

## 100.00 SYNERGY

### 100.01 Introduction: Scenario of the Child

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[100.01-100.63 Child as Explorer Scenario]

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

Awareness = self + otherness

Awareness = observer + observed

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

100.012 Universe to each must be

All that is, including me.

Environment in turn must be

All that is, excepting me.

(Compare Secs. [264.10](#) and [1073.12](#).)

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

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

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

100.016 Although children have the most superb imaginative faculties, when they explore and arrive at new objective formulations, they rely—spontaneously and strategically—only upon their own memory of relevant experiences. With anticipatory imagination children consider the consequences of their experiments, such as a physical experiment entailing pure, unprecedented risk yet affording a reasonable possibility of success and including a preconception of the probable alternative physical consequences of their attempt. For example, they may conceivably jump over a ditch today even though it is wider than any over which they have previously leapt. They only make the attempt because they have also learned experientially that, as they grow older and bigger, they are often surprised to find that they can jump farther and higher than ever before. "How do all my muscles feel about it now?" and "Shall I or shall I not try?" become exquisitely aesthetic questions leading to synergetically integrated, physical-metaphysical, split-second self-appraisals and exclusively intuitive decisions. If it's "Everything go!" all thoughts of negative consequences are brushed aside.

100.017 Children conduct their spontaneous explorations and experiments with naive perceptivity. They have an innate urge first subjectively to *sort out, find order in, integratively comprehend, and synergetically memory-bank* their experience harvests as intertransformability system sets. Thereafter they eagerly seek to demonstrate and redemonstrate these sets as manifest of their comprehension and mastery of the synergetic realizability of the system's physical principles. Consequently children are the only rigorously pure physical scientists. They accept only sensorially apprehensible, experimentally redemonstrable physical evidence.

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

100.020 Human Sense Awareness

#### INFRARED THRESHOLD

(Only *micro*-instrument-apprehensible)

*Tactile:* Preponderantly sensing the crystalline and triple-bonded atom-and-molecule state, including all the exclusively infraoptical frequency ranges of the electromagnetic wave spectrum's human receptivity from cold "solids" through to the limit degrees of heat that are safely (nonburningly) touchable by human flesh.

*Olfactoral:* Preponderantly sensing the liquid and double-bonded atom-and-molecule state, including all of the humanly tunable ranges of the harmonic resonances of complex chemical liquid substances.

*Aural:* Preponderantly sensing the gaseous and single-bonded atom-and-molecule state, including all ranges of humanly tunable simple and complex resonance harmonics in gasses.

*Visual:* Preponderantly sensing the radiantly deflecting-reflecting, unbonding-rebonding, atom-and-molecule energy export states, including all ultratactile, humanly-tune-in-able, frequency ranges of electromagnetic wave phenomena.

#### ULTRAVIOLET THRESHOLD

(Only *macro*-instrument-apprehensible)

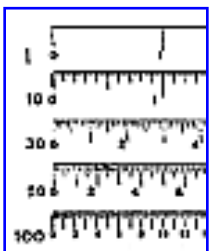
(See Secs. [267.02](#), [801.01-24](#), and [1053.85](#).)

100.021 The direct sensing of information may sometimes be deceptive and illusory due to such factors as coincidence, congruence, or the time-and-angle distortions of perspective. For instance, the parallel railroad tracks seem (mistakenly) to converge at the horizon, and the apparently "motionless" remote stars seem (mistakenly) fixed, while they are in fact speeding at celestial macrorates.

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

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

### 100.030 **Resolvability Limits**



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

[Fig. 100.031](#)

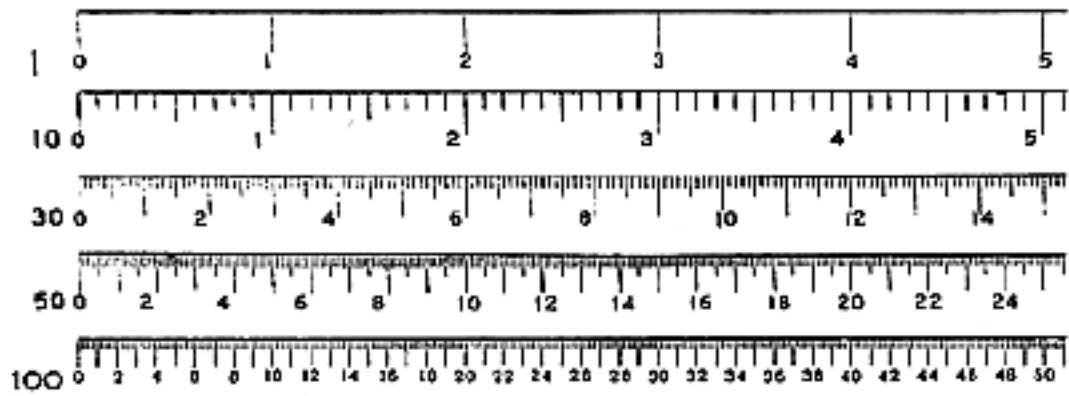


Fig. 100.031 Resolvability Limits: Engineer's inch scale.

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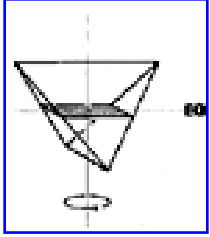
100.032 A point-to-able something may be much too small to be optically resolved into its constituent polyhedral characteristics, yet be unitarily differentiated as a black speck against a white background. Because a speck existed yet defied their discernment of any feature, mathematicians of the premicroscope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

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

#### 100.10 **Subdivision of Tetrahedral Unity**

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

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

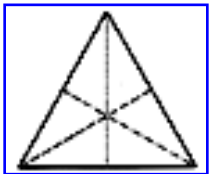


[Fig. 100.103](#)

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

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

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



[Fig. 100.1041](#)

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

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

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

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

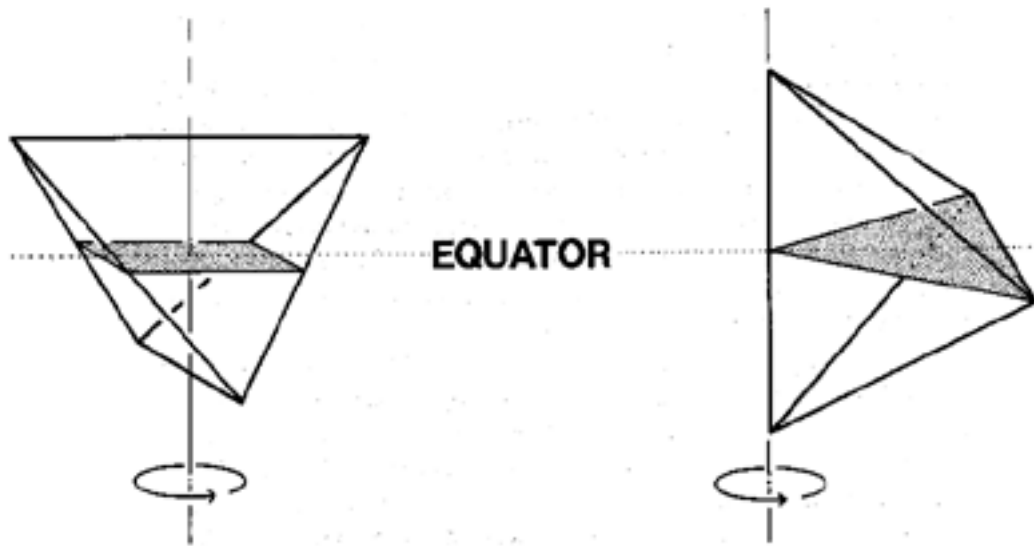


Fig. 100.103 *Parallel and Perpendicular Halving of Tetrahedron:*  
Compare [Figs. 527.08](#) and [987.230B](#).



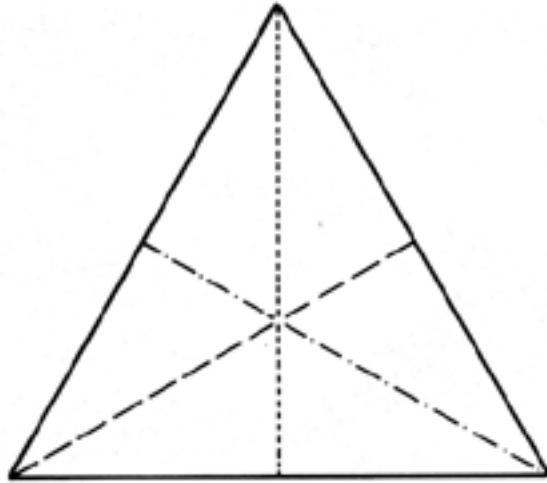


Fig. 100.1041 Three-way Bisecting of a Triangle.

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



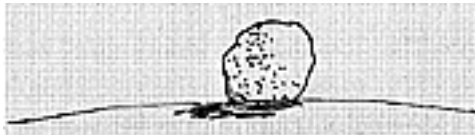
[Fig. 100.120](#)

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

### 100.20 **Scenario of the Child**

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

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



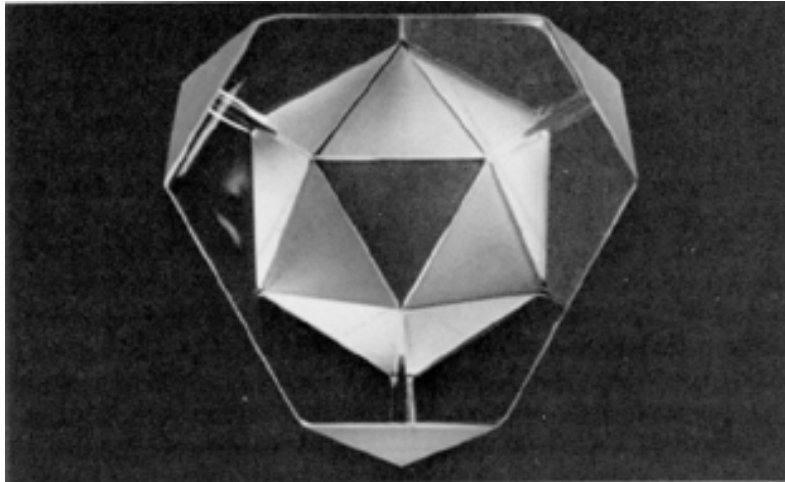
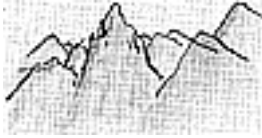


Fig. 100.120 *Image of Icosa and Tetra*: Photograph of a truncated glass tetrahedron with frosted triangular facets producing an image of clustered tetrahedra that approximate an icosahedron. (See discussion at [Sec. 934.](#))

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- picture of the Matterhorn



- minimum of three faces around a corner



- child breaks off piece of something



- separate individual "things"



- child takes hammer and breaks rock



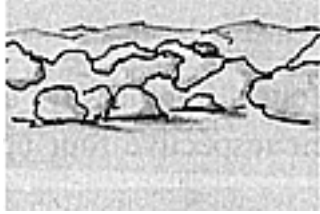
- nature breaks big rocks



- humans blast apart rock cliff with dynamite



- picture of rocks on Earth



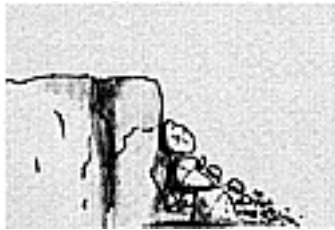
- picture of rocks on Moon



- picture of rocks on Mars



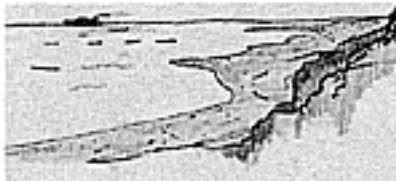
- picture of big rocks broken into smaller rocks.



- picture of small rocks broken into sand



- picture of sandy beach



- picture of individual grains of sand

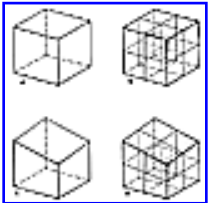


- minimum separable something has a minimum of four corners, each surrounded by a minimum of three faces; each face is surrounded at

minimum by three edges. "Minimum somethings" consist altogether of a minimum of four corners, four faces, six edges, 12 angles, insideness, outsideness, concavity, convexity, and two poles of spinnability—a minimum total of 32 unique geometrical features ([Sec. 1044](#))

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

### 100.30 Omnirational Subdividing



[Fig. 100.301](#)

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

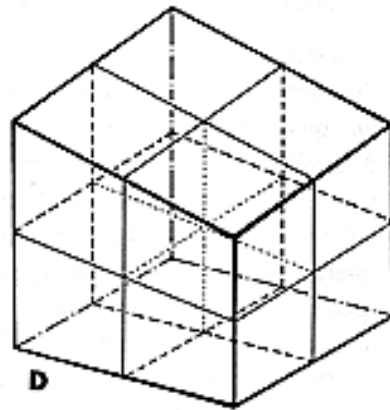
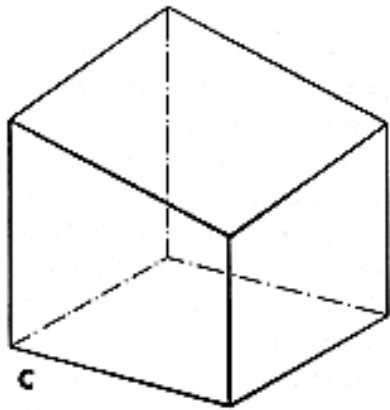
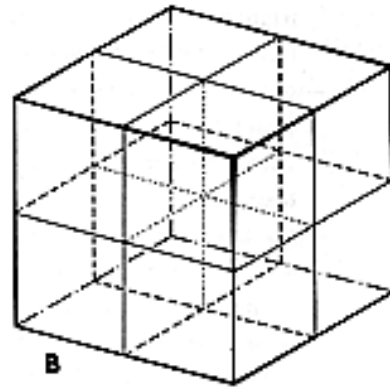
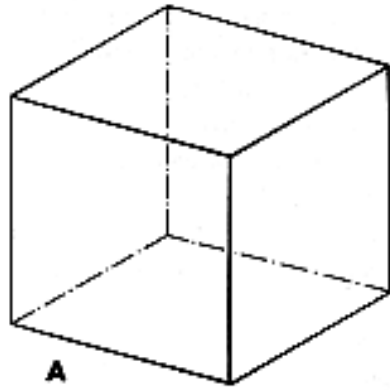


Fig. 100.301A-D Dissimilar Subdivision of Irregular Hexahedra

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

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

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

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

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

100.320 **Modular Subdivision of the Cosmic Hierarchy**



100.321 Any four points in Universe are always most economically interrelated by an ever-transforming tetrahedron, the whole, low-order, rational volume of whose primitive, cosmic, equiwavelengthed-and-frequenced corresponding vector equilibrium, cube, octahedron, rhombic triacontahedron, and rhombic dodecahedron—stated in tetravolumes—are always 1, 2 ½, 2 ½, 3, 4, 5, 6—which hierarchy of constituent geometrical structures remains eternally invariable. (See [Table 1033.192.](#))

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

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

### 100.330 "Me" Ball

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

### 100.40 Finite Event Scenario

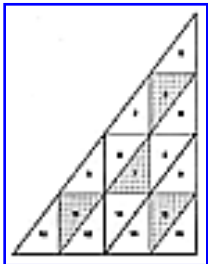
100.401 Events are changes of interrelationships.

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

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

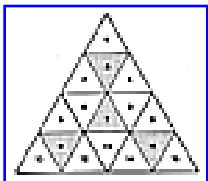
#### 100.41 **Foldability of Triangles into Tetrahedra**

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



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

[Fig. 100.412](#)



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

[Fig. 100.413](#)

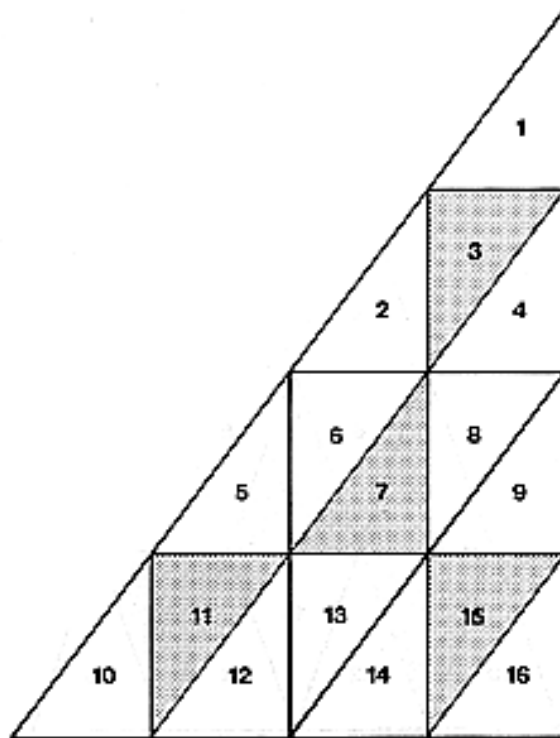


Fig. 100.412

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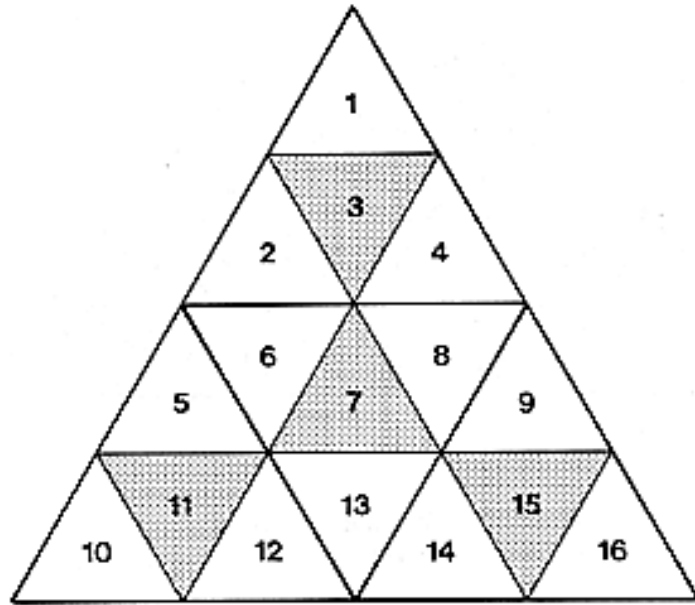
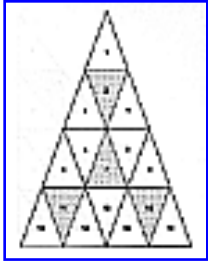


Fig. 100.413

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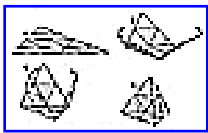
100.414 The isosceles triangle, with all angles less than 90 degrees, folds into an irregular tetrahedron consisting of four similar irregular tetrahedra. Their total volume equals the volume of the central irregular octahedron (inadvertently described). (See Fig. 100.414.)

[Fig. 100.414](#)



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

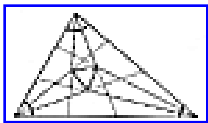
[Fig. 100.415](#)



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

[Fig. 100.416](#)

### 100.50 Constant Triangular Symmetry



[Fig. 100.51](#)

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

### 100.60 Finite Episoding

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

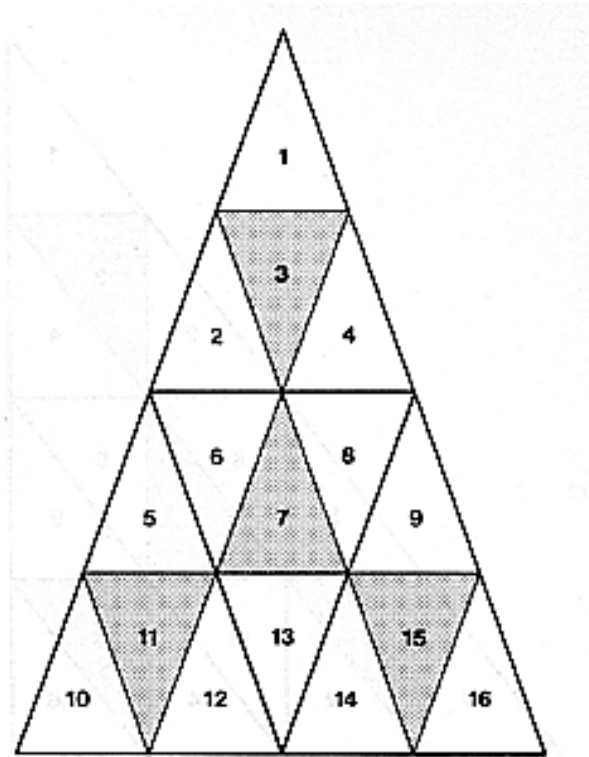


Fig. 100.414

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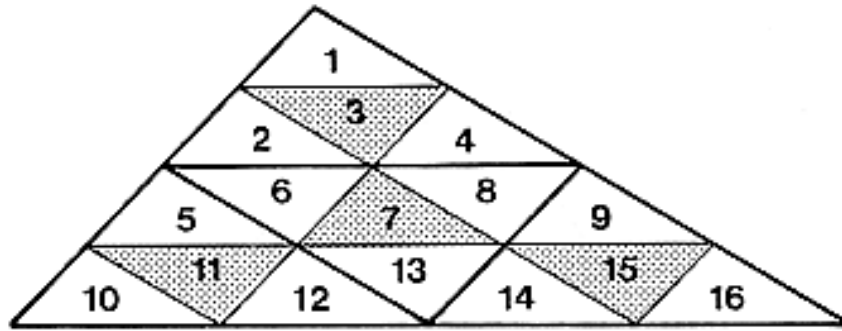


Fig. 100.415

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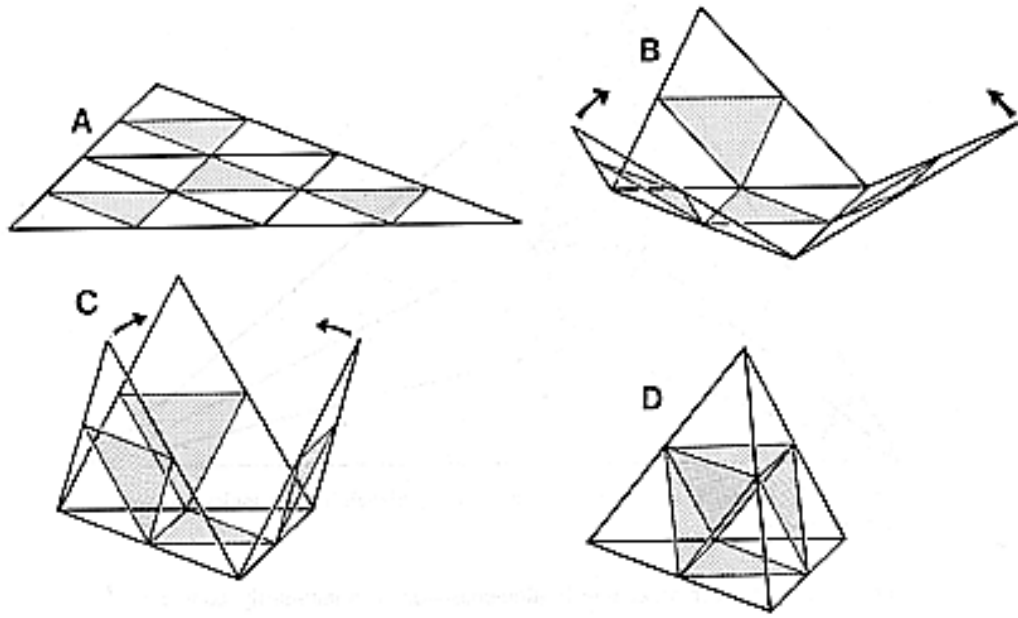


Fig. 100.416

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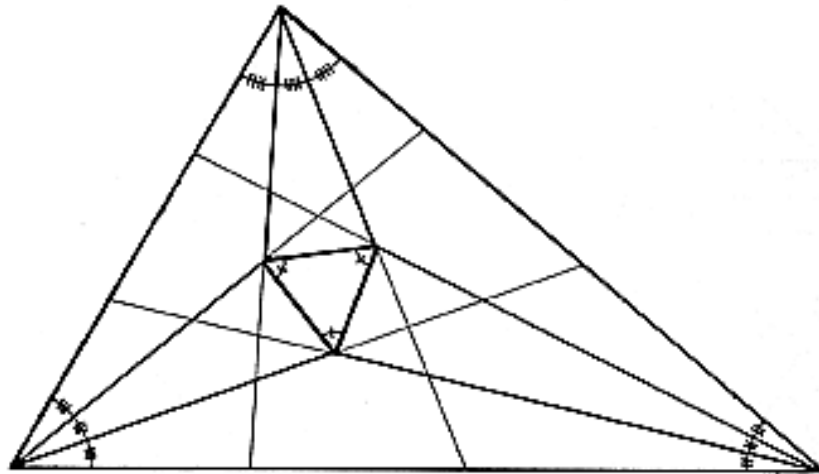


Fig. 100.51 Morley Theorem: The trisectors of any triangle's three angles describe an equiangular triangle.

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

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

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