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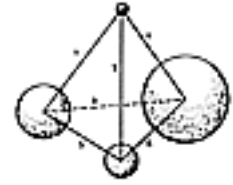
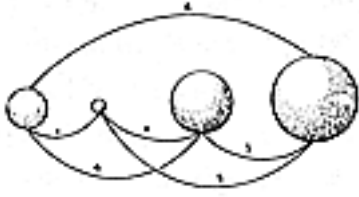
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200.00 SYNERGETICS

200.001 **Definition: Synergetics**

200.01 Synergetics promulgates a system of mensuration employing 60-degree vectorial coordination comprehensive to both physics and chemistry, and to both arithmetic and geometry, in rational whole numbers.

200.02 Synergetics originates in the assumption that dimension must be physical; that conceptuality is metaphysical and independent of size; and that a triangle is a triangle independent of size.

200.03 Since physical Universe is entirely energetic, all dimension must be energetic. Synergetics is energetic geometry since it identifies energy with number. Energetic geometry employs 60-degree coordination because that is nature's way to closest-pack spheres.

200.04 Synergetics provides geometrical conceptuality in respect to energy quanta. In synergetics, the energy as mass is constant, and nonlimit frequency is variable.

200.05 Vectors and tensors constitute all elementary definition.

200.06 Synergetics shows how we may measure our experiences geometrically and topologically and how we may employ geometry and topology to coordinate all information regarding our experiences, both metaphysical and physical. Information can be either conceptually metaphysical or quantitatively special case physical experiencing, or it can be both. The quantized physical case is entropic, while the metaphysical generalized conceptioning induced by the generalized content of the information is syntropic. The resulting mind-appreciated syntropy evolves to anticipatorily terminate the entropically accelerated disorder.

201.00 **Experientially Founded Mathematics**

201.01 The mathematics involved in synergetics consists of topology combined with vectorial geometry. Synergetics derives from experientially invoked mathematics. Experientially invoked mathematics shows how we may measure and coordinate omnirationally, energetically, arithmetically, geometrically, chemically, volumetrically, crystallographically, vectorially, topologically, and energy-quantum-wise in terms of the tetrahedron.

201.02 Since the measurement of light's relative swiftness, which is far from instantaneous, the classical concepts of instant Universe and the mathematicians' instant lines have become both inadequate and invalid for inclusion in synergetics.

201.03 Synergetics makes possible a rational, whole-number, low-integer quantation of all the important geometries of experience because the tetrahedron, the octahedron, the rhombic dodecahedron, the cube, and the vector equilibrium embrace and comprise all the lattices of all the atoms.

201.10 **Accommodation of Proclivities, Phases, and Disciplines**

201.11 The tetrahedral and vector equilibrium models in the isotropic vector matrix provide an absolute accommodation network of energy articulation, including the *differentiated proclivities* of:

associative-disassociative

convergent-divergent-oscillating-pulsating

dynamic-kinetic

energetic-synergetic

entropic-syntropic

expansive-contractive

explosive-implosive

gravitational-radiational

hydraulic-pneumatic

importing-exporting

inside-outing-outside-inning

involuting-evoluting

omnidirectional-focal push-pulling

radial-circumferential

rotational-ovational gearing
synchronous-dissynchronous
torque-countertorque
turbinizing-counterturbinizing
vector-tensor

together with the *integrated synergetic proclivities* of:

inward-outward and three-way aroundness;
precessional processing of plus-minus polarization; and
wave propagation mechanics;

together with the intertransformative behavioral *phases* of:

incandescent
liquid
plasmic
thermal
vapor;

and the mensurabilities elucidating the *disciplines* of:

biological
chemical
cryogenic
crystallographic
electrical
genetic
geodesic
geodetic
geological
geometrical
logical

mathematical
mechanical
nonbiological structuring
physiological
scientific
teleologic
thermodynamic
virological

explorations for comprehensive rational interrelationship number constants. (See [Sec. 424.01.](#))

201.20 **Synergetic Hierarchy: Grand Strategy**

201.21 Although we are deeply and inescapably aware of the vast ranges of unexploited geometry, we must not permit such preoccupations to obscure our awareness of the generalized, comprehensively coordinate, arithmetical, geometrical, and factorial system employed by nature in all her energetic-synergetic transformative transactions. With the general systems' discovery of the tetrahedron as the basic structural unit of physical Universe quantation, we find that there is a fundamental hierarchy of vectorial-geometric relationships that coincides with and integrates topology, quantum mechanics, and chemistry.

201.22 All of the exact sciences of physics and chemistry have provided for the accounting of the physical behaviors of matter and energy only through separate, unique languages that require awkward translation through the function of the abstract interpreters known as the *constants*. But synergetics now embraces the comprehensive family of behavioral relationships within one language capable of reconciling all the experimentally disclosed values of the XYZ—CG_tS mensuration systems adopted by science. The adoption of the tetrahedron as mensural unity, as proposed in [Table 223.64](#), and the recognition of the isotropic vector matrix as the rational coordinate model, are all that is needed to reveal the implicit omnirationality of all chemical associating and disassociating. Thus we can provide a single language to recognize and accommodate—

Avogadro's law of gases;

Bohr's fundamental complementarity;

Bridgman's operational procedure;
Brouwer's fixed-point theorem;
Gibbs' phase rule;
Field equations;
Einstein's energy equation;
Euler's topology of points, areas, and lines;
Kepler's third law;
Newton's theory of gravity;
Pauling's chemical structuring;
Pauli's exclusion principle;
Thermodynamic laws;
L.L. Whyte's point system

202.00 **Angular Topology**

202.01 Synergetics is a triangular and tetrahedral system. It uses 60-degree coordination instead of 90-degree coordination. It permits conceptual modeling of the fourth and fifth arithmetic powers; that is, fourth- and fifth-dimensional aggregations of points or spheres in an entirely rational coordinate system that is congruent with all the experientially harvested data of astrophysics and molecular physics; that is, both macro- and micro-cosmic phenomena. It coordinates within one mensurational system the complete gears-interlocking of quantum wave mechanics and vectorial geometry.

202.02 Synergetics topology integrates laws of angle and volume regularities with Euler's point, area, and line abundance laws.

202.03 **Angular Topology:** Synergetics discovers the relative abundance laws of Euler's point-area-line conceptual regularities and integrates them with geometrical angle laws, prime number progression, and a primitive geometrical hierarchy. All of this synergetic integration of topology with the angular regularities of geometrical transformabilities is conceptually generalizable independent of special case, time-space-sizing relations.

203.00 **Scope**

203.01 Synergetics explains much that has not been previously illuminated. It is not contradictory to any of the experimentally based knowledge of the classically disciplined sciences. It does not contradict the calculus or any other mathematical tool for special-case applications, although it often finds them inadequate or irrelevant.

203.02 Experientially founded synergetics clearly identifies the conceptual limitations and coordinate functionings of all the classical tools of mathematics, and it shows how their partial functioning often frustrates comprehension of experience.

203.03 Synergetics follows the cosmic logic of the structural mathematics strategies of nature, which employ the paired sets of the six angular degrees of freedom, frequencies, and vectorially economical actions and their multialternative, equieconomical action options.

203.04 Rather than refuting the bases of presently known Euclidean and non-Euclidean and hyperbolic and elliptic geometry, synergetics identifies the alternate freedoms of prime axiomatic assumption from which the present mathematical bases were selected. It embraces all the known mathematics. All of the axiomatic alternatives are logical. Thus, original assumptions eliminate the necessity for subsequent assignment of physical qualities to nonconceptual mathematical devices. Classical mathematics has, of necessity, assigned progressively discovered attributes of physical Universe to irrational relationships with the ghostly, a priori Greek geometry. The quest for a mathematics expressing nature's own design has been an elusive one. Synergetics has developed as the search for the omnirational, comprehensive, coordinate system employed by nature, i.e., Universe, throughout all its complementary and interaccommodatively transforming transactions.

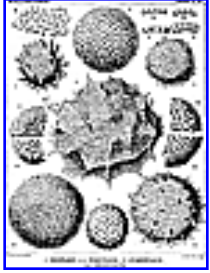
203.05 As Werner Heisenberg says "if nature leads us to mathematical forms of great simplicity and beauty . . . to forms that no one has previously encountered, we cannot help thinking that they are 'true,' and that they reveal a genuine feature of nature."¹

(Footnote 1: *Physics and Beyond*, Harper & Row, New York, 1970, p. 68.)

203.06 Synergetics altogether forsakes axioms as "self-evident," premicroscope, superficial beliefs. It predicates all its relationship explorations on the most accurately and comprehensively statable observations regarding direct experiences. The new set of data employed by synergetics seemingly results in sublimely facile expression of hitherto complex relationships. It makes nuclear physics a conceptual facility comprehensible to any physically normal child.

203.07 Synergetics discloses the excruciating awkwardness characterizing present-day mathematical treatment of the interrelationships of the independent scientific disciplines as originally occasioned by their mutual and separate lacks of awareness of the existence of a comprehensive, rational, coordinating system inherent in nature.

203.08 Synergetics makes possible the return to omniconceptual modeling of all physical intertransformations and energy-value transactions, as exclusively expressed heretofore—especially throughout the last century—only as algebraic, nonconceptual transactions. The conceptual modeling of synergetics does not contradict but complements the exclusively abstract algebraic expression of physical Universe relationships that commenced approximately a century ago with the electromagnetic-wave discoveries of Hertz and Maxwell. Their electrical-apparatus experiments made possible empirical verification or discard of their algebraic treatment of the measured data without their being able to see or conceptually comprehend the fundamental energy behaviors. The permitted discrete algebraic statement and treatment of invisible phenomena resulted in science's comfortable yielding to complete abstract mathematical processing of energy phenomena. The abandonment of conceptual models removed from the literary men any conceptual patterns with which they might explain the evolution of scientific events to the nonmathematically languaged public. Ergo, the lack of modelability produced the seemingly unbridgeable social chasm between the humanities and the sciences.



[Fig. 203.09](#)

203.09 A study of the microbiological structures, the radiolaria, will always show that they are based on either the tetrahedron, the octahedron, or the icosahedron. The picture was drawn by English scientists almost a century ago as they looked through microscopes at these micro-sea structures. The development of synergetics did not commence with the study of these structures of nature, seeking to understand their logic. The picture of the radiolaria has been available for 100 years, but I did not happen to see it until I had produced the geodesic structures that derive from the discovery of their fundamental mathematical principles. In other words, I did not copy nature's structural patterns. I did not make arbitrary arrangements for superficial reasons. I began to explore structure and develop it in pure mathematical principle, out of which the patterns emerged in pure principle and developed themselves in pure principle. I then realized those developed structural principles as physical forms and, in due course, applied them to practical tasks. The reappearance of tensegrity structures in scientists' findings at various levels of inquiry confirms the mathematical coordinating system employed by nature. They are pure coincidence—but excitingly valid coincidence.

203.10 Synergetics represents the coming into congruence of a mathematical system integrating with the most incisive physics findings and generalized laws. At no time am I being scientifically perverse. I am astonished by a philosophic awareness of the highest scientific order, which accommodates the most mystical and mysterious of all human experience. What we are experiencing is vastly more mystically profound by virtue of our adherence to experimentally harvested data than has ever been induced in human comprehension and imagination by benevolently implored beliefs in imagined phenomena dogmatically generated by any of the formalized religions. We are conscious of aspects of the mysterious integrity Universe which logically explains that which we experience and the integrity of the Universe to far more comprehensible degree than that occurring in the make-believe, nonscientifically founded communications of humanity.

204.00 **Paradox of the Computer**

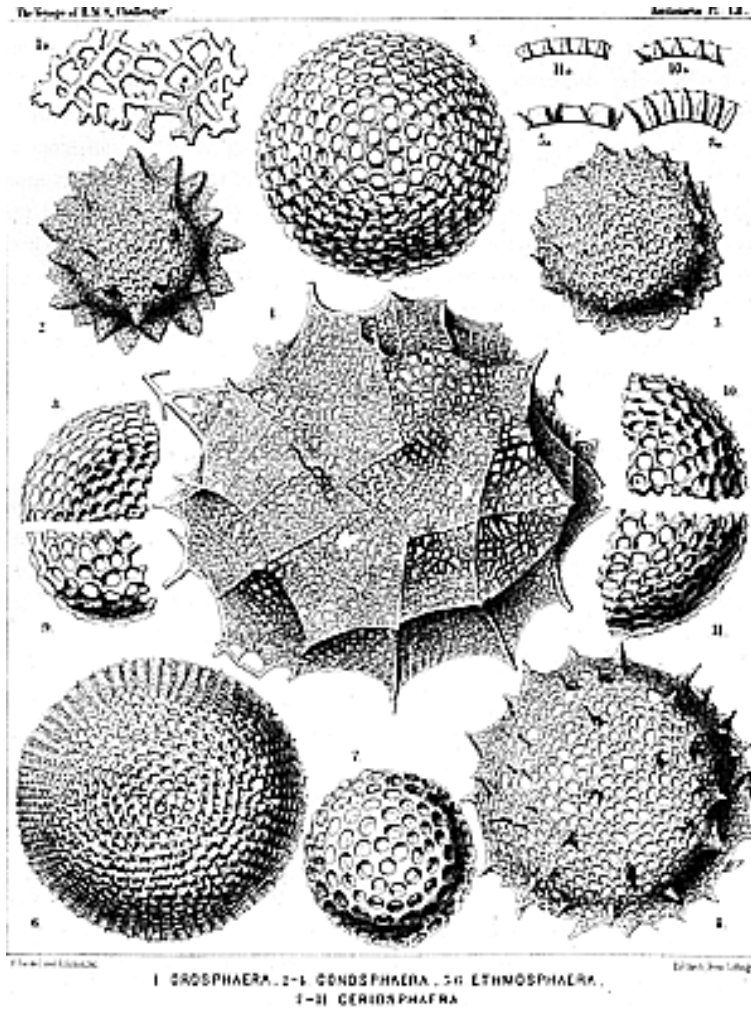


Fig. 203.09 Examples of Geodesic Design in Nature.

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204.01 Scientific entry into the present realm of nuclear competence was accomplished with the awkward irrational tools of the centimeter-gram-second (CGS)² measurement and the Cartesian XYZ 90-degree coordinate system. But the awkwardness had to be corrected by Planck's constant to produce reliable, usable information. The development and adoption of the great computers has now relieved humans of the onerous computational tasks entailed in the corrective processing by the irrational constants necessitated by the ineptness of the arithmetical rigidity of arbitrarily exclusive, three-dimensional interpretation of Euclidean geometric mensuration. These irrational constants interlink the many separately evolved quantation techniques of the separately initiated explorations of the many separate facets of universal experience—for instance, biology, crystallography, or physics are called separate, "specialized" scientific inquiries by academic departments and surrounded by NO TRESPASSING signs and electrically charged barbed wire. Because these tasks are being carried by the computers, and men are getting along all right on their blind-flown scientific pilgrimages, realization of the significance of the sensorially conceptual facility of dealing with nature that is opened up by synergetics has been slow.

(Footnote 2: Or, more properly, the centermeter-gram-temperature-second, $CG_T S$ measurement.)

204.02 It is a paradox that the computer, in its very ability to process nonconceptual formulae and awkwardly irrational constants, has momentarily permitted the extended use of obsolescent mathematical tools while simultaneously frustrating man's instinctive drive to comprehend his direct experiences. The computer has given man physical hardware that has altered his environmental circumstances without his understanding how he arrived there. This has brought about a general disenchantment with technology. Enchantment can only be sustained in those who have it, or regained by those who have lost it, through conceptual inspiration. Nothing could be more exciting than the dawning awareness of the discovery of the presence of another of the eloquently significant eternal reliabilities of Universe.

205.00 **Vector Equilibrium**

205.01 The geometrical model of energy configurations in synergetics is developed from a symmetrical cluster of spheres, in which each sphere is a model of a field of energy all of whose forces tend to coordinate themselves, shuntingly or pulsatively, and only momentarily in positive or negative asymmetrical patterns relative to, but never congruent with, the eternality of the vector equilibrium. The vectors connecting the centers of the adjacent spheres are identical in length and angular relationship. The forces of the field of energy represented by each sphere interoscillate through the symmetry of equilibrium to various asymmetries, never pausing at equilibrium. The vector equilibrium itself is only a referential pattern of conceptual relationships at which nature never pauses. This closest packing of spheres in 60-degree angular relationships demonstrates a finite system in universal geometry. Synergetics is comprehensive because it describes instantaneously both the internal and external limit relationships of the sphere or spheres of energetic fields; that is, singularly concentric, or plurally expansive, or propagative and reproductive in all directions, in either spherical or plane geometrical terms and in simple arithmetic.

205.02 When energy-as-heat is progressively extracted from systems by cryogenics, the geometries visibly approach equilibrium; that is to say, removing energy-as-heat reduces the asymmetrical pulsativeness in respect to equilibrium. As the asymmetric kinetics of energy-as-heat are removed, and absolute zero is neared, the whole field of vectors approaches identical length and identical angular interaction; that is to say, they approach the model of closest-packed spherical energy fields. The lines interconnecting the adjacent spheres' centers constitute a vectorial matrix in which all the lines and angles are identical, which is spoken of by the mathematical physicists as the isotropic vector matrix, i.e. where all the energy vectors are identical, i.e., in equilibrium: the cosmically absolute zero.

205.03 Metaphysically, the isotropic vector matrix is conceptually permitted. The difference between the physical and the metaphysical is the omnipulsative asymmetry of all physical oscillation in respect to the equilibrium. Metaphysical is equilibrious and physical is disequilibrious.

205.04 The metaphysically permitted frame of reference for all the asymmetrical physical experience of humanity is characterized by the 60-degree coordination with which synergetics explores nature's behaviors—metaphysical or physical.

205.05 The phenomenon of time entering into energy is just a metaphysical concept. It explains our slowness and our limitations. Temporality is time, and the relative asymmetries of oscillation are realizable only in time— in the time required for pulsative frequency cycling. Synergetics correlates the verities of time and eternity. The awareness of life is always a complex of cognition and recognition lags. Lags are wave frequency aberrations.

206.00 The vectorial coordinate system deriving from closest packing of spheres permits fourth- and fifth-power models of modular-volume symmetrical aggregations around single points in an omnidirectional, symmetrical, allspace-filling radial growth. (See illustration [966.05](#).) The unit of modular volumetric measurement is the tetrahedron, whose 60-degree angles and six equilateral edges disclose omnipersistent, one-to-one correspondence of *radial wave modular growth with circumferential modular frequency growth* of the totally involved vectorial geometry. This means that angular and linear accelerations are identical. This is a rational convenience prohibited by 90-degree coordination, whose most economical circumferential geometries are in most cases inherently irrational.

207.00 The angular and linear accelerations of synergetics' isotropic, vectorially triangulated, omnidirectional matrix initiations are rational and uniformly modulated; whereas in the XYZ 90-degree coordinate analysis and plotting of the computational findings of the calculus, only the linear is analyzable and the angular resultants are usually irrationally expressed.

208.00 The frequency and magnitude of event occurrences of any system are comprehensively and discretely controllable by *valving*, that is, by angle and frequency modulation. Angle and frequency modulation exclusively define all experiences, which events altogether constitute Universe. (See [Sec. 305.05](#).)

209.00 It is a hypothesis of synergetics that forces in both macrocosmic and microcosmic structures interact in the same way, moving toward the most economic equilibrium patternings. By embracing all the energetic phenomena of total physical experience, synergetics provides for a single coherent system of geometric principles and secures a metaphysical and evolutionary advantage for all experiential accounting and prospecting.

210.00 Synergetics provides vectorial modeling of heretofore only instrumentally apprehended phenomena—for instance, those discovered in nuclear physics. Since it discloses nature's own most economical coordinate system, it provides conceptual models for humanity to accommodate the scientists' energy experiment discoveries.

211.00 Synergetics both equates and accommodates Heisenberg's indeterminism of mensuration inherent in the omnisymmetry of wavelinear physical pulsations in respect to the only metaphysical (ergo, physically unattainable) waveless exactitude of absolute equilibrium. It is only from the vantage of eternal exactitude that metaphysical mind intuitively discovers, comprehends, and equates the kinetic integrities of physical Universe's pulsative asymmetries.

212.00 The whole theory of structure is both altered and enormously expanded and implemented by the introduction of a mathematically coordinate, comprehensively operative, discontinuous-compression, continuous-tension system as inherent to synergetics and its omnirationality of vectorial energy accounting.

213.00 The solving of problems in synergetics starts with the known behaviors of the whole system plus the known behavior of some of the system's parts, which makes possible the discovery of other heretofore unknown parts of the system and their respective behaviors. For instance, in geometry, the known sum of a triangle's angles—180 degrees—plus the known behavior of any two sides and their included angle, or vice versa, permits the discovery and measurement of the values of the other three parts.

214.00 In its search for a coordinate system of nature, synergetics has continually reexamined and reconsidered the experimentally based successive discoveries of what seemed to be a hierarchy of generalized principles possibly governing all of the physical Universe's intertransforming transactions. Thus it aims at a total epistemological reorientation and a unique philosophical reconceptioning regarding the regenerative constellar logic of Universe, making possible the formulating of more comprehensive and symmetrical statements regarding dawningly apparent natural laws.

215.00 **A Geometry of Vectors**

215.01 Assuming an energy Universe of curved paths generated by angular accelerations of varying intertensions, rates, and radii, resulting in orbits of high-frequency continuities, and separating time out of the compound dynamic system, there remain only the relative attractions and repulsions expressed in relative vectorial terms in respect to the radius of any one interattracted couple of the set of all the radii expressed.

215.02 In such a timeless and equilibrious instant, the remainder of the system may be discovered as a vector construction of force interrelationships between centers. A geometry composed of a system of interrelated vectors may be discovered that represents the complete family of potential forces, proclivities, and proportional morphosis by octave introversion and extroversion .

216.00 **Significance of Isotropic Vector Matrix**

216.01 Even with foreknowledge of the exact elegant congruences of the isotropic vector matrix ([Sec. 420](#)) with nature's eternally transforming transaction needs, we can still understand the ease with which humanity's optical-illusion-producing, minuscule stature in relation to his spherical planet magnitude made it logical for him to institute experience analysis as he did, with lines, planes, squares, perpendiculars, and cubes; and present knowledge of the significance of the isotropic vector matrix also explains lucidly why scientists' faithful measuring and calculation discovered the family of irrational mathematical constants correlating their findings as seemingly expressible only in the terms of cubism's centimeter-gram-second, *XYZ* rectilinear coordination of seemingly obvious "three-dimensional" reality.

216.02 Humanity's escape from the irrational awkwardness of the axiomatic hypothesis trap of eternal askewness which snags him, involves all young humanity's discovery of the isotropic vector matrix synergetics' elegant rational simplicity and its omniaccommodation of all experimentally founded research. Popular understanding and spontaneous employment of synergetics' isotropic vector matrix coordination involves young, popular, experience-induced, spontaneous abandonment of exclusively rectilinear *XYZ* coordination, but without loss of the *XYZ*'s uneconomically askew identity within the system—all occurring "naturally" through youth's spontaneous espousal of the most exquisitely economical comprehension of the most exquisitely economical freedoms of opportunity of individual realizations always regeneratively inspired by the inherent a priori otherness *considerations* (see [Sec. 411](#)).

216.03 Comprehension of conceptual mathematics and the return to modelability in general are among the most critical factors governing humanity's epochal transition from bumblebee-like self's honey-seeking preoccupation into the realistic prospect of a spontaneously coordinate planetary society. Insect and avian bumbling in general inadvertently cross-fertilizes all the vegetation's terrestrial impoundments of the star-radiated energy which alone regenerates all biological life around Earth planet. The vegetational impoundments would be dehydrated were they not osmotically watercooled by their root-connected hydraulic circuitry of Earth waters' atomization for return into the sky-distributed, fresh-water-regenerating biological support system; and the rooting frustrates integral procreation of the vegetation which is regeneratively cross-fertilized entirely by the insect and avian, entirely unconscious, pollen-delivering inadvertencies. It is highly probable that universal comprehension of synergetics is strategically critical to humanity's exodus from the womb of originally permitted absolute helplessness and ignorance at birth and entry into the realization that planetary society can spontaneously coordinate in universally successful life support, that is, achieve freedom from fundamental fear and political bias inherent in the ignorant assumption of life-support inadequacy.

217.00 Prospects for Synergetics

217.01 Synergetics recognizes the history of progressively larger and more incisive conceptionings, which have eliminated previously uncomprehended behaviors of local Universe. It recognizes that the elegant conceptionings of one period that greatly widened the horizons of human understanding reached their limits of informative capability to be progressively obsoleted by ever greater conceptioning accruing to the ever-mounting harvest of cosmic experience.

217.02 The rate of change and number of special-case self-retransformings of physical evolution tend ever to accelerate, differentiate, and multiply; while the rate of change and numbers of self-remodifyings of generalized law conceptionings of metaphysical evolution tend ever to decelerate, simplify, consolidate, and ultimately unify. (See [Sec. 323.](#))

217.03 In the inherently endless scenario model of Einstein's Universe, truth is ever approaching a catalogue of alternate transformative options of ever more inclusive and refining degrees, wherefore the metaphysical might continually improve the scenario by conceptual discoveries of new generalized principles. (See Secs. [529.07](#) and [1005.50.](#))

217.04 Synergetics augments the prospect of humanity becoming progressively exploratory. There is clearly disclosed the desirability of commencing scientific exploration with synergy-of-synergies Universe: metaphysical and physical. While synergetics seems to open new ranges of cosmic comprehension, we assume that the time will come when the inventory of experiences that have catalyzed both its conceptioning and inception will have become overwhelmed by vaster experientially based knowledge and may well become progressively useful but, in its turn, obsolete. Because the generalized principles cannot be principles unless they are eternal, and because human experience is inherently limited, there can be no finality of human comprehension.

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220.00 Synergetics Principles

220.01 Principles

220.011 The synergetics principles described in this work are experimentally demonstrable.

220.02 Principles are entirely and only intellectually discernible. The fundamental generalized mathematical principles govern subjective comprehension and objective realization by man of his conscious participation in evolutionary events of the Universe.

220.03 Pure principles are usable. They are reducible from theory to practice.

220.04 A generalized principle holds true in *every* case. If there is one single exception, then it is no longer a generalized principle. No one generalization ever contradicts another generalization in any respect. They are all interaccommodating .

220.05 The physical Universe is a self-regenerative process. Its regenerative interrelationships and intertransformings are governed by a complex code of weightless, generalized principles. The principles are metaphysical. The complex code of eternal metaphysical principles is omni-interaccommodative; that is, it has no intercontradiction. To be classifiable as “generalized,” principles cannot terminate or go on vacation. If indeed they *are* generalized, they are eternal, timeless.

220.10 Reality and Eternality

220.11 What the mathematicians have been calling abstraction is reality. When they are inadequate in their abstraction, then they are irrelevant to reality. The mathematicians feel that they can do anything they want with their abstraction because they don't relate it to reality. And, of course, they *can* really do anything they want with their abstractions, even though, like masturbation, it is irrelevant to the propagation of life.

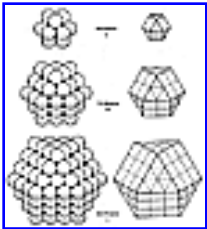
220.12 The only reality is the abstraction of principles, the eternal generalized principles. Most people talk of reality as just the afterimage effects—the realization lags that register superficially and are asymmetric and off center and thereby induce the awareness called life. The principles themselves have different lag rates and different interferences. When we get to reality, it's absolutely eternal.

220.13 The inherent inaccuracy is what people call the reality. Man's way of apprehending is always slow: ergo, the superficial and erroneous impressions of solids and things that can be explained only in principle.

221.00 Principle of Unity

221.01 Synergetics constitutes the original disclosure of a hierarchy of rational quantation and topological interrelationships of all experiential phenomena which is omnirationally accounted when we assume the volume of the tetrahedron and its six vectors to constitute both metaphysical and physical unity. (See chart at [223.64.](#)) (See Sec. [620.12.](#))

222.00 Omnidirectional Closest Packing of Spheres



222.01 Definition: The omnidirectional concentric closest packing of equal radius spheres about a nuclear sphere forms a matrix of vector equilibria of progressively higher frequencies. The number of vertexes or spheres in any given shell or layer is edge frequency (F) to the second power times ten plus two.

[Fig. 222.01](#)

222.02 Equation:

$$10F^2 + 2 = \text{the number of vertexes or spheres in any layer,}$$

Where,

F = edge frequency, i.e., the number of outer-layer edge modules.

222.03 The frequency can be considered as the number of layers (concentric shells or radius) or the number of edge modules of the vector equilibrium. The number of layers and the number of edge modules is the same. The frequency, that is the number of edge modules, is the number of spaces between the spheres, and not the number of spheres, in the outer layer edge.

222.10 **Equation for Cumulative Number of Spheres:** The equation for the total number of vertexes, or sphere centers, in all symmetrically concentric vector equilibria shells is:

$$10(F_1^2 + F_2^2 + F_3^2 + \dots + F_n^2) + 2F_n + 1$$

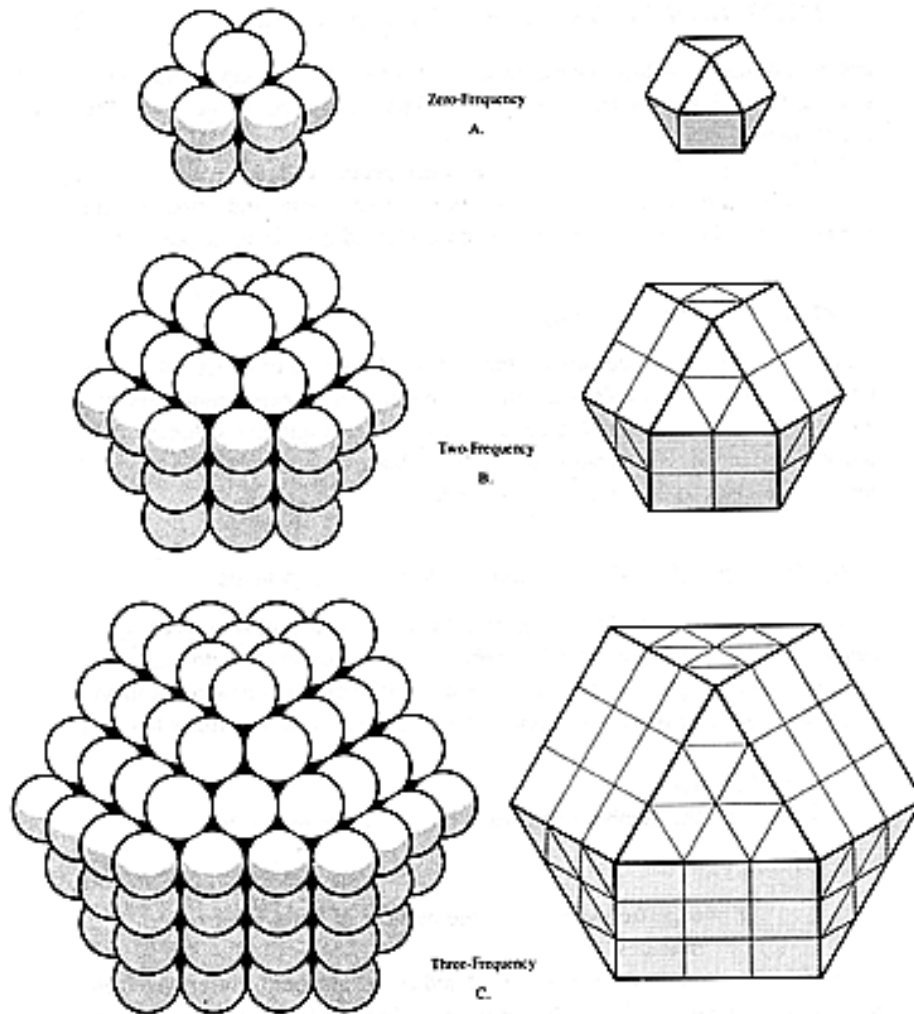


Fig. 222.01 *Equation for Omnidirectional Closest Packing of Spheres*: Omnidirectional concentric closest packings of equal spheres about a nuclear sphere form series of vector equilibria of progressively higher frequencies. The number of spheres or vertexes on any symmetrically concentric shell outer layer is given by the equation $10F^2 + 2$, where $F =$ Frequency. The frequency can be considered as the number of layers (concentric shells or radius) or the number of edge modules on the vector equilibrium. A one-frequency sphere packing system has 12 spheres on the outer layer (A) and a one-frequency vector equilibrium has 12 vertexes. If another layer of spheres are packed around the one-frequency system, exactly 42 additional spheres are required to make this a two-frequency system (B). If still another layer of spheres is added to the two-frequency system, exactly 92 additional spheres are required to make the three-frequency system (C). A four-frequency system will have 162 spheres on its outer layer. A five-frequency system will have 252 spheres on its outer layer, etc.

222.20 **Characteristics of Closest Packing of Spheres:** The closest packing of spheres begins with two spheres tangent to each other, rather than omnidirectionally. A third sphere may become closest packed by becoming tangent to both of the first two, while causing each of the first two also to be tangent to the two others: this is inherently a triangle.

222.21 A fourth sphere may become closest packed by becoming tangent to all three of the first three, while causing each of the others to be tangent to all three others of the four-sphere group: this is inherently a tetrahedron.

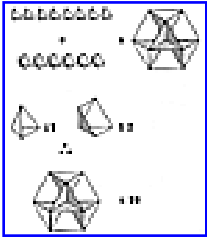
222.22 Further closest packing of spheres is accomplished by the omniequiangular, intertriangulating, and omnitangential aggregating of identical-radius spheres. In omnidirectional closest-packing arrays, each single sphere finds itself surrounded by, and tangent to, at most, 12 other spheres. Any center sphere and the surrounding 12 spheres altogether describe four planar hexagons, symmetrically surrounding the center sphere.

222.23 *Excess of Two in Each Layer:* The first layer consists of 12 spheres tangentially surrounding a nuclear sphere; the second omnisurrounding tangential layer consists of 42 spheres; the third 92, and the order of successively enclosing layers will be 162 spheres, 252 spheres, and so forth. Each layer has an excess of two diametrically positioned spheres which describe the successive poles of the 25 alternative neutral axes of spin of the nuclear group. (See illustrations [450.11a](#) and [450.11b](#).)

222.24 *Three Layers Unique to Each Nucleus:* In closest packing of spheres, the third layer of 92 spheres contains eight new potential nuclei which do not, however, become active nuclei until each has three more layers surrounding it—three layers being unique to each nucleus.

222.25 *Isotropic Vector Matrix:* The closest packing of spheres characterizes all crystalline assemblages of atoms. All the crystals coincide with the set of all the polyhedra permitted by the complex configurations of the isotropic vector matrix (see Sec. [420](#)), a multidimensional matrix in which the vertexes are everywhere the same and equidistant from one another. Each vertex can be the center of an identical-diameter sphere whose diameter is equal to the uniform vector's length. Each sphere will be tangent to the spheres surrounding it. The points of tangency are always at the mid-vectors.

222.26 The polyhedral shape of these nuclear assemblages of closest-packed spheres—reliably interdefined by the isotropic vector matrix’s vertexes—is always that of the vector equilibrium, having always six square openings (“faces”) and eight triangular openings (“faces”).



222.30 **Volume of Vector Equilibrium:** If the geometric volume of one of the uniform tetrahedra, as delineated internally by the lines of the isotropic vector matrix system, is taken as volumetric unity, then the volume of the vector equilibrium will be 20.

[Fig. 222.30](#)

222.31 The volume of any series of vector equilibria of progressively higher frequencies is always *frequency to the third power times 20*.

222.32 *Equation for Volume of Vector Equilibrium:*

$$\text{Volume of vector equilibrium} = 20F^3,$$

Where F = frequency.

222.40 **Mathematical Evolution of Formula for Omnidirectional Closest Packing of Spheres:** If we take an inventory of the number of balls in successive vector equilibria layers in omnidirectional closest packing of spheres, we find that there are 12 balls in the first layer, 42 balls in the second layer, and 92 balls in the third. If we add a fourth layer, we will need 162 balls, and a fifth layer will require 252 balls. The number of balls in each layer always comes out with the number two as a suffix. We know that this system is a decimal system of notation. Therefore, we are counting in what the mathematician calls congruence in modulo ten—a modulus of ten units—and there is a constant excess of two.

222.41 In algebraic work, if you use a constant suffix—where you always have, say, 33 and 53—you could treat them as 30 and 50 and come out with the same algebraic conditions. Therefore, if all these terminate with the number two, we can drop off the two and not affect the algebraic relationships. If we drop off the number two in the last column, they will all be zeros. So in the case of omnidirectional closest packing of spheres, the sequence will read; 10, 40, 90, 160, 250, 360, and so forth. Since each one of these is a multiple of 10, we may divide each of them by 10, and then we have 1, 4, 9, 16, 25, and 36, which we recognize as a progression of second powering—two to the second power, three to the second power, and so forth.

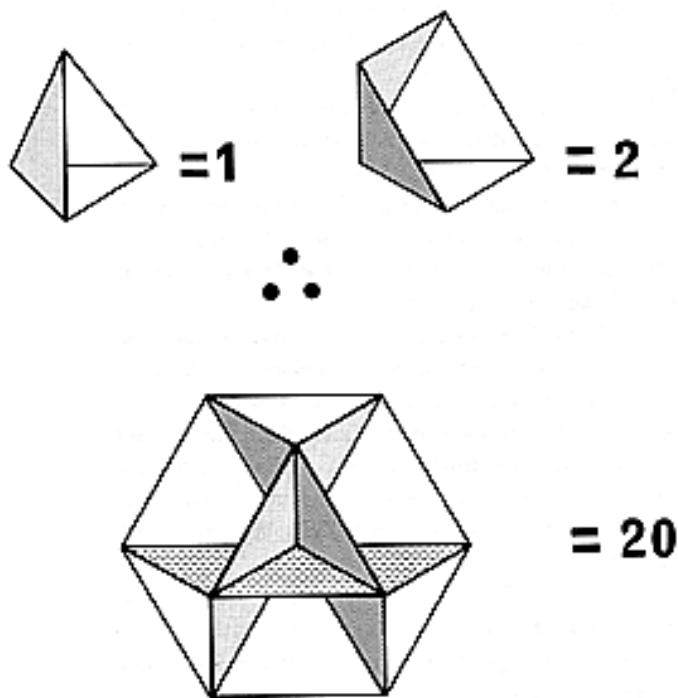
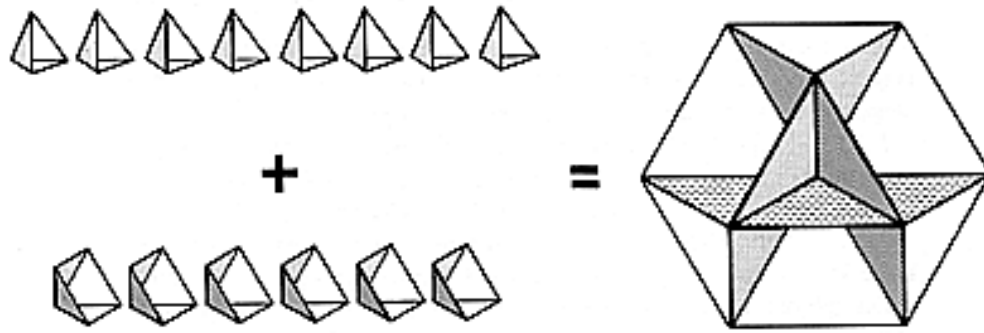


Fig. 222.30 *Volume Of Vector Equilibrium*: The volume of the vector equilibrium consists of eight tetrahedra and six half-octahedra. Therefore, the volume of the vector equilibrium is exactly twenty.

222.42 In describing the number of balls in any one layer, we can use the term frequency of modular subdivisions of the radii or chords as defined by the number of layers around the nuclear ball. In the vector equilibrium, the number of modular subdivisions of the radii is exactly the same as the number of modular subdivisions of the chords (the "edge units"), so we can say that *frequency to the second power times ten plus two* is the number of balls in any given layer.

222.43 This simple formula governing the rate at which balls are agglomerated around other balls or shells in closest packing is an elegant manifest of the reliably incisive transactions, formings, and transformings of Universe. I made that discovery in the late 1930s and published it in 1944. The molecular biologists have confirmed and developed my formula by virtue of which we can predict the number of nodes in the external protein shells of all the viruses, within which shells are housed the DNA-RNA-programmed design controls of all the biological species and of all the individuals within those species. Although the polio virus is quite different from the common cold virus, and both are different from other viruses, all of them employ frequency to the second power times ten plus two in producing those most powerful structural enclosures of all the biological regeneration of life. It is the structural power of these geodesic-sphere shells that makes so lethal those viruses unfriendly to man. They are almost indestructible.

222.50 **Classes of Closest Packing:** There are three classes of closest packing of unit-radius spheres:

222.51 **SYSTEMATIC** *Symmetrical Omnidirectional Closest Packing:* Twelve spheres closest pack omnitangentially around one central nuclear sphere. Further symmetrical enclosure by closest-packed sphere layers agglomerate in successive vector equilibria. The nucleus is inherent.

222.52 **ASYMMETRICAL** *Closest Packed Conglomerates:* Closest-packed conglomerates may be linear, planar, or "crocodile." Closest packed spheres without nuclear organization tend to arrange themselves as the octet truss or the isotropic vector matrix. The nuclei are incidental.

222.53 **VOLUMETRIC** *Symmetrical Closest Packing:* These are nonnuclear symmetrical embracements by an outer layer. The outer layer may be any frequency, but it may not be expanded or contracted by the addition inwardly or outwardly of complete closest-packed layers. Each single-layer frequency embracement must be individually constituted. Volumetric symmetrical closest packing aggregates in most economical forms as an icosahedron geodesic network. The nucleus is excluded.

[Next Section: 223.00](#)

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223.00 **Principle of Prime Number Inherency and Constant Relative Abundance of the Topology of Symmetrical Structural Systems**

223.01 **Definition:** The number of vertexes of every omnitriangulated structural system is rationally and differentially accountable, first, by selecting and separating out the always *additive two* polar vertexes that must accommodate the neutral axis of spin inherent in all individual structural systems to permit and account for their independent motional freedom relationship from the rest of Universe. The number of nonpolar vertexes is called the base number. Second, we identify the always *multiplicative* duality factor of *two* characterizing the always coexistent insiderness-outsiderness of systems and their inherently positively and negatively congruent disparity of convexity and concavity. Third, we find the multiplicative duality factor of two to be multiplied by one of the first four prime numbers, 1, 2, 3, or 5 (multiplied by 1 if the structural system is tetrahedral, by 2 if it is octahedral, by 3 if it is the triangularly structured cube, or by 5 if it is the icosahedron or the triangularly stabilized vector equilibrium), or factored by a variety of multiples comprised of combinations of only those first four prime numbers, whether the polyhedra are, in the Platonic, Archimedean, or any other progression of symmetrical structural systems. When the vector edges of the symmetrical systems are modularly subdivided, all of the foregoing products are found to be multiplied again to the second power by the frequency of uniform modular subdivisions of the vector edges of the symmetrical structural system. In respect to the original base number of nonpolar vertexes, there will always be twice as many openings ("faces") and three times as many vector edges of the symmetrical structural system, always remembering that the two polar vertexes were first extracted from the inventory of topological characteristics before multiplying the remaining number of vertexes in the manner described and in relation to which the number of nonpolar vertexes and the relative abundance of the other topological characteristics are accurately derived and operationally described.

223.02 **Axis of Spin:** Any two vertexes may be selected as the axis of spin, whether or not the axis described by them is immediately conceivable as the logical axis of spinnability, i.e., the axis need not be statically symmetrical. (You can take hold of a boy by his two hands and, holding one above the other and leaning backward spin him centrifugally around you. Although his two hands do not represent the symmetrical static axis of the boy's body, their dynamic positions defined the axis of your mutual spinning.)

223.03 Equation of Prime Number Inherency of All Symmetrical Structural Omnitriangulated Systems:

$$X = 2NF^2 + 2$$

Where:

X = number of vertexes (crossings) or spheres in the outer layer or shell of any symmetrical system;

N = one of the first four prime numbers: 1, 2, 3, or 5; and

F = edge frequency, i.e., the number of outer layer edge modules.

223.04 Equation of Constant Relative Abundance of Topological Aspects of All Symmetrical Structural Systems: Multiplication of one of the first four prime numbers or their powers or multiples by the constant of relative topological characteristics abundance:

$$1 + 2 = 3$$

1 Nonpolar vertex

2 Faces

3 Edges

In addition to the product of such multiplication of the constant relative abundance equation by one of the first four prime numbers—1, 2, 3, or 5—or their powers or multiples, there will always be two additional vertexes assigned as the poles of the axial spinnability of the system.

223.05 Two Kinds of Twoness: There are two kinds of twoness:

(1) the numerical, or morphationally unbalanced twoness; and

(2) the balanced twoness.

The vector equilibrium is the central symmetry through which both balanced and unbalanced asymmetries pulsatingly and complexedly intercompensate and synchronize. The vector equilibrium's frequency modulatability accommodates the numerically differentiated twonesses.

223.06 There are four kinds of positive and negative:

(1) the eternal, equilibrium-disturbing plurality of differentially unique, only-positively-and-negatively-balanced aberratings;

(2) the north and south poles;

(3) the concave and convex; and

(4) the inside (microcosm) and outside (macrocosm), always cosmically complementing the local system's inside-concave and outside-convex limits.

223.07 There is a fourfold twoness: one of the exterior, cosmic, finite (“nothingness”) tetrahedron—i.e., the macrocosm outwardly complementing all (“something”) systems—and one of the interior microcosmic tetrahedron of nothingness complementing all conceptually thinkable and cosmically isolatable “something” systems. (See Sec. [1070](#).)

223.08 A pebble dropped into water precessionally produces waves that move both outwardly from the circle's center—i.e., circumferentially of the Earth sphere—and reprecationally outwardly and inwardly from the center of the Earth—i.e., radially in respect to the Earth sphere. Altogether, this interregeneratively demonstrates (1) the twoness of local precessional system effects at 90 degrees, and (2) the Universe-cohering gravitational effects at 180 degrees. These are the two kinds of interacting forces constituting the regenerative structural integrity of both subsystem local twonesses and nonunitarily conceptual Scenario Universe. The *four* cosmically complementary twonesses and the *four* local system twonesses altogether eternally regenerate the scientific generalization known as complementarity. Complementarity is sum-totally eightfoldedly operative: four definitive local system complementations and four cosmically synergetic finitive accountabilities.

223.09 Topologically the additive twoness identifies the opposite poles of spinnability of all systems; the multiplicative twoness identifies the concave-insideness and convex-outsideness of all systems: these four are the four unique twonesses of the eternally regenerative, nonunitarily conceptual Scenario Universe whose conceptual think- aboutedness is differentially confined to local “something” systems whose insideness-and- outsideness-differentiating foci consist at minimum of four event “stars.” (See Secs. [510.04](#) and [510.09](#).)

223.10 **Constant Relative Abundance:** Topological systems that are structurally stabilized by omnitriangulation reveal a constant relative abundance of certain fundamental characteristics deriving from the additive twoness and the multiplicative twoness of all finite systems.

223.11 The *additive* twoness derives from the polar vertexes of the neutral axis of spin of all systems. This twoness is the beginning and essence of consciousness, with which human awareness begins: consciousness of the other, the other experience, the other being, the child's mother. To describe that of which we are aware, we employ comparison to previous experience. That which we are aware of is hotter, or bigger, or sharper than the other experience or experiences. The a priori otherness of comparative awareness inherently requires time. Early humanity's concept of the minimum increment of time was the *second*, because time and awareness *begin* with the second experience, the prime *other*. If there is only one think, one think is naught. Life and Universe that goes with it begins with two spheres: you and me . . . and you are always prior to me. I have just become by my awareness of you.

223.12 The *multiplicative* twoness is inherent in the disparity of the congruent convexity and concavity of the system. The multiplicative twoness is because both you and I have insiderness and outsiderness, and they are not the same: one is convex and one is concave.

223.13 Conceptual systems having inherent insiderness and outsiderness are defined at minimum by four event foci and are, ergo, tetrahedral; at maximum symmetrical complexity, they are superficially "spherical"—that is, they are a spherelike array of event foci too minute for casual resolution into the plurality of individual event foci of which, in experiential fact, they must consist, each being approximately equidistant from one approximately identifiable event focus at the spherical array's center. Since all the "surface" event foci may be triangularly interconnected with one another by chords that are shorter than arcs, all spherical experience arrays are, in fact, polyhedra. And all spheres are polyhedra. Spherical polyhedra may at minimum consist of the four vertexes of the regular tetrahedron.

223.14 We discover that the additive twoness of the two polar (and a priori awareness) spheres at most economical minimum definition of event foci are two congruent tetrahedra, and that the insiderness and outsiderness of complementary tetrahedra altogether represent the two invisible complementary twoness that balances the visible twoness of the polar pair. This insideouting tetrahedron is the minimum compound curve—ergo, minimum sphere. (See Sec. [624](#).)

223.15 When the additive twoness and the multiplicative twoness are extracted from any symmetrical and omnitriangulated system, the number of vertexes will always be a rational product of one or more of the first four prime numbers, 1, 2, 3, or 5, or their powers or multiples.

223.16 The number of openings (or "faces") will be twice that of the vertexes, minus two.

223.17 The number of vector edges will be three times the number of vertexes, minus two.

223.18 When we reduce the topological inventory of basic vertexes, areas, and edges of all omnitriangulated structural systems in Universe—whether symmetrical or asymmetrical—by taking away the two poles and dividing the remaining inventory by two, we discover a constant relative abundance of *two faces* and *three lines* for every one vertex. This is to say that there is a constant topological abundance characterizing all systems in Universe in which for every *nonpolar* vertex there are always *two faces* and *three (vectorial) edges*.

223.19 In an omnitriangulated structural system:

- a. the number of vertexes ("crossings" or "points") is always evenly divisible by two;
- b. the number of faces ("areas" or "openings") is always evenly divisible by four; and
- c. the number of edges ("lines," "vectors," or "trajectories") is always evenly divisible by six.

223.20 **Primary Systems:** Only four primary systems or contours can be developed by closest packing of spheres in omnisymmetrical concentric layers. The exterior contours of these points are in the chart:

	After subtracting the two Polar vertices: the Additive two	And dividing by the Duality Factor Two	Outer Layer of Two Frequency	Outer Layer of Three Frequency
(a) Tetrahedron (four sides):				
$2+[(2 \times 1) \times F^2]=4$ vertexes (crossings)	2	1	10	20

(b) Octahedron (eight sides):

$$2 + [(2 \times 2) \times F^2] = 6 \quad 4 \quad 2 \quad 18 \quad 38$$

vertexes
(crossings)

(c) Cube (six sides):

$$2 + [(2 \times 3) \times F^2] = 8 \quad 6 \quad 3 \quad 26 \quad 56$$

vertexes
(crossings)

(d) Vector Equilibrium (fourteen sides):

$$2 + [(2 \times 5) \times F^2] = 12 \quad 10 \quad 5 \quad 42 \quad 92$$

vertexes
(crossings)

223.21 **Primary Systems:** Equations: The formulas for the number of spheres in the outer layer of closest packed spheres in primary systems is as follows:

(a) *Tetrahedron:*

$$X = 2F^2 + 2$$

(b) *Octahedron:*

$$X = 4F^2 + 2$$

(c) *Cube:*

$$X = 6F^2 + 2$$

(d) *Vector Equilibrium (Icosahedron):*

$$X = 10F^2 + 2$$

Where:

X = the number of spheres in the outer layer or shell of the primary system;

F = edge frequency, i.e., the number of outer-layer edge modules.

223.30 **Symmetrical Analysis of Topological Hierarchies:** Symmetrical means having no local asymmetries. Omnisymmetrical permits local asymmetries .

223.31 The following omnitriangulated systems are symmetrical:

Tetrahedron

Octahedron

Icosahedron

223.32 The following omnitriangulated systems are omnisymmetrical:

Cube

Diagonal Rhombic Dodecahedron

Rhombic Dodecahedron

Dodecahedron

Tetraxidecahedron

Triacontahedron

Enenicontrahedron

223.33 The vector equilibrium is locally mixed symmetrical and asymmetrical.

223.34 **Symmetrical Analysis of Topological Hierarchies:** Whenever we refer to an entity, it has to be structurally valid, and therefore it has to be triangulated. Being locally mixed, vectorially symmetrical but facially asymmetrical, being triangulated but not omnitriangulated, vector equilibrium may function as a system but not as a structure.

223.40 **Powering:** Second powering in the topology of synergetics is identifiable only with the vertexes of the system and not with something called the "surface area." Surfaces imply experimentally nondemonstrable continuums. There are no topologically indicated or implied *surfaces* or *solids*. The vertexes are the external points of the system. The higher the frequency of the system, the denser the number of external points. We discover then that second powering does not refer to "squaring" or to surface amplification. Second powering refers to the number of the system's external vertexes in which equating the second power and the radial or circumferential modular subdivisions of the system multiplied by the prime number *one* if a tetrahedral system; by the prime number *two* if an octahedral system; by the prime number *three* if a triangulated cubical system; and by the prime number *five* if an icosahedral system; each, multiplied by two, and added to by two, will accurately predict the number of superficial points of the system.

223.41 This principle eliminates our dilemma of having to think of *second* and *third* powers of systems as referring exclusively to continuum *surfaces* or *solids* of the systems, neither of which states have been evidenced by experimental science. The frequencies of systems modify their prime rational integer characteristics. The second power and third power point aggregations identify the energy quanta of systems and their radiational growth or their gravitational contraction. They eliminate the dilemma in which physics failed to identify simultaneously the wave and the particle. The dilemma grew from the misconceived necessity to identify omnidirectional wave growth exclusively with the rate of a nonexperimentally existent spherical surface continuum growth, the second power of radiational growth being in fact the exterior quanta and not the spherical surface being considered as a continuum.

223.50 **Prime Number Inherency:** All structurally stabilized polyhedra are characterized by a constant relative abundance of Euler's topological aspects in which there will always be twice as many areas and three times as many lines as the number of points in the system, minus two (which is assigned to the polar axis of spin of the system).

223.51 The number of the topological aspects of the Eulerian system will always be an *even* number, and when the frequency of the edge modulation of the system is reduced to its second root and the number of vertexes is divided by two, the remainder will be found to consist exclusively of a prime number or a number that is a product exclusively of two or more intermultiplied prime numbers, which identify the prime inherency characteristics of that system in the synergetic topological hierarchy of cosmically simplest systems.

223.52 All other known regular symmetrical polyhedra (other than the tetrahedron and the octahedron) are described quantitatively by compounding rational fraction elements of the tetrahedron and the octahedron. These elements are known as the A and B Quanta Modules (see Sec. [920 through 940](#)). They each have a volume of one-twenty-fourth of a tetrahedron.

223.60 **Analysis of Topological Hierarchies: Omnitriangulation:** The areas and lines produced by omnitriangularly and circumferentially interconnecting the points of the system will always follow the rule of constant relative abundance of points, faces, and lines.

223.61 Only triangles are structures, as will be shown in [Sec. 610](#). Systems have insiderness and outsiderness ergo, structural systems must have omnitriangulated isolation of the outsiderness from the insiderness. Flexibly jointed cubes collapse because they are not structures. To structure a cubical form, the cube's six square faces must be diagonally divided at minimum into 12 triangles by *one* of the two inscribable tetrahedra, or at maximum into 24 triangles by *both* the inherently inscribable positive-negative tetrahedra of the cube's six faces.

223.62 Lacking triangulation, there is no structural integrity. Therefore, all the polyhedra must become omnitriangulated to be considered in the Table. Without triangulation, they have no validity of consideration. (See [Sec. 608](#), "[Necklace](#).")

223.64 Table: Synergetics Hierarchy of Topological Characteristics of Omnitriangulated Polyhedral Systems (See pp. 46-47.)

223.65 The systems as described in *Columns 1 through 5* are in the prime state of conceptuality independent of size: metaphysical. Size is physical and is manifest by frequency of "points-defined" modular subdivisions of lengths, areas, and volumes. Size is manifest in the three variables of relative length, area, and volume; these are all expressible in terms of frequency. Frequency is operationally realized by modular subdivision of the system.

223.66 *Column 1* provides a statement of the true rational volume of the figure when the A and B Quanta Modules are taken as unity.

Column 2 provides a statement of the true rational volume of the figure when the tetrahedron is taken as unity.

Columns 1 and 2 describe the rationality by complementation of two selected pairs of polyhedra considered together. These are (a) the vector-edged icosahedron and the vector-edged cube; and (b) the vector-edged rhombic dodecahedron and the vector-edged dodecahedron.

Column 3 provides the ratio of area-to-volume for selected polyhedra.

Column 4 denotes self-packing, allspace-filling polyhedra.

Column 5 identifies complementary allspace-filling polyhedra. These are: (a) the A and B Quanta Modules in combination with each other; (b) the tetrahedron and octahedron in combination with each other; and (c) the octahedron and vector equilibrium in combination with each other.

Column 6 presents the topological analysis in terms of Euler.

Columns 7 through 15 present the topological analysis in terms of synergetics, that is, with the polar vertexes extracted from the system and with the remainder divided by two.

Column 7 accounts the extraction of the polar vertexes. All systems have axes of spin. The axes have two poles. Synergetics extracts two vertexes from all Euler topological formulas to function as the poles of the axis of spin. Synergetics speaks of these two polar vertexes as the additive two. It also permits polar coupling with other rotative systems. Therefore a motion system can have associability.

Column 9 recapitulates *Columns 7 and 8* in terms of the equation of constant relative abundance.

Column 10 accounts synergetics multiplicative two.

Column 11. The synergetics constants of all systems of Universe are the additive two and the multiplicative two—the Holy Ghost; the Heavenly Twins; a pair of twins.

Columns 12 and 15 identify which of the first four prime numbers are applicable to the system considered.

Column 13 recapitulates *Columns 11 and 12.*

223.67 Synergetics Hierarchy: The Table of Synergetics Hierarchy (223.64) makes it possible for us to dispense with the areas and lines of Euler's topological accounting; the hierarchy provides a definitive description of all omnitriangulated polyhedral systems exclusively in terms of points and prime numbers.

223.70 Planck's Constant

223.71 Planck's constant: symbol = h . $h = 6.6$ —multiplied by 10^{-27} grams per square centimeters per each second of time. The constant h is the invariable number found empirically by Planck by which the experimentally discovered, uniformly energized, *minimum increment of all radiation*, the *photon*, must be multiplied to equate the photon's energy value as rated by humans' energy-rating technique, with the effort expended in lifting weights vertically against gravity given distances in given times. Thus automotive horsepower or electromagnetic kilowatts per hour performance of stationary prime movers, engines, and mobile motors are rated.

223.72 Max Planck's photons of light are separately packaged at the radiation source and travel in a group-coordinated flight formation spherical surface pattern which is ever expanding outwardly as they gradually separate from one another. Every photon always travels radially away from the common origin. This group-developed pattern produces a sum-totally expanding spherical wave-surface determined by the plurality of outwardly traveling photons, although any single photon travels linearly outwardly in only one radial direction. This total energy effort is exactly expressed in terms of the exponential second-power, or areal "squaring," rate of surface growth of the overall spherical wave; i.e., as the second power of the energy effort expended in lifting one gram in each second of time a distance of one "vertical" centimeter radially outward away from the origin center.

223.73 *Whereas:* All the volumes of all the equi-edged regular polyhedra are irrational numbers when expressed in the terms of the volume of a cube = 1;
Whereas: The volume of the cube and the volumes of the other regular polyhedra, taken singly or in simple groups, are entirely rational;
Whereas: Planck's constant was evaluated in terms of the cube as volumetric unity and upon the second-power rate of surface expansion of a cube per each second of time;

Whereas: Exploring experimentally, synergetics finds the tetrahedron, whose volume is one-third that of the cube, to be the prime structural system of Universe: *prime structure* because stabilized exclusively by triangles that are experimentally demonstrable as being the only self-stabilizing polygons; and *prime system* because accomplishing the subdivision of all Universe into an interior microcosm and an external macrocosm; and doing so structurally with only the minimum four vertexes topologically defining insiderness and outsiderness;

Whereas: Structuring stability is accomplished by triangularly balanced energy investments;

Whereas: Cubes are unstable;

Whereas: The radial arrangement of unit tetrahedral volumes around an absolute radiation center (the vector equilibrium) constitutes a prime radiational-gravitational energy proclivity model with a containment value of 20 tetrahedra (where cube is 3 and tetrahedron 1);

Whereas: Max Planck wished to express the empirically emerged value of the photon, which constantly remanifested itself as a unit-value energy entity in the energy-measuring terms of his contemporary scientists;

Wherefore: Planck employed the XYZ rectilinear frame of shape, weight, volume, surface, time, distance, antigravity effort, and metric enumeration, mensuration

tools adopted prior to the discovery of the photon value.

223.74 Planck's constant emerged empirically, and to reconvert it to conformity with synergetics the 6.6ness is canceled out:

$$6.6 = \frac{20}{3} = \frac{\text{volume of vector equilibrium}}{\text{volume of cube}}$$

Therefore, to convert to synergetics accounting, we multiply Planck's $6.6 \times 3 = 20$. As seen elsewhere in synergetics' topology, the number of surface points of the identically vector-radiused and vector-chorded system's vector equilibrium—as well as of its spherical icosahedron counterpart—always multiplies at a second-power rate of the frequency (of modular subdivision of the radius vector of the system) times 10 to the product of which is added the number 2 to account for the axial rotation poles of the system, which twoness, at the relatively high megacycle frequencies of general electromagnetic wave phenomena, becomes an undetectable addition.

223.75 In synergetics' topological accounting, surface areas are always structural triangles of the systems, which systems, being vectorially structured, are inherently energy- investment systems. As synergetics' topology also shows, the number of triangular surface areas of the system increases at twice the rate of the nonpolar surface points, ergo the rate of energetic system's surface increase is accounted in terms of the number of the triangular areas of the system's surface, which rate of system surface increase is $20F^2$, where F = frequency; while the rate of volumetric increase is $20F^3$. The vector is inherent in the synergetics system since it is structured with the vector as unity. Because vectors = mass \times velocity, all the factors of time, distance, and energy, as both mass and effort as well as angular direction, are inherent; and E as energy quantum of one photon = $20F^2$.

223.80 **Energy Has Shape**

223.81 I recognize the experimentally derived validity of the *coordinate invariant* the result does not depend on the coordinate system used. Planck's constant is just what it says it is: an experimentally ascertained constant cosmic relationship. Planck's constant as expressed is inherently an irrational number, and the irrationality relates to the invariant quantum of energy being constantly expressed exclusively in the volume-weight terms of a special-case *shape* which, in the geometrical shape-variant field of weight-strength and surface-volume ratio limits of local structural science containment of energy, as mass or effort, by energy-as-structure, is neither maximum nor minimum. The special-case geometrical shape chosen arbitrarily by the engineering-structures-eschewing pure scientists for their energy-measurement accommodation, that of the cube, is structurally unstable; so much so as to be too unstable to be classified as a structure. Unwitting of this mensural shortcoming, Planck's constant inadvertently refers to the cube, implicit to the gram, as originally adopted to provide an integrated unit of weight-to-volume mensuration, as was the "knot" adopted by navigators as a velocity unit which integrates time-space incrementation values. The volume and weight integrate as a gram. The gram was arbitrarily assumed to be constituted by a cubic centimeter of water at a specific temperature, 4 degrees centigrade.

223.82 Relationship constants are always predicated on limits. Only limits are invariable. (This is the very essence of the calculus.) Variation is between limits. Though Planck's constant is indirectly predicated on a limit condition of physical phenomena, it is directly expressed numerically only as a prefabricated, constantly irrational number- proportionality to that limit, but it is not the inherently rational unit number of that limit condition. This is because the cube was nonstructural as well as occurring structurally between the specific limit cases of surface-to-volume ratio between whose limits of $1 \rightarrow 20$, the cube rates as 3.

223.83 Max Planck found a constant energy-value relationship emergent in all the photon-discovery experimental work of others. A great variety of exploratory work with measurements of energy behaviors in the field of radiation disclosed a hitherto unexpected, but persistent, minimum limit in relation to such energy phenomena. Planck expressed the constant, or limit condition, in the scientifically prevailing numerical terms of the physical and metaphysical equipment used to make the measuring. The measuring system included:

- the decimal system;
- the CG_tS and;
- XYZ coordinate analysis,

which themselves were procedurally assumed to present the comprehensively constant limit set of mensuration systems' input factors.

223.84 Let us assume hypothetically that Ponce de Leon did find the well of eternal- youth-sustaining water, and that the well had no "spring" to replenish it, and that social demand occasioned its being bailed out and poured into evaporation-proof containers; and that the scientists who bailed out that precious well of water used a cubically-shaped, fine- tolerance, machined and dimensioned one-inch-thick shelled, stainless steel bucket to do their carefully measured bailing and conserving task. They did so because they knew that cubes close-pack to fill allspace, and because water is a constant substance with a given weight per volume at a given temperature. And having ten fingers each, they decided to enumerate in the metric system without any evidence that meters are whole rational linear increments of a cosmic nature. Thus organized, the Ponce de Leon scientists soon exhausted the well, after taking out only six and two-thirds cubic bucket loads—with a little infinitely unaccountable, plus-or-minus, spillage or overestimate.

223.85 Planck's constant, h , denotes the minimum energy-as-radiation increment known experimentally by humans to be employed by nature, but the photon's energy value could and should be expressed in terms of a whole number as referenced directly by physical experiment to nature's limit-case transforming states.

223.86 Had, for instance, the well-of-youth-measuring scientists happened to be in a hurry and had they impatiently used a cubical container of the same size made of a thin-wall plastic such as the cubically shaped motel waste containers, they would have noticed when they stood their waterfilled plastic cube bucket on the ground beside the well that its sides bulged and that the level of the water lowered perceptibly below the container's rim; though this clearly was not caused by leaking, nor by evaporating, but because its shape was changing, and because its volume-to-container-surface ratio was changing.

223.87 Of all regular polyhedra, the sphere (i.e., the high-frequency, omnitriangulated, geodesic, spheroidal polyhedron) encloses the most volume with the least surface. Whereas the tetrahedron encloses the least volume with the most surface. The contained energy is at minimum in the tetrahedron. The structure capability is at maximum in the tetrahedron.

223.88 Planck did not deliberately start with the cube. He found empirically that the amount of the photon's energy could be expressed in terms of the CGS-XYZ decimal-enumeration coordinate system already employed by science as the "frame of reference"³ for his photon evaluation which, all inadvertently, was characterized by awkwardness and irrationality.

(Footnote 3: For "frame of reference" synergetics speaks of the "multi-optioned omni-orderly scheme of behavioral reference." See sec. [540](#).)

223.89 Energy has shape. Energy transforms and trans-shapes in an evolving way. Planck's contemporary scientists were not paying any attention to that. Science has been thinking shapelessly. The predicament occurred that way. It's not the size of the bucket—size is special case—they had the wrong shape. If they had had the right shape, they would have found a whole-rational-number constant. And if the whole number found was greater than unity, or a rational fraction of unity, they would simply have had to divide or multiply to find unity itself.

223.90 The multiplier 10^{-27} is required to reduce the centimeter magnitude of energy accounting to that of the tuned wavelength of the photon reception. Frequency and wave are covariably coupled; detection of one discloses the other. Since synergetics' vector equilibrium's energy converging or dispersing vector is both radially and chordally subdivided evenly by frequency—whatever that frequency may be—the frequency fractionates the unit vector energy involvement by one-to-one correspondence.

223.91 If they had taken the same amount of water at the same temperature in the form of a regular tetrahedron, they would have come out with a rational fraction of unity. They happened to be enumerating with congruence in modulo 10, which does not include any prime numbers other than 1, 2, and 5. The rational three-ness of the cube in relation to the tetrahedron is not accommodated by the decimal system; nor is the prime 7 inherent in modulo 10. Therefore, Planck's constant, while identifying a hitherto undiscovered invariant limit condition of nature, was described in the wrong frame of reference in awkward—albeit in a constantly awkward—term, which works, because it is the truth; but at the same time it befogs the otherwise lucid and rational simplicity covering this phenomenon of nature, just as does nature's whole number of utterly rational atoms exchanging rates in all her chemical combining and separating transactions accounting.

[Next Section: 234.00](#)

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224.00 **Principle of Angular Topology**

224.01 **Definition:** When expressed in terms of cyclic unity the sum of the angles around all the vertexes of a structural system, plus 720 degrees, equals the number of vertexes of the system multiplied by 360 degrees.

224.02 All local structural systems in Universe are always accomplished by nature through the elimination of 720 degrees of angle. This is the way in which nature takes two complete 360-degree angular tucks in the illusory infinity of a plane to render systems locally and visibly finite. The difference between visually finite systems and illusory infinity is two cyclic unities.

224.03 Structural systems are local, closed, and finite. They include all geometric forms, symmetric or asymmetric, simple or complex. Structural systems can have only one inside and only one outside. Two or more structures may be concentric and triangularly interconnected to operate as one structure.

224.04 The difference between the sum of all the angles around all the vertexes of *any* system and the total number of vertexes times 360° (as angular unity) is 720° , which equals two unities. The sum of the angles of a tetrahedron always equals 720° . The tetrahedron may be identified as the 720 differential between any definite local geometrical system (such as Greek "solid" geometry) and finite universe.

224.05 **Line:** A line has two vertexes with angles around each of its vertexial ends equal to 0° . The sum of these angles is 0° . The sum of the vertexes (two) times angular unity (360°) is 720° . The remainder of 0° from 720° is 720° , or two unities, or one tetrahedron. Q.E.D.

224.06 **Triangle:** The three angles of one "face" of a planar triangle always add up to 180° as a phenomenon independent of the relative dimensional size of the triangles. One-half of definitive cyclic unity is 180° . Every triangle has two faces—its obverse and reverse. Unity is two. So we note that the angles of both faces of a triangle add up to 360° . Externally, the sum of the angles around each of the triangle's three vertexes is 120° , of which 60° is on the obverse side of each vertex; for a triangle, like a line, if it exists, is an isolatable system always having positive and negative aspects. So the sum of the vertexes around a triangle (three) times 360° equals 1080° . The remainder of 360° from 1080° leaves 720° , or one tetrahedron. Q.E.D.

224.07 **Sphere:** The Greeks defined the sphere as a surface outwardly equidistant in all directions from a point. As defined, the Greeks' sphere's surface was an absolute continuum, subdividing all the Universe outside it from all the Universe inside it; wherefore, the Universe outside could be dispensed with and the interior eternally conserved. We find local spherical systems of Universe are definite rather than infinite as presupposed by the calculus's erroneous assumption of 360-degree-ness of surface plane azimuth around every point on a sphere. All spheres consist of a high-frequency constellation of event points, all of which are approximately equidistant from one central event point. All the points in the surface of a sphere may be interconnected. Most economically interconnected, they will subdivide the surface of the sphere into an omnitriangulated spherical web matrix. As the frequency of triangular subdivisions of a spherical constellation of omnitriangulated points approaches subvisibility, the difference between the sums of the angles around all the vertex points and the numbers of vertexes, multiplied by 360 degrees, remains constantly 720 degrees, which is the sum of the angles of two times unity (of 360 degrees), which equals one tetrahedron. Q.E.D.

224.08 **Tetrahedron:** The sum of the angles of a tetrahedron, regular or irregular, is always 720° , just as the sum of the angles of a planar triangle is always 180° . Thus, we may state two propositions as follows:

224.081 The sum of the surface angles of any polyhedron equals the number of vertexes multiplied by 360° minus one *tetrahedron*; and

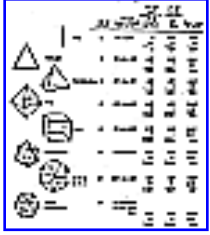
224.082 The sum of the angles of any polyhedron (including a sphere) is always evenly divisible by one *tetrahedron*.

224.10 Descartes: Descartes is the first of record to have discovered that the sum of the angles of a polyhedron is always 720° less than the number of vertexes times 360° . Descartes did not equate the 720° with the tetrahedron or with the one unit of energy quantum that it vectorially constitutes. He did not recognize the constant, whole difference between the visibly definite system and the invisibly finite Universe, which is always exactly one finite invisible tetrahedron outwardly and one finite invisible tetrahedron inwardly.

224.11 **The Calculus:** The calculus assumes that a sphere is infinitesimally congruent with a sphere to which it is tangent. The calculus and spherical trigonometry alike assume that the sum of the angles around any point on any sphere's surface is always 360 degrees. Because spheres are not continuous surfaces but are polyhedra defined by the vectorially interconnecting chords of an astronomical number of event foci (points) approximately equidistant from one approximate point, these spherically appearing polyhedra—whose chords emerge from lesser radius midpoints to maximum radius convergences at each of the spherically appearing polyhedra's vertexes, ergo, to convex external joining—must follow the law of polyhedra by which the sum of all the angles around the vertexes of the polyhedra is always 720 degrees less than 360 degrees times the number of vertexes. The demonstration thus far made discloses that the sum of the angles around all the vertexes of a sphere will always be 720 degrees or one tetrahedron—less than the sum of the vertexes times 360 degrees—ergo, one basic assumption of the calculus and spherical trigonometry is invalid.

224.12 **Cyclic Unity:** We may also say that: where unity (1) equals 360° , 180° equals one-half unity ($1/2$), and that 720° equals two times unity (2); therefore, we may identify a triangle as one-half unity and a tetrahedron as cyclic unity of two. As the sum of a polyhedron's angles, 720° is unique to the tetrahedron; 720° is the angular name of the tetrahedron. 720° is two cyclic unities. The tetrahedron is the geometrical manifest of "unity is plural and, at minimum, is two." The tetrahedron is twoness because it is congruently both a concave tetrahedron and a convex tetrahedron.

224.13 Where cyclic unity is taken as 360 degrees of central angle, the difference between infinity and finity is always exactly *two*, or 720 degrees, or two times 360 degrees, or two times unity. Cyclic unity embraces both wave and frequency since it represents angles as well as cycles. This is topologically manifest in that the number of vertexes in any structural system multiplied by 360 degrees, minus two times 360 degrees, equals the sum of the angles around all the vertexes of the system.



224.20 **Equation of Angular Topology:**

$$S + 720^\circ = 360^\circ X^n$$

Where:

S = the sum of all the angles around all the vertexes (crossings)

X^n = the total number of vertexes (crossings)

[Table 224.20](#)

224.30 **Polarity:** Absolutely straight lines or an absolutely flat plane would theoretically continue outward to infinity. The difference between infinity and finity is governed by the taking out of angular sinuses, like pieces of pie, out of surface areas around a point in an absolute plane. This is the way lampshades and skirts are made. Joining the sinused fan-ends together makes a cone; if two cones are made and their open (ergo, infinitely trending) edges are brought together, a finite system results. It has two polar points and an equator. These are inherent and primary characteristics of all systems.

224.40 **Multivalent Applications:** Multiple-bonded bivalent and trivalent tetrahedral and octahedral systems follow the law of angular topology. Single-bonded monovalent tetrahedral and octahedral arrangements do not constitute a system; they are half systems, and in their case the equation would be:

$$S + 360^\circ = 360^\circ X^n$$

224.50 **Corollary: Principle of Finite Universe Conservation:** By our systematic accounting of angularly definable convex-concave local systems, we discover that the sum of the angles around each of every local system's interrelated vertexes is always two cyclic unities less than universal nondefined finite totality. We call this discovery the principle of finite Universe conservation. Therefore, mathematically speaking, all defined conceptioning always equals finite Universe minus two. The indefinable quality of finite Universe inscrutability is exactly accountable as two.

224.60 **Tetrahedral Mensuration:** The sum of the angles around all vertexes of any polyhedral system is evenly divisible by the sum of the angles of a tetrahedron. The volumes of all systems may be expressed in tetrahedra.



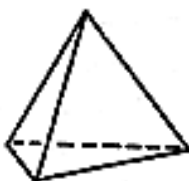

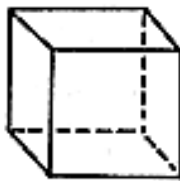

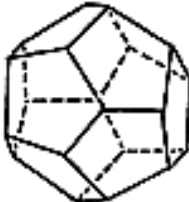

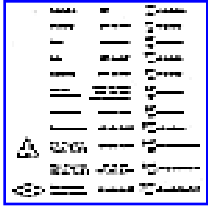
	No. of Vertices	Sum of Angles around each Vertex	Sum of angles multiplied by No. of Vertices. De-Finite	No. of Vertices multiplied by 360°. Finite	Finite minus De-Finite
	2	$0^\circ \times 1 = 0^\circ$	0° $\times 2$ <hr/> 0°	360° $\times 2$ <hr/> 720°	720° $- 0$ <hr/> 720°
	3	$60^\circ \times 2 = 120^\circ$	120° $\times 3$ <hr/> 360°	360° $\times 3$ <hr/> 1080°	1080° $- 360$ <hr/> 720°
	4	$60^\circ \times 3 = 180^\circ$	180° $\times 4$ <hr/> 720°	360° $\times 4$ <hr/> 1440°	1440° $- 720$ <hr/> 720°
	6	$60^\circ \times 4 = 240^\circ$	240° $\times 6$ <hr/> 1440°	360° $\times 6$ <hr/> 2160°	2160° $- 1440$ <hr/> 720°
	8	$90^\circ \times 3 = 270^\circ$	270° $\times 8$ <hr/> 2160°	360° $\times 8$ <hr/> 2880°	2880° $- 2160$ <hr/> 720°
	12	$60^\circ \times 5 = 300^\circ$	300° $\times 12$ <hr/> 3600°	360° $\times 12$ <hr/> 4320°	4320° $- 3600$ <hr/> 720°
	20	$108^\circ \times 3 = 324^\circ$	324° $\times 20$ <hr/> 6480°	360° $\times 20$ <hr/> 7200°	7200° $- 6480$ <hr/> 720°
	12	$90^\circ \times 2 = 180^\circ$ $60^\circ \times 2 = 120^\circ$ <hr/> 300°	300° $\times 12$ <hr/> 3600°	360° $\times 12$ <hr/> 4320°	4320° $- 3600$ <hr/> 720°

Table 224.20 Angular Topology Independent of Size.



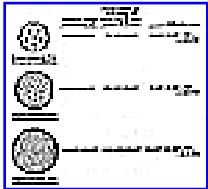
224.70 *Equation of Tetrahedral Mensuration:*

Sum of face angles

$$\frac{\text{-----}}{720^\circ} = n \text{ tetrahedra}$$

[Table 224.70A](#)

Where: $720^\circ =$ one tetrahedron



[Table 224.70B](#)

225.00 Principle of Design Covariables

225.01 **Definition:** The principle of design covariables states that angle and frequency modulation, either subjective or objective in respect to man's consciousness, discretely defines all events or experiences which altogether constitute Universe.

225.02 There are only two possible covariables operative in all design in the Universe. They are modifications of angle and frequency.

225.03 Local structure is a set of frequency associable (spontaneously tunable), recollectible experience relationships, having a regenerative constellar patterning as the precessional resultants of concentrically shunted, periodic self-interferences, or coincidences of its systematic plurality of definitive vectorial frequency wavelength and angle interrelationships.

226.00 **Principle of Functions**

226.01 **Definition:** The principle of functions states that a function can always and only coexist with another function as demonstrated experimentally in all systems as the outside-inside, convex-concave, clockwise-counterclockwise, tension-compression couples.

226.02 Functions occur only as inherently cooperative and accommodatively varying subspects of synergetically transforming wholes.

226.10 **Corollary: Principle of Complementarity:** A corollary of the principle of functions is the principle of complementarity, which states that two descriptions or sets of concepts, though mutually exclusive, are nevertheless both necessary for an exhaustive description of the situation.



	Tetrahedron	720°	$\frac{720^\circ}{720^\circ} = 1$ tetrahedron
	Octahedron	$240^\circ \times 6 = 1440^\circ$	$\frac{1440^\circ}{720^\circ} = 2$ tetrahedra
	Prism	$240^\circ \times 6 = 1440^\circ$	$\frac{1440^\circ}{720^\circ} = 2$ tetrahedra
	Cube	$270^\circ \times 8 = 2160^\circ$	$\frac{2160^\circ}{720^\circ} = 3$ tetrahedra
	Icosahedron	$500^\circ \times 12 = 5600^\circ$	$\frac{5600^\circ}{720^\circ} = 5$ tetrahedra
	Rhombic Dodecahedron	$109^\circ 28' \times 24 = 2628^\circ$ $70^\circ 32' \times 24 = 1692^\circ$ $2628^\circ + 1692^\circ = 4320^\circ$	$\frac{4320^\circ}{720^\circ} = 6$ tetrahedra
	Dodecahedron	$524^\circ \times 20 = 6480^\circ$	$\frac{6480^\circ}{720^\circ} = 9$ tetrahedra
	Triacontahedron	$180^\circ \times 60 = 10,800^\circ$	$\frac{10,800^\circ}{720^\circ} = 15$ tetrahedra
	Two Frequency Regular Geodesic	$180^\circ \times 80 = 14,400^\circ$	$\frac{14,400^\circ}{720^\circ} = 20$ tetrahedra = 5×2^2
	Three Frequency Alternate Geodesic	$20^\circ \times 9 = 180^\circ$ $180^\circ \times 180 = 32,400^\circ$	$\frac{32,400^\circ}{720^\circ} = 45$ tetrahedra = 5×3^2
	Four Frequency Triacon Geodesic	$180^\circ \times 240 = 43,200^\circ$	$\frac{43,200^\circ}{720^\circ} = 60$ tetrahedra = 15×2^2

Table 224.70A *Tetrahedral Mensuration Applied to Well-Known Polyhedra*. We discover that the sum of the angles around all vertexes of all solids is evenly divisible by the sum of the angles of a tetrahedron. The volumes of all solids may be expressed in tetrahedra.




	<u>Number of Vertices Multiplied by 360°</u>	<u>Number of Triangles Multiplied by 180° Equals Sum of Angles around All Vertices</u>	<u>Difference</u>
 Regular Geodesic Two-Frequency Icosahedron	$42 \times 360^\circ = 15,120^\circ$	$80 \times 180^\circ = 14,400^\circ$	$15,120^\circ - 14,400^\circ = 720^\circ =$ 1 tetrahedron
 Regular Geodesic Four-Frequency Icosahedron	$162 \times 360^\circ = 58,320^\circ$	$320 \times 180^\circ = 57,600^\circ$	$58,320^\circ - 57,600^\circ = 720^\circ =$ 1 tetrahedron
 Regular Geodesic Nine-Frequency Icosahedron	$812 \times 360^\circ = 292,320^\circ$	$1620 \times 180^\circ = 291,600^\circ$	$292,320^\circ - 291,600^\circ = 720^\circ =$ 1 tetrahedron

Table 224.70B *Tetrahedral Mensuration Applied to Spheres.*

226.11 Every fundamental behavior patterning in Universe always and only coexists with a complementary but non-mirror-imaged patterning.

227.00 Principle of Order Underlying Randomness

[Table 227.01](#)

227.01 **Definition:** The number of relationships between events is always

$$\frac{N^2 - N}{2}$$

Where: N = the number of events of consideration

227.02 The relationships between four or more events are always greater in number than the number of events. The equation expresses the conceptuality of the number of the most economical relationships between events or the minimum number of interconnections of all events.














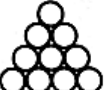



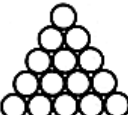



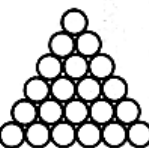



227.03 The number of telephone lines necessary to interequip various numbers of individuals so that any two individuals will always have their unique private telephone line is always $(N^2 - N)/2$, where N is the number of telephones. This is to say that all the special interrelationships of all experiences define comprehension, which is the number of connections necessary to an understanding of "what everything is all about." When we understand, we have all the fundamental connections between the star events of our consideration. When we add up all the accumulated relationships between all the successive experiences in our lives, they will always combine cumulatively to comprise a tetrahedron, simple or compound.

228.00 Scenario Principle

228.01 **Definition:** The scenario principle discloses that the Universe of total man experience may not be simultaneously recollected and reconsidered, but may be progressively subdivided into a plurality of locally tunable event foci or "points," of which a minimum of four positive and four negative are required as a "considerable set," that is, as the first finite subdivision of finite Universe.

228.10 **Considerable Set:** All experience is reduced to nonsimultaneously "considerable sets"; irrelevant to consideration are all those experiences that are either too large and therefore too infrequent, or too minuscule and therefore too frequent, to be tunably considerable as pertaining to the residual constellation of approximately congruent recollections of experiences.

UNDERLYING ORDER IN RANDOMNESS

No. of Events	Conceptuality of number of most economical relationships between events or minimum number of inter-connections of all events	No. of Relationships $\frac{n^2 - n}{2}$	Closest packed, symmetrical and most economical conceptual arrangement of number relationships.	Sum of Adjacent Relationships $(n-1)^2$	Conceptuality in closest packed Symmetry Note: This occurs as \diamond "diamonds" and not as \square "squares".	Sum of Experiences or of Events Is Always Tetrahedral
1		0				
2	 AB	1		$0 + 1 = 1$		
3	 AB, BC, AC	3		$1 + 3 = 4$		
4	 AB, BC, CD, AC, BD, AD	6		$3 + 6 = 9$		
5		10		$6 + 10 = 16$		
6		15		$10 + 15 = 25$		
7		21		$15 + 21 = 36$		
7	 Same number of events could be in random array but minimum total of relationships are same in number.	21				

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Table 227.01 Underlying Order in Randomness.

228.11 A "considerable set" inherently subdivides all the rest of irrelevant experiences of Universe into macrocosmic and microcosmic sets immediately outside or immediately inside the considered set of experience foci.

228.12 **Scenario Principle:** Considerable Set: In considering all experiences, the mistakes of the past and the anticipations of the future are metaphysically irrelevant. We do not have to be preoccupied with hypothetical or potential experiences because we are always living in the *now*. Living in the present tense obviates impatience. (See Sec. [529.11](#).)

229.00 **Principle of Synergetic Advantage**

229.01 **Definition:** The principle of synergetic advantage states that macro → micro does not equal micro → macro. Synergetic advantage is only to be effected by macro → micro procedure. Synergetic advantage procedures are irreversible. Micro → macro procedures are inherently frustrated.

229.02 The notion that commencing the exploration of the unknown with unity as one (such as Darwin's single cell) will provide simple and reliable arithmetical compounding (such as Darwin's theory of evolution: going from simple → complex; amoeba → monkey → man) is an illusion that as yet pervades and debilitates elementary education.

229.03 Synergy discloses that the information to be derived from micro → macro educational strategy fails completely to predict the experimentally demonstrable gravitational or mass-attraction integrities of entropically irreversible, universal scenario reality.

229.04 Human experience discloses the eminent feasibility of inbreeding biological species by mating like types, such as two fast-running horses. This concentrates the fast- running genes in the offspring while diminishing the number of general adaptability genes within the integral organism. This requires the complementary external care of the inbred specialist through invention or employment of extracorporeal environmental facilities—biological or nonbiological. It is easy to breed out metaphysical intellection characteristics, leaving a residual concentration of purely physical proclivities and evolving by further inbreeding from human to monkey. (Witness the millions of dollars society pays for a "prizefight" in which two organisms are each trying to destroy the other's thinking mechanism. This and other trends disclose that a large segment of humanity is evolving toward producing the next millennia's special breed of monkeys.) There is no experimental evidence of the ability to breed in

the weightless, metaphysically oriented mind and its access to conceptions of eternal generalized principles.

229.05 All known living species could be inbreedingly isolated from humans by environmental complementation of certain genetic proclivities and lethal exclusion of others, but there is no experimental evidence of any ability to compound purely physical proclivity genes to inaugurate metaphysical behaviors humanity's complex metaphysical- physical congruence with the inventory of complex behavioral characteristics of Universe.

229.06 Universe is the aggregate of eternal generalized principles whose nonunitarily conceptual scenario is unfoldingly manifest in a variety of special cases in local time-space transformative evolutionary events. Humans are each a special-case unfoldment integrity of the complex aggregate of abstract weightless omni- interaccommodative maximally synergetic non-sensorial Universe of eternal timeless principles. Humanity being a macro → micro Universe, unfolding eventuation is physically irreversible yet eternally integrated with Universe. Humanity cannot shrink and return into the womb and revert to as yet unfertilized ova.

229.10 **Corollary: Principle of Irreversibility:** The principle of irreversibility states that the evolutionary process is irreversible locally in physical "time-space"—that is, in frequency and angle definitioning, because the antientropic metaphysical world is not a mirror-imaged reversal of the entropic physical world's disorderly expansiveness.

230.00 **Tetrahedral Number**

230.01 **Definition:** The number of balls in the longest row of any triangular unit-radius ball cluster will always be the same as the number of rows of balls in the triangle, each row always having one more than the preceding row, and the number of balls in the complete triangular cluster will always be

$$\frac{(R + 1)^2 - (R + 1)}{2}$$

Where: R = the number of rows of balls, or the number of balls in the longest row.

230.02 We can stack successively rowed triangular groups of balls on top of one another with one ball on the top, three below that, and six below that, as cannon balls or oranges are stacked. Such stacks are always inherently tetrahedral. We can say that the sum of all the interrelationships of all our successive experiences from birth to now—for each individual, as well as for the history of all humanity—is always a tetrahedral number.

231.00 **Principle of Universal Integrity**

231.01 **Definition:** The principle of universal integrity states that the wide-arc tensive or *implosive* forces of Universe always inherently encompass the short-arc vectorial, explosive, disintegrative forces of Universe.

231.02 The gravitational constant will always be greater than the radiational constant—minutely, but always so. (For further exposition of this principle, see Secs. [251.05](#), [529.03](#), [541](#) and [1052](#).)

232.00 **Principle of Conservation of Symmetry**

232.01 **Definition:** Whereas the tetrahedron has four symmetrically interarrayed poles in which the polar opposites are four vertexes vs. four faces; and whereas the polar axes of all other symmetrical structural systems consist of vertex vs. vertex, or mid-edge vs. mid-edge, or face vs. face; it is seen that only in the case of vertex vs. face—the four poles of the tetrahedron—do the four vertexial “points” have polar face vacancies or “space” into which the wavelinear coil spring legs of the tetrahedron will permit those four vertexes to travel. The tetrahedron is the only omnisymmetrical structural system that can be turned inside out. (See Secs. [624.05](#), [905.18](#) and [905.19](#).)

232.02 Take the rubber glove that is green outside and red inside. Stripped off, it becomes red. The *left-handedness* is annihilated: inside-outing. You do not lose the convex-concave; all you lose is the *leftness* or the *rightness*. Whether it is a tree or a glove, each limb or finger is a tetrahedron.

232.03 Synergetics shows that the tetrahedron can be extrapolated into life in all its experience phases, thus permitting humanity's entry into a new era of cosmic awareness.

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240.00 Synergetics Corollaries

240.01 Universe is finite.

240.02 Local systems are de-finite.

240.03 Unity is complex and at minimum two.

240.04 The tetrahedron is the lowest common rational denominator of Universe. The four unique quanta numbers of each and every fundamental "particle" are the four unique and minimum "stars" of every tetrahedron.

240.05 A "point" is a tetrahedron of negligible altitude and base dimensions.

240.06 A "line" (or trajectory) is a tetrahedron of negligible base dimension and significant altitude.

240.07 A "plane" (or opening) is a tetrahedron of negligible altitude and significant base dimensionality.

240.08 There are no solids or particles—no-things.

240.09 A point is an as yet undifferentiated focal star embracing a complex of local events.

240.10 There are no indivisible points.

240.11 Unities may be treated as complex star points.

240.12 For every point in Universe, there are six uniquely and exclusively operating vectors.

240.13 Vectors are size.

No vectors = No size.

No size = No vectors.

240.14 The size of a vector is its overall wavelinear length.

240.15 There are six vectors or none.

240.16 Every event has size.

240.17 Every event is six-vectored.

240.18 Six unique vectors constitute a tetrahedral event.

240.19 Each vector is reversible, having its negative alternate.

240.20 All "lines," trajectories, are the most economic vectorial interrelationships of nonsimultaneous but approximately concurrent local-event foci .

240.21 Potentially straight-line relationships require instantaneity or actions in no- time; therefore, straight lines are nondemonstrable.

240.22 The overall longitudinal length of wavelinear vectorial lines is determined by the number of waves contained.

240.23 The number of waves longitudinally accomplished in a given time constitutes frequency.

240.24 Physics has never made an experimentally demonstrable discovery of a straight line. Physics has found only waves and frequencies, i.e., angle and frequency modulation.

240.25 There are no straight lines, physical or metaphysical. There are only geodesic, i.e., most economical, interrelationships (vectors).

240.26 All "lines," trajectories, are complexedly curved.

240.27 Vectorial lines, or "trajectories," are always the most economical event interrelationships, ergo, geodesic.

240.28 Every "point" (event embryo) may articulate any one of its four event vector sets, each consisting of six positive and six negative vectors, but only one set may be operative at any one time; its alternate sets are momentarily only potential.

240.29 Potential lines are only inscrutably nonstraight; all physically realized relationships are geodesic and wavelinear.

240.30 Two energy event trajectories, or "lines," cannot go through the same point at the same time.

240.31 All geodesic lines, "trajectories," weave four-dimensionally amongst one another without ever touching one another.

240.32 It takes a minimum of six interweaving trajectories to isolate insideness from outsideness, ergo, to divide all Universe systematically into two parts—macrocosm and microcosm.

240.33 A six-trajectory isolation of insideness and outsideness has four interweaving vertexes or prime convergences of the trajectories, and four areal subdivisions of its isolation system, and constitutes a tetrahedron.

240.34 Tetrahedrons occur conceptually, independent of realized events and relative size.

240.35 Whereas none of the geodesic lines, "trajectories," of Universe touch one another, the lines, "trajectories," approach one another, passing successively through regions of most critical proximity, and diverge from one another, passing successively through regions of most innocuous remoteness.

240.36 All lines, "trajectories," ultimately return to close proximity with themselves.

240.37 Where all the local vectors are approximately equal, we have a potentially local isotropic vector equilibrium, but the operative vector complex has the inherent qualities of both proximity and remoteness in respect to any locally initiated action, ergo, a complex of relative velocities of realization lags. (See Sec. [425.01](#).)

240.38 Universe is a nonsimultaneously potential vector equilibrium.

240.39 All local events of Universe may be calculatively anticipated by inaugurating calculation with a local vector equilibrium frame and identifying the disturbance initiating point, directions, and energies of relative asymmetrical pulsings of the introduced action. (See Sec. [962.30](#).)

240.40 In the isotropic vector matrix derived from the closest packing of spheres, every vector leads from one nuclear center to another, and therefore each vector represents the operational effect of a merging of two force centers upon each other. Each vector is composed of two halves, each half belonging respectively to any two adjacent nuclear centers; each half of the vector is the unique radius of one of the tangent spheres that is perpendicular to the point of tangency. The half-vector radii of the isotropic vector matrix are always perpendicular to the points of tangency; therefore they operate as one continuous vector. Unity, as represented by the internuclear vector modulus, is of necessity always of the value of two; that is, unity is inherently two, for it represents union of a minimum of two energy centers.

240.41 Synergetics' six positive and six negative omnisymmetrical, potential realization, least effort interpatterning, evolutionary schemata reference frames are reinitiated and regenerated in respect to specific local energy event developments and interrelationships of Universe. (See Sec. [537.14](#).)

240.42 Arithmetical one-dimensionality is identified geometrically with linear (trajectory) pointal frequency.

240.43 Arithmetical two-dimensionality is identified geometrically with areal (openings) growth rate.

240.44 In a radiational (eccentric) or gravitational (concentric) wave system: *Arithmetical three-dimensionality* is identified with volumetric space growth rates;

Arithmetical four-dimensionality is unidentifiable geometrically;

Synergetical *second-powering* is identified with the point population of the progressively embracing, closest-packed arrays at any given radius stated in terms of frequency of modular subdivisions of the circumferential array's radially-read concentricity layering;

Synergetical *third-powering* is identified with the cumulative total point population of all the successive wave layer embracements of the system;

Synergetical *fourth-powering* is identified with the interpointal domain volumes; and

Fifth- and *sixth-powerings* are identified as products of multiplication by frequency doublings and treblings, and are geometrically identifiable.

240.45 Synergetical six-dimensionality is identified geometrically with vectorial system modular frequency relationship.

240.46 Synergetical size dimensionality is identified geometrically with relative frequency modulation.

240.47 Dimension may be universally and infinitely altered without altering the constant vectorial integrity of the system.

240.48 There is no dimension without time.

240.49 Doubling or halving dimension increases or decreases, respectively, the magnitude of volume or force by expansive or contractive increments of eight, that is, by octave values.

240.50 Identically dimensioned nuclear systems and layer growths occur alike, relative to each and every absolutely compacted sphere of the isotropic vector matrix conglomerate, wherefore the integrity of the individual energy center is mathematically demonstrated to be universal both potentially and kinetically. (See Sec. [421.10](#).)

240.51 Frequency is multicyclic fractionation of unity.

- 240.52 A minimum of two cycles is essential to frequency fractionation.
- 240.53 Angle is subcyclic—that is, fractionation of one cycle.
- 240.54 Angular relationships and magnitudes are subcyclic; ergo, subfrequency; ergo, independent of size.
- 240.55 Shape is exclusively angular.
- 240.56 Shape is independent of size.
- 240.57 Abstraction means pattern relationship independent of size. Shape being independent of size is abstractable.
- 240.58 Abstractions may be stated in pure principle of relationship.
- 240.59 Abstractions are conceptually shapable!
- 240.60 Different shapes—ergo, different abstractions—are nonsimultaneous; but all shapes are de-finite components of integral though nonsimultaneous—ergo, shapeless—Universe.
- 240.61 There are no impervious surface continuums.
- 240.62 In a structural system, there is only one insiderness and only one outsiderness. (See Sec.[602.02](#).)
- 240.63 At any instant of time, any two of the evenly coupled vertexes of a system function as poles of the axis of inherent rotatability.
- 240.64 In a structural system:
- (a) the number of vertexes (crossings) is always evenly divisible by two;
 - (b) the number of faces (openings) is always evenly divisible by four; and
 - (c) the number of edges (trajectories) is always evenly divisible by six. (See Sec.[604.01](#).)

240.65 The six edges of the tetrahedron consist of two sets of three vectors, each corresponding to the three-vector teams of the proton and neutron, respectively. Each of these three-vector teams is identified by nuclear physics as

one-half quantum, or

one-half Planck's constant, or

one-half spin,

with always and only co-occurring proton and neutron's combined two sets of three- vector teams constituting one quantum of energy, which in turn is vectorially identifiable as the minimum structural system of Universe.

240.66 All structural phenomena are accounted in terms of tetrahedron, octahedron, vector equilibrium, and icosahedron.

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250.00 Discoveries of Synergetics

250.01 Discovery

250.02 Discoveries are uniquely regenerative to the explorer and are most powerful on those rare occasions when a generalized principle is discovered. When mind discovers a generalized principle permeating whole fields of special-case experiences, the discovered relationship is awesomely and elatingly beautiful to the discoverer personally, not only because to the best of his knowledge it has been heretofore unknown, but also because of the intuitively sensed potential of its effect upon knowledge and the consequently improved advantages accruing to humanity's survival and growth struggle in Universe. The stimulation is not that of the discoverer of a diamond, which is a physical entity that may be monopolized or exploited only to the owner's advantage. It is the realization that the newly discovered principle will provide spontaneous, common-sense logic engendering universal cooperation where, in many areas, only confusion and controversy had hitherto prevailed.

250.10 Academic Grading Variables in Respect to Science Versus Humanities

250.101 Whether it was my thick eyeglasses and lack of other personable favors, or some other psychological factors, I often found myself to be the number-one antifavorite amongst my schoolteachers and pupils. When there were disturbances in the classroom, without looking up from his or her desk, the teacher would say, "One mark," or "Two marks," or "Three marks for Fuller." Each mark was a fifteen-minute penalty period to be served after the school had been let out for the others. It was a sport amongst some of my classmates to arrange, through projectiles or other inventions, to have noises occur in my vicinity.

250.11 Where the teacher's opinion of me was unfavorable, and that, in the humanities, was—in the end—all that governed the marking of papers, I often found myself receiving lower grades for reasons irrelevant to the knowledge content of my work—such as my handwriting. In science, and particularly in my mathematics, the answers were either right or wrong. Probably to prove to myself that I might not be as low-average as was indicated by the gradings I got in the humanities, I excelled in my scientific classes and consistently attained the top grades because all my answers were correct. Maybe this made me like mathematics. But my mathematics teachers in various years would say, “You seem to understand math so well, I’ll show you some more if you stay in later in the afternoon.” I entered Harvard with all As in mathematics, biology, and the sciences, having learned in school advanced mathematics, which at that time was usually taught only at the college level. Since math was so easy, and finding it optional rather than compulsory at Harvard, I took no more of its courses. I was not interested in getting grades but in learning in areas that I didn't know anything about. For instance, in my freshman year, I took not only the compulsory English A, but Government, Musical Composition, Art Appreciation, German Literature, and Chemistry. However, I kept thinking all the time in mathematics and made progressive discoveries, ever enlarging my mathematical vistas. My elementary schoolwork in advanced mathematics as well as in physics and biology, along with my sense of security in relating those fields, gave me great confidence that I was penetrating the unfamiliar while always employing the full gamut of rigorous formulation and treatment appropriate to testing the validity of intuitively glimpsed and tentatively assumed enlargement of the horizon of experientially demonstrable knowledge.

250.12 My spontaneous exploration of mathematics continued after I left Harvard. From 1915 to 1938—that is, for more than twenty years after my days in college—I assumed that what I had been discovering through the postcollege years, and was continuing to discover by myself, was well known to mathematicians and other scientists, and was only the well-known advanced knowledge to which I would have been exposed had I stayed at Harvard and majored in those subjects. Why I did not continue at Harvard is irrelevant to academics. A subsequent special course at the U. S. Naval Academy, Annapolis, and two years of private tutelage by some of America's leading engineers of half a century ago completed my formally acknowledged “education.”

250.20 **My Independent Mathematical Explorations**

250.21 In the twentieth year after college, I met Homer Lesourd, my old physics teacher, who most greatly inspired his students at my school, Milton Academy, and who for half a century taught mathematics at Harvard. We discovered to our mutual surprise that I had apparently progressed far afield from any of the known physio-mathematical concepts with which he was familiar or of which he had any knowledge. Further inquiry by both of us found no contradiction of our first conclusion. That was a third of a century ago. Thereafter, from time to time but with increasing frequency, I found myself able to elucidate my continuing explorations and discoveries to other scientists, some of whom were of great distinction. I would always ask them if they were familiar with any mathematical phenomena akin to the kind of disclosures I was making, or if work was being done by others that might lead to similar disclosures. None of them was aware of any other such disclosures or exploratory work. I always asked them whether they thought my disclosures warranted my further pursuit of what was becoming an ever-increasingly larger body of elegantly integrated and coordinate field of omnirationally quantified vectorial geometry and topology. While they could not identify my discoveries with any of the scientific fields with which they were familiar, they found no error in my disclosures and thought that the overall rational quantation and their logical order of unfoldment warranted my further pursuing the search.

250.30 Remoteness of Synergetics Vocabulary

250.301 When one makes discoveries that, to the best of one's knowledge and wide inquiry, seem to be utterly new, problems arise regarding the appropriate nomenclature and description of what is being discovered as well as problems of invention relating to symbolic economy and lucidity. As a consequence, I found myself inventing an increasingly larger descriptive vocabulary, which evolved as the simplest, least ambiguous method of recounting the paraphernalia and strategies of the live scenario of all my relevant experiences.

250.31 For many years, my vocabulary was utterly foreign to the semantics of all the other sciences. I drew heavily on the dictionary for good and unambiguous terms to identify the multiplying nuances of my discoveries. In the meanwhile, the whole field of science was evolving rapidly in the new fields of quantum mechanics, electronics, and nuclear exploration, inducing a gradual evolution in scientific language. In recent years, I find my experiential mathematics vocabulary in a merging traffic pattern with the language trends of the other sciences, particularly physics. Often, however, the particular new words chosen by others would identify phenomena other than that which I identify with the same words. As the others were unaware of my offbeat work, I had to determine for myself which of the phenomena involved had most logical claim to the names involved. I always conceded to the other scientists, of course (unbeknownst to them); when they seemed to have prior or more valid claims, I would then inventor select appropriate but unused names for the phenomena I had discovered. But I held to my own claim when I found it to be eminently warranted or when the phenomena of other claimants were ill described by that term. For example, quantum mechanics came many years after I did to employ the term *spin*. The physicists assured me that their use of the word did not involve any phenomena that truly spun. *Spin* was only a convenient word for accounting certain unique energy behaviors and investments. My use of the term was to describe a direct observation of an experimentally demonstrable, inherent spinnability and unique magnitudes of rotation of an actually spinning phenomenon whose next fractional rotations were induced by the always co-occurring, generalized, a priori, environmental conditions within which the spinnable phenomenon occurred. This was a case in which I assumed that I held a better claim to the scientific term *spin*. In recent years, *spin* is beginning to be recognized by the physicists themselves as also inadvertently identifying a conceptually spinnable phenomenon—in fact, the same fundamental phenomenon I had identified much earlier when I first chose to use the word *spin* to describe that which was experimentally disclosed as being inherently spinnable. There appears to be an increasing convergence of scientific explorations in general, and of epistemology and semantics in particular, with my own evolutionary development.

250.32 Because physics has found no continuums, no experimental solids, no things, no real matter, I had decided half a century ago to identify, mathematical behaviors of energy phenomena only as *events*. If there are no things, there are no nouns of material substance. The old semantics permitted common-sense acceptance of such a sentence as, "A man pounds the table," wherein a noun verbs a noun or a subject verbs a predicate. I found it necessary to change this form to a complex of events identified as *me*, which must be identified as a verb. The complex verb *me* observed another complex of events identified again ignorantly as a "table." I disciplined myself to communicate exclusively with verbs. There are no *wheres* and *whats*; only angle and frequency events described as *whens*.

250.40 *The Climate of Invention*

250.401 In the competitive world of money-making, discoveries are looked upon as exploitable and monopolizable claims to be operated as private properties of big business. As a consequence, the world has come to think of both discoveries and patents as monopolized property. This popular viewpoint developed during the last century, when both corporations and government supported by courts have required individuals working for them to assign to them the patent rights on any discoveries or inventions made while in their employ. Employees were to assign these rights during, and for two years after termination of, their employment, whether or not the invention had been developed at home or at work. The drafting of expert patent claims is an ever more specialized and complex art, involving expensive legal services usually beyond the reach of private individuals. When nations were remote from one another, internal country patents were effective protection. With today's omniproximities of the world's countries, only world-around patents costing hundreds of thousands of dollars are now effective, with the result that patent properties are available only to rich corporations.

250.41 So now the major portions of extant inventions belong to corporations and governments. However, invention and discovery are inherently individual functions of the minds of individual humans. Corporations are legal fabrications; they cannot invent and discover. Patents were originally conceived of as grants to inventors to help them recover the expenses of the long development of their discoveries; and they gave the inventor only a very short time to recover the expense. Because I am concerned with finding new technical ways of doing more with less, by which increasing numbers of humanity can emerge from abject poverty into states of physical advantage in respect to their environment, I have taken out many patent claims—first, to hold the credit of initiative for the inspiration received by humanity's needs and the theory of their best solution being that of the design revolution and not political revolution, and second, to try to recover the expense of development. But most importantly, I have taken the patents to avoid being stopped by others—in particular, corporations and governments—from doing what I felt needed doing.

250.50 Coincidental Nature of Discoveries

250.501 What often seems to the individual to be an invention, and seems also to be an invention to everyone he knows, time and again turns out to have been previously discovered when patent applications are filed and the search for prior patents begins. Sometimes dozens, sometimes hundreds, of patents will be found to have been issued, or applied for, covering the same idea. This simultaneity of inventing manifests a forward-rolling wave of logical exploration of which the trends are generated by the omni-integrating discoveries and the subsequent inventions of new ways to employ the discoveries at an accelerating rate, which is continually changing the metaphysical environment of exploratory and inventive stimulation.

250.51 I have learned by experience that those who think only in competitive ways assume that I will be discouraged to find that others have already discovered, invented, and patented that which I had thought to be my own unique discovery or invention. They do not understand how pleased I am to learn that the task I had thought needed doing, and of which I had no knowledge of others doing, was happily already being well attended to, for my spontaneous commitment is to the advantage of all humanity. News of such work of others frees me to operate in other seemingly unattended but needed directions of effort. And I have learned how to find out more about what is or is not being attended to. This is evolution.

250.52 When I witness the inertias and fears of humans caused by technical breakthroughs in the realms of abstract scientific discovery. I realize that their criteria of apprehension are all uninformed. I see the same patterns of my experience obtaining amongst the millions of scientists around the world silently at work in the realm of scientific abstract discovery, often operating remote from one another. Many are bound to come out with simultaneous discoveries, each one of which is liable to make the others a little more comprehensible and usable. Those who have paid-servant complexes worry about losing their jobs if their competitors' similar discoveries become known to their employers. But the work of pure science exploration is much less understood by the economically competitive-minded than is that of inventors. The great awards economic competitors give to the scientists make big news, but no great scientist ever did what he did in hope of earning rewards. The greats have ever been inspired by the a priori integrities of Universe and by the need of all humanity to move from the absolute ignorance of birth into a little greater understanding of the cosmic integrities. They esteem the esteem of those whom they esteem for similar commitment, but they don't work for it.

250.53 I recall now that when I first started making mathematical discoveries, years ago, my acquaintances would often say, "Didn't you know that Democritus made that discovery and said just what you are saying 2,000 years ago?" I replied that I was lucky that I didn't know that because I thought Democritus so competent that I would have given up all my own efforts to understand the phenomena involved through my own faculties and investment of time. Rather than feeling dismayed, I was elated to discover that, operating on my own, I was able to come out with the same conclusions of so great a mind as that of Democritus. Such events increased my confidence in the resourcefulness and integrity of human thought purely pursued and based on personal experiences.

250.60 **Proofs**

250.61 I know that many of the discoveries of synergetics in the book of their accounting, which follows, may prove in time to be well-known to others. But some of them may not be known to others and thus may be added to the ever-increasing insights of the human mind. Any one individual has inherently limited knowledge of what total Universe fronting consists of at any one moment. My list embraces what I know to be my own discoveries of which I have no knowledge of others having made similar discoveries earlier than my own. I claim nothing. Proofs of some of my theoretical discoveries have been made by myself and will be made by myself. Proofs may have been made by others and will be made by others. Proofs are satisfying. But many mathematical theorems provide great living advantages for humanity over long periods of time before their final mathematical proofs are discovered. The whys and wherefores of what is rated as mathematical proof have been evolved by mathematicians; they are formal and esoteric conventions between specialists.

251.00 Discoveries of Synergetics: Inventory

251.01 The ability to identify all experience in terms of only angle and frequency.

251.02 The addition of angle and frequency to Euler's inventory of crossings, areas, and lines as absolute characteristics of all pattern cognizance.

251.021 Synergetics adds four additional topological aspects to Euler's three cosmically unique aspects of vertexes, faces, and edges. Synergetics adds (1) angles, (2) irrelevant untuned insiderness and outsiderness, (3) convexity and concavity, and (4) axis of spin, making a total of seven topological aspects (see Sec. [1044.00](#)); synergetics has also recognized the addition of frequency as being always physically manifest in every special case.

251.03 The omnirational accommodation of both linear and angular acceleration in the same mathematical coordination system.

251.04 The discovery that the pattern of operative effectiveness of the gravitational constant will always be greater than that of the radiational constant—the excess effectiveness being exquisitely minute, but always operative, wherefore the disintegrative forces of Universe are effectively canceled out and embraced by the integrative forces.

251.05 The gravitational is comprehensively embracing and circumferentially contractive—ergo, advantaged over the centrally radiational by a 6:1 energy advantage; i.e., a circumference chord-to-radius vectorial advantage of contraction versus expansion, certified by the finite closure of the circumference, ergo, a cumulative series versus the independent, disassociating disintegration of the radii and their separating and dividing of energy effectiveness. (This is an inverse corollary of the age-old instinct to divide and conquer.) (See Secs. [529.03](#), [541.00](#) and [1052.00](#).)

251.06 The gravitational-radiational constant $10F^2+2$.

251.07 The definition of gravity as a spherically circumferential force whose effectiveness has a constant advantage ratio of 12 to 1 over the radial inward mass-attraction.

251.10 The introduction of angular topology as the description of a structural system in terms of the sum of its surface angles.

251.11 The definition of structure as the pattern of self-stabilization of a complex of events with a minimum of six functions as three edges and three vertexes, speaking both vectorially and topologically.

251.12 The introduction of angular topology as comprised entirely of central-angle and surface-angle phenomena, with the surface angles accounting for concavity and convexity, and the thereby-derived maximum structural advantage of omni-self- triangulating systems.

251.13 As a result of the surface-angle concave-convex take-outs to provide self-closing finiteness of insiderness and outsiderness, central angles are generated, and they then function in respect to unique systems and differentiate between compoundings of systems.

251.14 One of the differences between atoms and chemical compounds is in the number of central-angle systems.

251.15 The tetrahedral trisecting of angles: the trisection of a 180-degree angle. (See Secs. [841.16](#) and [841.30](#).)

251.16 The rational volumetric quantation or constant proportionality of the octahedron, the cube, the rhombic triacontahedron, and the rhombic dodecahedron when referenced to the tetrahedron as volumetric unity. (See Sec. [1053.21](#).)

251.17 The rational and symmetric surface subdivision of the icosahedron, the octahedron, the cube, and the rhombic dodecahedron by the 48 spherical triangle tiles of the vector equilibrium's 25-great-circle grid, rationally quantized in a reverse order of magnitude in whole, low-order, even numbers. (See Secs. [1053.20-21](#).)

251.18 The seven unique axes of great-circle spinnability that also describe the seven great circles foldable into bow ties. (See Sec. [1040](#).)

251.19 The definition of the omniequiangled and omnitriangulated tetrahedron, octahedron, and icosahedron, with respectively three, four, and five triangles around each of their vertexes, as altogether constituting the topological and finitely limited set of prime structural systems. (See Sec. [610.20](#).)

251.20 The discovery of the mathematically regular, three-way, greatcircle, spherical-coordinate cartographic grid of an infinite frequency series of progressive modular subdivisions, with the spherical radii that are perpendicular to the enclosing spherical field remaining vertical to the corresponding planar surface points of cartographic projection; and the commensurate identification of this same great-circle triangulation capability with the icosahedron and vector equilibrium, as well as with the octahedron and the tetrahedron. (See Secs. [527.24](#) and [1009.98](#).)

251.21 The development of the spherical triangular grid bases from the spherical tetrahedron, spherical cube, spherical octahedron, and the spherical vector equilibrium and its alternate, the icosahedron, and the discovery that there are no other prime spherical triangular grids. All other spherical grids are derivatives of these.

251.22 The spherical triangular grids are always identified uniquely only with the first four prime numbers 1, 2, 3 and 5: with the tetrahedron always identifying with the prime number 1; the octahedron with 2, the face-triangulated cube with 3; and the vector equilibrium and icosahedron with the prime number 5; with the other Platonic, Archimedean, and other symmetrical polyhedra all being complex compoundings and developments of these first four prime numbers, with the numbers compounded disclosing the compounding of the original four base polyhedra.

251.23 The number of the external crossings of the three-way spherical grids always equals the prime number times the frequency of modular subdivision to the second power times two, plus the two extra crossings always assigned to the polar axis functioning to accommodate the independent spinnability of all systems.

251.24 The mathematical regularity identifies the second power of the linear dimensions of the system with the number of nonpolar crossings of the comprehensive three-way great circle gridding, in contradistinction to the previous mathematical identification of second powering exclusively with surface areas.

251.25 The synergetic discovery of the identification of the surface points of the system with second powering accommodates quantum mechanics' discrete energy packaging of photons and elucidates Einstein's equation, $E = Mc^2$, where the omnidirectional velocity of radiation to the second power— c^2 —identifies the rate of the rational order growth of the discrete energy quantation. This also explains synergetics' discovery of the external point growth rate of systems. It also elucidates and identifies the second power factoring of Newton's gravitational law. It also develops one-to-one congruence of all linear and angular accelerations, which are factorable rationally as the second power of wave frequency.

251.26 The definition of a system as the first subdivision of finite but nonunitary and nonsimultaneous conceptuality of the Universe into all the Universe outside the system, and all the Universe inside the system, with the remainder of the Universe constituting the system itself, which alone, for the conceptual moment, is conceptual.

251.27 The definition of Universe as a scenario of nonsimultaneous and only partially overlapping events, all the physical components of which are ever-transforming, and all the generalized metaphysical discoveries of which ever clarify more economically as eternally changeless.

251.28 The vector model for the magic numbers, which identifies the structural logic of the atomic isotopes in a symmetrical synergetic hierarchy.

251.29 The trigonometric identification of the great-circle trajectories of the seven axes of symmetry with the 120 basic disequilibrium *LCD* triangles of the spherical icosahedron. (See [Sec. 1043.00.](#))

- 251.30 The rational identification of number with the hierarchy of all the geometries.
- 251.31 The *A* and *B* Quanta Modules.
- 251.32 The volumetric hierarchy of Platonic and other symmetrical geometricals based on the tetrahedron and the *A* and *B* Quanta Modules as unity of coordinate mensuration.
- 251.33 The identification of the nucleus with the vector equilibrium.
- 251.34 Omnirationality: the identification of *triangling* and *tetrahedroning* with second- and third-powering factors.
- 251.35 Omni-60-degree coordination versus 90-degree coordination.
- 251.36 The identification of waves with vectors as waviform vectors; the deliberately nonstraight line.
- 251.37 The comprehensive, closed-system foldability of the great circles and their identification with wave phenomena.
- 251.38 The accommodation of odd or even numbers in the shell-generating frequencies of the vector equilibrium.
- 251.39 The hierarchy of the symmetrically expanding and contracting pulsations of the interpolyhedral transformations, and their respective circumferentially and radially covarying states. (Also described as the symmetrical contraction, "jitterbugging," and pumping models.)
- 251.40 The provision for the mathematical treatment of the domains of interferences as the domains of vertexes (crossings).
- 251.41 Mathematical proof of the four-color map theorem.
- 251.42 The introduction of the tensegrity structural system of discontinuous compression and continuous tension.
- 251.43 The identification of tensegrity with pneumatics and hydraulics.
- 251.44 The discovery of the number of primes factorial that form the positives and negatives of all the complex phenomena integratively generated by all possible permutations of all the 92 regenerative chemical elements.
- 251.45 The disclosure of the rational fourth-, fifth-, and sixth-powering modelability of nature's coordinate transformings as referenced to the 60° equiangular, isotropic vector equilibrium.

251.46 The discovery that once a closed system is recognized as exclusively valid, the list of variables and the degrees of freedom are closed and limited to six positive and six negative alternatives of action for each local transformation event in Universe.

251.47 The discovery of the formula for the rational-whole-number expression of the tetrahedral volume of both the spherical and interstitial spaces of the first- and third- power concentric shell-growth rates of nuclear closest-packed vector equilibria.

251.48 The disclosure of a hierarchy of rational quantation and topological interrelationships of all physically experiential phenomena that are omnirationally accounted when we assume the volume of the tetrahedron and its six vectors to constitute both metaphysical and physical quantation unity. (See Secs. [221.01](#) and [620.12](#).)

251.50 The integration of geometry and philosophy in a single conceptual system providing a common language and accounting for both the physical and metaphysical.

260.00 **The Epistemography of Generalization and Special Case**

[260.00-269.07 Nature in a Corner Scenario]

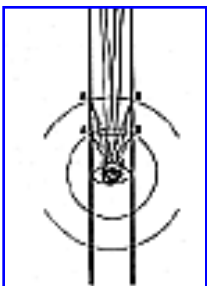
260.10 **Invisibility of Macro- and Microresolutions**

260.11 The eye of a healthy human can comfortably perceive an interval of 1/50th of an inch, and the human's timing sense can recognize the rhythm of identical minimum intervals lying between the black vertical lines of an engineer's white ivory measuring scale, but with optimum naked eyesight humans can only with great difficulty read on a scale that equals 1/100th of an inch. Humans' eyesight cannot "resolve," i.e., differentially perceive 1/200th-inch intervals between microdots of 1/200th-of-an-inch diameter. For these reasons black-and-white or color printing plates for picture reproductions, which consist of subvisible benday screen dots spread 1/200th of an inch apart, produce pictures whose surface information appears to humans as being realistically "continuous" and as a progressive color blending—ergo, natural.

260.12 The diameter of the spherical activity domain of a single atom, including the electrons orbiting its nucleus, is called one angstrom. And one angstrom is 1/2,500,000th the diameter of the smallest humanly seeable *speck*. Moreover, the diameter of the atomic nucleus is 1/10,000th of one angstrom, and the nucleus has now been found to consist of a plurality of further "particles" such as quarks, leptons, hadrons, and so forth. Humans have now developed electromagnetic sensors, have microphotographed individual atoms, and have macrophotographed a billion galaxies, each of hundreds of billions of star- population magnitudes—99.9999 percent of which information about reality is invisible to the naked human eye. (See Sec. [1238.60](#).) What humans have been experiencing and thinking of "realistically" as dim "somethings" or "points" in a field of omnidirectional seeming nothingness now requires experimentally provable reconsideration, epistemographic reconceptioning, and rewording.

260.20 **Convergent vs Parallel Perception**

260.21 All exclusively three-dimensional matrixes, consisting only of parallel lines and perpendicular rectilinear interactions—like parallel railroad tracks—inherently fail to accommodate any terminal convergence. Such matrixes fail to accommodate the inherent strategy of range-finding: the fact that the linear-distance relationship between our two human eyes—and also those of other optically equipped creatures—was designed to provide the baseline of a triangle whose opposite apex occurs at the position of a sighted object. The convergent apex angle of the object provides the human brain's computer circuitry with a limited, distance-to-object-magnitude appraising, or range-finding perceptivity, whose maximum terrestrial range is the horizon. Beyond the horizon the distances between remote objects are reduced to optically nontunable angle-size or -frequency discernibility. Ergo, at the maximum tunability of differential-wavelength- perceptivity, our range-finding optical system produces a false image of a seemingly convergent pair of parallel railroad tracks. It is not that the tracks or the ties are coming together, but that the distance between them is subtunable.



260.211 Our two eyes form the baseline of an isosceles triangle and seek to discern the convergent angle at an opposite object apex: for instance, tracks A or B, with the distance between A and B constant. The farther away they are, they become relatively shorter and shorter chords of ever larger circles A and B, and finally they appear to be congruent. See Fig. 260.211.

[Fig. 260.211](#)

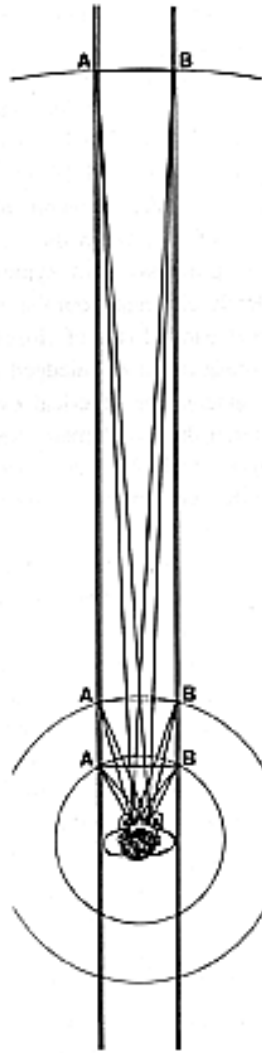


Fig. 260.211 *Humans' Range-finding Optical System*: Our two eyes form the baseline of an isosceles triangle and seek to discern the convergent angle at the opposite object apex: for instance, tracks A or B, with the distance between A and B constant. Farther away they become shorter chords of ever larger circles and finally appear to be congruent.

260.22 Though the diameter of Betelgeuse in Orion's Belt is greater than the diameter of the planet Earth's orbit around the Sun, Betelgeuse appears to Earthians only as a fine point of light. As in the rate of information recall by the mind from brain storage, there is also an inherent lag in the rate human optical equipment can apprehend newly perceived phenomena. The pulsative frequency of alternating current electric light is 60 cycles per second, which is designed to coincide with the frequency corresponding to humans' "second look" stroboscopic rate of apprehending. In a like manner the frequency rate of the cinema's picture-frame running is synchronized to coincide with the human rate of mental-mouthful digestibility of new information receptivity, which must check the new information with the old to permit recognition or new cognition. The static frames themselves—as in benday screen printing—are frequency-subdivided into local increments whose wavelength-spacing is infratunable by the human-brain-apprehending set. The human brain apprehends 200 info-bits per inch as omnicontinuous, despite the separate frequency islands of their different color light points, each of which is an island of different electromagnetic frequencies. All of the spots are frequency islands like events and novents (see Sec.[524.01](#)).

260.30 **Physical Experience and Closest Packing of Spheres**

260.31 The XYZ-rectilinear coordinate system of humans fails to accommodate any finite resolution of any physically experienced challenge to comprehension. Physical experience demonstrates that individual-unit wavelength or frequency events close-pack in spherical agglomerations of unit radius spheres. Two unit-radius spheres in tangency provide a seemingly linear pattern, but a third closest-packed sphere nests in the valley of the first two and produces triangulation. In equilateral triangular growth of closest-planar-packed unit-radius spheres the triangle's edges are never parallel. As human experience increases—event by event—the number of experience spheres along the faraway edge of the triangle of individual observations also increases. Each successive row of closest-packed spheres away from the observer always increases by one event. While the rows are parallel to one another, the outermost row can be taken perpendicularly away from the master triangle and from any one of its sides without disturbing the integrity of equiangular symmetry. This progression of symmetrical shrinkage of the triangle is a property completely different from that of the square, wherein the removal of any one outer most parallel row of closest-packed cubes from any of the four sides leaves a nonsquare, nonequiedged rectangle.

260.32 Closest-packed spheres, or spherical events, of equal frequency and wavelength produce tetrahedral agglomerations which, as events transpire, produce additional layers, each of which consists of equilateral triangles of one more edge row than the previous one. (See the event relationship law at Sec. [227](#).)

260.33 Because nature always operates most economically—ergo, most closest packed—and because all asymmetries are observable only relative to idealized symmetry, we find all the similar-magnitude events of experience tend to close pack triangularly in symmetrical convergent or divergent aggregations. (See Secs. [223.05](#), [505.62](#), and [532.10](#).)

260.34 The XYZ coordinates of parallels and perpendiculars have nothing to do with the way Universe is operating. Universe is operating in radiational-divergence and gravitational-convergence. Events in parallel never get resolved; convergent events become exquisitely resolved. You cannot have a nucleus in a perpendicular or a parallel system. You can have nuclei only when you have symmetrical tetrahedral convergence.

260.40 **Convergence to a Nucleus**

260.41 The coordinate system of nature as manifest in synergetics is one in which nature operates in convergent-divergent, associative-disassociative agglomerating, a system in which the inherent symmetry is maintained only by the equiangular triangles. Synergetically, nature is both expansively radiant and convergently gravitational: radiant as radiation—an expansive, disintegrative, ever more disorderly coming apart—or nature as gravitationally convergent with increasing symmetry and order. Nature resolves her problems by their resolution to inherent nuclei.

260.42 The synergetic coordinate system of nature and its finite macro-micro turnaround-limited hierarchy of primitive ascending or descending timeless-sizeless, omnisymmetrically concentric, polyhedral components provides the human mind with a rational means of resolving problems by bringing nature into a corner—a convergent terminus center, a four-dimensional corner of the four-dimensional planes of the tetrahedron. Only with the four-dimensional convergence and divergence of synergetics can the human mind reduce problems to comprehension as minimum-limit systems. The minimum polygon is a triangle; the minimum polyhedron is a tetrahedron; both of their structural behaviors are unique (see Secs. [614.00](#) and [621.00](#)). By their academic training humans think only in terms of parallel and rectilinear coordination, and so they tend to hold to

the unresolvable parallel interpretations of their lives' experiences. They seek to maintain the status quo and—despite the organic and biologic manifests of birth and death—they fail to be able to take advantage of the cornerability of comprehension and the positional fixes provided by the four-dimensional, synergetic, convergent-divergent coordination.

260.50 **Precession of Two Sets of 10 Closest-Packed Spheres**

260.51 Two identical sets of 10 spheres in closest packing precess in 90-degree action to form a prime, nonnucleated, four-ball-to-the-edge tetrahedron with a total of 20 spheres. Each of the two sets of 10 balls consists of a line of four balls arranged in a tangentially cohered row nested in the long valley of a rectangle consisting of three pairs of balls tangentially cohered to one another in a parallel array, with two balls on one end and three balls on the other end. Cohering the four-ball row tangentially to the valley of the six-ball quadrangle produces a 10-ball aggregate. When brought together, these two 10-ball assemblies produce the prime, four-ball-edge tetrahedron of 20 balls, the largest single-shell tetrahedron without a nuclear ball. (This 20-ball tetrahedron is at the heart of the tetrahedral assembly of 120 balls comprised of two sets of 60 closest-packed spheres—see Sec. [417.00](#).) To bring them into tetrahedral symmetry of assembly, each four-ball edge of the two separate assemblies must be precessed (turned at right angles) to the other's four-ball edge. In these conditions the two-ball edges of the six-ball rectangle are now addressing the three-ball edges of the other quadrangle. To the trained eye and rationale of rectilinear coordination it seems illogical to address two balls to three balls or three balls to two balls. In matching such assemblies people think of doing so only in parallels or perpendiculars. (See Sec. [527.08](#).)

260.52 In universally convergent-divergent coordinate growth or shrinking, each row is greater (or lesser) by one than the next. Three automatically goes to two in a convergent, planar-arrayed, structurally stable system and two automatically goes to three in a divergent, planar-arrayed, structurally stable system. Tetrahedral expansion or contraction produces a structurally stable systematic model of universal behavior. In tetrahedral growth one goes to three and three goes to six and six goes to 10 (see Sec. [415.55](#) and Fig. [415.55A](#)). Tetrahedral growth from unity is special-case angularly directional. Vector equilibrium growth from unity is nuclear-divergent at a growth rate of ten times frequency to the second power plus two:

$$1 \rightarrow 12$$

12 → 42

42 → 92, etc.

(See Sec. [418.01](#).)

260.53 A tetrahedron has three—and only three—inherent polar symmetries; their axes run between the midpoints of the tetrahedron's three pairs of opposite edges. (See Sec. [622](#).) These midpoints are in edges that are oriented at 90 degrees to one another.

261.00 **Getting Nature into a Corner**

261.01 Getting nature into a corner is the essence of synergetics' exploratory strategy. Synergetics is the coordination of thought and physical action, the genesis of geometry, system, and structure. Physics and metaphysics are resonantly integral: the integrity of their intertransformative mathematics into all the special case, variably enduring associabilities cognized by humans as structural design. The frequency rates are the separate, static frame rates of inspection and are recognized by humans' brains as mechanics when the frequency of inspection by humans synchronizes with the cinema frames' running. The difference between structures and machinery is the same as the difference between "moving" and "static" pictures as both relate to human information comprehending. This is the grand strategy.

261.02 What Euler and all professional topologists and mathematicians called "areas" are only windows in polyhedrally conceptual systems. You look out the window at the nothingness of undimensional night—or of fog. The "faces" of presynergetics topology packaged the undimensionable nothingness into arbitrary somethingness, which thus misassumed the dimensions of the face windows and their closed-circuit edges to constitute dimensional attributes of the undimensional nothingness so framed. Academically misinformed teachers go to the blackboard, drawing a "square," and saying to the students, "A square is an area bound by a closed line of four equal-length edges and four equiangled corners," without paying any attention to the inherently existent complementations of Universe. To start off with, the phenomenon "square" is dependent on the phenomenon "blackboard," whose structural matrix alone maintained the symmetrical shape of the nonstructurally stabilized pattern of the square. (Compare Sec. [617.04](#).) The closed-line pattern of the square inadvertently subdivides the whole surface of the polyhedral blackboard into two areas, both bound by the closed line of four equal edges and four equal angles. The four equal edges of the large complementary

square are the same length as those of the small square; the big square's corners are each 270 degrees, while the small square's corners are each 90 degrees. (Compare Sec. [810](#).) Moreover, the drawing of the square also inadvertently subdivides the insidiness and outsidiness of the blackboard into concave and convex big and little squares; it also deposits part of the Universe as "chalk" atoms onto the blackboard's agglomeration of atoms, which inadvertently rearranges the chemical element resources of Scenario Universe.

261.03 In the layer-around-layer, symmetrical closest packing of unit radius spheres around a nuclear sphere of the same radius, the number of spheres in each layer will always be 10 times the second power of the frequency of comprehensively concentric layer enclosings plus the number 2—i.e., $10F^2 + 2$. By this we discover that in the first layer, where frequency (F) = 1, we have $1^2 = 1$, and $10 \times 1 = 10$, $10 + 2 = 12$. Thus we find experimentally that 12 unit radius spheres comprehensively omni-inter-close-pack around the single nuclear sphere. Where frequency is two, in the case of the second layer, we have

$$2^2 = 4, 4 \times 10 = 40, 40 + 2 = 42$$

spheres symmetrically embrace the 12-ball system. Thus the number of unit radius spheres in the third layer is 92, and so forth (see Sec. [418](#)).

261.04 Since the central or nuclear sphere has no outer layer and is only the nucleus, its frequency of layer enclosures is zero. (See Sec. [415.10](#).) Following our symmetrically and convergently diminishing uniform rate of contraction to its inherent minimum and terminal frequency case of zero, and applying our generalized formula $10F^2 + 2$, we have

$$0^2 = 0, 0 \times 10 = 0, 0 + 2 = 2$$

and we discover that unity is two. The single nuclear sphere consists of both its concave inside and its exterior convex sphere, its inbounding and outbounding co-occur at the convergent, center-of-volume turnaround point. Unity is plural and at minimum two (see Secs. [224.12](#) and [240.03](#)). That the nuclear ball is inherently two has been incontrovertibly discovered by reducing nature to her omnidirectionally convergent, nuclear-center terminal case.

262.00 **Conceptual Minimum**

262.01 Since there was nothing more exaltedly high than heaven and nothing more degradingly low than hell, *up* and *down* were limited or terminal dimensions.

—Since humans were so tiny in respect to their laterally surrounding world, and since the tales of travelers reported greater mountains as one went inland from the sea, and since the sea ever surrounded the land, the best-informed humans assumed Earth to be an island floating on a sea that extended laterally to infinity in all horizontal directions as a plane, a plane whose surface could be made rough by god-blown winds, while the skies were filled with gods disguised as clouds blowing winds.

—Since the shortest distances between two points seemed obviously to be a straight, stretched-hair line, all the straight lines on the infinite plane of the world ran to infinity; and since humans could never reach infinity, they need not worry about where the points were located between which the straight infinite lines were stretched. All they had to do was to have two local points through which to run their “straight” line, which could thus be extended to infinity in two opposite directions. This was the genesis of "flat land," from which humans have not yet emerged. In flat land there are infinite biggest and smallest: In the vertical sense this means giants bigger than mountains and gods bigger than giants—ergo, the biggest greatest god, the biggest of visually engendered conceptioning enthroned on the highest mountain, while the invisibly smallest emerged as the elves and the evil spirits existing in things.

262.02 The human concept of a geometrical point was established eons before the inventive conceptualizing by anyone that humans might develop a microscope. The point seemed to be the terminal, smallest visual experience. The visual smallest was smaller than the smallest touchable, handleable experience. The visual smallest engendered the assumption of an infinitely smaller nondimensional point. The point is premicroscopic.

262.03 Similarly, the concept of spatial nothingness is pretelescopic, established eons before anyone knew that humans might develop a telescope. Now that humans have acquired discretely measured knowledge regarding the speed and other behavioral characteristics of all radiation, including the refraction of light, and have developed the science of optics and the chemistry of light-sensitive emulsions for phototelescopy, they have discovered a macrocosm of billions of galaxies consisting of an average of 100 billion stars each; 99.9999 percent of these progressively outwardly considered, discovered phenomena are invisible to the naked human eye. In the opposed or inwardly considered experience field the physicists have discovered and measured the unique frequency characteristics of each of the chemical elements together with frequency characteristics and other energetic characteristics of atomic components. Physicists employing the same

radiation-sensitive emulsion photography—first through the human-spectrum-range microscope, subsequently through the scanning electron microscope, and after that through the field emission microscope—have photographed individual atoms. In this inwardly and diminishing magnitude progression humans have photographically harvested knowledge of physical reality that is 99.9999 percent infra- or subvisible to humans, meaning untunable within the very limited electromagnetic frequency range of the human senses' crystal-equipped radio sets. The exponential, fourth-power, historical acceleration rate of these outwardly exploding and inwardly permeating human cognitive events has become too sudden for societal digestion and recognition of the significance of what seemed to be *terminal* yesterday. The reality of the *point* and the *space* have been variously conceptualized in the purely theoretical and physically unexperienceable rationalizations of progressively misinformed humans.

262.04 Man suddenly got to thinking of the atom as the terminal, the conceptual minimum. He had the terminal case of the atom as a point, but then later found that the atoms consisted of at minimum a proton, a neutron, an electron, and an atomic nucleus, and so forth. And so for a while the atomic nucleus was the terminal limit, until humans began smashing the atom and breaking the nucleus into new component particles: Thus the quarks became the most recently apparent terminally smallest limits of considerability. But the characteristics of the quarks are very exciting because they, too, incontrovertibly manifest a complex of a plurality of interdependent and numerically consistent behaviors. So what physics is really discovering is primitive *system conceptuality* independent of time and size. And in synergetics conceptuality independent of time and size discloses a complex hierarchy of nuclear system intertransformabilities with low-order numerical and topological relationships, a complex of interrelationships consistently characterizing every one of their realizations as special case, experimentally demonstrable, sense-tuned, physical reality.

262.05 Whenever we look at something that is special case—call it a nucleus or call it a quark—we find that the special cases all break up into the complex of pure principles of conceptuality independent of size and time as elucidated by synergetics. Physically discovered, i.e., experientially, i.e., sense-tuned terminal discoveries, are always special case. Special cases have always time-incremented duration magnitudes—ergo, they are terminal.

262.06 There are no terminal generalizations. Generalizations are eternal independent of size and time. The weightless, sizeless, frequency-innocent principles are dealt with in synergetics and are exclusively mind-employable. Synergetics represents an exclusively mind-conceptual, complex system of numerically identifiable, geometrical interrelationships holding eternally true in all special case manifestations and physical discoverabilities, utterly independent of time-size. (See Sec. [445.11](#).)

262.07 Our Scenario Universe will continually open up more thing-and thingness special cases and our beautiful—because eternally exquisite—generalized thingless principles will tend to become conceptually ever more lucidly clear and more evidently operative at no matter what magnitude: macro . . . medio . . . micro.

262.08 The physical is always special case; this is why we spell Universe with a capital U.

262.09 So our new understanding of reality involves an eternal extension of the tunability in pure unlimited principle. Physical energy occurs only in finite packages. Physical Universe is a discontinuity of such finite islanded events. Events and novents: so life and death—so high-frequency intermingled as to be distinguishable only by our live- event-frequency-tuning capability. Death is as-yet-untuned reality. We used to have two structurally static Universes of life and afterlife. That we seem to be accelerating toward a unified Scenario Universe field seems to be implicit.

262.10 We do not have two Universes: this world and the next world. Death is only the as-yet-unexperienced, superlow frequencies. Both death and life are complementary functions of our electromagnetic experience. (See Secs. [526.25](#) and [531.10](#).)

263.00 **Nothingness and Tunability**

263.01 Having introduced the electromagnetic concept of the infratunable-to-human-sense frequency range set and the ultratunable-to-human-sense frequency range set, it becomes manifest that the nothingness is simply the as-yet-not-tuned-in information. We never deal in nothingness. *Nothing* occurs only as the at-present-untuned-in information broadcasting of nature—when we tune into the next higher or lower frequency, our senses resonate again and anew and may detect significant information, as in the inadvertently discovered photographic emulsion tuning in of the theretofore- unknown unique frequencies of the inherently regenerative set of the 92 chemical elements.

263.02 Our brains are physical tuning capabilities consisting of uniquely resonant atoms and cells. Apprehension consists of resonant atoms tuning into congruently resonant atoms. There is a cosmic meshingness; an angle-and-frequency congruence similar to that of mechanical gear trains when the number of teeth per circular perimeter and the angular modulation of the valleys and peaks of the individual teeth of the larger, smaller, or unit radius gears must mesh with minimally tolerated aberrational error; wherein the aberrations of metallic gears must be compensatingly interfilled with lubricants that prevent the aberrations of one part from reaching the aberrations of the reciprocating part. In much modern machinery nylon and other plastic gears have provided interyieldability, obviating the use of lubricants. Such yielding is demonstrably employed by nature in the hydraulic-pneumatic, crystalline structuring of all biological organisms. (See Sections [522.36](#) and [1052.52](#).)

263.03 Special cases are inherently terminal. Brain, which deals only with special case experiences, each of which is energetically terminal, demands knowledge of how everything begins and ends. But principles are eternal, a word with which the brain is not familiar. All inputs to the brain are finite. (See Sec. [504.04](#).)

263.04 We have what we refer to as events and novents (Sec. [524.01](#)). Experiences are always special case event programs. The special cases of music or noise are temporarily tunably sensed frequencies, of whose message significance we become progressively aware and in between which unsensed, untunable, eternal interrelationships persist. There is no verb for eternity. Verbs are always special case.

264.00 **Geometry of Self and Otherness**

264.01 A point is a something, a complex entity system, but an infratunable system. A point occurs as the first moment of awareness of a looming-into-tunability of any system in Universe. A point—or a noise—appears in an angularly determinable direction within the total omnidirectional spherical sphere of reference of the individual observer's sense-informed environment. It is oriented in respect to the observer's head-to-heel axis of reference in respect to which the direction from which the somethingness of infradiscrete tunability—as well as the non-tune-outability of the static—is emanating, as distinct from the nothingness of untuned-in, omnidirectional withinness and withoutness. (See Secs. [505.65](#), [505.74](#), and [527.25](#).)

264.02 At minimum, life involves awareness, self involves otherness, and otherness involves somethingness. Awareness is of otherness: awareness of the outside superficiality of the observer's "finger" by the externality-searching optical system of the observer. Indeed, the externality-searching for the nipple of its mother's breast by the olfactorily guided external nose-mouth of the newborn constitutes initial otherness awareness. As a fertilized ovum of an integrally evolving female organism umbilically circuited with the female organism, no otherness awareness is involved except that of the mother even as she may be sensorially aware of a sore spot on her arm.

264.03 Otherness involves somethingness: This brings us to the consideration of the nature of the epistemographic evolution of experience that—at one historical moment—evolved the misconceptioning of a nothingness—ergo, dimensionless—point.

264.10 **Prime Othernesses: Single and Plural Otherness**

264.11 While environment plus me equals Universe, Universe minus me does not equal environment.

264.12 Environment does not exist without me. I the observer am the living human experience. Life is the present experience. Experience begins with awareness. No otherness: No awareness.

264.13 I am one of the two prime othernesses: I am the single otherness; environment is the plural otherness. I am the present otherness; environment is the past otherness. By the time I have become aware, other as-yet-untuned-in events of nonunitarily conceptual Universe have transpired. Environment is inherently historical. Universe is eternally inclusive of all past, present, and future experiences plus all the at- present-untune-inable otherness of Universe. Universe is eternally general; environment is always special case.

264.14 Environment is the complex of all observed experiences of all life. Environment is the present scene, and all the remembered scenes, and all the scenes remembered by all the other scenes, which I cannot remember but memories of which are all registered in the environment to be rediscovered from time to time.

264.15 Every individual is an evolutionary pattern integrity. Each individual's environment of the moment is different from that of the next moment and from that of every other individual, though two or more individuals may think that they are mutually experiencing the same environment. The individual is the product and servant of a plurality of semisimilarities of mutual tuned-in-ness.

265.00 Unity of Triangulation

265.01 Otherness involves somethingness; This brings us to reconsideration of the nature of epistemological evolution and of the gradual transition in degrees of relative adequacy of macroscale of human comprehending and in microscale of definitive exactitude in interpreting what is being humanly experienced. Humans were included in the cosmic system's design to fulfill critical functions in respect to maintenance of the integrity of eternally regenerative Scenario Universe. To arrive full-blown and functioning in its cosmic role, humanity has been given the capability to inventory its tactical resources progressively and to reorient its functioning from an omniautomated behavior to a progressively more conscious and responsible behavioral pattern.

265.02 The epistemological evolution of individual humans has also included progressive appraisal of the relative significance of the separate scenarios of experience as periodically elucidated by the synergetically accruing concepts. Thus the sum of all human experiences seems periodically to explain how humans fit into the cosmic scheme, as that cosmic scheme itself evolves as emergingly and sum-totally appraised and disclosed by scholars—together with those cosmologists' controversial explanatory theories.

265.03 At one early historical moment in that epistemological evolution humans evolved the mathematical concept of dimensionless points, lines, and planes. Their dimensionless lines and planes were aggregates of the dimensionless points, yet these self-contradictory concepts have persisted in the children's school curricula of today, despite the fact that they were adopted long before humans had even dreamed of optical magnifying lenses, let alone electron microscopes. The philosophy that adopted such nonoperational educational devices was predicated—they said—upon "purely imaginary phenomena," and since the imagination of the brain is entirely furnished with special case experiences of system conceptuality (see Secs. [504.04](#) and [1056.15](#)), it is appropriate in this moment of instrumentally informed experience to reformulate our experience-substantiated philosophy.

265.04 Considerability (*con-sidus*—the interrelationship of a plurality of stars) is experientially furnished and is inherently systemic. The axial spinnability of all systems provides observational orientation in azimuth around the head-to-heel axis, storable in measurable fractions of circular unity. In the special case of humans as the observing system we have the head-to-heel axis of observational reference. We have therefore the human observer's system's inherent "additive twoness" provided by the system's two poles of such axial spin. In humans' organic systems we have also the multiplicative twoness of insideness-outsideness—i.e., the system's convex-concave congruity.

265.05 The observed otherness can be an organically integral part of the individual observer, for the individual human organism is—at simplest—a system comprised of a myriad of systems, which in turn are comprised of myriads of subsystems of subsystems of subsystems—to the limit of present microexploration capability. And the individual human organism will always consist of systems and never of nonsystems, for less-than-system systems are inherently nondiscoverable. (See Sec. [400.011](#).)

265.06 Observing individuals can be visually or tactilely aware of another (complex or subsystem) part of their own systemic organism—for example, the child's hand tactilely discovering its own foot's temperature, texture, olfactoral, taste, relative size, and conformation. This self-discovery, otherness-aroused awareness of the individual includes the child's cerebral-cortex feeling that its stomach is hungry, whereby the brain instructs the child's fourfold aural-communication-system-defining mouth, throat, tongue, and lungs to start pumping in and out of the smellable, nonorganically integral, otherness atmosphere to produce “crying” for contact with an external udder of the nonintegral otherness—the m-m-motherness from which to suck (pump) out her nonintegral otherness milk produced by her digested consumption of a plurality of nonintegral othernesses. This is an objective- subjective awareness of the complex individual's integral otherness parts.

265.07 Here is the complex integral otherness with which philosophers have for so long failed to confront themselves in their epistemological considerations. They have erroneously assumed that original, or initial, cognizable otherness exists exclusively in a separate external entity other than that of the organism of the observer. The individual is inherently complex, having four different sensing systems: the same four separate and differentially unique apprehending advantages that are always acquired to define a tetrahedron as the minimum system in Universe.

265.08 As with the “out” of in-out-and-around directions, the ultratunable is ultra to both external and internal experiences of human record. The ultratunable nothingness persists where the electromagnetic wavelengths involved are greater than the span of all humanly remembered experiences; wherefore the last time such a phenomenon occurred was prior to human experience recording, the next time its wave is to peak is unpredictable, because it always takes a minimum of two experiences to define a wavelength, but it always takes a minimum of three identical-magnitude events (waves) and their identical-magnitude wave intervals to definitively arouse humans' awareness that they are experiencing an unfamiliar wave-frequency phenomenon—ergo, to trigger humans' re-cognition capability thus to become aware of the same phenomenon being repeated for a third time (tres-pass) with the same interval of time between them occurring for the second time. (See Sec. [526.23](#).)

265.09 But it takes a fourth equifrequenced and equiwavelengthed experience in the angular direction deviations of the never-occurring straightlinedness of wavelinear Scenario Universe to produce the altitude from which sensing advantage the intertriangulatability of the first three experiences may be apprehended—which triangular pattern integrity becomes realized by mind as forming the base, the three separate directions toward which three previous event corners provide altogether the six unique lines of interrelationship direction of the four experience events that constitute a system, of whose presence the observer-sensor is now initially aware. Conceptuality is tetrahedral.

265.10 The operational self-discovery of any given conceptually periodic frequency is predicated upon a minimum experience quota of four successively experienced, similar events. This is because the three original time intervals between four angularly finite events constitute the minimum number of experience intervals necessary to establish the human mind's awareness that it is experiencing an identical interval repetition between what seem to be similar events. The first interval between the first two similar experiences was entirely unanticipated and—as of the moment of first recurrence—seemed to be only an inconsequential happenstance. But the *third repeat* of a similar, angularly conformed, finite experience that is recurring at a second and similar interval of elapsed time to that intervening between the first and second experiences could—and sometimes does—arouse an intuitive sense of there being a possible time-lapse-identifying significance present in the second successively similar lapse of time between the *now-threefold* similarity of angularly conformed experiences.

265.11 On the occasion of the third similar experience intuition can—and sometimes does—educate a hypothetical assumption and prediction by the experiencing individual of the possibility or probability of the future recurrence of a fourth such similar experience, which predicative hypothesis can only be confirmed by the actual fourth-time experiencing of the similar, angularly conformed, finite event recurring on schedule after the third experiencing of the same interval of elapsed time. If this fourth finite event does occur as hypothetically predicted after the third interval of the same time lapse, it provides experimental evidence of the existence of a consistent frequency and interval system of event recurrences. This may be recorded by humans as scientifically reliable—ergo, as operationally usable data.

265.12 A frequency of four events provides the three intervals that also form the base triangle of the tetrahedron apexed by the initially unpaired, angularly finite event. The insiderness and outsiderness of this primitively evolved tetrahedron constitute the minimum macrocosm-microcosm-differentiating system of the Universe. This tetrahedron has six angularly directional interrelationship lines interconnecting its four finite events. (See "Observer as Tetrasystem," Sec. [267](#).)

265.13 The chief characteristic of *frequency* is the accommodation of special case systems. Frequency identification begins only upon the recurrence of a directionally continuous fourth similar event along any one line of vertexial interrelationships of a system—ergo, with a minimum of three similar time intervals. An angle, as we learn at Sec. [515.00](#), is inherently a subfrequency event. Four nonsimultaneous, unique, angular event experiences occurring successively as a trajectory trending in the same direction constitute the minimum constituents for the time-size-measurable special case—i.e., temporal case—identifications.

266.00 **Science and Mathematics in the Language of Electromagnetics**

266.01 The ability of humans to tune in information is dependent on their being initially equipped with limited-range tuning apparatus, such as that of seeing, hearing, touching, smelling; human tunability is also dependent upon the special case data of experience stored in their recallable brain banks, the interrelatedness of which is only intuitively apprehended at first and later is experimentally reconfirmed, but comprehended only by human minds. Infra or ultratunability at any one moment of human experience neither precludes nor promises—but can suggest to intuition—the possibility of further tunability to be developed by humans to occur beyond any time-and-event predictability of our experience-cognition projecting—quite possibly billions of years either *ago* or *hence*. The infrequency may involve wavelength intervals between the too-recent-to-be-experienced and the too-late-to-be-experienced cyclic phenomena. This brings all our synergetic, event-vector convergence-divergence into congruence with the meanings of the language of electromagnetics.

266.02 A geodesic always is the operationally most economically accomplishable, and therefore most accommodatingly steerable, line of interrelationship existing exclusively between any two event foci. While generalizable as "straight," all geodesic realizations are superficially special-case—ergo, line events involving energy expenditures. Their lines of interrelationship accomplishment are radiationally noninstantaneous, and because of omni-in-motion Universe are wavilinear, as progressively modulated and accommodated for the differential changes of interpositioning of the interrelated events. From all that has yet been learned the gravitational or convergent forces may be assumed to be instantaneous and continually operative—ergo, always prevailing over the speed- limited radiational entropy. And being omnembracing rather than linear, gravity may also be assumed to have no directional identification.

266.03 A geodesic line is a component concept of systems' interrelationships.

266.04 So we now comprehend that humans' initial experiences of subresolvable, as- yet-discretely-non-tune-in-able, but directionally oriented awareness sensing of “twilight” specks or noise signals were reasonably defined by the human as a realistic somethingness occurring in a specific point-to-able direction, which is an as-yet-frequency-untunable system.

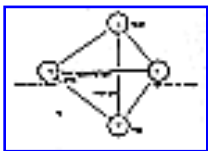
266.05 Self as observer is part of a system observing the integral-to-organic-system self's integral or separate otherness systems, or systemic subsystems—a system's as-yet- untuned systemic parts observing its as-yet-untuned systemic parts. The organic self has built-in, cerebrally coordinated equipment for in-tuning, as with the unique crystals of a radio set.

266.06 Humans' integral sensing and brain-operated tunability is always special-case, size-and-frequency limited. But the conceptioning and comprehending of a human's mind is concerned exclusively with relative-magnitude-and-frequency interrelationships constituting limitless synergetic systems in pure, abstract, generalized, eternal principle. All humans' minds are now and always have been capable of employing those principles as soon as they have been apprehended, experimentally verified, and mathematically quantified, to enlarge multibillionsfold both the macro- and microranges of special case, definitively exquisite harvesting of cosmic information, the significance of which is almost undetected and unrealized by humanity's common-sense, socioeconomic, and spontaneous recreational preoccupations.

266.07 The exclusive parallel-perpendicular coordination of physics—the XYZ Cartesian and centimeter-gram-second systems—probes blindly in fields of nonconceptuality. The exclusively convergent-divergent coordination of synergetics deals exclusively in conceptuality—conceptuality of omniinterrelatedness independent of size and time. Size depends on frequency, and frequency is cyclic. Angle, as only a fraction of a circle, is inherently subcyclic and subsize. But angle expresses a direction: This is where geometry enters into conceptuality. An angle—or a noise—has direction in respect to the head-to-heel axis or other system initiators.

267.00 Observer as Tetrasystem

267.01 The unity-at-minimum-twoness of the observed somethingness and the unity- at-minimum-twoness of the observer provide the initial four-dimensional foci of a tetrasystem. Otherness as a noise always has a direction relative to both the vertical human observer's head-to-heel axis and the horizontal axis of any pair of the human's two nostrils, ears, eyes, hands, and arms. The two polar terminals of the vertical axis derive from the initial head-to-heel axis of the observer. The diametric axis is generated subsequently and spun horizontally and circumferentially in the observational plane of any two of its terminally sensing facilities. The two polar terminals of the head-to-heel axis and any two of the sensing terminals of the diametric observational axis are intertriangularly connectable to produce the six interrelationships of the inherent systemic tetrahedron of the observer system. The interim orbital repositioning of the observer system totality during the spin cycle inherently occasions the occurrence of the diametric axis in a plane always other than that in which the original axis of spinnability had occurred.



267.02

[Fig. 267.02A-B](#)

- Tactile: touch _____ omnidirectionally outward
- Olfactory _____ inward
- Sight: optical _____ frontally oriented
- Hearing _____ sidewise

Inherent tetrahedral relationship. (See Fig. 267.02A.)

Observer is inherently a tetra-system. (See Fig. 267.02B.)

267.03 Physical self is inherently a tetrahedral observing system with four alternate, "fail-safe," distance-and-direction-sensing circuits.

267.04 Special case is angularly referenced to the inherent twoness of the polar axis of the system doing the observing, because the observer is a system and the system is four-dimensional. The fact that unity is two (Sec. [513.03](#)) means that an observer is at minimum two, but realistically four, because the observer is a system; and the observed is at minimum two, but being a system, is realistically four. A range-finder is inherently tetrahedral.

267.05 The sensing apparatus and the action apparatus with which humans are integrally equipped are both designed to provide them with angular orientation and the triangulated observation of distance. The two ears, two eyes, two nostrils, two arms, and two legs all produce triangulated distance-to-object information. They are range-finders. Using the distance between any pair of their integral sensing instruments as the baseline of a triangle whose opposite vertex is marked by the external object they are viewing, touching, hearing, or smelling, they sense the relative magnitude of the angles at the sensing ends of the baseline—which gives them the sense of magnitude of the complementary third angle at the apex of the triangle where the sensed object is located. Range-finding is triangulation. Sensing is triangulation.

268.00 **Omnioriented Tunability**

268.01 We call it a triangle only because the observing system lacks the frequency tunability to see the altitude of the tetrahedron.

268.02 System insiderness and outsiderness means two congruent, concave-convex systems, four corner-defining *ins*, and their four opposite windows through which the omnidirectional *out* nothingness is revealed. The eight were there all the time. The fourness of self and the fourness of otherness = comprehension. Comprehension involves tuned-in octave resonance as well as omnidirectional and local angular integrity. The sum of all the angles around all of the system vertexes must add up to 720 degrees, which is not only four triangular enclosures but is also unity as two, for 360 degrees is one cycle—ergo, 720 degrees = unity two.

268.03 A system's parameters are the exact number of lucidly relevant somethings constituting the system. Parameters are the consideration. *Sidus* = star; *con- sidus*— consideration: how many interrelationships between the tunably relevant events con-sidered. There must be six or multiples of six to satisfy the generalized Eulerean topological equation.

268.04 All who have been educationally conditioned in science's formal, three-dimensional, XYZ, CG_rS, rectilinearly coordinate frame of omniparallel lines of conceptual reference are condemned to infinite travel in three sets of opposite directions, along and between whose infinite parallelism there are no inherent resolutions of answers to infinite questions. It is quite otherwise when they are advantaged by the inherent nucleated, omnidirectionally-concentrically enclosing, wave-frequency magnitude gradations of radiant growth or gravitational contraction of synergetics, whose convergent-divergent, systemic resonatability and tunability have the capability to run nature into terminal minimum-involvement systems of omnioriented considerability.

268.05 Conditioned to linear, special-case-directions thinking by the formally adopted educational systems of world-around society, humans think of life as a continuous linear experience despite all experiencing being inherently omnidirectionally informed. But they fail to consider that for every two eighthour periods of seemingly continuous consciousness they stop conscious experiencing for eight hours—two on and two off—two on and two off. And they fail to realize that their sight is stroboscopically discontinuous and that there are inherent lags between sightings and cognitions, with the intervals between sights and cognitions too short to be cerebrally tunable. Here again we have evidence of the omnidirectional, finitely islanded, closed-system moments of awareness, which moments alone can be identified with what we call life. Here we have infratunable discontinuity of life occurring 60 times every second and tunably discontinuing for eight hours every 16 hours—with no human ever having the capability to prove that he is the same human who went to sleep nor that what he calls being awake is not a more vivid dream.

268.06 In view of the experimental provability—and ever reprovability—of the omnidirectionally islanded discontinuities of the packaged moments of life of which we are unaware, we must nonetheless comprehend that we have also been unconsciously "dying" 60 times a second. We must also become aware of the possibility that there is a periodicity of unconsciousness that is only as yet supratunable in terms of the as-yet-only-minuscule, cosmic duration of human experience.

268.07 This inference is also implicit in the closest-packed uniradius spheres, as photographically manifest by atomic agglomerations whose spherical domains are those of their spherical triangles' stabilized orbiting electrons' great circle patterns and their comprehensive constants of axial rotations, between whose closest packing are the spaces whose space-to-sphere ratio is one to six. Inasmuch as the rhombic triacontahedron volume is five (when the tetrahedron's volume is 1) and the allspace volume is six as manifest by the allspace-filling rhombic dodecahedron that tangentially embraces the sphere—the space-to-space ratio (or its nonexperience-to-experience, inherently spherical ratio) is clearly manifest in the co-occurring $10F^2 + 2$ and $6F^2 + 2$ rates of concentric closest packing of uniradius spheres around a nuclear sphere in which the rate of occurrence of the concentric layers of space modules is twice that of the whole sphere layer occurring—ergo, $5F^2 + 2$ is to $6F^2 + 2$ as 5:6. (See Secs. [983.04](#) and [986.860-64](#).)

269.00 **Topology of Ins, Outs, and Interrelationships**

269.01 The self or otherness somethingnesses seem initially to be infra-tune-in-able. Thinking in terms of Euler and advantaged by all electromagnetically harvested experience, we may now employ the term *inframicrosystems* instead of "points" and *ultramicrosystems* instead of "space." The tuner and the tuned have a minimally-energy- expensive—ergo, geodesic—set of interrelationships. Tune-in-ability and tune-out-ability systems function as transceivers. Tune-out-ability is omnidirectional transmission: it does not mean shut off, as does "turning out the light." The tuner and the tuned inherently constitute an in-out transceiver system—a coordinate, concentric, convergent-divergent, frequency-differentiable system.

269.02 The silence is ultratunable; the noise is infratunable; and the music is tunability itself. Color is special case tunable.

269.03 *In* and *out* are characteristic of the tunability language of electromagnetics. Any or no direction is of equal information importance.

269.04 We can call the focals the *ins*. Focal point = *in*; *in* vs omnidirectional. The focal *ins* are special case, while the outness is generalization. This is how conceptuality produces geometry independent of size and time. *Outness* is ultratuned conceptuality independent of time-size. *Inness* is conceptually oriented independent of size.

269.05 But there are always the outsideness and the insideness of tetrahedral system unity—the ultratunable, omnidirectionless nothingness and the infratunable, twilight- radiant-threshold-crossing, directionally oriented somethingness. Instead of Euler's vertexes, crossings, or points, we say:

- *inframicrosystems*, which are only directionally identifiable; specific directional *ins*; threshold-crossing, twilight-radiant, twilight-frequency somethingnesses tune-in-able only as noise.
- ultramacrosystems, which are nondirectionally identifiable; the omnidirectional *outs*, never-as-yet and maybe never-ever tunable; wherever and whenever the seeming nothingness may have color only as threshold-crossing, twilight-radiant, twilight- frequency, nondirectional, ultratunable *outness*; a number of glimpsed or window-framed views of nothingness.
- *interrelationships*, the directionally orientable, local-azimuthally-angled, cyclically- fractionated aroundness from this moment to that; the most economic geodesic interrelationship lines occurring as curvilinear arc segments of complex orbital accelerations. (Compare Sec. [1007.22](#).)

269.06 The observer and the observed are two *ins* with one relationship. Euler said $V + A = L + 2$, but we may now say: The number of somethings + the number of nothings = the number of interrelationships + 2.

- *Or we may say: The number of ins + the number of outs = the number of most economical interrelationships between the ins + the number 2.*
- *Or we may say: Observer + observed + outness = three elements = one interrelationship + the number 2.*

The complete generalization of Euler does away with the windows. Windows were the rims of the eyeglass-framing separate views of the same nothingness.

269.07 In generalized topology we may use symbols for *ins*, *outs*, and *interrelationships*:

$S =$ *Somethingness ins*

$N =$ *Nothingness outs*

$R =$ *Minimum number of interrelationships*

Ⓢ = *Multiplicative twoness*

$P =$ *Additive twoness*

Ⓢ = Multiplicative twoness = Euler's + 2 unity = twoness = the inherently co-occurring, concave-convex, systemic, inward-outward dichotomy.

$P =$ Additive twoness = Euler's + 2 unity = twoness = the two axial poles of inherent rotatability of all systems

We may say:

Ⓢ $(S + N = R + P)$

$2(S + N = R + P)$

$2(S + N = R + 2)$

[Next Section: 270.00](#)

270.10 Topological Accountability of All Vanishing and Elsewhere-Reappearing Quanta

270.11 The whole of synergetics' cosmic hierarchy of always symmetrically concentric, multistaged but continually smooth (click-stop subdividing), geometrical contracting from 20 to 1 tetravolumes (or quanta) and their successive whole-number volumes and their topological and vectorial accounting's intertransformative convergence- or-divergence phases, and in particular the series of posters appearing in [color plates 1-10](#), elucidate conceptually, and by experimentally demonstrable evidence, the elegantly exact, energetic quanta transformings by which

- a. *energy-exporting structural systems precisely accomplish their entropic, seemingly annihilative quantum "losses" or "tune-outs," and*
- b. *new structural systems appear, or tune in at remote elsewheres and elsewhens, thereafter to agglomerate syntropically with other seemingly "new" quanta to form geometrically into complex systems of varying magnitudes, and how*
- c. *such complex structural systems may accommodate concurrently both entropic exporting and syntropic importing, and do so always in terms of whole, uniquely frequenced, growing or diminishing, four-dimensional, structural-system quantum units.*

270.12 In the era before the measurement of the speed of light scientists assumed an instant, unitarily conceptual, normally-at-rest (but for the moment, and only locally, perversely restless) Universe. Before the 20th-century discoveries of other galaxies and in the early days of thermodynamics and its disclosure of entropy—the inexorable systemic loss of energy—the scientists were prone to assume that the vast instantaneous cosmic machine as a thermodynamic system must itself be "running down"—that is, continually spending itself entropically and trending eventually to self-annihilation.

270.13 Boltzmann contradicted that assumption by saying in effect that the a priori fact of the existence of billions of stars radiantly and entropically broadcasting their energies must require an as-yet-undiscovered but obviously operative energy redistribution system by which stars are elsewhere and elsewhen assemblingly formed. Boltzmann therefore assumed a cosmic complex of invisible energy-importing centers whose nonsimultaneous formations but sum-total, long-run energy importing exactly balances all the long-run cosmic exportings. The entropic radiance of the exporting centers makes them visible to us, while the importing centers are inherently invisible, except when starlight bounces reflectively off them as does Sunlight make the Moon—and the planets Venus, Jupiter, Mars, and Saturn—reflectively visible to us Earthians.

270.14 Because Boltzmann could not demonstrate the astrophysical presence of such inherently invisible importing centers, his concept was not widely accepted by other scientists. Einstein, however, later supported Boltzmann's concept as constituting a logical corollary of Einstein's own implicit concept of the Universe as an aggregate of nonsimultaneous, variously enduring, and only partially overlapping energy events. Though Einstein did not employ the analogy, his was in effect an endless ropelike concept of variously enduring, finite, special case episodes converging in generalized principle to apparent irrelevance and overlapping one another momentarily to constitute a fat- or thin-diametered rope of meaningful concern as might preoccupy any one cosmologist at any one time.

270.15 Among their many sophisticated mathematical devices mathematicians' most advanced conceptual tool is the topology of Leonhard Euler, whose three irreducible visualizable aspects of *vertexes* V , *planar faces or areas* F , and *edges of faces or lines* E seem to the geometrically heedless mathematical physicists and astrophysicists to have no inherent correspondence with experimentally demonstrable energetic reality.

270.16 Synergetics defines *structure* as meaning the self-interstabilization by a complex of forces operative in six degrees of freedom. This complex definition can be resolved into only one word—*triangulation*. The faculty of the Massachusetts Institute of Technology has defined mathematics as "the science of structure and pattern in general."

270.17 Synergetics and operational mathematics find that by combining topology and vectorial geometry, and by always requiring structural stability and intertransformative proofs in four-dimensional electromagnetic reality for all propositions, and by starting with minimum conceptuality of a substantive entity as having inherent insiderness and outsiderness, *it is in evidence*

- that the minimum polyhedron (the tetrahedron) consists entirely of minimum polygons (triangles);
- that the minimum polyhedron systematically and inherently divides all Universe into (a) an excluded macrocosm, (b) an included microcosm, and (c) the remainder of Universe constituting the dividing system itself;
- that this tune-in-able minimum, systemic, primitive entity is apprehensible conceptually because of its contrast to the “nothingness” of the presently untuned- in and un-tune-in-able (within the limited frequency range of the human observer's given equipment);
- that the cosmically comprehensive equilibrium of all vectors provides the geometrically conceptual field of *structuring-as-you-go* reference and is known as the four-dimensional isotropic vector, meaning cosmically everywhere and everywhen *the same* energy conditions—ergo undifferentiable, ergo untunable and unapprehensible in any special case time-size reality—but both intellectually and geometrically conceptualized in synergetics' vectorial, angular-oriented comprehensivity; and
- that there is no "space"; there is only the tuned-in and the at-present-untuned- in—over ten million invisible electromagnetic waves of radio, TV, and other broadcasts are surrounding you and permeating you in what we usually call space.

270.18 Euler shows that in respect to all uncored polyhedra the number of vertexes plus the number of faces always equals the number of edges plus the number 2 ($V+F=E+2$). But the diversion of this formula into local aspects of polyhedra introduced a nonexistent two-dimensionality, allowing the mathematicians to detour around reality. Academic mathematicians (themselves indifferent to physical manifestation of experimental evidence) have detoured Euler's concepts into such games as that of the pretended existence of a substanceless rubber sheet having no insiderness but only a one-way-at-a-time-facing surface with no edge thickness or obverse surface. On such an imaginary surface Euler's vertexes, faces, and edges have been distortingly redeployed.

270.19 Euler was almost blind, but with his compensatorily vivid imagination he discovered that all visual experiences could be reduced to three prime aspects: *lines*, and where lines converge to *vertexes*, and where lines surroundingly cross one another to describe *areas* bound by those lines. Because his topology was concerned with only visual aspects, Euler was able to overlook substantial textures, sounds, tastes, and smells; temperatures, weights, and volumes; durations, intensities, frequencies, and velocities. But he was so great a scientist and so competent a mathematician that he evolved the fundamentals of structural analysis employed in the 20th century in designing structures of land, sea, sky, and extraterrestrial functioning.

270.20 The chemist Willard Gibbs, developed the phase rule dealing with liquid, gaseous, and crystalline states of substances, apparently not realizing that his phase rule employed the same generalized mathematics as that of Euler's topological vertexes, faces, and edges.

270.21 Synergetics is concerned exclusively with physically demonstrable, and thus experimentally evidenceable, phenomena. Synergetics adds to Euler's topology its discovery of the mathematically generalizable constant relative interabundance of angles, volumes, and all the physical characteristics of time-space velocity, force, wavelength and frequency, directional orientation, and systems consideration—always identifying Euler's edge lines *E* as representative only of physical energy vectors or metaphysical lines of unique interrelationships of vertexially located phenomena. Vectors are discrete in length, being the product of physical velocity and mass operating in a given angularly describable direction in respect to a given axis of observation. Velocity is a product of time and distance, while mass is a relative density of energy events per given volume; wherefore all the qualities of physical experience are describable in a unified four-dimensional field, a state at which physical Universe never tarries, and relative to which (and through which) all of nature's physical manifestations are local, differentially frequenced aberratings and pulsative omniconvergent-divergent, omniinteraccommodative transformings.

270.22 Since the sum of the chordally convergent angles of any triangle (right, isosceles, or scalene) is always 180 degrees, the sum of the angles of any chordally defined tetrahedron, regular or irregular, is always 720 degrees; therefore, all its topological and geometrical interrelationship properties are consistently similar—ergo, universal independently of time-size considerations.

270.23 We start our vectorial, topological, structuring-as-you-go exploration with the primitive state of conceptuality (independent of size and time) of the universal tetrahedron, with its four triangular facets, its four corners, its 12 angles, and its six most economical, chordal, interrelationship lines running between its four-corner event foci.

270.24 In exploring the intertransformability of the primitive hierarchy of structuring-as-you-go, with its omnitriangularly oriented evolution and the interbonding of its evolving structural components, we soon discover that the universal interjointing of systems and their foldability permit the angularly hinged convergence into congruence of vectors, faces, and vertexes as demonstrated in the *vector equilibrium jitterbug* (Sec. [460](#)), each of whose multicongruences appears as only one edge or one vertex or one face aspect. Topological accounting as conventionally practiced accounts each of these multicongruent aspects as consisting of only one such aspect. Only synergetics accounts for the presence of all the congruent aspects—double, triple, or fourfold—by always accounting for the initial inventory of the comprehensive tetravolume-48 rhombic dodecahedron and the 20 tetravolume vector equilibrium, together with their initial or primitive inventory of vertexes, faces, and edge lines, which are always present in all stages of the 48 → 1 jitterbug convergence transformation, though often imperceptibly so.

270.25 With recognition of the foregoing topological deceptiveness, and always keeping account of the primitive total inventory of such aspects, we find it possible to demonstrate conceptually and to prove the validity not only of Boltzmann's concepts but of all quantum phenomena. This makes it possible to interlink the mathematical accounting of synergetics conceptually with the operational data of physics and chemistry as well as with the complex associabilities of their related disciplines.

[Next Chapter: 300.00](#)
