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KINEMATIC SERENDIPITY

A performance with flexing mathematical models

Caspar Schwabe

AHA, Spiegelgasse 14, 8001 Zürich. E-mail: aha@datacomm.ch

"Kinematic Serendipity" is a demonstration of flexing mathematical models invented by scholars from all over the world. The performance of these shape-changing models is a "romance of many dimensions". In the course of unfolding them into 'three space', they unveil interesting kinematic phenomena like translation and rotation, explosion and implosion, inversion and gastrulation, jitterbugging and tensegrity, knots and loops and Moebius strips.

The Object and the Super-Object

These flexing models generally correspond, in their flat state, to simple symmetrical symbols or emblems, such as circles or polygons.

Apart from serving as flexing demonstration models they have a further superior significance as super-objects, i.e. as a cipher of their inherent basic kinetic phenomenon. In the course of the objects movement or transformation, a kinetic phenomenon is 'solemnized'. During the demonstration, the separate models together perform like actors and every stage in movement is brought into a larger context.

Serendipity, Analogy and Intuition

Serendip is the old arabic name for the island of Sri Lanka (former Ceylon) and means unexpected and fortunate discovery (of land).

It is the faculty of happening upon or making fortunate discoveries when not in search of them. The English expression was coined by Horace Walpole in 1751 in his novel *The three Princess of Seredip*.

The three princes are the heroes of which make such discoveries.

The performance of these shape-changing models should help the audience to get into a intuitive mood for innovative ideas.

The analogy of form plays a large part in the inspiration of an artist or scientist. One could say that discovery consists of recognizing a hidden analogy.

Inversion, Doubling Phenomenon and Dimensions

Some of the models have, beside their translational or rotational movements, a further mechanical degree of freedom, that of inversion. The inversion is, so to speak a fourdimensional process, permitting the solution of problems which would remain insolvable in their respective dimensions. The famous 'Squaring the Circle', impossible with a ruler and compass on a flat sheet of paper, will be possible with the help of the inversion movement in a threeedimensional space.

If a single point is duplicated, it forms a line with two vertices. Again duplicated it forms a square with four vertices. The square elavated into space, becomes a cube with eight vertices. Futher duplication results in the Hypercube with 16 vertices and leads us into the field of binary systems, which is the stuff of our digital computers. The best analogy of this fourdimensional process we find in biology, where the phenomenon of doubling shows as division of cells and later in the gastrulation process, in which an embryo starting out as a ball of cells can pull in part of its outer wall to form a cavity, the most essential processes in the developments of all higher forms of species. Thus basic morphological principles, as they occur in natur, become apparent.

The flexible models allow us to demonstrate the change in dimensions: the diagonal becomes a polygon, the polygon a polyhedra, the polyhedra a polytop and so on.

Paul Klee writes 1922:

"Form als Erscheinung aber ist ein böses, gefährliches Gespenst.
Gut ist Form als Bewegung, als Tun, gut ist tätige Form.
Form ist Formung. Schlecht ist Form; Form ist Ende, ist Tod.
Formung ist Bewegung, ist Tat. Formung ist Leben".

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