

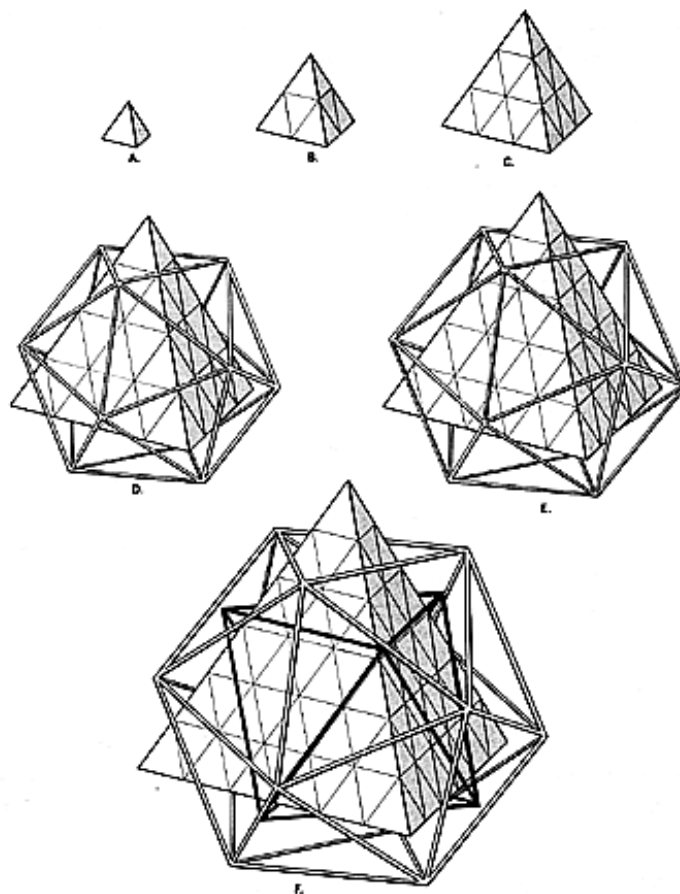


Fig. 995.03 Vector Models of Atomic Nuclei: Magic Numbers: In the structure of atomic nuclei there are certain numbers of neutrons and protons which correspond to states of increased stability. These numbers are known as the magic numbers and have the following values: 2, 8, 20, 50, 82, and 126. A vector model is proposed to account for these numbers based on combinations of the three fundamental omnitriangulated structures: the tetrahedron, octahedron, and icosahedron. In this system all vectors have a value of one-third. The magic numbers are accounted for by summing the total number of vectors in each set and multiplying the total by  $1/3$ . Note that although the tetrahedra are shown as opaque, nevertheless all the internal vectors defined by the isotropic vector matrix are counted in addition to the vectors visible on the faces of the tetrahedra.