

## Eco-Mathematic/Geometric Aspects of a Design Proposal for Landscape/Public Art

Thomas Michael Stephens  
Art Research Center  
4923 Walnut Street  
Kansas City, Missouri 64112

The Social Sciences and Humanities offer **problems**; the Natural Sciences offer **foundations**.

Edward O. Wilson

An existing, historic, city water works site of many acres adjoining a major river is offered for a public art proposal. My approach is to analyze, plan and design around four basic types of structural systems: 1) stochastic, 2. proportional, 3) programmatic, and 4) dynamic. The river of rapid current feeds the water system's need for unceasing flow to a major metropolis - water means life. The functions of purification, pumping, treatment, stabilization, filtration and distribution are fundamentally **turbulence**.

The water cycle of evaporation, condensation and precipitation feeds the river and the land site – where one quarter of the system's water is from a well - all part of **weather's dynamics** and interaction with this earth area. The landscape and structural needs suggest a two-dimensional version of the Lorenz dual attractor (“strange attractor” shape of weather systems) as a land form and symbol. The earth gradients and the location of prior structures provide possibilities for landscape material – formed logarithmic spirals as site over-lays (also offering ‘golden section’ proportioning).

*[The famous sand garden of Kyoto's Ryoan-ji Zen Temple has the placid order of Divine Proportion yet turbulent bifurcations raked around stones (laminar flow to whorling change) which seems an appropriate analog to the potential of this large civic site.]*

This site with a rapid river, low and high ground perpetually, with an enhanced water cycle, produces fog and mist almost year-round – a perfect location for laser beams to be readily observed from sunset till sunrise. The same conditions in daylight (with added lake and misting devices and polyhedral prisms) produce rainbows, full spectral colors, to be observed all about the site. *[Thus, there are two more analogs, perhaps homologs: those to Einstein's Atomic Physics and to General Relativity. The laser is a literal product of his theories (from light particles to a coherent beam), and the perceptual experience of the rainbow is as the 'curvature of light in space'.]* Three colored (red, blue, green) lasers are to be mounted on tall structures and mirrored into triangular patterns interlocked and resolving into the suggestion of a hyper-tetrahedral projection 60' to 400' above and spanning the entire area.

The crossover of the entrance gateway (42'x32'x36') is a micro-version of the macro-laser beam pattern with tensioned colored acrylic sheets (projecting triangular shadows onto white stone obliquely as day passes). Three tetrahedral legs resolve as a tower above the roadway (welded and jointed aluminum and

stainless steel tubular struts, topped by a refracting glass polyhedron equipped with a water supply and misting rings. Other prisms/misting rings on top of two 60' flagpoles which also hold angle-mounted mirrors for lasers' triangulated beams – evening 'hyperspace.'

A nearby man-made lake is 'Julia-Set' shaped (a basin of an attractive fixed point and another fractal/chaos reference), on a shallow white-stone bottom, with 'floating' acrylic, three-colored modules.

Simple geometric, colored, solid concrete units are to be placed around the lake and near the gate for human scale and use. Painted tubular steel shaped triangles, tetrahedrons, tetra-struts and hyper-tetrahedrons (combination), and a hyper-tetrahedron enclosing an entwining, triple-closed curve of tubular aluminum (my 'universal model') as sculptural constructions to reiterate the human scale, are scattered near the lake and entrance for public play.

Thus a complex functional area becomes a public celebration of diverse elements for a unifying and awe-inspiring experience. As Keith Ellis concludes: "Number permeates the cosmos as salt flavors the sea. We can enjoy it consciously through mathematics or unconsciously through art."

#### Readings:

- [1] *The Gentle Art of Mathematics*, Dan Pedoe, Dover
- [2] *Number Power; In Nature, Art and Everyday Life*, Keith Ellis, St. Martins
- [3] *The Powers of Limits; Proportional Harmonies in Nature, Art and Architecture*, György Doczi, Shambala
- [4] *The Rainbow Book*, Ed: F. Lanier Graham, Vintage
- [5] *Nature of Light and Color in the Open Air*, M. Minnaert, Dover
- [6] *Critical Path*, R. Buckminster Fuller, St. Martins
- [7] *Schönheit In Chaos*, Peitgen, Richter, Herbert W. Franke, Benoit B. Mandelbrot, Gert Eilenberger
- [8] *The Beauty of Fractals*, H. O. Pietgen, P. H. Rcihter, Springer
- [9] *Force of Nature; The Life of Linus Pauling*, Thomas Hager, Simon & Schuster
- [10] *Land Form Designs*, Thomas C. Hazlett, PDA
- [11] *Constructivism and the Geometric Tradition*, Curator: Celia Ascher, Essay: Willy Rotzler McCrory
- [12] *Order out of Chaos*, Ilya Prigogene, Isabelle Stengers, Bantam
- [13] *Genius; The Life and Science of Richard Feynman*, James Gleick, Pantheon
- [14] *ReNew, Time, Graphic Example*, T. M. Stephens, New Circle