416.00 **Tetrahedral Precession of Closest-Packed Spheres**

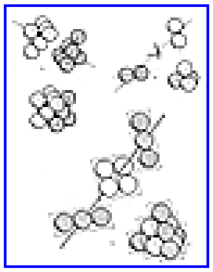

Fig. 416.01

416.01 You will find, if you take two separate parallel sets of two tangent equiradius spheres and rotate the tangential axis of one pair one-quarter of a full circle, and then address this pair to the other pair in such a manner as to bring their respective intertangency valleys together, that the four now form a tetrahedron. (See Fig. B, illustration 416.01.)

416.02 If you next take two triangles, each made of three balls in closest packing, and twist one of the triangles 60 degrees around its center hole axis, the two triangular groups now may be nested into one another with the three spheres of one nesting in the three intersphere tangency valleys of the other. We now have six spheres in symmetrical closest packing, and they form the six vertexes of the octahedron. This twisting of one set to register it closepackedly with the other, is the first instance of two pairs internested to form the tetrahedron, and in the next case of the two triangles twisted to internestability as an octahedron, is called *interprecessing* of one set by its complementary set.

416.03 Two pairs of two-layer, seven-ball triangular sets of closestpacked spheres precess in a 60-degree twist to associate as the cube. (See Fig. A, illustration 416.01.) This 14-sphere cube is the minimum cube that may be stably produced by closest-packed spheres. While eight spheres temporarily may be tangentially glued into a cubical array with six square hole facades, they are not triangulated; ergo, are unstructured; ergo, as a cube are utterly unstable and will collapse; ergo, no eight-ball cube can be included in a structural hierarchy.

416.04 The two-frequency (three spheres to an edge), two-layer tetrahedron may also be formed into a cube through 90-degree interprecessional effect. (See Fig. A.)

417.00 **Precession of Two Sets of 60 Closest-Packed Spheres**

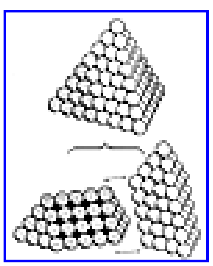

Fig. 417.01

417.01 Two identical sets of 60 spheres in closest packing precess in 90 degree action to form a seven-frequency, eight-ball-to-the-edge tetrahedron with a total of 120 spheres; exactly 100 spheres are on the outer shell, exactly 20 spheres are in theinner shell, and there is no sphere at the nucleus. This is the largest possible double-shelled tetrahedral aggregation of closest-packed spheres having no nuclear sphere. As long as it has the 20- sphere tetrahedron of the inner shell, it will never acquire a nucleus at any frequency.

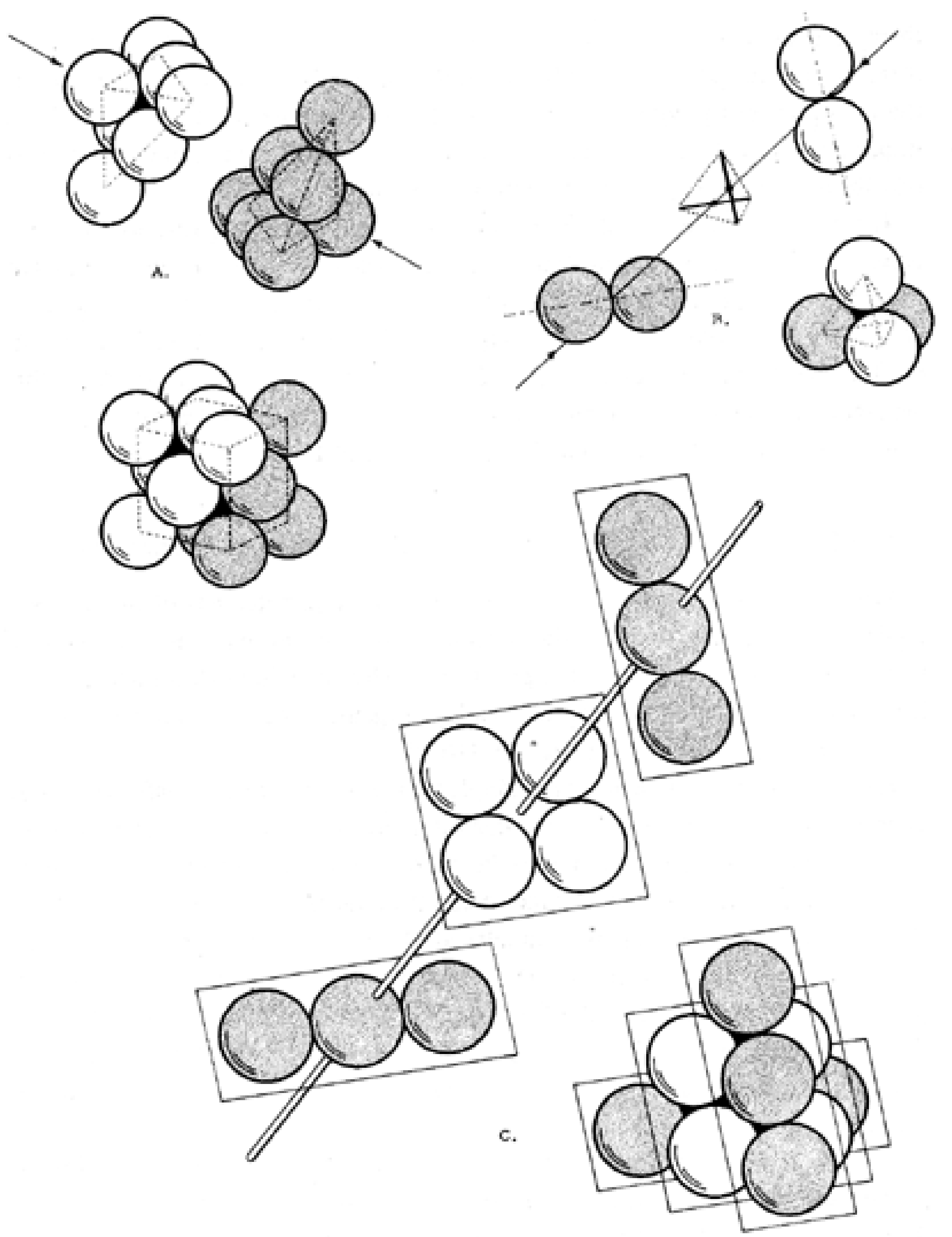

Fig. 416.01 *Tetrahedral Precession of Closest Packed Spheres:*

A. Two pairs of seven-ball, triangular sets of closest packed spheres precess in 60 degree twist to associate as the cube. This 14-sphere cube is the minimum structural cube which may be produced by closest-packed spheres. Eight spheres will not close-pack as a cube and are utterly unstable.
B. When two sets of two tangent balls are self-interprecessed into closest packing, a half-circle inter- rotation effect occurs. The resulting figure is the tetrahedron.
C. The two-frequency (three-sphere-to-an-edge) square-centered tetrahedron may also be formed through one-quarter-circle precessional action.

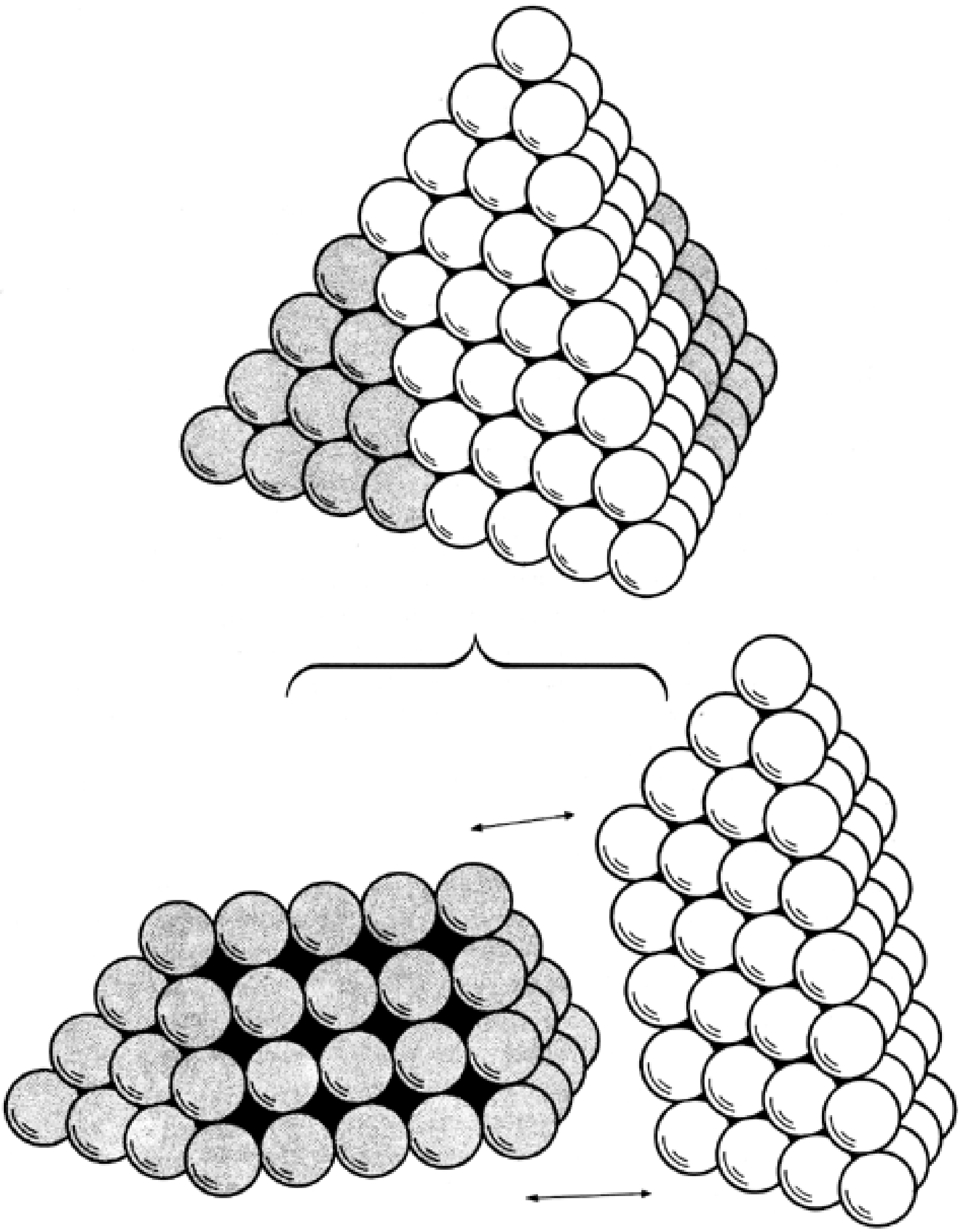

Fig. 417.01 Precession of Two Sets of 60 Closest-Packed Spheres as Seven-Frequency Tetrahedron: Two identical sets of 60 spheres in closest packing precess in 90-degree action to form a seven-frequency, eight-ball-edged tetrahedron with a total of 120 spheres, of which exactly 100 spheres are on the surface of the tetrahedron and 20 are inside but have no geometrical space accommodation for an equiradius nuclear sphere. The 120-sphere, nonnucleated tetrahedron is the largest possible double-shelled tetrahedral aggregation of closest-packed spheres having no nuclear sphere.

417.02 The 120 spheres of this non-nuclear tetrahedron correspond to the 120 basic triangles that describe unity on a sphere. They correspond to the 120 identical right- spherical triangles that result from symmetrical subdividing of the 20 identical, equilateral, equiangular triangles of either the spherical or planar-faceted icosahedron accomplished by the most economical connectors from the icosahedron's 12 vertexes to the mid-edges of the opposite edges of their respective triangles, which connectors are inherently perpendicular to the edges and pass through one another at the equitriangles' center and divide each of the equilaterals into six similar right triangles. These 120 triangles constitute the highest common multiple of system surface division by a single module unit area, as these 30° , 60° , 90° triangles are not further divisible into identical parts.

417.03 When we first look at the two unprecessed 60-ball halves of the 120-sphere tetrahedron, our eyes tend to be deceived. We tend to look at them "three-dimensionally," i.e., in the terms of exclusively rectilinear and perpendicular symmetry of potential associability and closure upon one another. Thus we do not immediately see how we could bring two oblong quadrangular facets together with their long axes crossing one another at right angles.

417.04 Our sense of exclusively perpendicular approach to one another precludes our recognition that in 60-degree (versus 90-degree) coordination, these two sets precess in 60-degree angular convergence and not in parallel-edged congruence. This 60-degree convergence and divergence of mass-attracted associabilities is characteristic of the four- dimensional system.

418.00 **Analogy of Closest Packing, Periodic Table, and Atomic Structure**

418.01 The number of closest-packed spheres in any complete layer around any nuclear group of layers always terminates with the digit 2. First layer, 12; second, 42; third, 92 . . . 162, 252, 362, and so on. The digit 2 is always preceded by a number that corresponds to the second power of the number of layers surrounding the nucleus. The third layer's number of 92 is comprised of the 3 multiplied by itself (i.e., 3 to the second power), which is 9, with the digit 2 as a suffix.

418.02 This third layer is the outermost of the symmetrically unique, nuclear-system patterns and may be identified with the 92 unique, selfregenerative, chemical-element systems, and with the 92nd such element— uranium.

418.03 The closest-sphere-packing system's first three layers of 12, 42, and 92 add to 146, which is the number of neutrons in uranium—which has the highest nucleon population of all the self-regenerative chemical elements; these 146 neutrons, plus the 92 unengaged mass-attracting protons of the outer layer, give the predominant uranium of 238 nucleons, from whose outer layer the excess two of each layer (which functions as a neutral axis of spin) can be disengaged without distorting the structural integrity of the symmetrical aggregate, which leaves the chain-reacting Uranium 236.

418.04 All the first 92 chemical elements are the finitely comprehensive set of purely abstract physical principles governing all the fundamental cases of dynamically symmetrical, vectorial geometries and their systematically self-knotting, i.e., precessionally self-interfered, regenerative, inwardly shunting events.

418.05 The chemical elements are each unique pattern integrities formed by their self-knotting, inwardly precessing, periodically synchronized selfinterferences. Unique pattern evolvement constitutes elementality. What is unique about each of the 92 self- regenerative chemical elements is their nonrepetitive pattern evolvement, which terminates with the third layer of 92.

418.06 Independent of their isotopal variations of neutron content, the 92 self-regenerative chemical elements belong to the basic inventory of cosmic absolutes. The family of prime elements consists of 92 unique sets of from one to 92 electron-proton counts inclusive, and no others.

Next Section: 419.00
