

Geometric Extensions of Consciousness

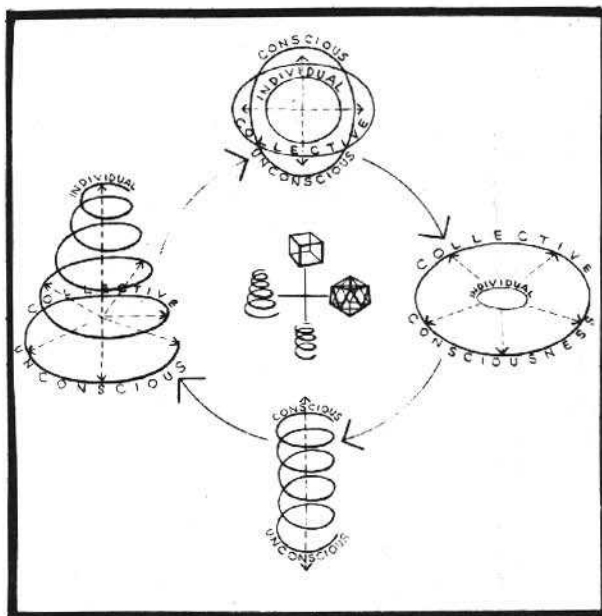
excerpts from Anne Griswold Tyng's article

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The evolution of man's consciousness was built, atom by atom, into the configurations of matter and mind. Both for our understanding of its evolution and for its own extensions of consciousness, the form of mind-matter finds clues in geometry.

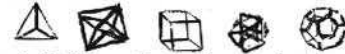
The difficulty of tracing the history of man's consciousness of space in a continuous sequence lies in the cyclic nature of the evolution of total spatial awareness—a repeating cycle in which man's perception and understanding have been stretched asymmetrically in different shapes of tension between the individual and the collective, and between consciousness and unconsciousness. Thus the more introverted phases of the cycle tend to appear as a regression (a "return to the unconscious" when vitality is renewed through a reunion with primitive natural sources) instead of being seen as part of a continuous process of expanding spatial awareness.

The cycle itself proceeds from simplicity to complexity and from a balanced axial *bilateral* order to the movement of rotation to the serpentine flow of the *helix* to the animated form of the *spiral*—a building up of form and energy which are integrated in a new cycle. (The synthesis of *bilateral* symmetry, a new simplicity of order which includes and integrates the previous complexity, begins a new cycle of spatial awareness from *bilateral* (synthesis) to *rotational* (space) to *helical* (time) to *spiral* (space-time).) As "generative molecular elements" inherent in man's own evolution, these principles may provide geometric links in the extension of man's consciousness.



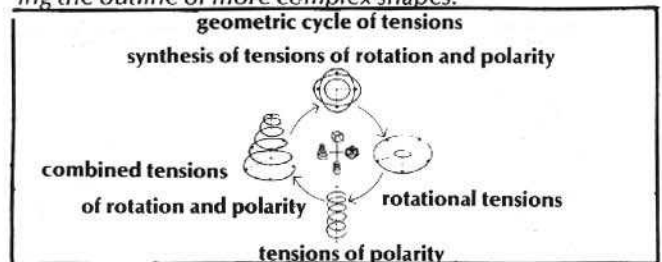
In 450 B.C., in his search for an 'atomic' order of spatial concepts, Empedocles proposed as the building blocks of everything fire, air, earth and water. On mathematical grounds Plato, in his *Timaeus*, determined the 'exact' forms of the smallest parts of these elements as the five shapes we now call the Platonic Solids; fire the tetrahedron, earth the cube, air the octahedron, water the icosahedron, and as the symbol of the cosmos, the dodecahedron. This intuitive concept is given a measure of validity

today when we know that the relationships of form expressed in these five Platonic Solids are involved in the way in which 'fundamental' particles—protons and neutrons—are built up into atoms of about a hundred different elements (according to Pauling's Close-Packed-Spheron Theory and Fuller's proposals of atomic close-packing)¹ and are involved in the way in which different arrangements of these atoms form the building blocks of a million or so different forms of matter, both natural and synthetic.



These five Platonic Solids—the only regular forms possible in three dimensional space, each with all of its faces the same and with the angles at which the faces meet each other the same—are involved, not only in the spatial organization of forms at the level of nuclei of atoms and molecules, but also in cells, organs, plants, animals, the human embryo, the psychic structure of man, the works of man and in the astronomical forms of the universe which pre-existed man. Previously invisible ordering of the primordial atoms within us, revealed by the electron microscope, gives proof of internal geometry in natural forms.

The four stages of symmetric form in this geometric progression, as in the cyclic extensions of human consciousness, I have called *bilateral*, *rotational*, *helical*, and *spiral*, with each stage seen as the *motion of simpler forms defining the outline of more complex shapes*.



The polarity of a tetrahedron can be expressed in the polarization of two of its four edges (as Fuller has suggested). One tetrahedron in two positions, which have a

Anne Tyng was one of the first women to receive an architectural degree (M. Arch.) from the Harvard Graduate School of Design. She has worked for a number of years for and with the architect Louis Kahn, associating with him on the "Project for a City Tower", featured in the Museum of Modern Art exhibit "Visionary Architecture". Based on a triangulated three dimensional system which had been used previously only as structure separate from usable space, as in Bucky Fuller's "octet truss", the undulating geometry of this tower, which appears to have a life of its own, is probably the first to be conceived as occupiable space as in a bee's honeycomb. Her independent research in forming principles, for which she received a Graham Foundation grant in '65, has been oriented primarily toward principles of asymmetry, proportion, and hierarchical ordering of form. As Maria Bottero, editor of *Zodiac*, states, "It is geometry, with its oscillations between symmetry and asymmetry, which, according to Anne Tyng, offers the key to the reading of the processes and phases of organic and cognitive becoming." Inspired by Louis Kahn, Bucky Fuller, Lancelot Law Whyte (Accent on Form & Aspects of Form), the zoologist Adolf Portmann (Animal Forms and Patterns), and the work of the psychologist Carl G. Jung (Man and His Symbols & Memories, Dreams and Reflections), as well as by recent developments in molecular biology, her work is one of synthesis. In her articles, *Urban Space Systems as Living Form* (published in the *R.A.I.C. Journal Architecture Canada*) and *Geometric Extensions of Consciousness* (in *Zodiac 19*), she has found links between basic geometric principles (which Bucky Fuller has called "her discovery of Golden Mean relationships between the whole family of Platonic Solids not previously known by man.") and atomic structure, molecular configurations, biological forms, psychic structure and human creativity.