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COMPREHENSIVE DESIGN STRATEGY

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World Resources Inventory
Southern Illinois University
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U. S. A.

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by John McHale

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CONTENTS

APPENDICES

DESIGN STRATEGY

Statement to a Leading Figure in the World Building Industry – 1966

Programmed to seek a weather protected building site a worker wasp will some-times fly in through open windows of human habitats. Failing to find the programmed requirements for a site, the wasp flies as programmed, back toward the light. Very frequently it runs into invisible window glass whose atoms are far enough apart to permit light and radio waves to pass through, but not wasps. The wasp crashes against the glass but its soft landing-gear readjusts its mechanisms whose arrested wing foils, having lost their "lift", stall and allow the wasp to be pulled by gravity to a second crash on the window sill. From here it takes off on a spiral climb back into the room for a second and many successive flights outward toward the light. Only the "probability" statistics governing the chances of success with a half open window and x numbers of flights, initiated from below the glazed portion of the window opening, can hold any hope for the wasp's avoiding ultimately lethal re-encounters with the unprogrammed contingency – an invisible barrier.

Eddington said, "Science is the earnest and sustained intellectual attempt to set in order the facts of experience". Humans' intellects subjectively comprehend the wasp's problem but the wasp's sting is also a fact of human experience and despite a compassionate urge few humans are objective, energetic and scientifically ingenious enough to invent safe ways of helping the wasp to escape. They think of the wasp instead of the window whose open half could be shifted from the top to the bottom – or whose glass portion could be covered opaquely with a newspaper, so that the wasp's light seeking mechanism would steer safely only for the brightly illuminated, free, outward passage into the open air.

In short the humans spontaneously try to ”shoo" the wasp, i.e. to reform the wasp’s behavioral pattern instead of spontaneously thinking of how to reform the environment so that the wasp would be spontaneously stimulated by the reformed environment to escape and thus terminate the interference episode between man and wasp.

The unprogrammed lethal frustration of wasps lends insights into many of humanity's present day frustrated behaviors. The human's same fear frozen, subconscious reflexes – usually mistakenly identified as apathy – plus their ineptitude in not "seeing" what to do about the wasps – is often redisplayed in their apathy and ineptitude in dealing with humanity's own sensorially inexplicable dilemmas.

Better than 99Vp of humanity’s frustrations are occasioned by surprise encounters with the almost completely invisible evolutionary transformation trendings of human ecology and the latter's environmental transformings. Also invisible and inaudible are the universal evolution’s information generating and distribution systems which if adequately tuned in and integrated could warn mankind of such trendings as may be negative or even lethal to future human existence on Earth.

We may bring thousands of wide-band radio sets into any room in any building any-where around Earth and tune each one in on different radio programs all of which thousands of simultaneous programs axe always invisibly permeating and present everywhere within vast distances of space outward around Earth. However, humanity's technical discovery and use of some of nature's invisible communication systems does not mean that he comprehends the universal evolution. Half the messages sent by humanity contradict the other half in respect to transpiring history.

During World War 1 – for the first time in history – industrial man's ecological transformation processes entered into a comprehensively operating program which went predominantly beyond the sensorially apprehended ranges of human experience, experiments, communications and realizations. In 1914 – 1918, humanity went from wire to wireless communications, from tracked to trackless transportation, from two-dimensional transport to four-dimensional, from visible structuring and mechanical techniques to in-visible – atomic and molecular -- structuring and mechanics.

As with airplane pilots operating instrumentally in night and fog, so today (1966) do humanity's myriad of specialized experts subjectively read, or objectively program exquisitely differentiated, sub- or supra-visible electromagnetic functions within the complex of routine or exploratory events of world embracing industrio-economic ecological revolution. The latter in turn – but altogether inadvertently – gives inexorable birth to a supra-political and supra-geographical identity – that of: World Man.

The essence of all the foregoing is that ninety-nine percent of all important evolutionary trends are invisible. Ninety-nine percent are either unapprehended or uncomprehended by society. The invisible, inexorable evolution will soon convert all nationally and subnationally identified humanity into Worldians, Earthians or just plain, omni-spontaneously, universally coordinate, individual ”people". The inexorable trending to one world citizen-ship is ignorantly and expeditiously opposed by the sovereign nations' self-perpetuating proclivities. The sovereign nations own or control the communication systems and preoccupy the systems with disintegrative news of the disintegrative actions taken by the sovereign political entities.

Up to a century ago, 27 years was the average life span of humanity – despite that a few exceptional humans of history lived beyond their "four score years and ten" i.e. 90 years. Up to a half century ago, it was assumed that only one human in one hundred could be economically successful and even then would only survive to an average age of *42* years. Now in the nineteen-sixties, average expectancy of North American industrialized man has reached 70 years, with two out of five men an economic success as well. By 1970, the majority (i.e. more than 50% of all humans around Earth) will be both physically and economically successful – or there won't be any humanity – save possible a few hapless short-lived survivors of the atomic holocaust.

For only the last decade of all history has total physical and economic success for all humanity been conceded by science to be feasible. Realization of this extraordinary potential is importantly frustrated, however, by several factors.

First it is' frustrated by the, as yet, rigid geographical and political partitioning of humanity under divisive and competitive ideological concepts, each purported to cope most effectively, only on a political bias basis, with locally sovereigned groups of yesterday’s on foot to-and-fro-ing humans and their heretofore only but-one-in-one-hundred survival probability. This self-entrapment by man in political straight jackets came about through psychological and physiological events which may be explained as follows.

Biology's two main branches -- Zoology and Botany – disclose two main and clearly differentiated modes of survival – static and mobile – with the giant trees and the world around voyaging whales at the two size extremes.

The biologically static are subjectively advantaged. The environment brings them what they need. The mobiles are objectively advantaged to ”go" and get what they need or want.

After hunting fruits, nuts, herbs, as well as fish and other zoological game, fairly successfully for thousands of millennia, man discovered that he could tame some of the game which spontaneously performed its own regeneration. From this lesson man discovered that he could plant the vegetation's seeds and thus man started about eight millennia ago to cease his wandering and to remain to guard the territories he found most favorable for his locally regenerative animal husbandry and agriculture.

Because man's legs are so short and the planet Earth so big and because the few areas around it where he could find immediate vital support in his early days on the planet amounted totally to less than five percent of the Earth's surface, man has mistakenly identified himself during the last eight millennia with the rooted vegetation rather than with the mobile vertebrates of which type he is a member. Those few humans who found a local "good thing", "DUG-IN" and the multitude of others hung hopefully and hungrily around the successful few's exclusive "property" which the economically successful, successfully enacted as a concept into -- strong-arm enforced -- laws of men.

Physical or "natural" law has no inherent static "property" law -- only behavioral properties. Nature's laws of evolution defy all static patterns. Entropy breaks them up. "Ownership" is not immoral, amoral or ethically unsound. Physical "ownership" is anti-entropic -- ergo, eventually unsustainable. Metaphysical conceptualizations now are identifiable with individuals, which, in turn, are unique behavioral integrities. Democritus' concept of -- and sound pattern identification of -- the phenomenon "Atom", are forever identifiable as Democritus -- i.e., as his intellect functioning. These individual metaphysical discoveries are not ownership identities. Democritus did not and does not own any Atoms, but he is irrevocably identifiable with their conceptioning and naming.

Ergo: "Ownership" of physical entities by man are untenable in natural law and are inherently obstructive to evolution and realization of the comprehensive emancipation of man -- from his ignorance rooted failures, and from his imminently potential physical and economic success. However, unique service behaviors are identifiable with individuals and their respective creative capabilities. Only one's own "personality" and life are ownable. Only one's own inherently unique, chromosomically monitored, and experience modified patterning integrity is ownable.

Secondly, the physical, omni-success of all humanity is frustrated by the fact that scientific evolution -- by which it could be accomplished -- is almost entirely invisible and its integrated significances are too difficult for total and effective comprehension by society.

One reason for the latter frustration is that the language of science has been up to now almost exclusively mathematical – i.e. non-conceptual.

A second reason is that scientists altogether constitute less than one percent of the world population. Their thoughts are popularly unknown.

A third reason is that most scientists operate exclusively on a subjective basis – as "pure" scientists. They also operate non-conceptually. Most of the objective technologists – or "applied" scientists – are specialists and are unaware of the comprehensively integrated significance, to society, of the tasks they perform.

A fourth reason is that world society is frustrated by the communication barriers between the many languages of mankind.

For the foregoing reasons, there are only a very few humans whose experience and operative faculties permit and inspire them to inform society regarding the significance of the evolutionary trending and of mankind's now potential physical and economic success.

What could be done and up to now has been done in a big way – as a consequence of man's access to the vast energy wealth of universe, discovered by "purely" operating scientists – has not been determined by the technologists, but by their economic masters who see only the immediate profits – in, for instance, the exploitability of the fossil fuels – or "savings account" energy wealth – which can bring the highest profits in the most wholesale manner through national governments' commitments, most swiftly realizable in anticipation of the emergencies of total war. Science and technology operate economically and socially only as slaves of the most powerfully short-sighted cashiers of humanity's needs and weaknesses. The latter see less profit in organizing the business of humanity to survive on the energy income of the environment.

Realization of mutual success by all mankind is frustrated also by the now entirely irrelevant and invalid "inferiority" or ”failure" complex of world around behaviors of humans, conditioned exclusively by two millions of years of experience with major failures of mankind, as well as with vital inadequacies of vital necessities; plus the ages long, seemingly obvious and seemingly inevitable fact that the vast majority must die at a relatively early age – either through starvation, disease, superstitiously governed human sacrifice, capital punishment, war or dueling – as physical evolution whittled down the numbers surviving – to match the numbers supportable by the ignorantly and only opportunistically exploited – ergo, only short-sightedly and meagerly organized world resources.

The analogy to the wasp's dilemma occurs in humanity's long conditioned, reflexively superstitious assumption that man is (with only "divine" exceptions) designed to be a failure. The "normal" human has always been a potential and probable failure. At an early age, the average human acquires a powerful inferiority complex from his exposure to his parents and his childhood community's deeply inhibited culture of misinformation and misfortune. The deep-seated proclivity of humans to gamble their monies is founded on the working assumption of human. consciousness that individuals are inherently programmed for failure and that only cultivated luck can divert the individual from his negative plight.

One reason why humanity in general loves, admires and worships human babies is that all physically normal babies are both unblemished and are designed to be physically successful. They are swiftly blemished by man's ignorantly served love. If, despite his millenniums-conditioned, failure prone complex, man is to survive on the planet Earth he must be educated to assume a new "norm" for humanity. Because of the facts world society must now assume that: normal man is designed to be a success and the universe designed to support that success – for as we shall presently see, man is essential to the success of universe itself. If humanity on Earth "flunks out" humanity on other planets will probably "carry-on” to perform the uniquely human, antientropic functions essential to the total regenerative evolution of universe.

To effect the successful transition of world society to the new "norm" of man as a physical and intellectual success can, and we hope will, be realized on space ship Earth through the idealism of youth, as implemented by the educational process revolution which is beginning to take place around the planet. If so, the reality of the new norm of success will be progressively fortified by the incorruptibility of the cybernated participation of man in evolutionary transformations of human ecology and on a continuous, instead of a short term, expediency basis.

And it is not a matter of being a little more far-sighted and looking out for one or two more generations of man on Earth. It is a matter of making man on Earth a continuing success -- forever.

It may be assumed that scientific and humanistic literacy must and will be popularly developed at the earliest moment in order to spontaneously obtain scientifically generalized comprehension and systematically and conceptually formulated socio-technological answers to any and all moral economic, aesthetic and ethic questions, as well as objective answers regarding the relative harmonic desirability, feasibility and economic practicality of any and all human preoccupations and capability commitments.

We must now ask, "What will emancipate science from her century of unnecessary 'Blind Flying' exclusively on instruments -- as a slave profession -- with lethal consequences -- and without any sense of long distance economic success objectives for all of posterity?"

We must also ask, "From whence will come the tools of conceptuality which will emancipate science and permit its assumption of the prime, social, direct, conscious, sensorial responsibility?"

What can and will bring world society's leaders and world society itself to comprehend its economic potential and its essential function in universe and to its successful performance of that function -- in time to permit the continuance in universe of the Earthian team of human's?

It seems to me that our commitment to mutual examination of our respective functioning leads abruptly to these fundamental questions. I assume this to be so. I also assume that neither of us has innate characteristics making us uniquely fitter than others to address these questions. I assume, however, that both of us have come independently to the realization of the tasks to be done by world society and by individual men operating with integrity on their own initiative on behalf of their fellow humans. I assume that both of us has now unique experiences and organized information and accredited effort which provide us with some measurable degree of intellectual, technical, and economic advantage in addressing these prime questions. On my part, I would like to contribute the following thoughts.

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First, it seems to me that unless we have experimentally demonstrable and scientifically definable meaning in our words, we cannot communicate effectively with words. Communication is with self, as well as with others. Ergo: we may say -- the degree of effectiveness of communication is proportional to the degree of exactness of commonly accepted definition of meanings of the words used. This statement is a corollary of my long held working assumption that: – a problem adequately stated is a problem fundamentally ripe and potential of solution.

In seeking definitive meanings I recognize, of course, that Heisenberg's principle of indeterminism, forestalls absolute exactness. However, the tolerance of error is reducible. Ergo: we may approach exactitude in progressive degree. Ergo: what I mean by mutual comprehension of meanings is stateable only in terms of approximately exact meanings.

It is also my working assumption that lacking the approximately exact meaning of the most profound generalized concepts there is little meaning and approximately no direct

teleologic effectiveness, in any and all special case, local experience communications. For instance, it is impossible to understand the previous sentence without a fundamental comprehension of the concept teleology. It is also fundamentally impossible for us to make conscious solution of the greatest and prime problems and their secondary technical challenges without use of the phenomenon teleology.

It is my working assumption that the following 40 questions must be definitively answered before we may realistically discuss our respective philosophies and grand strategies.

STRATEGIC QUESTIONS

1. What do we mean by universe?
2. Has man a function in universe?
3. What is thinking?
4. What are experiences?
5. What are experiments?
6. What is subjective?
7. What is objective?
8. What is apprehension?
9. What is comprehension?
10. What is positive? Why?
11. What is negative? Why?
12. What is physical?
13. What is metaphysical?
14. What is synergy?
15. What is energy?
16. What is brain?
17. What is intellect?
18. What is science?
19. What is a system?
20. What is consciousness?
21. What is subconsciousness?
22. What is teleology?
23. What is automation?
24. What is a tool?
25. What is industry?
26. What is animate?
27. What is inanimate?
28. What are metabolics?
29. What is wealth?
30. What is intuition?
3I. What are aesthetics?
32. What is harmonic?
33. What is prosaic?
34. What are the senses?
35. What are: mathematics?
36. What is structure?
37. What is differentiation?
38. What is integration?
39. What is integrity?
40. What is truth?

If we first accept mutually agreed upon, experimentally based definitions and answers to these questions as a priori to our dialogue, we may then also observe the following to be pertinent and useful to the initiation of our mutual search for the definitive answers to the immediately foregoing set of prime questions.

First, I refer you to my own attempts to make experience founded -- ergo scientifically definitive -- answers to all 40 of the questions. (see appendix "B")

Most of my attempts have been published in books, essays and lectures. I do not assume that I have found the answers. I do assume that I have addressed the problems on a scientific basis for I have as Eddington put it, "made a sincere attempt to set in order the facts of experience". I have progressively included and refined the experience basis of those meanings and have progressively refined their verbalization. I have thus discovered -- for instance -- that there are no nouns for physics has found no things (static, solid phenomena) – Ergo there are only verbs.

Though there are many special concepts which constantly reoccur in my day to day deliberations, I find that there are fourteen which dominate. All of them overlap integratingly. Part of the content of one will of necessity often reappear under other concepts due to the synergetic interactions. I will group and discuss all the secondary concepts, unique to my philosophy, under the following main concepts in 14 concept chapters thumb-indexed below.

DOMINANT CONCEPTS

l. UNIVERSE

2. HUMANITY

3. CHILDREN

4. TELEOLOGY

5. REFORM THE ENVIRONMENT

6. GENERAL SYSTEMS THEORY

7. INDUSTRIALIZATION

8. DESIGN SCIENCE

9. WORLD SERVICE INDUSTRIES

10. EPHERMERALIZATION AND INVISIBLE COMMONWEALTH

11. PRIME DESIGN INITIATIVE

12. SELF DISCIPLINES

13. COMPREHENSIVE COORDINATION

14. WORLD COMMUNITY AND SUB COMMUNITIES OF WORLD MAN

Concept One – UNIVERSE

non-instantaneity
non-simultaneity
physical and metaphysical regeneration
irreversibility of evolution
irreversibility of metaphysical comprehension of physical

I start with my own definition. Universe is the aggregate of all humanity's all time, consciously apprehended and communicated experiences. (The communication may be to self or others – it is the apprehending formulation of the information regarding the experiences that constitutes original consciousness).

The physicists' Law of Conservation of Energy which states that energy may be neither created nor destroyed -- ergo is finite -- embraces only the physical aspects of experience. It excludes all metaphysical aspects of experience.

I have defined Universe in such a manner that none may present experimental proof of its inadequacy for my definition includes both the objective and subjective: i.e. all voluntary experiences -- i. e. experiments -- as well as all involuntary experiences – i.e. all happenings.

My definition embraces both the physical and the metaphysical, the latter being all the weightless experiences of thought which includes all the mathematics and the organization of the data regarding all physical experiments, science, both first and last, being metaphysical.

The metaphysical includes the mind extracted, refiningly concentrated and consciously formulated anti-entropic generalizations, in a hierarchy of progressively contracting degree, which most economically describe the workings of the metaphysical sub-division of universe. (See VISION '65 SUMMARY ADDRESS – pages 79-86).

My definition of universe inherently includes all the ponderable -- i.e. weighable, instrumentally detectable, associative and disassociative, material and radiational, energy behaviors of the physical subdivision of universe.

Concept Two – HUMANITY

human function in universe
entropy and anti-entropy

Is the human an accidental "theater goer" who happened in on the "Play of Life" – to like it or not: – or does humanity perform an essential function in universe? We find that latter to be true. The discovery develops as follows.

By entropy, I refer to the experimentally demonstrated physical behaviors covered by the Second Law of Thermodynamics and the latter's disclosure of the omni-accelerating-acceleration of the diffusion of physical energy patternings of universe -- spoken of by the mathematical physicist as the "Law of Increase of the Random Element", which may also be called the "Law of the Expanding Universe". As the stars are all in complex motions, the radiations given off by them are ever more diffusely dispatched.

By anti-entropy, I refer to the omni-accelerating-acceleration of the clarifyingly differentiated and inter-communicated, experience derived, pattern cognitions of the human mind which progressively disclose the orderly complex of omni-interactive, pure, weight-less and apparently eternal principles governing the intellectual design and operation of the – seemingly and "suggestively" only -- infinitely self-regenerative universe.

We may call this metaphysical phenomenon -- which continually simplifies and con-tracts the generalized description of principles apparently operative in all special case experiences -- "The Law of Decreasing Confusion", or the "Law of Intellectual Conservation"; or the "Law of the Contracting Universe"; or the "Law of Diminishing Chaos"; or "The Law of Progressive Order"; or the "Law of Contractively Orderly Generalizations".

Radiation is physical, entropic, incoherent, propelling, disassociative, pushing.
The logical questions arise: – Is gravity metaphysical, anti-entropic coherent and tensive? Are gravity and order wrested and collected intellectually from chaos? Is intellect a priori to both physical and metaphysical universe? Is the tensional integrity of universe exclusively an intellectual integrity phenomenon and a consequence only of intellectual exploration and measurements?

While gravity's effects are physically measurable, the concept of gravity is in itself unweighable. Likewise the effects of electromagnetism are physically weighable. The physicists have ruled intellectually that all that is imponderable is metaphysical. Clearly it is seen that the metaphysical is to the physical as anti-matter is to matter, i. e. as the electron is to the positron.

Metaphysics and physics are thus seen to co-function, to progressively conserve the self-regeneration of non-simultaneously and overlappingly evolving universe. Man's function in universe is that of the metaphysical, anti-entropic function. He is essential to the conservation of universe which is in itself an intellectual conception. In 1951 I published my conclusion that man is the anti-entropy of universe. Norbert Weiner published the same statement at the same time. Both of us arrived at our conclusions by different routes and without knowledge of the other's discovery. I will now expand on the human's anti-entropic functioning.

In the above statements I am giving precise meaning to the word "metaphysics".
By metaphysical I mean no more nor less than is implicit in my definition of universe.
Since magic has never been experimentally demonstrated, my use of the word "metaphysics" does not contain overtones of magic or mysticism.

I

"Why Universe?" -- is at present an unanswerable inquiry into the mystical. Though mystical sounds like a contraction of metaphysical, they are not the same. For this reason, I consider all time spent in speculation regarding the inherently unanswerable to he inherently profitless and a squandering of the opportunity to answer those questions which are answerable by man. It is, however, experienced by us that the unanswerables provoke a sensation in us to which we allude -- only intuitively -- as "Mysterious".

By the same reasoning, I discredit all the speculations which suggest or persuade the concept of a "beginning or ending" of universe. The most recent statements of the leading scientists hold that the concept of original chaos is untenable because the physical composition of universe may not be reduced to less than the orderly intertransformability of the neutron and the proton and their respective weak effect leftness and rightness adjuncts the electron, positron; neutrino, anti-neutrino -- the positive and negative counterparts including both their negative as well as positive weights, ergo: – the average of all weight of all physical phenomena is zero.

This is to say that the universe, both physical and metaphysical, is resolvable into a set of principles which are ever more accurately (but never exactly) described by the scientists' weightless intellectual generalizations. And generalized principles which are weightless cognitions of intellect have no inherent beginning or ending (nothing in human experience has ever suggested the beginning or ending of a generalized principle) -- ergo the 'beginning' of universe concepts together with all axioms are experimental or unproven and only superficially obvious fictions. Before the measurements of the speed of radiations, all phenomena seemed (erroneously) to be visually "INSTANT". This gave rise to the superstitiously invented legend of a genie or god creating an instant universe. A physicist said to me a few days ago: "I have become bored with the nonsense concept of infinity --with one end closed by a 'beginning' and the other end open to infinity".

Universe by definition and its derivative concepts are synergetic. Synergy as you know, means: Unique behaviors of whole systems unpredicted by any behaviors of their component functions taken separately.

Some of ancient Greece's natural philosophers and geometers took effective advantage of Synergy when they recognized that the sum of the angles of a plane triangle is always 180 degrees, or exactly one-half of cyclic unity -- with unity taken as 360 degrees – ergo unity equals two triangles. I assumed in 1917 that "unity is plural and at minimum two".

The stable structural behavior of a whole triangle, which consists of three edges and three individually and independently unstable angles or a total of six components is not predicted by any one or two of its angles or edges taken by themselves. The six edges of the two triangles can and frequently do associate with one another, one as a left helix and the other as a right helix, to form the six-edged tetrahedron which having four triangular faces gives synergetic demonstration of four triangles occurring as the result of associating only two triangles. Incidentally, the right and left helixes formed of the two triangles' respective sets of three edges each constitute the vectorial modeling in conceptual array of the positive and negative "half spins" or "half quanta" corresponding respectively with the pro-ton set and the neutron set consisting of neutron and neutrino on the left hand and the proton, electron and antineutrino on the right hand. Together these six make one quantum unit – which is identified as the tetrahedron.

Triangles as conceived by the Greeks are synergetic. The Greeks went on to demonstrate the corollary of Synergy, to wit: that the known behavior of the whole and the known behavior of some of the components makes possible predictions of the behavior of each and all of the other, previously, unknown components.

The Arabs' algebraic formulations and all their modern derivatives, including the calculus, are synergetic strategies.

This synergetic strategy of proceeding from the whole to discover discrete local particulars within the whole was demonstrated powerfully once again a century ago in Euler's Topology which reduced all patterning of universe to lines, intersections of lines --called "vertexes" – and the areas bound by three or more intersecting lines. Euler found a constant mathematical relationship of all these three fundamental aspects of pattern i. e. – V+ A = L+ 2.

The power of synergy was demonstrated once again by physicists in the modern quantum mechanics -- in which latter the assumption of a finite physical energy universe always requires a 100% accountability of all energy transactions. Synergetic accounting of the finite system plays a major part in the success of modern nuclear physics.

Kepler's Third Law and Newton’s theory of gravity provided synergetic advantage for astronomy.

Willard Gibb’s Phase Rule -- akin to Euler's topological equation of the relative abundance of basic mathematical pattern aspects -- provided synergetic advantage in chemistry.

Synergetic behavior is omni-manifest in bio-chemistry and metallurgy. Synergy alone explains, for instance, why the tensile strength of chrome nickel steel if 50% stronger than the sum of all its constituent alloys' respective tensile strengths. Synergy is the "back bone" of general systems theory.

Despite the powerful capabilities demonstrated historically by Synergetic Strategy today's primary educational systems, all around the world, start the children’s would-be education only with elementary parts of subdivisions which never explain the wholistic behaviors and thus imply that science and technology may only be successful as a myraid of separate intricate specializations which may never be subject to unified comprehension by one mind.

Specialization -- therefrom today's chain reaction of the self-accelerating fractionation of all thinking into exploding categoritis -- resulted from the old master pirates', pre-World War One's synergetic strategy by which they required that all the bright lieu-tenants and experts must confine their labor and inquiry to differentiation, and that each roust mind his own business and must eschew all integration which they must concede to be the old "master” pirates' exclusive prerogative.

Thus, the elementary educational system which in contrast to synergy starts exclusively with a few parts or elements, leads at best only to differentiated statistical probability based entirely on the separate behaviors of those elementary parts. Probability, the strongest tool of statistics which deal only with parts, at its best is a weak tool. Were probability strong it would predict the stock market behavior with precision and would foretell horse race results with reliability. Contrariwise, Synergy and General Systems Theory are powerful forecasting tools and have been the back bone of modern physics, astronomy and chemistry.

My Fourteen Concepts -- taken one by one and considered only in the ”separate”, elementary educational, manner might seem too special and too diffuse to be effective. Taken altogether, synergetically, I hope you will find them as promising as I have already found them to be.

I

If I had not been consciously and deliberately pursuing all fourteen concepts synergetically and teleologically for the last 38 years and if I had not obtained innumerable practical results, I would not be a position now to know you and to be asked to exchange grand strategy information with you.

Within the last 14 years, thousands of my structures have gone to 50 countries around S. S. (space ship) Earth. They were most frequently transported to their sites by air, fully assembled or in systematically coded and tightly packaged parts. I have succeeded therefore within only thirty-eight years in demonstrating the validity of my proposal -- published in 1927 – to commence in twenty-five years -- 1952 – the air delivery of high performance environment controls for those of mankind's activities most advantageously performed under scientifically protected and valved conditions. In 1953 the U.S. Marine Corps made the first air delivery of my geodesic dome, fully assembled and skinned, flying it to its site by helicopter at 60 nautical miles per hour. I prophesied this in 25 years. It took 26.

The year in which I first made this proposal – 1927 -- was that in which Lindberg made his epochal non-stop New York City to Paris flight in an airplane with cloth-covered wingfoils. International airplane passenger service was not as yet even seriously discussed. Jet propulsion, rocketry, television, fission, transistors, cellophane tape, computers, highway cloverleafs, staplers, stainless steel, high strength aluminum, uranium, the Great Crash, The Depression, Hitler, World War Two, juvenile delinquency and atomic bombs were unanticipated, unthought of or held to be only fantastic possibilities realizable, if at all, one thousand years hence. Discussions of rocket trips to the moon were engaged in only by lunatics in mental institutions. Only twenty-three years ago when I attended World War Two meetings in Washington, D. C., I was often greeted by someone saying, "Please don't ruin this meeting by once again introducing your preposterous, mass-produced scientifically designed air-deliverable houses."

As a consequence of my finding both the metaphysical and physical subdivisions of Universe to be finite I have also discovered the finite, arithmetical, geometrical, energetical, rationally coordinate comprehensive mensuration system employed by nature to rationally integrate the physical and metaphysical and have thereby also provided a conceptual and definitive bridge of understanding between the humanities and the sciences. I am confident that the comprehensiveness of my fourteen concepts rather than being over-ambitious, represent the "minmaxfamfax" (minimum and maximum family of prime variable factors) uniquely governing general system theory.

Such (only intellectually discovered and only intellectually employable) principles are apparently amongst the most powerful thus far to have become available to man. The a priori (and only intellectually conceivable) complex of self-regenerative, intertransformative (macro-micro), cosmic ranging scale of generalized principles governing non-simultaneous universe – thus far discovered by man only in "piecemeal" isolations – is now disclosing a comprehensive inter-relatedness unanticipated by man at the time of the individual explorations. This total inter-relatedness and its orderliness and mathematical elegance are obviously transcendental to the inventive capabilities of individual man. For these reasons, taken synergetically, there is evidenced to science an a priori, omni-functioning intellection greater than that demonstrated or demonstrable by humans.

Are we not most intimate, i. e. closest with those-farthest away from us physically, ergo closest metaphysically. No rapport between individuals "sardine packed" in subways

and buses. Intimacy of those writing to one another halfway around the world. This relative intimacy may be plotted in terms of time, history and geography. All those who influence us daily by love, wisdom, conceptual stimulation and understanding are most often relatively remote both in time and space. Most of the time the powerful influences are the immortal influences, i.e. "most remote".

The Human Function in Universe and its individually, fleetingly, sensed responsibilities -- heeded or unheeded by the individual -- occur as the consequence of ”built-in" driving forces, the metabolic, physical regeneration drives of hunger and procreation. The most prominent of the metaphysical regeneration drives are human curiosity and the drive to demonstrate competence, i.e. – to employ the abilities to subjectively differentiate and thereafter to objectively integrate in preferred patterns or to organize events in such a manner as to obtain answers to the questions which curiosity asks -- metaphysical drives -- to understand and be understood.

The dual and regenerative human functioning as successive, high frequency, subjective and objective, (subconscious and conscious) which altogether provide angular range finding and the teleologic irreversibility of human articulations are implemented exclusively by two principles with which humanity modifies his forward experiences in Universe in preferred ways. The two physical principles by which alone man may alter his ever evolving environment are those of angular and frequency modulations. Angular modulation (c.f. ruddering) is erroneously spoken of by man as Spatial modification. Frequency of event modulation is erroneously spoken of by humanity as Time modification. These cap-abilities of man's senses, brain and mind, provide the basis for his strategically selective differentiations of experience. The humans’subjective experiences are teleologically and spontaneously transformed into objective alterations of the evolutionary environment -- to most effectively support man's unique brain and mind functioning in Universe in the anti-entropic role.

It is the intent of my concept No, 2 to bring about most effective employment of those built-in drives of individuals in such a manner as to bring about the physical success and happiness of all humanity in the shortest time with the least effort.

It is my intent to employ the built-in capabilities to accomplish all the foregoing without ever advantaging one by deprivation of another.

It is the purpose of my Concept No, 2 to so design or control the angles and frequencies of the evolving environment events that the spontaneous reflexing of society will result in all men enjoying all of Earth – and the progressive reaches of the universe about it – without mutual interference with one another's degrees of subjective and objective freedoms.

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Concept Three – CHILDREN

> Focus of human effort on the critical, first 13 years of life --wherein 98% of brain function is progressively and automatically "tuned-on", "tuned-in", "tuned-out" or shut-off in direct response to the positives or negatives of the individuals' environmental experiences and potentials.

Focus on new life. Recognizing that humanity consists of all ages, it is obvious that before any of the objectives of one have become fulfilled many human individuals and particularly the aged will have died. As a consequence, it becomes necessary to set up time and beneficiary priorities within the total scheme.

The behavioral sciences have disclosed the direct effects of the environment on new life. These are so great as to make it clear that the environment (including all the dynamic events and humans operative within the "scenery") is more than 999' responsible for the lives becoming capable and happy or frustrated and confounded. And the most pro-found effects on human life have been completed within the first 17 years. Ninety-eight percent of the environment's positive or negative effects have been wrought upon the new life by age 13. Eighty percent have been wrought by age of 8, and fifty percent by age of 4. It is obvious that effective work that can be done in advantaging life through favorable environment transformation can be realized within the first 13 years of human life and particularly in the first 4 years of life.

In order for the individual to be objectively effective as a design scientist in altering the environment on behalf of his fellow man, it is necessary for him to organize his efforts so that they may become operative a sufficient number of years ahead of his original initiating to be able to transcend any frustration of his efforts by the momentum of already invested interests. This period has been discovered to be one generation, or 25 years. My work was initiated in 1927 and was designed to become effective in 1952. This proved to be a realistic forecast. In 1952, Ford Motors bought a large geodesic dome.

Combining the concept of the time lags and most effective period for advantaging life, my concept number three came to focus on advantaging the new life -- to protect the new life prominently from 1 to 4; secondarily on 4 to 7; thirdly on 7 to 13; and lives of the parents to be advantaged. See Dr. Benjamin Bloom's book "Stability and Change in Human Characteristics" published by John Wiley and Son.

Design Strategy

Concept Four – TELEOLOGY

The conscious deliberations and decisions of the human mind which reorganize the subconsciously fed-back informations. The philosophic reduction of a plurality of subjectively experienced pattern cognitions into conceptually recognized (imagined) patterns of generalized principles to forwardly control specifically anticipated events by designed modifications of environment patterns.
Generalized, comprehensive and anticipatory, design science.

Design Science Event Flow

Teleology

Intuition

Conception

Subjective — Apprehension

(Search Research) — Comprehension

Experiment

Feedback

****

Generalization

****

Prototyping #l

Objective — " " #2

Development — " " #3

Production Design

Production Modification

Tooling

Reduction to Practice — Production

Distribution

Installation

Concept Four – (Cont.)

	Maintenance....	Service
Regeneration	Re-installation	
	Replacement	
	Removal	
	Scrapping	
	Recirculation	

The philosophy of my fourteen point strategy derives from my intuition that all experiences may be progressively generalized and that man thus discovers that only a few principles govern all the multirate, non-simultaneous, transformative interstructuring transformations of non-simultaneous universe. It becomes obvious that the subjectively apprehended data and the intellectually recognized data inter-relationships concerning the abstracted principles -- governing evoluting universe -- provides the individual with high potential for the objective realization of advantages for humanity. Teleology means: – ”the intuitive conversion by brain and mind of special case, subjective experiences into generalized principles and their subsequent objective employment in special case under-takings. "

The discovered principles governing the inter-transformative structuring of universe permit the subconsciously teleological and conscious design initiating individual to reform the environment in such a manner as to provide ultimately higher advantage for men and in such a manner as to regenerate in other 'individuals the drive to further transform the environment to even higher advantage for all. The design may increase the degrees of freedom of individuals by reducing environmental interferences or it may decrease freedoms as with traps and prisons.

C. H. Waddington, University of Edinburgh Geneticist, speaks of the Epigenetic landscape in identifying the powerful effects on human behavior played by environmental factors. Waddington shows how man and other factors alter the environment and how the altered environment alters the human and other biological behaviors and how the whole process becomes regenerative and continually inter-accelerates. He does not show or suggest that the environment alters man's physical organism nor that the environment adds capabilities to the human’s innate capabilities, but does indicate the way in which arbitrarily favorable changes in the environment may permit a higher percentum of realizations and development of the innate human brain, body and mind capabilities, theretofore inactive – only because frustrated by unfavorable regenerative alterations of the environment. Thus we see that human evolution is not confined to organic life alone, but also consists of reciprocal interactions of all the combined transformations of the environment and all it contains. This combined regenerative evolution has now attained a 'chain reaction rate' around the surface of the spherical space ship Earth.

Concept Five – REFORM THE ENVIRONMENT

> Don' t attempt to reform man. An adequately organized environment will permit humanity's original, innate capabilities to become successful. Politics and conventionalized education have sought erroneously to mold or reform humanity, i. e. the collective individual. See Universal Requirements Checklist-Volume 3, Design Decade.

Reform the Environment – Not man. Each of my fourteen concepts and their teleologically engendered strategies tend to illumine the interdependence of all the items; for instance, my item number five is taken in consideration of all the first four but goes on to make the distinct point that my philosophy and strategy confine the design initiative to re-forming only the environment in contradistinction to the almost universal attempts of humans to reform and restrain other humans by political actions, laws and codes. This re-straining begins with the earliest parental attempts to reform their childrens' spontaneous behaviors in order to conform them to ”accepted" standards and codes. The reforming of others is subsequently manifest in attempts of grown ups to reform other grown ups' pat-terns through politically enacted law.

My experience teaches me that all philosophic concepts which are translated only into "bright ideas" as voiced or written suggestions or criticisms are abortions of intellects higher potentials. My experience teaches me that philosophic conclusions which are always teleologically derived may always be reduced to design science changes of the environment which can permit other individuals ' spontaneous realizations of higher destiny, i. e. to be-have unconsciously in more effective manner. For instance, a turn in the highway may be banked angularly so that poor drivers or drunken drivers will negotiate even sharp radius turns subconsciously due to the fact that the banked angles and gravity together effect the motor cars steering wheel linkages in such a manner that the cars steer themselves around the turns. In the same way, highway overpasses allow automobilists to subconsciously avoid crossing collisions.

In speaking of reforming the environment of man, I include a surgeon's operations on the human body for the latter is mobile environment of the brain. I contrast the reform of the integral or deployed physical environment in contradistinction to legal or verbal at-tempts to reform man's behavior patterns. I find that there are two ways in which the environment may be altered to effect man, one positive and the other negative – i.e. one may decrease the degrees of freedom of humanity, negatively by prisons, traps and straight jackets and positively by inventing better shoes for men's feet. The normal speed of universal formulations and transformative events is seven hundred million miles per hour. Man's thus far attained top speed of physical self transport is fifteen thousand miles per hour. Normal speed is 46,000 times man's rocket speed. Therefore, man is – relatively speaking – almost as immobile as death. On the other hand his environment facilities may be so ordered by design science as to give him some appreciably large percentage communication advantage by radio which operates normally at seven hundred million miles per hour. Summarizing: – Positive design science reformations of the environment must be under-taken with the intent of permitting man’s innate faculties and facilities to be realized with subconscious coordinations of his organic process. Reform of the environment is under-taken with purpose of de-frustrating man's innate capabilities whether the frustration be by the inadequacies of the physical environment or by the coordinated reflexes of other humans induced in those humans by the inadequacies of the environmental advantages as, for instance, mothers' unreasonable punishing of children, not for the children's direct act, but because of the mother's ever subconsciously present fear of the future, or of the all history experienced approximately complete poverty which compounded the parents drudge weari-

ness and failure of the physical environment to provide any hope of the parents opportunity to protect the new life that has inadvertently been placed in their care.

See ”Universal Requirements Check List", Volume 3, Design Science Decade and Design Initiative, Volumes 2 and 3. Design Science Decade for basic environmental control sieve-See also Ideas and Integrities, Prentice Hall Publishing Company.

Concept Six – GENERAL SYSTEMS THEORY

> Mind vs. Brain, Generalization as constituting the thinking of mind vs. the information storage and feed-back functioning of the brain. Topology of systems. The topological hierarchy of systems. Triangulated topological – Quantum coordination of generalized systems. Open and closed systems.

Comprehensivity – Theory of General Systems. As with the preceding items, we again find each and all items to induce considerations of their integrated comprehensivity. We find all the non-simultaneous events of universe tending to effect all other events in degrees ranging from powerful to insignificant.

My own generalizations -- from the total of my own special case experiences as well as from other scientists and mathematicians -- especially my experience on the sea and in the air -- brought me to a clear cut discovery of twelve fundamental degrees of freedom governing the external and internal motions and transformations of all independent systems in universe. Six of these freedoms are positive and six are negative; therefore, there are only six sets of fundamental freedoms. These cover all variable inter-relation-ships of universe. They become the controlling facts governing general systems and thereby such supercomplex systems as the design of a nation's navy. General system's design science includes the navy’s progressive fabrication and evolutionary replacement, its manning, its operation, establishment of its naval bases; repair, maintenance, evolutionary modification, support, logistics, ballistics and industrial tools-to-make-tools to make tools. All these functionings are comprehensively and anticipatorily undertaken -- under a system of time controls and priorities which in turn are governed by fundamental resource programs and the political mandate for its existence. I have developed a completely work-able, generalized systems approach -- starting with the differentiation of universe, including both the metaphysical and physical -- which has not only held up but permitted progressive subdivisions in cybernetical "bits" to bring any local pattern of any problem into its identification within the total scheme of generalized systems events. This means that I always start all problem solving with universe and thereafter subdivide progressively to identify a special local problem within the total of problems.

Concept Seven – INDUSTRIALIZATION

> Definition in terms of tools. Differentiation of the tools of Industrialization in contradistinction to Craft tools. Industrialization only operates as a world around system. Its inherent economic accountability as energy M (matter) x energy R (radiation) x intellect, I x frequency F of evolutionary design advancements. Industrialization is the externalized complementation of man's interior metabolic regeneration organism.

I define industrialization as the extra corporeal, organic, metabolic regeneration of humanity. Industrialization consists of tools. All the tools are externalizations of originally integral functions of humans. I divide all tools into two main classes. Craft tools and industrial tools. The craft tools consist of all the tools that can be invented and produced by one man starting and operating alone nakedly in the wilderness. I define the industrial tools as: – all the tools which cannot be produced by one man. The steamship Queen Mary, the giant dynamo, the concrete highway, New York City, or even the lowly but modern forged alloy steel carpenter's hammer, with electro-insulated plastic handles, whose alloy components and manufacturing operations involve thousands of men and the unique resources of several countries of the Earth.

By my definition, the spoken word which can only be invented by two or more men, was the first industrial tool. This is reminiscent of the biblical account ”In the beginning was the word." In my experience appraised concepts the scriptural statement needs to be modified to read "In the beginning of industrialization was the word." Crafts are limited to a single man and involve only very local resources and very limited fragments of Earth and time. Industrialization, through the relayed experience of all men--permitted through the individualization of the spoken and written word – involves all experiences of all men everywhere in history.

The fundamental material resources of industry consist of 92 regenerative chemical elements--91 of which occur randomly around the Earth. They are randomly disposed around the Earth at an average distance of half-way around the Earth from any given resource marshalling point. The processes of industrialization take the resources from where they occur and progressively separate them from their gross ore matrix and forward them half-way around the world for further refinement and distribution. Half-way around the Earth the resources attain maximum separation. Thereafter, they are re-assembled in preferred alloys and in preferred machines and structures. They are also associated and in-vested in progressively major tool complexes. The vast initial total cost of industrialization has to be amortized by those who need the products. Therefore, the products and services of industrialization must be mass produced and distributed to people all around Earth to widely distribute the capital and overhead costs. The latter thus become almost negligible sums - simply the cost per pound of the product. In order to obtain enough customers to sub-divide the cost it is necessary to go all around the Earth which means that the centrally produced machine, mechanics, structures, etc. must now be distributed half-way around the Earth again. The logistics of industrialization therefore involves both inbound and outbound transportation half-way around the world, twice per each unit of industrial accounting. Industrialization is inherently comprehensive and omni-interrelated in respect to all humanity and all of humanity's ecological environment. This includes the sun and moon and all physical phenomena. Industrialization embraces many alternate systems of technical solutions ranging all the way from electrical to mechanical. All of the systems and their operators which range from private businesses to sovereign nations work inadvertently towards ultimately providing all men with higher standards of living. Although total industrialization’s, often negatively competitive, sub-systems may be motivated locally by short-sighted monetary

or political profits and ambitions the total inadvertently results, in evolutionarily changing the total environment to ever higher advantage of all men and works toward the ultimate enjoyment of all Earth by all men – all both economically and physically successful, without any mutual self-interferences or deprivations.

Though popularly unrealized -- in industry there is a residual, high premium, function of the crafts as basic tool and model makers which permit the original realization of individuals inventive conceptions and their translation into mass advantage gains for society. Crafts are ever less efficiently employed in the production of consumer goods, tools and services.

Having established for our first seven basic concepts it becomes clear that there is a completely separate design science activity which is concerned with the anticipatory scheduling of all the complex interaction of the foregoing general systems events of industrialization. Design science deals in studies of the gestation rates operative in the many different constituent patterns of general world systems. For instance, it has been learned that inventions reach industrial acceptance at very different rates. Inventions in electronics are usually employed industrially within two years after invention. Aeronautical inventions are generally employed (after thorough testing) within five years. There is a lag of 15 years between railroad inventions and general use. There is a forty-two year lag between invention and use in the craft-bogged building arts. There was a fifty year lag between the first blast furnace production of steel for ships and the use of steel in a "sky-scraper". There was a forty-two year lag between the steel companies' by production of portland cement in their subsidiary companies and the time when a piece of steel fell into the setting cement to disclose accidentally the principle of steel reinforcing of concrete.

The going economies accredits the merger of a dozen economic "failures" to produce a "success". The American automobile industry was compounded out of many thousands of "failures" whose managements lost their credit authority but whose energy processing real machinery assets had never failed. The accounting and the speculative funding, and pro-motional shortsightedness and the economic accrediting failed but not the evoluting machinery of industrialization. Industrialization is physical evolution and channeled energy transformations which by the law of energy conservation can never fail. Through traffic in interest paying debt increases, present day economics exploits the failure of debt crops to support the increasing numbers of humanity displaced as automatons by automation. We are in for a world economic accounting revision of first magnitude. We will switch from a negative to a positive world economic accounting.

Because energy is wealth, the integrating world industrial networks mean ultimate access of all humanity everywhere to the total operative commonwealth of Earth.

What do we know about wealth stated rigorously and only in the terms of experimental science?

Wealth cannot alter yesterday. It can only alter today and tomorrow.

Multiplication of craft wealth began, as we have noted earlier, when man stepped on the long end of a log lying across another log with its short end under another big log and saw the big log which was too heavy for him to lift with his muscles, lifted easily by gravity pulling his miniscule weight against the high advantage, long arm of the lever. Multiplication of industrial wealth began when man fastened a set of levers radially around the hub of a wheel and put the wheel under a waterfall and connected the wheel with a grind-

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ing mill. Thus, he learned to stand aside from the work and, gaining perspective, to use only his brain to rearrange inanimate energy patterns, external to his own integral bodily energies to do more and more fundamental, man advantaging work. He did so by shunting energy patterns to impinge upon his machine levers.

Humans found that the vast associative (gravity, matter) and disassociative (radiation) energy patternings of universe can be harnessed, shunted and valved by them to impinge at preferred time and quality rates upon the long ends of levers to be led through trains of gears and electric generators and conductors and motors to do preferred work for man ad infinitum.

Man is now learning through the repeated lessons of experimental science that wealth is explicitly the organized tool articulated energy capability to sustain his forward hours and days of metabolic regeneration; to physically protect him; to increase his know-ledge and degrees of freedom while decreasing his inter-frustrations. Wealth, he finds, is inherently regenerative, but because of comprehensive synergies the rate of regeneration of man's solo wealth is to his commonwealth regeneration rate only as X is to X^4. As experimentally demonstrated – wealth is: energy compounded with intellect's know-how.

Science's law of conservation of energy states that "energy cannot be created or Destroyed." The first constituent of wealth – energy – is therefore irreducible. Science states that the entire physical universe is ENERGY. $E=MC^2$. Some of the energy is operative in associative patterns – as matter. The associative energy as matter is organ-zed in leverage systems to do work. The other energy patterns disassociatively, as radiation which is transformed into free energy to be directed to impinge on the levers.

Every time man uses the second constituent of wealth – his know-how – this intellectual resource automatically increases. He learns more. Learning is only growthful. It is impossible to "learn less".

Energy cannot decrease. Know-how can only increase.

It is therefore scientifically clear that: - wealth which combines energy and intellect can only increase, and that wealth can increase only with use and that wealth in-creases as fast as it is used. The faster-the-more! Those are the facts of science. Those are the facts of life.

Because we have found: (A) that the metaphysical balances the physical; (B) that .the metaphysical universe embraces the physical – both being finite, -but the metaphysical being always one tetrahedron greater than the physical; (C) that the metaphysical's generalized "capture" and identification of the physical is an irreversible. condition – e. g. Einstein as intellect (metaphysical) writing the identification of the physical universe $E= MC^2$ is irreversible – for the physical which is ”disorderly" cannot "think" and make orderly statements. Energy cannot write what Einstein's intellect is. Therefore, we can say that the metaphysical is greater than and re-concentrates and coheres the physical.

Wealth is, therefore inherently irreversible. Wealth can only gain as in our proposition
Q. E. D,

Concept Eight – DESIGN SCIENCE

> Angle and frequency modulation of directions and sequence rates of least resistant event developments. Selections of progressive, one out of twelve, alternately equal, least resistant directions. i. e. the twelve fundamental degrees of freedom of inter-transformative transactions in physical universe. See Volumes 2 and 3, Design Science Decade.

My topic eight then isolates the objective and subjective design science activities relating to the total evolutionary events of man in universe, as for instance, when in 1969 the new generation of 700 passenger (or 125 ton cargo) airplanes will be able to fly non-stop across the Pacific Ocean to establish approximate ten-fold the present aeronautical transport capability within two years after their regular operations begin. Such events must be comprehensively integrated with all the other vastly accelerating environment relationships transformations. Mining on the moon will by this time become of challenging consideration.

The rental service industry -- to be discussed in item 9 -- must be compounded with time designing doubling and possibly tripling the environment control capabilities. World-around traveling man greatly accelerates the experience of seasonal changing between winter and summer. The regularity of days and nights will be almost obliterated by the ability to fly around the Earth at the rate of its turning. He will want, however, to sleep for 8 hours every 24 hours, independent of sunlight or shadow. This may often force him to the use of a hotel bedroom one hour after it has been vacated by others. A good standard hotel bedroom and all its equipment should be indistinguishable from "brand new". Hotel rooms may be occupied successively by two or three different humans each 24 hours, just as the airport gates are progressively occupied by airplanes which receive their rehabilitating services and move on to be immediately replaced by another plane. This concept introduces a new concept to man on Earth which is to be spoken about as frequency modulated environment occupancies.

While this frequency modulated use of service industry products by humanity may seem extreme in terms of yesterday's experiences, the trends clearly indicate this mode of life will soon dominate world-around living pattern and will become the major mode of life within the next 25 years.

Lockheed Aircraft Company has a 10,000 (ten thousand) passenger airplane on the drawing boards. These new large ships, starting with the 700 passenger, can land in unprepared fields. Length of the 10,000 passenger ships' fuselage is in the magnitude of the Empire State Building's height or the Queen Mary's length. This means that within the next decade, or fifteen years, if man maintains evolutionary schedule, he will be able to fly a whole fleet of -- automated-factory produced -- skyscrapers into place and up-ended for immediate occupancy. This is analogous to a fleet of ocean liners coming into port and taking on a city-sized passenger population on the same day. Instant city! Static urban planning will be as obsolete and inappropriate in fifteen years as the attempt to build brick ships upon a stormy sea. With the computer storing and retrieving all the latest data on elevator shafting, electrical harnesses, plumbing, manifolds and doing the drawings -- architecture and planning as now taught will be obsolete.

Concept Nine – WORLD SERVICE INDUSTRIES

> To swiftly replace "ownership" with rentals of "new" equipment maintained at constantly renewed higher standard of performance, because more profitable and more satisfying to humanity. Service industries on world-around and year-around, automatedly accountable credit card basis.

The Service Industry. As world industrialization and transportation step-up in-creases, all humanity is gradually trending toward being Worldians -- all to enjoy total Earth – the static environment appurtenances of their earlier life will become progressively disused and cumbersome. Therefore, the trend to development of rental services industries will be vastly accelerated. After a half century of owning and operating 55 successive automobiles, I am now switching to rental cars. The general concept was pioneered by the telephone companies service-maintained contact instruments which are only incidental to the service. Service industries have now grown to include automobiles, typewriters, calculating machines and many other tools. There are a myriad of other industrial rental services. Despite the uses of the term "ownership", only a minor fraction of home and car "owners" actually own these items free of encumbrances. The quasi-owners of yesterday and today make payments on mortgages of great length in which the under-writing funds are provided by banks, labor funds, insurance companies. All are under-written in one way or another by federal governments. The fact is the telephone in the home, though clearly rented, is as clean and new as if purchased and "owned". It is swiftly replaced by superior sets because it is owned by the telephone company whose use-frequency pays dividends and use-frequency is predicated on the relative efficiency and its induced desirability of the constant improvement of: the machines.

I assume that within another two decades, the exclusively geographic identity of humanity will have given way to a general world citizenship in which it will be practical only to operate on a rental service industry basis.

Concept Ten – EPHEMERALIZATION AND INVISIBLE COMMONWEALTH

> The progressive doing of more with less per each and every rein-vested resource unit of energy M (matter), energy R (radiation) and I (Intellect). Wealth is intellect harnessed in animate energy, tooled anticipatorily to automatically produce the forward metabolic regeneration of humanity.

Ephemeralization. A ship of the sea had first of all to float and stay on top of the water. A floating ship could and still can carry vastly larger and heavier cargoes than can be carried by men on their backs or on the backs of animals. Through shipping com-petition there developed swift evolution in ways of doing ever more important tasks with ever less material effort and time. This doing-more-with-less came into high magnitude of effectiveness in the development of steel steamships. Doing of ever more with ever less I identified in 1927 as "ephemeralization". It is the major control objective of design science in respect to development of airplane evolution.

As a total consequence of ephemeralization's paramount importance to the world's military efforts on the sea, in the air and in space, men are constantly doing so much more with so much less that within the last century we have witnessed the growth from less than 1% to a benefaction of 40% of humanity with a higher standard of living than had been realized in any previous century by any monarch.

The accelerating-acceleration of doing-more-with-less will, within the next 24 years, bring an even higher standard of living to the remaining 60% of humanity, while gaining the same higher standard for the already advantaged 40% – all to be realized out of the Earth's physical resources which are continually decreasing per each world man.

Ephemeralization,. the comprehensive effect of more with lessing, is scientifically identifiable with anti-entropy. Ephemeralization, a product of the metaphysical conservation being more effective and coherent than physical entropy is the number one economic surprise of world man. Up to ten years ago, all world economists counselled the world political leaders that there never had been and never would be enough vital sustenance to support more than a very few.

The development of ephemeralization has been conducted by design scientists and technologists whose numbers have amounted to a small fraction of 1% of all humanity. And their work has been focused almost exclusively upon the weaponry or defense systems. Political men dealing with the great majority of humanity were utterly surprised ten years ago to discover that their destructive weapons system' had inadvertently developed a constructive by-product. This occurred when the prime and secondary weaponry contractors were displaced by other contractors with superior devices. The socially constructive inadvertancies occurred when the displaced weapons contractors turned to the domestic market for outlets for their high performances per pound and per unit of time capabilities. So much ephemeralization drifted into the domestic economy between 1900-1966 as to have converted 40% of humanity from "have-nots" to ”haves".

This ephemeralization developed by the technology which preoccupied less than 1% of humanity in weapons development had never been thought of as benefiting society. That is why its conversion of 40% of humanity from "have-nots" to "haves" in two-thirds of a century has come as an utter surprise to humanity. 99. 99% of humanity don't know that this is why automobiles pack every highway and mechanical drudge" savers, iceboxes and a higher standard of living are appearing as a flood all around the Earth.

Because ephemeralization is accelerating it will complete the task of providing enough for all of humanity within another 34 years. This will occur despite the political systems which deliberately divide society and set one group against another. World man disembarrassed of political systems could accomplish universal success within twenty years. The fourteen-year difference might readily be the fatal difference within which a disgruntled man might touch off the atomic war head retaliatory systems which would destroy humanity on Earth.

Concept Eleven – PRIME DESIGN INITIATIVE

> Strategy for attaining and sustaining the comprehensive design conception and realization initiatives by the individual in the era of the massive world corporations and massive, sovereign, geographical states which only "seemingly" overwhelm the individual with their economic advantages in respect to investment capital, working capital, credit capital and influence.

Economic Strategy of the Individual. Comprehensive ephemeralization involves original thought, invention, scientific calculations, technical drawings, scientific proto-typing, testing production engineering. This brings us to the Economic Strategy of the Individual. I have had all manner of experience in initiating the reduction of inventions to industrial use. I have experienced owning, renting of shops, owning and renting tools, hiring of individuals, and dealing in the great complexes of accounting and maintenance of such high priority technology.

I have had all manner of experience in protecting of the individual initiative and I have learned some important lessons, though frequently just short of bankruptcy. I have been able to learn those lessons without going "broke" and have managed eventually to liquidate all indebtedness. I have learned that it is fatal for an invention developing pioneer to own his own shop and tools because it forces him to exploit his non-production tools with "paying" products involving repeat performances bound to vitiate experimental work. It is fatal for an inventor-explorer to build up any large staff dependent on any one economic product or focus.

The unique and superior advantage of the economic explorer maintaining his economic initiative in the face of the massive capital, staff and equipment advantages of the large corporations and great states -- who seemingly have top-heavy advantage -- is demonstrated by the lone individual's complete freedom of the checks and balances of bureaucracy. Walter Chrysler found that I could produce the full fledged operating prototype of a better, more advanced, automobile than could he and his Chrysler Corporation and that I could do so with 1/3 the time and 1/4 the money. The U.S. Navy wrote a report which showed that I was able, time and again, to produce satisfactorily working structural innovation prototypes in one month with an average of only $5,000 and with the help of 30 university students which were superior in every way to the results obtained by the Navy department when dealing exclusively with their prime industrial contractors which averaged them two years and 1/4 million dollars only to discover that such methods failed to produce any satisfactory results.

Quite clearly the individual initiative is at highest advantage with the least staff and property.

I have found it essential to take patents. This was proven as 50 large corporations applied to me to operate under my patents. On approximately all such occasions the attorney of the large corporation said to my attorney, ”Of course, the first thing my client had me do was to try to get around your patents. The only reason we have come to you is because your patents are so well written". This was to say that the industrial corporation would have ridden over me ”rough shod" if I had not protected my inventions with patents. I would never have been heard of if I had not taken patents. The monetary earnings from the patents have been negligible in proportion to the accreditation of my abilities and my theoretical activities accruing as a consequence of the economic and physical success of

my geodesic domes. My accreditation as a pioneer trend navigator and environment transformer always concentrating on environment transformation was confirmed by the geodesic dome success. I have taken a large number of patents in every country in the world in which I am allowed as an American to apply. I find that the world is so integrated that patenting within only one nation provides inadequate protection.

Concept Twelve – SELF DISCIPLINES

> Working assumptions, cautions, encouragements and restraints of intuitive formulations and spontaneous actions. My own rule: "Do not mind if I am not understood as long as I am not misunderstood. "

Personal Self Disciplining. In 1927 I gave up forever the general economic dictum of society, i.e. that every individual who wants to survive must earn a living. I substituted, therefore, the finding made in concept one, i.e. the individual's anti-entropic responsibility in universe. I sought for the tasks that needed to be done that no one else was doing or attempting to do, which if done would physically and economically advantage society and eliminate pain.

As a consequence, it was necessary for me to discipline my faculties to develop technical and scientific capability to invent the physical innovations and their service industry logistics.

My Recommendations for a Curriculum of Design Science:

1. Synergetics

R. General Systems Theory

3. Theory of Games (Van Neumann)

4. Chemistry and Physics

5. Topology, Projective Geometry

6. Cybernetics

7. Communications

8. Meteorology

9. Geology

10. Biology

11. Sciences of Energy

12. Political Geography

13. Ergonomics

14. Production Engineering

Concept Thirteen – COMPREHENSIVE COORDINATION

> Effected through discovery of nature's omnirational vectorial, quantum arithmetical, geometrical, topological, equilibriously and dynamically coordinate intertransformative system. i. e.
> Synergetics -- Energetic, Synergetic, vectorial and topological geometry.

Self development involved my re-establishing the self disciplining in cornprehensivity which I originally received at the U.S. Naval Academy, which training countered the almost complete trend to specialization in other universities and colleges. At the Naval Academy, the brightest were selected for the most comprehensive training. At the other colleges and universities the brightest were corralled and shunted into sharp specialization. It was evident to me specialization had been developed by the great, master world pirates as a means of dividing up all the bright ones, who might otherwise aspire to displace the great ones, and thus conquering society by keeping all powerful individuals compartmented by their specialization as the great master pirates reserved for themselves all the integrating of the wealth producing potentials accruing to the specialists' multitude of special detail accomplishments. I call them the great pirates, for they were the masters of the world commerce which took place on the oceans covering 3/4 of Earth. Three miles off shore, all man-made laws were nil. Only the laws of physical universe were operative. The great masters were, therefore, inherently "Outlaws".

Only the chief naval officers who maintained the master pirates, high seas, world around fleets needed to have the comprehensive capability to be the master pirates right-hand men.

Foremost of my personal disciplines is that: – I must never attempt to sell one of my ideas to others. I must confine myself entirely to the production and testing of the invention. I find that there are always capable people who learn of my activity and ask, "What is it that you are doing?" When people ask me either for an explanation or my services, I give them the best I have. I, therefore, have no promotion and allow no promotion by any associates. I have learned that when you ask people to listen to you, they become defensive. On the other hand, when they ask you to speak to them and especially when they pay a high fee, they are highly receptive.

I have learned that all consideration of my inventions and developments by others have occurred in emergencies. In effect, my work emerges through emergencies. The U. S. Marine Corp, the U.S. Navy, the Air Force, the Department of State, the Ford Motor Corp. have all come to me in emergencies when everything else they had tried had failed. I represented the last and most remotely possible solution to their problem.

Because I have disciplined myself and have put into operation all the strategies listed under my fourteen topics, I have always had something awaiting their emergencies which I knew by experimental work would solve their problems – and do it under the circumstances which had created the dilemma. I have never had agents seeking to sell my ideas or my products. I have no agent seeking to sell my lecturing capability and have no agents trying to sell my patents.

Because I only go where I am asked to go, I am able to use the geographic and frequency of travels patterning as a trend indicator. I often gain important previews of coming events through study of my own trend patterning. Because I live in the frontiers, what happens to me usually happens to others later on. I have therefore powerful trend prognosticating experiences.

It is part of my personal discipline to continue to try making obsolete all the inventions which I have previously developed by designing ever more effective and efficient devices for solving the complex and comprehensive world problems. I consider my patents of no consequence except for their protection of my initiative.

I do not profess anything. I am not a professional. My own description of my own work with university students is: – the attempt to discipline myself to be an effective explorer in the realm of mastery of principles of comprehensive anticipatory design science.

I assumed in 1917 that nature did not have separate departments for chemistry, mathematics, physics, biology, history, etc. I decided nature had only one department and only one arithmetical, angle and frequency, modulating and coordinating system. I am quite confident that I have discovered an importantly large area of the arithmetical, geometrical, topological, crystalographic and energetically vectorial coordinate system employed by nature itself. It is a triangular and tetrahedronal system. It users 60 degree coordination instead of 90 degree coordination. It permits kindergarten modeling of the 4th and 5th arithmetical powers, i. e. 4th and 5th dimensional aggregations of points and spheres, etc., in an entirely rational coordinate system. I have explored the fundamental logic of the structural mathematics strategies of nature which always employ the six sets of degrees of freedoms and most economical actions.

I have been able to develop structures which are shown by engineering publications and scientific papers to be able to cover very large clear span spaces more economically than by any known rectilinear or other shaped systems as for instance 1000 fold more economically weight-wise than accomplished in the dome of St. Peter's in Rome and 30 times more efficiently than this is to be accomplished by reinforced concrete or by its 10 times more complex conventional steel trusses.

Scientists operating in the area of the viruses and many places elsewhere in the area of nature have found nature employing the mathematics and the structural stratagems which have come by study from the mathematics which I have discovered most probably to be part of nature's own coordinate system.

I find that there are only two possible co-variables operative in all design in universe. They are modifications of angle and frequency.

Employing the coordinates employed by nature (which as yet are unemployed in any of the educational institutes of the Earth and are as yet unemployed by any professional engineer or architect other than myself) and employing the contents of my fourteen concepts I find I am able to effect ephermeralization in so important a degree as to make it clear that when and if world society adopts and employs my fourteen strategies, mankind will always have more than adequate of everything with which to effect his physical success and intellectual satisfaction.

Concept Fourteen – WORLD COMMUNITY AND SUB COMMUNITIES OF WORLD MAN

> City today must be world serving unit. The real urbanites of 1966 are world people like Constantinos Doxiadis. The whole of humanity is increasing not only its ecological ranging but also is accelerating its pace. The children of the Doxiadis family of Greece and the Gin Su family of Hong Kong all attend colleges and universities in America and all hands circle th e world yearly as prototypes of all families of tomorrow. Yesterday only notable humans achieved travel abroad. Today anyone may expect to meet anyone else anywhere around the world (and some anywhere in space) with no more surprise than was caused by meeting one another "downtown" a half century ago. Humans are only hyperconsciously aware of themselves or their own parts --their tongues, eyes and fingers -- as constituting separate items when those separate parts get damaged. Otherwise humans are aware only of the totality of being as a coordinate part of their total environment. At such times they "feel great". When humans first acquired automobiles they were acutely aware of all the autos' separate parts because they had continually to repair, regulate and replace them. Only muscularly powerful amateur expert4 could drive early cars. A half century later almost any human can drive an auto, a coordinately whole extension of their integral organism. The outcry about automation in general and its emerging comprehensivity is for the moment only provoking, hyperconsciousness of society. All humans and biological phenomena have always been automated. There will be a gradual subsidence of humanity's consciousness and specific awareness of the separate tool parts of its complex world around network of industrialization which is in reality only the externalized automation of its originally only integrally operating, anatomical automation of its metabolic regeneration functions.

World Community and Its Sub Communities. Because synergy shows experimentally the behavior of whole systems unpredicted by behavior of the parts and because the known behavior of the whole and the known behavior of some of the parts (at least three) makes possible discovery of the required behavior of the other parts. I assume that all planning of humanity's economic, urban and other undertakings must start with world trendings and possible modifications of the total or world environment.

According to my speculative reconstruction, the ecological history of humanity around Earth has two chapters. In chapter one, humanity – whose bodies are better than 90% water -- lived in huts on rafts beside the rivers, lakes, bays, and oceans, for fish were the most plentiful food and the raft kept the humans safe from wild animals on the shore. Some of these raft dwellers were blown out to sea and preponderantly eastward around Earth's surface, three quarters of which is water.

In the second chapter of all history, men learned to sail to windward. Following the sun, to which they intuitively attributed their metabolic regeneration, men worked west-ward fighting into the head wind seas.

In Japan the originally sea-faring people have an annual "Golden Boy Day”. They celebrate by flying fish-shaped kites above the roofs of their homes – one for each of their

male children. The kites symbolize the salmon, who swims and leaps upstream in order to regenerate. That is the Japanese ideal.

Approximately the whole of the last ten thousand years' span of recorded history takes place during chapter two's preponderantly westbound movement of humanity. In the Eurasian continent, where 76% of humanity exists, this westward motion finally funnels into Western Europe. As humanity converged it crossbred. Western Europe represented an amalgam of a myriad of previously isolated "nations". The "nations" had developed through milleniums of inland, inbred adaptations to unique local subsistence patterns. Along the waterfronts the sailors crossbred.

Crossbreeding Europe, intermingling with the Angles 'and Jutes, poured into the British Isles to crossbreed even more. West bound Indian Ocean people inhabited Africa in ever further westward, tribally inbreeding, inland isolations. Then crossbreeding Western European humanity jumped westward across the Atlantic to the Americas. For ten successive generations they have settled further westward. As they moved westward they crossbred acceleratingly, not only with their own west bound, chapter two Eurasian stocks but with the Eurasian stock of chapter one, which had drifted eastward to the American continents at least ten thousand years earlier. Into the north and South American continents and their islands there also flowed westward, both by slave trade and migration, a swiftly crossbreeding homogenization of the inbred African tribesmen.

In California, at the mid-point of the western shores of America, cross-breeding man has become so genetically integrated as to defy superficial identification with any of the earlier inbred national characteristics of Eurasia.

In California today -- 1966 -- we find an advanced phase of crossbred world man poised on an epochal springboard about to fly both skyward and into the seas' depths around the Earth, thus to open chapter three of history.

In logical consequence of this historical trending the United Nations was born on the West Coast of America a score of years ago. Logically the air and space vehicles of man's acceleration into world and universe citizenship are predominantly produced on the West Coast of North America. Around the world we find nationally named airlines – the Ghana, Japan, and India airlines, etc. -- but, the vast majority of their vehicles are California designed, developed, and produced, as are also a large proportion of the new space and sea penetrating vehicles.

California is in the center of the outermost jump-off pad of humanity's springboard. From this pad, humanity is taking off – from its flounder, snail, and crab-like existence, only around the two dimensional bottom of the skyocean world -- into its self-interference free, four dimensional occupancy of universe.

99.999 percent – not only of all the search, research and development, but of all the operating controls of man's entry into the one-town world and its surrounding skyocean – are conducted exclusive]v in the ranges of the electromagnetic spectrum, which are infra and ultra to humanity's sensorial apprehending. Only through mind conceived and brain operated instruments does humanity command the operations of its birth and entry into world and universe citizenship. Education is therefore essential and central to man's successful transformation.

The fundamental concepts of humanity are transforming overnight from the working assumption of man as a physical and economic failure -- as inexorably demonstrated through-

out the whole of past history wherein only one in a thousand lived out his days and only one in one hundred thousand lived out his days in economic success.

For only the last twelve years of all history has it been scientifically acknowledged that all of humanity may now be physically and economically successful. Humanity's master of vast, inanimate, inexhaustible energy sources and the accelerated doing more with less of sea, air and space technology has proven Malthus to be wrong. Comprehensive physical and economic success for humanity may now be accomplished in one-fourth of a century. For the first time in history it is to be assumed now and henceforth that it is normal for man to be a physical and economical success -- as normal as it is for a hydrogen atom to demonstrate the success of its. designed inter-atterning potentials. Now and henceforth it is not only normal for man to be a physical and economic success but to be so without endangering the success of any others and without interfering with the degrees of freedom of others. A design science revolution is underway.

In California I find a powerful latent awareness of the significance of this great moment of human transition. I find in this community a spontaneous desire to cease backing up into our future and enthusiasm for a general forward facing of society.

Typical of the power of this west coast springboard into the new chapter three relationship to universe is the initiative of San Jose State College in throwing off the semantic yoke of "Engineering", with all its tradition and professionally starched fabric, to re-identify the general engineering undergraduate major as the "Cybernated Systems Discipline", open to all undergraduates.

Such semantic reorientation is only the beginning. In my constant travel around the world I witness everywhere the swiftly accelerating birth of world man. Nowhere, in my seventy years, and in my many years of world travel, with oft-repeated visits at 174 world around universities and colleges, have I felt the final leap into universal citizenship from the springboard of local inertia to be as imminent as I intuit it to be in California, North America.

The U.S.A. as the theater of crossbred world man best discloses the patterns coming upon all men. In the U.S.A. the population census is taken every ten years. Two censuses ago, it was found that the average U.S.A. family moves out of town every five years. In the last census, they are moving out of town every 4 1/2 years. The pace is quickening. At the last (every four year) Presidential election, it was estimated that thirty million were unable to vote because they had not been in their new homes long enough to qualify for voting. Since sixty-five million did vote, those disqualified by the glacial speed reshuffling of society numbered 50% of those who did vote. Since the shift is accelerating, it is clear that within a few more national elections that the majority of American citizens will be unable to vote and democracy will have to find other than a static geographical base for qualifying man to have his voice heard.

What do we know and what can we see of Chapter Three. Nature has devised two main and fundamental organic designs for the systematic solution of life's metabolic regeneration requirements – the zoologicals and the botanicals, the vegetation is designed with roots to receive its sustenance at first hand by photosynthesis from the sun and sun-energized hydraulicly and pneumaticly regenerated chemical recyclings. The zoologicals are designed with high mobility to go after their sustenance and receive their sun energy in-directly by first feeding upon the vegetation. Some zoologicals feed on other zoologicals which latter first feed on vegetation. Man, though designed zoologically to go after his sustenance found few places where the vegetation gave him the fruits and palatable foods.

Those who did find favorable vegetation conditions set about to guard that territory and to cultivate the most favorable types of vegetation and others hung hopefully about them. Thus, man with very short legs and a very big Earth came to confuse himself with the botanicals and pretended to himself that he had roots and that he owned the favorable pieces of the Earth. The swift evolutionary changes taking place invisibly are about to uproot him -- all concepts of urbanization will become obsolete. Only the Earth and the solar system will be his temporary home.

The swift shrift of humanity from an agricultural to an industrial world economy draws men from the agricultural lands into the city. The industrialized tools and industrialized planting, cultivating, and harvesting service industries sweep over the cultivated lands.

Urbanization is only temporary as the cities become the launching pads for each human's blast-off into world shuttling citizenship.

The centers of cities explode outwardly like volcanoes to deploy their super-market services to ever newer mobile traffic centers. The immobilized families and individuals begin to shuttle swiftly between high concentrations and highly diffuse deployments. They converge for the metaphysical exchange -- for the brain and mind activities -- for cultural and commercial exchange for museums, theaters and university study, for broadcasting which is high velocity publishing. They deploy for their physical activities -- for the muscular and energetic activities -- for mountain and water skiing, for factories and physical archaeological and geological and ecological research.

The whole of the urbanism is a vast oscillating system -- a world embracing, en-tropic, volcanic, physical explosion countered at increasingly high frequency with the world embracing, metaphysically contracting and information concentrating system which regenerates by broadcast and publishing its progressively generalized concepts for regeneration of man's anti-entropic functioning -- that fulfills his universe functioning.

R. Buckminster Fuller
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