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## 100.00 SYNERGY

100.01 Introduction: Scenario of the Child

[100.01-100.63 Child as Explorer Scenario]

100.010 **Awareness of the Child:** The simplest descriptions are those expressed by only one word. The one word alone that describes the experience "life" is "awareness." Awareness requires an otherness of which the observer can be aware. The communication of awareness is both subjective and objective, from passive to active, from otherness to self, from self to otherness.

Awareness = self + otherness Awareness = observer + observed

100.011 Awareness is the otherness saying to the observer, "See Me." Awareness is the observer saying to self, "I see the otherness." Otherness induces awareness of self. Awareness is always otherness inductive. The total complex of otherness is the environment.

100.012 Universe to each must be

All that is, including me.

Environment in turn must be

All that is, excepting me.

(Compare Secs. <u>264.10</u> and <u>1073.12</u>.)

100.013 Life begins only with otherness. Life begins with awareness of environment. In Percival W. Bridgman's identification of Einstein's science as *operational science*, the comprehensive inventory of environmental conditions is as essential to "experimental evidence" as is the inventory of locally-focused-upon experimental items and interoperational events.

100.014 The child's awareness of otherness phenomena can be apprehended only through its nerve-circuited sense systems and through instrumentally augmented, macro- micro, sense-system extensions—such as eyeglasses. Sight requires light, however, and light derives only from radiation of celestial entropy, where Sunlight is starlight and fossil fuels and fire-producing wood logs are celestial radiation accumulators; ergo, all the sensings are imposed by cosmic environment eventings.

100.015 The child apprehends only sensorially. The combined complex of different sensorial apprehendings (touch, smell, hear, see) of each special case experience are altogether coordinated in the child's brain to constitute "awareness" conceptions. The senses can apprehend only other-than-self "somethings"—for example, the child's left hand discovering its right hand, its toe, or its mother's finger. Brains differentially correlate the succession of special case informations communicated to the brain by the plurality of senses. The brain distinguishes the new, first-time-event, special case experiences only by comparing them with the set of all its recalled prior cognitions.

100.016 Although children have the most superb imaginative faculties, when they explore and arrive at new objective formulations, they rely—spontaneously and strategically—only upon their own memory of relevant experiences. With anticipatory imagination children consider the consequences of their experiments, such as a physical experiment entailing pure, unprecedented risk yet affording a reasonable possibility of success and including a preconception of the probable alternative physical consequences of their attempt. For example, they may conceivably jump over a ditch today even though it is wider than any over which they have previously leapt. They only make the attempt because they have also learned experientially that, as they grow older and bigger, they are often surprised to find that they can jump farther and higher than ever before. "How do all my muscles feel about it now?" and "Shall I or shall I not try?" become exquisitely aesthetic questions leading to synergetically integrated, physical-metaphysical, split-second self-appraisals and exclusively intuitive decisions. If it's "Everything go!" all thoughts of negative consequences are brushed aside. 100.017 Children conduct their spontaneous explorations and experiments with naive perceptivity. They have an innate urge first subjectively to *sort out, find order in, integratively comprehend,* and *synergetically memory-bank* their experience harvests as intertransformability system sets. Thereafter they eagerly seek to demonstrate and redemonstrate these sets as manifest of their comprehension and mastery of the synergetic realizability of the system's physical principles. Consequently children are the only rigorously pure physical scientists. They accept only sensorially apprehensible, experimentally redemonstrable physical evidence.

100.018 Things = events = patterns = somersaults = intertransformability systems ... that's what delights a girl as she accepts her uncle's invitation to face him, take hold of his two hands, walk up his front until, falling backward—and still holding his hands—the child finds herself looping the loop, heels over head, to land with feet on the ground and head high.... "Wow, let's do it again!"

100.020 Human Sense Awareness

#### INFRARED THRESHOLD

(Only *micro*-instrument-apprehensible)

- *Tactile*: Preponderantly sensing the crystalline and triple-bonded atom-andmolecule state, including all the exclusively infraoptical frequency ranges of the electromagnetic wave spectrum's human receptivity from cold "solids" through to the limit degrees of heat that are safely (nonburningly) touchable by human flesh.
- *Olfactoral*: Preponderantly sensing the liquid and double-bonded atom-andmolecule state, including all of the humanly tunable ranges of the harmonic resonances of complex chemical liquid substances.
- *Aural*: Preponderantly sensing the gaseous and single-bonded atom-andmolecule state, including all ranges of humanly tunable simple and complex resonance harmonics in gasses.
- *Visual*: Preponderantly sensing the radiantly deflecting-reflecting, unbondingrebonding, atom-and-molecule energy export states, including all ultratactile, humanly-tune-in-able, frequency ranges of electromagnetic wave phenomena.

#### ULTRAVIOLET THRESHOLD

(Only *macro*-instrument-apprehensible) (See Secs. <u>267.02</u>, <u>801.01-24</u>, and <u>1053.85</u>.) 100.021 The direct sensing of information may sometimes be deceptive and illusory due to such factors as coincidence, congruence, or the time-and-angle distortions of perspective. For instance, the parallel railroad tracks seem (mistakenly) to converge at the horizon, and the apparently "motionless" remote stars seem (mistakenly) fixed, while they are in fact speeding at celestial macrorates.

100.022 Children can learn from their successive observations of the rotational progression of angles that the hour and minute hands of a clock have moved; that the tree and the vine have grown; and that the pond's top has frozen into ice that surprisingly floats—getting colder usually means getting denser and heavier per given volume, which erroneously suggests that ice should sink to the pond's bottom. But the crystallization of water forms a "space frame" whose members do not fill allspace. This vacated space embraces and incorporates oxygen from the atmosphere—which makes ice lighter than water. The crystallization of water takes up more room than does the water in its liquid nonform condition. Crystallization is structurally and vectorially linear: it is not allspace- filling. Crystalline structurings are interspersed by additional atmospheric molecules occupying more volume (ergo, having less mass); the process of crystallization life would have long since disappeared from planet Earth.

100.023 Comprehensively concerned children can learn how to avoid the miscarriages of misconceptioning as induced by too-brief reviews of their progressive experiences as observed from too few viewpoints or loci. They can learn—as did Einstein—of the plurality of different, instrumentally measured, time-angle-and-size aspects of the same phenomena as viewed from different given environmental surrounding points by different observers at as close to the "same" time as possible, taken at "almost the same time" as well as at distinctly different times. The foregoing is what led Einstein to the discovery of relativity.

#### 100.030 Resolvability Limits



100.031 The visual limits of "now-you-see-it-now-you-don't," yes-no-yes-no, something-nothing-something-nothing, dot-dash-dot-dash are relative size-scale discernibilities spoken of technically as *resolution*. These resolvability limits of the human eye may be pictured as (in Fig. 100.031)(follows:) The finest "smooth"-surface, intercolor-crossblending, continuum photogravure printing is accomplished with a benday screen that uses 200 unique color dots per square inch of printed surface. (See Secs. <u>260.11</u> and <u>260.22</u>.)

Fig. 100.031



Fig. 100.031 Resolvability Limits: Engineer's inch scale.

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100.032 A point-to-able something may be much too small to be optically resolved into its constituent polyhedral characteristics, yet be unitarily differentiated as a black speck against a white background. Because a speck existed yet defied their discernment of any feature, mathematicians of the premicroscope era mistakenly assumed a speck to be self-evidently unitary, indivisible, and geometrically employable as a nondimensional "point." (See Secs. 262.02-05, 264, 527.25, and 530.11.)

100.033 A plurality of points became the "building blocks" with which the mathematicians of the day before microscopes imaginatively constructed their lines. "Lines" became the one-dimensional, substanceless "logs" that they floored together in their two-dimensional, planar, thicklessness "rafts." Finally they stacked these planar rafts one upon another to build a "solid" three-dimensional "cube," but having none of the essential characteristics of four-dimensional reality—i.e., having neither temperature, weight, nor longevity.

#### 100.10 Subdivision of Tetrahedral Unity

100.101 Synergetic Unity: Quantum mechanics commences with the totality of energy of physical Universe—energy intertransformable either as matter or as radiation. Quantum mechanics assumes conservation. Energy can be neither created nor lost. Cosmic energy is plural unity, always-and-only coexistent, complementarily complex unity, i.e., *synergetic unity*, consisting of an overlapping mix of infrequent big events and frequent little ones. Multiplication of energy events can be accomplished only by progressive subdividing of its cosmic unity.

100.102 The child-scientist's show opens with reiteration of rigorous science's one- and-only acceptable *proof*: experientially redemonstrable physical evidence. All of the scenario's proofs—and their rationally interrelated number values—derive exclusively from progressive equatorial-symmetry-halvings of Universe's minimum structural system: the tetrahedron. Multiplication occurs only through progressive fractionation of the original complex unity of the minimum structural system of Universe: the tetrahedron.



100.103 Rational numerical and geometrical values derive from (a) parallel and (b) perpendicular halving of the tetrahedron. (See Fig. 100.103.)

 (a) The parallel method of tetrahedral bisecting has three axes of spin—ergo, three equators of halving. Parallel equatorial halving is both statically and dynamically symmetric.

(b) The perpendicular method of tetrahedral bisecting has six axes of spin—ergo, six equators of halving. Perpendicular equatorial halving is only dynamically symmetric.

100.104 The three-way, symmetry-imposed, perpendicular bisecting of each of the tetrahedron's four triangular faces results in an inadvertent thirding. This halving and inadvertent thirding physically isolate the prime number three and its multiples and introduce the 24 A Quanta Modules. (See Sec. <u>911</u>, Fig. 913.01, and <u>Table 943</u>.)



100.1041 The initial halvings of the triangular facets inadvertently accomplish both thirdings and quintasectings. Halving a triangle by perpendicular bisectors finds three ways of doing so. (See Fig. 100.1041.)

100.1042 Great circles inherently halve unity. The six positive and six negative great circles spin around the 12 positive and 12 negative poles vertexially identified by the 12- great-circle and four-great-circle intersections of the vector equilibrium producing the pentagons from the quintasectings.

100.105 All the geometries in the cosmic hierarchy (see <u>Table 982.62</u>) emerge from the successive subdividing of the tetrahedron and its combined parts. After the initial halvings and inadvertent thirdings inherent in the bisecting of the triangles as altogether generated by all seven sets of the great circle equators of symmetrical-systems spin (Sec. <u>1040</u>), we witness the emergence of:

- \_ the A quanta modules
- \_ the octa
- \_ the "icebergs"
- \_ the Eighth-Octa
- \_ the cube
- the Quarter-Tetra



Fig. 100.103 *Parallel and Perpendicular Halving of Tetrahedron:* Compare <u>Figs. 527.08</u> and <u>987.230B</u>.



Fig. 100.1041 Three-way Bisecting of a Triangle.

- \_ the rhombic dodeca
- the B quanta modules
- \_ the icosahedron
- the T quanta modules
- \_ the octa-icosa, skewed-off "S" modules
- \_ the rhombic triacontahedron
- the E quanta modules
- \_ the Mites (quarks)
- \_ the Sytes
- \_ the Couplers



Fig. 100.120

100.120 **Icosa and Tetra:** The icosahedron concentric within, but flushly askew, in the four-frequency truncated tetrahedron completes the whole cosmic hierarchy as subdivisioning of the primitive unity of the tetrahedron—one quantum—the minimum structural system of Universe. Looked at perpendicularly to the middle of any of the tetrahedron's four truncated faces—as a line of sight—the icosahedron appears at the center of volume of the tetrahedron as a four-dimensional symmetrical structure. (See Fig. 100.120)

#### 100.20 Scenario of the Child

100.201 Our scenario, titled "Experimentally Certified Scientific Proofs," opens with a child standing outdoors, glancing all around, pausing to look more intently at an aggregate of generalized somethings, and finally focusing upon a special case something:

- o a point-to-ability
- o a surface of something
- a substance having "insideness and outsideness." The smallest thing we know of—the atom—has a withinness nucleus and one or more withoutness electrons.
- o a big something fastened to the Earth





Fig. 100.120 *Image of Icosa and Tetra:* Photograph of a truncated glass tetrahedron with frosted triangular facets producing an image of clustered tetrahedra that approximate an icosahedron. (See discussion at <u>Sec. 934.</u>)

o picture of the Matterhorn



o minimum of three faces around a corner



o child breaks off piece of something



o separate individual "things"



o child takes hammer and breaks rock



o nature breaks big rocks



• humans blast apart rock cliff with dynamite



o picture of rocks on Earth



o picture of rocks on Moon



o picture of rocks on Mars



o picture of big rocks broken into smaller rocks.



• picture of small rocks broken into sand



o picture of sandy beach



o picture of individual grains of sand



 minimum separable something has a minimum of four corners, each surrounded by a minimum of three faces; each face is surrounded at minimum by three edges. "Minimum somethings" consist altogether of a minimum of four corners, four faces, six edges, 12 angles, insideness, outsideness, concavity, convexity, and two poles of spinnability—a minimum total of 32 unique geometrical features (Sec. 1044)

- o picture of one tetrahedron
- picture of tetrahedron turning inside out in four different ways as each of four corner vertexes plunges through their respective four opposite triangular openings to produce four different positive and four different negative tetrahedra, for a total of eight different tetrahedra
- picture of four great circle planes of tetrahedron all going through a common center to produce both the zero volume tetrahedron and the vector equilibrium's eight tetrahedra with only nuclear-congruent vertexes
- o minimum of four cosmically different tetrahedra:
  - the tuned-in, at-presently-considered-complex system—a tetrahedral time-size somethingness
  - the infra-tuned-in micro-tetra-nothingness
  - the ultra-tuned-in macro-tetra-nothingness
  - the metaphysical, only primitively conceptual, timeless-sizeless tetra.

## 100.30 Omnirational Subdividing



100.301 Omniquadrilaterally interconnecting the mid-edge-points of any dissimilarly- edge-lengthed quadrilateral polygon always produces four *dissimilar* quadrangles. Omnitriangularly interconnecting the mid-edge-points of any dissimilarly-edge-lengthed triangle always produces four *similar* triangles. (See Fig. 990.01.) Whereas omniinterconnecting the mid-edge-points of a cube always subdivides the cube into eight similarly equiedged cubes, interconnecting the mid-edge-points of any dissimilarly-edge- lengthed quadrangular-faced hexahedra always subdivides the hexahedron into eight always dissimilar, quadrangular-faced hexahedra. (See Fig. 100.301.)



Fig. 100.301A-D Dissimilar Subdivision of Irregular Hexahedra

100.3011 Necklace: Here we observe the sequence of the child's necklace (<u>Sec.</u> <u>608</u>). The child starts with an enlargement of his mother's necklace consisting of a dozen half- inch-by- 12-inch aluminum tubes strung tightly together on dacron cords. The child drapes the necklace over his shoulders to assume various shapes. Then, removing one tube at a time, he finds that the necklace remains flexible . . . until all but the last three are removed and—as a triangle—it suddenly holds its shape. (Thus we arrive at the triangular definition of a structure.)

100.302 A triangle is a microaltitude tetrahedron with its apex almost congruent with one of its base triangle's vertexes. A right-angled triangle, an isosceles triangle, and a scalene triangle are all the same triangle. The seeming difference in edge lengths and angles is a consequence only of shifting the base-plane locus of the observer.

100.303 Most economically intertriangulating the midpoints of any regular equiedged or any dissimilarly edged tetrahedra will always subdivide that tetrahedron into four similar tetrahedra and one octahedron whose volume is always four times that of any of the four similar and equivolumed tetrahedra.

100.304 **Cheese Tetrahedron:** If we make all the symmetrical Platonic solids of firm cheese, and if we slice the cube parallel to one of its faces, the remaining hexahedron is no longer equiedge-lengthed. So too with all the other Platonic solids—the dodecahedron, the octahedron, or the icosahedron—with one, and only one, exception: the tetrahedron. The cheese tetrahedron may be sliced parallel to any one, or successively all four, of its faces without losing its basic symmetry; ergo, only the tetrahedron's four-dimensional coordination can accommodate asymmetric aberrations without in any way disrupting the symmetrical integrity of the system.

100.310 **Two Tetra into Cube:** The child wants to get inside things. What is the minimum something it can get inside of? The necklace tetrahedron strung together with long-tube-beads. A child tries the necklace cube, and it collapses. The child then takes the edge tubes of the collapsed cube and reassembles them as an octahedron—which holds its shape. The child also takes two sets of six tubes and makes two tetrahedra producing an omnitriangulated superficially induced cube with eight corners.

#### 100.320 Modular Subdivision of the Cosmic Hierarchy

100.321 Any four points in Universe are always most economically interrelated by an ever-transforming tetrahedron, the whole, low-order, rational volume of whose primitive, cosmic, equiwavelengthed-and-frequenced corresponding vector equilibrium, cube, octahedron, rhombic triacontahedron, and rhombic dodecahedron—stated in tetravolumes—are always 1, 2  $\frac{1}{2}$ , 2  $\frac{1}{2}$ , 3, 4, 5, 6 —which hierarchy of constituent geometrical structures remains eternally invariable. (See <u>Table 1033.192</u>.)

100.322 The omnirational subdivision of any regular or irregular tetrahedron by the systemic triangular interconnecting of the tetrahedron's similarly frequenced, modular subdivision points of its six edges, respectively, will always subdivide the tetrahedron into the same rationally volumed geometrical constituents constituting the *cosmic hierarchy* and its A and B Quanta Modules as well as its T, E, and S Modules.

100.323 Only the tetrahedron can accommodate the asymmetric aberrations of otherness without losing the integrity of its own four-dimensional symmetry and its subdivisible volumetric rationality. The asymmetric aberrations of otherness are essential to awareness, awareness being the minimum statement of the experience life. In the accommodation of asymmetric aberration the tetrahedron permits conceptual focus upon otherness, which is primitively essential to the experience of life, for it occasions life's initial awareness. (See Fig. 411.05.)

#### 100.330 "Me" Ball

100.331 Here we observe the child taking the "*me*" ball (Sec. 411) and running around in space. There is nothing else of which to be aware; ergo, he is as yet unborn. Suddenly one "*otherness*" ball appears. Life begins. The two balls are mass-interattracted; they roll around on each other. A third ball appears and is mass-attracted; it rolls into the valley of the first two to form a triangle in which the three balls may involve-evolute. A fourth ball appears and is also mass-attracted; it rolls into the "nest" of the triangular group. . . and this stops all motion as the four balls become a self-stabilized system: the tetrahedron. (See<u>Fig.</u> 411.05.)

#### 100.40 Finite Event Scenario

100.401 Events are changes of interrelationships.

100.402 Events are changes of interrelationships between a plurality of systems or between constituents of any one system. Events are changes of interrelationships, between any one of the separate "thing" system's constituent characteristics—a minimum thing has separable parts. A thing is always special case. Special cases always have time-frequency relative sizing; whereas the minimum system—the tetrahedron—is generalized, prefrequency, timeless, yet conceptual, ergo, does not have separable parts—but being primitive and timeless does have primitive fractionability into structurally conceptual, timeless, omnirationally accountable, symmetrical, differential polyhedra of the cosmic hierarchy.

100.403 The cosmic hierarchy is comprised of the tetrahedron's inherent, intertransformable interrelationships—four active, four passive—all of which occur within the six primitive, potential, omnidirectional vectorial moves found in each primitive system`s (timeless) event potential.

## 100.41 Foldability of Triangles into Tetrahedra

100.411 Every triangle is always a projected tetrahedron. Any triangle having no angle greater than 90 degrees can be folded into a tetrahedron. No squares or quadrangles may be folded into a hexahedron.



100.412~ The scalene right triangle is a limit case that folds into an almost-flat tetrahedron. (See Fig. 100.412. )

Fig. 100.413

100.413 The equiangular triangle folds into a regular tetrahedron consisting of four similar, equivolume, regular tetrahedra. Their total volume equals the volume of the central octahedron (inadvertently described). (See Fig. 100.413.)



Fig. 100.412

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Fig. 100.413

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Fig. 100.414

Fig. 100.415

100.414 The isosceles triangle, with all angles less than 90 degrees, folds into an irregular tetrahedron consisting of four similar irregular tetrahedra. Their total volume equals the volume of the central irregular octahedron (inadvertently described). (See Fig. 100.414.)

100.415 **Unfoldable Limit:** The scalene triangle, having one angle greater than 90 degrees, will not fold into a tetrahedron, but it consists of 16 similar triangles. (See Fig. 100.415.)



100.416 The triangle folded into a tetrahedron inadvertently describes the four exposed faces of the tetrahedron's internal octahedron. (See Figs; 100.416A-D.)

## 100.50 Constant Triangular Symmetry



100.51 Dr. Frank Morley, a professor of mathematics at Johns Hopkins University, was the author of a theorem on triangular symmetry: The three interior intersection points of the trisectors of any triangle's three angles will always describe an equiangular triangle. It may be demonstrated graphically as in Fig. 100.51. This theorem is akin to the tetrahedral coordinate system of synergetics (Sec. 420), which describes how the superficial dissimilarities and aberrations of the tetrahedron in no way alter any of its constant symmetries of omnirational subdivisioning .

#### 100.60 Finite Episoding

100.61 Nonunitarily conceptual but finite Scenario Universe's only separate, differently enduring, and only overlappingly occurring, conceptual episodes, their scenery, costumes, and character parts—all being special case and temporal—are each and all demonstrably separable—ergo, finite—and only altogether coordinate, to provide the ever-aggregating *finiteness* of Scenario Universe's complex, nonsimultaneous—ergo, nonunitarily conceptual—episodes.



Fig. 100.414

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Fig. 100.415



Fig. 100.416

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Fig. 100.51 Morley Theorem: The trisectors of any triangle's three angles describe an equiangular triangle.

100.62 This moment in the evolutionary advance and psychological transformation of humanity has been held back by non-physically-demonstrable—ergo non- sensorial—conceptionless mathematical devices and by the resultant human incomprehensibility of the findings of science. There are two most prominent reasons for this incomprehensibility: The first is the non-physically demonstrable mathematical tools. The second is our preoccupation with the sense of static, fixed "space" as so much unoccupied geometry imposed by square, cubic, perpendicular, and parallel attempts at coordination, *rather than* regarding "space" as being merely systemic angle-and-frequency information that is presently non-tuned-in within the physical, sensorial range of tunability of the electromagnetic sensing equipment with which we personally have been organically endowed.

100.63 The somethingness here and the nothingness there of statically interarrayed "space" conceptioning is vacated as we realize that the infratunable is subvisible high- frequency eventing, which we speak of as *matter*, while the ultratunable is radiation, which we speak of as *space*. The tunable is special case, sensorially apprehensible episoding.

Next Section: 101.00

101.01 Synergy means behavior of whole systems unpredicted by the behavior of their parts taken separately.

102.00 Synergy means behavior of integral, aggregate, whole systems unpredicted by behaviors of any of their components or subassemblies of their components taken separately from the whole.

103.00 A stone by itself does not predict its mass interattraction for and by another stone. There is nothing in the separate behavior or in the dimensional or chemical characteristics of any one single metallic or nonmetallic massive entity which by itself suggests that it will not only attract but also be attracted by another neighboring massive entity. The behavior of these two together is unpredicted by either one by itself. There is nothing that a single massive sphere will or can ever do by itself that says it will both exert and yield attractively with a neighboring massive sphere and that it yields progressively: every time the distance between the two is halved, the attraction will be fourfolded. This unpredicted, only mutual behavior is synergy. Synergy is the only word in any language having this meaning.

104.00 The phenomenon synergy is one of the family of generalized principles that only co-operates amongst the myriad of special-case experiences. Mind alone discerns the complex behavioral relationships to be cooperative between, and not consisting in any one of, the myriad of brain-identified special-case experiences.

105.00 The words synergy (*syn*-ergy) and energy (*en*-ergy) are companions. Energy studies are familiar. Energy relates to differentiating out subfunctions of nature, studying objects isolated out of the whole complex of Universe—for instance, studying soil minerals without consideration of hydraulics or of plant genetics. But synergy represents the integrated behaviors instead of all the differentiated behaviors of nature's galaxy systems and galaxy of galaxies.

106.00 Chemists discovered that they had to recognize synergy because they found that every time they tried to isolate one element out of a complex or to separate atoms out, or molecules out, of compounds, the isolated parts and their separate behaviors never explained the associated behaviors at all. It always failed to do so. They had to deal with the wholes in order to be able to discover the group proclivities as well as integral characteristics of parts. The chemists found the Universe already in complex association and working very well. Every time they tried to take it apart or separate it out, the separate parts were physically divested of their associative potentials, so the chemists had to recognize that there were associated behaviors of wholes unpredicted by parts; they found there was an old word for it—synergy.

107.00 Because synergy alone explains the eternally regenerative integrity of Universe, because synergy is the only word having its unique meaning, and because decades of querying university audiences around the world have disclosed only a small percentage familiar with the word *synergy*, we may conclude that society does not understand nature.

#### 108.00 Four Triangles Out of Two



108.01 Two triangles can and frequently do associate with one another, and in so doing they afford us with a synergetic demonstration of two prime events cooperating in Universe. Triangles cannot be structured in planes. They are always positive or negative helixes. You may say that we had no right to break the triangles open in order to add them together, but the triangles were in fact never closed because no line can ever come completely back into itself. Experiment shows that two lines cannot be constructed through the same point at the same time (see Sec. 517, "Interference"). One line will be superimposed on the other. Therefore, the triangle is a spiral—a very flat spiral, but open at the recycling point.



Fig. 108.01 *Triangle and Tetrahedron: Synergy* (1 + 1 = 4): Two triangles may be combined in such a manner as to create the tetrahedron, a figure volumetrically embraced by four triangles. Therefore one plus one seemingly equals four.



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108.02 By conventional arithmetic, one triangle plus one triangle equals two triangles. But in association as left helix and right helix, they form a sixedged tetrahedron of *four* triangular faces. This illustrates an interference of two events impinging at both ends of their actions to give us something very fundamental: a tetrahedron, a system, a division of Universe into inside and outside. We get the two other triangles from the rest of the Universe because we are not out of this world. This is the complementation of the Universe that shows up time and again in the way structures are made and in the way crystals grow. As separate actions, the two actions and resultants were very unstable, but when associated as positive and negative helixes, they complement one another as a stable structure. (See <u>Sec.</u> 933.03.)

108.03 Our two triangles now add up as *one plus one equals four*. The two events make the tetrahedron the four-triangular-sided polyhedron. This is not a trick; this is the way atoms themselves behave. This is a demonstration of synergy. Just as the chemists found when they separated atoms out, or molecules out, of compounds, that the separate parts never explained the associated behaviors; there seemed to be "lost" energies. The lost energies were the lost synergetic interstabilizations.

#### 109.00 Chrome-Nickel-Steel

109.01 Synergy alone explains metals increasing their strengths. All alloys are synergetic. Chrome-nickel-steel has an extraordinary total behavior. In fact, it is the high cohesive strength and structural stability of chrome-nickel-steel at enormous temperatures that has made possible the jet engine. The principle of the jet was invented by the squid and the jellyfish long ago. What made possible man's use of the jet principle was his ability to concentrate enough energy and to release it suddenly enough to give him tremendous thrust. The kinds of heat that accompany the amount of energies necessary for a jet to fly would have melted all the engines of yesterday. Not until you had chrome-nickel-steel was it possible to make a successful jet engine, stable at the heats involved. The jet engine has changed the whole relationship of man to the Earth. And it is a change in the behavior of the whole of man and in the behavior of whole economics, brought about by synergy.

109.02 In chrome-nickel-steel, the primary constituents are iron, chromium, and nickel. There are minor constituents of carbon, manganese, and others. It is a very popular way of thinking to say that a chain is no stronger than its weakest link. That seems to be very logical to us. Therefore, we feel that we can predict things in terms of certain minor constituents of wholes. That is the way much of our thinking goes. If I were to say that a chain is as strong as the sum of the strengths of its links, you would say that is silly. If I were to say that a chain is stronger than the sum of the strengths of all of its links, you might say that that is preposterous. Yet that is exactly what happens with chrome-nickel- steel. If our regular logic held true, then the iron as the weakest part ought to adulterate the whole: since it is the weakest link, the whole thing will break apart when the weakest link breaks down. So we put down the tensile strength of the commercially available iron—the highest that we can possibly accredit is about 60,000 pounds per square inch (p.s.i.); of the chromium it is about 70,000 p.s.i.; of the nickel it is about 80,000 p.s.i. The tensile strengths of the carbon and the other minor constituents come to another 50,000 p.s.i. Adding up all the strengths of all the links we get 260,000 p.s.i. But in fact the tensile strength of chrome-nickel-steel runs to about 350,000 p.s.i. just as a casting. Here we have the behavior of the whole completely unpredicted by the behavior of the parts.

109.03 The augmented coherence of the chrome-nickel-steel alloy is accounted for only by the whole complex of omnidirectional, intermass-attractions of the crowded- together atoms. The alloy chrome-nickel-steel provides unprecedented structural stability at super-high temperatures, making possible the jet engine one of the reasons why the relative size of our planet Earth, as comprehended by humans, has shrunk so swiftly. The performance of the alloy demonstrates that the strength of a chain is greater than the sum of the strengths of its separate links. Chrome-nickel-steel's weakest part does not adulterate the whole, allowing it to be "dissolved" as does candy when the sugar dissolves. Chains in metal do not occur as open-ended lines. In the atoms, the ends of the chains come around and fasten the ends together, endlessly, in circular actions. Because atomic circular chains are dynamic, if one link breaks, the other mends itself. 109.04 When we break one link of a circular chain continuity, it is still one piece of chain. And because atomic circular chains are dynamic, while one link is breaking, the other is mending itself. Our metal chains, like chrome-nickel-steel alloys, are also interweaving spherically in a number of directions. We find the associated behaviors of various atoms complementing each other, so that we are not just talking about *one thing* and another *one thing*, but about a structural arrangement of the atoms in tetrahedral configurations .



110.00 We take one tetrahedron and associate it with another tetrahedron. Each of the two tetrahedra has four faces, four vertexes, and six edges. We interlock the two tetrahedra, as illustrated, so that they have a common center of gravity and their two sets of four vertexes each provide eight vertexes for the corners of a cube. They are interpositioned so that the vertexes are evenly spaced from each other in a symmetrical arrangement as a structurally stable cube .

111.00 Each of those vertexes was an energy star. Instead of two separate tetrahedra of four stars and four stars we now have eight stars symmetrically equidistant from the same center. All the stars are nearer to each other. There are eight stars in the heavens instead of four. Not only that, but each star now has three stars nearer to it than the old stars used to be. The stars therefore interattract one another gravitationally in terms of the second power of their relative proximity—in accordance with Newton's law of gravity. As the masses are getting closer to each other, synergy is increasing their power of interattraction very rapidly.

112.00 The distance between the stars is now in terms of the leg instead of the hypotenuse. The second power of the hypotenuse is equal to the sums of the second powers of the legs, so we suddenly discover how very much more of an attraction there is between each star to make each one more cohesive in the second power augmentation. There was no such augmentation predicted by the first power addition. Thus, it is no surprise to discover that the close interassociation of the energy stars gives us a fourfolding of the tensile strength of our strongest component of the alloy chrome-nickel- steel of 350,000 p.s.i. in relation to nickel's 80,000 p.s.i. Gravity explains why these metals, when in proper association, develop such extraordinary coherence, for we are not really dealing in a mystery—outside of the fact that we are dealing in the mystery of how there happened to be gravity and how there happened to be Universe. How there happened to be Universe is certainly a great mystery—there is no question about



Fig. 110A



Fig. 110B

that—but we are not dealing with any miracle here outside of the fact that Universe is a miracle.

113.00 When we take two triangles and add one to the other to make the tetrahedron, we find that one plus one equals four. This is not just a geometrical trick; it is really the same principle that chemistry is using inasmuch as the tetrahedra represent the way that atoms cohere. Thus we discover synergy to be operative in a very important way in chemistry and in all the composition of the Universe. Universe as a whole is behaving in a way that is completely unpredicted by the behavior of any of its parts. Synergy reveals a grand strategy of dealing with the whole instead of the tactics of our conventional educational system, which starts with parts and elements, adding them together locally without really understanding the whole.

114.00 It is a corollary of synergy (see <u>Sec. 140.00</u>) that once you start dealing with the known behavior of the whole and the known behavior of some of the parts, you will quite possibly be able to discover the unknown parts. This strategy has been used—in rare breakthroughs—very successfully by man. An example of this occurred when the Greeks developed the law of the triangle: the sum of the angles is always 180 degrees, and there are six parts (three edges and three vertexes—forming three angles); thus the known behavior of the whole and the known behavior of two of the parts may give you a clue to the behavior of the other part.

115.00 Newton's concept of gravity also gave him the behavior of the whole. Other astronomers said that if he were right, they should be able to explain the way the solar system is working. But when they took the masses of the known planets and tried to explain the solar system, it didn't work out. They said you need two more planets, but we don't have them. There are either two planets we cannot see or Newton is wrong. If he was right, someday an astronomer with a powerful telescope would be able to see sufficient distance to pick up two more planets of such and such a size. In due course, they were found. The known behavior of the whole explained in terms of gravity and the known behavior of some of the parts permitted the prediction of the behavior of some of the other—at that time unknown—parts. 116.00 Physicists had predicated their grand strategies upon the experience of trying to make something like a perpetual motion machine. They found that all local machines always had friction, therefore energies were always going out of the system. They call that entropy: local systems were always losing energy to the rest of the Universe. When the physicists began to look at their total experience instead of at just one of their experiences, they found that while the energy may escape from one system, it does not go out of the Universe. It could only disassociate in one place by associating in another place. They found that this was experimentally true, and finally, by the mid-19th century, they dared to develop what they called the Law of Conservation of Energy, which said that no energy could be created and no energy could be lost. Energy is finite. Physical Universe is finite. Physical Universe is just as finite as the triangle of 180 degrees.

117.00 Dealing with a finite whole in terms of our total experience has taught us that there are different kinds of frequencies and different rates of reoccurrence of events. Some events reoccur very rapidly. Some are large events, and some small events. In a finite Universe of energy, there is only so much energy to expend. If we expend it all in two big booms, they are going to be quite far apart:

boom

Given the same finite amount of time, we could alternatively have a great many very small booms fairly close together:

boom boom boom boom

boom

In others words, we can take the same amount of copper and make a propeller with just two blades, with three smaller blades, or with four much smaller blades. That is, we can with the same amount of copper invest the whole in higher frequency and get smaller wavelength. This is the quantum in wave mechanics; it is a most powerful tool that men have used to explore the nucleus of the atom, always assuming that 100 percent of the behaviors must be accounted for. We are always dealing with 100 percent finite. Experiment after experiment has shown that if there was something like .000172 left over that you could not account for, you cannot just dismiss it as an error in accounting. There must be some little energy rascal in there that weighs .000172. They finally gave it a name, the "whatson." And then eventually they set about some way to trap it in order to observe it. It is dealing with the whole that makes it possible to discover the parts. That is the whole strategy of nuclear physics.

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120.01 Synergy is disclosed by the interattraction for one another of two or more separate objects. But any two masses will demonstrate that halving the distance between them will fourfold their attraction for each other. (Which is the way Newton might have said it, but did not.) He discovered the mathematical gain in attraction, but he stated it "inversely," which is awkward and nonspontaneously illuminating. The inverseness led him to speak in terms of progressive diminution of the attraction: as the distance away was multiplied by two, the attraction diminished by four; ergo, he could speak of it as "squared." The attraction of one mass for the other increases as the second power of the rate of increase of their proximity to one another: halve the distance and the interaction is fourfolded.

121.00 Our senses are easily deceived because mass interattraction is not explained and cannot be predicted by any characteristic of any one massive body considered alone. Local observation of mass attraction is also obscured by the overwhelming presence of Earth's gravity. For instance, two 12-inch-in-diameter spheres of so dense a material as ivory do not appear to attract each other until they are only about a paper-thin distance apart. The thickness of a paper match superimposed on a 12-inch globe represents the point at which a rocket precesses into orbit, going from its 180-degree tendency to fall into its 90-degree orbital independence as an astronomical entity. This is the critical- behavior point at which it becomes an independent entity in Universe, a satellite. Small Earth satellites orbit at an altitude of only about 100 miles, which is only about 1/80th of the diameter of the Earth. This critical proximity event of transition from 180degree to 90-degree independence is called precession. Mass attraction is also involved in precession, another member of the family of generalized principles. But scientists still have not the slightest idea why mass attraction occurs; they only know that it does. They do not know why. This requires admission of an utter a priori mystery within which the masses demonstrate their utterly mysterious attraction for one another. It appears that no single part of the Universe can predict the behavior of the whole. As we attain greater experience and opportunity to observe the synergetic effects of Universe, there is always a greater discernment of generalized principles. The discovery of a plurality of generalized principles permits the discovery of the synergetic effect of their complex interactions.



130.01 Critical proximity occurs where there is angular transition from "falling back in" at 180-degree to 90-degree orbiting—which is precession. (Gravity may be described as "falling back in" at 180 degrees.) The quantity of energy that ceased to "fall in" is the system's entropy. Critical proximity is when it starts either "falling in" or going into orbit, which is the point where either entropy or antientropy begins.

131.00 An aggregate of "falling ins" is a body. What we call an object or an entity is always an aggregate of interattracted entities; it is never a solid. And the critical proximity transition from being an aggregate entity to being a plurality of separate entities is precession, which is a "peeling off" into orbit rather than falling back in to the original entity aggregate. This explains entropy intimately. It also explains intimately the apparent energy losses in chemical transformations, associations, disassociations and high-order element disintegration into a plurality of lower-order elements—and nothing is lost. Entity has become invisible. The switch is precessional.

132.00 The unprotected far side of the Moon has more craters of the "fallen-in" asteroids. Ergo, the far side weighs more than the near side, which is shielded by the Earth. The additional far-side weight of the Moon acts centrifugally to keep the weighted side always away from the Earth around which it orbits. Ergo, there is always one side, the same side, facing us. The Moon is always oriented toward us, like a ship that has its masts pointed inwardly toward us and its weighted keel away from us. This explains why the first photographs showed a greater number of craters on the far side of the Moon. The Earth acts as a shield. On Earth, the craters are not so concentrated because the Earth gets its cosmic fallout quite evenly. Earth's weight and massive pull are progressively increased to offset the Moon's farside weight increase and tendency otherwise to forsake Earth.

133.00 "Solids" are simply the fraternities of the "fallen-into-one-anothers."

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141.00 There is a corollary of synergy known as the Principle of the Whole System, which states that the known behaviors of the whole plus the known behaviors of some of the parts may make possible discovery of the presence of other parts and their behaviors, kinetics, structures, and relative dimensionalities.

142.00 The known sum of the angles of a triangle plus the known characteristics of three of its six parts (two sides and an included angle or two angles and an included side) make possible evaluating the others. Euler's topology provides for the synergetic evaluation of any visual system of experiences, metaphysical or physical, and Willard Gibbs' phase rule provides synergetic evaluation of any tactile system.

143.00 The systematic accounting of the behavior of whole aggregates may disclose discretely predictable angle-and-frequency magnitudes required of some unknown components in respect to certain known component behaviors of the total and known synergetic aggregate. Thus the definitive identifications permitted by the Principle of the Whole System may implement conscious synergetic definition strategies with incisive prediction effectiveness.

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150.01 There are progressive degrees of synergy, called synergy-of-synergies, which are complexes of behavior aggregates holistically unpredicted by the separate behaviors of any of their subcomplex components. Any subcomplex aggregate is only a component aggregation of an even greater event aggregation whose comprehensive behaviors are never predicted by the component aggregates alone. There is a synergetic progression in Universe—a hierarchy of total complex behaviors entirely unpredicted by their successive subcomplexes' behaviors. It is manifest that Universe is the maximum synergy-of- synergies, being utterly unpredicted by any of its parts.

151.00 It is readily understandable why humans, born utterly helpless, utterly ignorant, have been prone to cope in an elementary way with successive experiences or "parts." They are so overwhelmed by the synergetic mystery of the whole as to have eschewed educational strategies commencing with Universe and the identification of the separate experiences within the cosmic totality.

152.00 Synergetics is the exploratory strategy of starting with the whole and the known behavior of some of its parts and the progressive discovery of the integral unknowns and their progressive comprehension of the hierarchy of generalized principles.

153.00 Universe apparently is omnisynergetic. No single part of experience will ever be able to explain the behavior of the whole. The more experience one has, the more opportunity there is to discover the synergetic effects, such as to be able to discern a generalized principle, for instance. Then discovery of a plurality of generalized principles permits the discovery of the synergetic effects of their complex interactions. The synergetic metaphysical effect produced by the interaction of the known family of generalized principles is probably what is spoken of as wisdom.

Next Section: 160.00

161.00 Science has been cogently defined by others as the attempt to set in order the facts of experience. When science discovers order subjectively, it is pure science. When the order discovered by science is objectively employed, it is called applied science. The facts of experience are always special cases. The order sought for and sometimes found by science is always eternally generalized; that is, it holds true in every special case. The scientific generalizations are always mathematically statable as equations with one term on one side of the equation and a plurality of at least two terms on the other side of the equation.

162.00 There are eternal generalizations that embrace a plurality of generalizations. The most comprehensive generalization would be that which has U = MP, standing for an eternally regenerative Universe of M times P, where M stands for the metaphysical and P stands for the physical. We could then have a subgeneralization where the physical  $P = E^r \cdot E^m$ , where  $E^r$  stands for energy as radiation and  $E^m$  stands for energy as matter. There are thus orders of generalization in which the lower orders are progressively embraced by the higher orders. There are several hundred first-order generalizations already discovered and equatingly formalized by scientist-artists. There are very few of the higher order generalizations must be inherently eternal. Though special-case experiences exemplify employment of eternal principles, those special cases are all inherently terminal; that is, in temporary employment of the principles.

163.00 No generalized principles have ever been discovered that contradict other generalized principles. All the generalized principles are interaccommodative. Some of them are synchronously interaccommodative; that is, some of them accommodate the other by synchronized nonsimultaneity. Many of them are interaccommodative simultaneously. Some interact at mathematically exponential rates of interaugmentation. Because the physical is time, the relative endurances of all special-case physical experiences are proportional to the synchronous periodicity of associability of the complex principles involved. Metaphysical generalizations are timeless, i.e., eternal. Because the metaphysical is abstract, weightless, sizeless, and eternal, metaphysical experiences have no endurance limits and are eternally compatible with all other metaphysical experiences. What is a *metaphysical experience?* It is comprehending the relationships of eternal

principles. The means of communication is physical. That which is communicated, i.e., understood, is metaphysical. The symbols with which mathematics is communicatingly described are physical. A mathematical principle is metaphysical and independent of whether X,Y or A,B are symbolically employed.

164.00 The discovery by human mind, i.e., intellect, of eternally generalized principles that are only intellectually comprehendable and only intuitively apprehended—and only intellectually comprehended principles being further discovered to be interaccommodative—altogether discloses what can only be complexedly defined as a design, design being a complex of interaccommodation and of orderly interaccommodation whose omni-integrity of interaccommodation order can only be itself described as intellectually immaculate. Human mind (intellect) has experimentally demonstrated at least limited access to the eternal design intellectually governing eternally regenerative Universe .

165.00 *Generalized design-science exploration* is concerned with discovery and use by human mind of complex aggregates of generalized principles in specific-longevity, special-case innovations designed to induce humanity's consciously competent participation in local evolutionary transformation events invoking the conscious comprehension by ever-increasing proportions of humanity of the cosmically unique functioning of humans in the generalized design scheme of Universe. This conscious comprehension must in turn realize ever-improving implementations of the unique human functioning as well as an ever-increasingly effective concern for the relevant ecological intercomplementation involved in local Universe support of humanity's functioning as subjective discoverer of local order and thereafter as objective design-science inventor of local Universe solutions of otherwise unsolvable problems, design-science solutions of which will provide special-case, local-Universe supports of eternally regenerative generalized Universe.

166.00 The prime eternal laws governing design science as thus far accrued to that of the cosmic law of generalized design-science exploration are realizability and relative magnitude of reproducibility, which might be called the law of regenerative design: the relative physical time magnitude of reproducibility is proportional to the order of magnitude of cosmic function generalizability. Because the higher the order of synergetic function generalization, the more embracing and simple its statement; only the highest orders can embracingly satisfy the plurality of low-order interaccommodation conditions. 167.00 There are several corollaries to the prime law of regenerative design durability and amplitude of reproducibility. *Corollary A:* The simpler, the more enduringly reproducible. *Corollary B:* The special-case realizations of a given design complex correlate as the more symmetrical, the more reproducible. *Corollary C:* There being limit cases of optimum symmetry and simplicity, there are simplicities of conceptual realization. The most enduringly reproducible design entities of Universe are those occurring at the min-max limits of simplicity and symmetry.

168.00 *Corollary D:* There being unique minimum-maximum system limits governing the transformation of conceptual entities in Universe, which differentiate the conceptually unique entities of Universe into those conceptions occurring exclusively outside the system considered and all of the Universe inside of the conceptual entity, together with the structural pattern integrity system separating the inside from the outside, there being a limited minimum set of structural and operating principles eternally producing and reproducing recognizable pattern integrity. And there are likewise a minimum set of principles that interact to transform already orderly patterns into other structured patterns, and there being minimum constituent patterns that involve the complex intertransformings and structural formings of symmetrical orders and various magnitudes of asymmetrical deviations tolerated by the principles complexedly involved. There are scientifically discoverable nuclear aggregates of primary design integrity as well as complex symmetrical reassociabilities of the nuclear primary integrities and deliberately employable relationships of nuclear simplexes which designedly impose asymmetrical-symmetrical pulsative periodicities.

169.00 *Corollary E:* The more symmetrical and simple and nuclear, the more frequently employable; ergo, the more frequently occurring in eternally regenerative Universe's transformative problem solutions.

170.00 *Corollary F:* The smaller and simpler, more symmetrical, frequently occurring in Universe and the larger and more complex, less frequently originally occurring and periodically reoccurring: for example, the hydrogen minimum limit simplex constituting not only nine-tenths of physical Universe but most frequently and most omnipresent in Universe; with asymmetrical battleships (fortunately) least frequently and compatibly recurrent throughout the as yet known cosmos, being found only on one minor planet in one typical galaxy of one hundred billion stars amongst an already-discovered billion galaxies, there having been only a few score of such man-made battleships recurrent in the split-second history of humans on infinitesimally minor Earth.

171.00 All the fundamental nuclear simplexes of the 92 inherently selfregenerative physical Universe elements are a priori to human mind formulation and invention and are only discoverable by mind's intuitive initiatives. Many myriads of complex associability of chemical compounding of the nuclear simplexes can be experimentally discovered, or, after comprehending the order of the principles involved, deliberately invented by human mind. The chemical compounds are temporary and have limited associabilities. Human minds can then invent, by deliberate design, momentarily appropriate complex associative events—as, for instance, hydraulics, crystallines, and plasmics, in turn involving mechanics of a complex nature and longevity. Omniautomated self parts replacing sensingly fedback industrial complexes can be comprehensively designed by human mind, the mass reproducibility and service longevity of which will always be fundamental to the design laws, both primary and corollary.

172.00 Biological designs a priori to human alteration contriving are directly reproducible in frequency design magnitude. Blades of grass are reproduced on planet Earth in vast quantities due to the universal adequacy of Sun and other star photosynthetic impoundment. Daisies, peanuts, glowworms, etc. are reproduced in direct complement to their design complexity, which involves biological and eternal environmental interplay of chemical element simplexes and compounds under a complex of energy, heat, and pressure conditions critical to the complex of chemical associating and disassociating involved. Humans have thus far evolved the industrial complex designing which is only of kindergarten magnitude compared to the complexity of the biological success of our planet Earth. In its complexities of design integrity, the Universe is technology.

173.00 The technology evolved by man is thus far amateurish compared to the elegance of nonhumanly contrived regeneration. Man does not spontaneously recognize technology other than his own, so he speaks of the rest as something he ignorantly calls nature. Much of man's technology is of meager endurance, being comprised at the outset of destructive invention such as that of weaponry, or for something in support of the quick-profit, man-invented game of selfishly manipulative game-playing and rule-inventing for the playing of his only-ignorantly-preoccupying value systems.

174.00 The greatest and most enduring discoveries and inventions of humans on our planet are those of the scientist-artists, the name joined, or artist, or scientist. The name of artist or scientist, though often self-professed, can only be accredited to an individual by others who in retrospect discover the enduring quality of the symmetries with which the individual converted his conceptioning to the advantage of others, and realizations of increasing interadvantage in respect to survival—the gradual discovery of the function in Universe which humanity has been designed to fulfill.

Next Section: 180.00

181.00 Humans are often spoken of as behaving like animals. Vast experimental study of animal reflexes and proclivities has disclosed reliable benign behaviors to be predictable when the creatures' vital necessities are both habitually and readily available well within critical limits of safe, healthy input periodicities of the chromosomically and DNA-RNA programmed optimum metabolic processing of the subject species creatures.

182.00 Such scientifically conducted zoological behavior studies use the words *reward* and *punishment*. By the word *reward* they do not refer to a gold medal. And their word *punishment* does not refer to whipping. The animal behavior scientist's word *reward* means that the creature is acquiring the vital life-support chemistries of air, food, and water well within the critical metabolic timing tolerance. Punishment, to these scientists, means that the creature's subconsciously generated hunger, thirst, and respiratory instincts are not met within comfortably tolerable time limits, whereafter the creature panics. Its original subconscious, spontaneous, innate trust that its environment will always provide what it wants and needs exactly when it is needed having been violated, the creature panics, and forever after its behavior pattern is unpredictable.

183.00 It is clear that with the pushing of the panic button a secondary act of subconscious behavior controls has been activated. It is one of the self-disciplined responsibilities of comprehensive, anticipatory design science always to include fail-safe , automatically switched-in, alternate circuitry for mechanical functioning whenever a prime-function facility is found wanting. When a series of failures has blown out all the alternate circuits' fuses, then a sense of lethal frustration sets in that is identified as panic. Once panicked, the individuals—creatures or humans—tend to trust nothing, and their behavior then becomes utterly unpredictable. They become spontaneously suspicious of their environment in general and prone to be spontaneously hostile and aggressive.

184.00 When they are aggressive—or even worse, when they panic—both humans and animals demonstrate a subconscious drive only for self-survival. For instance, when a great theater fire disaster occurs and the flames quickly exhaust all the oxygen, people suffocate within two minutes. When the fire is over and many of the human dead are found inside unscorched, their deaths having been caused by suffocation, we discover that the otherwise loving fathers lost personal consciousness and stampeded over their own children and crushed them to death—the children for whom the conscious fathers would gladly have given their lives a hundred times over.

185.00 This frustratedly insecure or panicked animal survival drive is not a primary human behavior; it is only a secondary, subordinate, "fail-safe" behavior that occurs only when the very broad limits of physical tolerance are exceeded. When supplies are available, humans daily consume about two dry pounds of food as well as five pounds of water and seven pounds of oxygen, which their blood extracts from the 50 pounds of atmosphere that they inhale every day. Humans can go 30 days without food, seven days without water, but only two minutes without air. With 30 days' tolerance, humans have plenty of time to decide how to cope with vital food problems; with a week's waterless tolerance, they have to think and act with some expedition; with only one-and-a-half minutes' oxygenless tolerance, they rarely have time to think and cope successfully. Because the substances that humans require the least can be gone without for 30 days, nature has for millions of years used humans' hunger and the fertility potentials to force them to learn by trial and error how most competently to solve problems. But because the absence for more than a minute or so of oxygen (the substance humans use the most) could not be tolerated, nature provided the air everywhere around the world-in effect, "socialized" it.

186.00 As long as the 30-day, seven-day, two-minute tolerances, respectively, for lack of food, water, and air are not exceeded, humans' minds tend to remain in ascendance over their brain-reflexive sensing, and people are considerate of their fellow humans. When the human is stressed beyond these tolerable limits, the preconditioned-reflexing brain function takes over from the thoughtful, loving, orderly reasoning of mind. Then the secondary utterly thoughtless behavior occurs.

187.00 It is at least scientifically plausible, and possibly even scientifically validated, to say that not only all humans but all creatures are designed to behave spontaneously in a benign manner and that all creatures have toleration limits within which they continue to function with subconsciously spontaneous amiability, but that many have been stressed and distressed beyond those limits early in their lives and consequently have developed aggressive, belligerent, or outright mad proclivities. This is not to say that this switch by both creatures and humans from dominance by their primary proclivities to dominance by their secondary proclivities is an irreparable condition of life on Earth. Though Humans as yet know little about complete repair of their innate propensities, there are promising signs that such cures are not beyond attainment by the human mind.

Next Chapter: 200 Synergetics