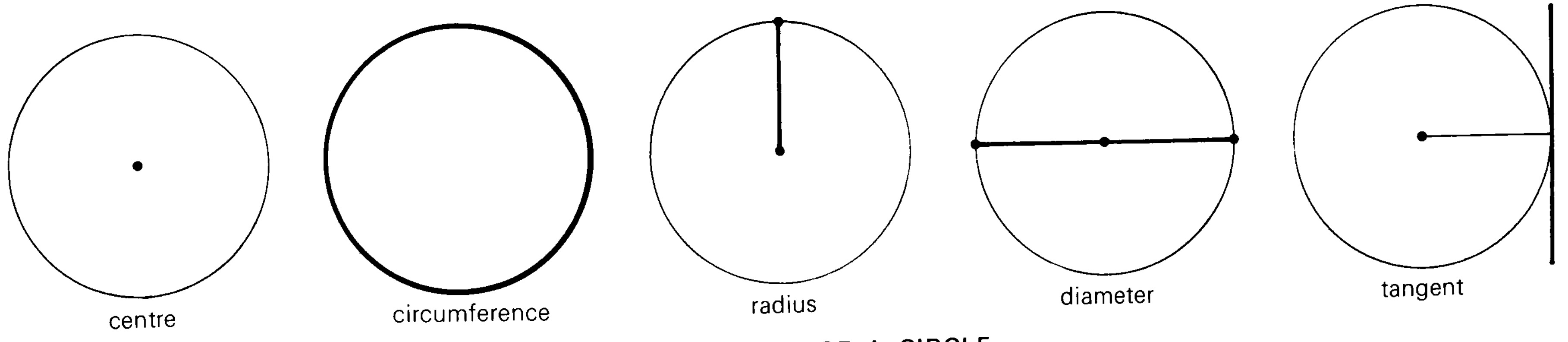
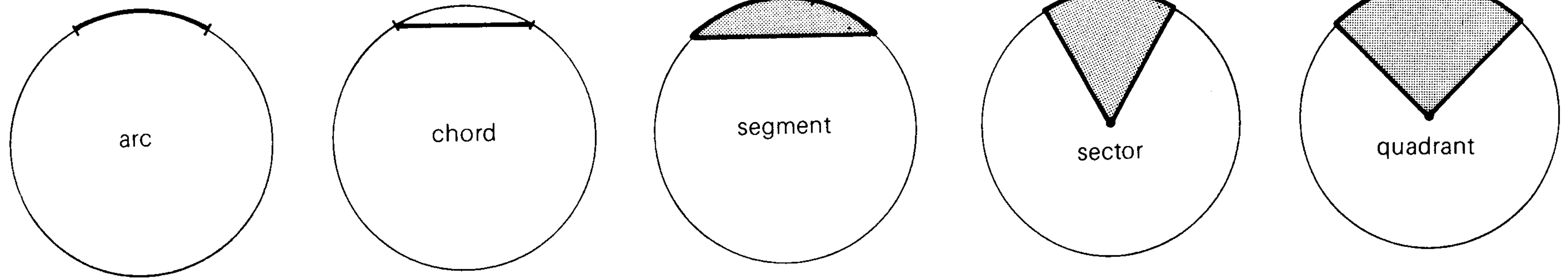
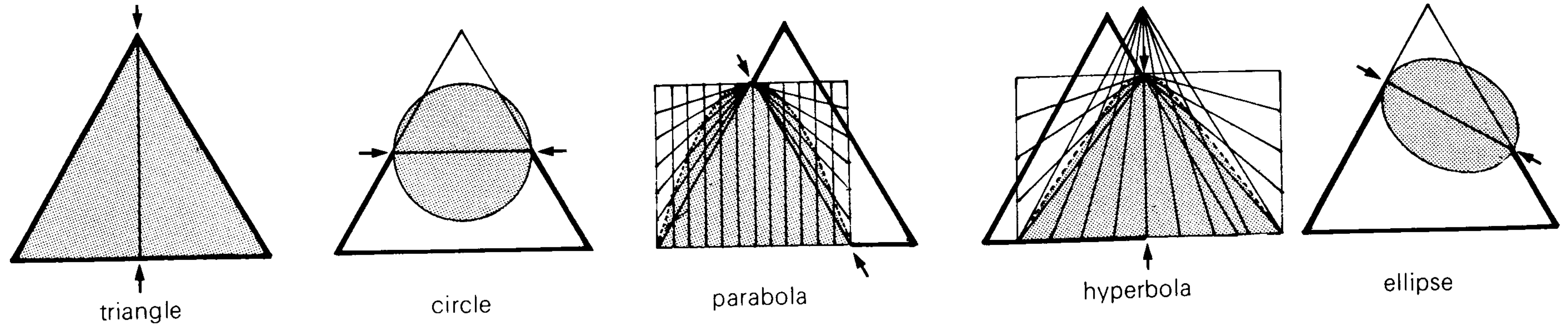
APPENDIX 3 ASPECTS AND DEFINITIONS



THE FIVE FACTORS OF A CIRCLE



THE FIVE PARTS OF A CIRCLE



THE FIVE CONIC SECTIONS

arrows indicate line of section through cone

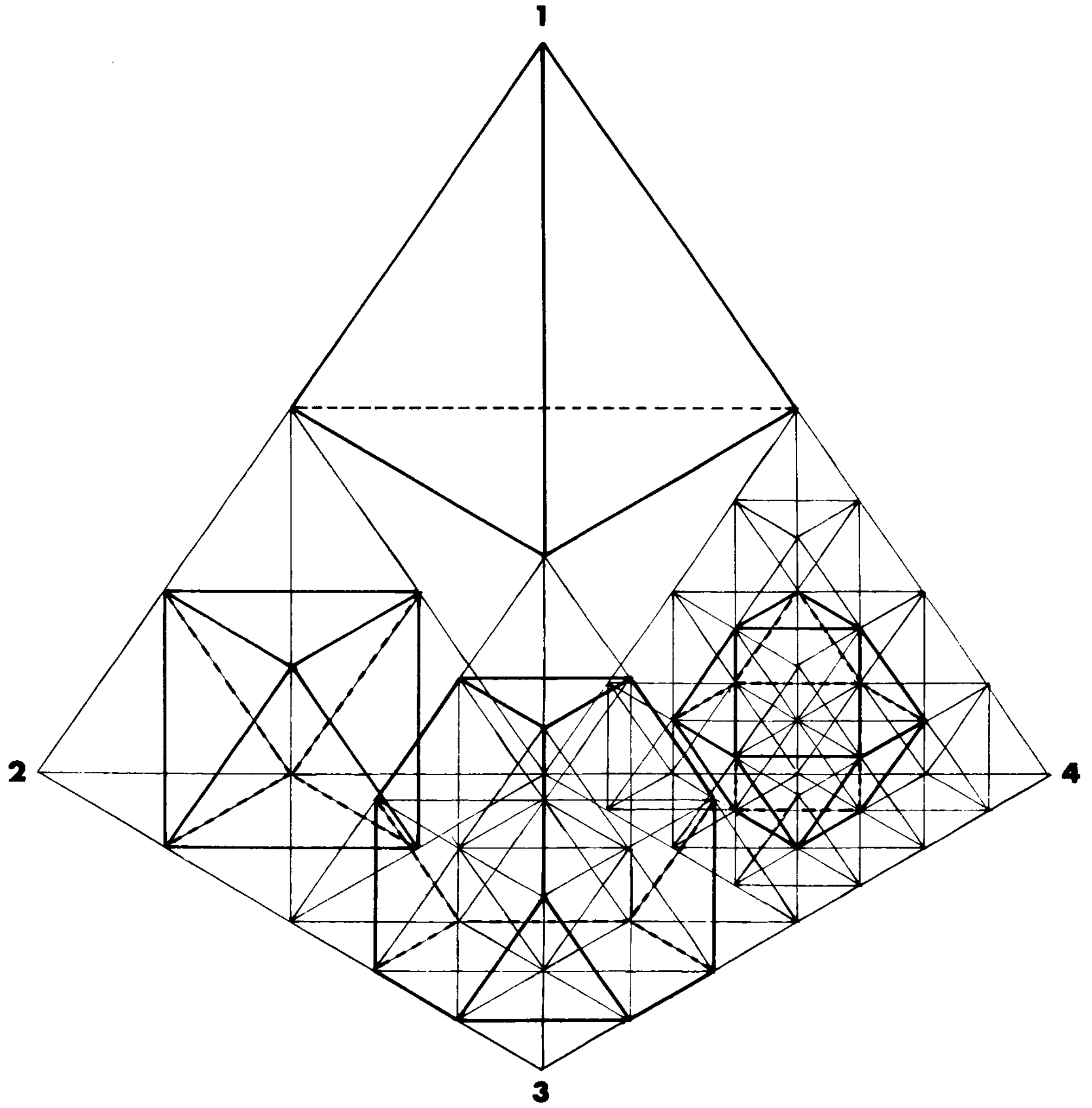
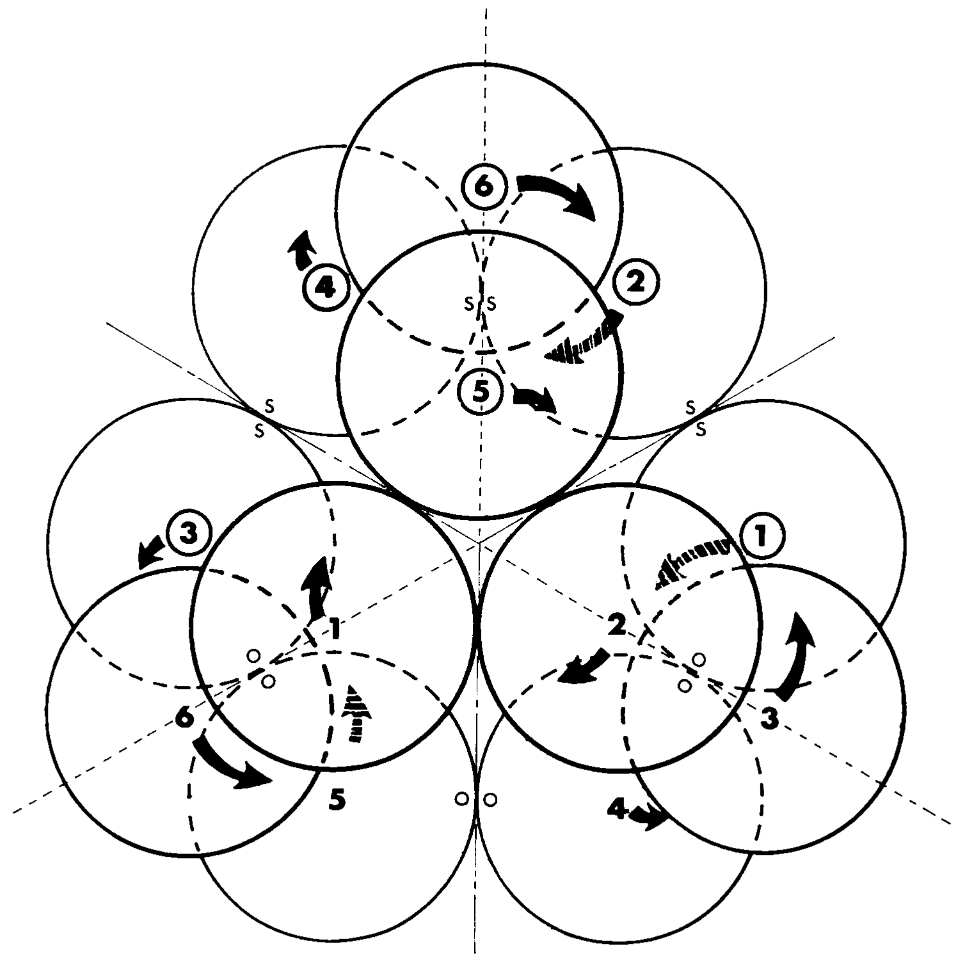


Figure I (3) is one large tetrahedron, subdivided to show the frequency subdivision from one to three. The nodes are numbered 1 to 4: 1 is the undivided tetrahedron; 2 is the first frequency subdivision, giving the octahedral nucleus; 3 is the second frequency subdivision, giving the truncated tetrahedral configuration as nucleus; and 4, the third frequency subdivision, gives a nuclear condition of the dymaxion or cuboctahedron. The drawing contains all the direct neighbour linkages in fine line to show the octahedral and tetrahedral packed nature of the subdivisions.

Figure I (4) indicates the nature of the 'wind-in' or natural closing in to tighter configuration of the twelve constituent spherepoints. This rotation inward can take place to the right or left. The spherepoints are numbered 1 to 6 twice to indicate the nature of the allocations of six to the octahedral symmetry and six to the icosahedral symmetry of the Archimedean figures. Those of the octahedral symmetry are shown in the drawing with the numbers ringed. Group (4), (6), (2) is rotating anti-clockwise as is group (3), 6, 5, while group (5), 2, 1, and group (1), 3, 4, rotate clockwise. This gives rise to the conditions where the groups contact each other (at the centre of the edges of the basic truncated tetrahedron), with three moving in the same direction (marked *ss*) and three moving in opposite directions (marked *oo*).



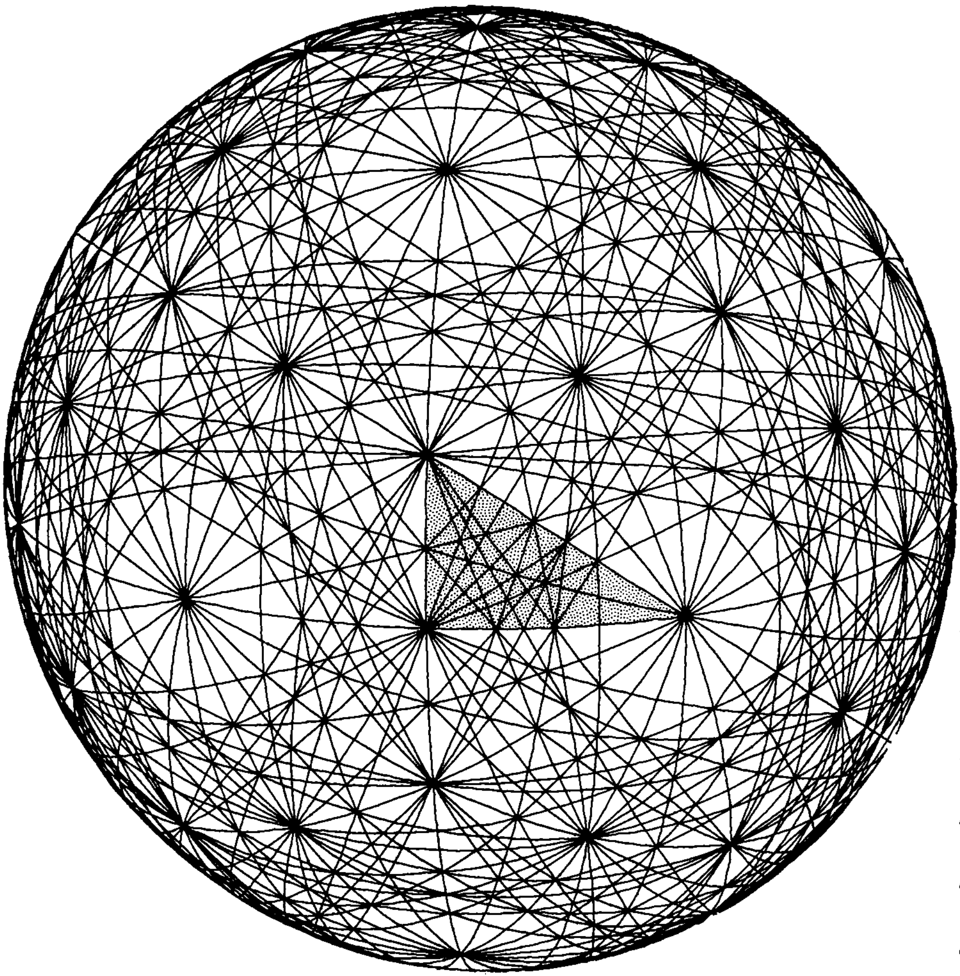


Fig. *987.132E Composite of Primary and Secondary Icosahedron Great Circle Sets:* This is a black-and-white version of color plate 30. The Basic Disequilibrium 120 LCD triangle as presented at Fig. 901.03 appears here shaded in the spherical grid. In this composite icosahedron spherical matrix all of the 31 primary great circles appear together with the three sets of secondary great circles. (The three sets of secondary icosahedron great circles are shown successively at color plates 27–29.)

987.200 Cleavagings Generate Polyhedral Resultants

987.210 Symmetry #1 and Cleavage #1

987.211 In Symmetry #1 and Cleavage #1 three great circles—the lines in Figs. 987.210 A through F— are successively and cleavingly spun by using

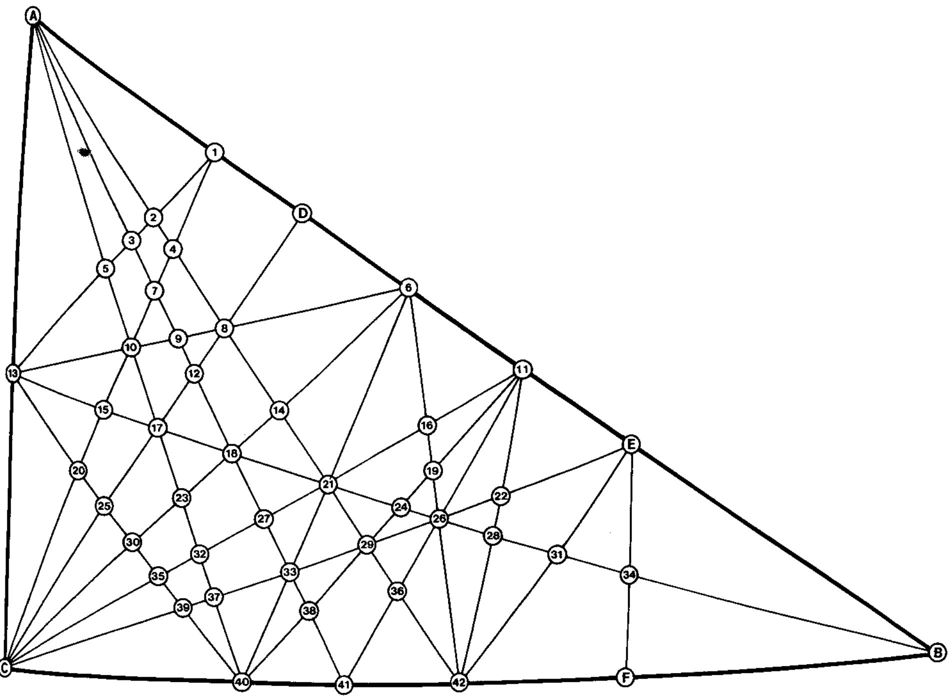
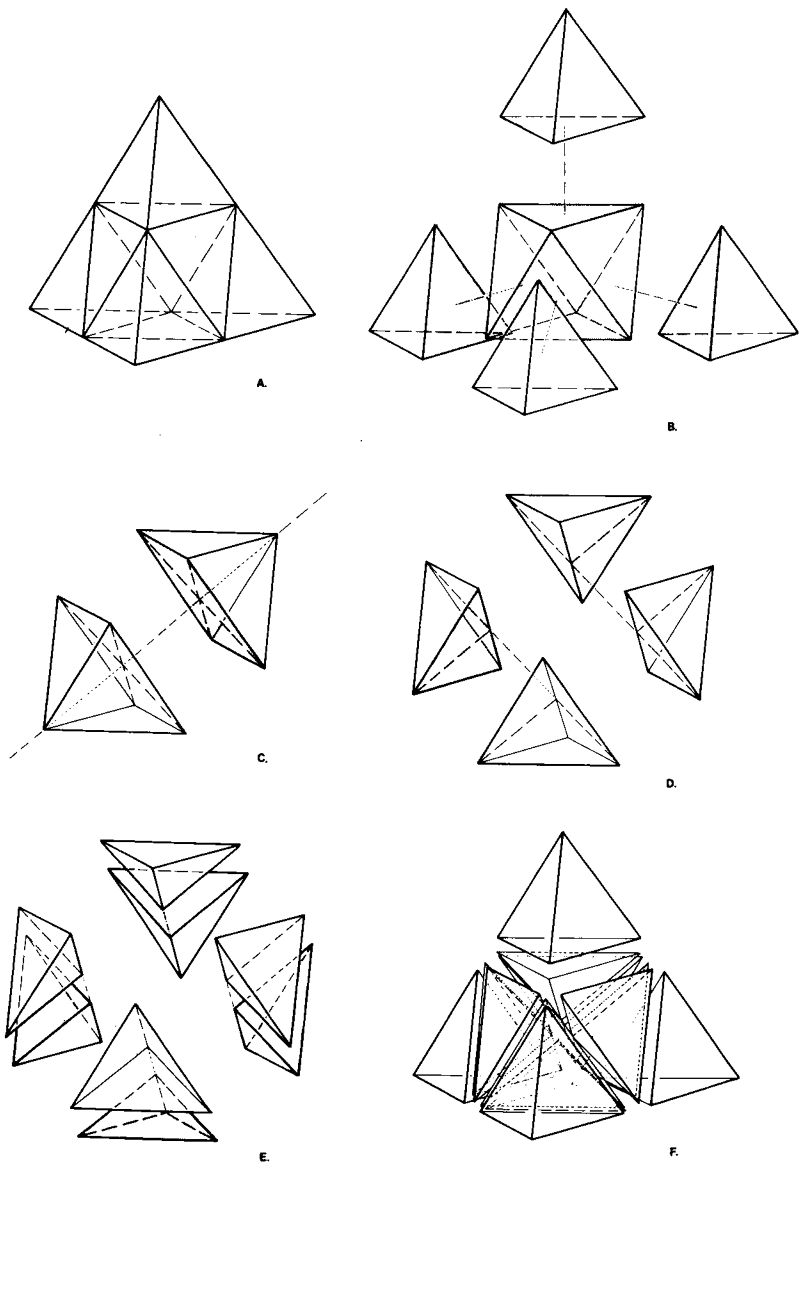


Fig. *987.132F Net Diagram of Angles and Edges for Basic Disequilibrium 120 LCD Triangle:* This is a detail of the basic spherical triangle shown shaded in Fig. *987.132E* and at Fig. 901.03. It is the key to the trigonometric tables for the spherical central angles, the spherical face angles, the planar edge lengths, and the planar face angles presented at Table *987.132G*.

the midpoints of each of the tetrahedron's six edges as the six poles of three intersymmetrical axes of spinning to fractionate the primitive tetrahedron, first into the 12 equi-vector-edged octa, eight Eighth-octa (each of ½-tetravolume), and four regular tetra (each of 1-tetravolume).

987.212 A simple example of Symmetry #1 appears at Fig. 835.11. Cleavage #1 is illustrated at Fig. *987.210E*.

987.213 Figs. *987.210A-E* demonstrate Cleavage #1 in the following sequences: (1) The red great circling cleaves the tetrahedron into two asymmetric but identically formed and identically volumed "chef's hat" halves of the initial primitive tetrahedron (Fig. *987.210A*). (2) The blue great circling cleavage of each of the two "chef's hat" halves divides them into four identically formed and identically volumed "iceberg" asymmetrical quarterings of the initial primitive tetrahedron (Fig. *987.210B*). (3) The yellow great circling cleavage of the four "icebergs" into two conformal types of equivolumed one-Eighthings of the initial primitive tetrahedron—four of these one-Eighthings being regular tetra of half the vector-edge-length of the original tetra and four of these one-Eighthings being asymmetrical tetrahedra quarter octa with five of their six edges having a length of the unit vector = 1 and the sixth edge having a length of $\sqrt{2} = 1.414214$. (Fig. *987.210C.*)



987.220 Symmetry #2 and Cleavage #4:

987.221 In Symmetry #2 and Cleavage #4 the four-great-circle cleavage of the octahedron is accomplished through spinning the four axes between the octahedron's eight midface polar points, which were produced by Cleavage #2. This symmetrical four-great-circle spinning introduces the nucleated 12 unit-radius spheres closest packed around one unit-radius sphere with the 24 equi-vector outer-edge-chorded and the 24 equi-vector-lengthed, congruently paired radii—a system called the vector equilibrium. The VE has 12 external vertexes around one center-of-volume vertex, and altogether they locate the centers of volume of the 12 unit-radius spheres closest packed around one central or one nuclear event's locus-identifying, omnidirectionally tangent, unit-radius nuclear sphere.

987.222 The vectorial and gravitational proclivities of nuclear convergence of all synergetics' system interrelationships intercoordinatingly and intertransformingly permit and realistically account all *radiant* entropic growth of systems as well as all *gravitational* coherence, symmetrical contraction, and shrinkage of systems. Entropic radiation and dissipation growth and syntropic gravitational-integrity convergency uniquely differentiate synergetics' natural coordinates from the *XYZ*–centimeter-gram-second abstract coordinates of conventional formalized science with its omniinterperpendicular and omniinterparallel nucleus-void frame of coordinate event referencing.

987.223 Symmetry #2 is illustrated at Fig. 841.15A.

987.230 Symmetries #1 & 3; Cleavages #1 & 2

987.231 Of the seven equatorial symmetries first employed in the progression of self-fractionations or cleavages, we use the tetrahedron's six mid-

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Fig. *987.210 Subdivision of Tetrahedral Unity: Symmetry #1:*

A. Initial tetrahedron at two-frequency stage.
B. Tetrahedron is truncated: four regular corner tetra surround a central octa. The truncations are not produced by great-circle cleavages. C, D, and E show great-circle cleavages of the central octahedron. (For clarity, the four corner tetra are not shown.) Three successive great-circle cleavages of the tetrahedron are spun by the three axes connecting the midpoints of opposite pairs of the tetra's six edges.
C. First great-circle cleavage produces two Half-Octa.
D. Second great-circle cleavage produces a further subdivision into four irregular tetra called "Icebergs."
E. Third great-circle cleavage produces the eight Eighth-Octahedra of the original octa.
F. Eight Eighth-Octa and four corner tetras reassembled as initial tetrahedron.