936.00 **Volumetric Variability with Topological Constancy**

936.10 **Symmetrical and Asymmetrical Contraction**

936.11 An octahedron consists of 12 vector edges and two units of quantum and has a volume of four when the tetrahedron is taken as unity. (See Table 223.64.) Pulling two ends of a rope in opposite directions makes the rope's girth contract precessionally in a plane at 90 degrees to the axis of purposeful tensing. (Sec. 1054.61.) Or if we push together the opposite sides of a gelatinous mass or a pneumatic pillow, the gelatinous mass or the pneumatic pillow swells tensively outward in a plane at 90 degrees to the line of our purposeful compressing. This 90-degree reaction—or resultant—is characteristic of precession. Precession is the effect of bodies in motion upon other bodies in motion. The gravitational pull of the Sun on the Earth makes the Earth go around the Sun in an orbit at degrees to the line of the Earth-Sun gravitational interattraction. The effect of the Earth on the Moon or of the nucleus of the atom upon its electron is to make these interattractively dependent bodies travel in orbits at 90 degrees to their mass-interattraction force lines.

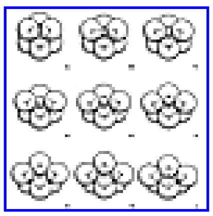
Fig. 936.12

936.12 The octahedron represents the most commonly occurring crystallographic conformation in nature. (See Figs. 931.10 and 1054.40.) It is the most typical association of energy-as-matter; it is at the heart of such association. Any focused emphasis in the gravitational pull of the rest of the Universe upon the octahedron's symmetry precesses it into asymmetrical deformation in a plane at 90 degrees to the axis of exaggerated pulling. This forces one of the 12 edge vectors of the octahedron to rotate at 90 degrees. If we think of the octahedron's three XYZ axes and its six vertexes, oriented in such a manner that X is the north pole and X' is the south pole, the other four vertexes—Y, Z, Y', Z'—all occur in the plane of, and define, the octahedron's equator. The effect of gravitational pull upon the octahedron will make one of the four equatorial vectors disengage from its two adjacent equatorial vertexes, thereafter to rotate 90 degrees and then rejoin its two ends with the north pole and south pole vertexes. (See Fig. 936.12 and color plate 6.)

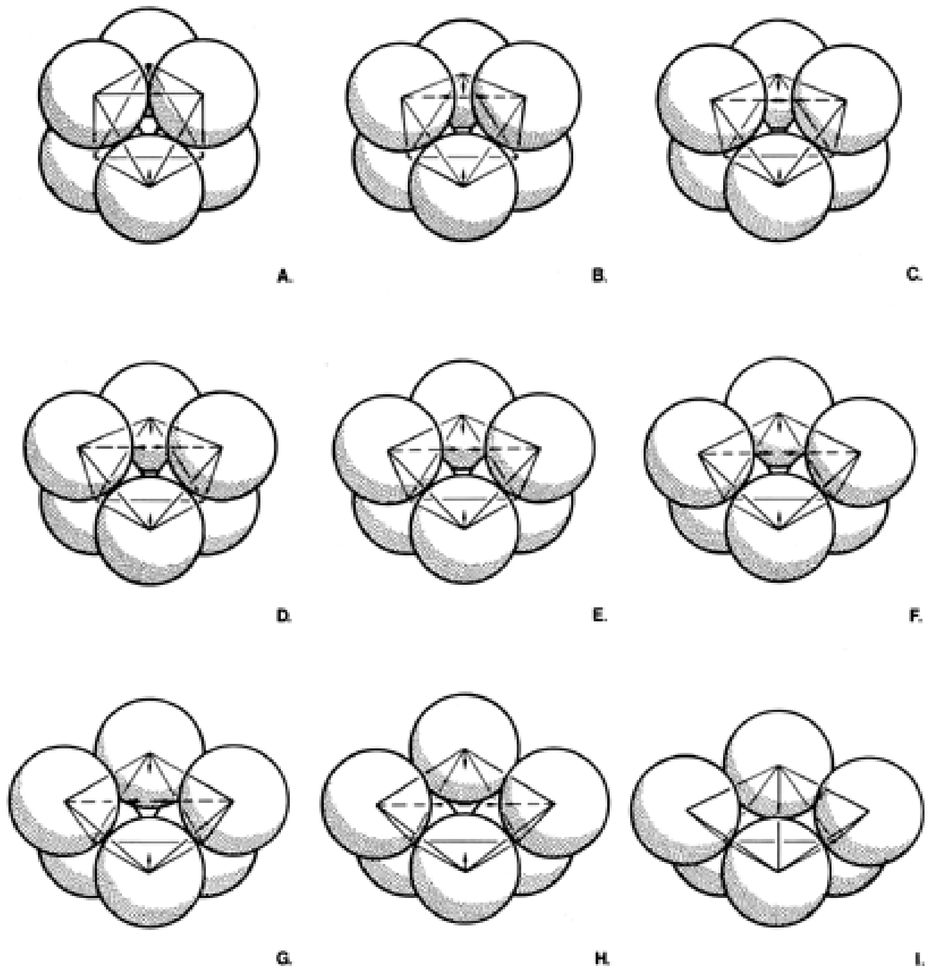

Fig. 936.12 Octahedron as Conservation and Annihilation Model: If we think of the octahedron as defined by the interconnections of six closest-packed spheres, gravitational pull can make one of the four equatorial vectors disengage from its two adjacent equatorial vertexes to rotate 90 degrees and rejoin the north and south vertexes in the transformation completed as at I. (See color plate 6.)

936.13 When this precessional transformation is complete, we have the same topological inventories of six vertexes, eight exterior triangular faces, and 12 vector edges as we had before in the symmetrical octahedron; but in the process the symmetrical, four- tetrahedra-quanta-volume octahedron has been transformed into three tetrahedra (three- quanta volume) arranged in an arc section of an electromagnetic wave conformation with each of the two end tetrahedra being face bonded to the center tetrahedron. (See Sec. 982.73)

936.14 The precessional effect has been to rearrange the energy vectors themselves in such a way that we have gone from the volume-four quanta of the symmetrical octahedron to the volume-three quanta of the asymmetric tetra-arc-array segment of an electromagnetic wave pattern. Symmetric matter has been entropically transformed into asymmetrical and directionally focused radiation: one quantum of energy has seemingly disappeared. When the radiation impinges interferingly with any other energy event in Universe, precession recurs and the three-quantum electromagnetic wave retransforms syntropically into the four-quantum octahedron of energy-as-matter. And vice versa. Q.E.D. (See Fig. 936.14.)

936.15 The octahedron goes from a volume of four to a volume of three as one tensor is precessed at 90 degrees. This is a demonstration in terms of tension and compression of how energy can disappear and reappear. The process is reversible, like Boltzmann's law and like the operation of syntropy and entropy. The lost tetrahedron can reappear and become symmetrical in its optimum form as a ball-bearing-sphere octahedron. There are six great circles doubled up in the octahedron. Compression is radiational: it reappears. Out of the fundamental fourness of all systems we have a model of how four can become three in the octahedron conservation and annihilation model.

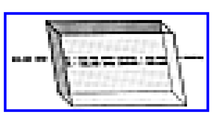
Fig. 936.16

936.16 See the Iceland spar crystals for the octahedron's double vector-edge image.

936.17 The interior volume of the concave-vector-equilibrium-shaped space occurring interiorly between the six uniradius octahedral collection of closest-packed spheres is greater than is the concave-octahedrally-shaped space occurring interiorly between the four uniradius tetrahedral collection of closest-packed spheres, which tetrahedral collection constitutes the minimum structural system in Universe, and its interior space is the minimum interior space producible within the interstices of closest- packed uniradius spheres.

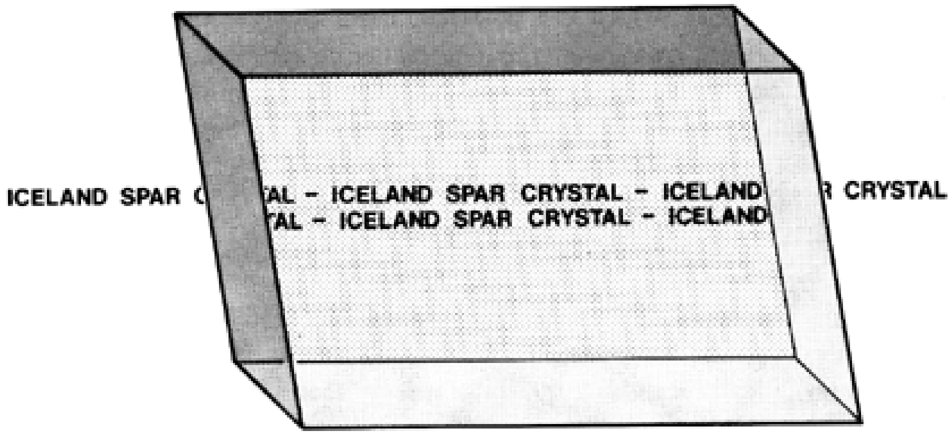

Fig. 936.16 Iceland Spar Crystal: Double vector image.

936.18 Thus the larger interior space within the omnitriangularly stable, six-vertex- ball, 12-vector-edge octahedron is subject to volumetric compressibility. Because its interior space is not minimal, as the octahedron is omniembracingly tensed gravitationally between any two or more bodies, its six balls will tend precessionally to yield transformingly to produce three closest-packed, uniradius, sphere-vertex-defined, face- bonded tetrahedra.

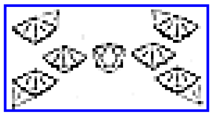

Fig. 936.19

936.19 As we tense the octahedron, it strains until one vector (actually a double, or unity-as-two, vector) yields its end bondings and precesses at 90 degrees to transform the system into three double-bonded (face-bonded) tetrahedra in linear arc form. This tetra- arc, embryonic, electromagnetic wave is in neutral phase. The seemingly annihilated—but in fact only separated-out-quantum is now invisible because vectorless. It now becomes invisibly face-bonded as one invisible tetrahedron. The separated-out quantum is face- bonded to one of the furthermost outward triangular faces occurring at either end of the tetra-arc array of three (consisting of one tetra at the middle with each of the two adjacent tetra face-bonded to it); the fourth invisible tetrahedron is face-bonded to one or the other of the two alternatively vacant, alternatively available furthermost end faces of the tetra- arc group. With this fourth, invisible tetrahedral addition the overall triple-bonded tetrahedral array becomes either rightwardly or leftwardly spiraled to produce a four- tetrahedron tetrahelix, which is a potential, event embryo, electromagnetic-circuitry gap closer. Transmission may thereafter be activated as a connected chain of the inherently four-membered, individual-link continuity. This may explain the dilemma of the wave vs the particle. (See Sec. 973.30, Fig. 936.19, and color plates 6 and 7.)

936.20 **Conceptual Conservation and Annihilation**

936.21 The octahedron as the conservation and annihilation model provides an experiential and conceptual accounting for the question: What happens to entropically vanishing quanta of energy that have never been identified as discretely lost when new quanta appeared elsewhere and elsewhen? Were these appearing and disappearing quanta being encountered for the first time as we became capable of penetrating exploration of ever vaster ranges of Universe?

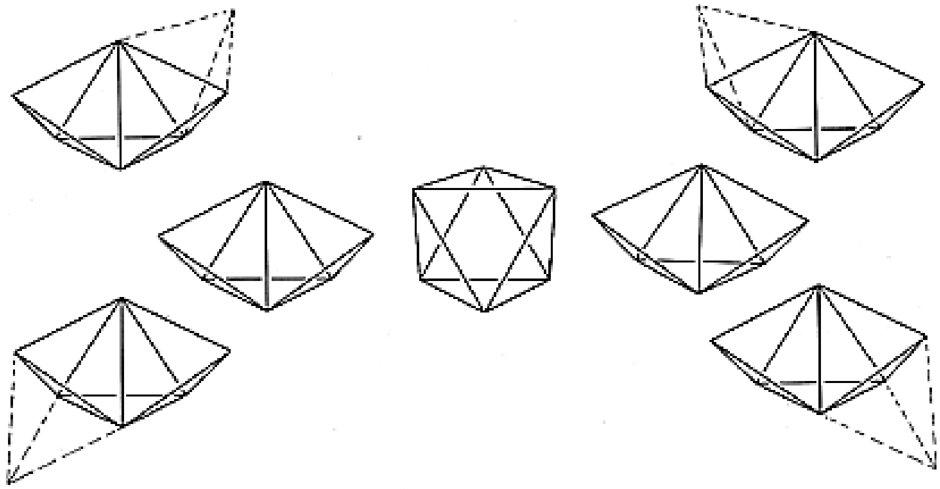

Fig. 936.19 Tetrahedral Quantum is Lost and Reappears in Transformation between Octahedron and Three-tetra-arc Tetrahelix: This transformation has the precessional effect of rearranging the energy vectors from 4-tetravolumes to 3-tetravolumes and reverse. The neutral symmetric octahedron rearranges itself into an asymmetric embryonic wave pattern. The four-membered individual-link continuity is a potential electromagnetic-circuitry gap closer. The furthermost ends of the tetra-arc group are alternatively vacant. (See also color plate 6.)

936.22 Boltzmann hypothesized and Einstein supported his working assumption—stated in the conceptual language of synergetics—that there can be no a priori stars to radiate entropically and visibly to the information-importing, naked eyes of Earthian humans (or to telescopes or phototelescopy or electromagnetic antennae) if there were not also invisible cosmic importing centers. The importing centers are invisible because they are not radiantly exporting; they are in varying stages of progressive retrieving, accumulating, sorting, storing, and compressing energies. The cosmic abundance of the myriads of such importing centers and their cosmic disposition in Scenario Universe exactly balances and conserves the integrity of eternally regenerative Universe.

936.23 In Scenario Universe (in contrast to a spherically-structured, normally-at-rest, celestially-concentric, single-frame-picture Universe) the episodes consist only of such frequencies as are tune-in-able by the limited-frequency-range set of the viewer.

936.24 There is no such phenomenon as space: there is only the at-present-tuned-in set of relationships and the untuned intervalling. *Points* are twilight-border-line, only amplitude-tuned-in (AM), directionally oriented, static squeaks or pips that, when frequency-tuned (FM), become differentially discrete and conceptually resolvable as topological systems having withinness and withoutness—ergo, at minimum having four corner-defining yet subtunable system pips or point-to-able corner loci. In systemic cosmic topology Euler's vertexes (*points*) are then always only twilight energy-event loci whose discrete frequencies are untunable at the frequency range of the reception set of the observer.

937.00 **Geometry and Number Share the Same Model**

937.10 **Midway Between Limits**

937.11 The grand strategy of quantum mechanics may be described as progressive, numerically rational fractionating of the limit of total energy involved in eternally regenerative Universe.

937.12 When seeking a model for energy quanta conservation and annihilation, we are not surprised to find it in the middle ranges of the geometrical hierarchy of prime structural systems—tetrahedron, octahedron, and icosahedron (see Sec. 610.20). The tetrahedron and icosahedron are the two extreme and opposite limit cases of symmetrical structural systems: they are the minimum-maximum cosmic limits of such prime structures of Universe. The octahedron ranks in the neutral area, midway between the extremes.

937.13 The prime number characteristic of the tetrahedron is 1; the prime number characteristic of the icosahedron is 5. Both of these prime numbers—1 and 5—are odd numbers, in contradistinction to the prime number characteristic of the middle-case structural-system octahedron, which is 2, an even number and the *only even numbered prime* number. Again, we are not surprised to find that the octahedron is the most common crystal conformation in nature.

937.14 The tetrahedron has three triangles around each vertex; the octahedron has four; and the icosahedron has five. The extreme-limit cases of structural systems are vertexially locked by odd numbers of triangular gears, while the vertexes of the octahedron at the middle range have an even number of reciprocating triangular gears. This shows that the octahedron's three great circles are congruent pairs—i.e., six circles that may seem to appear as only three, which quadrivalent doubling with itself is clearly shown in the jitterbug model, where the 24 vector edges double up at the octahedron phase to produce 12 double-congruent vector edges and thus two congruent octahedra. (See Fig. 460.08D.)

937.15 The octahedron is doubled-up in the middle range of the vector equilibrium's jitterbug model; thus it demonstrates conceptually the exact middle between the macro- micro limits of the sequence of intertransformative events. The octahedron in the middle of the structural-system hierarchy provides us with a clear demonstration of how a unit quantum of energy seemingly disappears—i.e., becomes annihilated—and vice versa.

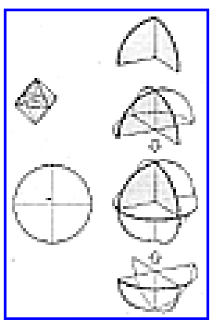
Fig. 937.20

937.20 **Doubleness of Octahedron**

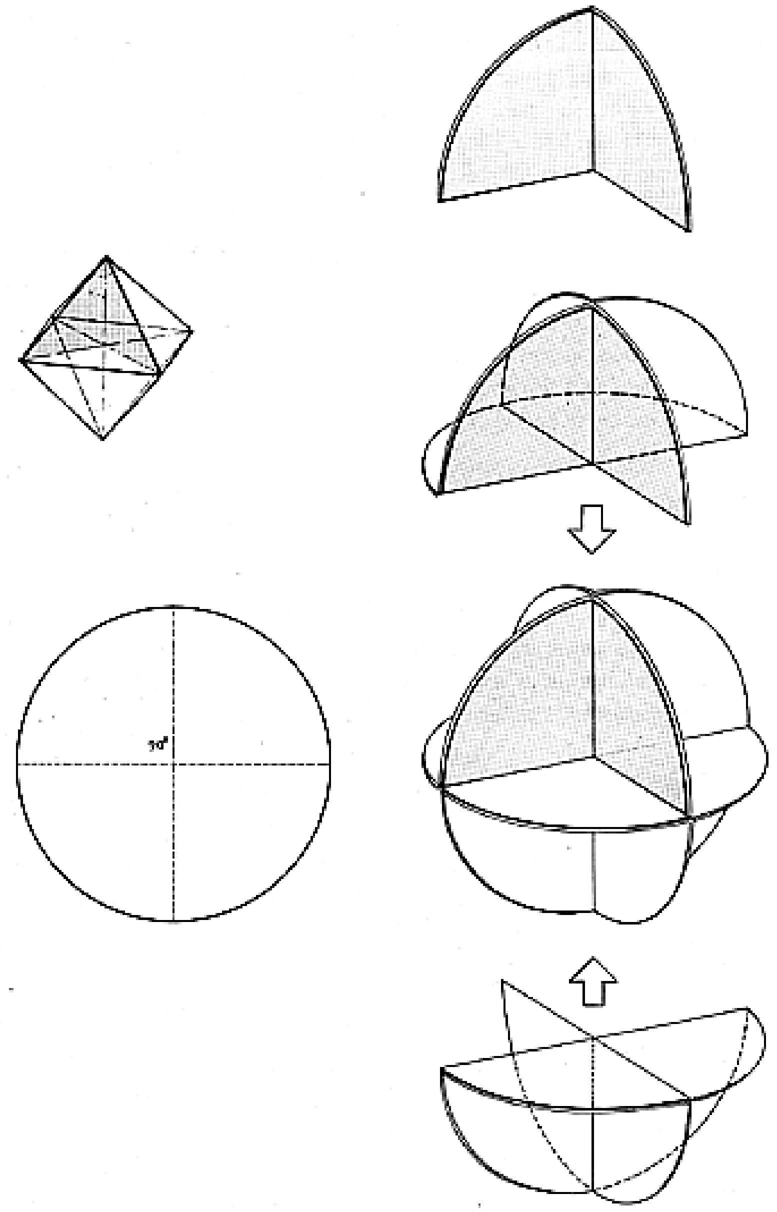

Fig. 937.20 Six-great-circle Spherical Octahedron: The doubleness of the octahedron is illustrated by the need for two sets of three great circles to produce its spherical foldable form.

937.21 The octahedron always exhibits the quality of doubleness. When the octahedron first appears in the symmetrical contraction of the vector equilibrium jitterbug system, it appears with all of its vectors doubled (see Fig. 460.08D 460.08D). It also takes two sets of three great circles each to fold the octahedron. You might think you could do it with one set of three great circles, but the foldability of the octahedron requires two sets of three great circles each. (See Secs. 835 and 836.) There are always six great circles doubled up in the octahedron to reappear only as three. (See Fig. 937.20.)

937.22 And we also recall that the octahedron appears as the prime number 2 in the geometrical hierarchy, while its volume is 4 when the tetrahedron is taken as volumetric units (see Table 223.64).

The tetrahedron's prime number identity is 1

The octahedron's prime number identity is 2

Both cubes and rhombic dodecahedra are 3

And icosahedra and vector equilibria are 5

They first occur volumetrically, respectively, as

1, 4, 3, 6, 18.51, and 20.

937.30 **Octahedron as Sphere of Compression**

937.31 The slenderness ratio in gravitationally tensed functioning has no minimum overall limit of its structural-system length, as compared to the diameter of the system's midlength cross section; ergo,

$$\frac{\text{tensile length}}{\text{diameter}} = \frac{\text{alpha}}{0}$$

In crystalline compression structures the column length minimum limit ratio is 40/1. There may be a length/diameter compression-system-limit in hydraulics, but we do not as yet know what it is. The far more slender column/diameter ratio attainable with hydraulics permits the growth of a palm tree to approach the column/diameter ratio of steel columns. We recognize the sphere—the ball bearing, the spherical island— column/diameter = 1/1 constituting the optimal, crystalline, compressive-continuity, structural-system model. (See Fig. 641.01.) The octahedron may be considered to be the optimum crystalline structural representation of the spherical islands of compression because it is double-bonded and its vectors are doubled.

Next Section: 938.00