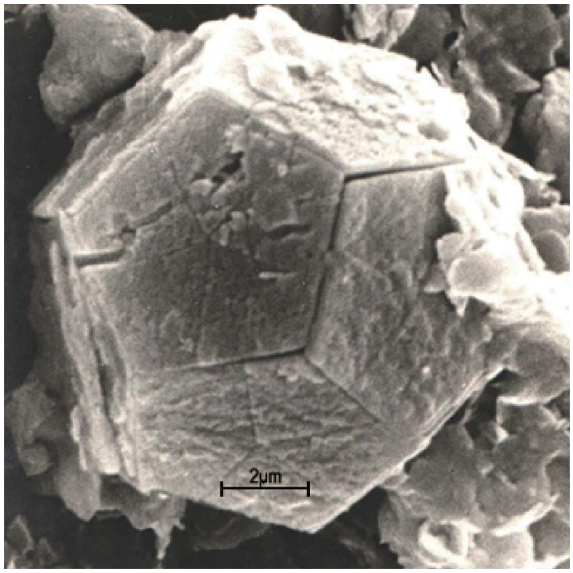

Fig. 1. Test of a complete regular pentagonal dodecahedron of *Braarudosphaera bigelowii* (Gran and Braarud, 1935) Deflandre, 1947, from *ca.* 15 million year old Miocene rocks of Walbersdorf, Austria. Note dextral rotation of five radial sutures on each pentagonal plate of mineral Calcite occasionally carving perfect tiles of "golden trapezium". A total of 60 such tiles (sinistrally oriented) make up the entire and hollow pentagonal dodecahedron (scanning Electron Micrograph: reproduced from Jafar,1975).

Fig. 2. Diagram of a complete regular pentagonal dodecahedral test of a Coccolithophore: *Braarudosphaera bigelowii* (Gran and Braarud, 1935) Deflandre, 1947, consisting of finely laminated pentagonal plates (six shown) of biogenic Calcite traversed by five dextrally rotated radial sutures carving six-sided Calcite units displaying outlines of tiles matching "Golden Trapezium" (blue).

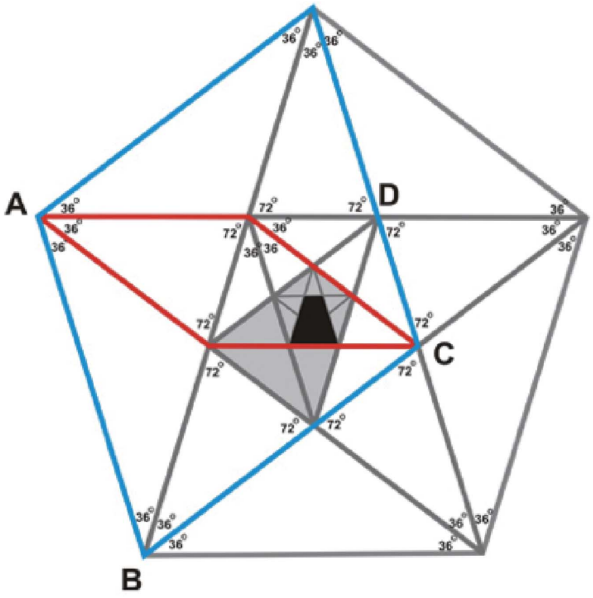

Fig. 3. Pythagorean Pentagram showing 3-generations of deflating "Golden Trapezium" (ABCD) tile in fractal dimension. Fat (blue) - Slim (red) rhombi and Kite-Dart pair of Penrose tiles are also marked.

finity. Thus an infinite structure can simply be generated, the nucleus of which is a pentagonal dipyramid of seven spheres. This structure bears striking resemblance to isosceles triangle tiling observed in *Micrantholithus hoschulzii* with interior angles of 72° - 54° - 54°. Length of the edge of pentagon: 1, 2, 3, 4, 5 ⋯. Area of the pentagon: 1, 4, 9, 16, 25 ⋯. These increasing ratios are remarkably the same as for golden trapezium tiling (Figs. 4 and 5), which essentially differs from aperiodic Penrose tiling in lacking nested properties, while Penrose tiling is a nested structure. The trapezium tiling has a solitary centre of global five-fold rotational symmetry. The Penrose tiling has both solitary centre of global five-fold rotational symmetry and several centres of the local five-fold rotational symmetry.

Golden trapezium by definition is an isosceles trapezium whose two Legs and larger Base are of identical length and Base angles are equal (108° - 108° - 72° - 72°). An intercept equal to the length of smaller Base made on any of the equal line segments of Legs and larger Base results in golden ratio phi: $1 + \sqrt{5}/2 = 1.618\ldots$ (Mario, 2002). This tiling is indeed unique and could be taken to imply that slicing a regular pentagon into five golden trapeziums and concentric expansion of the pattern using a single tile could actually yield larger and larger regular pentagons in a perfect and infinite manner.

A Pythagorean pentagram containing any inscribed figure can inflate or deflate to infinity as every line segment in relation to the next smaller one maintains golden ratio. Familiar Penrose pair of Kite-Dart and Fat-Slim rhombi including "golden trapezium" described herein are demarcated (Fig. 3). Here it is shown that this single tile not only tessellates in periodic pattern but also retains conspicuous regular pentagonal outline at each completed generation of tiling. There is more than one elegant way to arrange five "golden trapeziums" around a vertex and let the pattern be inflated concentrically by adding 10 extra tiles in each completed generation of tiling: 5 - 15 - 25 - 35 - 45 ... (Figs. 4 and 5). The tiling has been named as "Cobweb" pattern. Figure 5 is generated by arranging the tiles slightly differently: first layer sinistral (black), second layer dextral (blue), third layer sinistral (red), fourth layer sinistral (green).