pathopathogens to accompany a pathogen in its contagious spread or general movement through nature, or to spring up whenever the pathogen becomes active (perhaps even via some sort of attractive or detective mechanism); which would make the postulated phenomenon easier to imagine.

Pathogens employed by species to fight their pathogens I propose to call **antinosogens** (from the Greek prefix anti-: against, opposed to, opposite in kind to, serving to prevent, cure, or alleviate; combating, destroying; + nosos: disease, sickness; + -gen: one that generates), which are imagined to cause **anticontagions** and other **antidiseases**.[2]

Antinosogens might either act directly on the pathogen, or fight the pathogen indirectly by inducing the pathic's body to 'fight' the pathogen or disease.

Antidiseases might be of several types: intra-organismal or interorganismal : contagions or noncontagions. By "contagions" are meant 'freely' self-reproducing organisms (propagating massively), whereas by "noncontagions" are meant 'source-produced and non-self-reproducing' organisms.

If antinosogens exist or are possible, then once again it can be expected that future medical, agricultural, and ecological technology will produce and release them to benefit civilization.

Do we know of any natural antinosogens?

Perhaps the first example of an antinosogen proper was announced in the 1988 December issue of the journal Science. A virus was reported that extinguished an autoimmune form of diabetes in mice when the latter were infected with the virus in the laboratory. The authors of the article regarded their discovery as revolutionary.

Of course, what was found might not have been an antinosogen but an anosogen; or it might even have been a sosogen enhancing kidney function above what is normal, or would be normal, and thereby relieving symptoms of the underlying disease.

Biologists with whom I discussed the paradoxical virus or putative antinosogen shared with me the view that the discovery probably represented just the tip of an iceberg or the first example of a large class of indirectly beneficial pathogens.

The development and use of antinosogens and antidiseases could empower man to 'fight fire with fire'.

I received the news about the antidiabetic antinosogen with what were inevitably mixed feelings. On the one hand, the discovery confirmed a major prediction of ideonomy about a biological phenomenon that, in 1984, was not known to exist, but that ideonomic reasoning implied would probably one day be found to exist. But on the other hand, it did this prior to the publication of the prediction in this book, thereby robbing ideonomy of a chance to have made a more publicly impressive prediction.

However, the opportunity that was lost cannot be of any real importance if the predictive power of ideonomy is as great as I believe it is, for in the latter case my book should abound in other predictions that will be tested only by what is discovered after the book is published. The present chapter, in particular, should provide the world with many 'tests' of ideonomy's supposedly unique prophetic skills.

Antinosogens might have been conceived of, or their existence predicted, simply on the basis of one principle, to the effect that: If life has evolved a major mechanism to produce a major effect, it is also likely to have developed an opposite mechanism, or form of the original mechanism, or to have exploited the original mechanism: to counter the effect or to produce an opposite effect, and to insure a state of dynamic equilibrium or of universal symmetry.

A simpler principle would be: A mechanism can easily be subverted, or operate or be used in reverse.

(4) Sympathogens.

These are pathogens that can or must act in concert with other pathogens to produce, amplify, or transform a disease or epidemic. Some of these could be analogous to enzymes, say by accelerating a disease process by a factor of a billion or more.

Clearly there could equally well exist what by analogy could be termed syssosogens and synanosogens (respectively, sosogens and anosogens acting in concert with their kind).

Almost certainly pathology already knows about the existence of some sympathogens; the occurrence in nature of sympathogens is overwhelmingly probable.

Sosogens, anosogens, antinosogens, sympathogens, etc all illustrate how thinking about simple but basic concepts, words, and etyma—and the uses, meanings, ambiguities, combinations, modifications, and relationships of same—can lead ideonomically to important new ideas.

After sympathogens have cooperated with one another for a long time (thousands or millions of years, say), their coevolution may naturally lead to their partial or total coalescence, either in the substantial sense of actually exchanging, combining, or fusing their material genes, or in the informational sense that they imitate one another's genes and/or phenes.

This illustrates how modern diseases and their analogs may be the product of countless millions of anastomoses and anastomotic generations that have occurred since life began on Earth.

The Ideonomic Division
IGNORANCES

It must at first seem paradoxical that one could study ignorance: knowledge about ignorance sounds like a contradiction. But the case is a good way to illustrate why there is a place for ideonomy in the world and how the new science works. It can also show how ideonomy is opposed by many glib assumptions.

Few divisions of ideonomy are as important to ideonomy as **IGNORANCES**. Ignorance is the antithesis of knowledge, the advancement of which is a supreme ideonomic goal and one of the field's raisons d'etre. The existence of ignorance is at once an impediment and a lure to the operation of all of ideonomy's divisions: ignorance of themselves, of their potential methods, principles, and elements—and ignorance of the ideas, subjects, problems, and possibilities they would treat—unavoidably impairs the divisions' work; but on the other hand, it gives them work, and represents the very things from whence derives the need and necessity of their existence.

It is significant that the earliest individual cited on the chart "Historical Origins of Ideonomy" is Nicholas of Cusa (1401-1464), who celebrated "learned ignorance"—knowledge of ignorance—as being the highest form of knowledge. To know what one does not know, to know what one might know, is the beginning of wisdom. To know the extent of what one knows—its limits and defects—is to know it better, and to know oneself better—which is also to know it better, for self-knowledge is the purest form of knowledge and it amplifies all other knowledge.

The relationship of knowledge to ignorance is that of figure to ground: the latter define the former and provide the contrast absent which they could have neither interest nor meaning. And vice versa, for they are contrapletes.

Ignorance poisons all knowledge and thought. It tolerates a premature complacency and is the source of illusions as dangerous as they are ridiculous. It compresses consciousness and breeds carelessness. It reduces the intelligence and judgment of mankind. It discourages the very process of inquiry that it makes urgent.

If ignorance is so wicked, and half its wickedness is our ignorance of it, then perhaps we should undertake to discover the full extent of our ignorance—to survey, catalog, and describe its range and variations, its human anatomy, if you will.

What are the ways in which we might do this?

EXHUMING IGNORANCE

We might ask ourselves what we don't know and write it down. We might ask our friends. We might search through books and journals—peruse the world's libraries—to determine the extent and character of what is known and the limits thereof, and to note what has evidently been omitted or neglected, or gone unconsidered, or been left unexplored.

We might be more ambitious and go out into the world to interrogate specialists and the leading authorities within all existing fields. We might simply ask them to tell us what they realize they don't know or what they surmise is unknown to the earth. Or we might play a more active role by asking specific questions, posing problems, or making use of queries specially designed to expose types, components, levels, or measures of personal or communal ignorance.

"The Ideonomic Division IGNORANCES AND AGNOLOGY";

"CHAPTER STRUCTURE"
(Sequence of Subsections)

1. Introductory remarks.
2. Exhuming ignorance.
3. Reasons for studying ignorance.
4. Subfields.
5. Related subdivisions.
6. Organons.
7. Divisional terms.
8. Ways to treat.
9. Dimensions of ignorance.
10. Ignorance scaled.
11. Ignorance spaces.
12. Sources, causes, and bases.
13. Genera.
14. Interrelations of genera.
15. Past ignorance.
16. Panoramic examples.
17. Comparative ignorance.
18. Concentrations of ignorance.
19. Biological ignorance; 'Life', 'disease', 'the brain'.
20. Ignorance dendrograms.
21. Sub-ignorance.
22. Ignorance regarding a specific thing.
23. What do we not know about the Milky Way galaxy?
24. Ignorance about man (Homo sapiens).
25. Homothematic ignorance; 'The smallest things'.
26. Complex ignorance.
27. Converging ignorances.
28. Divergent consequences of a bit of ignorance.
29. Ignorance chains, sequences, and series.
30. Compound, multiplicative, and exponential ignorance.
31. Commutations, loops, and networks of ignorance.
32. Foliations, levels, and hierarchies.
33. Repliant hypotheses.
34. Illustrative costs and dangers.
35. Concluding remarks and summary.

"A TABLE OF 21 'REASONS FOR STUDYING IGNORANCE'"

1. Recognize and remove or mitigate BLIND SPOTS due to ignorance.
2. Ascertain CAUSES, bases, and sources of ignorance.
3. CLASSIFY ignorance in all possible ways, and discover new and all possible types and taxa.
4. DERIVE forms of IGNORANCE FROM other forms of IGNORANCE; map past ignorance upon present, present ignorance upon future.
5. Reduce ERRORS and misconceptions that stem from ignorance.
6. EXPAND one's MIND and appreciations.
7. Discover possible FORMS OF KNOWLEDGE.
8. Find out relative IMPORTANCE OF DIFFERENT examples of ignorance.
9. Maximally INTERRELATE GENERAL AND SPECIFIC ignorance.
10. LESSEN DAMAGE ignorance does or can do (its general costs).
11. Learn LIMITS and defects OF KNOWLEDGE.
12. Learn about ONESELF (one's PERSONAL knowledge, ignorance, and possibilities).
13. Plan, systematize, and ORGANIZE future ELIMINATION of all forms and degrees of ignorance.
14. Identify ignorance's PATTERNS, laws, relationships, and transformations.
15. PERFECT the DESCRIPTION of ignorance; more completely describe what is not known about particular things or things in general; make description of ignorance finite, definite, specific, and quantitative.
16. PREPARE today's generation FOR FUTURE.
17. Characterize RELATIVE EXTENT and nature of our ignorance of particular or general things.
18. Increase SPEED AND EFFICIENCY with which ignorance can be curtailed.
19. Uncover WAYS and means TO REMOVE ignorance.
20. Discover WHAT is DISCOVERABLE or what may yet be discovered.
21. Understand more nearly or completely WHAT IT MEANS TO KNOW something or to possess knowledge.

We might involve the experts themselves in this interrogation of experts. Systematic methods for the revelation and characterization of ignorance might be developed, implemented, and refined. The structure of possible and actual ignorance and knowledge in one area or discipline might be generalized, or formulated in such a way that it could be used elsewhere or universally as a questionary that would quickly, efficiently, and comprehensively bring to light the architecture of ignorance in each case.

Indeed, such a device might be refined and transformed into a veritable predictive instrument.

This elaborate inquiry into man's ignorance might even go so far as to supplement the above with original scientific experiments aimed at testing the authenticity of knowledge, the worth of expert opinion, and the predictive power of existing theories, and designed especially to discover the limits and defects of the latter, or where and how they fail.

In this sequence of suggestions as to how we might go about learning what man does not know, we have unwittingly advanced into the realm of ideonomic methodology.

But why is it important to study ignorance? Apart from the rather general and abstract philosophical considerations with which the start of this chapter is appointed, are there reasons and arguments of a stronger and more specific sort that might be mentioned? Of what value or use could such research be? What could a student of ignorance expect —or what might he seek—to accomplish?

REASONS FOR STUDYING IGNORANCE

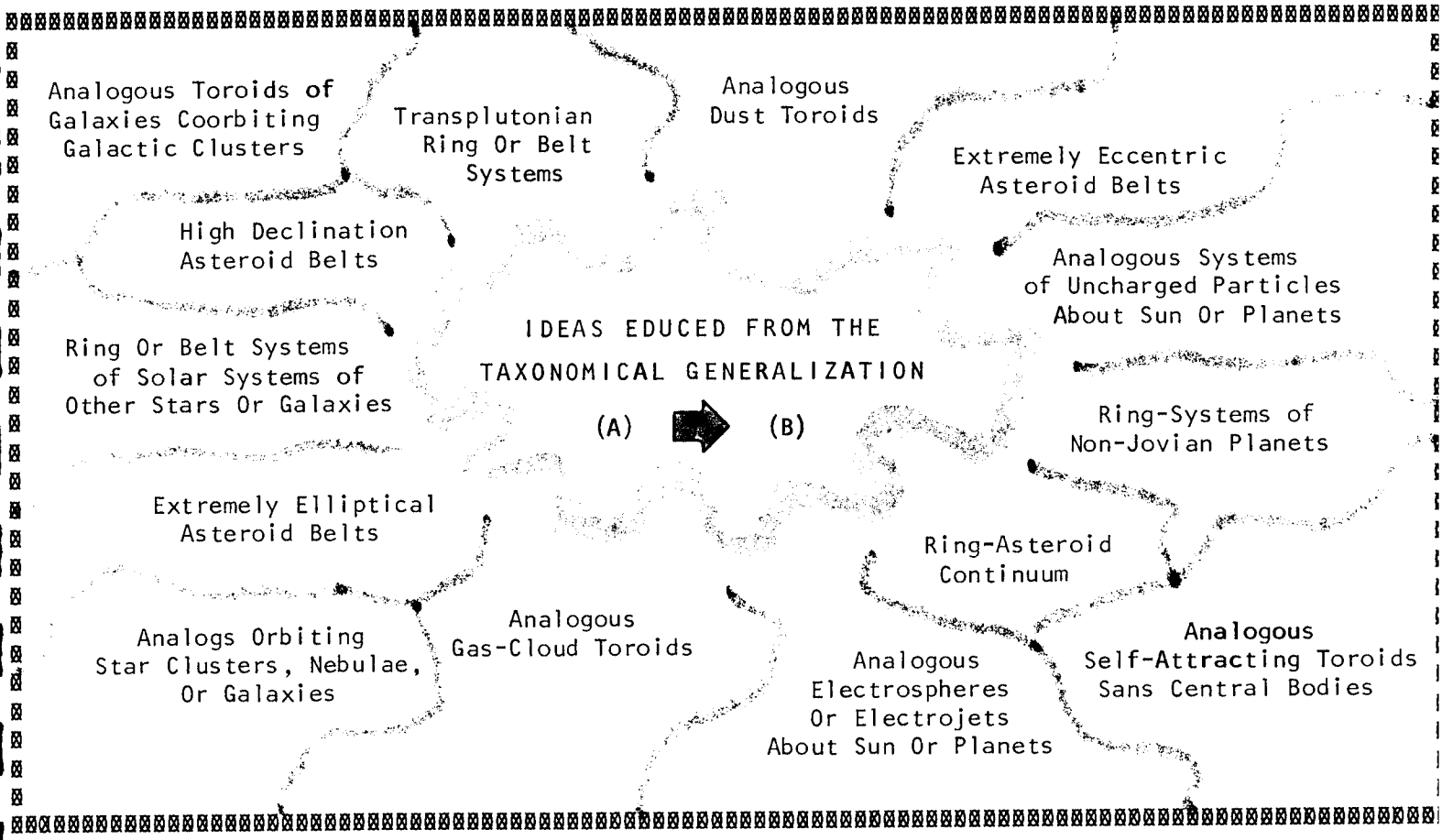
Please refer to "A Table of 21 'Reasons For Studying Ignorance'".

At the time of writing the physics community has begun to look actively into the possibility that the structure of physical space comprises many more dimensions than the conventional three. Ignorance of the existence, or simply of the possibility, of such higher dimensions could represent a blind spot of a larger nature by precluding the proper—or any—perception of many diverse—and especially many anomalous—physical phenomena whose existence would make no sense, or be absolutely meaningless, in the absence of the added dimensions. So ONE MOTIVE for considering what our ignorance could be is that we may thereby recognize, remove, or mitigate scientific, intellectual, or personal blind spots that spring from ignorance.

The irony often is that the blind spots—though considerable in their magnitude and consequences, and of great age—vanish instantly when seen for what they are, and appear obvious or absurd in retrospect.

ANOTHER REASON for studying ignorance is to acquire knowledge as to its causes, bases, and sources, knowledge that can be progressively generalized, and made use of in a variety of ways. Simply knowing that a certain source, or kind, of ignorance exists can lead one to the discovery and investigation of other general and specific ignorance that flows from, or partly depends on, that source or that kind of ignorance.

The cause, basis, and source of ignorance may be distinct, in certain cases, and yet at the same time interdependent in the sense that knowledge of one leads to, or is necessary for, knowledge of the others.


Analogous Toroids of Galaxies Coorbiting Galactic Clusters
Transplutonian Ring Or Belt Systems
Analogous Dust Toroids
Extremely Eccentric Asteroid Belts
High Declination Asteroid Belts
Analogous Systems of Uncharged Particles About Sun Or Planets
IDEAS EDUCED FROM THE TAXONOMICAL GENERALIZATION
(A)
(B)
Ring Or Belt Systems of Solar Systems of Other Stars Or Galaxies
Ring-Systems of Non-Jovian Planets
Extremely Elliptical Asteroid Belts
Ring-Asteroid Continuum
Analogous Gas-Cloud Toroids
Analogs Orbiting Star Clusters, Nebulae, Or Galaxies
Analogous Electrospheres Or Electrojets About Sun Or Planets
Analogous Self-Attracting Toroids Sans Central Bodies

Extinguishing an element of ignorance does not debar the original cause of that ignorance from being a source of new ignorance in the future. But accompanying knowledge of the existence, nature, and generality of the cause—or of its antidote—might have this greater benefit.

Eventually the identification of the types-of-causes-of-ignorance, in a given instance, should serve to coidentify, or at least to suggest, complementary ways of eliminating the ignorance that exists, or even help with the positive characterization of the missing knowledge itself.

A THIRD REASON to study ignorance is so that one can classify it and discover all of its possible types and taxa. When this has been done it will be possible to see that what had been assumed to be different and unrelated forms of ignorance in different fields and concerned with different phenomena, were actually a vastly smaller number of surprisingly similar and related, but endlessly recurring, types of ignorance belonging to but a single absolutely unifiable and universal taxonomy.

Statistical studies should reveal that when types and taxa of ignorance occur together in various specific combinations this tends to have predictive consequences: the simultaneous but undiscovered occurrence of other forms of ignorance, the compresence of certain relationships, processes, and phenomena, the applicability of certain devices and materials for the acquisition of knowledge and removal of ignorance, and the relevance of certain generic reasons for why the elimination of the ignorance may be important.

Let us say that we set out to classify ignorance in science. We find it advantageous to proceed in steps. First we divide science into subsciences and then subdivide these in turn. We recognize astronomy in this way and then solar-system astronomy. Perhaps we then go on to break the fields up into the objects they represent, first the objectival genera and then the objectival individuals. At this point we focus once again upon our original concern, which was scientific ignorance.

Let the asteroid belt-system between Mars and Jupiter and the ring-systems of the jovian planets be two things that were resolved through our analysis. If we look at them with the general classification of ignorance in mind, what ideas result? Perhaps we take note of the similarity between the two types of systems of multitudinous relative micro-bodies coorbiting a relative mega-body. The coincidence of their compresence within our solar system strikes us as suggestive, and this prompts us to generalize the taxonomy of scientific ignorance we are building thus:

(A) HISTORICALLY RESOLVED IGNORANCE OF THE EXISTENCE OF DIFFERENT SYSTEMS OF MULTITUDINOUS RELATIVE MICROBODIES COORBITING A RELATIVE MEGABODY IN THE SOLAR SYSTEM;

(B) PAST, PRESENT, AND FUTURE GENERIC IGNORANCE OF THE FULL NUMBER AND DIVERSITY OF SYSTEMS IDENTICAL OR DEVOLVINGLY ANALOGOUS THERETO IN THE SOLAR SYSTEM OR EXTERNAL UNIVERSE.

A simple generalization of the possibilities of ignorance in this way can be powerfully ideogenic or heuristic (SEE CHART).

Among the many ideas educible from the above taxonomical generalization of astronomical ignorance are: (1) The idea that even non-jovian planets may have ring-systems is triggered or reinforced by such reflections as: the reason why there are jovian ring-systems not yet being known, it cannot be used as an argument against non-jovian systems; no minimum density or

mass for possible ring-systems has yet been defined or discovered; rings may in principle orbit a body at any declination relative to its self-rotational plane; ring-systems of jovian planets other than Saturn were discovered only recently; advances in solar-system astronomy have had to await successive advances in instrumentation; and present observational thresholds for the detection of possible non-jovian systems still remain very high.

(2) Asteroid belts could exist tilted at any angle to the ecliptic plane of the solar system; (3) Asteroid belts hidden by extreme ellipticity or eccentricity could exist; (4) Transplutonian asteroid belt- or ring-systems could exist (a survey of ignorance about the solar system would also remind us of this by noting our ignorance of the latter's diameter within three orders of magnitude); (5) If we are ignorant of the full number and full diversity of such systems as imagined, the natural tendency of "full number" to generalize even further to "any number", and (6) of "full diversity" to bridge the phenomenological gap between "asteroid-like" and "ring-like" systems, suggests that the number and/or diversity of these systems may actually be less even than that of which we now (acclaimedly) "know".

(7) The idea that analogous dust or gas clouds, perhaps in toroidal systems, might orbit the sun or planets, or (8) of analogous systems of charged or uncharged particles (e.g. electrospheres or electrojets); (9) The possible diversity of ring-systems and asteroid belts elsewhere in our galaxy or universe; (10) Analogs thereof orbiting or otherwise linked to objects larger than stars, such as star clusters, nebulae, or galaxies; (11) Analogs representing belts or rings of multitudinous galaxies in orbit around galactic clusters; (12) Toroids of any size of objects of any size anywhere in the universe, not held together rotationally by being bound to a central object but rather by self-attraction.

A FOURTH REASON to study ignorance is so that one may derive forms of ignorance from one another, or map them onto one another in progressive and highly suggestive ways. Thus brain neurons are extraordinary body cells in terms of their length, vergent branching, connectivity, energy, reactivity, proteanness, individuality, and plasticity, and we are greatly ignorant of the reasons, causes, and laws of these things. It is likely, however, that the neurons are merely displaying exaggerated, extreme, concentrated, narrowed, or generalized forms of the properties that are common to all of the body's cells, and perhaps the future evolutionary patterns of the latter as well; they may also be manifesting essential traits and processes that are hidden in these cells. Hence ignorance of the neurons may be insightfully mapped onto recognized and unrecognized ignorance, or possibilities of ignorance, of all types of cells in all man's tissues and organs; whereat it may redefine, generalize, and interconnect old ignorance, knowledge, and ideas, and have synergistic and reciprocal benefits. This cross mapping and derivation of ignorance may be extended to diseased cells and cells in the ill, for it is particularly with these cells that neurons often seem to have so much in common. The superficially redundant reference to "diseased cells" was deliberate: single cells, cells as the equivalent of bionts, may—all unsuspected by modern medicine—have their very own diseases and ills, on a level and of a nature entirely divorced from the 'macro-diseases' of human tissues and organs; and if this micropathology, this literal cytopathology, exists, as a brilliant addition to the atlas of human ignorance, then it, too, may signal a dual need and opportunity for the reciprocal mapping, derivation, and generalization of cellular ignorance, knowledge, and thought.

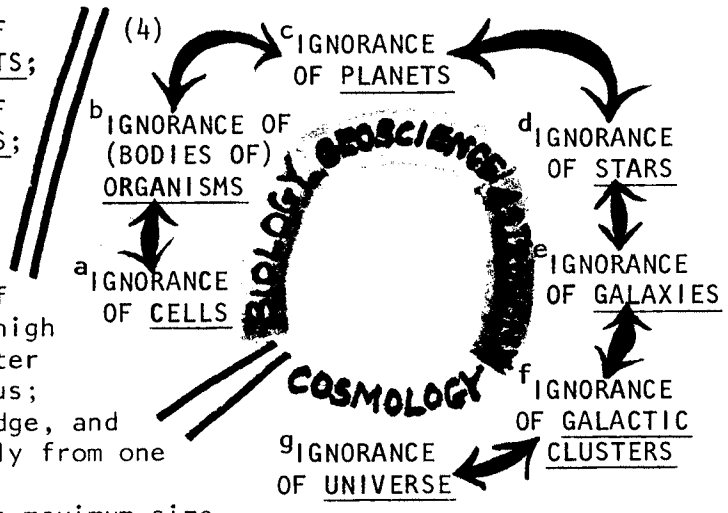
Three ideonomic principles are that a method that has been extended successfully should be extended further, that the reasons why human beings hesitate to make advances in what they do and in the way they think should all be made explicit, and that possibilities should be subjected to mental reductiones ad absurdum. Accordingly, since a major source of hesitation in extending ignorance about neurons to ignorance of other cells of the body was the relative conservativeness of the latter, we might wish to extend categories of ignorance even further, by exploring analogies between the cells of animals—neurons in particular—and the incomparably more placid cells of plants.

The following diagrams may suggest other ways in which it might prove profitable to attempt to reciprocally derive and generalize supposedly different and unrelated forms of ignorance about phenomena of different types, levels, or subjects:

(1) IGNORANCE OF EARTH ⇄ IGNORANCE OF OTHER PLANETS;

(2) IGNORANCE OF SUN ⇄ IGNORANCE OF OTHER STARS;

(3) IGNORANCE OF MILKY WAY ⇄ IGNORANCE OF OTHER GALAXIES;



We are ignorant of the cause of counterrotations and anomalously high temperatures that occur in the outer atmospheres of both earth and Venus; here [vide (1)] ignorance, knowledge, and future discoveries may map usefully from one to the other, or reciprocally.

Our ignorance [vide (2)] of the maximum size sunspots may attain maps onto identical ignorance in the case of other stars; but there are a trillion stars in the galaxy, offering analogs of our sun over its life-span and at intervals of days, so we might explore ignorance of the greatest possible sunspots by exploring ignorance of biggest actual spots of stars first.

A surprising number of different forms of energy in the Milky Way [vide (3)] have about the same energy-density: a coincidence not yet explained. The latter ignorance fathers the thought that we may wish to investigate the possibility of our being ignorant of the existence in some other galaxies of even greater agreement among these energy-densities; and that discovery of the nonexistence of such would also be important.

The elaborate hypothetical chain of reciprocally derivable and generalizable ignorance represented by (4) in the diagram is more challenging and potentially interesting, in part because ignorance is imagined as mappable over drastic changes of scale (length changes of as much as or more than 31 orders of magnitude ≡ 103 octaves) and among four different (and three almost unrelated) sciences! How might the chain be instantiated?

One very simple way is by referring to categories of ignorance that simultaneously apply to all seven (a-g) nodes of the chain. Turbulence, for example, is an important phenomenon at all the nodes (levels), and at all of them its fundamental causes, or mathematical bases, are unknown, since a general theory of turbulence remains to this day one of the great unsolved —and profoundly consequential—problems of science. Indeed we would be

well-advised to wonder what the possible unknown nature and manifestations of 'turbulence' occurring at each of the levels might imply about turbulence at each of the others; it is obviously a very transitive problem. Not only might explanation of turbulence at one level clarify turbulence in general or at the others, but separate explanations of the peculiarities of turbulent phenomena at each of the levels might turn out to be synergistic, and supplemental to the general explanation arrived at unilaterally.

In addition to turbulence, as a category of seven-level ignorance, one could mention cycles, anomalous phenomena, electricity, and boundaries and boundary conditions. These I leave to my readers to explore, apart from a few comments I will make on cycles.

At every level—from cells to stars to the universe as a whole—man is ignorant about the possible richness of the cycles that occur, and about the possible existence, causation, and consequences of harmonic, continuum-like, series-like, and/or concatenated relationships within their spectrums. Existence or nonexistence of high spectral density at just one level, if demonstrated, would imply similar existence or nonexistence at all the other levels: which illustrates the possible mapping of ignorance between and among all seven levels.

Of course chains of mappings of ignorance between the seven levels need not be homogeneous: common benefits may result even if the mappings between all levels or pairs of levels are different, disparate, or seemingly orthogonal, wholly unrelated, or contradictory.

More radically, it need not be the type of ignorance found or postulated at one level that is actually mapped onto the next level; instead, it may be the implications—even very indirect implications—of that ignorance that are mapped; or the causal consequences, or whatever.

Likewise the ignorance mapped backwards or reciprocally need not be the same, even where the result that interests us is a generalization of different forms of ignorance.

A FIFTH REASON to study ignorance is so that one may curtail errors and misconceptions that stem from it. Ignorance of the existence in nature of microscopic organisms—especially ones of micron dimensions or less—perpetuated the misconception that life springs and springs continuously from inanimate nature, and erroneous treatments of disease founded upon this catastrophic misconception.

Similarly, recent challenges to the dogma that the genetic control of all life on earth flows only in lineages that branch but never anastomose would suggest that there may be a corollary error in the gratuitous assumption that in the future it will be possible to banish in toto the hereditary defects of mankind, or of agricultural species, by the mere identification and control, or surgical removal, of the pathogenic genes and polymorphisms of lineages: since lateral gene flow might perpetually reintroduce pathogenic genes. This conjecture could have important implications for the future formulation of policies that are to guide biomedical research.

A SIXTH MOTIVATION for studying ignorance is to expand one's mind and appreciations. This is not as trivial or unimportant as it might sound. Civilization itself constantly falls in a rut and needs to be revitalized by the goad of new and bothersome thoughts and possibilities; it is not that the old ways and knowledge have lost their inherent power to transform and advance the world, but that through their excessive familiarity they are no longer able to excite mankind to achieve great things.

There is something shocking in the revelation of one's ignorance. More shocking, in a way, than the discovery of positive knowledge—which relaxes the mind with an awareness of finality, with the sudden reduction of infinite complexity to a mere, even tawdry singularity.

If a man was given paradise he might find it boring; but if merely told of its existence, he might find it an inspiration.

Yet a SEVENTH REASON for studying ignorance is to discover the possible forms of knowledge. Might nature contain forms of organization of the mathematics of which we are entirely ignorant? Fractals (scale invariance), holographic patterns (the holonomical group), chaos theory, solitons, catastrophe theory, and cellular automata are all recent examples of things that would appear to indicate that this is in fact the case, and that there may be many—even indefinitely many—undiscovered forms of organization and mathematics within the fabric of physicomental reality.

The important thing to note about the examples given is that their discovery has the power to transform the very way we think, to rework our ideas in general, and to create entirely new forms of knowledge. Not just knowledge but the very bases—and the universal bases—of knowledge can turn out to be wrong, defective, or insufficient, can be added to and evolve.

We are ignorant—theoretically and/or empirically—of the evolutionary homologies, bases, and origins of diseases, of their abstract and evolutionary transformations, of the complete range of their symptoms, of their fundamental causes, etc; not only are we ignorant, in a simple sense, but we are ignorant of the full possibilities of our ignorance. The primary result of this ignorance is a foreclosure of countless potential and necessary forms of knowledge of disease—and hence a severe reduction of our fundamental ability to think about, imagine, and recognize diseases. We are also made unable to test our ideas, insofar as such testing requires appropriate knowledge of the forms of knowledge.

An EIGHTH REASON to study ignorance is to find out the IMPORTANCE OF DIFFERENT examples of ignorance; or, more elaborately, to [research, specify, and work out the various possible ⟨interests and consequences⟩ of] the {[absolute and relative] [intrinsic and extrinsic] [general and specialized] [independent and interdependent]} [importance and unimportance] of {[different and diverse] [related and unrelated] [known and possible]} [relata, elements, dimensions, examples, types, and taxa] of ignorance.

DIFFERENT EXAMPLES OF IGNORANCE MAY VARIOUSLY BE IMPORTANT TO:

1. Oneself;
2. Understanding other ignorance;
3. Assessing what the state of ignorance is;
4. Removing annoying hitches to scientific or intellectual progress;
5. Narrow topic or immediate matter;
6. Entire science or subject;
7. Science or human understanding or interest in general, or to clarifying physico-mental reality or deep philosophic questions;
8. Civilization's welfare, conduct, or progress;
9. Constructing a general taxonomy or theory of ignorance;
10. Ideonomy's long-term purposes or needs;
11. A passing application of ideonomy.

One ignorance may be more important than another because its elimination would help answer more questions; or else, solve a few fundamental problems; or, contribute more to the sheer quantity, diversity, or range of human knowledge.

It could be argued that knowing the age of the universe would be more important than knowing the amount and distribution of antimatter in the universe, since the first issue is more universal, fundamental, unique, simple, consequential, investigable, testable, near to being resolved, tied in with current cosmological theory, restricted by and discriminatory of different theories and hypotheses, or the like. On the other hand, it might be argued that it is ignorance and knowledge of the second issue that is, or might be, more important; on the grounds that: the first issue is old hat and continued preoccupation with it can only sap the vigor and impede the mysteriously essential variegation of scientific thought, the age of the cosmos is already pretty well-known whereas the amount and distribution of its antimatter is poorly known at best, the cosmological problem of missing antimatter is apt to outlast the problem of the age of the universe, and hidden antimatter may conceivably abound and play a major role in astronomy.

Ignorance of the existence of any teleological infrastructure of the universe and cosmology could be more important than either of the above, if such teleology is real (since ignorance can be pseudo-important), and if it is not of some trivial type (of marginal teleology, lacking major cosmological consequences, or tautological). It might turn out that we men do a grave injustice to the whole concept of "purpose" when we think of it as necessarily an artificial, biological, or psychological phenomenon that requires intelligence, planning, or design, rather than being able to operate, and perhaps 'having' to operate, by pure and simple physical mechanisms that, though ubiquitous in nature, may have gone entirely unnoticed because of human blindness to the underlying principles. Cosmological teleology of this sort could be, and be only, important in a sense.

As for the eleven alternative bases of the importance of ignorance that were suggested above, consider a single example of biological ignorance: our ignorance of the basis of smell. The list referred to began with the possible importance of (the existence or knowledge of) ignorance to oneself. The basis of smell may be such that a class of odors are detected and only detected unconsciously; perhaps parts of the brain are concerned with olfaction of a type or degree that is inferior or ulterior to consciousness, at least in the usual sense, and that receive and respond to 'smells never thought of' in 'ways never imagined' for 'purposes unseen'.

What I have just postulated has, in fact, recently been discovered. It has been found that the axillary sweat of men evidently contains at least one sexual pheromone, for when a group of women were exposed to an extract of this sweat thrice weekly for two months—an extract which they could not consciously smell—their menstrual cycles became more regular. Probably what has been discovered is only the tip of an iceberg; one would expect under the circumstances that there are also woman-to-man pheromones, for example, of the effects of which we are ignorant, in a primary, secondary, and tertiary way (or at once 'meta-ignorant, super-ignorant, and ignorant', in the special agnological vocabulary that will be given its debut later in the chapter).

This example makes it clear that ignorance of smell's basis may be important to oneself: [1]The opposite sex may be influencing one's behavior and sexual capacity (the pheromone was reported to reduce sterility, too); [2]A future commercial product might reduce women's dependence upon, and hence involvement with, men; [3]One's brain may be responding in an unknown variety of ways, and to an unknown degree, to biogenic and abiogenic odors of unknown number, variety, and importance—individually and overall; [4]There may be

environmental qualities, and bad and good features, that are only 'smelled' beyond a threshold of months, but which then convey important information; [5]There may be parts of one's mind that operate and only operate on time scales of months or greater; and [6]The other senses may have analogous unconscious and instinctual perceptions and responses.

These examples also illustrate how ignorance of the sense of smell, and hence ignorance in general, may be important to the next three items on the list of eleven alternative bases of the importance of ignorance: understanding other ignorance; assessing what the state of ignorance is; and removing hitches to scientific and intellectual progress.

A 'hitch to be removed' could be the immemorial scientific presupposition that man's sensorium is merely a unified, conscious, and aboveboard entity operating in real-time; the new discoveries about smell imply that this may have been a misconception that arrested the progress of science and kept it from making a multitude of discoveries of a widely divergent nature.

Ignorance of smell's basis may be important to a narrow topic or immediate matter in senses that can also be illustrated by the case of the pheromone, for the discovery of the latter may imply many important things about the 'narrow topic or immediate matter' of olfaction in general: that the known receptors may be incomplete and not all used, or used wholly or in understood ways, for the conscious part of olfaction; that sensory stimuli may be diachronically assimilated, and progressively integrated, over indefinitely long intervals of time; that immediate and conscious reactions of organisms are insufficient means for investigating olfaction; and that the evolution of the senses may in a certain sense have been irreducibly guided by the state of the organism as a whole and by the whole of an organism's lifetime.

The pheromone findings may, in fact, be used to illustrate the importance of ignorance to each of the things named by the remaining six items of the list.

Thus they illustrate how a random example of ignorance (ignorance of smell) may be important to:

An entire science or subject: neuropsychology, by suggesting slow, unconscious, deterministic, and psychosomatic dimensions to the brain and mind; and biology, by suggesting the possible occurrence of extremely slow, cumulative, indirect, and subtle informational and regulatory processes;

Science or human understanding or interest in general...: by implying the neglected importance of extremely slow and diachronic phenomena (and observations!), the resurrectability of determinism at extremes, etc;

Civilization's welfare, conduct, or progress: by having multifold implications for the actual, possible, and proper biosociology of the human race;

Constructing a general taxonomy or theory of ignorance: e.g. by suggesting the need for a universal taxon of ignorance re extremely slow and delayed phenomena;

Ideonomy's long-term purposes and needs: by suggesting the applicability and possible mode of application of ideonomy to general sensory theory and research;

And a passing application of ideonomy, finally, ipso facto.

To continue with the list of twenty-one reasons for studying ignorance, a NINTH REASON for such study is that one may maximally interrelate general with specific ignorance.

I will illustrate it by returning to the fascinating subject of man's ignorance of disease, and by discussing specifically his ignorance about the causation of same:

(A) GENERAL IGNORANCE: Ignorance of Causes of Diseases In General;  (B) SPECIFIC IGNORANCE: Ignorance of Causes of Specific Diseases: e.g. cancer.

[1]It would be important, in this case, to say which ignorance possibilia concerning the causes in general of disease in general do and do not apply to the causation of specific diseases, such as cancer; and to explicate and argue those known or postulated applications. Likewise it would be appropriate to show the applicability of the first to the specific causes of diseases in general, and of specific diseases.

A fanciful example of this could be: discussion or demonstration of the possibility that, or ways in which, "general ignorance of forms of feedback in general as 'cause' of diseases in general" might be applicable to "specific ignorance, or forms of ignorance, of oncogenes in the genesis of cancer, or in the causation or control of specific forms or aspects of cancer". Perhaps disinhibition or disruption of normal modes of negative feedback—known or postulated to play a widespread role in pathogenesis—would constitute a general area of knowledge or inquiry applicable to the specific case of oncogenes.

[2]On the other hand, it would be important to use ignorance about a specific disease such as cancer to 'mine' for typological elements of ignorance worth adding to the existing set of general forms of ignorance about disease. Spontaneous remissions—and the boundaries and metastatic timing—of tumors are all puzzling phenomena that could help to define and classify our ignorance of diseases in general.

[3]It would also be important to investigate how different elements of the set of ignorances of diseases in general are [modulated, sub-differentiated, reexpressed, interrelated, etc] when they are used in a specific case, such as that of the causes of cancer.

[4]It would be important to determine which sets of many different types of general ignorance about disease simultaneously apply to or 'project' any single specific ignorance or ignorance about any single specific disease (à la polygenism, wherein many genes simultaneously contribute to or modulate each or any phene)—and to determine how they do so.

[5]It would also be important to learn the opposite: how a single generic or else general ignorance simultaneously 'projects' many species of or specific ignorance (à la pleiotropy, where each or any gene simultaneously contributes to or gives rise to many different phenes).

[6]Going beyond the third point, it would be valuable to discover how all possible successive examples of specific ignorance, and of species of ignorance, about the causes of diseases progressively [clarify, and add specific concrete and abstract elements of character and meaning to,] those genera with which they are interrelated.

It should be added, in passing, that general and specific ignorance alike are in reality multilevel; indeed, they are also multipolar, and embracive of many different hierarchies.

A TENTH REASON to study ignorance is to reduce the damage it does or can do—its general costs and dangers, if you will.

Ignorance is, among other things, a source of inefficiency and a cause of poor planning. It can lead to the taking of unnecessary risks, to the launching of undertakings that are fundamentally misconceived and even altogether worthless. Ignorance infecting initial assumptions can lead to perpetual and growing errors that long remain undetected and unimagined. Unnecessary ignorance continually masks major and massive possibilities for scientific discoveries and technological breakthroughs that are latent in existing knowledge. The injuries done by ignorance are nearly, and possibly truly, inexhaustible.

Yet the risks and costs are reducible, even without any actual elimination of the ignorance. Very often it suffices for the ignorance to become known, or for its risks and costs to become known. This minimal knowledge may lead to aversive, corrective, or compensatory planning, to new or wiser tactics, strategies, or goals, or to other critical reforms and initiatives.

To learn the limits and defects of knowledge is an ELEVENTH REASON to study ignorance. And among the possible reasons for this reason, or for learning the limits and defects of knowledge, are:

[1]To make one's ignorance more explicit, vivid, or conscious—or knowledge of it more active;

[2]To acquire meta-knowledge or to discover what knowledge is not (to learn, for example, that to know one thing is not necessarily to know another thing —that one ordinarily thinks of as equivalent, or as inseparable from knowledge or ignorance of the first);

[3]So that one can generalize such limits and defects of knowledge as become known to others that remain unknown or that are equivalents or corollaries.

WAYS TO TREAT IGNORANCE

There are many different ways in which one can treat forms and examples of ignorance. Students of ideonomy should know and master these alternative approaches—and ubiquitous concerns. Overreliance on just one or a few approaches can ossify and dull thought and almost catastrophically reduce intellectual flexibility.

On various occasions it will be appropriate to treat ignorance via several approaches, combined, ordered, and interrelated in certain a priori or experimentally determined ways.

Different forms of ignorance, different circumstances of ignorance, different needs in treating ignorance, concomitant attention to certain other ideonomic divisions, can all call for different ways of treating ignorance. There is no limit to what one can learn about these possibilities and to the skill that might be acquired in handling them.

Let us consider individually the approaches listed in the "Table of 34 'Ways To Treat Ignorance'" (the reader is asked to examine this table in advance).

(1) ANALOGIZE IGNORANCE: What are the ways in which ignorance of one thing may be like knowledge of another thing, in which a genus of ignorance may be like—or unlike—another genus of same, in which species, elements, or dimensions of ignorance may resemble other same, in which causes or effects of ignorance may be similar, in which cases of ignorance may have 'analogy' simply because the phenomena to which they refer happen to have something in common, in which ignorances may have in common that they happen—or require—to be treated in the same way, in which ignorance of a thing may be like some other ideonomic aspect of the thing (or the thing treated by some other ideonomic division), etc?

Ignorance of ending, for example, bears analogy to ignorance of beginning, inasmuch as both: are temporal, are terminal, may be singular, may be vergent, may be symmetric (in direct or reversed order, in structure, in chiral or helical arrangement, in composition, e/vc), bound the existence of an entity, involve the increase and/or decrease of quantities, may repeatedly follow one another in time (ending may directly precede beginning, beginning may directly follow ending, etc), relate to the whole of an entity, etc.

These and other generic bases of analogies between generic beginnings and endings can be used to suggest interesting analogies and complexes of analogies between the beginnings and endings of arbitrary specific things, such as stars, genes, bionts, clouds, societies, or waterfalls; and counterexamples here will have their own interest. Thus the ending of one generation of star is often the beginning of another, through recycling of the material; the question arises whether clouds begin and/or end via vergence or instead scalar (ubiquitous) condensation and dissipation; also whether genes succeeding one another linearly on a genome have or lack pleiotropic traces, as a rule; also whether helical motions initiated in water parcels, strands, or braids at the beginning of a waterfall display some tendency to reverse chiral sign at the ending of the waterfall or in the plunge pool or its outflow; etc.

Findings here can be generalized via multivariate analysis, multidimensional scaling, and ideonomy's other standard methods, giving rise to increasingly organized, empirical, intercorrelated, order-specific, and useful idea spaces of both specific and general nature.

"A TABLE OF 34 'WAYS TO TREAT IGNORANCE'"

1. Analogize (IT).
2. Analyze.
3. Categorize or classify.
4. Circumvent.
5. Collect or survey.
6. Conceptualize.
7. Concretize or empiricize.
8. Condition or functionalize (i.e. depict as function of something else).
9. Confirm or document.
10. Define or precise.
11. Describe.
12. Detail.
13. Differentiate or compare.
14. Discover or describe origin.
15. Evaluate or criticize.
16. Formalize, axiomatize, or logicize.
17. Generalize.
18. Give variations of.
19. Illustrate or 'maximally instantiate'.
20. Interpolate.
21. Investigate.
22. Limit or circumscribe.
23. Mitigate consequences, costs, or risks.
24. 'Multidimensionalize'.
25. Operationalize (its circumstances or consequences).
26. Plan research into or extinction of.
27. Publish or communicate.
28. Quantify.
29. Redefine or diversely characterize.
30. Reduce or extinguish.
31. Situate, or describe its context.
32. Structure.
33. Subdivide.
34. Teach.

PAST IGNORANCE

What types of ignorance, and what specific ignorance, flourished in the past? Of what ignorance now known to exist did we know in the past? What past ignorance has and has not been cleared up subsequently? What ignorance preceded present knowledge?

Of what were we once ignorant in various sciences, or about various phenomena, relationships, laws, causes, effects, entities, realms, processes, etc?

Why is it important to study, discuss, know, describe, etc historical ignorance?

"Reasons For Studying Past Ignorance"

1. Abstractable complexes of past ignorance may be reapplicable to the future;
2. Present and future ignorance may mimic past ignorance;
3. Timeless genera and species of ignorance may be identified;
4. Persisting or immortal bases of ignorance may be uncovered;
5. Obsolete or diminishing examples, forms, bases, sources, etc of ignorance may be discovered;
6. New or increasing examples, forms, bases, relata, realms, etc of ignorance may be noted;
7. Transformations, sequences, series, networks, hierarchies, etc of ignorance may be discovered;
8. Seemingly or supposedly disparate or unrelated ignorances may reveal themselves to in fact be analogous, homologous, related, etc;
9. Causes, effects, or solutions of or to past ignorance may suggest the same for present ignorance;
10. Possibilities for things and knowledge associated, in theory or fact, with past ignorance may—directly or upon transformation or generalization—remain applicable to the present or future;
11. Past ignorance supposedly extinguished by subsequent advances in knowledge may in reality abide in the present, perhaps for being more refractory, complex, or subtle than assumed;
12. The sociological, psychological, or cultural bases of past or continuing ignorance may come to light;
13. The immediate and broad importance of any ignorance may be highlighted;
14. Errors in present-day science, or human knowledge or conduct, tied to past ignorance may be revealed or implied;
15. The fundamental meaning and possibilities of knowledge—and hence of ignorance—may remain unknown, and be clarified by investigations of past ignorance.

"GENERAL IGNORANCE OF DISEASE"

TO BE READ: "Ignorance of..."

1. [BIOTIC (biopathogenic) VS. ABIOTIC (abiopathogenic)] [forms and CAUSES] of diseases, or the general ratios thereof.
2. DISEASES OF [DISEASES (and perhaps, ...of diseases...)] and INTERACTIONS [interferences, competitions, synergisms, interdependences, coevolutions, etc] of diseases in their 'hosts'.
3. The EVOLUTIONARY—or larger, fundamental, or complex—FUNCTION [past and present] of disease.
4. The extent of the ANONTOLOGY of diseases (i.e. to which abstractly possible diseases do not exist); and which [diseases, syndromes, symptoms, and pathogens] 'could' exist but do not.
5. The extent of the [TRANSSPECIFICITY AND TRANSTAXONICITY] of (the compossible [hosts or vectors] of given) diseases.
6. The extent of the [secular or other] VARIABILITY OF VIRULENCE of identical diseases; and the extent to which this variability is [intrinsic or extrinsic] to the pathogen.
7. The EXTENT to which disease is genetic (HEREDITARY); and the [number and diversity] of hereditary diseases.
8. The extent to which [evolutionary and polymorphismic] [and 'improvements'] of diseases are [(predetermined) (aleatory)].
9. The EXTENT to which panhuman disease is or is not REALLY CONTROLLABLE over the long term.
10. The extent to which the [reduction or extinction] of successive diseases may hypothetically create a VACUUM INTO WHICH OTHER DISEASES then automatically STEP.
11. The [EXTENT, and maximal extent,] to which the OVERALL HEALTH OF SPECIES FLUCTUATES over [secular and geological] time.
12. The FASTEST [developing, 'infecting', or propagating] diseases.
13. The FULL extent of [interspecific (BETWEEN-HOST-SPECIES) and pan-specific (among-all-host-species)] VARIATION of diseases.
14. The full extent of [LATENT diseases or unexpressed pathogens] (say in man).
15. The full EXTENT to which ORGANISMS (e.g. men or plants) are VECTORS for pathogens.
16. IDIOPATHOLOGY: the full variation of given diseases [in and between] individuals, and the possible extent of 'idiodiseases' [peculiar and limited] to bionts.
17. The LARGEST CONTAGIONS: in [space and time] or in [density of pathogens, saturation of host population, longevity, etc].
18. The long-term (secular) 'global' [STABILITY AND INSTABILITY] of diseases.
19. The MAXIMAL VARIABILITY (diversity) OF GIVEN diseases.

(CONT.)

(CONTINUATION OF TABLE)

20. The MOST COMPLEX disease of all: e.g. the most [broadly, multiply, diversely, polymorphously, proteanly, intricately, subtly, superstructurally, holistically, substructurally, hierarchically, arborescently, plexurally, networkly, anastomotically, circuitally or cybernetically, self-interactingly, vergently, order-taxonomically, "chaotically", rigorously, mathematically, logically, tessellationally, group-theoretically, morphodynamically, morphogenetically, ontodynamically, progressionally, paradoxically, ideonomically, combinatorially, plenistically, mogologically, &vc] symptomatic.
21. The MOST SPECIFIC disease of all: e.g. the most [narrowly, uniquely, delomorphously, invariantly, simply, unsubtly, &vc] symptomatic.
22. The PALEOEVOLUTION and paleontology of diseases (PALEODISEASES).
23. The PERPETUAL ORIGIN (wellspring) of diseases: e.g. host population, plants, bacteria (for viruses, etc), larger microorganisms, the sea, tropical rain forests, tropical beetles, or outer space.
24. The SLOWEST [developing, 'infecting', or propagating] diseases.
25. The [STRANGEST or most anomalous] diseases; and the [MOST EXTREME] diseases and extreme-most dimensions of diseases].
26. SUBCLINICAL [diseases and symptoms]; the pathological [background and 'continuum']; whether the normal—everyone—has diseases at every instant of time; and the absolutely minimal [types, degrees, and senses] of diseases.
27. The universal TAXONOMY of diseases; the [smallest and largest] taxonomic differences; and the highest taxons.
28. The [total and 'pan-temporal'] worldwide geographic (PLANETARY) FLOWS of diseases.
29. Total [DISEASE-FIGHTING and disease-resisting] mechanisms (in man or all species).
30. WHERE diseases are 'STORED' when inactive; the reservoirs [whence they come and to which they return].
31. Whether diseases engage in any sort of [protective or offensive] [CAMOUFLAGE OR MIMICRY] (incl. mimicry of [model, receiver, or mimic]); and if so, the [extent, and gamut of ways,] in which they do so.
32. Whether INDIVIDUAL CELLS have their OWN diseases.
33. Whether there are a [FINITE OR INFINITE] NUMBER of possible (occurable) types of disease.
34. Whether there are so-called "PATHOGENIC (pathological) NICHES".
35. Whether there are 'negative' (BENEFICIAL) [DISEASES or pathogens ("anosogens")]; and if so, whether these [equal or exceed] in abundance the accepted, 'bad' [diseases and pathogens].
36. WHETHER ('bad') diseases are REALLY BAD, in the 'net' (to [individuals, the species, or the bios]); or the [control or elimination] of diseases [is or would be] really 'good'.
37. [Whether, or the extent to which,] there are NEUTRAL (innocuous commensal) ANALOGS of [pathogens and anosogens].

IGNORANCE ABOUT DISEASE

Modern medicine and biology know much and yet they are not all-wise. Indeed, relative to what could and should be known about the central phenomenon of medical biology - disease - what is actually known is pitifully little. A visitor from the twenty-fifth century would no doubt allude in a shocked and contemptuous way to the totality of our ignorance and the splendor of our myths and illusions.

But if we are to recognize the extent of our pathological ignorance we must first identify the basic categories of that ignorance - the most important, fundamental, and universal things that we do not or may not know at the present time about the nature, behavior, and possibilities of disease - in man or other forms of life.

A preliminary inventory of these things will be found in the accompanying list, "General Ignorance of Disease". Let us discuss its entries, which have been alphabetized by their key words (in upper case).

(1) Ignorance of {BIOTIC (bio-pathogenic) VS. ABIOTIC (abio-pathogenic)} (forms and CAUSES) of diseases, or of the general ratios thereof: Of course all of the items in the list can encompass many things, even disparate and unrelated things. The full treatment of this list can only be an ongoing scholarly endeavor.

To what extent does disease originate within the organism and to what degree from the physical environment? What portion of diseases arise from the actions, effects, and passive roles of other organisms, and how much of the debilitation characteristic of particular diseases is to be blamed upon the latter?

How free of disease would we be if we lived in a physically perfect world? Or if Earth were stripped of every pathogenic organism?

What is the contribution of chance to disease?

How many diseases presuppose for their occurrence a combination of biotic and abiotic events or agencies? How many diseases have both biotic and abiotic origins or forms?

(2) Ignorance of DISEASES OF {DISEASES (and perhaps ...of diseases...)} - and of INTERACTIONS {interferences, competitions, synergisms, interdependences, coevolutions, etc} of diseases in their 'hosts': A fact little known to the complaintive public is that diseases or pathogenic organisms themselves suffer from diseases and the ravages of other organisms. Scientists themselves have neglected the subject, and yet what an opportunity it affords for the control and elimination of disease in the future, by fighting fire with fire or for distracting the Grim Reaper with devils and maladies of his own!

Some epidemics may even arise from imbalances between biological pathogens and their pathogens, or from the outcomes of perpetual battles among diseases.

The ecological hazards that mankind faces in the years ahead may include the potential release of contagions from the constraint of other diseases, where certain organisms are deliberately or inadvertently, and either directly or indirectly, deracinated.

It is not inconceivable that species populations suffering an epidemic caused by some microorganism are able to generate and release pathogens to that pathogen, or an 'anti-epidemic', so that there is a basic type of disease-fighting mechanism that biologists have yet to discover. The possibilities here would include the modification of the original microorganism to make it antagonistic to itself or to the original, the changing and use of some other pathogenic organism in the environment (say by altering, triggering, or adding to its genes), or even something like the biogenesis of a suitable novel organism (or of an unstable quasi-organism).

When civilization at last begins to modify the fundamental microorganismal composition and structure of the Earth, and hence perturbs the ancient planetary hierarchy of diseases of diseases, might that risk the release of a previously inhibited reservoir of unknown diseases and disease organisms?

Might diseases of diseases have played an important role in the past evolution of life on Earth? Which leads us to the next item on the list...

(3) Ignorance of the EVOLUTIONARY—or larger, fundamental, or complex —FUNCTION (past and present) of disease: Here "function" could refer to an inadvertent role of disease in the evolutionary process, which might nonetheless have been tremendously important, but it could also refer to the very raison d'etre of disease, to the reason it was created or encouraged in the first place, to the major way in which it was evolved, or to the highest role it now plays in the largely mysterious operation of the bios.

Do diseases maintain a designed balance among Earth's species, populations, and communities of organisms, or serve the continued working out of some optimal or at least common evolutionary course? Do they compensate cosmic, geological, or chance perturbations? Could they conceivably be vehicles used by other organisms in their unceasing mutual warfare and competition?

Might a species use them to accelerate its own evolution or to maintain the vigor and integrity—or possibly the diversity—of its population? Might disease be a self-tuning mechanism used by life at all of its spatial, temporal, and qualitative levels?

Are diseases interadaptative processes among organisms?

Do diseases maximize the resilience or flexibility, or even the evolutionary fluidity, of life? Do they promote some useful rotation of species, say à la crop rotation in farming?

Are contagious diseases a 'language' whereby all organisms on Earth are able to communicate with one another more quickly and efficiently? Do they exist to enable lateral gene flows between all taxa? Are they simply mass migrations of the tiniest organisms?

Are they a device developed by the bios to prevent evolutionary stasis?

Are they turbulence arising from life's smallest scale or an opposite dissipation of largest-scale biological order or events?

Are they actually some sort of 'commerce' among different organisms or species?

Are they discontinuous, earthquake-like adjustments in the course of otherwise continuous, smooth, and regular biological evolution? Miniature evolutionary "catastrophes", or mild hyperdimensional changes of phase or state?

(4) Ignorance of the ANONTOLOGY of disease - e.g. of (diseases, syndromes, symptoms, or pathogens) (possible or impossible) that do not exist or of what such things are not: One way to learn what things are or encompass is by discovering and enumerating the things they are not or do not allow.

Are diseases strangely absent or rare in certain regions, climates, or environments?

Should rhinoviruses have certain forms, properties, or effects that they do not appear to have?

Are certain bionts, organs, tissues, cells, genes, physiological systems or functions, or the like inexplicably free of or resistant to disease or dysfunction? Or certain species or higher taxa? How incomprehensive are those bodily parts and systems that are affected by diseases; are they a majority or a small minority?

What generic mechanisms of disease can be imagined that do not appear to find exemplification in nature?

What past or primordial types or families of diseases or disease symptoms are now extinct? Might there have been wholly different disease regimes (worldwide collections of diseases) in former times, say because of the extremity of drift and evolution of disease over geological time?

(5) Ignorance of the extent of the (TRANS-SPECIFICITY AND TRANS-TAXONICITY) of - the compossible (hosts or vectors) of given - diseases: By trans-specificity and trans-taxonicity is meant "transmissibility (of a disease) by or to other or diverse species or higher taxons of organisms."

Such ignorance may be either known or hidden (say by an illusion of knowledge).

The range and limits of the transmissibility of many contagious diseases are supposed to be known, and yet illusions may obtain, at least about certain important aspects of a situation: e.g. where related species appear to be absolutely incapable of being infected by or of carrying pathogens, the reality may be that they are only that in a relative, temporary, or partial sense. Perhaps transmission is slow or delayed, to an arbitrary degree, is limited to small subpopulations of the species, or occurs unconventionally, with modes or signs that are unfamiliar or subtle. Who knows but that over evolutionary time pathogenic organisms radically change and exchange their hosts and vectors, or even drift comprehensively over the very length and breadth of the bios (with all of its taxa)?

Certainly we are consciously ignorant of the possible range of transmission of a number of diseases, not only between conspecific and congeneric organisms but between creatures as taxologically distinct as plants and animals. Conceivably people share a few diseases with weeds, or weeds are the occasional vectors for some human diseases, say ones produced by certain slow viruses, viroids, or other known or unknown types of organisms or quasi-organisms.

If the barriers to the transmission of diseases between species are not absolute, then the biological anomaly of the 'unnatural' population size ubiquity, self-interaction, and arrested natural selection of modern man - caused by technological progress - may risk making our singularly conspicuous species the convergent target of a vast number of diseases adaptively transmitted from Earth's more than 10,000,000 species.

EXAMPLES AND SOURCES OF BEAUTY

The MDS data used to produce the idea maps that will be discussed in this section were generated by means of the Triadic Method. A set of forty-six polar ideas ("diverse examples or sources of beauty") were intuitively and holistically characterized on the basis of a recurrent set of fifty virtually intra-set scaling dimensions and via 2,300 binary decisions (46 polar "examples or sources of beauty" × 50 recurrent scaling dyads = 2,300 decisions involving 4,600 monadic choices).

The scaling dimensions are described as "virtually intra-set" for two reasons. First, although the poles were usually drawn from the larger set of dyadized monads, the truncated nature of the exercise left some of the latter unpoled and hence unmapped. Second, a handful of poles that are not represented in the scaling-dyad set were chosen from a table titled "141 Examples and Sources of Beauty". (The former table, listing all of the fifty scaling dyads, as well as the latter table are reproduced here as figures ____ and ____.)

FIG. 5 2

The scaling dyads and their monads were effectively chosen at random, but the poled and mapped items were selected mainly for interest and irredundancy (although the culling was rather crude).

The original 141-item table was simply a product of my own mind. I did my best to think of things that could serve as maximally diverse and far-ranging and minimally redundant examples of beauty or of things that for human beings are sources of beauty. I continued to add to the table until I essentially ran out of ideas, which is to say, until the new ideas I had were of things that upon analysis proved to be mainly aesthetic variants of the old, either in a generic (higher-level) or specific (lower-level) sense. It only made sense for me to stop there, for it was not my purpose to scour reality and imagination for all possible instances of the different types and divergent sources of beauty.

Instead the idea was that the cases tabulated would suggest by their implicit matrix of mutual interrelations and implications the present spectrum of human aesthetic feelings. Which, however, should by no means be read as an assertion that the preliminary and probably somewhat personal table is free of internal redundancy or perfect in any other way. The only realistic way to check the table in these respects would be by attempting to define, categorize, cluster, group, classify, hierarchize, condense, justify, and complete its contents.

The important thing to emphasize about the table is that, despite its comprehensive ambitions, it is only in the end a listing of particular examples and sources of beauty, rather than an identification or naming of abstract types or taxons of beauty. At best it is the necessary preliminary that should subsequently enable the preparation of such a nomothetic, typological, and taxological scheme (and of a suitable table representing it).

It is hard, in fact it is impossible, to know at the outset whether the beauties of human progress and an industrious ant colony, or of athletic competition and cooperative endeavor generically, are largely the same or largely different or merely related aesthetically; or whether they should be represented as being such in some interpretive scheme that does or does not pretend to be fundamental, universal, and ultimate.

Actually the cartographic techniques I am about to describe could play a major role in helping us to answer such questions or confront such problems.

46 (of 141) Examples and Sources of BEAUTY.

Analogousness.

Triadic Method: 50 virtually intra-set scaling dyads (2,300 dec).

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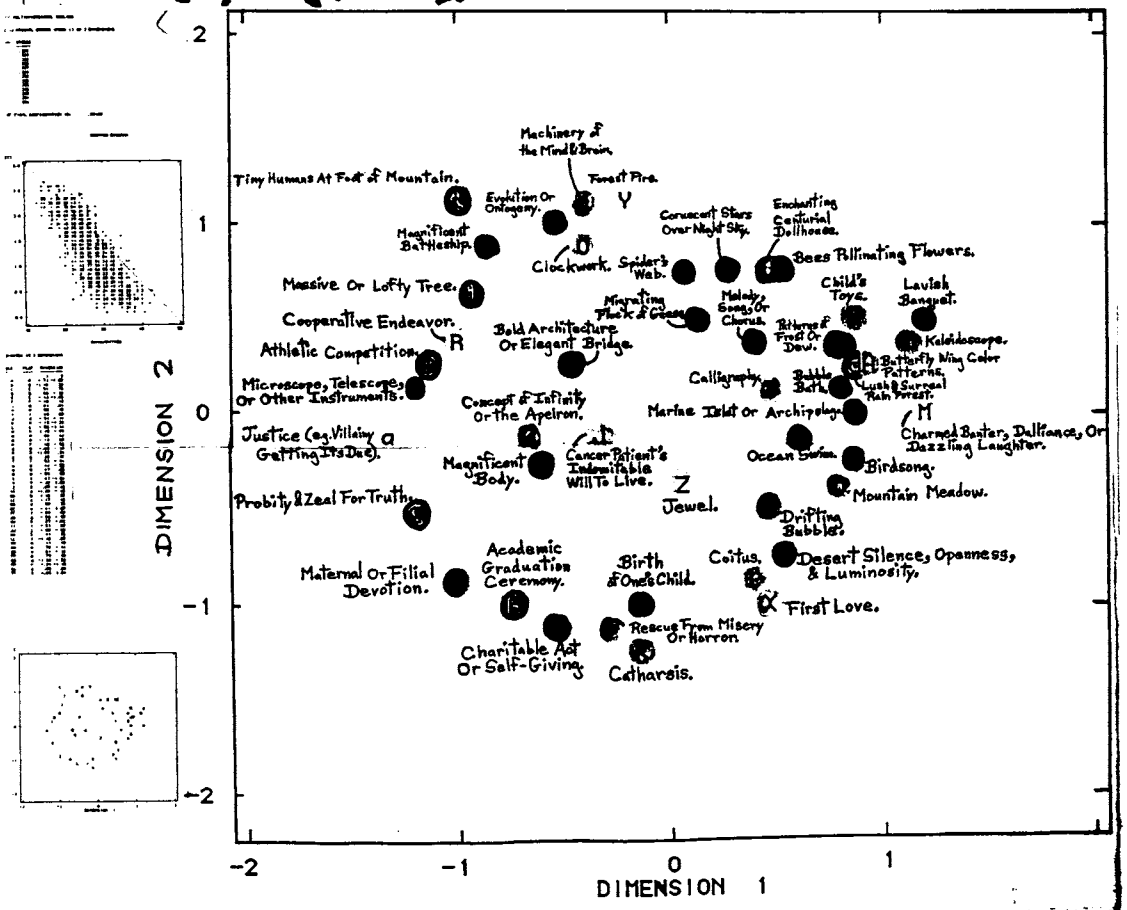
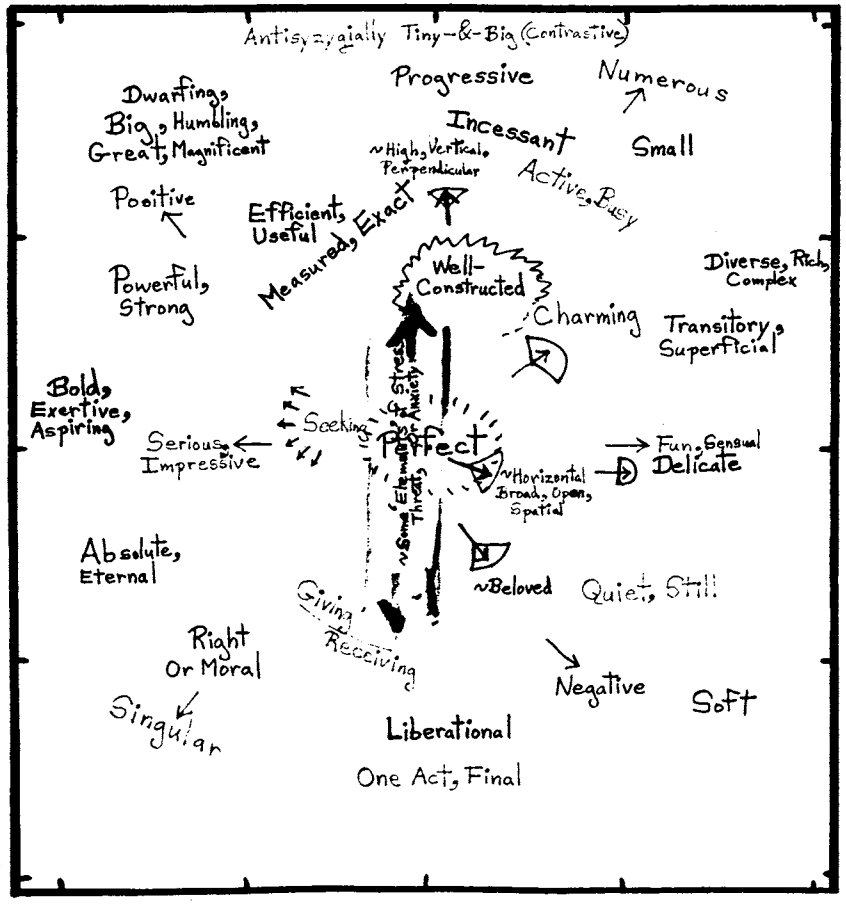


Various [Regions, Directions, Poles] Visibly Or Conjecturably [Present, Emergent, Or Confused] In Primary Plot:

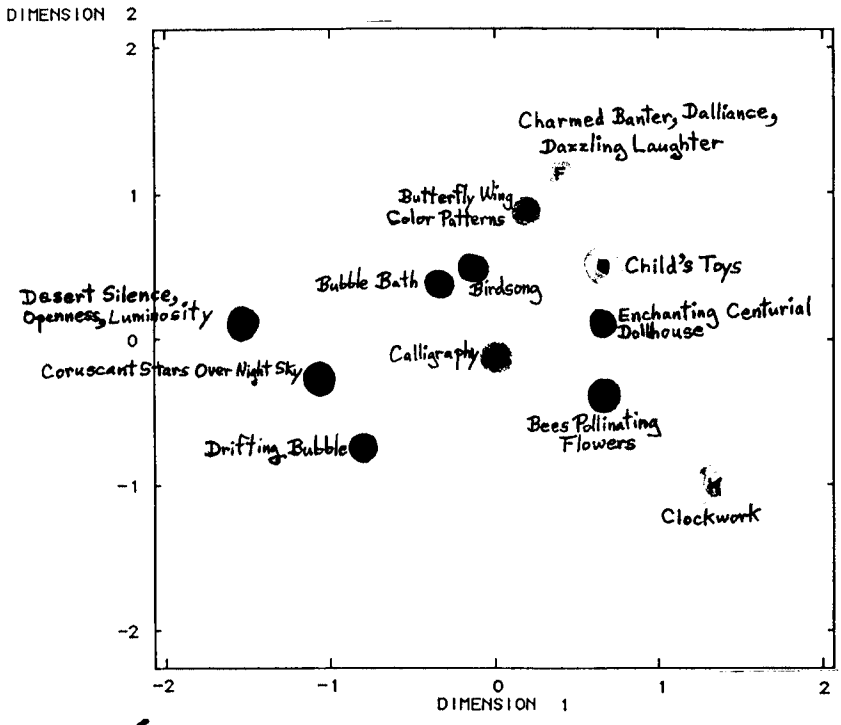


Analytic Regions Countermap

"MUTUAL ANALOGOUSNESS OF 12, THEN 6, AND THEN ONLY 3 'DELICACY-RELATED BEAUTIES'"

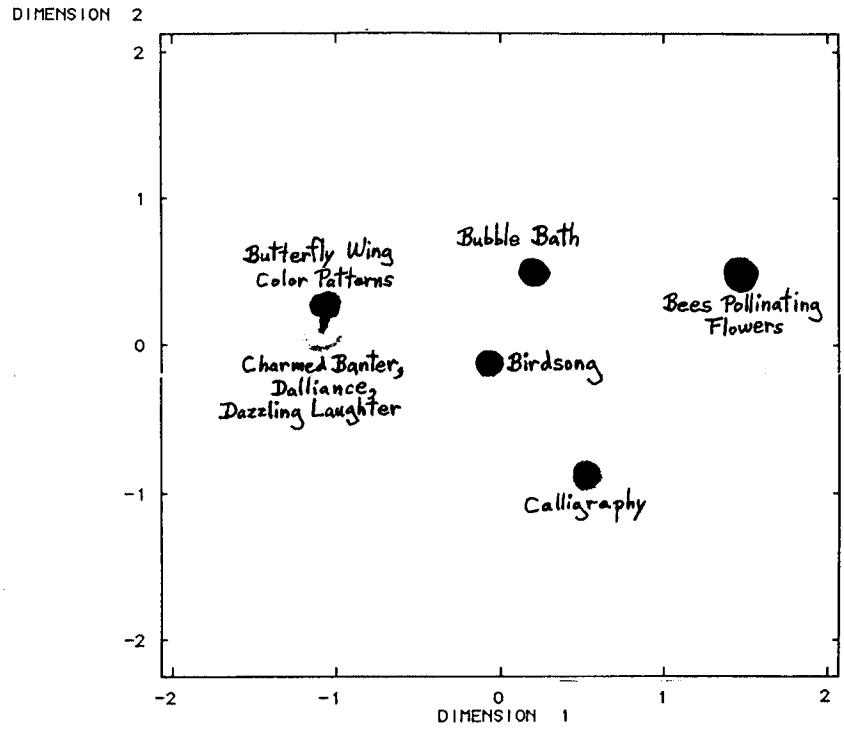
MDS Maps Showing the Effect of Successive Halvings of the Original Set of 24

TWELVE DELICACY-RELATED BEAUTIES:



1/2

SIX DELICACY-RELATED BEAUTIES:



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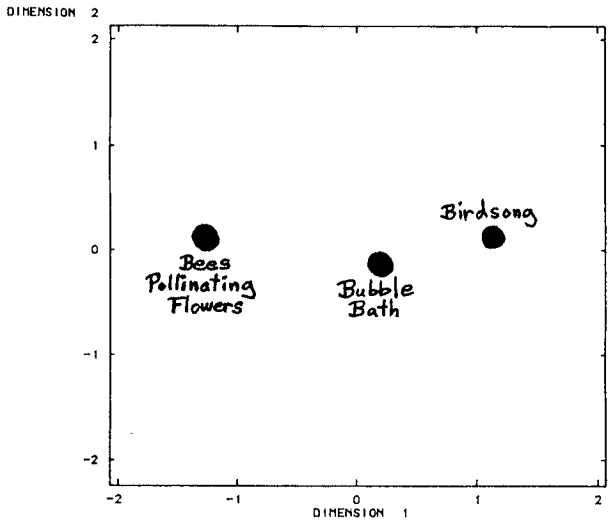
THREE DELICACY-RELATED BEAUTIES:



"MUTUAL ANALOGOUSNESS OF 24 'DELICACY-RELATED BEAUTIES'"

Speculative Dot-Structures In the Twenty Co-Plots of Dimensionality 2 - 5

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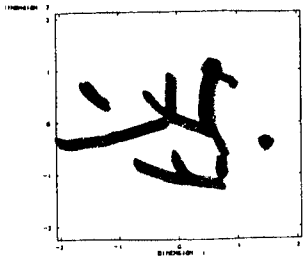

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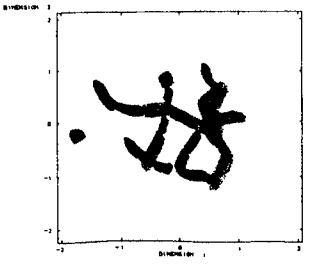

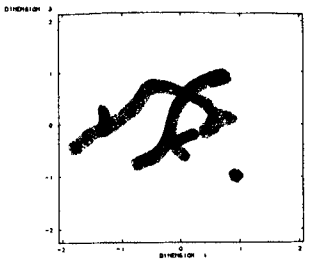

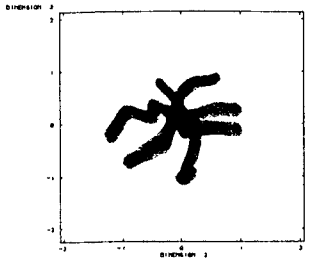

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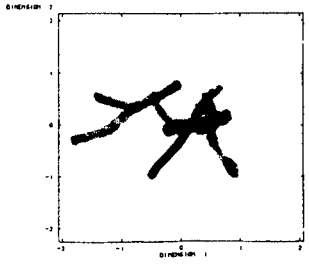

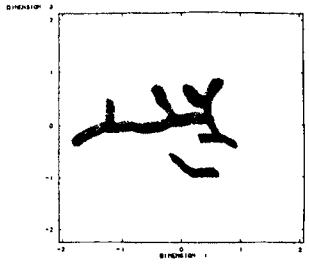

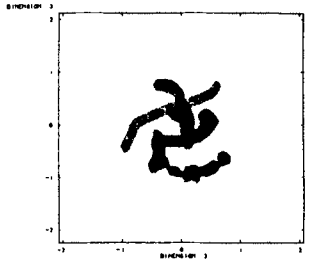

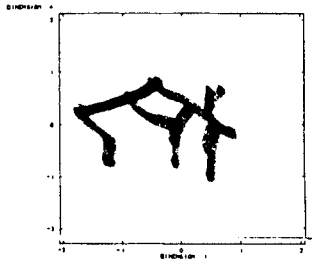

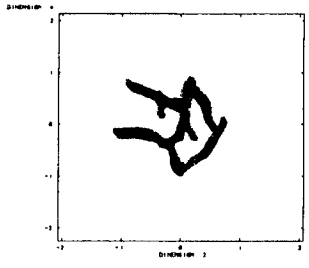

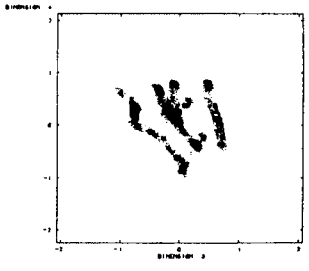

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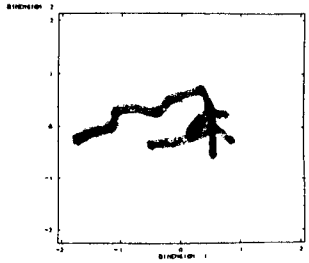
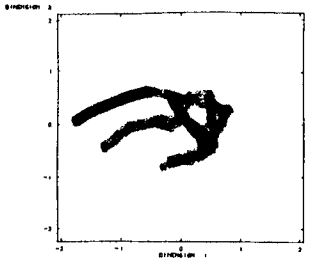
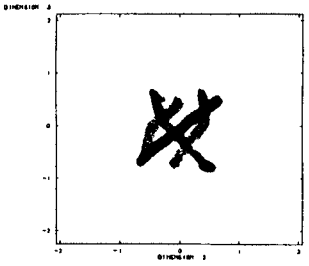
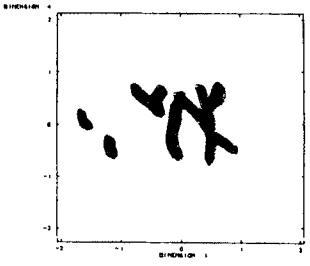
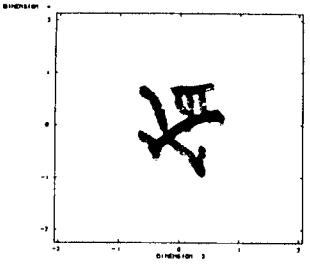
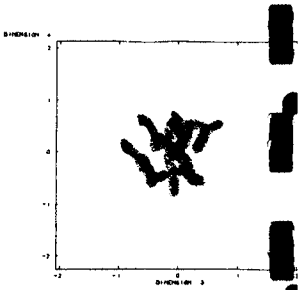


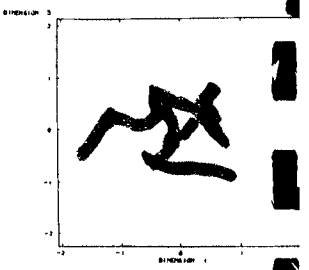


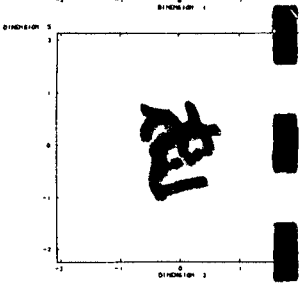


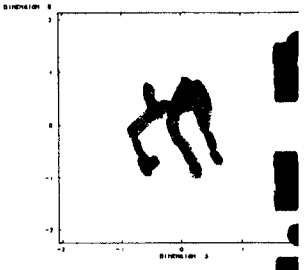


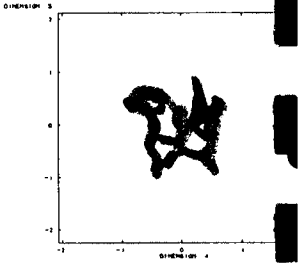


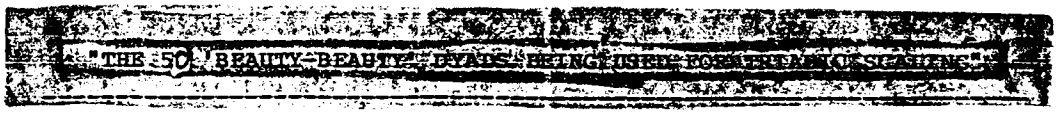












Academic graduation ceremony	Wonderfully fortuitous event
Acquisition of first home	Wedding
Apocalyptic psychostasia	Waterfall, river rapids, or freshet
Athletic competition	Vista from mountain top or canyon rim
Attractive voice	Visionary statemanship or sea-green incorruptible
Aurora	Victory in war
Beatitude (consummate bliss)	Unity of natural laws
Bees' pollinating flowers	Unflagging loyalty of spouse
Biological evolution or ontogeny	Twilight mystery
Birdsong	Tragic love
Birth of one's child	Tiny humans at foot of mountain
Bold architecture or elegant bridge	Time-lapse film of sky, anthesis, or child's growth
Brilliant attire	Supreme amical moment or act
Bubble bath	Sudden unexpected resolution of crisis
Butterfly wing color patterns	Sublime wickedness
Calligraphy	Sublime dream
Cancer patient's indomitable will to live	Springtime
Catharsis	Spaceship launch
Cavern decorated with speleothems	Snowfall
Charitable act or self-giving	Skyful of soaring thunderheads
Charmed banter, dalliance, or dazzling laughter	Skydiving or gliding
Child's toys	Singular humility or simplicity
Coitus	Sights and aroma of meal being prepared
Concept of infinity or Apeiron	Seashore (surf, immense beach, or towering cliff)
Cooperative endeavor	Saintly kindness
Coral reef	Rose
Coruscant stars across night sky	Revelatory insight or epiphany
Cosmos-atom size ratio (mental juxtaposition)	Reunion with childhood friend
Jewel	Industrious ant colony
Jupiter's surface or Saturn's ring system	Individual or panhuman wisdom
Justice, or villainy receiving its due	Impressionist painting
Lavish banquet	Hydrologic cycle
Lush and surreal rain forest	Human progress
Machinery of the mind and brain	Human ideals
Magnificent battleship	Harp's sound
Magnificent body (figure or physique)	Handsome face
Marine islet or archipelago	Glorious pageantry or pomp
Massive or lofty tree	Glamorous scientific laboratory
Maternal or filial devotion	Geometric proof
Melody, song, or chorus	General prosperity
Meteor shower or radiant, or spectacular comet	Forest fire
Microscope, telescope, or other instruments	Foreign travel
Old-age reminiscence and reverie	Exuberant elfin child
Palatial estate	Extraordinary wealth or good fortune
Patterns of frost or dew	Epic interpersonal tableau (eg diplomatic)
Personal grace or magnanimity	Elevatory metanoia
Probity and zeal for truth	Drifting bubble
Profound metaphor	Dramatic chess > game, position, or tactic
Rainbow or green flash	Destiny or time's river
Rescue from misery or horror	Democratic processes

FIG 3 In figure ____ is shown the two-dimensional mapping of the MDS consequences of those 2,300 decisions I made about the forty-six examples or sources of beauties (hereafter I will simply refer to these elliptically as "beauties").

FIG 3 In figure ____ I present the **analytic regions countermap** that I constructed after I spent some time trying to make sense of the primary map. As it indicates, it depicts various regions, directions, poles, concepts, etc that are visibly or conjecturably present, emerged, or confused in the plot that the computer calculated and rendered.

Perhaps it seems a bit odd that I should later find it to be necessary to confront the consequences of my own data in this way, or to explain to myself what a graphical representation of that data means or could mean. But is it really so odd?

One often notes one's reactions to things without properly, or at all, understanding those reactions. This is true even when the reactions are sophisticated, descriptive, and confident.

The beauty of **nonmetric MDS** is that it allows the basic dimensions and structures of one's reactions to and ideas about things to surface, or to be broken free of their customary masking matrix and mutual entanglements in the mind. Where A had always been confused with B, suddenly their mutual independence or degrees of freedom are made visible. Suddenly clues can be gotten to the nature and interrelation of A, B, C, and D by the exact mapping of the distances, angles, orders, and patterns they have to one another in our passive and active intelligence. (There is more, but I will get on to that later.)

In crafting the **analytic regions countermap** I used different colors to distinguish and imply connectedness of different loci and entries in the graph. Where I have actually written my words is not necessarily where the words accurately belong. There was only so much room, after all, and many of the loci alluded to overlap or are identical, are complex or diffusely distributed, are ambiguous or uncertain, are discontinuous, are multivalent, are derivative or hierarchical, etc.

Because of the annular symmetry of the original map (which gives it a one-dimensional quality), the azimuthal locations I have indicated are usually far more accurate, and real, than the radial positions (or distances from the origin of the graph), which often mean nothing (or are wholly artifactual).

The arrows merely signify a general direction away from the center or the direction opposite from the center; the circular sections that enclose heads of arrows bound an azimuthal range.

Part of the reason for the imprecision of the loci indicated lies in the insufficiency of the spatial samples represented by the mere forty-six beauties that are graphed; a great density of the examples would have enabled a far more reliable and authoritative countermap.

Before I use the countermap to analyze and synthesize the conceptual structure of the primary map, let me make a few observations about the possible dot structure of the latter.

The pattern of dots in the primary map, in the case of this particular MDS ideomap, strongly[α] suggests, not a simple circle or annulus, but a spiral, perhaps of $1\frac{1}{2}$ turns (540°). The spiral might have some angularities, cusps, branchlets, anastomoses, and/or clumps.

But is it a real spiral, or just a ring with a cluster or chainlet of points enclosed but free near its center?

α: Not in the accompanying wordless (dots-only) micromap — where any spiral is doubtful!

Be it spiral or annular, the structure resembles a square with rounded corners and balanced on an end vertically.

Hinted simple (and complex) geometric (and topological) patterns like this are a common sight in MDS plots, certainly MDS plots of idea-sets. They are extraordinarily tantalizing. But it is possible they are simply the product of random noise, of the idiosyncrasies of the mathematical or computational procedures, of optical illusions or mental fantasies, or of irrelevant psycho-neural phenomena that play a role in the weighting (Triadic decision) process.

Since (as I understand) the mathematics of nonmetric multidimensional scaling treats the so-called variables or stimuli (or, in our case, the ideas) in the manner of a gravitational system of mutually rotating and interacting particles, patterns mimicing those seen in the cosmic zoo of galaxies are not to be wondered at; and this includes rings, rectilinear and curvilinear lines, spirals, branches, loops, trees, bunches, and sub-whorls.

FIG 3 One frequently sees what appear to be radiations, decussations, webs and reticles, parallel rows, triangles, etc. (See figure ____.)

Patterns seen can seem to make great semantic sense, given the nature and placement of the ideas the dots represent.

I have succeeded in generating some of these patterns using random numbers submitted to the MDS programs in lieu of actual idea-set weightings. Yet even if all of the types of patterns could be produced in this way, or would be expected stochastically or as a consequence of the mathematical processes, this would not necessarily mean that the patterns are ideonomically unimportant or valueless. Thus the mathematics may package the useful information in the form of such inevitable patterns.

It is obvious that one has to be careful here and avoid drawing premature conclusions.

I will now undertake to apply and explain the countermap. Because half a year has passed since I created the primary and counter maps, I will actually be joining the reader in trying to reconstruct what they mean. This may make what I have to say more interesting and understandable, if only because I will not be complacent about my results and analyses.

Dimension 1: The first question concerns what the nature of the horizontal axis, or of Dimension 1, might be.

The countermap suggests that the biggest conceptual factor underlying the dimension and organizing the axis is an antipolarity between beauty or beauties on the right that represent the positive side of the dimension and that are or appertain to what is fun or sensual, and the opposite beauty or beauties upon the left that represent the negative side of the dimension and that are or appertain to what is serious or impressive.

Thus at the right limb one finds situated the beauties of charmed banter, dalliance, or dazzling laughter, of lavish banquet, of kaleidoscope, of butterfly wing color patterns, of birdsong, etc, whereas these are confronted on the left limb by the beauties of or that are associated with justice (as in villainy getting its due), with microscope, telescope, or other instruments, with probity and zeal for truth, with athletic competition, with maternal or filial devotion, etc.

"MUTUAL ANALOGOUSNESS OF 46 (of 141) EXAMPLES AND SOURCES OF BEAUTY"

Speculative Dot-Structures In the Ten Dimensionality-5 Co-Plots

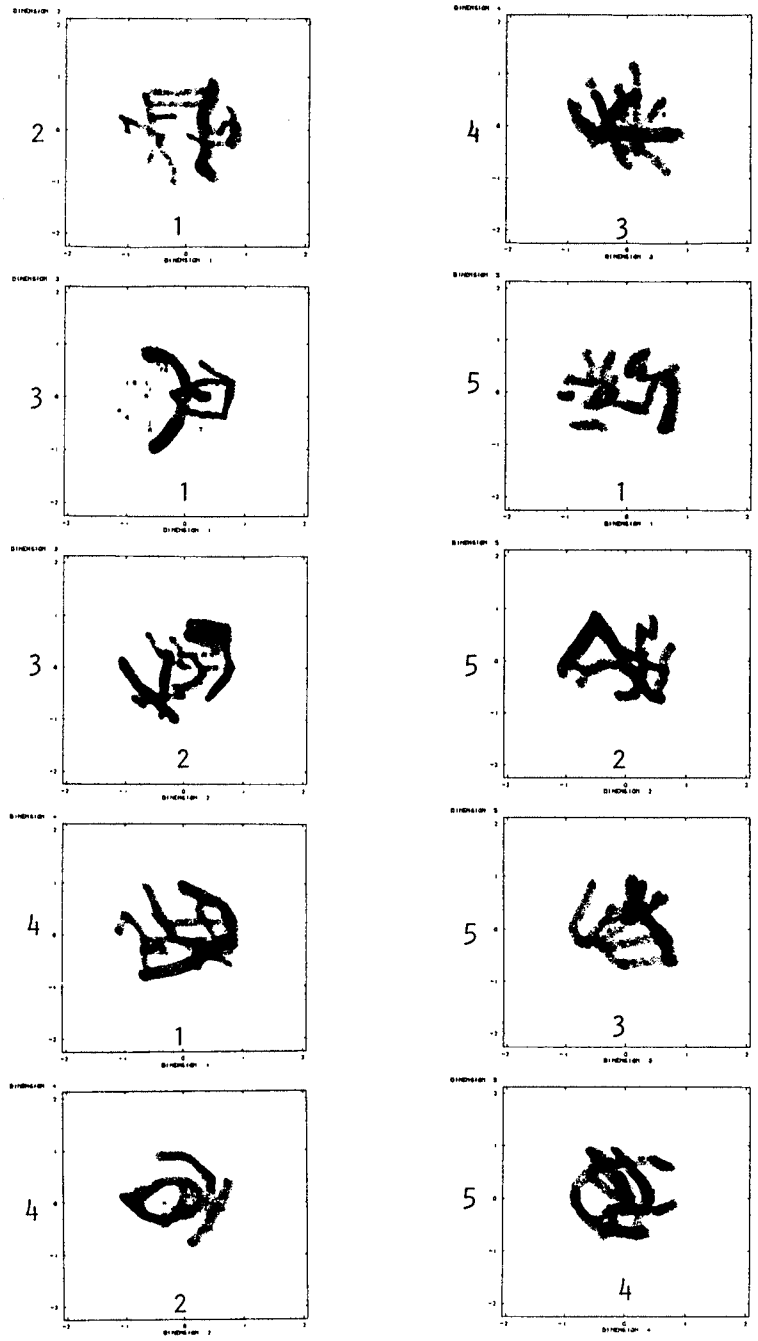


Figure ____

FIG 3

This Dimension 1 is reminiscent, then, albeit in reverse, of the Dimension 1 that so conspicuously figured in our analysis of the lowest-two-dimensional map of the interanalogousness of 36 emotions (figure ____).

It is always important, and practically always enlightening, to compare the equivalent-dimensionality MDS maps (both primary and counter) of different and disparate idea-sets. This is a subject I will discuss at some length elsewhere, for it is full of surprises and promise.

Inevitably the second question to be asked is about the meaning of the vertical axis or Dimension 2. What obvious aesthetic concept or qualities cause the forty-six 'beauties' to be ordered vertically or to be elevated or depressed in the absolute and relative way and degree they are with respect to the zero horizon?

Return to this Q!

Why is Dimension 2 less important than Dimension 1 and progressively more important than Dimensions 3, 4, 5, ... (none of which are explicitly expressed in this lowest-two-dimensional map)?

Return to this Q!

I am going to postpone for the moment any attempt to answer these questions, since doing so would be hard and probably premature.

Countermap's microscale:

My analysis will concentrate instead upon various local relationships of two or several named 'beauties'. I will try to discover, describe, and—where possible—explain these microscale and mesoscale contiguities, proximities, clumps, collinear chains, spurs, corners, junctions, and polygons.

From this smallest, lowest, richest, local, and most empirical level I will then try to ascend to the biggest, highest, most universal, most meaningful, most comprehensive, simplest, most abstract, most necessary or lawful, and most dimensionalized level.

Much of the beauty of the left half of the map's entries seems to have to do with things like achievement, endeavor, ambition, accomplishment, labor, strength, struggle, action, and the like; while the right half of the mapped items speak of the beauty of existence in a passive, observational, or experiential sense. Thus at the western edge of the countermap one finds inscribed the words "Bold, Exertive, Aspiring"; and near the center of the diagram an arc of arrows pointing leftward indicate "Seeking".

Probity and zeal for truth (@160°), in these terms, is probably a matter of aspiration and of the virtuous accomplishment honesty is apt to represent.

The beauty of microscope, telescope, and other instruments may be situated so far west because of the association of instruments with labor and because of the fine or even miraculous accomplishment a scientific instrument represents.

A massive or lofty tree is a grand accomplishment of Nature. The beauty of magnificent battleship relates to the potential for military accomplishment, the strength symbolized by and embodied in the object, the admirable cooperation of the sailors who man that intricate engine of war, etc. Tiny humans at foot of mountain is a testament to the embodied strength and titanic challenge of a massif, and perhaps as well to the unexpected power of the dwarfed men ironically symbolized by the presence of the mountain.

Why then is the beauty of cancer patient's indomitable will to live only just left of center in the ideomap? Perhaps because it is as apt as not to be a tragic beauty, the beauty of a doomed struggle or futile will to live.

The beauties of evolution or ontogeny, of the machinery of the mind and brain, and of a forest fire are presumably located on the left but only barely because they are peculiar hybrids of action and observation or contemplation. Biological evolution is a perpetual and nearly infinite achievement but it is ancient, slow, nonhuman, and unobserved; imagining it is like contemplating a scene in Nature. The architecture and industry of the mind and brain are sublime and yet inaccessible and abstract.

SE Quadrant:

What conceptual patterns are to be found in the southeast quadrant of the ideomap of beauty? Precisely ten 'beauties' reside here, their clockwise roster being: charmed banter, dalliance, or dazzling laughter (M), marine isle or archipelago (h), ocean swim (o), birdsong (D), mountain meadow (n), drifting bubble (U), desert silence, openness, and luminosity (T), first love (X), coitus (P), and jewel (Z). (Letter-names are those assigned to the so-called variables in the MDS plot.) The azimuthal range of the ten 'beauties' is ~70° (circle/5.1). It might also be noted that 10 variables ÷ 46 variables = 0.22 (as opposed to 0.25, so that the quadrant is slightly underpopulated).

'Quiet/Still' Theme:

Mountain meadow (n) and drifting bubble (U) being near the azimuthal center, an obvious theme here is "Quiet, Still", as the countermap avers.

Such a theme clearly extends to desert silence... (T), mutely symbolic jewel (Z), and ocean swim (o). But it also has aspectual, metaphorical, or connotative (mental-associational) pertinency to the tranquil and isolated marine isle or archipelago (h), the silential shyness of first love (X), the post-orgasmic phase of coitus (P), and the contrastive and refluent forestal quiet of birdsong (D). The only member of the quadrant to which the theme apparently does not apply (unless it be by analogy to what was said about birdsong) is charmed banter, dalliance, or dazzling laughter (M); but there is no reason why every member of an arbitrary like a quadrant should embody or owe its position to a single trait, and the organizational complexity of ideonomic MDS projections is so great, in any case, that such homogeneity would be neither expected nor desirable.

If one has a identified or postulated countermap theme such as "Quiet, Still", an attempt should be made to elaborate upon, internally differentiate, and extend the theme, which might be thought of as a seed from which a tree of analogous, related, and divergent themes or thematic ideas can or must naturally grow. For example, the present theme might be enlarged—both in theory and by consulting the actual composition and content of the ideomap—to "Quiet, Still, Peaceful".

Are these subthemes equally or at all applicable, instantially, outside the arbitrary quadrant or in its complement? They do seem pertinent to the beauties of lush, surreal rain forest (d) and patterns of frost or dew (p), which are vicinal, and to the beauty of coruscant stars over night sky (S). In this particular ideomap the latter is remote from the quadrant, but I see that in another map created from the same data-set (figure ____) this variable, and this variable alone, is radically displaced in the plot structure, so that it then resides at nearly the same azimuth as drifting bubble (U) (note asterisk). (This figure belongs to a pair of figures that I will explain later.)

FIG 8

!Return to!

Adjacent to the quadrant in the other direction, or clockwise, are found several examples and sources of beauty to which the quadrant theme could conceivably be extended aspectually: catharsis (K), birth of one's child (E), rescue from misery or horror (r), and academic graduation ceremony (A). Quiet, stillness, and/or peace attend or follow upon all of them.

Some of the beauties collocated in the quadrant are of interest because of their metaphorical value inter se, or their natural tendency to combine in the completion, elaboration, or intensification of mental images. The beauties of jewel (Z), coitus (P), and first love (X) share a line and practically an azimuth, and the analytic countermap imagines "Beloved" as a possible lineal, azimuthal, or regional theme of minor or faint character. In any case, jewel (Z) and first love (X) are almost reciprocal metaphors.

Desert silence, openness, and luminosity (T) can be used to suggest some of the aesthetic qualities of coitus (P). Drifting bubble (U) is a marvelous metaphor or symbol for first love (X), and resonates aesthetically with the miraculous levity, tension, extension, fragility, perfection, concentricity, and ephemerality that are aspects or elements of coitus (P). So also do ocean swim (o), birdsong (D), and mountain meadow (n) have the power to add to the aesthetic meaning of coitus (P) and first love (X).

The last pair of variables (P,X) may also be mentally and aesthetically illuminated by other qualities of the variables lying to the left of the quadrant. The beauties of catharsis (K), birth of one's child (E), rescue from misery or horror (r), and academic graduation ceremony (A) are celebrative of the bliss of escape or delivery, and the beauties of coitus (P) and first love (X) are easily related to the same transitional feelings: e.g. the coital beauty may be triumphant or successive to struggle, and the beauty of first love (X) may be heightened or defined by the contrast to or delivery from the special or aimless agonies, or unnatural emotional individuality, of childhood before the metanoiac psychobiological discoveries of puberty. (The azimuthal distance from (P,X) to those other variables is about 30°-65°, or 0.17-0.36 semicircles.)

Charitable act or self-giving (L), at +52° (0.29 semicircles), also resonates with the donative, self-denying, and self-sacrificial aspects of coitus (P) and first love (X).

'Soft' Theme:

The countermap likewise ascribes the property of "Soft" to some region in or near the southeast quadrant; although of course in this particular countermap, or this particular version of it, no effort has been made to specify or pictorially depict any precise peripheral or intercurrent boundaries of regions, any precise axes or underlying structures, any gradients, or the like.

From eight to ten of the ten quadrant variables seem to partake of this property, in or through one or more ways, elements, or respects: Drifting bubble$_U$ because of the gentle motion, humble raison d'etre, vague boundaries, soft surface, and fragility of such a bubble. Desert...$_T$ because of the describable softness of its sound and quiet, its paradoxical gentleness and its surprisingly delicate and charming minutiae, the soft contours of its dunes, the 'soft' sparsity of its vegetation, its 'soft' sweet mysterious fragrances, its lack of temporal or existential sharpness or hardness, its 'softly' distant horizon, the weakness and irresistance of its sand, the 'softness' of its colors

(their want of brilliance and of chromatic and spatial diversity and differentiation), the 'softness' of the featureless sky and shimmery air of the desert, the soft spectacular grandeur and negativity of the desert's night, etc. Mountain meadow$_n$ because of the obvious softness of its still quiet, aspect of a garden, marshy springiness, utter innocence, air of secrecy and of protective maternity, and seductive loveliness. Birdsong$_D$ because of its aural softness and delicacy. Ocean swim$_o$ because of the irresistance of the sea's supportive waters and the gentle pleasures of such a swim and of the sights and minutes that border it. First love$_X$ because of its delicate shades and graceful nuances of feeling and meaning and its transcendent benignity. Coitus$_P$ because of its wafting ecstasies, soft warm contacts, merger and extinction of identities, liquid penetration, hallucinatory levitation, resistless and unresisted progression and consummation, and hedonic omneity. Marine isle or archipelago$_h$ because of the softly paradisiacal aspects and symbolism of same (a la nearby ocean swim$_o$).

The two doubtful variables are charmed banter, dalliance, or dazzling laughter$_M$ and jewel$_Z$. Yet the first has the describably 'soft' lightness, delicacy, pleasantness, and/or association with quiet of its companions in the quadrant (of birdsong$_D$, etc); and the second has a 'softness' about it by virtue of its physical and symbolic beauty and its amorous, sentimental, royal, and other mental associations.

Realistically the full **azimuthal representation**, or **conceptual field**, of "Soft" could be interpreted as overspreading a semicircle or even 230° (0.64 circles) by reaching counterclockwise from the nearer maternal or filial devotion$_j$ to the farther spider's web$_s$. - Thus there is a literal or metaphoric softness about, or an element related or pertinent to softness in: devotion (j), post-exertional graduation (A), charity (L), salvation (r), childbirth (E), being freed or purged (K), jewelry (Z), love (P,X), desert (T), bubble (U), meadow (n), birdsong (D), natation (o), Oceanian isles (h), dalliance (M), bubble bath (G), delicate calligraphy (I), butterflies (H), rain forest (d), banquet (c), dew (p), some toys (N), music (k), pollinating bees (C), dollhouse (V), night sky (S), migrating geese (m), and the web of the spider (s).

This means that "Soft" has thematic relevance to at least 29 of the 30 variables in the 230° sector.

Whatever might specifically or in general be meant by "Soft", no diametrically opposite **antonymous** (anti-semous) property of 'hard' is explicitly named or localized by the countermap. Either this implies that the cartographic region is naturally **unipolar** or else the antipolar part of a properly **bipolar region** was overlooked in the construction of the countermap or was unrepresented by the chance subset of variables ('beauties') that were graphed in the primary map.

'Hard' Anti-Theme: Can I discover a 'hard' region in the sixteen-variable gap (of 130° = 0.36 circles) between the arms of the "Soft" region? I can check this in two different ways: by selecting a few variables in the gap at random to see if the imagined theme of 'hard' pertains to them, or instead by examining all of the variables in the gap (to once again see if they 'are' exclusively, mainly, or equally 'hard' or 'soft').

Use of a random number generator picks the beauty of evolution or ontogeny (W). In my opinion this 'beauty' is not 'soft' (at least not in the sense that the twenty-nine variables in the "Soft" region are soft), but I would also hesitate to associate 'hardness' with it.[4] Of course,

[4]: NB: On next p. (77) I changed my mind (possibly unwisely!) by making (W) "mainly or wholly hard". I can also see upon further reflection how evolution's aesthetics are in part 'soft'? Strange how facile or tardy meta-perception can be. Yet scales do not fall from the eyes on blog.

it does lie close to the edge of the hypothetical "Soft" region, so perhaps there are two neutral or ambiguous sectors between the soft and hard regions, and the variables lying in these sectors can be either soft, hard, soft-and-hard, or neither-soft-nor-hard.

In any case, if I look in the gap for 'beauties' that 'are' mainly or wholly 'soft' I come up without any bone in my mouth. Perhaps partial or minor elements of 'soft' beauty are suggested by machinery of the mind and brain (e), because of the operational subtlety of the machinery; by clockwork (O), which in loudness can be soft; by evolution or ontogeny (W), again, by analogy to the mind and brain; by tiny humans at foot of mountain (t), because of the 'soft' silence of such a scene; by massive or lofty tree (i) owing to the softness of the foliage and arboreal quiet, peace, mystery, and stillness; by cooperative endeavor (R); and by magnificent body (g) because that is as apt as not to be the soft and rounded body of a woman. (This list includes 7/16 = 44% of the sixteen gap variables.)

If I look for 'beauties' in the gap that are mainly or wholly 'hard' I find: magnificent battleship (f), athletic competition (B), microscope, telescope, or other instruments (I), justice (e.g. villainy getting its due) (a), bold architecture or elegant bridge (F), cancer patient's indomitable will to live (J), clockwork (O), probity and zeal for truth (q), concept of infinity or the Apeiron (Q), tiny humans at foot of mountain (t); and perhaps forest fire (Y) and evolution or ontogeny (W). (This includes 12/16 = 75% of the sixteen gap variables.)

Apart from this last category, perhaps partial or minor elements of 'hard' beauty are suggested by magnificent body (g), massive or lofty tree (i), cooperative endeavor (R), and machinery of the mind and brain (e). (Included here are 4/16 = 25% of the variables.)

To summarize my findings, then, respecting the sixteen gap 'beauties':

(1) MAINLY OR WHOLLY 'HARD': 75% (12/16);
(2) 'HARD' IN MINOR WAY: 25% (4/16);
(3) 'SOFT' IN MINOR WAY: 44% (7/16);
(4) MAINLY OR WHOLLY 'SOFT': 0% (0/16).

} Σ 100%

The evidence would therefore suggest that the analytic-regions countermap of 46 examples and sources of beauty is azimuthally divisible by a diagonal southeast-northwest axis into two opposite but highly unequal sectoral regions of 'soft beauties' (centered toward the southeast) and of 'hard beauties' (centered northwest), with both the azimuthal and populational ratios of the two regions ≈ 2/1 (see figure ____).

Once again it would be highly desirable to attempt to define, supplement, and explain countermap properties such as 'soft and hard beauty'. But properly this is a task that should be undertaken at a stage later than even that of the analytic-regions countermap, and that should produce a countermap of a higher order, a meta-countermap that might be referred to as a "synthetic or justificatory countermap".

The purpose of this third MDS map would be, then: (1) to logically interconnect and unify the different regions, structures, axes, poles, and concepts identified in the analytic countermap; and (2) to supply or speculate upon the fundamental raisons d'etre of both the synthetic and the earlier analytic regions and patterns.

Perhaps one should really visualize a multistep, hierarchical process possessed of at least four distinct stages: (1) Primary Map Stage, (2) Analytic Map Stage, (3) Synthetic Map Stage, and (4) Justificatory Map Stage.

In addition, there are other types of countermaps that it would commonly be appropriate to produce when investigating ideonomic MDS data or primary maps, but that would not fall into the same sequence, or at least not unilineally.

An example of such would be a countermap that would note the various important or expected things—such as primary map variables, or regions in the analytic countermap—that are actually found to be absent in the maps that are studied. Anontological maps of naughts of this sort may turn out to be quite valuable in future statistical ideonomy.

There are two separate arrows that point directly east in the analytic-regions countermap of 'beauties'. The one named "Fun, Sensual" I have already dealt with.

'Delicate' Theme: The arrow directly below it, titled "Delicate", is crudely indicated to refer to the entire eastern half of the countermap. This property of aesthetic delicacy has been mentioned several times already in connection with various variables, but I will now discuss it centrally and systematically.

Delicacy is a complex and ultimately somewhat obscure concept that is broadly applicable, both literally and as a metaphor, and that fairly cries out for refinement and generalization. The reader should keep this in mind as I proceed with my topographic analysis. The dictionary defines delicacy as "fineness or daintiness of form, texture, or constitution", but so many other senses of delicacy and delicate are also provided that, even though they are relevant, I will have to pass them by.

Delicacy most obviously contributes to the beauty of the following things in the primary map, beginning from the right side of the map and working leftward, with the horizontal (Dimension 1) coordinate of each 'beauty' indicated: +1.19 charmed banter, dalliance... (M), via the verbal, intonational, behavioral, and psychic nuances; +1.17 lavish banquet (c), via delicate morsels and flavors; +1.1 kaleidoscope (b); +.9 butterfly wing color patterns (H), via the subtle colorations and textural minutiae; +.88 lush and surreal rain forest (d), via the intricacy of its sights and life and their exotic variations; +.88 birdsong (D), via the delicacy of its warblings; +.86 child's toys (N), via their delicacy of construction; +.81 bubble bath (G), via the delicacy of the foam and individual bubbles; +.79 patterns of frost or dew (p), via the feathery ice and fragile half-held droplets; +.78 mountain meadow (n), via the delicacy of the ecology and of the patternings of innumerable flowers; +.54 bees pollinating flowers (C), via the anatomic delicacy of bees and flowers, and the bees' behavioral and 'sonic' delicacy; +.52 desert silence, openness, luminosity (T) via the associational delicacy of the desert's scant ecosystem and the sensory delicacy of its immense stillness, quiet, and clarity; +.49 calligraphy (I), via the kinetic and visual delicacy of marking; +.47 enchanting centurial dollhouse (V), via the delicacy of all miniaturization; +.44 drifting bubble (U), via the kinetic, structural, and visual delicacy, and a bubble's delicate sensitivity to human and zephyrean movements; +.47 first love (X), via the delicate web of subjective and intersubjective interdependent and protean meanings; +.41 melody, song, chorus (k), via e.g. the hierarchic fragilities of music; +.28 coruscant stars over night sky (S), via the delicate atmospheric scintillations of 10,000 all-but-imperceptible beacons; +.11 migrating flock of geese (m), via

the delicacy of the birds' flight formation and of the distant silent flapping of their wings; +.07 jewel (Z), via the symbol ically enlarged importance of the minute stone and its microscopically perfect facets; +.05 spider's web (s), via the delicate flutter of the ~~flimsy~~ gossamer net; -.13 birth of one's child (E), via the fragility of embryogeny, the newborn, and the mother-child relationship; -.41 machinery of the mind and brain (e), via the unfathomable delicacy of their loom and of the cloth they weave from instant to instant; -.42 clockwork (O), most obviously via the dynamic intricacy of the innards of a watch; -.55 evolution or ontogeny (W), via their labyrinthal complexity that bridges and exactly balances nature's greatest and least scales; -.99 tiny humans at foot of mountain (t), via the symbolic delicacy of the juxtaposed opposites; and -1.18 microscope, telescope, other instruments (I), via the delicacy of their adjustment and of what they are capable of resolving or detecting.

There are a number of things that could be done to yield clues as to the nature of aesthetic delicacy (beauty-via-delicacy).

For example, one could try to think of as many examples and types of this form of beauty as possible, and then subject just this special set of 'beauties' to MDS. Dimensions and other patterns found in this way might then be imposed upon or used to clarify the general set of forty-six 'beauties' that have been under discussion here.

One might also attempt to imagine things whose beauty exactly combines "delicacy" with each of the other themes identified in the analytic-regions countermap, one combination at a time. For example, what things best synthesize beauty-via-delicacy with beauty-via-bigness, beauty-via-multitude, or beauty-via-height? Earth's interdependent biosphere, Saturn's ring-system (which may comprise over 100,000 discrete rings), and Venezuela's Angel Falls (which drops 0.98 kilometers), perhaps?

Subset maps:

If one has mapped via MDS a set of ideas, but then takes a fractional subset of those ideas and has MDS create another map, or set of co-plots, based on the smaller set, geometric and topologic patterns will result that are somewhat different from those corresponding to the interrelations of the same subset of ideas in the original exercise.

Such changes need not be viewed as evidence against nonmetric MDS, or that limits the accuracy, reliability, utility, objectivity, or meaning of the ideic dimensions, rank-orderings, plots, structures, relations, regions, or behavior it purports to discover.

The question that must be addressed, before drawing conclusions of that highly critical sort, is whether the alterations induced possess additional, their own kind, or "transformationally" conservative semantic patterns, or are instead simply manifestations of noise, error, or randomness. The latter would indeed be damning; the former would merely represent an adaptational challenge or opportunity for accomplishing something greater.

Careful experimental and theoretical attention to this matter has persuaded me that the more optimistic possibility is apt to be closer to the truth. In particular, cartographic transformations caused by subset restrictions impress me as being both meaningful and irredundant—an enlarged opportunity associated with MDS.

!Return to!

I did in fact map such a subset of the 'beauties', but before I discuss what resulted I should introduce and expatiate upon the subject of paramaps.

Monothematic Paramaps:

The number of regions, so-called, that are identified in the analytic-regions countermap (or at least in the version given as figure ____) is 33, and these include 61, or about twice as many, discrete terms representing more or less related concepts (related, that is, to the region identified and to one another).

FIG.B

Many though not all of these 33 regions and 61 terms have been separately mapped, for their major and minor positive and negative distribution over the primary MDS map of the mutual analogousness of the forty-six examples and sources of beauty, in figures ____ through ____. This suite of 18 related countermaps I will henceforth refer to as monothematic paramaps, since all of them are functionally equivalent and yet each concerns the cartographic distribution of a single, unipolar or bipolar, theme over the identical ideospace or primary MDS map of the ideospace. As will be seen shortly, these maps are ultimately intended to be analyzed in connection with one another, or for the codistributional patterns they exhibit when virtually or actually superimposed, two or more at a time. (Here "codistributional" does not imply that such spatial and amplitude patterns as may come to light when the different paramaps are superimposed will necessarily be wholly or even partially identical, but only that they should have a tendency to be consignificant, or mutually meaningful.)

FIG.S B

Themes' Codistributions:

Figures ____-____ (with the exception of figure ____, which I will distinguish in a moment) have all been color-coded in such a way that each of the forty-six 'beauties' they share have been assigned six alternative valuations in each paramap according to whether the 'beauty' in that paramap was intuitively judged to be related in a major, minor, or opposite way to the special aesthetic theme of each map. The six-color scaling was: (1) ●, or RED, "Mainly or wholly related to the positive theme," (2) ●, or ORANGE, "Related to the positive theme in a minor way, but 'not related' to the negative theme (except of course negatively)," (3) ●, or CONCENTRIC COLORS, "Simultaneously related to the theme both positively and negatively (but in degrees indicated by the colors chosen)," (4) ●, or GREEN, "Related to the negative theme in a minor way, but 'not related' to the positive theme (except of course inversely)," (5) ●, or BLUE, "Mainly or wholly related to the negative theme," and (6) ○, or ACHROMATIC, "Not related to the theme, either positively or negatively, even in a minor way."

? Change 2nd clause of #2 and #4?

The exception, figure ____, is a 25-degree map that complements figure ____ (as discussed below).

As I have already hinted, the purpose of creating all of these paramaps is to enable them to be subsequently combined or compared in intelligent and revealing ways. I should point out at once, by the way, that even with small sets of paramaps the number of such comparisons that are possible is stupendous: 176 dyadic comparisons for 17, and 528 dyadic comparisons for 33, paramaps (in the present instance). The number of possible decisionally-chained combinations of the same number of paramaps is, moreover, infinite (depending only upon the amount of ferment of the pertinent ideas, able to give rise to diverse predictive hypotheses, in the mind that makes repeated use of the finite set of basic combinations).

When different random or intentional, pair or larger, combinations of the present set of 17 paramaps are made, for exploratory purpose, one discovers that the patterns of simple and complex : overlap (intersection), avoidance, co-avoidance, concentration, intensification ('thematic

strength'), etc : of the different thematic distributions are, ideonomically, extraordinarily meaningful and important.

They permit, indeed invite, the framing and predictive checking of innumerable theories and hypotheses with a bearing on the causes, effects, interrelationships, meaning, etc of the concepts that are (primarily, secondarily, and tertiarily) mapped, and hence they afford means for attaining a far deeper understanding of the general nature and possibilities of beauty.

Of course all that has been said here applies no less to any set of ideonomic paramaps whatever that might be constructed and treated in these ways.

I must strongly emphasize that as, for example, the number of different MDS countermap regions or themes—and hence the quantity of monothematic paramaps—goes up, the richness of the associated ideonomic possibilities and opportunities will eventually, in effect, exceed a cognitive threshold or critical mass, and subsequently grow explosively. A veritable universe of investigatory possibilities will be created in connection with the original set of concepts that were mapped by means of nonmetric MDS.

All of this inevitably suggests marvelous possibilities for the design of ideonomic graphical software, both commercial and scientific.

To give substance and plausibility to these abstract assertions, I will now present the reader with a few of the actual comparisons of the 17 paramaps that I have made to date, where there have been interesting and illustrative results, though as always my examination of the possibilities will perforce remain largely superficial and not at all representative of the 'best' possibilities that a more systematic and exhaustive study of the same material would uncover.

FIG.5B

Themes 'Multitude' ∩ 'Peaceful' ⇒ 'Charming':

Figures ____ and ____ respectively represent the paramaps for the spatial occurrence of beauty-via-multitude and of beauty-via-peacefulness. By "multitude" is meant numerousness, as opposed to fewness or singleness. "Peaceful" is a synonym for calm or tranquil, but the paramap neither explicitly names nor explicitly maps its opposite or opposites.

If you look at the distribution of those 'beauties' that are judged to maximally embody (mainly or wholly relate to) the two themes in question, and mentally superimpose them, you will see that they mainly represent two orthogonal arcs or bars that tend to converge and become superimposed toward the center-right of the primary map (whose underlying structure and coordinate system the paramaps retain).

When I noticed this I predicted to myself that if I referred over to an additional paramap, depicting the spatial distribution of the theme of beauty-via-charm, I would observe a tendency for beauty-via-charm to flourish in and near this region of overlap. And this is exactly what I did observe (compare figure ____).

FIG.?B

I made the prediction because I intuitively sensed that a peaceful multitude ought to be charming almost generically.

Certainly one can imagine a scientist framing an hypothesis of this sort and then checking it out, quantitatively or qualitatively. Were there a contrary result, such a result would be puzzling, challenging, and useful, a prompt to new hypotheses, theories, and experiments.

Of the forty-six 'beauties', there were six that had previously been judged to be "maximally or wholly related" to both the "multitude" and "peaceful" themes: namely bubble bath (G), lush, surreal rain forest (d),

patterns of frost and dew (p), bees pollinating flowers (C), coruscant stars over night sky (S), and massive or lofty tree (i).

Four of these six had also been judged equally related to the "charming" theme. The exceptions were bubble bath (G) and massive or lofty tree (i). The first was thought to be wholly unrelated and the second was deemed related in a minor way. "Charming" was a very difficult concept to cognize and valuate, however, and in retrospect I would think it obvious that charm must greatly contribute to or help explain the human beauty of both things. Yet I have no wish to be in a position of manufacturing excuses or of exonerating troublesome results.

Like Themes' Differences: : Themes 'Charming'-'Delicate':

Comparisons of paramaps can also be used to discover all, or at least diverse, ways in which the themes in analytic-regions countermaps differ. Thus if one compares the paramaps of the closely related aesthetic themes of "charming" and "delicate" one finds six discrepancies (respecting the valuation "mainly or wholly related"): migrating flock of geese (m) and birth of one's child (E) are judged to be that related to "charming" but only weakly related to "delicate" (as their eidetic source); machinery of mind and brain (e) and melody, song, chorus (k), quite the contrary, are judged to be that related to "delicate" but only "weakly" related to "charming"; and judged equally related to "delicate" but NOT AT ALL related to charming are lavish banquet (c) and bubble bath (G). Of course an excuse has already been made for bubble bath (and could be as easily made for melody, song, chorus) but one also has to consider what the statistical noise level ought to be here (and elsewhere).

Themes 'Moral/Right' C, 'Singular/Simple':

Can the nature of such beauty as is associated with the theme "moral, right" be clarified by comparing the paramap of the latter with the paramap of some other theme? Examining the 16 other paramaps that currently exist, I find the distribution of "singular, simple", in the paramap on the theme "diverse, complex : singular, simple" (where the intermediate colon signifies versus), especially analogous and appropriate cognitively. Truth presumably, and morality ideally, should be fundamentally singular, unified, and simple; at least, it is largely because we impute such properties to them that we think of them as also being beautiful. When confronting questions of truth and propriety we are forced to make a unique and definite choice, whereas at other times we are free to admire and affirm the infinite diversity, richness, and complexity of what is and can be.

Themes 'Delicate' X 'Singular/Simple' ≈ Ø:

When the monothematic paramaps upon the aesthetic themes of "delicate" and of "diverse/complex vs. singular/simple" are compared, one finds that the regional distributions of beauty-via-delicacy and beauty-via-singular/simple are almost totally opposite and nonoverlapping in space, with four interesting exceptions (in terms of the valuation "wholly or mainly related").

This throws out a challenge to imagine what such a conceptual (thematic) combination might be like in the abstract (that is, to mentally demonstrate its feasibility or non-self-contradictoriness), and then to instantiate it: 'What beauty might arise from something by virtue of at once its delicacy and its singularity/simplicity?' Perhaps the nub of the problem is, can there be 'delicate singularity'? The paradox is wonderfully ideogenic.

The four interesting exceptions alluded to were the 'beauties' desert silence, openness, luminosity (T), jewel (Z), drifting bubble (U), and birdsong (D). All are at once delicate and singular/simple. Notice that first love (X) is near to being a fifth exception to the aesthetic rule that these properties are immiscible in the beauty of things.

Themes 'Moral-' Links 'Mensural-' & 'Existential-':

The "Moral/Right/True" southwestern region (in figure ____) interlinks (as shown in figure ____) the northwestern "Mensural/Symmetric/Logical/Functional" region to the southeastern "Existential/Emotional/Atmospheric/Subtle" region.

That the first region should occur where the other two regions abut is highly appropriate. Morality relates to the measurement, symmetries, logic, and functions of human existence and emotions. Similarly truth has to do with the collision of abstract patterns (of symmetries, measurables, etc) with real existence, feelings, and meanings.

Themes 'Delicate' Links 'Mensural-' & 'Existential':

Notice that the northeastern "Delicate" region (of the paramap "Delicate vs. Undelicate", presented as figure ____) also interlinks the northwestern "Mensural/Symmetric/Logical/Functional" region to the southeastern "Existential/Emotional/Atmospheric/Subtle" region (in figure ____), but from the opposite direction that the "Moral/Right/True" region does: in other words, from the northeast rather than the southwest.

This dual situation could be interpreted in the following way. The southwestern "Moral/Right/True" interlinkage relates to the measurement, ETC of the emotions, ETC; whereas the opposite "Delicate" interlinkage relates to the emotional enjoyment and artistic appreciation of mensural, symmetric, logical, and functional relationships. Such an interpretation would explain why the beauties probity and zeal for truth (q) and maternal or filial devotion (j) are located at the southwestern interregional convergence, whereas one finds the beauties melody, song, chorus (k), enchanting centurial dollhouse (V), kaleidoscope (b), and calligraphy (l) at the northeastern interregional convergence. Again, the ~~latter~~ former beauties have more to do with the measurement of joys, the ~~former~~ latter with the joys of measurements.① (To be honest, however, it could be argued that music (k) has an equal amount to do with both functions.)

①: [... statement is benignly ambiguous ... interchange "former" and "latter" ... it still makes sense!]

Dipolar Themes 'Vertical- vs. Flat-', 'Big vs. Small', 'Strong vs. Weak-':

The "Vertical/High vs. Flat/Low" and the "Big vs. Small" and the "Strong vs. Weak/Fragile" dipolar regions are, it should be noted, roughly coextensive and the signs of their trends are semantically correct (so that, for example, "Vertical", "Big", and "Strong" coincide azimuthally).

FIG ? 25-Degree Delicacy' Paramap:

As already mentioned, one of the paramaps (figure ____) is of a different type from the others. It rank-orders the forty-six 'beauties' on a truncated 25-degree scale of beauty-via-delicacy. That is, it takes the subset of twenty-four 'beauties' that (in figure ____) were previously valuated "mainly or wholly related to delicate or subtle" and estimates their beauty-via-delicacy rank-order from 1 to 24 via the scaling question, "What is the absolute contribution of a thing's delicacy to its beauty (or the absolute delicacy-related beauty of each thing)?" These finer degrees of aesthetic delicacy are color-coded in the figure.

The same sensitive treatment could have been given to all the regions in all of the other paramaps. Had this been done, it would have brought to light semantic patterns of a far more complex, subtle, and cogent (or testing) nature. That this is so is underscored by a comparison of the 6-degree and 25-degree paramaps (figures ____ and ____). The 'beauties' rated highest for beauty-via-delicacy by the latter are not concentrated, as one would have expected, in the center of the "Delicate" region of the former, but rather in its northwestern extreme. Hence simple reliance on the 6-degree paramap could be highly misleading.

FIG.S ?

I will provide just one example of the potential value of such a highly rank-ordered monothematic paramap, by means of the 25-degree delicacy map.

Comparing figures ____, ____, and ____, it will immediately be seen that the strongest (most intense) beauty-via-delicacy occurs—as was by myself first hypothesized and then verified to be the case—where the "Beauty-Via-Small-With-Big Region" overlaps the "Beauty-Via-Delicacy Region". Which is to say that those 'beauties' that are rank-ordered in the 24-rank delicacy paramap and simultaneously valuated as being maximally or wholly related to the theme of beauty-via-small-with-big, are almost all rated especially high in (placed in ranks 1-12 rather than 13-24 of) beauty-via-delicacy: patterns of frost or dew (p) is rank-ordered as #4, child's toys (N) as #19—it represents the one failure or exception, enchanting centurial dollhouse (V) as #6, coruscant stars over the night sky (S) as #3, machinery of the mind and brain (e) as #1, and microscope, telescope, other instruments (l) as #9. Of course, not all of the 'beauties' that were valuated highest for the theme "Small-With-big" were also valuated "mainly or wholly related to delicacy": the two-of-nine-possible exceptions were evolution or ontogeny (W) and tiny humans at foot of mountain (t).

This convergence appears to suggest something about the causation of delicacy-related beauty and, more generally, about the mental bases of the concept of delicacy itself. Time does not permit me to speculate in writing upon what.

Now that I have touched upon monothematic paramaps, let me discuss what happened when I mapped a monothematic subset of the 'beauties'. It was in fact this same set of twenty-four 'beauties' especially related to delicacy that I independently mapped.

I did not do this mapping by employing the Triadic Method to produce a new set of data, but rather by exploiting the relevant subset of data in the original 46-beauty table. Partitionings of this sort do give rise to **the changed maps, or sub-maps**, spoken of earlier. The smaller 24-beauty data set incorporated only 1,200 of the original 2,300 binary Triadic Method decisions.

Figure ____ shows the reduced ideomap. Readers should be warned that the named 'beauties' are not coded by the same letters and colors that they are in the 46-beauty maps.

If the 24-beauty and 46-beauty dimensionality-two maps are compared (figures ____ and ____), it will be observed that the relative, and even the absolute, positions of the twenty-four 'beauties' are not so very different in the two cases (despite the distortion inevitably induced by the deletion of twenty-three other 'beauties'), except perhaps in the case of the beauties of coruscant stars over the night sky, of jewel, and of first love.

Actually this degree of similarity is ordinarily to be expected where that remapped is fully half of the original set of ideas, rather than something like a mere sixth, say.

The twenty-four 'beauties', moreover, represent a very homogeneous region in the 46-beauty map.

So less conservative behavior would have been the real surprise.

It was not only the dimensionality-two map of the twenty-four 'beauties' that I plotted and studied, but the entire set of ten dimensionality two - four co-plots (though these have not been reproduced here).

Logic would strongly suggest that the 'beauties' jewel and kaleidoscope share both appearance-related (phenological) and beauty-based (kalological) analogies and that they should therefore come together in space in at least some of the twenty D = 2-4 MDS co-plots of 'the twenty-four delicate-related beauties', and yet inspection of the co-plots reveals that they never do so even once, and in fact they always remain stubbornly distant —almost opposite—so that at their closest approach in any of the co-plots (in the $D_1 \times D_3$ co-plot in D = 3) there are no less than seven 'beauties' more proximal to jewel than kaleidoscope [to wit, in proximodistal order, calligraphy; melody, song, chorus; drifting bubble; clockwork; spider's web; coruscant stars over night sky; and patterns of frost or dew], and seventeen 'beauties' nearer to kaleidoscope than jewel.

What might this mean? Was the original 'classification' via the Triadic Method distorted, guilty of an oversight, superficial, or insufficient (e.g. were the scaling dyads used too few, positively or negatively biased, misappreciated, underappreciated, or perhaps mutually contradictory)? Or does nonmetric MDS itself suffer from some quantitative or qualitative limitation, defect, or quirk (whether slight, moderate, or severe)? Or am I just mistaken in seeing similarities between the two 'beauties'?

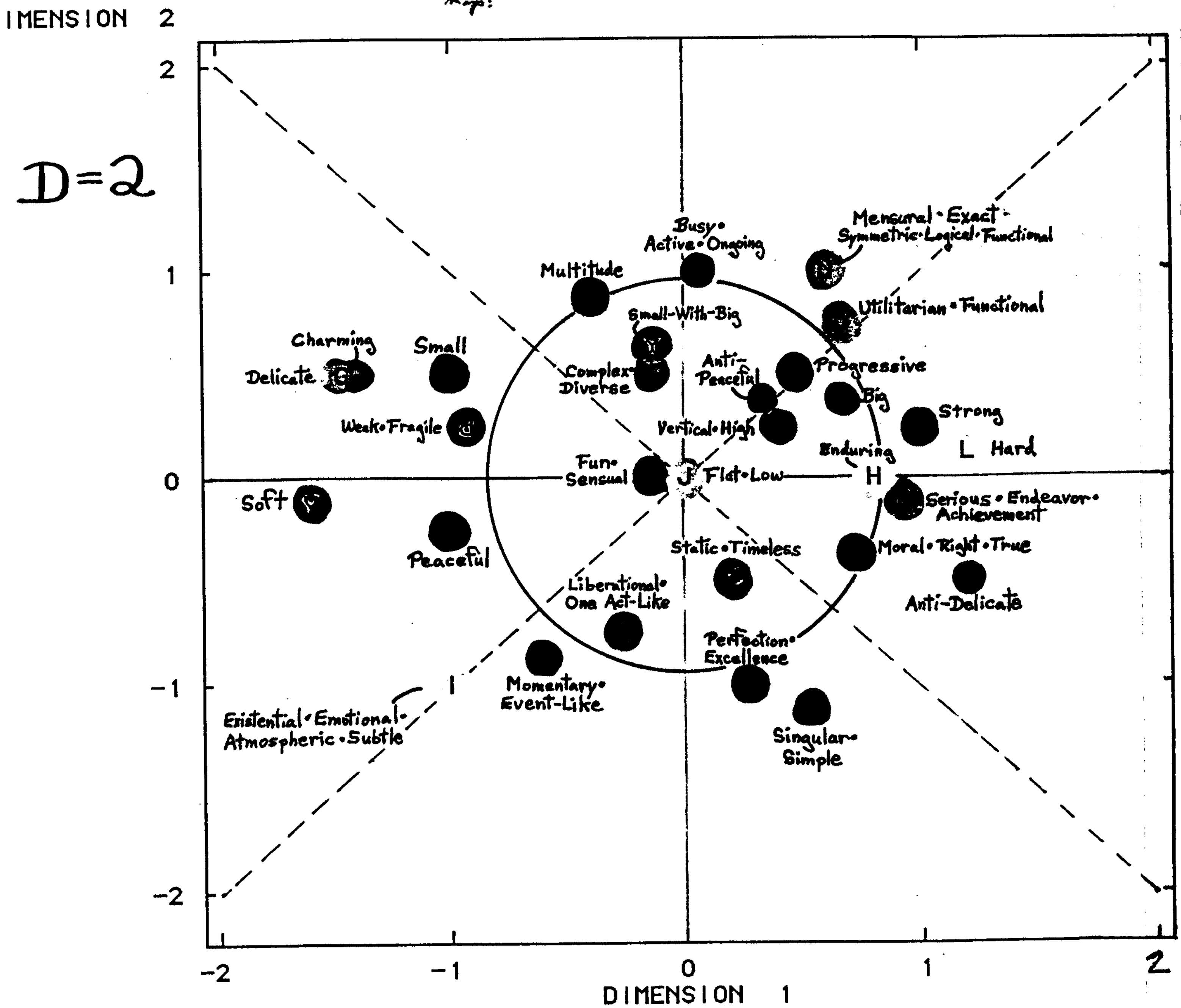
The existence or nonexistence of other logical or expected patterns such as this should be checked for systematically to determine what the : efficiencies, shortcomings, irregularities, mechanisms, and habits : of ideonomic MDS are in general.

→ '30 Beauty Themes' Taken From 'Analytic Regions Countering' For "46 Exx. & Sources of Beauty", Each of the 30 Themes Having Been Effectively Weighted On A 3-Point Scale For "Strong or No" Exhibitedness by The "46 Exx. & Sources of Beauty", This Data Being Used To Produce The mMDS Ideamap Below of the "Implicit Mutual Analogousness of 30 Beauty Themes":

[redacted] [redacted]

↑ Warning: There may be another Exercise Number that by accident was given to the table for these maps!

D=2



ANALOGIES BETWEEN A MOLECULE AND A DREAM

Notice first what is odd about these reciprocal analogates. A molecule is a material, definite, and simple object. On the other hand, a dream is a phenomenon, process, event, and state - elusive, amorphous, protean, complex, largely subjective (to ourselves), and (at present) poorly described and understood. The molecule is microscopic but finite, the dream spatially dimensionless (neither big nor small nor intermediate thereto). Molecules 'exist' for chemists and physicists, dreams 'have meaning' to psychologists and professional laymen; rarely a biologist will study both.

So an attempt to compare, relate, and assimilate these disparate entities is certainly ambitious and might even seem quixotic. Yet ideonomy is full of surprises.

Hypothetically, given that the things are so different, any deep (or even relatively superficial) analogies that are found might turn out to be unusually important or at least instructive.

Moreover, to the ideonomist even Nonexistence, Unimportance, and Unrelatedness are categories of interest about which there are questions of fundamental and universal importance that must be asked and one day answered (through pertinent studies such as this).

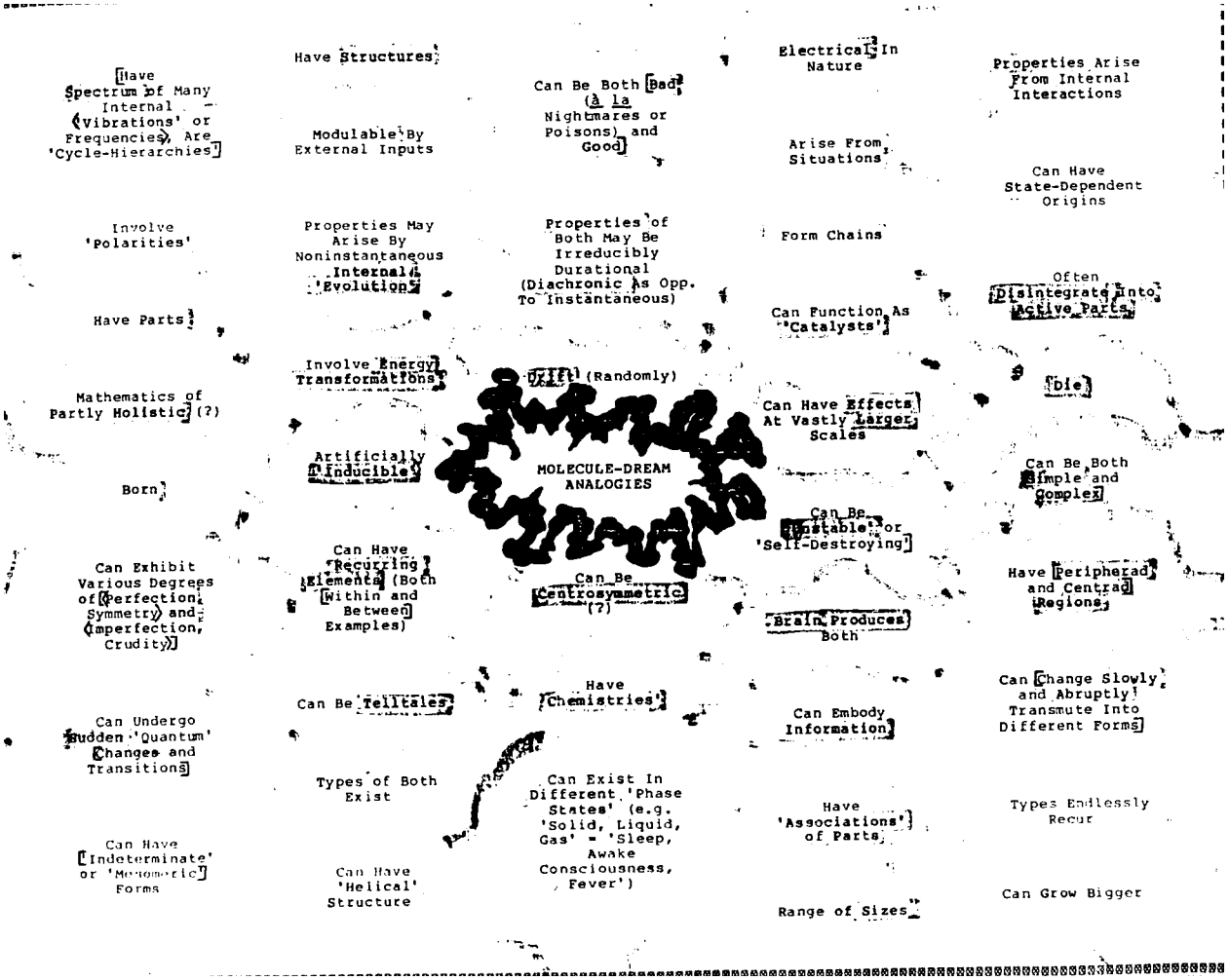
Then again we might find - and indeed below we will find - that molecules and dreams are really not such different entities (and concepts) after all. Although as a molecule you might not want your sister to be married to a dream.

One lesson here may be that analogical space is apt to have a very different structure, and therefore metric, than what naive intuition would lead us to believe; and that there is probably a grave fallacy in identifying it with, or in mapping it onto, "normal space" (so-called). Which error may be the indirect or even direct source of many consequential misconceptions and scientific problems!

If the reader will now turn his attention to the cellular entries of the chart "Molecule-Dream Analogies", I will begin my exegesis of and commentary upon this organon. My selection of items will be planless, improvisatory, unordered, desultory, and partial; although I will look for things especially interesting or instructive, either alone or in combination.

[1] Molecules and dreams are alike in that they both HAVE PARTS. Although there is certainly nothing earthshaking about this common property, it is worth mentioning simply because of the prevalence of elementary ignorance and of poor mental habits that destructively oversimplify reality (whether consciously or unconsciously).

Molecules do have parts—many diverse parts—and the parts are important. What kind of parts? Well, molecules may be made up of lesser molecules, for example, in coordination or subordination. This immediately prompts one to reexamine one's picture of and assumptions about molecules. What makes a set of atoms a molecule, or a molecule free or independent or circumscribed or integral or special? Is the concept of a definite and individual molecule semi-fictitious? If a molecule may contain molecules, then of course it in turn—even simultaneously—may be contained in other and bigger molecules, so that there can be submolecules and supermolecules and molecules of any order. But may such 'containment' be partial or intermittent; and if so, then is it ever absolute or absent, or truly reducible to just one or a few senses and forms? Are sets of atoms within molecules sometimes capable of behaving as independent systems, or of having their own chemistries and even external associations?


MOLECULE-DREAM ANALOGIES
Have Structures
Have Spectrum of Many Internal 'Vibrations' or Frequencies, Are 'Cycle-Hierarchies'
Modulable By External Inputs
Can Be Both Bad (à la Nightmares or Poisons) and Good
Electrical In Nature
Properties Arise From Internal Interactions
Arise From Situations
Can Have State-Dependent Origins
Involve 'Polarities'
Properties May Arise By Noninstantaneous Internal 'Evolution'
Properties of Both May Be Irreducibly Durational (Diachronic As Opp. To Instantaneous)
Form Chains
Often Disintegrate Into Active Parts
Have Parts
Can Function As 'Catalysts'
Involve Energy Transformations
Drift (Randomly)
Die
Mathematics of Partly Holistic (?)
Can Have Effects At Vastly Larger Scales
Artificially Inducible
Can Be Both Simple and Complex
Born
Can Be 'Unstable' or 'Self-Destroying'
Can Have Recurring Elements (Both Within and Between Examples)
Can Exhibit Various Degrees of Perfection, Symmetry and Imperfection, Crudity
Can Be Centrosymmetric (?)
Have Peripheral and Central Regions
Brain Produces Both
Can Be Telltales
Have Chemistries
Can Change Slowly and Abruptly Transmute Into Different Forms
Can Undergo Sudden 'Quantum' Changes and Transitions
Can Embody Information
Types of Both Exist
Can Exist In Different 'Phase States' (e.g. 'Solid, Liquid, Gas' = 'Sleep, Awake Consciousness, Fever')
Have 'Associations' of Parts
Types Endlessly Recur
Can Have 'Indeterminate' or 'Meromeric' Forms
Can Have 'Helical' Structure
Range of Sizes
Can Grow Bigger

These reflections then carry over to the counter-analogate. If molecules can include other molecules among their parts, and themselves be parts of larger or more extended molecules, then might there also exist by analogy—in some sense, degree, or order—sub-dreams in dreams and super-dreams of dreams: in unsuspectedly complex, extended, and important systems? And is one compelled to redefine the dream as well?

Are dreams fractals, or possessed of general or partial fractal structure (or fractal logic)? Might they be like strange attractors, with endless obsessive orbits and coorbits? Are they turbulent, somehow, with interwoven partial cells of motion and semantic flow at every level, in a dissipative system with undefined laws? Are the different parts of dreams semiautonomous? Do they define the dream as a whole or does that whole define them; does the dream develop 'upwards' or 'downwards', or by partition or by addition?

So the trivial analogy is perhaps not so trivial—or not so nugatory, uninteresting, or sterile—after all.

Perhaps a larger lesson is that we should look anew at the parts, and the possible parts, of other things.

[2] Molecules and dreams are similar in being characterized by a RANGE OF SIZES. Whether one is asserting or assessing this analogy, the act forces one to ask what might be all of the different senses, forms, and measures of size that apply to molecules and/or dreams, what criteria exist for choosing among them, and which are arguably the most appropriate, for the present purpose or for other purposes.

Molecules might be sized for spatial diameter, surface area, or volume, or by mass, number of constituents (such as atoms, electrons, bonds, or submolecules), total length of 'chains' (or length in some graph-theoretic sense), energy (as measured in some way), 'information content', etc.

Molecular mass ranges from that of the smallest monatomic molecule—a solitary hydrogen atom—or the 19 times heavier water molecule, upwards to the largest protein molecules, such as the largest hemocyanin molecule (9,000,000 x the hydrogen atom), or the average human chromosome (whose DNA is equivalent to more than 80 billion hydrogens). The sequential set of powers of ten here is (0,1,7,11), rounded to integers. Dropping the case of the chromosome, the spread of seven orders of magnitude in mass probably approximates the volume range as well. The range in diameters from the hydrogen molecule to the largest globular protein should be about two powers of ten. But candidly, it is rather meaningless to speak of some largest molecule because there is a continuous intergradation of large molecules and the finest semi-discrete substructures of materials. Also, the above hemocyanin molecule outweighs a ribosome (which is an organelle) by a factor of two-and-one-half, there are micelles, there are hierarchies of substructures such as those in muscle tissue, there are intracellular granules, there are vast clay molecules, the largest species of molecules must have inspecific (ever-varying) sizes, etc.

When one tries to assign sizes to dreams the problems become even worse! Yet not that much worse, given the complexities we have just confronted, and in an exponential sense one could say that the overall difficulty in the two cases is comparable.

A dream is a neurological phenomenon and as such possesses the same generic dimensions that other neural phenomena do. Thus it should have finite and measurable 'size' in respect to duration, energy, area, volume, the physical information necessary to characterize it, etc. And in having these many different senses of size, it must also have a corresponding set of ranges of occurrence.

The analogy then ultimately compels us to ask an interesting set of questions: What are the smallest and largest dreams (e.g. in terms of the volume, surface area, or cortical depth they actively involve in the brain; or the number or percentage of neurons, or the characteristic energies or durations)? Are there dreams so short that they end in under a second, or so long that they bridge lesser dreams or even span days or the entire lifetime? Are there atypical or unrecognized dreams (or other senses of dreams) that arise from or involve the entire brain or even parts of the nervous system beyond the brain (or other bodily systems), or that are so spatially or physiologically small that they are confined to single cortical layers, cell populations, neuronal columns, cell clusters, or neurons, or to certain biochemical subsystems (and perhaps for that reason are not consciously detectable)? Dreams, of course, may also be arbitrarily small in a mental sense or in some sort of abstract hyperspace. Perhaps there is properly a hierarchy of dreams, and what we term "consciousness" (or inward reality) simply represents the highest level or levels thereof.

If the largest 'molecule' is the whole genome, then perhaps the biggest dream is simply the so-called conscious self.[1]

If the genome is to be thought of as the largest molecule, even though it comprises a set of different chromosomes[3] that are not always, and never fully, connected in space, then perhaps by analogy dreams beyond a certain maximal size tend to become almost untraceably disconnected in space,[2] time, and properties. Is a dream that seems unitary in reality a loose 'family' or immense 'democracy' of separate dreams (or oneiric 'isles') existing more or less simultaneously in different parts of the brain?

Notice how a mutual suggestiveness only naturally obtains between this analogy from the chart and the analogy we considered before it.

3 Molecules and dreams alike HAVE STRUCTURES. Dreams have structure for several reasons or in several ways: their spatial activity in the brain has structure, their unidimensional temporal structure (say if described via words or Morse code) can be mapped as multidimensional structures in multidimensional spaces, and they must have complex logical structure (or structure in idea spaces). They must also have an unknown number of structural levels.

The immense diversity of molecular structures is well-known, though the intrinsic diversity, and the possible undiscovered or uncreated diversity, thereof are not known. Nothing like a perfect morphological classification of molecules has ever been constructed, and we are still groping our way toward an understanding of the morphological, morphodynamical, and morphogenetic laws of molecules.

Ideonomic organons depicting universal genera and species of forms (e.g. charts of the canonical species of rings, trees, radiations, chains, spheroids, and helixes) are profoundly suggestive of known and possible molecular structures. It is possible that molecules and dreams are alike not only in having structures but in having—even in mostly or only

①: (which bea[illegible] top, doesn't dream of its true nature

②: E.g. [illegible] "instructions" [illegible]

③: (and other elements scattered through cells)

having—like or equivalent structures. If this is true, and to the extent it is true, then those subsets of taxons of forms—of the ideonomic organons—that are found to be applicable to actual or possible molecules may turn out to be reapplicable to oneiric structures (and vice versa). Types and taxons of forms that are not exemplified may also be common to the two fields (e.g. if no molecule has or can have a certain form, then that form may also be alien to any dream). Extrapolations, interpolations, proportionalities, morphisms, group-theoretic generalizations, etc may all be possible, enabling the ideonomic integration of the two fields or sets of phenomena. This should be especially true after laws and principles are worked out. Even asymmetric exceptions should be generalizable or predictable.

[4] Molecules and dreams are similar in that both CAN HAVE 'INDETERMINATE' OR 'MESOMERIC' FORMS. Molecules can both simulate and have two or more different electronic or atomic structures, either in isolation or in certain chemical or other environments, and in various degrees and ways the structure of a molecule can be protean or involved in incessant change and adjustment. Conceivably there can be molecules whose structure is indeterminate or unresolvable in the more fundamental sense of the Heisenberg uncertainty principle. These possibilities include much more than just resonance hybrids (mesomerism) and tautomers (dynamic isomerism).

Dreams may have diverse analogs thereto.

Perhaps the electrical structure of the brain or the EEG have semiautonomous components that are active in the course of a dream and that cause the dream to be fundamentally ambiguous, dual, pluralistic, multilevel, oscillatory, self-mutative, or self-contradictory, and certainly irreducible to a single state, description, or event. Or there might be exceptional dreams that originate—or run their full course—like zoology's rare two-headed monsters.

Dreams may have forms of fractal structure, and certain dreams may even represent illusions repeated fractally (and hence provide examples of what could be termed "hyper-illusions"). Various related or unrelated dreams could be fractally compresent in the structure of a single dream.

A dream may represent an impossible attempt at self-observation, and hence a process that continually interferes with itself and diverges from its original essence (if any). Perhaps for this reason a dream spirals outward from its finite or infinitesimal inception.

[5] Molecules and dreams may be alike in that, hypothetically, both CAN BE CENTROSYMMETRIC. In general, of course, there can be different degrees and forms of centrosymmetry: e.g. topological or geometric, radial or rotational, point-centered or axis-centered, simple or compound, etc. The center may be either occupied or empty, either explicit or implicit. It can be truly central or eccentric, and it can even be peripheral or exterior.

Molecules can, for example, be annular or radiational. They can have one or more heavy-metal-atom centers. They can rotate about their barycenters.

Dreams might be centrosymmetric if they develop about time-invariant cores or germinal ideas, if they spiral outward semi-cyclically from their centers, if they represent either instantaneous or diachronous fractals, if they progressively develop and converge upon centers[1], if they always speak to certain archetypal themes, if they follow some (rectilinearly or curvilinearly) axial path over time, if the brain's electrical activity becomes centrosymmetrically structured about some spatial locus (to produce them or in the course of their existence), etc.

6 Molecules may be analogous to dreams in that, hypothetically, the MATHEMATICS OF both is partly HOLISTIC. Again, there are all sorts of ways and degrees in which the mathematics of both dreams and molecules could be said to be, or imagined as being, 'holistic'. And there are also many ways and respects in which their mathematics is probably not holistic.

But this analogy is somehow very suggestive, for both phenomena. One intuits either that it is close to the truth or that it forces one to have a valuable set or series of thoughts.

What could be meant by holistic here is that 'every' part of a thing, in space or conceivably even in time, or every part of a mathematical description of the thing, must simultaneously play some or some equivalent or equal role in the determination of the whole; or else that the overall structure, life, or nature of a thing—or perhaps its simplest or most universal characteristics—must simultaneously be determinative of every part; or else that there is simply a surprising sympathy or a kind of 'resonance' between a thing qua whole and its parts.

The mathematics of a molecule may have to be holistic in much the same way that the crystallogeny of a snowflake may need to be explained by holistic laws. How do the hexagonal parts of a snowflake manage to develop identically even though they are separated in space—even radially in arms of the snowflake divided by empty space? Are stresses and strains propagated over the body of the snowflake that nip asymmetric tendencies in the bud, is there some sort of static or dynamic energy-field equilibrium, is the previously formed internal structure of the flake subject to a perpetual cybernetic revision, was the later large-scale morphogenesis of the flake pre-modeled by the earliest and tiniest inner part, is the formative material of a snowflake so peculiar to and uniform within each flake that it predisposes the crystal to develop by a nearly identical spatiotemporal sequence in all six directions, does the earliest crystallization of the flake (randomly or deterministically) choose some set of dynamical rules that thereafter are fixed in self-reproducingly or recursively governing the rest of the crystal's hexagonal development—or instead of such rules might some equivalent ultrastructure (ultrastructural information) be imposed on the 'zygotic' or 'morular' crystal, or is a snowflake cryptically fractal in its radial structure (or perhaps, like the Mandelbrot set, "self-dissimilar")?

Although these are all largely developmental questions, they do illustrate the holistic regime that may control a molecule's structure, which is a step smaller than the structure of the germinal snowflake. If holism is exhibited by something 'as big' as a snowflake, then, arguably, a mere molecule—representing what might be termed a quantum object—should do so a fortiori. Quantum physics paradoxically provides some of the best theoretical and empirical reasons for believing that nature abounds in 'holistic' properties, phenomena, and laws (even as she abounds in nonholistic ones).

(1): (… branched subcenters)

One sign of holism is nonadditivity. When two things are added to one another, or two parts are added to a much larger thing, the resulting effect may not be what one would expect from the simple sum of the things: it may be greater, less, negative, or disparate. Such nonadditive behavior is in fact characteristic of molecules and molecular structure.

Another sign of holism is a tendency for a local change, say in the structure of a thing, to propagate elsewhere or everywhere in the thing, or to change the characteristic behavior of many or all of the thing's parts. For molecules this would mean that modifying one (perhaps arbitrary) part of a molecule should sometimes or always indirectly modify the structure or behavior of some or all other parts of the molecule.

What holism might imply for dreams is that the form any given element has in a dream—or its relationships, roles, timing, aspects, importance, or whatever—may depend on any or all other elements of the dream, or upon their form, relations, roles, etc, and may conceivably do so in an exquisitely interdependent and even surprisingly fundamental manner. And this may not just be true in an interpretative sense, for were it possible to intervene in the dream and experimentally alter the element, this might induce a welter of adjustments.

The possibility that dreams are governed by holistic mathematics, as postulated in this analogy, cannot help but trigger similar holistic speculations about the human mind generally. It is perfectly conceivable that future experimental and theoretical studies of holistic mathematics in molecules could contribute in a cost-effective way to the discovery and clarification of holistic neuropsychological phenomena.

ANALOGIES BETWEEN A MOLECULE AND AN ORGANISM

Whenever something is a characteristic part of something else, as a molecule is a part of an organism, there will be some interest in seeing whether the mutual analogies they possess intimate the existence of any type, degree, or analog of a 'fractal' relationship. The reasons for this interest are at least two: it is now known that such fractal relationships between different "length scales" (size levels), both within and between things, are at least rather common in nature, and are therefore to that extent to be expected in arbitrary situations; and secondly, the ideonomist is preeminently that scientist who expects and seeks universality in, among, and above things, and it is therefore important for him to know whether—or in what measure—some general fractal principle, law, or pattern governs the whole universe or all reality. It is also true that the meaning of 'fractality' must in part be empirical and dependent for its clarification upon the findings of such investigations as this.

A general ideonomic principle summarizes a common discovery in the history of science: When the range of occurrence or exemplification of some generic property, phenomenon, or relation is in the study of a subject initially assumed but not proven to be bounded (above or below), circumscribed, or discontinuous, the restriction is often later shown to have been unfounded, premature, overly general, misdirected, or deleterious. #There is another principle that is relevant here: Where two things are at first assumed to be sharply (separated or divided) from one another, or to be separated (by an absolute gap or hiatus) or by an interval over which their (abundance, strength, or effect) is zero—or are assumed to differ from one another absolutely, fundamentally, or dichotomically—it is often subsequently discovered that in reality the things are joined or united by a continuous intergradation or intertransformation, either direct or virtual.

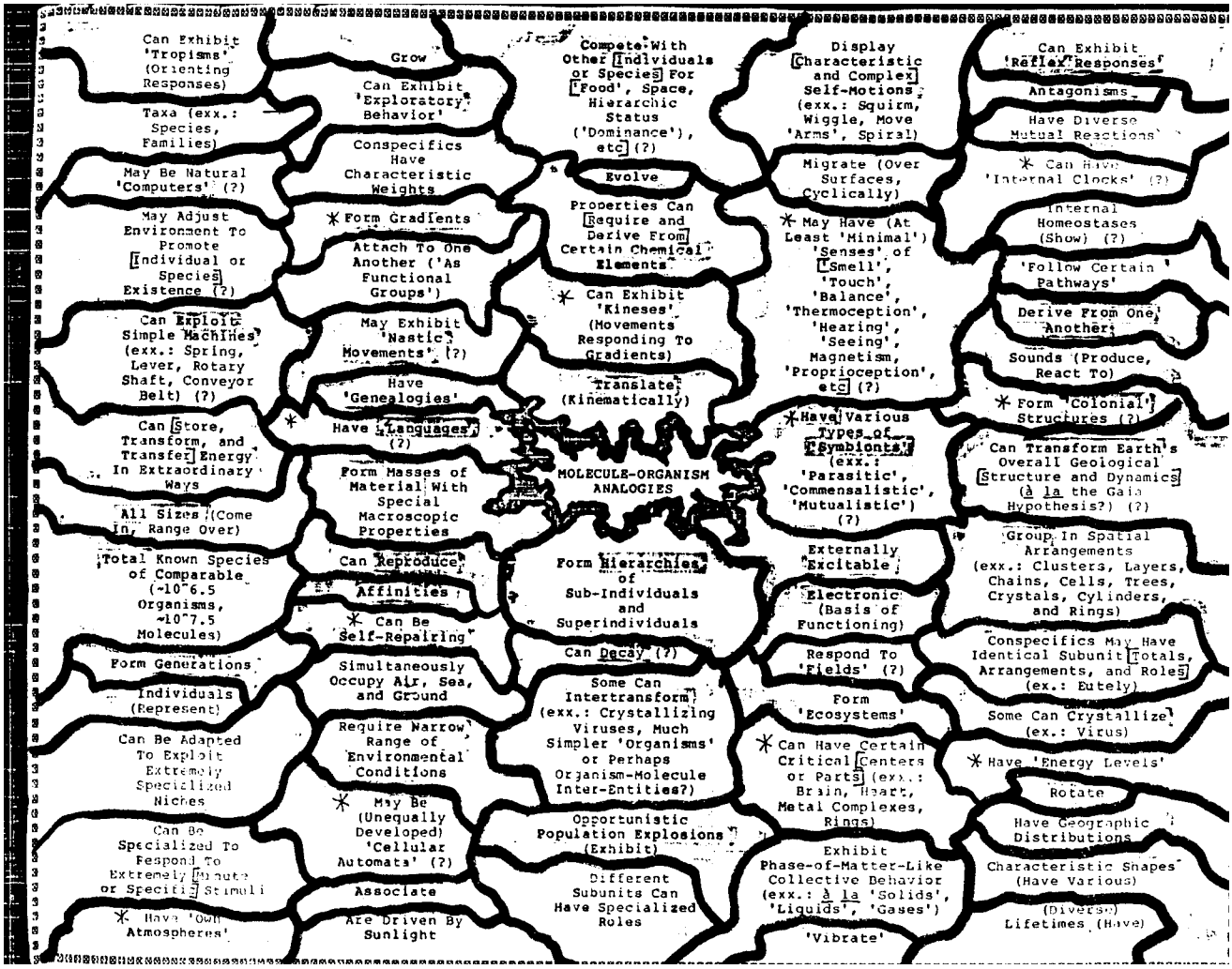
I will return to these matters later, after I have discussed some of the 69 entries on the chart "Molecule-Organism Analogies" (see).

[1]A molecule and an organism are alike in that both FORM GRADIENTS. The known and possible ways, senses, and instances in which organisms 'form' 'gradients' are numberless, but it will be instructive to mention a few. The density distribution of the bionts in the population of a species will contain intricate monotonic and nonmonotonic gradients throughout the range of the species. There will be thousands or millions of gradients for just the simplest polymorphisms. A species population will itself serve as a gradient for other species that compete with, eat, are transported by, coevolve with, or otherwise interact with it. The cumulative spoor of an animal will form a gradient over its territory. Velocity and pressure gradients are formed and followed by winds that forever circulate around the body of an organism. Sounds and smells emitted by an animal form gradients. In an organism's interior—in and as its tissues, major bodily systems, organs, cells, biochemical pathways, etc—there exist 1-, 2-, 3-, and hyperdimensional gradients that number many powers of a million①. Organisms are of course both cause and effect of myriad molecular gradients, including geochemical gradients.

The electromagnetic forces within and between molecules are gradient. Within materials and massive objects there are gradients of different chemical species. The molecular cohesion of a viscous liquid will cause it to form height, velocity, directional, and other gradients as it gravitates away from a spill site.

* EDIT: ?: Does this first # fit properly into the chapter?

① (e.g. possibly a million)


MOLECULE-ORGANISM ANALOGIES
Can Exhibit 'Tropisms' (Orienting Responses)
Taxa (exx.: Species, Families)
May Be Natural 'Computers' (?)
May Adjust Environment To Promote [Individual or Species] Existence (?)
Can Exploit Simple Machines (exx.: Spring, Lever, Rotary Shaft, Conveyor Belt) (?)
Can [Store, Transform, and Transfer] Energy In Extraordinary Ways
All Sizes (Come In, Range Over)
Total Known Species of Comparable (~10^6.5 Organisms, ~10^7.5 Molecules)
Form Generations
Individuals (Represent)
Can Be Adapted To Exploit Extremely Specialized Niches
Can Be Specialized To Respond To Extremely [Minute or Specific] Stimuli
* Have 'Own' Atmospheres
Grow
Can Exhibit 'Exploratory' Behavior
Conspecifics Have Characteristic Weights
* Form Gradients
Attach To One Another ('As Functional Groups')
May Exhibit 'Nastic Movements' (?)
Have 'Genealogies'
* Have 'Languages' (?)
Form Masses of Material With Special Macroscopic Properties
Can Reproduce
Affinities
* Can Be Self-Repairing
Simultaneously Occupy Air, Sea, and Ground
Require Narrow Range of Environmental Conditions
* May Be (Unequally Developed) 'Cellular Automata' (?)
Associate
Are Driven By Sunlight
Compete With Other [Individuals or Species] For ['Food', Space, Hierarchic Status ('Dominance'), etc] (?)
Evolve
Properties Can [Require and Derive From] Certain Chemical Elements
* Can Exhibit 'Kineses' (Movements Responding To Gradients)
Translate (Kinematically)
Form Hierarchies of Sub-Individuals and Superindividuals
Can Decay (?)
Some Can Intertransform (exx.: Crystallizing Viruses, Much Simpler 'Organisms' or Perhaps Organism-Molecule Inter-Entities?)
Opportunistic Population Explosions (Exhibit)
Different Subunits Can Have Specialized Roles
Display [Characteristic and Complex] Self-Motions (exx.: Squirm, Wiggle, Move 'Arms', Spiral)
Migrate (Over Surfaces, Cyclically)
* May Have (At Least 'Minimal') 'Senses' of ['Smell', 'Touch', 'Balance', 'Thermoception', 'Hearing', 'Seeing', Magnetism, 'Proprioception', etc] (?)
* Have Various Types of 'Symbionts' (exx.: 'Parasitic', 'Commensalistic', 'Mutualistic') (?)
Externally 'Excitable'
Electronic (Basis of Functioning)
Respond To 'Fields' (?)
Form 'Ecosystems'
* Can Have Certain Critical [Centers or Parts] (exx.: Brain, Heart, Metal Complexes, Rings)
Exhibit Phase-of-Matter-Like Collective Behavior (exx.: à la 'Solids', 'Liquids', 'Gases')
'Vibrate'
Can Exhibit 'Reflex' Responses
Antagonisms
Have Diverse Mutual Reactions
* Can Have 'Internal Clocks' (?)
Internal Homeostases (Show) (?)
'Follow Certain' Pathways'
Derive From One Another
Sounds (Produce, React To)
* Form 'Colonial' Structures (?)
Can Transform Earth's Overall Geological [Structure and Dynamics] (à la the Gaia Hypothesis?) (?)
Group In Spatial Arrangements (exx.: Clusters, Layers, Chains, Cells, Trees, Crystals, Cylinders, and Rings)
Conspecifics May Have Identical Subunit [Totals, Arrangements, and Roles] (ex.: Eutely)
Some Can Crystallize (ex.: Virus)
* Have 'Energy Levels'
Rotate
Have Geographic Distributions
Characteristic Shapes (Have Various)
(Diverse) Lifetimes (Have)

But what subtler organismal and molecular gradients might be imagined?

Perhaps the great variety of radicals and other chemical species that are generated by the chemical kinetics of a reaction form 1-, 2-, and 3-dimensional : unbranched and branched : steady-state and protean : gradients that, in part, are like natural chromatography, and that may even play an active role in shaping the dynamics or outcome of the reaction, or the structures and materials it may give rise to. Such gradients might be perfected and harnessed by the chemical industry.

What are the ontogenetic gradients that control the cellular differentiation of the human body after the formation of the monadic zygote?

What interwoven hierarchy of gradients exist in the brain as the basis of its mental processes? How is neural information strung along polysynaptic chains of neurons? Are there molecular gradients inside or over the surface of a neuron that contribute to memory? What is the structure of the gradient flows of energy within a neuron?

[2]Molecules may be analogous to organisms in that, hypothetically, both CAN BE SELF-REPAIRING. Biological self-repair is well-known, and in fact the tendency of an organism to correct such internal defects as arise through aging, wear, error, and injury is generally thought of as being one of life's major and basic properties. Although the process of repair is manifestly imperfect, new mechanisms, examples, and effects are continually being found and hypothesized. Nor is it clear what degree of repair might be optimal for life—or excessive. Just as the 'fundamental goals and priorities' of life qua life or qua the bios are unknown and almost impossible to imagine, the reasons for its self-repair largely remain problems for the future.

What scientists certainly must seek to achieve eventually is some synthesis of all the different bodily, ecological, and evolutionary elements of self-repair, in part with those elements reduced to some timeless, universal, and necessary form, or generalized to the point that they have ceased to be merely biological and have become ideonomic phenomena, with rich and equally necessary and comprehensive illustrations in the sciences of (supposedly) inanimate things. Life's totality of reparative elements must be redescribed within the system of meta-structures : of hierarchies, networks, series, rings, vergences, etc : that cause, govern, serve, and manifest them.

How, for example, do biological processes of repair rectify one another and repair themselves? How, inevitably, do they interfere with one another? Is bodily repair centralized or distributed? What are its redundant and irredundant features? Are the same or different processes at work at different (spatial, temporal, energetic, etc) scales? How homogeneous and heterogeneous is repair across the set of all species? What starts, supervises, and halts repair? What is the scale of efficiencies for all types of repair?

If biological self-repair is well-accepted, the concept of molecular self-repair is not, and indeed little has been said about the possibility of such repair. Except, of course, in the case of biomolecules, especially ones that play a direct role in the life of the genome. Currently (1988) complete and partial : direct and indirect : 'self-repair' by DNA and RNA molecules is a lively topic in molecular biology.

But might the concept of self-repair deserve extension to abiotic molecules or to physical chemistry?

If so, might the diverse simple and complex mechanisms of self-repair that are known to exist—or that might be surmised to operate—in the special case of biological molecules, also find some degree and form of illustration in the larger world of chemistry, if perhaps only metaphorically? The connection could actually justify the funding of research into biomolecular self-repair for the sake of the potential spin-off in other fields. The chemical industry could both exploit the natural processes and develop quite novel artificial ones. Moreover, the generalization of molecular self-repair to all of chemistry would make it more probable that such repair is not peculiar to molecules but rather is a general property of natural phenomena. A search for generalized mathematical—or even logical—laws might be warranted.

Of course speculations such as this require us to define more precisely what we mean when we speak of "self-repair", and they also require that we delimit or circumscribe the concept.

A minimal example of so-called self-repair in a nonbiological molecule might be where a transient loss of structure or of a constituent by such a molecule might have a tendency to be very quickly corrected through nothing more 'intrinsic' to the molecule than the regulative effects of other (like or different) molecules in its vicinity, which would presumably 'prefer' the molecule to have a certain form or to be of a certain type (owing to the kinetic equilibria of the total system).

But from here one can proceed to imagine more complex and essential forms of self-repair that might exist, as well as processes that might assist with such repair in a secondary—or even tertiary—capacity.

Perhaps when any molecule exists in the presence of other molecules it tends to organize its environment—or those other molecules—in ways that reinforce its peculiar nature or that contribute to the chances of its survival. Or different molecular species, when present together, might compete with one another, and induce in this manner a degree of natural selection of 'fittest' molecules. Smaller or specialized molecules might have a tendency to accumulate in the immediate neighborhood of a 'dominant' species of molecule, and play roles in its maintenance and repair (if only statistically, or from the standpoint of some sufficiently large sample).

Molecules that are directly self-repairing might also be selected for.

The concept of molecular self-repair could simply mean that the flexibility and resilience of a molecule that is subjected to a stress is fundamentally greater than would normally be assumed on the basis of the orthodox picture of molecules as delomorphous, nonself-adjustive entities possessed of meager dynamic equilibrium and 'cybernetics'.

Are the most familiar, stable, or long-lived molecules those that have the greatest self-reparative powers? May existing chemical laws and theories unknowingly subsume self-reparative behavior; and if so, can tests be devised to demonstrate or disprove its existence?

Generalization of molecular self-repair in such ways as this could in turn redound to the advantage of biochemistry. Thus to the extent that self-repair is chemically or physically universal, the prebiotic origin of life is easier to understand—or to believe in and model.

[3] Molecules and organisms may be alike in that both hypothetically HAVE or involve 'LANGUAGES'. That people have languages is trivial. All of life may be permeated with languages or things analogous to language. We still know almost nothing about animal communication and behavior, save that they are rife with 'linguistic' aspects, and true progress here may await breakthroughs in artificial intelligence, neurology, cognitive science, computer hardware, and even ideonomy. Language is one of the most badly defined, or moronically restricted, terms in all of science (as will be seen from discussions of it elsewhere in this book). Common sense alone would extend it so as to include microkinesics (body language), mathematics, music, diplomatic conduct, human customs, and the genetic code. But it is almost equally evident that the concept should be understood to embrace logic, nosology, all taxology, rules of games, emotional processes and states (or the system thereof), neural codes (defining messages sent by action potentials, used in memory, etc), perceptual codes (vocabularies, grammars, and messages), immunological recognition codes, protein structures, biochemical processes in general, information theory, all molecular interactions, all many-body processes and interactions in physics, crystallographic rules, and a great deal more. (Note that, in several senses, 'molecular language' is included in this list.)

If the postulated molecular languages really do exist, then these might be used—as the basis of new forms of chemical technology—to control the synthesis and manipulation of molecules in fantastically specific, precise, efficient, complex, and arbitrary ways, and to heighten in the
25 same extreme way the perceptual powers of analytical chemistry.[25]

KEY: A number in a box is the number of an item — in the list "Ideonomic Principles Relevant to Molecule-Organism Analogies" {Fig. 2,561} — wherein will be found a principle relevant to the origin or interpretation of an [idea or thought] in the marginalized text.

Since life is fundamentally a chemical process—or is a process that originally arose from and that currently is controlled by molecular interactions—it is perfectly conceivable that it is based throughout upon a single chemical language, or upon some permutation, transformation, evolution, expansion, or condensation of some earliest biotic or prebiotic chemical language, one that might have been either extremely simple or extremely complex. All present-day biological processes and languages may endlessly use and reuse this archetypal language. It may be repeated fractally at every level of an organism. It may offer a primitive key or else a Rosetta stone for deciphering the many languages of the body or for 'intertranslating' the Earth's millions of different species.

So the astonishing possibility exists that molecules and organisms are alike, not simply because they both have languages, but because they make
26 use of—or represent expressions of—the same language![26]

[4] Molecules and organisms are similar in that hypothetically both CAN HAVE 'INTERNAL CLOCKS'. We know that organisms have such clocks, although we have no idea how many different clocks they have or how diverse their bases may be. Clocks appear in brain waves, circadian rhythms, seasonal phases (as of flowering, fruiting, leaf color change and fall, migration, and hibernation), episodes of bodily development (such as those at human puberty), senescence and death, and ecological succession. "Protein clocks" are used to time the genomic distance of two species from one another. Almost surely there are kilohertz, megahertz, gigahertz, and terahertz 'clocks' in organisms, since those frequencies correspond to the characteristic periods of so many chemical reactions and events; and probably petahertz clocks as well, since so many physical phenomena occur on the corresponding temporal scale (of femtoseconds).

* [illegible] though [illegible] ed [illegible] level.

How might molecules be clock-like or contain clocks?

I will start with what are least relevant: entire chemical reactions. It is conceivable that there are certain reactants or combinations of reactants that can give rise to interactions and reactions characterized by motion or activity—vibrational, rotational, translational, excitational, relaxational, exchange, 'tessellational', 'choreographic', 'spin glass Hamiltonian', progressional, e/vc—that is extraordinarily: cyclic, synchronous, temporally sharp (leptokurtotic or spike-like), organized, wave-like, time-invariant, simple, universal, holistic, cascade-like, e/vc. But here the 'clock' would really be relational: a result of the interaction of two or more molecules, either of the same species or of different chemical species. Such a collective clock might 'give the time externally' by means of any of various possible emissions or manifestations (or, should it be a passive sort of clock, the time it keeps could still be read by a variety of probes and methods): emitted or transmitted photons, surface phenomena, escaping molecules, atoms, or electrons, postmortem examination, etc.

One could also imagine a collective clock of 'non-relational' nature whose particles would simply all fire off at approximately the same time, either spontaneously or as a result of being primed from without.

More relevant, perhaps, would be individual molecules behaving in a clock-like manner. These might emit or absorb photons or other particles with the kind of regularity and sharpness suggested above; or they might pulsate, rotate, deform, internally permute, circulate (e.g. as fluxional molecules) parts of themselves within themselves, periodically self-excite, incrementally decay, etc with such metronomic precision.

Or one could fantasize other and more complex types of molecular horologes. Particularly elegant mathematical (or number-theoretic) relationships might characterize the interactions of the different atoms, electrons, or structures within a molecule, especially if the molecule is of high molecular weight, has intricate structure, or is a biomolecule. The set of dynamic or electromagnetic spectra of the molecule's constituents might have harmonic or other spectroscopic correlations that contribute to clock-like resonances or sequences of behavior.

A molecule might have a structural or massive center or axis that dominates and modulates the energetics of the rest of the molecule, again with clock-like effect.

Microstructures that behave micromechanically : as twistable or elastic springs, pendulums, rubberbands, flywheels, etc : or that behave as electronic microcircuits and microcomponents, might simulate timepieces.

The generic concept of a molecular clock might also be extended to forms of molecular aging or evolution that are especially regular and useful. This clock here might keep either universal time, or time in the sense of counting stimuli or measuring external rates or degrees of change. Its mechanism might be either deterministic or stochastic.

Might a molecule involved in a chemical reaction have the ability to 'clock' temporal characteristics of the molecules it encounters, and reset its own temporal characteristics so as to favor, oppose, or specialize the reactions that actually occur (or at least might there be <u>some</u> molecules like this, or that the mind of man could create for special purposes)?

Molecules that are clock-like to the extent that they count things could conceivably do some minimal calculations or otherwise behave in the manner of a computer.

A molecule that ages incrementally and progressively in a clock-like way could reveal the age of the material or object in which it occurs or when it or its host was formed. Yet even without such internal aging, a molecule could serve as a clock if its structure or composition simply contained a single element dating a single past event. Micrometeorites, by analogy, have served as both types of clock (via diverse elements).

Organisms may also have computer-like features, and like today's computers may require a clock. The speculative molecular clocks we have been considering might play the role of such a clock, or even be the basis of the computational features.

[5] Molecules and organisms are alike in that both may hypothetically HAVE their 'OWN ATMOSPHERES'. This might be so in both literal and metaphorical senses of "atmosphere".

Organisms certainly possess atmospheres. The human body is surrounded by an atmosphere of water vapor, odorants, ions, electrons, and warmed ambient air. This atmosphere continually rises, boils, diffuses, blows, trails, sinks, and expands away, and is replenished. All of which is also true of Earth's atmosphere.

And just as with the terrestrial atmosphere, the eponymous atmosphere of an organism penetrates, or has analogs, within the body of the organism. There are the semigaseous chambers of the alimentary and respiratory tracts and the ear canal, of course. But then there are also the micro-atmospheres of skin pores and of in vivo micro-bubbles analogous to those found everywhere in stones and the sea.

Doubtless there are 'auroras' in bodily atmospheres just as there are auroras in our planet's atmosphere. And if one analogically tosses in Earth's magnetosphere, the body's magnetic field might be considered in a parallel way.

Multitudes of organisms of course give rise to a collective atmosphere on a larger scale, and ultimately the Earth's entire atmosphere may be the product of its bios (a biogenic atmosphere).

Turning then to the possibility that even individual molecules may be possessed of discrete, finite, and characteristic 'atmospheres'.

Prima facie the idea seems dubious for several reasons: at such an ultramicroscopic level gravitation is vanquished by electromagnetism, commotion of the molecular vicinity will be disruptively fierce, the exponential surface-to-volume law will make the effective content of a molecule (from which an atmosphere might evolve) insignificant, molecules seemingly do not have internal processes capable of generating an atmosphere, intermolecular distances are too slight, etc.

Yet at the molecular scale an 'atmosphere' could consist of as little as one monatomic molecule, atmospheric molecules would not have to be 'in' the gaseous state (in the usual sense), the atmosphere could comprise a single or fragmented monomolecular layer, different molecules could simply share a common minimal atmosphere, molecules could in some sense themselves be one another's atmosphere, 'atmospherical' molecules could protrude into or reside within the molecules that would be said to have atmospheres, for brief moments of time pieces of the molecule—or of other molecules about it—may continually dissociate (fully, partly, or in a sense) and behave as atmospheric particles, the atmosphere of a molecule

may resemble a hydrosphere in the sense that the atmospheric particles never really break free of the surface or framework of the molecule but rather roll, slide, bounce, stream, eddy, boil, flap, or undulate about; the constituents of a molecule's atmosphere might not be neutral molecules but rather ions, free radicals, an electron plasma, protons, or various quasiparticles; in lieu of gravitation, the many chemical forces (electromagnetic subforces) could retain an atmosphere about even the smallest molecule; the vastest molecules may have atmospheres even if lesser molecules do not; should it be thought necessary for a molecular atmosphere to be equipped with some richness of phenomena comparable to the phenomena of Earth's atmosphere—in order to truly qualify as an atmosphere—it is easy to imagine molecular analogs of clouds, storm fronts, jet streams, lightning, atmospheric strata, precipitation, winds, occlusions, inversions, circulation cells, Rossby waves, tornadoes, atmospheric tides, and even rainbows; etc.

[6] A molecule and an organism are alike in that both HAVE 'ENERGY LEVELS'. Molecules have a variety of different forms of 'energy levels': owing to the effects of environmental temperature, excitation of their individual atoms, dynamic states of the molecule and its atoms, ionization, ambient magnetic fields, interstitial electrons, vicinal molecules, structural and compositional variants of the molecule, etc. Some of these energy levels are discrete-valued (quantized or at least saltatory), whereas others are continuous-valued.

Of analogous energy levels of organisms we have some knowledge. The delta, theta, alpha, and beta rhythms of the mammalian brain are like compresent energy levels, and in different arousal, pathic, and ontogenetic states and stages of the organism one of these cycles can be dominant; moreover, much faster and much slower rhythms are known, some evidently corresponding to the special 'energy levels' of special brain regions, circuits, cells, or functions.

Fever, sleep, hibernation, coma, epilepsy, orgasm, dreaming (or Rapid Eye Movement sleep), etc are other examples of neural energy levels with distinctive bodily manifestations.

Apart from specifically neural rhythms, scales, and energy levels, other bodily systems are replete with equivalents.

But intuition suggests that there are manifold physiological 'energy levels' that are not yet discovered that, individually and collectively, are of profound importance.

Biochemical pathways and processes must inevitably have, at the very least, millions of different energy levels, internal and interactive 'resonances', 'phase states and transitions', etc. Biotechnological mastery of these would give man tremendous medical, bioengineering, agricultural, and ecological powers.

Looming over everything, of course, is the question, How are the totality of the body's multifarious 'energy levels' orchestrated to produce the integral phenomenon that is life?

Many organismal energy levels may simply reflect, or may originally have evolved from, molecular energy levels.

Collections of organisms may also have various 'energy levels'. Some of these will be cause or effect of the energy levels of bionts that were considered above, but others will be sui generis phenomena irreducible to the energetics of bionts qua bionts.

Among the phenomena recognized by sociologists that might qualify as the 'energy levels' characteristic of collections of persons, are war, mass hysteria, the atmospheres (or "resonances") of different neighborhoods, national moods, historical renaissances, a symmetric love affair, or the tone of a workplace.

As for hints of possible diverse 'energy levels' in populations of other species of organisms, one thinks of mass migration, population explosions, seasonal group mating, epidemics, speciation, and perhaps certain mass extinctions (and surges or maxima of taxonic diversity) over geological time.

Are there discrete or continuous 'energy-level fluctuations' of the global bios—either exogenous (e.g. climatic) or endogenous (biogenic)—that occur over great periods of time? If so, are they cyclic or aperiodic? Good or bad (say from an evolutionary perspective)? Maximal or constrained? A single repeating cycle or a spectrum or hierarchy of cycles of different types or orders? At what chance① energy level are we at present (e.g. moderate, high, or low)?

① : Cor non-

Perhaps when catastrophic planetary events occur—a sudden and persistent deterioration of climate, say, occasioned by the Earth's collision with an asteroid—they raise the energy level of the bios (for a while): possibly thereby causing a radical ecological reorganization of Earth, recasting of food chains, the appearance of novel higher taxa, biogeographic reapportionment, revolutions in the population ratios of all species, chaotic and universal migrations of organisms, inefficient energy flows, great material waste, disrupted biogeochemical cycles, ecological and demographic wars and a generally enhanced competition of the Earth's organisms, accelerated mutation and evolution, quickened rates of adaptation, more multidimensional ('broadened') variation, and/or the like.

In a more literal way, the percentage of incoming solar energy that is used by the bios, as well as the total power (wattage) of the bios, may fluctuate radically—the absolute energy consumption even by an order of magnitude, say—over millions or hundreds-of-millions of years.

7 Molecules and organisms may hypothetically be alike if they both FORM 'COLONIAL' STRUCTURES. First let it be said that the approximate concept of 'colonial structures' should probably be extended in biology to embrace many other, recognized and unrecognized, things that would not normally be described colonially: e.g. consortiums of diverse species and taxa of microorganisms, bacterial populations qua multicellular organisms, tumors or galls as quasi-colonial organisms, cooperating organelles within unicellular organisms, the bios as a single Gaian organism, the human genospecies, bodily organs, a genome, or even a viral population or epidemic!

The metaphorical application of the concept of 'colonial structures' to molecules suggests several arresting ideas.

Do certain molecules of the same chemical species have a tendency to cluster together into simple or complex : homogeneous or heterogeneous : clouds, structures, or global textures, either in a pure liquid or in a solution of many or even millions of different chemical species? The imagined clusters might be either static or more in the nature of dynamic systems.

When molecules representing different chemical species are compresent in, say, a liquid solution, do they as a general rule exhibit at least some tendency to organize themselves into diverse subpopulations separated from one another in space and individually comprised of many or all of the different species? Or, again, into clouds, structures, global textures, or dynamic systems (but of diverse chemistry)? Or as the number of different chemical species that are compresent in the solution rises to thousands or millions?

Do transient examples of such 'colonial structures' appear in the course of a chemical reaction as an unsuspected part of its chemical kinetics?

Simple morphological examples of the imagined 'colonial structures' could be where single molecules of species A, B, C, etc would tend to join up in that or some other order as a chain, ring, tree, or the like. The bonding here, or strength of the structure, might be arbitrarily weak; or even zero, since the configured molecules might simply represent a structured process in space rather than a connected object.

Do the different molecules or molecular species form 'colonial structures' that constantly change kaleidoscopically, that grow, or that evolve? Is there some semblance of colonial organisms or of biological processes that unexpectedly appears in this abiotic case?

Such colonial structures and processes in the realm of physical chemistry may be connected with the origin of the complex higher-level or multilevel structure that one sees in minerals or materials in general.

They might also help to explain the prebiotic origin of life, and life processes themselves (which may be more independent of the genome, or of purely biological constraints, than currently assumed).

THE IDEONOMIC PRINCIPLES THAT WERE ILLUSTRATED

Although the low-level process of comparing things such as molecules and organisms is fascinating and beneficial to the mind, its greater value to ideonomy is that it can lead to the fundamental development of the science, and especially its division Analogies and Icelology. It can do this by calling attention to, testing the validity and generality of, and interrelating the new and total types, bases, and dimensions of analogies, as well as analogical methods. These things can then in turn be generalized and differentiated into genera, species, and other —higher, lower, and companionate (horizontal or adjoint)—taxa (of whatever categories of things they represent).

But then there is an even higher value that these exercises can have to the scientific development of ideonomy, involving a higher stage and level of conceptual analysis and synthesis: the isolation of ideonomic principles, including principles that are ever more diverse, universal, fundamental, and powerful. The types and uses of these principles will be various: heuristic (discovery-aiding), classificatory, ideogenetic (idea-stimulating), cognitive (thought-aiding), perceptual (perception-aiding; which is not synonymous with heuristic), communicative, didactic, inductive (law-developing), organizational, experimental, axiomatizing, reductive, synthetic or generalizing, sophic (wisdom-purveying), differentiative, combinatorial, explanatory (not the same as didactic), predictive, definitional, transdisciplinary or pantological, etc.

The ideonomic division Principles and Axiomology will be advanced in this way.

I will now enumerate and discuss such ideonomic principles as I can think of that assisted or might have assisted, that were illustrated in or that are generally relevant to, or that were explicitly or implicitly discovered through those molecule-organism analogies that were : listed, conjectured, defined, explained, judged, permuted, transmuted, developed, generalized, categorized, subdivided, propertied or 'dimensionalized', formalized, exemplified, and applied : above.

My remarks, of course, will be neither exhaustive nor perfect. Rather they will be what everything else in ideonomy is: a fertile beginning. (Please consult the organon "Ideonomic Principles Relevant To Molecule-Organism Analogies".)

"IDEONOMIC PRINCIPLES RELEVANT TO MOLECULE-ORGANISM ANALOGIES"

1. Analogs and analogates may appear to have a completely different form.
2. An analogy with a restricted basis : e.g. minimal in its number or diversity of elements or dimensions, its size, its justifications, its interest, its conspicuousness, or the like : may nonetheless be arbitrarily powerful; the possible degree-combinations of such things are almost comprehensive.
3. Things may have, as well as not have, analogies at many different levels simultaneously (coexistently). (Cf. #26.)
4. Analogies between things at different scales or levels may or may not be equivalent, related, correlated, or causally 'interdependent'.
5. Analogies between things over a range or scale may vary regularly in one or more dimensions or respects, or by some invariant or variable formula.
6. Analogies that recur or continue over a scale or range may do so either fractally or nonfractally.
7. Things may have different sets of analogies at different levels.
8. Analogies between or among things are not necessarily symmetric (in degree, type, existence, equivalence, or importance): e.g. if "A" is analogous to "B", "B" may or may not be analogous to "A" in the same way, sense, or degree.
9. The meaning of analogies is not absolute, but instead depends upon the entire set of analogies that coexist between the analogates, as well as upon the general environment or context of the analogates (separately and together) and the properties, states, purposes, and decisions of the analogist.
10. Things that are analogous in at least one, or one major, respect are probably analogous in many other respects.
11. Complex analogies between things may or may not entail simple analogies between them.
12. Analogies, even apparently simple, analogies between things are often compounded of many simpler, and often heterogeneous, analogies.
13. When two things have many analogies, those analogies often belong to to one or more : descriptive or causal : hierarchies.
14. Finding analogies often leads to the finding of other analogies (i.e. analogies are mutually heuristic).
15. The process of finding analogies between things has an ironic tendency to obscure other types of analogies between the things; analogism (and perception and conception generally) become specialized, rigid, and anti-heuristic.
16. Over a range or at extremes, the analogies between two things may change, become transformed, be replaced by other analogies (or bases of analogies), fail, or persist unchanged.
17. Everything is analogous to everything else to some degree and in an infinity of ways.
18. Where an analogy between things encounters difficulties, it may be more appropriate to change, either slightly or drastically, the things themselves (or perhaps one's picture of, assumptions about, or criteria for them) rather than the analogy itself or its basis; or at least, by imagining such a change or its effects one may gain important insights into the analogy, analogates, or oneself.

(cont.)

19. Where an analogy between two things has, or seems to have, problems, it may be desirable to change the analogy or its basis, either slightly or radically, or to substitute a very different analogy; or simply imagining these changes may be of value.
20. It is often desirable to systematically imagine all of the possible ways in which an analogy, or the set of analogies, between two things could change or be changed, or all of the possible causes or effects of such alterations; both in the case where such changes would occur singularly and independently, and where they would occur in various combinations and sequences.
21. An analogy or its basis can sometimes be reduced to or produced by a single insignificant entity, element, or aspect: e.g. a solitary molecule could have an 'atmosphere' comprised of one oxygen atom loosely bound to or associated with the molecule.
22. An analogy is not precluded by a thing being a part of—or containing—its analog; indeed, parts and wholes are often unusually analogous (either directly or transformationally).
23. Things that are analogous are often homologous as well, and things that are homologous are also often analogous (though these possibilities are presumably the exception rather than the rule).
24. When two or more things are "strongly" analogous but of disparate size, and especially when they share or have shared the same spatiotemporal domain, the possibility exists that they are : in whole or part : directly or indirectly : causally or descriptively : related to one another in either a lineally homological, divergently homological, or (variously) coevolutionary manner.
25. Whenever an analogy exists, it is also apt to be exploitable, or to have technological or other practical value.
26. If similar analogies occur between two things at many levels, the reason may be that the analogies at the different levels are not just similar but identical; or an identical mechanism may be the source of the analogies at the different levels. (Cf. #3.)

The Ideonomic Division
DISCOVERIES

When a discovery is made in science the discoverer usually thinks that what has happened is unique, special, unprecedented, an event that could not have been foreseen or planned for. In good part he is apt to be right in thinking this; but in many ways he will be exaggerating. In a certain sense it is indeed true that "There is never anything new under the sun."

Contributing to the problem nowadays is the failure of our schools to teach history, history in general and the history of science in particular; and the failure to teach it properly when it is taught at all. Instruction in these things is probably regarded as sterile, and the subject taught as though it were irrelevant to the actual conduct of life or doing of science.

This is unfortunate because history can in fact be a most luminous guide to the present, and critical to understanding the meaning and possibilities of developments in science, whether these be of the past, the present, or the future.

All discoveries fall into genera and have a great variety of generic aspects. Thus discoveries have or involve various generic: elements, dimensions, bases, causes, requirements, modes, mechanisms, forms, laws, structures, subvariants, referents, relata, methods, tools, materials, circumstances, effects, importances, implications, differences, commonalities, concepts, sequences, stages, degrees, interrelationships, and ways of being treated by the ideonomist.

In the future course of its development ideonomy should progressively isolate these genera and generic aspects of discoveries, and then go on to define, logically analyze, empirically and experimentally research, explain, schematize, illustrate, delimit, extend, unify, exploit, and promulgate them.

The initially crude "genera" should at some point be transformed into multilevel taxa and taxonomies; not only should genera of discoveries be recognized, there should be species, families, orders, classes, and the like.

Genera of past, of present, and of future discoveries can all play a role in predicting particular and generic discoveries of the future; indeed, all three can be used to predict or say important things about discoveries past (of interest to the historian) and present (of interest to policy-makers, for example).

Discoveries and potential discoveries in one discipline can have important things to tell us about discoveries in any other discipline, even in fields that for all the world would seem to be utterly unrelated or totally different in subject-matter, methods, purposes, or structure, or in fields that would appear 'to speak a different language'.

In a sense it may even be true that all discoveries are in reality but complementary, quasi-finite components of one great composite discovery, or meta-discovery, that is forever being made and remade—or perhaps unendingly assembled—everywhere in time and space and in every field. There are in fact ways in which this must be the case; because of the unified structure of intelligence, for example, and the queer fundamental interdependence of physical nature and the human mind.

Other ideonomic reasons for the interdisciplinary similitude, connaturality, and interdependence of discoveries include the existence and possible importance of such (real or hypothetical) things as: so-called archanalogons, analogical raisons and raison-complexes, meta-analogies,

analogical hierarchies and networks; avatars and panavatars; arch-concepts, generic processes, universal order taxa, myriontologic states, infinite hierarchies (of phenomena, etc); virtuals, hyper-virtuals, higher-order equivalences, and antisyzygies; universal patterns and mega-patterns; quasi-ontological codes, vergences, morphisms and panintertransformations; holonomic groups, systems-of-relations, etc.

Many of the foregoing things, of course, raise extremely difficult questions.

Quite an interesting ideonomic possibility is that there may exist pairs and sets of things (and also of categories of things and discoveries) that, in a relative and possibly also in an absolute sense, can and can only be discovered if they are discovered simultaneously (codiscovered, if you will). To understand why this might be, visualize two patterns so designed psychophysically that they will only be manifest—indeed, will only exist—when they are superposed or combined. Hence in nature there may exist certain [patterns, laws, relationships, phenomena, processes, forces, entities, types of order, events, properties, or even realms] that cannot be discovered independently, or even asynchronously, but can only be codiscovered (indeed, there may even be certain codiscoverable things of this sort that it would be improper to speak of, or treat, as having genuine physical existence prior to—and perhaps thereafter apart from the form, consequences, and 'selectional corollaries' of—their codiscovery).

The set of major and minor discoveries that mankind is continually making may actually be so tautologous that ideonomists could master the generic and repetitive aspects of these discoveries and then construct a sophisticated heuristic organon with an immense power to accelerate panhuman discovery through the systematic anticipation of congeneric species of discoveries, group-theoretic permutations, combinations, and transformations of discoveries, and equivalent discoveries in every field.

The 'chains of discoveries' that have occurred historically should be isolated that we may usefully extrapolate them into the future, or at least use them to steer, excite, or rationalize our further homologous and analogous investigations. The extrapolability of certain progressions would be of particular interest.

Discoveries are known to occur in clusters. Do they also occur in generic clusters? Could past clusters of discoveries in one field be exported to other fields for predictive purpose (as well as moved about within a field)? Could only partially realized clusters—and generic clusters—of discoveries be used to 'cross-predict' discoveries in those sets of fields among which discrepancies exist in what is realized in the clusters of coprobable discoveries?

To what extent could multivariate analysis and multidimensional scaling be successfully employed to do something equivalent with clusters of a statistical, rather than morphological, character (dispersed, polymorphous, and complex)?

Are there certain generic discoveries that are automatic, logical corollaries of other discoveries?

Could the use of discovery-clusters be refined to the point where it would make more sense and be more economical, at least in some research, to invert the burden of proof by initially assuming existence, or the validity of some (cluster-analytic) prediction, and concentrating any concomitant experimentation not upon demonstration but refutation?

"A TABLE OF 150 'UNIVERSAL GENERA OF DISCOVERIES'"

ITEMS ARE TO BE READ: "Generic discoveries of..."

1. Absolutes.
2. Alternatives.
3. Ambiguities.
4. Analogies.
5. Anomalies.
6. Answers.
7. Antisyzygies.
8. Applications.
9. Axioms.
10. Boundaries.
11. Capabilities.
12. Cases.
13. Categories.
14. Causes.
15. Centralities.
16. Circumstances.
17. Classifications (e.g., proper).
18. Clues or signs.
19. Combinations.
20. Complementarities.
21. Complexities.
22. Concepts.
23. Concinnities.
24. Configurations.
25. Connections.
26. Consequences.
27. Constants.
28. Contradictions.
29. Correlations.
30. Counterexamples.
31. Counterparadigms.
32. Defects.
33. Dependences.
34. Dialectics.
35. Differences.
36. Different senses.
37. Dimensions.
38. Discontinuities.
39. Domains.
40. Dynamics.
41. Effects.
42. Elegances or beautiful things.
43. Elements.
44. Equivalences.
45. Equivalents.
46. Errors.
47. Essences.
48. Evidences.
49. Evolutions.
50. Examples.
51. Exceptions.
52. Experiments.
53. Extensions.
54. Externalities.
55. Fallacies.
56. Finites.
57. Forces.
58. Functions.
59. Fundamentals.
60. Generalizations.
61. Gestalts.
62. Greater efficiencies.
63. Hierarchies.
64. Ignorances.
65. Illusions.
66. Importances.
67. Improvements or refinements.
68. Instances.
69. Instruments.
70. Interdisciplinary relationships.
71. Laws.
72. Levels.
73. Limits.
74. Logics.
75. Manners or styles.
76. Meanings (of laws, principles, behaviors, patterns, etc).
77. Means.
78. Measures.
79. Mechanisms.
80. Mediums.
81. Metapatterns.
82. Methodologies.
83. Misconceptions.
84. Models.
85. Modifications.
86. Needs.
87. Negatives.
88. Neglects.
89. Neighborhoods.
90. Niveaus.
91. Nullities or anontology.
92. Omissions or plenology.
93. Opportunities.
94. Opposites.
95. Origins.

(CONT.)

After those remarks on the pure ideonomy of DISCOVERIES, let us turn to some of the possibilities for applied ideonomy within the division.

The divisional lists "Universal Genera of Discoveries" and "Alternative Bases of Discoveries" could be intersected to produce an 11,250-dyad idea-space entitled "Alternative Bases For the Occurrence of Genera of Discoveries; A Tabular Organon For Anticipating Possible Discoveries About Arbitrary Phenomena". Let us try this (the table of the idea-space will perforce be left virtual).

Our iterable ideogenetic formula could have the implicit form:

> "What (generic) discoveries of {of or re} [UNIVERSAL GENUS OF DISCOVERY {name of one}], re {re or of} the [{SUBJECT ADJECTIVE}] phenomenon [PHENOMENON OR TOPIC {name of one}], might occur with [ALTERNATIVE BASIS OF DISCOVERY {name of one}] as the {the or a} (⟨contingent or necessary⟩ ⟨fungible or quintessential⟩ ⟨partial or general⟩) basis {basis, means, or mode} of discovery?"

An example of an ideocombinatoric sentence generated by this formula reads:

"What (generic) discoveries of [1]FALLACIES, re the [2]ZOOLOGICAL phenomenon [3]ANT SLAVERY, might occur with [4]GUESS as the () basis of discovery?"

Permuting and reducing this to a semi-schematic form for ease of visualization (as will also be done hereafter):

⟨ (1) Ant slavery → Fallacies → Guess ⇒ ? EDUCTIONS;
PHENOMENON GENUS BASIS

(2) Ant slavery → Fallacies → Comparison ⇒ ? EDUCTIONS. ⟩
PHENOMENON GENUS NEW BASIS

Substituting a new "alternative basis of discovery" gives sentence #2.

Many potentially discoverable fallacies regarding ant slavery do indeed come to mind. Thus it might conceivably be learned one day that: [1]"Slave" species trick (in life) [2]or tricked (in paleoevolution) their ant "masters" into adopting them, [3]and perhaps slavocratic adaptations in the latter. [4]The evolutionary antiquity of the institution of ant slavery need not be identical to the anciency of enslavement of the slaves; enslaved species may have changed [5]or rotated over time. [6]If ants and their slaves are mutualists, the benefits of the partnership may nevertheless be unequal, [7]and it may be the formicine owners and masters who have gotten the shorter end of the stick. [8]The relationship might be metastable in the sense that an evolutionary 'revolution of the proletariat' might invert it in the future. [9]The slave species may serve two masters—[10]or the ants themselves be enslaved—if the gardened fungi are the invisible, real masters, having taken the original evolutionary initiative, either through self-modification or induced adaptation of the quasi-superior animals. (The list could easily be extended.)

To actually make explicit the fallacies that are implicit in the foregoing: Fallacies of treating slavery, mastery, or a relationship as absolute, final, symmetric, asymmetric, irreversible, circumscribed, simple or unidimensional, what it appears to be on the surface, irreducible, continuous, noncommutative, etc; Fallacies of taking and using words too literally and unthinkingly; Fallacy that there can be but one master—or that a master can have no master of its own, a slave no slave; Etc.

(NB: Ant slaves are often species of ants!)

(CONTINUATION OF TABLE)

96. Paradigms.
97. Paradoxs.
98. Partitions.
99. Patterns.
100. Permutations.
101. Phenomena.
102. Potentialities.
103. Principles.
104. Problems.
105. Procedures.
106. Proofs.
107. Properties.
108. Quantities.
109. Questions.
110. Realms.
111. Recurrences.
112. Reductions.
113. Refutations.
114. Regimes.
115. Relationships.
116. Relativities.
117. Representations.
118. Resources.
119. Rules.
120. Scales.
121. Simplicities.
122. Simplifications.
123. Solutions.
124. Spaces.
125. Specializations.
126. Structures of (relevant) disciplines.
127. Subfields.
128. Subtleties.
129. Synergisms.
130. Syntheses.
131. Taxonomies.
132. Techniques.
133. Tests.
134. Thresholds.
135. Traces.
136. Transcendents.
137. Transformations.
138. Types.
139. 'Ultrafundamentals'.
140. Uncertainties.
141. Unities.
142. Universals.
143. Uses.
144. Values.
145. Variables.
146. Variants.
147. Virtuals.
148. Wholes.
149. Wisdoms.
150. World views.

In sentence #1, the basis of the discovery of ant slavery fallacies is taken to be a "guess". The general meaning of guess was left undefined. How might this alternative basis of discoveries apply to the various specific fallacies and generic aspects of fallacies, regarding ant slavery, that I proposed in my largely illustrative pair of lists? Space permits only a few, bare suggestions.

Reasons why a guess might initiate or form the basis of such discoveries include: [1]Because "ant slavery" is such a distractingly and lullingly charming name for a phenomenon; [2]Or a sufficiently puzzling name that one's first (and only) act of attention is apt to be simply toward figuring out its rationale—the general nature and complex particulars of what it means; [3]The assumption that a thing is absolute is a common, if not even a universal, fallacy (indeed, the making of which is apt to be and remain unconscious); [4]There are numerous types of fallacies that in general are so common that they are almost habitual, and there are others that are habitual in recurring types of circumstances; [5]The possibility of certain fallacies is worth considering at once because they are so easily checked, by means of simple reasoning or corollaries, existing data, or elementary experiments or inquiries; [6]The perpetration or possibility of certain fallacies calls attention to certain other fallacies, as also being probable, possible, or necessary; [7]Certain other fallacies are worth considering at once because their logical qualities are such as to make them a useful preliminary to the consideration of fallacies in general or to particular series of fallacies (or to the branching tree thereof); [8]Experience or pure logic may suggest that, in general, certain fallacies or kinds of fallacies are quite apt to be associated with all or kindred instances or forms of biological enslavement or symbiosis; [9]Even more generally and radically, certain fallacies may have a tendency to occur in connection with the totality of biological and extra-biological phenomena that merely bear some order and form of analogy to biological enslavement or symbiosis, without actually—or in any way—being instances of same; [10]Simply making a guess is a good way of probing and testing oneself, or one's ideas in general (although this is really a universal reason for guessing the existence or possibility of fallacies); [11]Similarly, a guess may be all that is really possible in certain circumstances.

The broad-arrow symbol: "➡" :that is used in the schematized form of the ideocombinatoric sentences simply means, and should be read, "implies or suggests".

The universal ideonomic symbol: "ƨ" :signifies "What?" or "Means what?".

By "eductions" (etymologically, "acts or processes of leading forth or drawing out or the results or products thereof") are here meant, in general, "ideas deduced, induced, suggested, or imagined—educed, in a word—from something else; or latent, potential, or undeveloped ideas, data, or possibilities that have been and/or might yet be brought forth—or given a more manifest, active, definite, or finished form".

The new basis for the discovery of fallacies regarding ant slavery, "comparison", which by replacing "guess" produced the ideonomic sentence #2 above, clearly represents both a valid and a good basis for the making of such discoveries.

"A TABLE OF 75 'ALTERNATIVE BASES OF DISCOVERIES'"

1. Accident (serendipity).
2. Analogy.
3. Analysis of statistics.
4. Analytic perception.
5. Attempt to disprove something.
6. Axiomatization.
7. Calculation.
8. Careful observation.
9. Classification or attempted classification.
10. Combination or synthesis of different approaches.
11. Commonsense reasoning.
12. Comparison.
13. Comprehensive instrumental monitoring.
14. Computer simulation.
15. Conception and application of new principles.
16. Conjecture.
17. Consideration or exploration of extreme and limitary cases.
18. Convergent thinking.
19. Correlations (intercorrelations and autocorrelations).
20. Creation and use of new instruments.
21. Critical thinking.
22. Deduction.
23. Definition of terms.
24. Deliberate construction of new [phenomena, entities, processes, relationships, interdependences, patterns, wholes, &vc].
25. Deliberate introduction of [perturbations, disturbances, complications, stresses, &vc].
26. Divergent thinking.
27. Elimination.
28. Enlarged or widened experience.
29. Experimentation (cf. #63, #71).
30. Exploration of critical elements or ranges.
31. Exploration of new [regimes, domains, situations, conditions, sequences, arrangements, 'protocols', &vc].
32. Extension (to other areas, phenomena, cases, etc).
33. Gambling.
34. Gedankenexperiments.
35. Generalization (conceptual).
36. Guess.
37. Heterogeneous combinations [of things, phenomena, ideas, systems, processes, laws, &vc].
38. Hypothesis.
39. Increased control or its pursuit.

(CONT.)

(I noticed afterwards)
α: As much is implied by Darwin: see Origin of Species, ch. VII, § "Slave-making instinct"!

Among the reasons why an act or process of comparison might facilitate the discoveries are: [1]Because a comparison of the practice of slavery in ants and men might uncover an unexpected degree and diversity of similarity and commonalities, with the implication that fallacies may likewise have some tendency to carry over heuristically; [2]Like comparisons of slavery practiced by animal families other than Formicidae and Hominidae, or by different ant taxa, might likewise suggest that fallacies are generalizable; [3]Studies of the nervous systems of both ants and the species ants enslave, and of the potential neural bases for the evolution of behavior in both, might provide a priori reasons for expecting any form of interspecific enslavement to be or become reciprocal, at least virtually and in part[α]; [4]Detailed comparison of the genomes of ants that enslave and of the insects they enslave, and of the genomes of these insects and of their nearest and next-nearest nonenslaved relatives, might uncover such subtle but massive 'subversion or domestication' of the genomes of slaves by the genomes of enslaving ants (presumably involving processes of gene infiltration and coevolution on the basis of the only recently recognized phenomenon of lateral gene flow) that a fallacy would be revealed in the traditional perception of the taxonomic proximity or identity of an enslaved insect to its superficially nearest relative (in other words, it might be learned that "fine" and "small" genetic differences are not synonymous, and that the proper measure of genetic distance between organisms is either multilevel [holohierarchical] or indeterminate [irreducibly multivalent]); [5]Comparisons of forms of ant-associated slavery, parasitism (ectoparasitism and endoparasitism), synoecy, symbiosis, symphily, synecthry (myrmecophily), caste-specialization, social parasitism, and phytophily might bring to light potential fallacies both in assimilating and in differentiating ant slavery; [6]Comparisons of ant slavery and caste-differentiation might imply that it is fallacious to homologize—or else to not homologize—them; [7]Comparisons of two colonies of the same species, or of a colony with itself at very different points in time, might lead to the discovery that it is a fallacy to treat the maintenance of the colony as always requiring ant slavery (in those species where the latter has been viewed as obligatory); [8]More careful scrutiny of slavery might show that it is actually a complex phenomenon with many semi-distinct elements, and comparison of these elements might reveal contradictory behavior, making it a fallacy to treat slavery as a single, unified phenomenon with an asymmetric description; [9]Comparisons of ant slavery with analogous aspects of purely physical or mathematical phenomena might suggest that there is a fallacy in interpreting the former as necessarily being as complex, peculiar, and improbable as it seems or has been taken to be—and as therefore perforce an example of biologically inherited and controlled behavior—since evidently there are simple mathematical, physical, or cultural mechanisms that would suffice to produce it.

All of the foregoing myrmecological eductions were of course produced by someone who is merely an ideonomist and who knows almost nothing about ants or ant slavery. A myrmecologist trained in ideonomy, or simply availing himself of its elements, could be expected to do a much better job of it. What I have written was not really meant for this specialist at all. Rather it was intended to illustrate in a casual way how ideonomy might go about considering possible discoveries concerning things, and the way in which a single pertinent ideogenetic formula might work.

(CONTINUATION OF TABLE)

40. Induction (formulation, refinement, or application of new laws; cf. #35).
41. Intuition.
42. Jiggling of parameters.
43. Logical analysis.
44. Logical synthesis.
45. Measurement.
46. Method of 'negation and reconstruction'.
47. Model construction, analysis, and testing.
48. More complete description.
49. Multidimensional (or more multidimensional) analysis.
50. Noticing of [omissions, neglects, untried approaches, unasked questions, arbitrary assumptions, errors, fictions, irrational biases, illusions, communal idiosyncrasies, anomalies, dissonances and discrepancies, overlooked or unresolved problems, interpretational and representational ambiguities, &vc].
51. Obvention.
52. Optimization of parameters (cf. #42).
53. Passage of time and natural changes.
54. Patience.
55. Persistence.
56. Progressive constraints.
57. Pursuit of exceptions.
58. Reduction.
59. Reexamination or retesting.
60. Reexploration or integration of existing knowledge.
61. Refinement of accuracy or precision.
62. Reformulation or restructuring of one's ideas.
63. Repeated trial and error.
64. Research program.
65. Search for an equivalent.
66. Self-analysis and self-criticism (cf. #21).
67. Strategic and tactical thinking.
68. Substitution or interchange of elements.
69. Systematic exploration of (all) alternatives; many lines of inquiry and contrasting approaches.
70. Teamwork.
71. Test.
72. Theory.
73. Toil.
74. Trained or expert judgment.
75. Unconventional thinking.

Let us now go on to an entirely different ideocombinatoric sentence that was produced by the very same formula:

(3) Pain → Hierarchies → Progressive constraints ➡ ? EDUCTIONS.
PHENO- GENUS OF BASIS OF
MENON DISCOVERY DISCOVERY

Can there be hierarchies of pain? Most certainly! Different pain receptors in the body may form a hierarchy. Peripheral and central nervous system fibers bringing neural impulses from algetic stimuli to the brain form a structural and dynamic hierarchy; at all levels there are feedback loops and these constitute a hierarchy. The brain receives, processes, and responds to pain in more than a score of brain regions that have different functions, and these are hierarchic; the mechanisms by which the brain treats pain—the ways it does this—are complex and hierarchic. Neurohormones and neurotransmitters that mediate, modulate, process, and respond to pain have recently been discovered, and it is a reasonable conjecture that there exists in the body a large hierarchical system of neurochemicals relating to pain. Certain hierarchies related to pain may feed back into and interact in a complex way with the genome. The phylogeny of algetic systems represents a hierarchy that we have already begun to delineate. Known and as yet undiscovered psychopharmaceuticals useful in the treatment of pain embody a hierarchy of families of chemical species and congeners, which relate in turn to hierarchies of effects, processes, and interactions.

Could these hierarchies be discovered specifically on the basis of progressive constraints? Again the answer is yes! The route to their discovery might variously be that of the systematic examination and elimination of alternative possibilities and of a convergence upon ever fitter candidates (in the case of any of the hierarchies I have listed); that of the rediscovery of progressive constraints imposed upon incoming algetic or general sensory stimuli by the nervous system at successive levels, say by filtering, coding, and the transformation of impulses; that of the progressive imposition of reciprocal theoretical and experimental constraints by rival theories of pain in the course of the future; that of the progressive forcing of the biochemical machinery of pain into a series of discrete steps, systems, and laws arranged in a regulatory hierarchy; or that of theory gradually constrained to the necessary discovery of unique and complete truth by the growth of empirical and fundamental knowledge.

Here is another sentence, equipped with a pair of possible bases for the occurrence of discoveries:

(4) Meteor swarms → Different → [1]Method of 'negation & ➡ ? EDUCTIONS.
PHENOMENON senses [2]reconstruction';
(astronomical) GENUS OF [2]Analogy
DISCOVERY BASES (2) OF DISCOVERY

The two bases can either be used as perpetually fungible options or as dyadic cobases.

Several alternative eductions of this sentence occur to me at once:

1. If "meteor swarms" are the phenomenon, "different senses" are to be the genus of the discovery, and the discovery is to be made on the basis of an "analogy", then perhaps dust storms [*à la*, related to, or associated with] meteor swarms are discoverable [that are either novel in themselves or such that their consideration might give rise to novel thoughts or to discoveries]?

2. If the basis of the stipulable discovery is changed instead to "method of 'negation and reconstruction'", one might wish to consider possibilities arising from the negation, in some sense, of the obedience of meteor swarms to Kepler's law. Perhaps dust, gas, fiber, or cottony clouds exist within the solar system [*à la*, related to, or associated with] meteor swarms save that they are so extraordinarily light [owing to the low density, minimal size, or queer ultrastructure of the particles of which they are made] that the force dominating or controlling their [dynamics, distribution, behavior, structure, and properties] is not gravitational but the corpuscular, electromagnetic, magnetic, or electrical effluxes, currents, or fields of the sun?

3. If on the contrary one tries to imagine the heuristic implications of negating the very motion of meteor swarms, the possibility occurs to one that there might exist meteor swarms, or analogs thereof, that are either immobile relative to, or else in geocentric motion about, the earth. They might resemble an atmosphere or circumplanetary rings, or be associated with earth's electrosphere, magnetosphere, or LaGrangian libration points.

4. That negated might be the temporal or 'spatiotemporal' continuity of meteor or 'meteor' swarms or 'swarms'; swarms might be postulated that are not always together or 'existing', or whose very identity changes over time or is protean. Might there be swarms (systems) of swarms that are 'leaky' or that involve a constant interchange of swarms over time? Might there be swarms that periodically come together as diffuse, or as 'different', swarms in different (coplanar or non-coplanar) orbits? Both known and speculative mathematics would allow the existence of some extraordinarily complex and contraintuitive (stable and unstable) orbital motions and systems of motions.

Still another sentence:

(5) Palingenesis → Equivalents → Intuition ➡ ↻ EDUCTIONS.
PHENOMENON GENUS OF BASIS OF
(biological) DISCOVERY DISCOVERY

Biology has yet to decide whether the hypothetical phenomenon of recapitulation is real, or the extent, way, or reason why it may or does occur; certainly it has yet to describe the latter, especially in subhuman, and the simplest, creatures.

Here are some of the possibilities I would educe from, or use to justify, the aleatory triadic sentence:

Palingenesis is almost always considered in terms of anatomy alone; but equivalents could be discovered—intuition suggests—in physiology, histology, cytology, or biochemistry. Presumably the basis of this intuition is the absence of any logical or intuitive reason why palingenesis should be specialized as an exclusively or even predominantly anatomical phenomenon.

[2]Palingenesis is usually defined somewhat arbitrarily as the recapitulation during development of phylogenetic progress. But might it also 'reproduce', on occasion or to a degreee, a bit of regression that took place in the immensely long course of phylogeny? One would have thought it unlikely that the complete phylogenetic lineage of any modern species, including man, could have been free of all traces of catagenesis. The standard monotonic picture of evolution seems dubious indeed. Forms, senses, and degrees of [relative and absolute] catagenesis—as well as of [sustained and unsustained] lineal deviation and "paragenesis" (defined as pathological evolution)—are more likely to have been extremely common or even 'half of what happened'. Conversely, recognized examples of catagenesis may not have been as permanent as has been supposed. May atavism represent the postulated catagenetic palingenesis rather than strict reversion to atavi, at least in some cases? The ontogenetic basis of such palingenesis might be either deterministic or probabilistic, and the same applies to the phylogenetic basis of the catagenesis; probabilism would mean that the catagenesis seemingly recapitulated might actually represent other catagenetic—previously diverged or merely 'convergent'—lineages, or even 'catagenetic' patterns that never took place at all.

[3]Does palingenesis vary in the bionts of a species in a way that reflects the actual and possible phenotypal expressions of the actual and possible polymorphisms of the species? If so, how diverse is the palingenesis that results; and to what extent does or may it recapture the inspecific and specific diversity and range of the recapitulated or re-imaged species or lineage; and to what extent, if any, might it even revive or simulate the very polymorphisms that characterized the extinct species or lineage? And again, might that 'recapitulated' even include separated phylogenetic branches and the forms and possibilities of evolutionary branches that became possible but were never pursued?

[4]Does ontogenesis include anything like the palingenesis of 'unevolved' instantaneous pluripotentialities (plasticities)?

[5]Might there be palingenesis of evolutionary exoadaptations, too?

[6]Might ontogeny recapitulate some of the basic problems of evolution or phylogeny, or at least aid their decipherment?

[7]Might ontogeny repeat the phylogeny of ontogeny itself (say quasi-homeochronously)?

[8]Does ontogeny also palingenetically reproduce some of the erratic, saltatory, 'macromutational', or 'macroevolutionary' behavior of phylogeny? (Some evolutionary jumps may have represented programmed transiliences, transformations, 'oscillations', hierarchical oscillations, or relaxations.)

[9]Might the same process of natural selection as operated in phylogeny also operate in ontogeny, and do so as the cause and/or effect of palingenesis?

[10]Does PHYLOGENY ALSO 'REPRODUCE' ONTOGENY, say in such a way or for such a reason that clues as to the former might be read from the latter?

[11]Might genetic processes or genomic structure recapitulate evolution —fractally, say—as a discoverable equivalent to palingenesis?

Intuition could easily assist with the actual discovery of any of these diverse possibilities in a variety of ways and by a variety of means: It might link together seemingly unrelated facts in mysterious ways, to produce a testable prediction; It might recognize analogies or parallels in everyday experience that support the equivalent of everyday conclusions, in a very different realm; It might apprehend serious errors common to all would-be

objections to the discovery; It might realize that some of the (listed or unlisted) equivalents of the discovery are also mutually equivalent; It might sense that palingenesis is actually a complex or specialized example or manifestation of a much simpler or more universal phenomenon; Etc.

→ nMDS TASK: The 32or35 balloons (ideas) on this chapter's IdeaTree (vide) might be mapped experimentally via Triadic nMDS via some such Scaling Relation as "Cognitive \ Logical Derivability (Distance)". Partly to see if — or to what degree — [maps or cluster-analytic dendrograms] mimic the original IdeaTree!

APPLICATIONS
\ TREES
\ Ideography
Ideogram
Dendrogram

"ALLANTO-FOOD : SAUSAGE FOOD"
An Illustrative Idea Tree

Ideograms are special diagrams depicting relationships among ideas, and one form of ideogram is a dendrogram (or tree diagram). The most familiar example of a dendrogram is the family tree (showing either the kin relationships of a human family or the phylogenetic relationships of other species).

Dendrograms are among the most useful and important ideonomic diagrams, yet as of the time of writing (1988 D 13) few have been created within the Ideonomy Project.

"An Idea Tree" (see accompanying figure) resulted from an attempt to elaborate on paper the complete sets of discrete and important ideas that branched forth from the progressive study of a mechanically coined word and concept.

In preparing a chart meant to name the subjectively best set of ideas —in any subject and of any sort—that were generated in the previous five-year course of the Ideonomy Project, I felt it important to include ideas that were created purely through random combinations of words or concepts. I therefore pulled a computer printout with such ideas from the huge pile of such printouts that I have.

The printout that emerged from the stack was titled "The Word Spring (Words Coined By Ideonomy)". The printout was a random and unwinnowed sample from a set of about half-a-million ideas (or more precisely, half-a-million ideonomic propositions, so-called, representing half-a-million dyadic combinations of two sets of primary "terms"). To produce this collection of possible ideas, ninety nouns (such as animal behavior, attitude, blood type, and book) were comprehensively prefixed with several thousand prefixes that I had formed from Ancient Greek words.

The first page of the printout listed fifty-six coinages, or about 1/10,000th of the entire set of combinations. I was surprised to find when I examined this tiny sample that there were at least six coinages or propositions that struck me as probably being sufficiently important that they merited inclusion in the chart I was making. Six represents 11% of fifty-six, or one item in nine.

I should explain what I mean by an item being important. I had earlier analyzed the first page of the printout to see what interesting possibilities its different items had the ability to suggest to me. I had annotated the items with these possibilities. I was not able to think of plausible or important possibilities for each item, but I was often induced to record two or more possibilities in connection with a given item. Items to which I assigned at least one important possibility—and whose importance equaled the standard of my chart—are the "important" ones I have in mind here.

"Allanto-food" was one of the six items judged so important and one of the fifty-six items on page one. Presumably there were of the order of 50,000 other items of roughly equal (and often of even greater) intrinsic importance in the half-million set; although of course there must have been substantial degeneracy in that set.

The computer was programmed to automatically define the neologisms it advanced, and the meaning of allanto-food was given as "sausage food". Allanto- is a prefix derived from the Ancient Greek masculine nouns allas and allantos, translated as "sausage". I had originally included this prefix in my list of prefixes because of its ability to signify that a thing has a sausage-like or cylindroidal form. The ideonomic division Forms and Morphology has a need for such a combinatorial element.

The idea tree that is reproduced in this chapter was developed in "real time". That is, most of the thirty-six or so discrete ideas contained in its balloons were recorded on the chart virtually at the instant they appeared in my mind for the first time. Of course, this was not always possible (in part because of the parallel and exponential branching of the diagram, and in part because of the tendency of the diagram's side-branches to interact or to suggest analogous ideas in other branches already separated by one or more divergences).

The reasons why the project spawned so few idea trees earlier may have been several. One reason was probably my neurotic perfectionism: I was no doubt afraid to attempt to create things that I regarded as being so central to ideonomy. Crude trees would have horrified me.

Another reason must have been that I was like everyone else in our culture in never having been trained to consciously see the unfolding structure of my thought, much less to actually record it as it emerged. Consciousness of the patterns of one's thoughts can disrupt them. An attempt to monitor one's own thinking can interfere with the natural course of same or foster illusory impressions about its structure, content, and mechanisms.

I had no experience in thinking in a rigorously arboreal fashion.

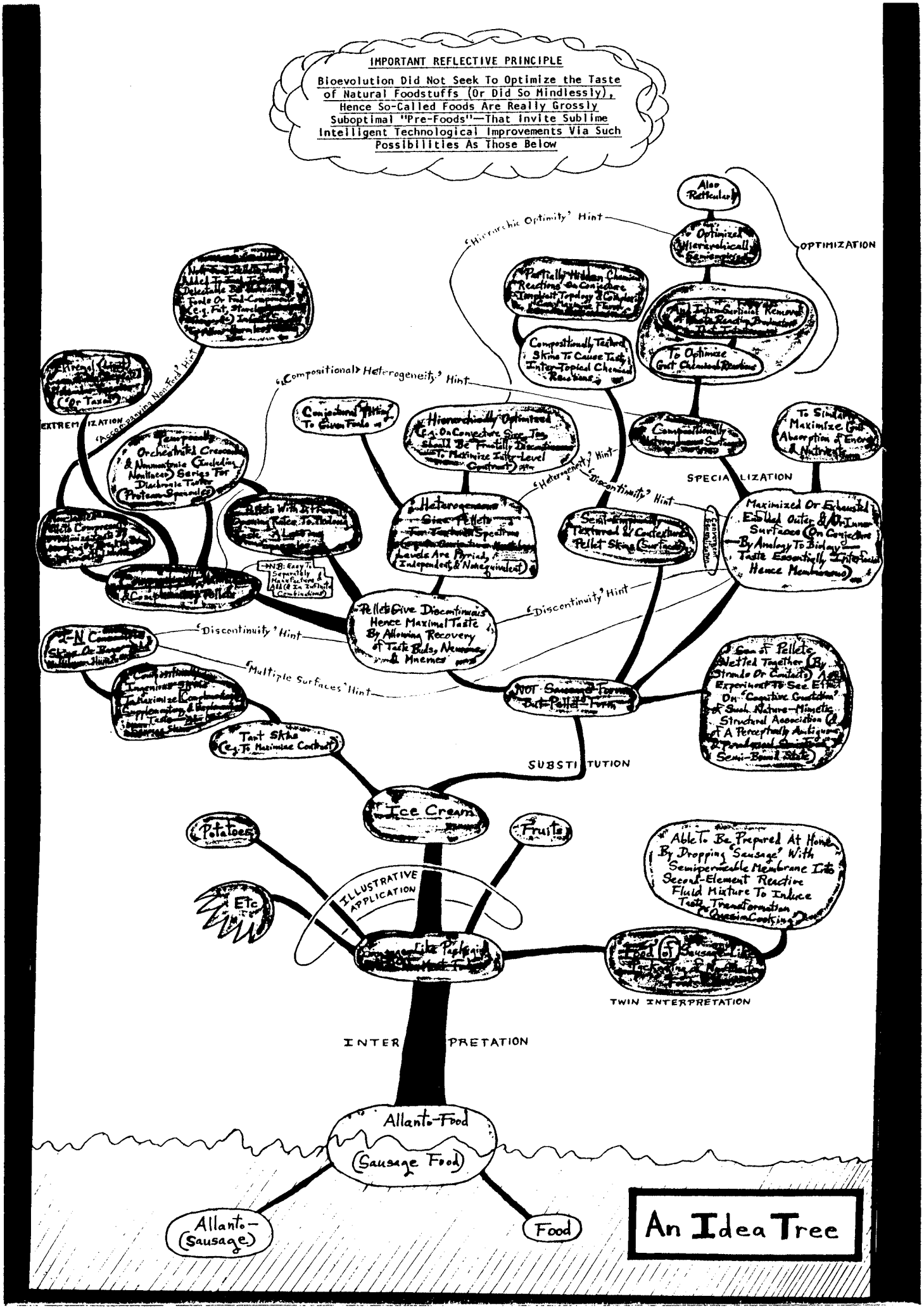
Yet the major reason for my neglect of dendrograms must have been the sheer magnitude of the Ideonomy Project and the incredible variety of tasks it gave me. Probably, had it not been for that burden, I could have made myself into an accomplished forester.

The idea tree that is the theme of this chapter would have been much easier to create with the aid of an appropriate computer program, rather than with the pens and paper I was forced to employ instead. The ideal might be a computer system that would enable one to construct a dendrogram by instructing the computer vocally and by pointing to the screen to choose items from hierarchical menus and to insert entries at particular points in space and move them freely about. Such a system would also automatically adjust spatial relationships to make them proportionate or symmetric, permit instantaneous corrections and editing, change the scale of what was shown over a hierarchy of many scales (or sizes of features), allow the introduction of special characters, symbols, and designs, highlight the recurrences of certain words (or even certain concepts or relationships), variously quantify items, etc.

I will now discuss the "Allanto-Food : Sausage Food" idea tree at length, or with respect to all of its entries.

As I have remarked already, the tree has two roots, which are named in the underground balloons Allanto- (Sausage) and Food. These converge at ground level to produce the base of the tree, identified by the cormoid balloon Allanto-Food (Sausage Food).

The last, however, could be interpreted in many alternative ways, creating a tree with multiple trunks. In the diagram I apply a unique interpretation, as the balloon Sausage-Like Packaging of Non-Meat Foods (up one). What I had in mind here was not the vegetable sausages that have been in our stores for a generation, but rather foods not mimicing meats at all.


IMPORTANT REFLECTIVE PRINCIPLE
Bioevolution Did Not Seek To Optimize the Taste of Natural Foodstuffs (Or Did So Mindlessly), Hence So-Called Foods Are Really Grossly Suboptimal "Pre-Foods"—That Invite Sublime Intelligent Technological Improvements Via Such Possibilities As Those Below
'Hierarchic Optimity' Hint
OPTIMIZATION
'Compositional Heterogeneity' Hint
'Heterogeneity' Hint
'Discontinuity' Hint
SPECIALIZATION
'Discontinuity' Hint
'Discontinuity' Hint
'Multiple Surfaces' Hint
SUBSTITUTION
ILLUSTRATIVE APPLICATION
TWIN INTERPRETATION
INTERPRETATION
Ice Cream
Potatoes
Fruits
Etc
Allanto-Food
(Sausage Food)
Allanto-(Sausage)
Food
An Idea Tree

Before I discuss these, I should mention that in the first branch to the right I do in fact offer a second interpretation of the base of the tree, but I offer it in sequence with, and hence as something visualized as combined with, the first interpretation. The balloon 'FOOD' (OF) Sausage-Like Packaging of Non-Meat Foods simply represents the initial and purely formal reinterpretation of the base (a recognition of the alternative surface meaning of the base's words, in other words), whereas in the following balloon this general concept or preconcept is given a more exact, particular, and practical meaning: Able To Be Prepared At Home By Dropping 'Sausage' With Semipermeable Membrane Into Second-Element Reactive Fluid Mixture To Induce Taste Transformation — ("Quasi-Cooking").

The second-element reactive fluid mixture, in other words, is a metaphorical 'food' that is 'eaten' by the first-element content of the quasi sausage. The inspiration for this idea was in part those commercial glues that consist of two fluid parts that are to be combined at the moment that cementation is to be induced.

Foods are often very unstable and their peak and proper flavor very brief, and the human sensorium may even be discriminatory of some ideal moment that is intrinsically instantaneous. The preparation of foods, moreover, is often messy, complex, and sacrificially variable.

What the balloon proposes could answer many of these problems (and opportunities).

That suggested might almost be like 'raising' a different kind of foodstuff.

If cooking improves taste by creating some transient high-energy chemical states, bi-element food systems might supply equivalents in other ways.

This lower-right branch of the tree was added to the tree as an afterthought, at a time when I was checking to see whether the base of the tree was polysemous or open to radically different interpretations.

Four other branches issue from the same node of the tree as this branch, but are concerned instead with suggesting some of the different kinds of familiar foods that might be encapsulated in such a sausage-like edible container or wrapping. These branches are named by the balloons Fruits, Ice Cream, Potatoes, and Etc.

Of course fruits and potatoes have their own natural skins or containers, but the latter are often flawed. Artificial exteriors could provide many new tastes and other gastronomic qualities, and give other advantages. Taste could be made more reliable and perfect, storage, handling, and cooking qualities could be improved, appearance could be enhanced, and odd nutritional shortcomings could be eliminated. Complementary tastes and textures of other foods could be added (though here I anticipate other parts of the idea tree).

The exteriors of many fruits and vegetables are inedible, unpalatable, or toxic. Often they are a nuisance in the preparation of food.

As for Ice Cream, that is the branch from which all of the rest of the tree derives. My reason for focusing upon ice cream was in part the shock that the idea of manufacturing it in sausage-like form gives.

But the notion may actually make surprisingly good sense.

Ice cream could be enclosed in edible, thin casings that would shatter or dissolve as soon as an ice cream sausage entered the mouth or was bitten into.

Sealed in such wrapping, the ice cream could be either more fluid or harder than is otherwise the case or possible. Especially fluid ice cream in a balloon might have some novel appeal or suit certain flavors. Some people (I am one) prefer their ice cream to be as hard as possible, but normally such hardness is limited by the practical difficulty of removing rigid ice cream from the carton.

Ice cream in the form of little 'sausages' could simply be shaken or poured from the larger container.

A principle that can be tentatively advanced is that the gastronomic sensorium delights in asymmetric, contrasting, and paradoxical qualities and relationships in foods—universally or often—and in the maximally general or meaningful combination of same (defining some 'positive volume' in an N-dimensional space). It may even, in these terms, include a radical sense of humor. (Cognitive humor may have had an earlier evolutionary origin in pre-cognitive sensorimotor forms of humor, or in the internally 'humorous' life of e.g. bacteria; and indeed, mathematical or logical equivalents of jokes and laughter may even exist—wholly unrecognized—in the realm of physical nature. At the limit, much of what seems funny may be funny, or manifest comedial laws of the cosmos.)

To the extent that the foregoing principle is valid, it can be used to steer the future development of new and better foods, which e.g. might be made to incorporate maximal numbers of paradoxes in maximally paradoxic ways, or in meta-structures of paradoxes.

(Validation of such a principle would also justify its extension to the experiences, pleasures, and beauties of all the senses.)

A long and smooth morsel of food presents a paradox. Rounded and closed, it yet extends longitudinally elsewhere, and defies the spherical stereotype of food morsels. Consumed at one end, it can endure unaltered at the other end. Its willed and unwilled movement in the oral cavity strains the laws that usually govern such movement.

A "line clump" crisscrossing of ice cream sausages in the mouth—rupturing unpredictably at odd points—could seem deliciously bewildering to a gastronome.

If we take first the left branch from the Ice Cream balloon we encounter Tart Skins (e.g. To Maximize Contrast). Here the principle postulated above comes into play, as it will repeatedly throughout our tour of the idea tree.

My artistic sense suggests that tart skins in ice cream sausages might be transformed into an exalted experience if they were twisted in appropriate shapes throughout the sausage and made foam-like or sponge-like (with the relevant parameters semiempirically coadjusted).

Ice cream is cold, thick, and plastic, whereas the tart skins would be 'hot', abrupt, continuous, and thin.

Tart skins suggested to me the next balloon, Compositionally Ingenious Skins To Maximize (Complementary, Supplementary, and 'Explementary') Taste —à la Meat-Sausage Skins.

In the old art of sausage-making, the skins were made from the animal and carefully cured and spiced. They represented high art and were a key part of the sausage. The skins of modern sausages are artificial and yet artless.

The thinness and small relative mass of the skin creates an illusion that it is less important than it really is. It is the skin, for example, that greets the tongue when the sausage is lifted into the mouth, and, in effect, introduces the rest of the sausage. The sausage's skin may be as important as a man's dress.

The brain may have some inborn or fundamental concepts of exteriority and interiority, of containment, of a boundary, of a division, of a 'cell', of a unit, of a part, of ownership, or the like, and such archetypical concepts may be what mainly trigger and structure gastronomic perception. Sausage-like food and the skin thereof may appeal to such instinctual 'words and grammar'.

Taste may be chain-like, defined by the accidental or necessary order of some series of physical events, sensa, percepts, or concepts.

The skins of ice cream sausages might be given qualities complementary to that of the ice cream: such as the taste, texture, and appearance of the skin or rind of various fruits; crunchiness, crumbliness, or crispness; oiliness; clear wetness; true iciness; etc.

An edible thick skin that was an extreme thermal insulator might enable cold ice cream to be eaten with a contrastingly hot exterior (from prior heating in an oven).

I ended this branch with the balloon 2-N Concentric Skins Or Bags—à la Multilayer Human Skin. Ice cream sausages could have multiple skins-within-skins. The successive skins could have the same or many different—contrasting, complementary, or series-like—tastes (or gastronomic properties). There could be liquids between the skins, and even different flavors of ice cream.

Many pastries, and other foods, exploit such stratification.

As we shall see below in connection with another balloon, the discontinuous or periodic sensory stimulation that results from such lamination could maximize taste by allowing receptors, or other elements of the sensorium, to recover. Moreover, it could augment taste in another way, by enabling cyclical recruitment in sensory cells and neuronal networks. Discontinuous and periodic stimulation (in time and/or space) recognizes the naturally digital (or quasi-digital) character of the nervous system and probably of other or all types of bodily systems; the arithmetical and symbolic nature or side of such systems, in other words.

It is important to mention that many of the ideas that I discuss in this chapter, or that are named or implied by the idea tree, are known or are apt to have realization—total, partial, or analogical—in already existing foods or in nature. Little attention has been called to such things and possibilities, however.

The remainder of the idea tree—representing the majority of its balloons—derives from the right upward branch of the Ice Cream balloon, or from the balloon NOT Sausage-Form But Pellet-Form.

What happened here is that the initial or basal idea of putting non-meat food in sausage form led onto, or was sublated as, the idea of putting food in the semi-analogous form of pellets, so-called, by which I mainly meant aggregated spheres or microspheres (although in animal feeding the word "pellets" refers to small cylindrical chunks of food, à la the abandoned 'sausages').

Such orthogonal or associational branching, or metamorphic avatars, are common in thought and ideogenesis, or an altogether natural and desirable phenomenon in both pure and applied ideonomy.

Of course much of what will now be proposed for pelletized food would be no less applicable to 'sausaged food'.

I will touch on the remaining, upper levels of the tree in counterclockwise order, starting with the rightward balloon Sea of Pellets Netted Together (By Strands Or Contacts) As Experiment To See Effect On 'Cognitive Gustation' of Such Nature-Mimetic Structural Association (And of A Perceptually Ambiguous and Paradoxical Semi-Free, Semi-Bound State).

I merely propose this idea as an experiment because I am very unsure what ice cream or other food in this form would be like and about whether it could really be appealing. But there might be a gastronomic niche for it, especially if the principle that human taste basically prefers or seeks some sort of maximally diverse, complex, and large qualitative space—and pleasures in surprises, paradoxes, asymmetries, 'incongruities' (or contrasts), etc—is valid (or in the measure to which it is valid).

That proposed finds exemplification or analogy in such extant foods as seaweeds, pomegranates, thick and light foams, etc.

The gastronomic part of our mind might be lastingly intrigued by food having so complex—or seemingly complex—a form.

Part of the reason why I used the words "such nature-mimetic" is that the netted pellets would to some extent be suggestive of the tissues and textures of many foods.

But it is also at least conceivable that there can be 'sensory metaphors', and that the human mind, brain, or body would find food possessed of the concrete form proposed somehow evocative of the 'abstractly' (logically or informationally) isomorphous structure (or orderly interrelations) of the 'nonmorphological' (e.g. chemical) qualities of foods.

The next branch of the tree is to the balloon Maximized Or Exhausted Enfolded Outer And/Or Inner Surfaces (On Conjecture—By Analogy To Biology —Taste Essentially Interfacial and Hence Membranous).

This is in a way like reproducing within the pellets, and there taking to the geometric, topological, or physiological limit, the external maximization of food surface area by the aggregated pellets.

Of course this particular proposal is complicated by many assumptions, and mechanical demands, that would have to be tested or met.

Do food surfaces and molecules always have to be in or make direct contact with sensory receptors, or can their effects be mediated by biological messenger or carrier molecules, micelles, "extracellular organelles" (sic), cells, or microphysical particles, waves, or quanta?

Micro- and macro-folded external surfaces of food pellets could repeatedly refold to diachronically expose their instantaneously hidden surfaces, during mastication or the other actions that accompany it.

But internally folded surfaces would present more of a problem, unless their effect was to promote the continual leakage from the pellets of massive clouds of tasted reactants, or the like.

Of course the pellets could also be surficial Peano curves—or fractal—and completely open out in the course of eating.

The pellets will in any case eventually disintegrate, perhaps via a succession of ever smaller and more numerous food fragments or particles. In the gastrointestinal tract the maximally enfolded or multilaminar food might break up into immense numbers of tiny flakes, churning past one another or raining upon the gastrointestinal folds and microvilli.

Another effect might operate, other than just the periodic stimulation.

The extent and nature of interoception are unclear, but it is known that the intestines are richly lined with sensory receptors and that they have a complex sensorimotor system coordinated, at least in part, by the nervous system, including parts of the brain and of its cortices. Very probably there are gustatory, chemoceptive, kinesthetic, textural, or even undefined sensory systems in the gut, and the neural processing of their sensa may not occur on the level of consciousness, or at least of consciousness in the ordinary sense (for there may be myriad parallel and hidden forms of consciousness and reason). Perceptions from the tract may not operate on the familiar time scale of seconds but rather, say, of hours or even months (à la the recently discovered sexual pheromone(s) in women). Feedback loops in the sensory and nervous systems may recodify quicker oral taste sensations based on long-term gastrointestinal 'sensations'.

Assuming that some form of taste does in fact occur in the gut, then one could speculate upon the possible existence of gastrointestinal mechanisms for the preferential perception of spatially correlated taste stimuli, by analogy to those fields and functions in the visual, auditory, and somatosensory sensorium that preferentially recognize spatially extended or disjoint, but synchronous and related, sights, sounds, and touch events.

Certainly there could be spatial, as well as temporal, integration of taste or taste-like stimuli scattered over a microvillus or villus or over the sequential walls of the alimentary canal.

Relevant here is that food flakes could trigger volleys of informationally correlatable discharges across patches of receptors, and that the nervous system might be selective of patterns of this sort.

This balloon branches sympodeally. Its short branch on the right is to the balloon To Similarly Maximize Gut Absorption of Energy and Nutrients.

Here the importance of the enfolded food surfaces that is imagined is not taste but rather energy or nutrition.

The maximal, intricate, or periodic surfaces could conceivably promote the transfer of energy or of nutrient molecules or atoms from the food to the body. The leaves of an electrical capacitor, or of a tree, serve a similar function. So for that matter may the primary (catenulate), secondary (helical), tertiary (egagropilar or flexural), and quaternary (branched or radiational) structure of protein molecules.

P: This may have to be corrected or improved?

The previous balloon also has a left branch, representing its major continuation. The first balloon reached by this branch is Compositionally Heterogeneous Surfaces.

Here the various folded or irregular surfaces of a food morsel that were just considered are to be conceived of as heterogeneous rather than homogeneous in their chemistry or chemical makeup.

Of course present-day chemical and food technology will necessarily be extremely limited in their ability to topographically differentiate the chemical structure of a piece of food in this deliberate way, either properly or at all. But the requisite powers should evolve in the decades ahead, especially if they are consciously sought, whether for this purpose or some other.

The reason for giving alternating or successive enfolded food surfaces different chemical compositions might be that named by the next balloon, or To Optimize Gut Chemical Reactions. Contrast or complementarity might have this effect. There might, for example, be small standing or other waves in chemical reactions, or intricate phasal geometries, that would be served by the compositional interlayering or stratification. It might be desirable to have compounds—or collections of compounds—of opposite or antagonistic character in extreme proximity or interdigitated. The arrays of folds might also serve the processes that characterize some multi-step chemical reactions.

Incidentally, should any of these things be true, then it should be possible to discover natural arrangements and effects of this sort, especially in the chemistry and ultrastructure of organisms.

This balloon is followed by another thought: And Inter-Surficial Removal of Waste Reaction Products That Interfere. The by-products and waste products of chemical reactions, in the gut or in any other chemical system, will almost invariably interfere in a major way with the purity, efficiency, speed, continuity, stability, and abilities of the basic reactions. Were there no such nuisance products the reaction would proceed very differently.

Once again it can be imagined that the evolution of biochemistry has instituted many mechanisms for spiriting away, preventing, suppressing, isolating, transforming, or recycling such products, which could be sought to confirm the above hypothesis and to suggest future technological approaches to the improved design of food.

Compositionally heterogeneous surfaces, of the present sort, could combine systems of primary reactants with separate but nearby systems for the beneficial destruction of the useless and harmful products of the primary chemical reactions.

Farther out on this branch of the tree is found the balloon Optimized Hierarchically Semiempirically. Since it derives nonsequentially from both the balloon that we have just been discussing and its precedessor, the latter pair of balloons are shown on the idea tree completely enclosed in an anonymous greater balloon, and it is from this super-balloon that the new balloon branches.

It might be emphasized here that not all of the relationships depicted on the tree are exact. The diagram represents an approximate recollection of the actual history of the ideas in my mind, and it undoubtably contains errors of order and structure. Moreover, the mental history of these ideas was probably itself imperfect as a model of what the interrelations of the ideas ought to be in a transcendental or purely semantic sense.

In short, the very charming dendrogram should not be taken too seriously.

As for this new balloon, hierarchization is a general ideonomic method for improving ideas as well as for deriving new ideas from them.

And indeed it is likely that the optimization of chemical reactions and the removal of their wastes—in the case of what I mean by compositionally heterogeneous surfaces—could both benefit from being made 'hierarchical', in one or more ways.

Hierarchical in either a spatial or temporal sense, or in both.

Finally this sub-branch of the tree ends with the balloon Also Reticularly.

All that has just been said about hierarchy can be restated about the applicability of network ideas to the modification of the earlier pair of proposals.

Also, what is hierarchic can at once be reticular: there can be hierarchic networks and reticular hierarchies (which are not wholly equivalent things, at least as these dyadic terms are ordinarily used in ideonomy).

The dictyosome is a cellular organelle that may exhibit structure of the kind envisaged by this balloon.

The third branch from the NOT Sausage-Form But Pellet-Form balloon goes first to the balloon Semi-Empirically Textured and Contextured Pellet Skins (Surfaces).

Perhaps the lips, tongue, fingers, or even eyes (visually) perceive the topographic texture of food and these textural perceptions, consciously or on some 'unconscious' level, contribute to the 'taste' of what we eat (say by accentuating, modifying, or adding nuances to gastronomic percepts). Such a process might occur, not on a macroscopic, but microscopic scale.

If so, the textural qualities of ice cream pellets might be important in negative and positive senses, and offer a range of possibilities for the ideonomically inspired gastronomic engineer. Haptic information naturally or artificially present at one spot on a pellet might reinforce, interact or interfere with (e.g. contradict), alternate with, or supplement like or different information present elsewhere on the same pellet—as well as on different pellets—contexturally.

At the very least, it might make a difference if the pellets of ice cream had rough surfaces or smooth. One reason might simply be mechanical: a smooth pellet might race frictionlessly around the oral cavity, and the effect of this might be either to reduce the taste (by giving taste buds suboptimal time to react) or to augment it (by optimizing the intermittency of receptoral stimulation). A rough and sticky pellet might also be tastier because it would have a greater tendency to massage or to be forced into the taste papillae and subservient lingual vasculature, or to be torn open by the raspy surface of the tongue itself; or because its total surface area would be greater (fractally); or (per contra the above) because its roughness would improve the intermittency of stimulation of the gustatory receptors.

The next balloon, Compositionally Textured Skins To Cause Tasty Inter-Topical Chemical Reactions, is essentially just a variant of the foregoing concept. But here the texture imagined is not that of the topographic relief of the surface but rather of its chemistry.

An analogous proposal was made above, but in terms of folded or stacked surfaces.

Even if the present suggestion is valid, it would be necessary to conduct systematic experiments to determine whether different bidimensional chemical configurations, arrays, or textures would be better than others or affect taste differently. Should the different topochemical sites be arranged à la the pointillist paintings of the French impressionist Georges Seurat, or in parallel lines as in an etching or moiré pattern, or in patches à la Paul Cézanne, or in slow multiplexed gradients à la Joseph M.W. Turner, or in the fragmentedly ambiguous manner of Cubism (to be addressed in my next balloon)? The questions and possibilities are endless.

The final balloon on this twig is Partially Hidden Chemical Reactions On Conjecture Implicit Topology and Complexity Can Maximize Flavor and Create Exotic Novel Tastes.

Frankly I am rather proud of this idea, which I think has important and potentially revolutionary implications far outside the field of food technology, not only in chemistry and physics but in many other areas.

I am not clear what the exact and entire nature of my intuitive idea may be, but an analogy could be drawn to nonrepresentational painting. Representational or realistic painting dominated Western Art for centuries. When abstract art emerged for the first time as a doctrinal school, in the twentieth century, it caused a furore. A large percentage of people viewed the new form of art as incomprehensible, based on a terrible error of omission or a fallacious assumption that abstract art could have universal meaning à la that of representational art, or even insane.

Nonrepresentational painting requires new perceptual, cognitive, and esthetic criteria, standards, and methods, and of course a period of flux and partial anarchy while such things develop and acquire a more or less fundamental and universal character. During the transitional period, from which civilization has still not graduated, abstract painting of an inferior, erroneous, and fraudulent kind will flourish side-by-side with exceptional and often naive, or unrecognized, excellence.

But among the fundamental discoveries of nonrepresentational painting are these: that a pictorial mimicry of the sensory world is not necessary for art to be beautiful, that nature has many forms of organization other than simply the Euclidean, homomorphic, geometric, topological, or even spatial, that different forms of reasoning and representation need not be redundant and can even interfere with one another and require nonsimultaneous and well-separated treatment, that the essence of art is related to information and logic, that getting closer to reality paradoxically requires that we also draw apart from it or at least disassemble it into its elementary pieces and possibilities, that the human mind can encode esthetic meaning into—and decode esthetic meaning from—many strange languages and forms, that the complexity of nature and of the mind is vastly greater than had been assumed (or even infinite), that there is something that needs to be said by systematically combining, permuting, and transforming all known, familiar, or imaginable things in all possible canonical ways, that as much or more can be said about or via things by using less of them or by not using them at all (e.g. that things can be reduced to traces, dispersed invisibly in the whole of a representation, resaid on other hierarchical levels, communicated implicitly or analogically, etc), and so forth.

Much of the foregoing has implications for and applications to chemical science and technology, and in the future a field that might be termed abstract chemistry can be expected to develop.

Postulated in the present balloon is that the psychophysiology of taste is such that a partial completion, mimicry, or sensing of taste-related chemical reactions will often suffice when something is being tasted, or even be optimal, and that more intense, complex, interesting, or novel tastes may exist or be possible only on the basis of such partial chemical reactions or of intricate and ingenious combinations thereof.

One reason may simply be the illusions and delusions enabled by such hidden, allusive, ambiguous, and implicit reactions. The design of food, whether by nature or man, is after all just another form of art.

From the balloon Pellets Give Discontinuous Hence Maximal Taste By Allowing Recovery of Taste Buds, Neurons, and Mnemes, which it can be seen branches from the left of the NOT Sausage-Form But Pellet-Form balloon, arise the remaining twigs and balloons of the tree.

In this balloon the generic concept or principle of "discontinuity" originated that is active over so much of the tree (as is suggested by the thread-like "discontinuity hints" that dress the tree like a faint spider's web).

Not only sensory receptors but neurons, mnemes, percepts, and concepts fatigue and habituate when continuously stimulated. The optimal form of stimulation is therefore apt to be discontinuous, and, moreover, discontinuous at many levels (and perhaps also, as I will show, in many forms and senses).

One undesirable kind of discontinuity is suggested by the next balloon, Heterogeneous Size Pellets For Textural Spectrum (e.g. On Conjecture Mental Levels Are Myriad, Independent, and Nonequivalent).

The tasting of a multitude of pellets creates a perception of texture, but this is apt to be a simple texture if all the pellets are of the same size. A more gastronomically interesting textural spectrum might result by including pellets of every possible size over a certain range.

The interaction of haptic images of pellets of diverse size might create perceptual ambiguity and complexity.

Different mental levels may exist—as a result of either genetics or experience—that are especially or exclusively sensitive to different sizes of pieces of food, or that specialize in different bands of the size continuum. Simultaneously stimulating many or all of these mental levels might increase the taste of a food or make it more distinct.

Notice that "heterogeneity" is a generic concept or principle that is responsible for or applicable to other balloons of the tree (as suggested by the one "heterogeneity hint").

In the balloon Hierarchically Optimized (e.g. On Conjecture Size, Too, Should Be Fractally Discontinuous—To Maximize Inter-Level Contrast) one is, in effect, cautioned against the simplistic application of concepts and principles.

Giving the pellets a continuum of sizes might result in anything but an optimal stimulation of the sensorium. Perhaps there is a principle that continuity and discontinuity should alternate at successive hierarchical levels (or alternate in some logically complex and dense structure).

Possibilities include that the range of pellet sizes should be briefly interrupted at a few or myriad, stochastically fixed or varying, scales; that the interruptions should be at regular linear, quadratic, cubic, or other power-law intervals—and/or that the breadth of the interruptions should be governed by some power law; that there should be some sort of clustering or sub-clustering in the positive and interrupted sub-ranges; etc. Perhaps the sizes should have a fractal distribution.

The adjacent balloon Conjectural 'Fitting' To Given Foods suggests that the distribution of pellet sizes should perhaps be different for different foods, and worked out semiempirically in the various cases. If such a dependence is extreme it could have the effect of masking the importance of pellet size generally.

The general notion that gastronomic stimulation should be spread over time triggered the idea that is encapsulated in the balloon Pellets With Different Opening Rates To Prolong Taste à la Time Spansules.

Notice that given concepts are apt to have many different and dissimilar meanings that need to be distinguished or separately worked out, and that diverse concepts frequently occur in clusters.

Spansules are used to provide the body with a drug over a long period of time, and in a more uniform way than would be possible with several large pills meant to be given or taken at intervals of hours, say.

Of course the act of tasting a food or food morsel lasts mere seconds or less than a minute, after which the food vanishes down the gullet. But even this brief stay in the oral cavity might suffice to justify an attempt to prolong, or optimally spread over time, the taste of ice cream by means of pellets or micro-pellets designed to dissolve or open up in the mouth at different rates or periodic intervals (over 10,000-100,000 milliseconds).

Yet because it is normally the nature of ice cream to dissolve away slowly while in the mouth, that proposed might be more appropriate for other foods that are not optimal in this respect. Some potential foods, and taste components of foods, may be so far from optimal, in the excessive brevity with which they are tasted or would be tasted, that the spansule-analog proposed here might even be essential for them to be appreciated properly or at all.

Further out lies the balloon Temporally Orchestrated Crescendo and Nonmonotonic (Including Nonlinear) Series For Diachronic Tastes — (Protean Spansules). This balloon has the peculiarity that it can be reached via two divergent branches that anastomose in it.

The 'tastes' (or smells) of many foods are known to represent a series of different sub-tastes that 'follow one another' over time (say in less than a second or minute, depending on the particular case).

Presumably there is what is equivalent to a 'flicker fusion rate' that limits the consciously discriminable seriation of such sub-tastes; but the gastronomic sensorium surely distinguishes many finer temporal scales and series 'unconsciously', or subsumed in temporally unresolved tastes. (In describing or explicating different possibilities of this sort one must proceed extremely cautiously. Concepts, words, and references are apt to be misused and this can result in much lasting harm.)

What the balloon proposes is that different pellets of one and the same food be designed so as to open, or contribute to taste, at different rates or moments of time.

If compositionally homogeneous, these pellets could nevertheless produce flavor crescendos, bursts, and rhythms that might enhance or diversify taste.

If compositionally heterogeneous, the pellets could even further enhance and diversify taste. A whole parade of sub-tastes could be made to follow one another like the notes of a musical theme, melody, or composition. Both identical and different sub-tastes could be included in a given food's taste sequence.

The mathematics of some sequences or series could be highly nonlinear. Many sequences could be incorporated in the same food, and this could generate the same array of synchronous and asynchronous effects that multiple musical voices do.

In the balloon Compositionally and Gustatorily Heterogeneous and Complementary Pellets the concept of "compositional heterogeneity" that figured in the much earlier balloon Compositionally Heterogeneous Surfaces reappears, but is applied this time to volumes (and the multitude of pellets) rather than to mere surfaces (within a pellet).

The mass of pellets could contain diverse flavors and types of ice cream. The number of flavors or types could be two, three, seven, or endlessly varied (via discrete or continuous combinations or modifications of properties, compounds, or materials); to name the four most interesting possibilities.

Because of the diverse mass of pellets and the laws of chance, the ice cream would have a subtly different or unique taste each time it was eaten and a taste that would change continually from instant to instant and during the entire time that it was being eaten. If the pellets that accompanied one another in a container (or meal) were given special taste properties and a certain population spectrum, and were placed in the container in appropriate spatial order vis-à-vis one another (rather than randomly), the perpetual alterations of the taste of the ice cream in the course of its consumption could be made profoundly and astonishingly kaleidoscopic (even a high-level example of combinatorial ideonomy).

It would be easy for a manufacturer to separately produce the different kinds of pellets and then to add them together in various sets and ratios when subsequently packaging the product.

I pushed this concept of "compositional heterogeneity" to a logical extreme in the next balloon, Extremal (Limit) Case of 'No' Repeated Molecular Species ('Or Taxon').

Although "no" should be understood in a relative sense, the general proposal here is that the fundamental chemical and molecular diversity (and intricacy) of food should be maximized (within the limits of good taste and of gastronomic curiosity).

In other words, in all the foods that currently exist there is an internal compositional redundancy that is the result of the chance and nonesthetic character of biological evolution, and of the crudities of food technology, but that almost incalculably impairs the gastronomic range and excellence of our rudimentary diet.

It might be objected that chemistry itself permits nothing remotely like the amount of molecular variety that I am visualizing. But such is the power of combinatorial mathematics that the abstract and practical creatability of the necessary wealth of chemical congeners is assured.

It might also be objected that the psychophysiological mechanism of 'taste' is finite and places severe constraints upon the number, range, and specificity of taste variations that are ultimately recognizable or discriminable by man.

But in answer to this it can be suggested once again that the mechanisms of taste may extend beyond what are usually thought of as the "conscious" processes of the mind, and even beyond the modest powers that are now ours to detect, measure, and discriminate primary events in sense organs. Present-day estimates of how much we taste beg many questions and suffer from many fallacies.

What may lie in the inmost depths of life and mind has never yet been fathomed.

The balloon Non-Tasted Pellets Compresent To Maximize Taste By Absorbing Or Breaking Down Interferential Wastes recalls the earlier suggestion that chemical reactions may be associated with taste in the oral cavity and that these may produce by-products and waste products that normally reduce the quantity and quality of taste, in which case it might be possible and desirable to equip foods with augmented or special means for removing, destroying, or neutralizing these costly chemical products (or effects). But the new balloon proposes another way of accomplishing this.

Mixed in with the actual food pellets are to be pellets that do not themselves have any taste or nutritive value but rather are solely designed to fight the molecules polluting the desirable gastronomic reactions.

If innovations such as these are in fact feasible, they could also be of great agricultural importance, by increasing the efficiency of the digestive process in livestock and perhaps by leading to similar improvements in the processing of fertilizer and soil by crops.

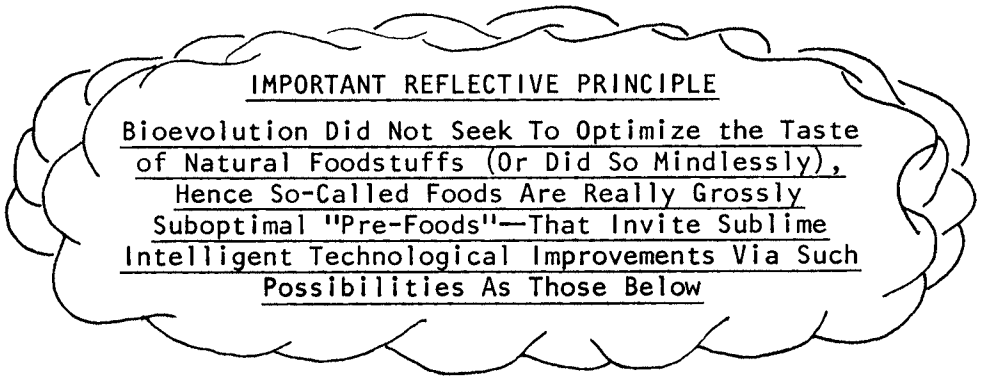
This leads to the final balloon of the tree proper, Non-Food Pellets ('Bubbles') Just Added To Food To Resorb Delectable But Unhealthy Foods Or Food Components (e.g. Fat, Starch, Gastralgic Things, Etc) In Gut (So As To Allow Harmless Eating).

With this alternative to dieting people could eat bad things without suffering or risking ill-effects, and even the absolute range of edible foods could be expanded. There would be less need for manufacturers to modify their food products in other ways (or privatively).

By analogy to what was suggested in the previous balloon, non-food pellets might also be designed to counteract what is bad in the actual pellets of food not by resorbing those things but by directly destroying them.

Could not something be added to ice cream that would act—after the ice cream had been savored and swallowed—to resorb, destroy, or prevent intestinal absorption of its bad fats and sugars?

Bannered in a cloud-like balloon that hovers over the idea tree are wise words with a general bearing on the plant beneath:



WAYS OF ORGANIZING "WordSprings"

RELEVANT TERMS (Verb?): base, fix, combining form, positive, attributive, noun-word, stem.

By "WordSprings" are meant not simply computer programs but any devices whatever for the systematic and massive production of new, novel, or transformed words.

The major methods of generation, which are themselves quite diverse and may be combined, include: [1]the combination of whole words, with or without a separating space, hyphen, or other connective; [2]the combination of pieces of words, from one's own or some other preexistent language, either by the attachment of the pieces to whole words or solely amongst themselves; [3]the permutation, or systematic linear reordering, of such combined or combinable words or pieces of words or PIECES OF PIECES of words, whether consecutively or self-referentially or not; [4]the adaptation or transformation of existing words (as opposed to their combination or combinatorial alteration); [5]the combination or transformation of the elements (words, pieces of words, characters, or special markings), not of an existing, but rather of some new artificial language or would-be language; [6]such combinations or transformations of words or word elements on the basis, variously, of rules (linguistic, logical, computational, ideonomic, or otherwise), statistics, chance, esthetics, artificial intelligence (including neural nets), cognitive goals, intuition, ongoing speculation, etymological history, or the like; [7]the generation of words that are meant to function on the basis of old, novel, or supplemented grammar; [8]the prior generation of a set of new concepts or of new modes of thought, and subsequent generation of words guided by, or answering to the needs or possibilities of, the preconceived ideas or logics; [9]variously (and either linguistically or cognitively), the convergent, divergent, or vergent synthesis of the new words; [10]the generation of words either irreversibly or reversibly (and in either reversible or irreversible patterns); [11]the generation of words through the modification of, or through reference to, existing (whole) text; [12]the generation of words better or alone able to describe or treat of predetermined phenomena and partaking of the special aspects of those phenomena (by reflecting same in their composition, structure, or statistics); [13]the generation of candidate new words accompanied by their composite or rule-based definition, automatically produced; [14]the generation of new words accompanied by their diverse possible subsenses; [15]the generation of new words on the basis of "group" transformations; [16]the coevolution of new words through their instantaneous and diachronous interdetermination and interaction; [17]the generation of new words through progressive reformation and approximation; [18]the generation of automatically defined words composed of elements that have been equipped beforehand with novel, stipulative senses, perhaps representing logically canonical variations, derivations, or extensions of the original senses of those elements; [19]and so forth.

"WordSprings" may also incorporate or be based upon an extensive class of methods that extrinsically modify or supplement the external aspect of existing words, and that may even leave those words qua words unchanged: e.g. by controlling intonation or the ways in which the words are spoken or heard, adding letters or pseudo-letters or other marks, coupling music or quasi-musical sounds to the words, varying the visual brightness and color of the words (as or when they are seen), accompanying the words with pictures or ideograms, modulating visual textures, varying type sizes and fonts, future automatic handwriting software (assuming chirographic patterns are or could be communicative), etc.

Of course the range of possibilities encompassed by the term "WordSpring" ultimately intergrades with other methods, devices, and purposes in the same ideonomic division of Languages and Semonamology.

In particular, the ideonomic generation of individual words abuts and intergrades the ideonomic generation of the equivalent of idiomatic expressions, integral sentences, running text or infinite discourse, and even conversations (both simulated and real).

If a "WordSpring" program combines the words it generates—or simply manages—into phrases, sentences, or discourse, the spatial form in which they are literally or virtually presented or represented need not be of the traditional lineal (1-dimensional) type. Rather than being rectilinear, for example, a sentence might curve, be a closed circle, or wind inward or outward as some species of spiral. Much more radically, a "WordSpring" could 'speak' in 2-dimensional and even N-dimensional sentences, in the manner of crossword puzzles, tables, matrices, or multidimensional-scaling maps. In the hyperspatial cases, of course, people would be compelled to diachronically sample the semantic hyper-structures and hyper-solids by means of various mathematical cuts, filters, tours, and surgeries.

But those matters are more properly the topic of other sections of the book.

Here the concern is not with the various major methods for coining words en masse but rather with the innumerable relatively 'minor' ways of organizing WordSprings. What is meant by this distinction will be made obvious by the examples discussed.

For instance, it is easily predicted that a WordSpring that prefixes words with the set of prefixes used in naming the hundreds of ideonomic divisions (the prefix caco- of the division Bads and Cacology being an example) will be relatively highly efficient at producing "good" coinages or coinages of outstanding ideonomic interest. Thus if one prefixes the words "insanity" and "law" with the eight divisional prefixes apato-, caco-, holo-, idio-, lito-, mero-, mixo-, and tauto-, all the sixteen candidate words manufactured in this way turn out to make excellent sense, sixteen illustrative senses being: insanity or law that is illusory, bad, whole, individual (peculiar to an individual thing), simple, part-like, combinational (mixed), or identical (tautologous).

Since the word "law" is more generic or ideonomic than the excessively particular word "insanity", coinages based on the former should and do have a tendency to be more interesting ideonomically.

Naturally all of this should also be true for synonymous prefixes, e.g. for words formed with "pseudo-" in lieu of "apato-" (words such as pseudo-insanity and pseudo-law).

Moreover, within each such division there are numerous organons that can easily be adapted to produce candidate words related to the division and its many purposes, the most obvious and perhaps most appropriate example being those organons that list each divisional theme's types—or genera, species, etc.

These would even allow a straightforward hierarchical organization of the possibilities, using the preexisting organizational schemes of the division.

To illustrate, within the ideonomic division Functions and Draology there exists a master organon titled "Generic Functions". It so happens

that this set of generic functions has already been mapped to show the relative mutual analogousness of the functions, using nonmetric multidimensional scaling.

If you examine this ideomap you find that it is easy to assign one or more prefixes to each of the generic functions it maps. Many of the prefixes are of common occurrence, or at least the concepts which they designate figure continually in our thinking.

I have inscribed a number of such more or less 'synonymous' or closely related prefixes into the ideomap, as figure ___. Considerations of space and time kept my efforts from being more comprehensive and meticulous.

Fig. 8

Some prefixes inevitably have simultaneously been appended to two or more different generic functions. Close matches between prefixes and generic functions will not always be possible, other than stipulatively, if only because the vocabulary of the languages that can be drawn on in the creation of suitable prefixes, such as ancient Greek and Latin, will always prove to be finite, imperfect, polysemous, and inspired by things other than ideonomy.

Another way to organize a WordSpring is by simply having an entire set of prefixes simultaneously joined to a single word, in order to bring out and examine all of the possible simultaneous and alternative meanings and possibilities of the individual word and the concept for which the word stands.

Of course if the set of prefixes were previously organized into some systematic structure, such as a hierarchic classification, this structure will also serve to organize the entire set of identically-ended coinages. The set of prefixes might also have been previously interrelated via heavy annotation analyzing nonhierarchic or simply more complex conceptual connections among the different prefixes and subsenses thereof: analogies, differences, overlaps, symmetries, combinations, ranges of application, etc.

The variety of prefixes could suggest the potential of such one-at-a-time things as: bacterium or bacteria; gene; volcano; car; job; disease; or principle.

Obversely, a large set of unrelated or related words might also be simultaneously preceded by the same prefix, such as "anti-". One value of this approach would lie in the broad, deep, and lasting insight it could afford into the meaning, possibilities, and limitations of any given prefix treated via it.

Anyone who would ever use a WordSpring ought to have the experience of both of these things at least once in order to understand better what a WordSpring is and how it functions.

Complementary to the two possibilities just described would be a WordSpring organized to append not prefixes but rather a very large set of variant suffixes to one unchanging word, or perhaps to a word specially modified to allow such free suffixation.

Quite a different approach to an affixational WordSpring would not start with affixes at all but rather with pure words or concepts. These would be combined en masse to suggest words and concepts for which there might exist a need or that might have some value or intrinsic interest. Once these presumably exceptional cases were identified they could be removed from the rest, and a second-stage effort could be made to think of words and affixes appropriate for or best suited to the perceived opportunities and requirements.

In the instance where the things initially combined were concepts, strings of words or of other symbols would of course have to be prepared and combined to specify or intimate the concepts. Phrases or short sentences no doubt could be combined dyadically without putting excessive strain upon the human memory, but it might make more sense to represent longer arguments by means of single letters or numbers.

Words could be made or allowed to evolve or change in or via chains (e.g. both simple and complex, of various species of the genus of form "Chains", and in obedience to diverse Taxons of Order).

Words could be formed or subsequently arranged in various fractal patterns.

New words formed—whether through chance, laws, or unfolding human decisions—could instantaneously be mapped into one or more nonmetric or metric multidimensional scaling ideospaces.

Or inversely, an arbitrarily compound, complex, and self-organized meta-structure or manifold of ideospaces embedded in and coupled to ideospaces of ideospaces of ideospaces, could be carefully worked out in advance, and programmed on a computer in such a way that the human operator sitting at the controls would be able to explore or create such semantic paths as might interest him or he might think of, either for their own sake or in connection with some problem brought to the system. As he gradually moved himself or some cursor to different geometric and topologic loci in the great semantic structure, the nymopoeic system could instantaneously and continuously coin new words successively more appropriate for the kaleidoscopically shifting hyperdimensional points, isopleths, regions, fields, surfaces, structures, links, nodes, twists and knots in space, and perhaps even dynamic phenomena.

Perhaps the most important element to emphasize in the system that was just envisioned is that there would exist within it a multitude of semantic gradients radiating and interwoven in N dimensions. Words would form on the screen as one 'flew' within the system in pursuit of thoughts-evolving-from-thoughts. Whenever there was sufficient movement to transgress boundaries separating the competitive semantic spheres of different words, prefixes, concepts, concept-sets, etc, coinages would be modified or replaced to express the alternative or vectorial, or even tensorial nuances, the denotational and connotational symmetries, the semantic phase-transitions, and perhaps the history of one's progression.

Virtually any pair of opposite ideas or things can be combined (via affixes, words, etc) and the combination of such opposites will almost make sense, from a linguistic (onamastic) or ideonomic point of view. The ideonomic division Opposites and Enantiology already has inventoried hundreds of pairs of opposites, even at a fairly high (gross) taxonic level. Thousands of individual (particularistic), varietal, specific, generic, familial, ordinal, etc opposites remain to be compiled, discovered, imagined, postulated (or theorized to exist or be meaningful), described, defined, explained, illustrated, categorized, classified, compared, differentiated, evaluated, ranked, dimensionalized, mapped, homologized, quantified, logicized, axiomatized, generalized, circumscribed, modeled and experimented upon, self-related, reduced to laws, perfected, disambiguated, synthesized in multidimensional structures and manifolds, operationalized, transformed as higher

"groups", functionally mapped as higher "categories", derived from the pan-universal taxons of order, joined and disjoined in all possible and meaningful : combinations, orders, permutations, modulations, arrangements, systems, evolutions, etc : and so forth.

Certain opposites will have different degrees and kinds of meaning in connection with different subjects or things, and these relationships all need to be discovered, mapped out, and unified, for the present purpose and for ideonomy in general.

"Oppositeness", as a general ideonomic concept, itself has a variety of aspects, senses, forms, and congeners, whose total number and variety is currently unknown and beyond surmise, but which must be carefully worked out in the future if ideonomy is to function properly, efficiently, and with all its potential power.

Some examples will serve to illustrate the readiness of combination of pairs of opposites, and the abundance of meaning and application that words formed in this way can have.

"Small bigness" variously suggests that what has magnitude may be: unexpectedly petty, trivial, inconsequential, unsuccessful, equivalent to or less than what is small or average, contemptuous or absurd, unmeaning, irrelevant, possessed of small aspects or elements, dependent upon what is still small, superficially or illusorily or wrongly (or in some other way) big, prematurely or artificially large, big only in a relative sense (small by comparison with yet larger existing or potential things), weak or fragile, less than it ought to be, capable of further augmentation or of being transcended, superseded, or obviated, asymmetric, large in only some or a few categories or dimensions (or in just one) while being small (or finite, zero, negative, or nondimensional) in (some, most, all, or infinitely many) others (as in breadth, height, length, area, volume, mass, multiplicity, complexity, age or duration, density, excellence, power, hyperdimensions, e/vc); etc.

One could name or refer to this particular combination (and perhaps permutation) of opposites with such neologisms as: micro-bigness, micro-magnitude (or parvo-magnitude), micromacro-, micromega-, etc. Of course, some of the different senses or meanings of "small bigness" that were distinguished above could be recognized by forming other, categorematic or syncategorematic, neologisms: thus "illusorily big" could be named pseudo-big, "wrongly big" mis-big or mal-big (one might even scale a thing for its intrinsic or effective para-magnitude), 'big only in a partial, narrow, mixed, secondary, comparative, or ordered sense' could respectively be termed mero-big, steno-big, micto-big, sub-big, para-big (or juxta-big), and tacto-big, etc.

What might seem an intolerable proliferation of new words, here, would not have to have this status at all, assuming an ideonomic convention was worked out that prefixes belonging to one standard : universally known, uniquely defined, absolutely generic, mutually complementary, encyclopedic, and reasonably small : set of prefixes may be freely attached to any existing word whatsoever, without need of apology or explanation, to modulate its sense or reference ideonomically, in an understood way (for the nonce or lastingly).

The logical effect of joining words or word-elements to one another in ordered dyads such as "small bigness, micro-bigness, or micromacro-", is to create a canonical set of alternative interpretations of the meaning of the ordered combination or combinational relationship. By "canonical" is meant that they are not only finite and fundamental but universally applicable (barring stipulative proscription of any subset of them).

For pairings of opposites, at least, the most obvious and important co-interpretations of the meaning or function of the combination are or include:

1. Comparison (one is invited to compare the two opposites, but no method, mode, or outcome of the comparison is specified),
2. Coexistence of the opposites (or their association),
3. Interdependence (functional, conceptual, e/vc),
4. Mixture of elements,
5. Interaction of the opposites (e.g. their mutual or asymmetric competition, antagonism, interference, alternation, e/vc),
6. Successiveness of the opposites (temporal or other antecedence),
7. Existence of second opposite sensu the existence (or nature) of the first opposite,
8. First opposite part or aspect of second,
9. Second opposite (conversely) part or aspect of first,
10. Causation of second opposite by first,
11. Part of or entire range defined or spanned by the opposites,
12. Submaximal degree of second opposite (as limited or qualified by first opposite),
13. Falsification of one opposite by the other (especially of the second by the first),
14. Derivation or transformation of one opposite from the other,
15. Equivalence or analogy of the opposites,
16. Contrast or differences of the opposites, or simply the relationship itself (or its properties or possibilities transcendently),
17. Antisyzygy (paradoxic meeting of the two opposites).

These potential interpretations and meanings of the relationship between the first and second elements of a neologism formed by dyadic combination in a WordSpring program, although they were listed with the pairing of two opposites in mind, can be seen in retrospect to apply to virtually any dyadic neologism; although in this more general case they represent a mere subset of the possibilities.

The normal importance of the order in which two semantic monads are combined to form dyadic neologisms can be suggested by reversing the order of the elements in the dyad I have been considering.

When "small bigness" (and therefore micro-bigness and micromacro-) are reversed, to produce "big smallness", macro-smallness, and macromicro-, or the like, the definitions and subsenses that come to mind are for the most part different from the ones that were paraded above (and usually antonymous, not unexpectedly).

What is physically or virtually small very often proves to have an effect or importance that is altogether disproportionate. This is trivially true of molecules, but more profoundly it is exemplified by the international importance of the American White House or of its solitary President, by the diptheria toxin that slays cells a quadrillion times its molecular mass (as David fell Goliath), by the power of a scientific discovery—or of some political notion hatched in the brain of a single individual—to transform the whole subsequent course of history, and by the fact that, at least in principle, each and every seemingly insignificant quantum event occurring on the floor of the universe triggers an exponential chain of consequences that remakes the universe or changes the nature of reality.

More generally (in defense of parvitude), that which seems or is tiny often turns out to be surprisingly or even paradoxically: tough, stable, persistent, ubiquitous, multitudinous, complex, subtle, basic, versatile, reliable, fertile, multiform, interesting, perfect, special, essential, infinite, etc.

A cell is a microcosm, the human brain an unvisited universe. A neutron star is a spherule a quadrillionth the Sun in volume and yet just as massive. Our planet's continents dance no more than the length of a nose in the course of a year, but form and reform thence. The universe itself is assumed to have begun as a nearly infinitesimal seed, astronomically smaller than any fundamental particle of which we know. The work of a supercomputer simulating the world's economy or the creation of a galaxy is done by nothing larger or more complex, and by nothing more, than ones and naughts (or sums of singular differences).

All of these are examples of "big smallness", or of macro-small things.

Another way in which a Word Spring might function, either in a computer or with human help, would involve taking some existing word and massively coining synonyms for it. Given the meaning or form of the initial word, one would expect a subset of the new synonyms to offer morpho-phonologic improvements upon the word, either in general or with respect to some specific usage or application.

Here one might wish to subject the word in advance to intensive and systematic ideonomic and other criticism, which could help to narrow, prepare, or augment the possibilities beforehand.

Of course this could also be done, not just for a single word or one word at a time, but for many different words simultaneously.

Another approach of a related nature would mean taking a given word and coining new words en masse that by etymologic nature or morpho-phonology (morphology or phonology) suggest, or else by stipulation designate, all, some, or certain canonical variations and covariations (either finite or infinite) upon the meaning or semantic possibilities or relationships of the word.

The meaning of the word might variously be determined (discovered or created and then fixed) at the outset by semantic analysis or decomposition of its morphemic structure (presumptive etymology), by investigating its actual etymologic history, by lexiconic or de novo definition, by research into its uses and contexts in human literature or discourse, by creative construction, or by fiat.

SOME WORDS PRODUCED BY "WordSpring" EXAMINED

An ideonomic device such as WordSpring cannot be understood, assessed, or appreciated in the abstract. It is necessary to experience it directly, or to inspect its actual products.

The table designated figure ____ presents a very tiny (~3‰) random sample of the product of one WordSpring computer program. This WordSpring repeatedly attached a set of prefixes to a set of words. Since there were 177 prefixes with from one to eight (or averaging a little over three) subsenses each (figure ____), and 154 words (listed in figure ____, with the word subject or 'type' indicated parenthetically), this WordSpring was equipped to coin 177 x 154 = 27,258 hypothetical words collectively possessed of 90,000 explicit, albeit hypothetical, subsenses.

If these would-be words, word-senses, and concepts were simply generated by the WordSpring without any subsequent thought as to what they might mean, then assuredly they would mean very little indeed, and the magnificently prolific WordSpring would just be another of those dubious inventions—which have become increasingly common in recent years—for giving the world much of nothing or illusory wealth.

In actual practice, the frightful torrent of neologisms thrown out by a WordSpring all have to be individually inspected, cogitated, and judged, and at least at the moment the latter things must be done by a human being (although some ideonomic methods exist which could partially automate these toilsome tasks).

The inspection of a set of coined words to confirm their semantic validity, and lexical and cognitive importance, is a process that really requires several 'passes', or later reexaminations of the full set of candidate words and senses. To a surprising extent, words that strike one as totally nonsensical prima facie will as often as not reveal unsuspected meaning and utility when they are reconsidered by the same person on the morrow or after a week has passed. Although the overwhelming tendency is for supposedly unsuccessful neologisms to turn out to make sense and have value upon later study, it is also true that some of the most brilliant onomastic debutantes mysteriously lose all charm after the ball.

Often when a WordSpring proposes several subsenses for a coinage, the mind will initially confuse the different possibilities for one another. One idea tends to stand before another, impeding its emergence or corrupting its meaning. Such interference often proves transitory when the neoterism is revisited.

Of course when a coinage is at once defined in many ways, or for various possible senses, the alternatives may be mutually suggestive, differentiating, and synergistic. Even hypothetical subsenses that ultimately prove to be themselves invalid may have a helpful role to play.

The possible subsenses of the essentially dyadic neologisms in figure ____ have been codified to indicate my evaluation of their worth. The would-be senses of the coinages were judged for being: meaningless or meaningful; and if meaningful, for being: (1) trivial, or familiar and redundant, or on the contrary (2) possessed, or seemingly possessed, or potentially possessed, of considerable semantic and/or linguistic novelty, interest, value, charm, or other merit.

I will now give my interpretations of and reflections upon the subsenses.

Fig. ____

"177 DIVERSE PREFIXES"

(From G - Z)

1. Gambro: (1) Akin, (2) Related.
2. Gamo: (1) Marriage, (2) Union.
3. Gemisto: (1) Laden.
4. Genico: (1) Generic.
5. Geno: (1) Genus, (2) Kind, (3) Race, (4) Stock, (5) Generating, (6) Origin, (7) Offspring, (8) Birth.
6. Gero: (1) Old, (2) Aged, (3) Old age.
7. Gigo: (1) Giant.
8. Giso: (1) Border.
9. Gito: (1) Neighbor, (2) Neighborly.
10. Gnosto: (1) Known.
11. Gymno: (1) Naked, (2) Bare, (3) Uncovered.
12. Habro: (1) Graceful, (2) Dainty, (3) Pretty, (4) Tender.
13. Hadro: (1) Bulky, (2) Strong, (3) Large, (4) Great, (5) Well-developed, (6) Ripe, (7) Stout.
14. Hagio: (1) Sacred, (2) Holy.
15. Hagno: (1) Innocent, (2) Pure, (3) Sacred.
16. Halmo: (1) Leap, (2) Bound, (3) Spring.
17. Halosimo: (1) Easily taken, caught, conquered, or attained.
18. Haloto: (1) Attainable.
19. Hamillo: (1) Contest, (2) Conflict.
20. Haplo: (1) Simple, (2) Single.
21. Hapso: (1) Joint.
22. Harmosto: (1) Adapted, (2) Fit, (3) Suitable.
23. Hecisto: (1) Least.
24. Hecto: (1) Habit, (2) Habitual, (3) Habit-forming, (4) Possession, (5) Condition, (6) State.
25. Hedo: (1) Abode, (2) Seat, (3) Base or pedestal.
26. Hedy: (1) Pleasant, (2) Sweet, (3) Dear.
27. Heno: (1) Former, (2) Old, (3) One.
28. Heolo: (1) Stale.
29. Herco: (1) Enclosure, (2) Fence, (3) Wall.
30. Herpo: (1) Creep.
31. Hesso: (1) Worse, (2) Less.
32. Hetero: (1) Other, (2) Different, (3) Unusual.
33. Hicano: (1) Sufficient, (2) Competent, (3) Fit, (4) Able, (5) Arrive at or reach.
34. Hileo: (1) Gracious, (2) Kind.
35. Hircto: (1) Cage, (2) Prison.
36. Holico: (1) General, (2) Universal.
37. Holo: (1) Whole, (2) All, (3) Complete, (4) Homogeneous, (5) Entirely, (6) Similar or similarly.
38. Homo: (1) Uniform, (2) Similar, (3) Same, (4) Homomorphic, (5).
39. Hoplo: (1) Tool, (2) Implement, (3) Shield, (4) Armor.
40. Horimo: (1) Timely, (2) Seasonable, (3) Ripe.
41. Horisto: (1) Definable.
42. Hormo: (1) Chain, (2) String, (3) Necklace, (4) Harbor.
43. Horo: (1) Boundary, (2) Limit, (3) Standard, (4) Rule, (5) Landmark.
44. Hyio: (1) Son.
45. Hypato: (1) Highest, (2) Uppermost.
46. Hyper: (1) Excessive, (2) Above, (3) Very, (4) Beyond.
47. Hypo: (1) Under, (2) Less than, (3) Down, (4) Beneath, (5) Lower, (6) Subnormal.
48. Hypso: (1) High, (2) Height, (3) On high.
49. Hythlo: (1) Nonsense, (2) Gossip.
50. Ico: (1) Probable, (2) Reasonable, (3) Likely.
51. Icrio: (1) Platform, (2) Scaffold, (3) Flooring, (4) Bench.
52. Idico: (1) Specific.
53. Idio: (1) Individual, (2) Peculiar, (3) Self-produced, (4) Personal, (5) Separate, (6) Arising within.
54. Inter: (1) Between or among, (2) Mutual, (3) Reciprocal, (4) Shared by two or more, (5) Between the limits of.
55. Intro: (1) In, (2) Into, (3) Inward, (4) Internal, (5) During, (6) Underneath, (7) Inside.
56. Ipo: (1) Press, (2) Weigh down.
57. Irmo: (1) Series, (2) Sequence, (3) Train, (4) Connection.
58. Ischo: (1) Restrain, (2) Hold, (3) Have.
59. Iso: (1) Like, (2) Equal, (3) Homogeneous, (4) Uniform, (5) For or from individuals of the same species of thing.
60. Isthmo: (1) Isthmal, (2) Neck, (3) Narrow passage.
61. Juxta: (1) Situated near.
62. Kakisto: (1) Worst.
63. Keno: (1) Empty.
64. Kino: (1) Motion, (2) Action.
65. Lao: (1) People.
66. Lepto: (1) Thin, (2) Weak, (3) Fine, (4) Delicate, (5) Small, (6) Peeled or dehusked.
67. Lero: (1) Nonsensical, (2) Silly, (3) Foolish.
68. Lio: (1) Smooth.
69. Lipo: (1) Lacking, (2) Without, (3) Abandoned, (4) Leaving, (5) Deficient.
70. Lipsano: (1) Relic, (2) Remnant.
71. Lito: (1) Simple, (2) Frugal, (3) Plain.
72. Loxo: (1) Slanting.
73. Lyo: (1) Release, (2) Break up, (3) Dissolve, (4) Loose, (5) Lacking, (6) Rudimentary in.
74. Macro: (1) Large, (2) Macroscopic, (3) Long, (4) Including and more comprehensive than.
75. Mal: (1) Irregular, (2) Abnormal, (3) Bad, (4) Evil, (5) Poor, (6) Inadequate.
76. Malisto: (1) Most.
77. Mano: (1) Rare, (2) Thin.
78. Meco: (1) Long, (2) Length.
79. Mega: (1) Great, (2) Very, (3) Powerful, (4) Enlarged, (5) Abnormally large.
80. Meleo: (1) Idle, (2) Useless.
81. Mello: (1) Future.
82. Meno: (1) Remain, (2) Stay, (3) Force, (4) Strength.
83. Merico: (1) Particular.
84. Meristo: (1) Divided, (2) Divisible.
85. Mero: (1) Part, (2) Portion, (3) Partial, (4) Share.
86. Meso: (1) Middle, (2) Medium, (3) Moderate, (4) Linking, (5) Intervening.
87. Messato: (1) Midmost.

88. Meta: (1) Beyond, (2) Higher-order, (3) Transformed, (4) Over, (5) Succeeding, (6) Among, (7) Situated behind.
89. Metro: (1) Measure, (2) Rule, (3) Matrix, (4) Mother, (5) Womb.
90. Mezo: (1) Greater.
91. Micro: (1) Small, (2) Minute, (3) Amplifying, (4) Petty, (5) Abnormally small.
92. Micto: (1) Mixed.
93. Minyorio: (1) Short-lived.
94. Mio: (1) Less, (2) Fewer, (3) Slightly, (4) Smaller.
95. Mis: (1) Wrong, (2) Bad, (3) Mistaken, (4) Improper, (5) Unfavorable, (6) Fearful or suspicious, (7) Hatred.
96. Mito: (1) Thread.
97. Mogi: (1) Barely, (2) Difficult, (3) Labor or exertion, (4) Distress or trouble.
98. Monado: (1) Unit, (2) Alone, (3) Single.
99. Monimo: (1) Stable, (2) Steady.
100. Mono: (1) One, (2) Single, (3) Alone-or-solitary, (4) Monocausal.
101. Multi: (1) Multiple, (2) In many respects, (3) Much.
102. Myrio: (1) Countless, (2) Myriad.
103. Neo: (1) New, (2) Recent, (3) Young, (4) Imitation, (5) Immature.
104. Nomo: (1) Law, (2) Distributing, (3) Arranging, (4) Place or condition for living.
105. Nosto: (1) Return home.
106. Ob: (1) Inverse, (2) In-reverse-order, (3) On account of, (4) Toward, (5) Against, (6) Inward, (7) Upon.
107. Oeo: (1) Singular, (2) Unique, (3) Peculiar, (4) Alone.
108. Off -: (1) Diverging from, (2) Off, (3) Situated or occurring apart from.
109. Oligo: (1) Few, (2) Scanty, (3) Deficient, (4) Insufficient, (5) Small.
110. Omni: (1) All, (2) Universal, (3) Without restriction.
111. Onio: (1) Useful.
112. Ortho: (1) Correct or true, (2) Normal, (3) Straight, (4) Direct, (5) Upright or vertical, (6) Parallel, (7) Exact, (8) Right.
113. Oxy: (1) Sharp, (2) Acute, (3) Keen, (4) Quick.
114. Ozo: (1) Branch, (2) Bough, twig, or offshoot.
115. Ozoto: (1) Branched.
116. Pacho: (1) Thick.
117. Pagio: (1) Firm, (2) Solid, (3) Fixed, (4) Steadfast.
118. Paleo: (1) Ancient, (2) Old, (3) Ancestral, (4) Early, (5) Primitive, (6) Archaic.
119. Palino: (1) Again, (2) Back, (3) Repetition.
120. Pan: (1) All, (2) Every, (3) General, (4) Whole.
121. Para: (1) Beside or near, (2) Parallel, (3) Against, (4) Almost, (5) Abortive, (6) Beyond, (7) Outside of.
122. Para: (1) Subsidiary or accessory, (2) Faulty, (3) Irregular, (4) Disordered, (5) Abnormal, (6) Perverted.
123. Patho: (1) Disease, (2) Pathological.
124. Pato: (1) Way, (2) Trodden path.
125. Pecto: (1) Compacted, (2) Congealed, (3) Fixed.
126. Pen: (1) Almost.
127. Per: (1) Through, (2) Throughout, (3) Very, (4) By means of.
128. Peri: (1) Around, (2) About, (3) Near, (4) Round, (5) Surrounding, (6) Enclosing.
129. Phanero: (1) Manifest, (2) Visible, (3) Open.
130. Plagio: (1) Oblique, (2) Aslant.
131. Plano: (1) Level, (2) Flat, (3) Plane, (4) Clear or plain, (5) Smooth.
132. Plaso: (1) Molding.
133. Pleisto: (1) Most.
134. Plexo: (1) Interwoven, (2) Network, (3) Braided or twining.
135. Plio: (1) More.
136. Poikilo: (1) Variegated, (2) Various.
137. Poly: (1) Many, (2) Diverse, (3) Very, (4) Excessive, (5) Abnormal.
138. Pompo: (1) Conductor, (2) Guide, (3) Parade, (4) Display.
139. Pore: (1) Hole, (2) Passage, (3) Pore.
140. Post: (1) Later, (2) After, (3) Subsequent, (4) Behind, (5) Posterior.
141. Prao: (1) Mild, (2) Meek, (3) Gentle, (4) Tame.
142. Pre: (1) Antecedent, (2) Earlier, (3) Anterior, (4) Preparatory, (5) Formative.
143. Proto: (1) Primary, (2) Beginning, (3) Archetypal, (4) Chief, (5) Giving rise to, (6) First or lowest of a series.
144. Pseudo: (1) False or illusory, (2) Substitute, (3) Feigned, (4) Aberrant, (5) Abnormal.
145. Quasi: (1) In some sense, (2) In some degree, (3) Seemingly, (4) Virtual, (5) Seemingly but not really.
146. Re: (1) Again, (2) Anew.
147. Retro: (1) Backward, (2) Back, (3) Retrograde, (4) Past, (5) Behind.
148. Semi: (1) Half, (2) Partial, (3) Incomplete.
149. Stato: (1) Equilibrium, (2) Balanced, (3) Fixed, (4) Resting, (5) Placed, (6) Standing, (7) Static.
150. Steno: (1) Narrow, (2) Tight, (3) Close.
151. Strepto: (1) Twisted.
152. Sub: (1) Below, (2) Subnormal, (3) Somewhat, (4) Subordinate, (5) Secondary or derived, (6) Imperfect, (7) Immediately following.
153. Super: (1) Higher, (2) More inclusive, (3) Superior, (4) Over or atop, (5) Extra, (6) Supernormal.
154. Supra: (1) Higher than, (2) Dorsal, (3) Transcending, (4) Prior to.
155. Sur: (1) Above, (2) Over, (3) Up, (4) Excessive.
156. Syno: (1) Associated, (2) With, (3) Like, (4) Synchronous, (5) By means of.
157. Tacho: (1) Fast or swift, (2) Accelerated.
158. Tacto: (1) Ordered.
159. Tauto: (1) Identical, (2) Tautological.
160. Telo: (1) End, (2) Mature, (3) Complete, (4) Far, (5) Consummational.
161. Thamno: (1) Often, (2) Frequent.
162. Themelio: (1) Foundational.
163. Themisto: (1) Lawful.
164. Trans: (1) Across, (2) Beyond, (3) Through, (4) Transverse, (5) Transformed, (6) Transfer or interchange.
165. Tremo: (1) Hole, (2) Opening, (3) Orifice.
166. Ultra: (1) Transcending, (2) Beyond the range or limits of, (3) Extraordinary, (4) Beyond right, proper, moderate.
167. Un: (1) Not, (2) Extinguish, (3) Opposite of, (4) Reverse, (5) Deprive of, (6) Release from.
168. Usio: (1) Reality, (2) Substance, (3) Essence, (4) Property.
169. Vice: (1) One that takes the place of.
170. Vicisso: (1) Alternation, (2) Change, (3) Stead.
171. Xeno: (1) Strange, (2) Foreign, (3) Guest, (4) Intrusive.
172. Xyno: (1) Common, (2) Companion, (3) Partner.
173. Zelo: (1) Rivalry, (2) Emulation, (3) Ardor or enthusiasm.
174. Zeteto: (1) Searcher, (2) Seeker.
175. Zopho: (1) Darkness, (2) Dusk, (3) Nether world.
176. Zoro: (1) Pure, (2) Sheer.
177. Zygo: (1) Pair or team, (2) Yoked or joined, (3) Union, (4) Fusion, (5) Balance.

"154 DIVERSE WORDS"

1. Act (ideonomy).
2. Analogy (ideonomy).
3. Anger (an emotion).
4. Answer (ideonomy).
5. Artist (a role).
6. Assumption (ideonomy).
7. Baby (random thing).
8. Bacterium (bacteriology).
9. Balancing (an action).
10. Beauty (aesthetics).
11. Book (literature).
12. Boundary (ideonomy).
13. Bridge (civil engineering).
14. Building (architecture).
15. Calling (an action).
16. Car (thing with functions).
17. Cause (ideonomy).
18. Cave (archanalogon).
19. Change (ideonomy).
20. Circuitry (electronics).
21. City (geography).
22. Civilization (archaeology).
23. Combination (ideonomy).
24. Compassion (a personality trait).
25. Computer (computer science).
26. Conflict (ideonomy).
27. Connection (ideonomy).
28. Content (ideonomy).
29. Continuity (ideonomy).
30. Continuum (random thing).
31. Contract (business).
32. Contradiction (ideonomy).
33. Conversation (random thing).
34. Courage (a personality trait).
35. Crime (criminology).
36. Critic (a role).
37. Crystal (crystallography).
38. Cycle (ideonomy).
39. Cynicism (a personality trait).
40. Decay (ideonomy).
41. Desert (archanalogon).
42. Disease (medicine).
43. Display Behavior (ethology).
44. Earthquake (geophysics).
45. Echo (acoustics).
46. Ecology (ecology).
47. Effect (ideonomy).
48. Embryo (embryology).
49. Entropy (thermodynamics).
50. Enzyme (biochemistry).
51. Error (ideonomy).
52. Event (ideonomy).
53. Evolution (evolutionary biology).
54. Example (ideonomy).
55. Fabric (textile industry).
56. Farming (agriculture).
57. Fastener (technology).
58. Fear (an emotion).
59. Fidelity (general usage).
60. Flight (aeronautics).
61. Food (food engineering).
62. Forest (random thing).
63. Form (morphology).
64. Fossil (paleontology).
65. Friend (a role).
66. Frontogenesis (meteorology).
67. Game (recreation).
68. Gene (genetics).
69. Genesis (ideonomy).
70. Goal (ideonomy).
71. Government (political science).
72. Grimaching (an action).
73. History (history).
74. Hurricane (archanalogon).
75. Idea (ideonomy).
76. Illusion (ideonomy).
77. Immunogenesis (immunology).
78. Industry (industry).
79. Insanity (psychopathology).
80. Insect (entomology).
81. Inventor (a role).
82. Joke (random thing).
83. Kissing (an action).
84. Knot (random thing).
85. Lamp (technology).
86. Law (law).
87. Leaf (botany).
88. Learning (education).
89. Ledger (accounting).
90. Light (physics).
91. Lightning (archanalogon).
92. Logic (ideonomy).
93. Looking (an action).
94. Love (an emotion).
95. Management (administration).
96. Material (materials science).
97. Melody (music).
98. Memory (psychology).
99. Metaphor (ideonomy).
100. Microscope (technology).
101. Mineral (mineralogy).
102. Molecule (chemistry).
103. Money (economics).
104. Morality (ethics).
105. Motion (ideonomy).
106. Movie (cinematography).
107. Museum (thing with functions).
108. Need (ideonomy).
109. Network (ideonomy).
110. Neuron (neurology).
111. News (journalism).
112. Number (mathematics).
113. Objectivity (a personality trait).
114. Ocean (oceanography).
115. Opportunity (ideonomy).
116. Opposite (ideonomy).
117. Organ (anatomy).
118. Organelle (cytology).
119. Painting (art).
120. Parasite (parasitology).
121. Particle [elementary] (physics).
122. Phenomenon (ideonomy).
123. Poverty (random thing).
124. Principle (ideonomy).
125. Probability (ideonomy).
126. Process (ideonomy).
127. Property (ideonomy).
128. Question (ideonomy).
129. Regime (ideonomy).
130. Road (random thing).
131. Rug (thing with functions).
132. Season (random thing).
133. Sleep (random thing).
134. Society (sociology).
135. Soil (pedology).
136. Species (biology).
137. Star (astronomy).
138. Subject (ideonomy).
139. Symbol (random thing).
140. Symmetry (ideonomy).
141. Synthesis (chemistry).
142. Taxon (ideonomy).
143. Tool (technology).
144. Tree (ideonomy).
145. Tribe (anthropology).
146. Truth (ideonomy).
147. Tunnel (thing with functions).
148. Universe (cosmology).
149. Value (ideonomy).
150. Volcano (geomorphology).
151. Waste (pollution control).
152. Waterfall (hydrology).
153. Weather (meteorology).
154. Weed (archanalogon).

Figure ____

(1) Lito-volcano: (1) simple volcano, (2) frugal volcano, or (3) plain volcano.

A volcano may be simple because, as it happens, it is not compound or not complex. It may be compound sensu being made of two or more synchronous or asynchronous volcanoes, or central conduits, or central or secondary vents; or complex sensu being a hybrid between two types, or complicated in behavior, or transitional to geologic phenomena other than the species volcano...

A volcano may be frugal for producing subnormal solid, liquid, or gaseous matter, or owing to the supernormal efficiency of its energetics or material conversions, or through the fact that its crater is under-proportionate to its lifetime power or other material products.

A volcano may be plain rather than being extraordinary, or for being smooth rather than rugged in outline or tuberculated in surface.

(2) Meso-parasite: (1) middle parasite, (2) medium parasite, (3) moderate parasite, (4) linking parasite, or (5) intervening parasite.

A middle parasite might be a taxon intermediate between two (or all) others, or an endoparasite favoring a central residence in the body of its hosts (as opposed to a subsurficial or exoparasitic site), or a parasite dwelling or operating amongst other parasites (bionts or species), or a metamorphic stage in the life-cycle of a parasite, or a parasite species share.

A medium parasite might be half-way-ascended up the evolutionary tree of parasites or parasitic forms.

A moderate parasite might be an organism of only mildly parasitic character or habit, or a tolerant and nonlethal parasite, or a parasite whose progress or effect is very gradual.

A linking parasite might be one so important to a set of host or non-host species that it is critical to their demographic or evolutionary balance or dynamic equilibrium, or that by inflicting one species serves another, or that makes a set of nonparasitic species necessary to one another's survival (connecessary).

An intervening parasite might be a parasite's parasite, or a parasite that—by interposing itself in a physiological process or along a 'long' organ—interferes with the operation of same (e.g. by exploiting some intermediate step in a biochemical or metabolic pathway), or a parasite that habitually competes with another parasite or seeks to impropriate its ecological or evolutionary niche (in a set of hosts), or a parasite that characteristically attacks some successive generation of a host, or that specifically disrupts reproduction.

(3) Meta-memory: (1) Beyond memory, (2) Higher-order memory, (3) Transformed memory, (4) Over memory, (5) Succeeding memory, (6) Among memory, or (7) Situated behind memory.

By beyond memory one might be being reminded that there will always be memories that are not accessible at a given moment, in a certain situation, by given methods or certain brain circuits or structures, to the same degree, or at all; that memorization and recall are mental functions and per se must have certain inherent limitations; that it may be critical for a student of the mind to know the exact omissions and failures of human memory; etc.

The subsense higher-order memory suggests that all memories should form and belong to various hierarchies within which there should be higher- and lower-order levels of memories and types, processes, and

functions of memory, that there may be memories possessed of various characteristic grades of excellence, that much more advanced mechanisms of memory must be possible than those used by any organism on Earth or by any existing computer, that a given memory is capable of being perfected in various ways (and to an as yet unspecifiable degree), that behind the bits and processes of memory that are consciously known to us there may be much more sophisticated and powerful forms of memory at work (of a subconscious or supraconscious character), or that certain persons—possibly even certain animals—may have forms of memory of an unusual and higher order (e.g. ones that are far more efficient, fast, effective, specialized, comprehensive, organized, decay-free, vivid, active, creative, multi-channel, flexible, or cotentive).

The sense transformed memory could refer to a discrete memory changed into another memory or another type of memory, or to what a memory is like after it has been corrected (having been defective in some way), or to the ubiquitous spread of information within the brain, or to the transformation of society's historical memories over the years.

Over memory suggests higher-level mental functions that rely upon memory to supervise lower-order ones, or specific memories associated satellitically with specific memories in a superintending capacity, or a memory that shapes a particular perception, feeling, or action.

Succeeding memory calls attention to the chains of memories that surely operate in mind and behavior, or asks us to discover what kinds of or individual memories follow upon other kinds of or individual memories (or are in fact excluded by certain antecedent memories), or furnishes us a name with which to distinguish direct memory immediately following upon experience from secondary memories of memories (or vice versa!), or calls attention to the possibility that what we think of as continuous and uninterrupted memory over time may in reality be a process of subtle degradation or of replacement of original memories by copies of copies of memories or by ersatz or highly selective or biased or generic memories or by mere mnemonic procedures or a mythopoeic process in which accumulating errors induce complex confabulation.

The sense of the neologism among memory could be taken to suggest the queer idea that to some extent memories may be individual and autonomous entities living a life of their own and having their own (or semi-independent) forms of memory, or to refer to memory that is possible or complete only in the presence or gestalt context of other memories or of certain sensa or life experiences, or to memories as they are modified generally—whether nomothetically or idiographically—when they are in the company of other memories, or to memory that is inextricably—even if only accidentally or irrelevantly—embedded in other memories, or to things that always accompany or are associated with memories but are not themselves memories (or that may not even be mnemonic), or to memories or bits of memory that may be held in common by or shared among several different or truly 'whole' memories, or to memories fragmentary in individual persons but capable of complete reassemblage through the simultaneous presence or virtual collaboration of that set of individuals.

Finally, by situated behind memory could be meant memories that new or active memories have a tendency to eclipse or that they just happen to be hiding momentarily, or older or more generic memories that encourage or situate new memories that are similar or related to them, or paleopsychic memories (so-called ancestral memories) that might play an equivalent role but on an evolutionary scale.

Henceforth I will try to resist the temptation to completely explicate the possible subsenses of the neologisms. The value of the foregoing is that it illustrates the degree of such explication that can be achieved if one is determined and slightly fey. In future ideonomic research there will be special situations where such detail and thoroughness will be appropriate.

(4) Micro-example: (1) Small example, (2) Minute example, (3) Amplifying example, (4) Petty example, or (5) Abnormally small example.

A small example may be what is more suited to the present purpose, a small sample, a physically or numerically little example or instance of something, an example sought and offered for its efficient smallness.

A minute example may be an extremely small example, or the tiniest example that exists, can be found, or that could exist, or a microscopic specimen or specimen of a microscopic thing.

An amplifying example might be a specialized example that makes or dramatizes or helpfully exaggerates a particular point, or an example that gives access or calls attention to a detail that was or might otherwise be overlooked, or an example illustrating the larger or speculative possibilities of a thing.

A petty example could be a frivolous and obstructive objection or an example chosen or designed to help with such a quibble or the sort of trifling problem or counterexample that can always be instanced in any situation.

An abnormally small example could be one insufficiently large, or anomalously or pathologically small, or too small to deservingly belong to a set of more evident or evidential things; or simply an example of an abnormally small thing.

(5) Micto-tree: (1) Mixed tree.

The word tree here could variously be understood in its simple botanical sense, or in the sense of a dendrogram, or in its extraordinarily fundamental and diverse ideonomic sense.

To a botanist a micto-tree (or mictotree) could be a hybrid tree or a tree grafted onto another tree, whether of the same or a different species; or a species of tree with strangely assorted morphological or behavioral characters (and perhaps for this reason presenting taxonomic difficulties); or a tree with obligate episymbionts or involved in an obligate symbiosis or supporting a rich symbiotic population (say of vines, epiphytes, birds, insects, snakes, bacteria, etc); or a tree growing amid trees of other species.

A dendrogram could represent a micto-tree for co-mapping heterogeneous things, or synthesizing many dendrograms, or simultaneously addressing several distinct needs or problems, or combining features of different types of dendrogram.

These remarks about a dendrogram also serve to suggest ways in which a tree in the most universal ideonomic sense could be a micto-tree: for mixing categories, features, themes, purposes, etc. Moreover, an ideonomic tree can contain and be contained in many trees, and form composite networks of trees.

One of the major functions of a tree can be to mix things, via its tributary or distributary branches.

(6) Lipo-farming: (1) Lacking farming, (2) Without farming, (3) Abandoned farming, (4) Leaving farming, or (5) Deficient farming.

So far I have only treated the coinages as being nouns, but of course they could also be treated as adjectives or as other parts of speech. In some cases this would even make more sense.

Lipo-farming (lipofarming) could be farming lacking in such things as: a necessary or desirable soil mineral or chemical element, adequate drainage or sunlight, four seasons, sufficient unskilled labor, managerial expertise, or modern farm equipment.

Or it could be farming without: e.g. without land (as in hydroponics or aquaculture), sunshine, farming itself in the traditional sense (as in food factories that would bypass whole organisms via tissue or cell cultures—or even biology, via direct synthesis of foods from chemicals), human labor (via total automation), natural species of organisms (say as opposed to artificial species created by biological engineering), or loss (other than that lost in the mass of the marketed crops, in an environmentally closed system).

Or it could be abandoned farming, say in the sense that the agrarian sector of the economy of some Third World country might be virtually abandoned because of mass rural flight of farmers to the industrial cities, or simply in the sense that some specific type of farming might be abandoned, or the class of crops that, although necessary to the poor, are less profitable to the individual farmer.

Or it could be leaving farming: say in the sense of leaving some crops or parts of crops to serve as fertilizer or to help over time to maintain the soil or to preserve its structural integrity and oppose erosion.

Or finally it could be deficient farming, in the sense of a farming industry insufficient in scale or diversification to meet the needs or opportunities of a region or nation.

(7) Lepto-light: (1) Thin light, (2) Weak light, (3) Fine light, (4) Delicate light, (5) Small light, or (6) Peeled or dehusked light.

Thin, as in the light of the sun when it is near or over the horizon, or light escaping between or among interstices or clouds or through a barrier or 'cloud', or a laser beam, or rays of sunlight breaking through forest canopy to reach the ground; or as in light that has a leptokurtic spectrum, owing to filtering or a monochromatic source.

Weak, as in the light that remains at dusk or that bathes the ground as starlight.

Fine, as in that light whose spectral composition makes it the most complimentary to the complexion or the most revelatory of the contents of a painting.

Delicate, as in the light associated with the repeated mutual reflections of all of the objects in a room (critical to the ray path tracing technique of computer graphics), or that exalts the landscape during a golden sunset, or of flickering candles illuminating an altar.

Small, as the light of fireflies.

The sixth mechanically suggested subsense, peeled or dehusked light, I dismiss as meaningless (although it does recall some esoteric speculations of particle physicists).

✳ Having in the above addressed every sense of every word in succession, I will now confine myself to just the most interesting coinages and subsenses of those coinages. Of course what is "most interesting" will depend in part on one's point of view and momentary interests and purposes. Also, "most" is quantitatively inspecific; perhaps I will choose the one word in 10 or 15 that I find the most admirable.

The value of the preceding explication of coinages is that it shows the broad applicability of the prefixes and the general interest of the coinages they can give rise to. What follows, by contrast, provides the reader with an indication of the height of interest such artificial words can have when the production of a WordSpring is winnowed. My use of the word "height" should not be taken too literally, however, because the coinages I consider represent an extremely superficial culling.

(8) Meristo-news: (1) Divided news, [(2)] Divisible news.

Only (2) interests us here. By meristonews sensu "divisible news" might be meant an item of news or newspaper story clearly containing two or more individually important and easily separable stories, themes, facts, or developments. Often one item of news eclipses or subjectively distorts another bit of news that accompanies it; what would be a tree of divergent news refuses to branch, much less throw off propagules. Often journalists or their editors are at fault for failing to differentiate new news from old, and different elements and aspects of the news.

(9) Poly-question: [(1)] Many question, [(2)] Diverse question, (3) Very question, (4) Excessive question, (5) Abnormal question.

A polyquestion sensu "many question" (or multiple question) could be a question that is, asks, involves, implies, or leads to two or a multitude of questions (even when answered). Recalling the previous neologism, a polyquestion could be a meristo-question naturally divisible and properly divided into two or more conjoint or disjoint questions, or into superordinate, subordinate, lateral, and disparate questions.

Or sensu "diverse question", a question that is ambiguous or complex, or perhaps contributory to the diversity of a set of questions associated with it.

One could imagine (in a world of all words) a civil servant being asked a question by a reporter, and responding, "You have asked not a monoquestion but a polyquestion! - Yes, no, and maybe."

(10) Pseudo-flight: [(1)] False or illusory flight, [(2)] Substitute flight, [(3)] Feigned flight, (4) Aberrant flight, (5) Abnormal flight.

All five senses would find application in ethology.

A pseudoflight, sensu "false or illusory", could be a flight initially launched in a misleading direction, say to misdirect a diving raptor.

Or, sensu "substitute flight", a nonstandard or unexpected direction, pattern, or mode of flight chosen to confuse an attacking animal.

Or sensu "feigned flight", a mere pretense of flight, such as a dash into the brush, followed by immobility and silence.

(11) Tacho-looking: [1] Fast or swift looking, [2] Accelerated looking.

These two senses of tacholooking could refer to the enormously quickened, energetic, and purposeful observations one may make almost unconsciously when suddenly confronted by novelty, the unexpected, danger, complexity, what is unknown, sublimity, or the eyes of others; or to methods for inspecting things fast and efficiently to which the brain can have recourse (methods involving sampling, guesses, risks, assumptions, oversimplifications, priorities, etc).

It can be conjectured that a large part of visual (and other sensory) perception is disguised in this way, or is concentrated in temporally atypical, opportunistic bursts requiring special instrumental and statistical methods to measure or even detect.

The spatial mappings of the bodies, sensory receptors, and basic sensorimotor dimensions of animals in their brains are enormously distorted to emphasize certain regions, parts, and functions. The rat's whiskers are represented by a ludicrously disproportionate fraction of the rat's somatosensory cortex, for example, and in our own cortical homunculi comparable real estate belongs to the fovea centralis, fingers, and lips.

Such skewed spatial representations are far easier to detect then the analogous temporal and functional biases that surely obtain as well and that would probably be associated with the occasional bursts of accelerated, concentrated, and supernormally meaningful perception that I have proposed.

But by fathering these thoughts, the neologism "tacholooking" may have played the essential role of initiating the process of discovery.

(12) Re-desert: [1] Again desert, [2] Anew desert.

Both senses of redesert evoke in my mind a picture of the deserts of the world waxing and waning over geologic time, and possibly ceasing to exist altogether for periods, only to be born and reborn again later. So a redesert would be a cyclically re-created desert or expanse of desertification. It is a word of little interest to a layman, but which geologists might wish to adopt to plug a vacant terminological niche. In geology—or in any subject—there may exist a multitude of such regrettable vacancies, whose sum effect may be truly tragic.

(13) Pleisto-combination: [1] Most combination.

From the standpoint of the mathematician, chemist, ideonomist, and many other professionals, the introduction of this term would be a godsend. One could define pleistocombination, sensu "most combination", as: that particular combination in which most or maximally many things or contents combine or combine most completely, truly, efficaciously, or synergistically.

The discovery of ultimate or progressive pleistocombinations is a major quest everywhere in science, and (less consciously) in all of life. Combinatorial laws are obscure, hypercomplex, and insurpassably counterintuitive.

What pleistocombinations might there be of atoms, chemicals, genes, phenes, numbers, component 'probabilities', concepts, words, esthetic elements, people, and species? All wonderful things to dream about!

(14) Vicisso-display behavior: [(1)] Alternation display behavior, [(2)] Change display behavior, [(3)] Stead display behavior.

In these senses generated by the Latin prefix, the ethologist might find rich ground for imaginative speculation.

In its first, alternational sense vicisso-display behavior could be defined as: typically, binary or bipartite (often contradictory, co-opposite, dialectical, or neutral-extreme) behavior displayed in a (slow or fast) 'sinusoidal or discrete (continuous or discontinuous)' cycle (sequential oscillation). One is encouraged to believe that such behavior should occur in animals by the mere fact that analogous oscillatory behavior is all-pervasive in Nature. Actually many instances and forms of it have already been documented by zoologists.

"Change display behavior", the proposed second sense of the term, might be used to refer to animal display behavior which is start-specific or start-relative, or, alternatively, which is self-contrast-defined. The meaning, or the occurrence, of some display behavior might depend on the state or behavior of the animal at or before the onset of the display, either generically or specifically, in some absolute or relative way; or be independent thereof; or be a function of dynamical contrast internal to the sequence of behavior or events, or of second-order, higher-order, or perpetual changes.

The third sense of vicisso-display behavior, or "stead display behavior", might be interpreted as referring to substituted, alternative, optional, 'diffractional', or variational display behavior.

To give hypothetical examples of these three general senses: (1) would be illustrated by a rapid oscillation between defensive and flight behavior in an animal's response to a predator, (2) by an identical behavioral display simultaneously triggerable by an encounter either with aggression or courting behavior on the part of another animal, and (3) by the second or "substitute flight" subsense of the coinage "pseudo-flight" discussed earlier.

(15) Hythlo-artist: [(1)] Nonsense artist, (2) Gossip artist.

As a "nonsense artist", a hythloartist might be defined as an artist who (or whose art) is one or more of the following: not-serious, frivolous, nonsensical, vapid, worthless, humorous, anti-art, random, hopelessly confused, insane, profoundly erroneous, or hideously bad.

For coinages generated by a WordSpring such as this it might in certain instances be appropriate to indicate one or more substitutable prefixes or words of identical, analogous, homologous, better, or different meaning (whether denotative, connotative, or associational), form, or sound. This might be done universally (and automatically), or to set a given word or meaning apart from others with which it might have a tendency to be confused, or to somehow bring out special aspects of a certain meaning or application.

Thus in place of the six-letter prefix hythlo-, here, in sense (1), one might wish to consider substituting either of two other Greek prefixes: the five-letter prefix alogo- (from the word alogos, meaning speechless, irrational, or absurd) or the still shorter, four-letter lero- (from leros, meaning silly, nonsensical, or foolish). Words such as alogoartist or alogartist, and leroartist or lerartist, would not twist the tongue in the way hythloartist does.

(16) Keno-friend: [(1)] Empty friend.

Such a kenofriend might be a fairweather friend, a worthless or unprofitable friend, or a feigned friend.

Antonymous prefixes could be plenofriend or pleofriend, meaning "full friend", or eufriend, meaning "true or good friend", or sterofriend or sterefriend, meaning "solid, firm, hard, three-dimensional friend". Simultaneously generating an antonymous coinage, or anti-neologism, is often desirable and might be a good idea generally. Some words and concepts may remain practically meaningless when they are not provided with an opposite (which is to say that certain opposites may be virtually coessential). In any case, referring to a thing's opposite, if only for the nonce, will almost always make the thing easier to understand or more meaningful. Many antineologisms, and anti-senses of neologisms, could be created automatically by a computer WordSpring.

Substitutable prefixes for keno- that come instantly to mind are: pseudo-, quasi-, para-, mimo-, and epi-. These six prefixes have differing nuances.

(17) Macro-anger: (1) Large anger, (2) Macroscopic anger, [(3)] Long anger, (4) 'Including and more comprehensive than' anger.

The meaning of macroanger sensu "long anger" is clear enough. Since macro- more often signifies large, a better coinage might be dolicho-anger (Gk. dolichos = long), meco-anger (Gk. mekos, n. = length), tany-anger (Gk. tany- = long, tanyo = stretch out), or dero-anger (Gk. deros = long, long time, too long).

About these alternatives or their useful nuances it might be remarked that macroanger could distinguish forms of anger that are long as an effect of their being big or intense, or else big as an effect of being long; that dolichoanger has special appeal because of the length of its prefix; that mecoanger could distinguish anger prompted by length; that tanyanger suggests a finite quantity of anger artificially stretched out by circumstances (rather than a greater absolute amount of anger); and that deroanger could be used to refer to long-festering or very or overly persistent anger.

Possible antonyms of macroanger are possessed of enough interest to be worth commenting upon. Micro-anger stimulates the thought that there may be in our brains at every single moment, and in fact concurrently, tiny bursts, fluctuations, processes, or other events of, contributing to, or deriving from 'anger'; and at such an unfamiliar or minimal scale—as in ideonomy is often the case—the phenomenon of anger may be qualitatively and even unrecognizably different, in its effects, mechanisms, etc, and may even be inextricably entangled with supposedly opposite emotions, be a 'good' or wholly positive emotion, be an absolutely continuous and all-pervasive 'emotion', etc.

If bracho-anger is the antonym, in sense (3) above, or whose anti-sense is "short anger", then one might also wish to form the superlative brachisto-anger, meaning "shortest anger". Brachistoanger forces one to ask what, on the scale or spectrum of emotional events of every duration, the very shortest episodes of anger might be. Ones with lifetimes on the order of a second, millisecond, or even mere microsecond?

So microanger and brachistoanger pose a fascinating theoretical and experimental challenge to the neuroscientist: that he ascertain what are the littlest, briefest, commonest, and subtlest of angers in our brain, psyche, and lives.

(18) Mis-critic: (1) Wrong critic, [(2)] Bad critic, [(3)] Mistaken critic, [(4)] Improper critic, (5) Unfavorable critic, (6) Fearful or suspicious critic, (7) Hatred critic.

Of outstanding interest to me are miscritic sensu "bad critic" (a poor or defective critic), sensu "mistaken critic" (a critic who errs or is mistaken about something or who faults what is essentially faultless), and sensu "improper critic" (a critic who is tactless or indecent, or who goes about criticizing something in a wrong, artless, or immethodical way).①

① A better coinage for the last might be mal-critic.

(19) Omni-opportunity: [(1)] All opportunity, [(2)] Universal opportunity, [(3)] 'Without restriction' opportunity.

In the sense of "all opportunity", omniopportunity or omnopportunity might be defined as [1](an) opportunity for all persons (individually, collectively, or synergistically), or as [2]opportunity involving (or requiring the cooperation of) all persons or 'ones'.

Or sensu "universal opportunity", as [1]universally available, existing, or applicable opportunity, as [2]synergistic opportunity, as [3]opportunity requiring all persons or things, or as [4]omnifarious opportunity.

Or sensu "'without restriction' opportunity", as [1]opportunity open to all (a sense already suggested), or as [2]unqualified, comprehensive, or supreme opportunity.

(20) Holo-need: [(1)] Whole need, (2) All need, (3) Complete need, (4) Homogeneous need, (5) Entirely need, (6) 'Similar or similarly' need.

I will only focus upon the possible meanings of holoneed sensu "whole need".

Those which occur to me are sixteen in number: [1]a complete and irreducible need [2]or description of a need; [3]holistic or gestalt need; [4]need for a complete : transformation, replacement, substitution, refurbishment, reconceptualization, e/vc : of a situation or thing; [5]'need' sensu the totality of one's needs; [6]need for a whole environment, ecology, or world; [7]essential need; [8]comprehensive need; [9]'need' sensu the set of all known or potential needs of or re all; [10]need of (i.e. possessed by) some impersonal "holon"; [11]spiritual or organismal need; [12]diachronic (or transtemporal) need; [13]a single, integral, and circumscribed need; [14]an evolutionary, anamorphic, or infinite need; [15]a 'monadic' need, or need symbolizing, equivalent to, or synthesizing all needs or the universe; and [16]something 'wholly a need and nothing else'.

Again, this neologism would make much more sense if its mutually equivalent and nonequivalent antonyms were named and defined (which cannot be done here).

(21) Gnosto-objectivity: [(1)] Known objectivity.

For the scientist, at least, it might be important to distinguish cases where judgment, knowledge, or perception are actually known (demonstrated or confirmed) to be objective (as opposed to being subjective), from cases which are not, or not yet known, to be, such. Too much rides on the distinction, perhaps, to allow us to continue to operate without terms for the former, such as the noun gnostobjectivity and adjective gnosto-objective, and antonyms corresponding thereto.

(Which is not to argue that absolute distinctions of this sort are philosophically tenable.)

A certain visual texture may seem to be objectively present in a scene. Perhaps everyone who is asked agrees that it is there. Yet all human beings may simply share the same illusion, or a tendency to interpret an ambiguous texture in a unique or arbitrary way. Artificial intelligence employing nonanthropomorphic perceptual mechanisms may in the future demonstrate that the presence of the texture in the scene is not an example of gnostobjectivity, and in fact is purely subjective or pseudo-objective.

(22) Tauto-food: (1) Identical food, [(2)] Tautological food.

By tautofood sensu "tautological food" I mean that certain foods, nutritionally, may be unrecognizedly equivalent in a statistical sense, as complex composites of diverse nutrients, even though none of the specific nutrients they contain are conspicuously well-matched in a pairwise sense.

So there are two different ways of answering the seemingly unambiguous question as to which foods, or food-sources, are least redundant (overall).

Knowing which or what combinations of foods are least redundant is important to dietary planning.

Of course only in a stipulative sense does the neologism tautofood take this distinction into account, or provide a name for the more sophisticated sense of a redundant food. More to the point might be a term such as "statistical tautofood". Tautofood by itself could be generic.

Actually a welter of other phenomena may simultaneously contribute to the nutritional redundancy, and irredundancy, of foods, or bear on the proper measurement thereof.

For example, the need for nutrient A may depend upon the availability of nutrient B, or upon the co-availability or even mutual interaction of nutrients B and C!

Again, two different foods containing the same absolute amount of nutrient A may nonetheless be nutritionally nonequivalent, because of the differing general form of the foods (including differences in their overall chemical composition).

That which probably most deserves to be emphasized here, then, is that our present means and ways of measuring the nutritional value and tautologousness of the foods we eat are no doubt profoundly unsophisticated and deficient.

(23) Trans-baby: (1) Across baby, (2) Beyond baby, (3) Through baby, (4) Transverse baby, (5) Transformed baby, [(6)] 'Transfer or interchange' baby.

Transbaby could be used in sense (6), to refer to an infant produced via a surrogate parent (which is a new issue in medical law).

(24) Retro-question: [(1)] Backward question, (2) Back question, (3) Retrograde question, (4) Past question, (5) Behind question.

A retroquestion could be a "backward question" in the sense of a question only asked later in a conversation about something that was touched on earlier in the exchange, or in the sense of a new question about some historical issue, perhaps one that has been wrongly assumed to have been settled a long time ago.

(25) Gito-friend: [(1)] Neighbor friend, (2) Neighborly friend.

A gitofriend sensu "neighbor friend" could be a neighbor who happens to be a friend (or perhaps a friend who happens to be a neighbor).

Not all neighbors are friends, nor are all friends neighbors. Thus some neighbors are mere acquaintances, wholly unknown to one, or even sworn enemies. But the phenomenon of the befriended neighbor is very important in sociology, and gitofriend may deserve a place in the jargon of that field.

Persons who have been close friends sometimes choose to live nearby to one another to further their friendship.

(26) Peri-genesis: [(1)] Around genesis, (2) About genesis, (3) Near genesis, (4) Round genesis, (5) Surrounding genesis, (6) Enclosing genesis.

Sensu "around genesis", perigenesis could be used to refer to forms of development, growth, or transformation that tend to occur around a thing, perhaps because the thing actively or passively induces such genesis.

A condensation nucleus triggers a progressive accumulation of water around itself, which can yield a raindrop, and of course a snowflake forms as a result of very similar perigenesis around a precipitation nucleus (the seed in these cases may be a grain of dust or the body of a bacterium).

Many protein molecules form—and originally evolved—about a heavy-metal center.

Fascinating perigeneses may occur around ideas in the mind that function as catalysts, organizing centers, or precipitation nuclei. In society certain gifted individuals must play a similar role as inducers of large-scale perigenesis.

(27) Tacto-goal: [(1)] Ordered goal.

An "ordered goal" or tactogoal might be a goal that is approached in a planned and methodical way, as opposed to one achieved more casually.

(28) Tacho-boundary: [(1)] 'Fast or swift' boundary, (2) Accelerated boundary.

The word tachoboundary, sensu "'fast or swift' boundary", might be used by a fluid-dynamicist to designate any boundary at which there is a high or sudden velocity difference or change, and perhaps therefore a high sheer. The tachoboundary might occur wholly within a fluid or where a fluid meets a possibly stationary solid edge or wall. The term could also be used for boundaries of a very different or much more abstract character.

The bed and banks of a river, walls of a rocket nozzle or volcanic conduit, and edge of a highway would all be tachoboundaries. So would the spinning edge of a rotating saw blade.

(29) Trans-synthesis (chemical): (1) Across..., (2) Beyond..., (3) Through..., (4) Transverse..., (5) Transformed..., [(6)] 'Transfer or interchange' synthesis.

The chemist could use the term transsynthesis in sense (6), to refer to chemical synthesis achieved by means, say, of the simple or complex "transfer or interchange" of whole chunks of molecules between different molecules.

COINING NAMES FOR ANONYMS

An anonym, says Webster's III, is "an idea that has no exact term to express it".

The power of ideonomy to coin new words can be applied in two opposite ways or orders. Either new words can be created first, and perhaps supplied at the time with a possible definition or set of hypothetical subsenses, or else new ideas can be created first, and then ideonomy can be employed to coin new words, or perhaps multi-word terms, to designate, describe, or serve the novel or transformed ideas. (Actually the preexisting ideas may simply be old but undeservedly innominate ones; or ones that, although already possessed of names, are badly or confusingly named.)

This section will discuss some of the ways in which the science of ideas can be used to rescue important concepts from the deadening sea of anonymity.

A nameless and unnameable idea, for being such, may also be: incommunicable, indefinable, incogitable or undiscoverable, incapable of being evaluated or appreciated, undevelopable, useless, obscure, a source of misunderstandings, inexact, etc.

Certain concepts are even worse off than mere anonyms: not only are they unnamed, but the structure and grammar of the vocabulary of our language essentially leaves them unverbalizable, even by combinations of existing words (where by "unverbalizable" is presumably meant: verbalizable only with difficulty or improbably).

My early researches in ideonomy have convinced me of the following pertinent things: the languages we use (such as contemporary English) are profoundly deficient, excessive, flawed, biased, unbalanced, ignorant, and inaesthetic in words, word-senses, and word-forms; our systems, habits, and productions of language are unscientific, illogical, antiquated, and pre-ideonomic; our thought and behavior is unconsciously constrained by a 'virtual vocabulary' (or virtual language) representing the immense but ultimately finite and peculiar dyadic, triadic, and perhaps higher potential and actual combinations of the vastly smaller official vocabulary of monadic (uncombined) words (numbering from 50,000 to 5,000,000); we constantly use and encounter thousands and even millions of unnamed concepts and cognitive relationships; reality is an infinite continuum of overlooked patterns, possibilities, concepts, and opportunities that yet press upon us conspicuously from all sides and await only the seeing, saying, or doing of the obvious; the real, and fantastically greater, power of words, concepts, thoughts, facts, and things lies in their illimitable possibilities of reciprocal combination, permutation, and modulation; etc.

Whence the anonyms whose methods for being named I am about to consider?

To come up with such anonyms one might simply sit down and attempt to recall and record all of the many things and ideas one has met or conceived of in life that have lacked, to the best of one's knowledge, any satisfactory name.

Subsequent study of this compilation might suggest by analogy many more, and possibly many times as many, anonyms that should be added to it.

When working on a specific topic, or in a specific field, one may become conscious, with or without intention, of concepts and possibilities relevant thereto but bereft of a suitable name.

Those ideonomic subdivisions whose themes are Ignorances, Concepts, Possibilities, Combinations, Futuribles, Functions, Uses, Taxons, and the like, can be used to massively suggest anonyms.

The growth of Idea Trees may also represent a growth of trees of anonyms, especially if the last is the objective of the endeavor.

Often when one is forming a certain word, one or more other needed or desirable words (or anonymous concepts) are suggested on the side.

Like all else in the world, anonyms will exist in clusters. It would be possible for ideonomy to discover the rules and meta-rules that could help to identify, create, and name these clusters of anonyms.

Quite often something has a name, but no name exists for the thing's opposite, the actual relationship of the thing and its opposite, the analogs, congeners, or elements of the thing, higher and lower taxons of the thing, etc. Fortunately in these cases it may be rather easy to invent appropriate new words simply by modifying the name of the primary thing with the help of prefixes, or the like, that embody or suggest the relevant referents and relations.

One of the things we need most is a class of linguistic engineers whose vocation, unlike that of conventional lexicographers, would be the active shaping and invention of human language, in response to both the vocalized and speculative requirements of civilization.

In my comments here upon the possible origins of anonyms, I have also begun to suggest the methods that can be used to name anonyms.

One of the 'methods' would be that of consulting various rules, and categories of rules, capable of providing guidance.

The guidance supplied by some of these rules would be largely philosophical, such as the advice that affixes, words, or other elements used to form new words should be as simple as possible, at least insofar as they are not as a result apt to be ambiguous, confused with other elements, esoteric, or of too important a character to be wasted on a relatively trivial or specific concept.

Other rules could deal with things such as inflectional forms, the proper sequential order of the elements inside coinages, the phonetics of the neologism, underambition and overambition in coinage of a word, etc.

A general ideonomic task is to both discover and arbitrarily legislate which affixes, and the like, ought to be given the largest role in ideonomy, or in linguistic engineering generally, in the process of forming new words. Or more precisely, what the degree of importance and use, and the general and specialized roles, of each such element should be, within a framework of explicit rules.

A Herculean task, of course, but one that is perfectly feasible.

An anonym can have a word constructed to name it whose principle of construction may variously be: the metaphorical character of the new word or its elements, mental association, the taxological effect of the coinage, an implicit process, the essence or a key element of the concept (imaged by the elements of the word), memorability or mnemonic value, an effect resembling that created by combining parts of speech (such as nouns, verbs, adjectives, adverbs, conjunctions, or prepositions), repetitive emphasis or internal contrast, resonance with the divisions of ideonomy, etc.

Examples of anonyms, or of nameless concepts meriting names, will now be given. Whenever possible, proposed names will be coined, and a definition will be given. The suggested names will ordinarily be designed purely for illustrative purpose, rather than being based upon a careful investigation and weighing of the various etymological possibilities.

1. A silent conversation: with oneself or between or among individuals or with a pet or other animal or between or among animals or among great minds across history.

This anonym could be named by combining some Greek word meaning silence (such as anepes = without a word, speechless, sigelos = silent, sige = f. silence, siope = f. silence, or aphono = soundless, silent, dumb) with some other Greek or Greek-derived word or combining form meaning voice, hearing, or speech (such as -log or -logue, -logy, -lalia, -loquy, or -rhesis).

Thus one could give the notion of a "silent conversation" the magical authority of a name by dubbing it an anepolog.

Anepologs might be witnessed between two lovers, members of a jury, conspirators, or two animals confronting one another over who is to mate some bored female.

A poet might speak figuratively of a colossal anepolog among the stars.

2. An imaginary dialogue conducted in one's head with a known but absent, or possibly deceased, person; or simply, imaginarily heard or known words, counsel, or thoughts of such a person.

Not surprisingly, this concept (or anonym) was inspired by its predecessor. (It is a minute illustration of a process of descent and derivation of anonyms from other anonyms, or ex-anonyms, that in practice, and with encouragement, could become massive.)

To name this anonym, a word-element meaning from, ghost, image, absent, or the like (such as Gk. apo = from, off, away, separate, without, after, skia = shade, shadow, phantom, opsis = face, likeness, vision, apparition, bretas = n. wooden image, mere image, blockhead, eidolon = n. image, form, or plasma = image, figure, model, substance) could be prefixed to one of the endings proposed for anonym #1.

Such an apolog, sciolog, opsolog, bretolog, idolologue, or plasmolog (as you please) might represent a surprisingly important and neglected human phenomenon. I do not know what is true for other people, but I do know that in my own case, at least, apolog have played a great role in my intellectual and psychic development. I will frequently engage in a voluntary or involuntary conversation, in my imagination, with someone I know, have met, or know about (such as a debate with a person with whom I have had challenging discussions in the past, or whose view on some matter is the opposite of mine). These apologs may last hours or recur in the course of years.

The apolog may therefore be an example of a topic whose great intrinsic importance has not been reflected in mankind's actual treatment of it to date, simply because perchance it has remained anonymous.

An interesting research question would be, How greatly do people differ in the frequency, vividity, and richness of their apologs; and how well do these differences correlate with the relative creativity, intelligence, astucity, or sociality of individuals?

Notice, incidentally, how the various alternative names that were suggested for such a dialogue have a tendency, through their etymological roots and contemporary associations, to bring to mind a number of additional concepts, related to or different from the primary concept, that might themselves represent anonyms sufficiently important to warrant the invention of names for them.

Apolog, for instance, reminds me of those mental conversations I have always had with people back home when I am abroad, say in another country[5].

Sciolog brings to mind the tendency to people the shadows, or dark corners in the night, with fictitious persons or animals ("spirits", I suppose, usually via a kind of healthy or cheerful paranoia). It also suggests the notion that the human mind may contain an 'anti-self' or subjective alter ego, and engage in some manner of dialogue with it over life. Furthermore, it evokes the thought that in the brain of even a perfectly normal individual there may exist something like quiet, background schizophrenia; perpetual subconscious dialogues or chatter among a plurality of 'selves' or shadow beings; a functional, dreamlike murmur, not quite speech and not quite noise.

Opsolog (lit. speech or conversation involving the face or an apparition) variously suggests facial (e.g. microkinesic) speech, its reading, or a conversation via same; or, in a literary way, speech of or with a ghost.

Bretolog recalls the imaginary 'conversations' one has with buildings (because of their architectural design or individual identities)[4], or by analogy with other inanimate things upon which one (with modern animism) projects a personality or consciousness[5]. Idolologue[6] suggests the new languages that are just beginning to evolve with the aid of the computer, making use not of words but of icons[3] or imagery, where in the future an idolologue might be speech or conversation wholly via such icons or abstract or concrete images.

Finally, plasmolog suggests the ways in which future computer simulations will enable a physical phenomenon[7], say, or any modeled entity or process whatsoever, to vocalize its states and development and even engage in a conversation with one; and the power of such bizarre speech to amplify our perception and understanding of things.

3. Progress achieved via retrogression or retrenchment.

Often one has to retreat before advancing again, or return to one's origins in order to discover oneself, or proceed forward via a nonmonotonic progression that may lead one through swales.

The crudest way to name this anonym would be via an oxymoronic combination, such as retroprogression or prosoregression (proso- = in a forward direction or onward), or anacatagenesis (ana- = up, upward; catagenesis = retrograde evolution).

As it happens, the prefix ana- not only means up or upward but also back or backward. So one could redefine the existing word anagenesis—or form from scratch the word anogress (the element gress is from the L. gradi = to step, go)—to signify development or movement that is upward-via-backward.

That should not seem like an indecent pun, for in etymological history many words have been formed by a similar or even more synthetic (senses-combining) trick.

4. Virtual presence of a person (or machine) at a distance, achieved via remote sensors and effectors and telecommunicational links.

As teleoperators, robots, and mechanical sensors become ever more sophisticated, they allow an individual or a computer to operate and perceive things actually present at a small or vast remove with a degree of fidelity, complexity, and realism comparable to and simulating physical presence (compresence).

A neologism designating this concept could be formed by attaching a prefix signifying such things as far, separate, artificial, beyond, or illusory with a word or suffix~~ing~~ suggesting presence, existence (being), reality, or self.

Possibilities would include...

For "far": Gk tele = far, apios = far away, dioche = f. distance, ektopos = away, distant, strange, hekas = far, far off;

For "separate": Gk apo = from, separate;

For "artificial": Gk skeuastos = artificial, prepared;

For "beyond": Gk pera = beyond, across, further, very, peraios = beyond, on the other side, opposite, hyper = beyond, over, above, very, meta = beyond, between, among, after, over, reverse, implying change, exorios = beyond the frontier, L disto- = distal, distant, trans = across, over, beyond, through, ultra = beyond, far, on the other side;

For "illusory": Gk apate = f. deceit, fraud, pseudo- = false, sham, feigned, fake, counterfeit, fictitious, unreal, illusory.

And for the second element...

For "presence": the word itself, or such etyma meaning "near" as Gk anchi = near, engys = near, at hand, hard by, para = beside, near, by, plesios = near, or schedon = near, close, almost;

For "existence": Gk on, ontos = n. being, thing, that which has existence, eimi = I am, I be, L ens, entis = being, that which has existence;

For "reality": Gk ousia = f. essence, substance, property, reality, hypar, -tos = n. actual appearance, reality;

For "self": Gk autos = self, ego = I, myself.

Of course the word could be formed with the help of many other etymologic elements, especially ones connected with such concepts as: absence, near, add, in, yoke, bind, identical, derived, etc.

One coinage that would be as good as any here is telepresence.

It is time for the author to confess that he has been playing a trick of sorts upon the reader. Not only does the word telepresence already exist, but, as it happens, the author himself was responsible for its creation.

I had a telephone conversation with Marvin Minsky, one of the founders of artificial intelligence, in 1976. Minsky, who was an old friend, mentioned in passing that he was preparing an article for the popular science magazine Omni and needed an exact term for I have defined here as telepresence. I called him back afterward and suggested the neologism, which became the article's title. Since then the term has found wide acceptance.

I tell this story because it illustrates how and that a well-formed neologism for an anonym can become an established part of our language.

The word telepresence can also be used to illustrate how a neologism will very often suggest other anonyms, of related or unrelated nature, and even neologisms therefor.

I am writing over a decade after I coined telepresence, and in the time that has passed technological developments have occurred that cry out for some appropriate vocabulary.

Thus one's presence can be projected or re-created not only afar but on a microscopic scale (micropresence is possible in the microcosm), inside of things (including materials, material objects, and the human body; which could be spoken of as endopresence), within a computer model or simulated world (as pseudopresence, mimopresence, or plasmopresence), on a gigantic or supernormal scale (via megopresence), everywhere in a system at once (or ubiquitously, as so-called multipresence or holopresence), or within oneself (one's own body or mind, by autopresence). Already a computer has been able to simulate the mutual presence of two or more people in the same "artificial reality" (or mimocosm). At the moment this is limited to their body movements being reproduced in separate and individual computer-animated bodies seen by means of computer-microscreen goggles, but in the future technology will also permit a higher sense of such cenopresence (lit. common or general presence), involving something like the sensory, motor, and perhaps mental coalescence of the individuals, in the collective experience of an intersubjective reality.

Obviously both inventions and futuribles (which happen to represent two ideonomic divisions) create a great need for new words.

5. Good resident in bad.

In our day, at least, there has been much public discussion of the possible bad effects of supposedly good things. Unfortunately such discussion has at once gone too far, not gone far enough, and not been balanced by an equal appreciation of good inherent in or associated with bad.

A noun and adjective that would indicate 'beneficial bad' could be formed by adding a prefix for good, agreeable, correct, or useful, to an ending denoting bad, harm, evil, or the like.

The prefix might be created from such Greek words as agatho = good, arete = f. virtue, goodness, chrestos = good, useful, esthlos = good, eu = good, well, true, beautiful, exaitos = desired, arestos = pleasing, acceptable, laros = agreeable, pleasant, lovely, orthos = correct, right, or oneios = useful.

The ending could be one of the words that were listed or a suffix formed from corresponding ancient words, such as **Gk** dys = bad, ill, kakos = bad, harmful, poneros = bad, evil, worthless, useless, **L** deter = poor, bad, malus bad, **AS** mis- = wrong, bad, ill, evil.

The word agathokakological already exists in the dictionary ("adj: composed of both good and evil" - Web III), but is too embracive to name what is meant here.

Perhaps agathobad, oniobad, or aretocacy (adj. aretocacic) would make the anonym discussable or end the critical concept's neglect.

What are some actual examples of good bads or of benefits due to bads? Shorter life-expectancies of genetically defective organisms (from an evolutionary perspective), war-brought scientific and technological advances, or contributions to human character made by life's stresses and strains.

6. Bad resident in good.

As has been anticipated, that which is or is supposedly good may also be or bring bad.

The groundwork has already been laid for naming this anonym: essentially the dyadic neologisms that were proposed for naming anonym #5 would merely have to be reversed.

Dysgood, misgood, or cacagathy (adj. cacagathic) could be formed in this way.

Cacagathic things include cariogenic candy, human existence (which begets misery), and the poverty of affluence.

7. Beautiful ugliness.

Another antisyzygial anonym, corresponding to a phenomenon so well-known and common that its enduring namelessness is incomprehensible. The phenomenon, moreover, is important.

Old words meaning beautiful, charming, agreeable, graceful, fit, good, high, ornamental, light, etc : such as Gk kalos (beautiful), habros (pretty, graceful), aglaos (splendid, shining, bright, beautiful, noble), hypsos (high), charis, -itos (f. loveliness, grace, favor, thankfulness), trans (beyond), eu (good, well, beautiful), laros (agreeable, pleasant, lovely), kosmios (neat, well-ordered, decent), and himeros (desirable) : could be transformed into prefixes, and the prefixes combined with words or suffixes meaning ugly or bad : say based on such Greek words as aischros (ugly, base), akalles (ugly), aschemon (misshapen, ugly), or dyseides (ugly, unshapely) : to generate such words for the anonym as: kalugliness (wonderfully onomatopoeic!), transugly, eudyseidy, larakaky, or charocacy. or cakacic or eucacic or charicacic

Examples of "beautiful ugliness", or of transugly or eudyseidic things, are: badlands, the paintings of Ivan (Le Lorraine) Albright (especially The Picture of Dorian Gray), certain sublimely hideous fungi, fire gutting a building, and, it has been claimed, New York City.

8. Ugly beauty.

The inverse of the foregoing, it is illustrated by meretricious or vulgar beauty of every sort (plastic flowers, glamorous but puerile movie stars, pretentious facades, etc), as well as by beauty that is tragically flawed, venal, destructive, evil, unfair, abused, wasted, inhuman, a source of torture, narcissistic, etc.

Using such words and etyma as were listed above, one could coin such names for "ugly beauty" as: dysbeauty, dyskaly, acalobeauty, or cacolary.

9. Deliberate and systematic invention or mass production of ideas or concepts (as opposed to mere ideation).

By analogy to the extant words mythopoesis, mythopoeia, mythopoeic, and mythopoetic, one could① coin ideopoesis, ideopoeia, ideopoeic, or ideopoetic. ① : respectively

Ideonomy has need for such terms.

10. Deliberate and systematic invention or mass production of words (as opposed to mere neoterism).

Notice how the concept and its definition were both bred from the previous concept and its definition. By further analogy one could coin lexipoesis, lexipoeia : and their adjectives lexipoetic, lexipoeic : by using a prefix derived from the Greek word lexis (meaning word or speech).

11. Something both true and false.

There are statements, propositions, and concepts which possess the superficially or fundamentally paradoxical property that they are, or may be, true and false at the same instant or in the same respect or way. They are often important, either directly or indirectly, because of this duality, ambiguity, or indeterminacy.

Little appreciation exists of this class of things and possibilities. Many misunderstandings and fallacies are due to it.

Some things are true-and-false because they contain multiple elements that are distinguishably true and false. Some concepts and assertions are self-contradictory. Some things are true-and-false in a partial or relative sense or depending on context or application.

Perhaps the most trivial examples of true-and-false things are the things that seem to be true but are not (quasi-true quasi-truths) and those things of an opposite nature that seem false but are really true (quasi-false or crypto-true quasi-falsities or crypto-truths). The first may be what are termed fallacies or illusions, and the second, hidden truths.

At the other extreme, physics and philosophy have speculated upon the possible existence of contrafactuals. A contrafactual phenomenon, for example, might simultaneously 'exist' and 'not exist'. Oddly enough, this concept is not inherently absurd, though it might have some absurd consequences. (Contrafactuals could easily make sense, for example, in a cosmology based upon a "Many-Worlds" interpretation of quantum mechanics.)

Neologisms to designate "both true and false" could variously be formed by combining morphemes with the following meanings, more or less, in the following ways: "two" + "truth" (e.g. dyo-truth, dyo-verity), "split" + "truth" (schizo-truth), "both" + "truth" (ampho-verity, where amphi = around, on both sides, double), "true" + "both" (cheo-amphy, eteo-amphy), "true" + "with" + "false" (eteo-syno-nothy : eteosynonothy, or v.v., notho-syno-gnesy : nothosynognesy), "true" + "false" + "together" (cheo-notho-hamy), "two" + "reality" (dyo-reality, dyo-hypary), "both" + "reality" (ampho-reality, ampho-hypary, amph-ousia), etc.

I am afraid this is a case where professional lexicologists would be expected to greatly improve upon the efforts of even the most earnest layman.

INTRODUCTION
QUANTITIES
\Methodology

UNIVERSAL SCALES OF FUNDAMENTAL QUANTITIES

When I was in high school I encountered a book by John Harpun, The Elements Rage, dealing with violent geological and meteorological events. At the back of this book there appeared a lengthy energy scale for all sorts of scientific and technological phenomena. The phenomena were ranked logarithmically in powers of ten of ergs per second.

From this scale I was able for the first time to gain a direct intuitive understanding of the relative and absolute energies that characterize such phenomena, and to appreciate what is really meant by low and high levels of energy in nature. Contrasts became more sharply defined. Clusters stood out. Limitations and excesses became apparent. The natural and artificial realms became unified and proportionate. Misperceptions were corrected and relationships were reordered. The difference between fine and large distinctions was manifest and etched in my mind. I could see the hierarchy of power governing the world unidirectionally. I knew at last what things are possible and what things are impossible. My own energetic place in the scheme of things was quantified. I could use the scale to interpolate and extrapolate the energy of other things and possibilities, either through calculation or guesswork, and it enabled me to reason by analogy with unusual freedom, and on an unusually high level of abstraction.

I have kept a copy of this rare universal scale over the years and have found it to be of constant and profound value with respect to many fields and many tasks. Its lack of knownness amazes me.

What amazes me more, however, is that similar scales do not exist for countless other important physical quantities. And in fact for quantities other than strictly physical ones; a 'universal' scale for the known or calculable economic costs or prices of things, for instance.

Actually some of these scales do exist. But it is my impression that they are always too small, lacking in universality, wanting in cleverness of the items chosen for inclusion, insufficiently publicized and used, etc. Their creator always seems implicitly embarrassed that he wasted the time to construct such a childish toy, and he almost never comments at any length on the content of his scale, the purpose and uses of the scale, the general need for such scales, etc. It is extremely rare for several scales of this sort to appear side by side.

The scales are often comprised of examples of things in one narrow area of science or society. The items in these scales frequently appear to have been stumbled upon or chosen accidentally. One fears that the scales may be full of errors, or that even one error may exist that is profoundly misleading.

Another common problem is that the scales are unnaturally limited to a certain range of the quantity they treat.

The topic of such scales might seem rather peripheral to ideonomy. But the purposes, methods, and means of the new science of ideas are in fact extraordinarily diverse and embracive. At this early juncture it is hard to say what they should and should not include.

One major ideonomic purpose is simply to clarify our general picture of the world. Ideonomy would improve scientific and nonscientific thought by rendering them more precise, quantitative, relational, analogical, transcendent of partial phenomena and entities, continuous, etc. It would lift the mind from the realm of concrete, particular, and specific things to abstract spaces of universal, eternal, fundamental, and important : concepts, laws, relationships, transformations, patterns, and processes.

The generation and use of the proposed scales would unquestionably contribute to such ends.

Moreover, even if the scales themselves perhaps represent a low-level form of ideonomy, they lend themselves to higher-level ideonomic applications (as I will demonstrate).

The preparation and employment of such scales is becoming more common. Part of the reason for this change must be the modern computer and the immense effects it is beginning to have on the way in which we do things. The computer and its software make it easy to create scales, and to manipulate, add to, redesign, store, publish, and use the scales. The miracle of computer graphics enables a scale or its content to be multiply illustrated in a variety of fascinating and illuminating ways. The computer is encouraging developments that are ideonomic in all but name.

Early in the Ideonomy Project I spent 1-2 work-months constructing about a dozen scales, including ones treating mass, velocity, viscocity, energy, price, risk, population (total number of things), flatness, pressure, length (size), time (sensu duration), limits of accuracy of measurement, etc.

I should warn readers that building scales is so much fun that it is addictive. It can also be expensive: my velocity scale cost me several hundred dollars for long-distance telephony. Only the rude intervention of friends recalled me to reality and saved me from bankruptcy.

This work led me to the concept of a huge, world atlas-sized book prepared by a team of gifted specialists. Scales of from 50 to 200 of the most important general quantities would be included in The Atlas of Scale. Each majestic scale might be reproduced on a double-spread, perhaps extended via one or two foldouts. Scales might be arranged alphabetically in the volume, and cross-referenced via a special index, table, or diagram. Things that belong to about five or ten major fields (such as astronomy, botany, geology, meteorology, physics, or technology) might be over-colored in all of the scales via a universal subject-color key.

Many of the same phenomena might be cross-indexed on many or all of the scales. Thus a car can be simultaneously indexed for mass ('weight'), geometric size (length, area, and volume), speed, population (e.g. total number in the U.S., or total number of parts), duration (e.g. half-life), risk (e.g. lifetime risk to the motorist), cost, energy (e.g. potential or kinetic), flux (e.g. rate of production of new cars), and so on.

This atlas, which might remain in perpetual use as one of the world's great reference books, could, in a practical sense, be a major product of ideonomy and a symbol of ideonomy's nature, novelty, and value.

About this atlas, which I tried to persuade a prominent publishing house to produce, I wrote:

> Scales would be constructed sharing these characteristics:
>
> 1. Each would treat a single major scientific quantity - Mass, Force, Pressure, Lifetime or duration, Age, Frequency, Velocity, Length, Area, or Volume, Mass, Number (numerousness), Work, Flux or transport, Distance, Height, or Depth, Density, Strength, Probability, Entropy, or (related to entropy) Information, Energy (in general), Power, Kinetic, Potential, or Mass Energy, Radiance, Temperature, Rotation (in general), Acceleration, and so forth.

Actually it would probably be a good idea to scale many lesser quantities - Viscocity (in poises and rhes); families of thermal, acoustic, electrical, magnetic, and optical quantities, chemical, biological, geological, meteorological, and astronomical quantities; Accuracy (incl. the limits of measurement), Relativistic velocities (>c/10), gravitational quantities, etc.

Certain scales could illustrate working mathematical formulas and workhorse dimensionless groups.

2. Each scale, where appropriate, would be 'universal' in these senses: it would include phenomena as diverse and ranging as possible in type, basis, domain, size, and in the sciences and principles they exemplify; it would span the limits of what is known and make mention of what is not known, including some assumed values and conjectured phenomena; it would attempt to include examples of things at each level of the scale corresponding to an order of magnitude; it would be designed to have interest and utility not only across the scientific community, but to students at every grade level and to laymen; it would make use of a single - maximally elementary, universal, and meaningful - scientific unit (grams or daltons mass, angstroms [~ atom-widths, or better, atom-radii], angstroms/second velocity, newtons force, pascals pressure).

Each universal unit would be carefully explained. Other, familiar or specialized, units used to re-quantify certain entries would acquire universal meaning by being present together and uniformly represented in the basic unit.

3. The place of each entry in the scale would be expressed as the logarithm of each unit (as powers of ten, two [octaves], or both), and mantissae (fractional 'powers') would be used rather than the usual illogical and obfuscating system of integral powers (a geometric component) multiplied by a bastard arithmetic factor: i.e., 10 exp 13.09 rather than 1.23 x 10^13. There are cogent reasons for replacing or accompanying powers of ten by octaves, but I'll not go into them here.

4. Highly unusual quantities or quantifications of phenomena would be inserted in each scale. Thus: Total atmospheric mass of radon = 2kg, a lightning bolt's mass = 10 exp -6.84g, the energy-mass of the geomagnetic field = 60mg and that of a graviton from two corotating stars = 10 exp -44.75g. Turnover time for the small intestine = 1.4d. Velocities of slowest natural crystal growth = 0.27Å/d, of peak sap flow in a tree = 16mm/s, of the hour hand of a watch = 5,818Å/s, of a great river's meander loop advance = 18m/y (6,000Å/s), of extrusive growth of a pingo (ice volcano) = 159Å/s (0.5m/y), of height growth of a young child = 25Å/s (read "VERY crudely, 25 atoms per second"), of the westward rotation of Earth's magnetic field = 2.5m/h.

5. Scales might be graphed as logarithmic spirals. I have made a "Logarithmic Spiral Mass Scale" and the effect is astonishingly elegant. Each revolution corresponds to one integral order of magnitude, and the entries of identical magnitude can be located in the exact angular (360^{o}) position specified by their mantissae.

Three methods would create the quantities featured in the scales:

1. Library research of a somewhat clerical nature that would recover published quantities from reference books, periodicals, and monographs.

2. Telephone consultation with scientists who are specialists and generalists. Many of these people can answers questions of this sort from memory, or by simple calculation or 'educated guessing'. They will also suggest additional items.

3. Auctorial calculations.

The value of the atlas, as I see it, would be manifold.

Any quantity casually or professionally encountered could instantly be 'located' on the appropriate scale, and partake in this way of the rich, orderly, and concrete context of its neighbors. Absent such a scale, viewed <u>in abstracto</u>, quantities are largely barren of associative meaning; they are deprived of an essential analogical relativity.

Even intrinsically difficult quantities such as entropy or enthalpy could acquire through the magic of these atlantean devices a familiar, intuitive, well-remembered meaning in the mind of a child in elementary school.

Yet even the trained mind of a scientist, I believe, requires the illuminating environments this unprecedented collection of complementary scales should have the power to provide.

To this publisher I added as one final allurement that the materials for this book could be reused to create a set of wall charts that would be at once marvelous and profitable. The key scales could be microreproduced as a composite Table of Universal Scales, and in this form serve as an important resource in science classrooms worldwide.

The set of scales could also be used to create other important things.

Perhaps the most impressive short animated scientific film I have ever seen—a film about 10 minutes long—was a result of the collaboration of Charles Eames and Philip Morrison. Powers of Ten depicts the relative size of things of almost every known size. Briefly, it starts with the human scale by showing a man and a woman lying on a picnic blanket beside Lake Michigan in Chicago. The virtual camera, viewing the scene from above, then effectively backs up or increases in size by one order of magnitude after another, until it finally pauses at a distance or width of 10^{26} meters; then it rushes back to the original scale and scene, resumes its former pace, and progresses in increasing nearness or diminishing size, until finally it penetrates into an individual nucleon and ends its telescopic-microscopic trek at a scale of 10^{-17} meters. The entire tour encompasses 43 powers of ten.

On several occasions I have been in the audience when this film has been shown to a group of people, and each time the air has been filled with giggles, gasps, and sighs expressive of a terrible awe, for the experience is truly stunning.

Powers of Ten is a film that simultaneously manages to give a direct and intuitive sense of the largeness, intricacy, volume, and hierarchy of the cosmos, a tangible sense of the very structure of the universe (which must be experienced to be understood), and an unforgettable appreciation of what is meant by a logarithmic scale, an order of magnitude, and the mathematical operation of exponentiation. It permanently transforms one's picture of nature, makes the universe seem stupendous and yet at the same time finite and simple, provides an apotheosis of the relationship between whole and part, instantly orders all that had been unordered, trivializes the merely real, equips one with a single image of the totality of the known cosmos, and dramatizes both the magnitude and the parvitude of things (to speak ideally).

But Powers of Ten is just one film and the set of scales could be used to produce an entire library of films depicting in a similar way the known and speculative range of other universal quantities.

In particular, there could be an educational film, for all ages, depicting Time's Hierarchy. The structure of this film might be identical: it could begin at what for human beings is the normal pace of events and then proceed one order of magnitude at a time to ever slower (or faster) things until reaching some known or definable extreme; it could then race backwards through the progression to the original scale of familiar time, and then proceed gradually in the other direction toward the opposite extreme of the fleetest (or most sluggish) phenomena, events, and chains of occurrences.

Alternatively, the animated—and perhaps partly photographic—film might proceed from one extreme to the other monotonically. Also, the indicated steps might not be in powers of ten but in powers of two (octaves).

The possibilities and alternatives are numerous.