

complicated is sometimes longing for simple

Ami Ran

why diagonally?

The constant need to adapt architecture to daily life has recently been unprecedentedly challenged. The virtual world - so predominant in our lives - is characterized by unbounded multi-dimensional forms. This leads to a constant search for equivalent formats in architecture, while heavy clumsy buildings, still connected to the real world, constitute (quite rightly) the starting point of design. The fact that in other areas of life, such as medicine, commerce and daily administration, virtual achievements are skyrocketing only increases the confusion. However, desperate attempts to free architecture from its necessary obligation to eternal stability, mainly through responsive buildings, are grasped so far as experimental gimmicks.

Immanuel Kant - one of the most influential philosophers on the universalization of modern thought, argued that the limitations of human knowledge stem from the inability of the brain to let go of perceiving the world through three dimensions alone. He argued that in order to perceive the conceptual world as real, we need a theoretical infrastructure independent of the three dimensional empirical reality.

The literal meaning of the Latin term 'dimension' is 'means of measure'. I.e. - one or more parameters that are required to describe the form or location of an object in space. In the real world this usually means length, width, and height. The accepted explanation of real space is that it is an integral part of the universe. That is - a spatial system of objects with defined and measurable form. Virtual space, however, being only an informative entity, has neither concrete form nor concrete location, and therefore cannot be described by conventional dimensions.

This assumption, rightly or wrongly, whereby the difference between real and conceptual realities could be expressed in the difference between Euclidean geometry and more complex geometry has led to the search for complex architectural solutions. However, it is clear that man and his basic needs have hardly changed during the last thousand years, and one might even say that nature around us still maintains her principles with divine meticulousness.

For instance, String Theory, attempting to describe the forces in nature, refers to nine dimensions. However, Fractal Theory indicates that one can describe all configurations in nature, by two or three dimensions alone, although some appear so complicated it seems to the human brain that it requires the brain of a computer to describe them.

However, fractal exploration, which began in the nineteenth century, points to a completely different way of thinking.

First observed in 1883 by the German mathematician Georg Cantor, the inventor of the "set theory", referring to repetitive objects, aspiring to infinity, on any scale.

Along these lines, important findings were discovered in 1904 by Swedish mathematician Helge von Koch, who investigated the basic element of snowflakes. Koch proved that in order to describe their endless configurations, one can use a repetitive element of a two-dimensional line, resembling an EEG made of an open triangle. Ninety years later, this principle served as the basis for Benoît Mandelblot's formulation of Fractal Theory, within which the term "Fractal" was first coined.

It is important to note that Mandelblot did not only focus on earthly nature, but on the description of infinite phenomena characteristic of all life processes, whether tangible - such as a liquid, or conceptual - such as economics. In the introduction to his book, *The Fractal Geometry of Nature*, he writes: "Clouds are not spheres, mountains are not cones, coastlines are not circles, and bark is not smooth, nor does lightning travel in a straight line."

Essentially made of rectangular volumes (even if they look amorphous), buildings are loaded with details based on diagonals - trusses, collapse resisting supports, cantilevers; roofs, beams, cornices and bundles - in short, anything meant to reduce the weight of constructed mass, improve its stability and maximize its efficiency.

Diagonal is defined in Wikipedia (sorry for the superficiality) as a "slanted line connecting two vertices of a polygon that are not on the same side. Therefore - a triangle has no diagonal line, a square has two, and a pentagram - five."