

## Outline

Thesis Statement: I hope to explore the question of why in light weight architectural edifices, and movement of the funambulist, beauty can be reached tangentially, created as a product of a devotion to a practice which involves qualities of simplicity, reduction and economy in a realm of danger.

I. Introduction. My research paper will be an exploration of the aesthetic consequences of reduction and economy in the creation of structures and movement in particular where the event of failure in construction or execution would be ruinous. How can our understanding of the above concept be broadened and connected by and to the words of philosophers and practitioners grappling with defining beauty and the sublime experience?

I will study the practice of engineers whose passion and work has been to make light weight structures. By using mathematics and looking at nature the engineer's focus is not upon creating a beautiful object, but rather in an interest in finding the essence of structure and what is necessary. Why when he discards everything else, do we often uncover a beauty in harmony with nature and the human spirit? (Le Corbusier)

I will read the words of engineers, writers, philosophers, a wire walker, and a martial artist, whose unique visions have created a bold legacy. I will look at majestic movements and forms which reach skyward, their lightness and grace seemingly suspended by a mysterious physics. While under a grand leaf, the volume of the enormous anticlastic roof built of cable and membrane a deep touch to body and spirit arises. When we see the arc of a funambulist high above his wire in a full layout salto landing perfectly in a silent pli  , so effortless, it exalts our perceptions of time and space. But also in our soul we understand that in this beauty exists a terrifying potential — snapped cables, twisted and maimed steel tubes, a fallen performer in great pain or worse.

II. Beauty and the Lightweight Structure: A desire to dance with gravity.

A. Frei Otto, The Institute for Light Weight Structure, Robert Le Ricolais, "Zero Weight Infinite Span."

1. Desire for a minimum of materials in the creation of structures

a. Studies of nature. soap bubbles, catenaries (Frei Otto)

(Boys, C.)

b. Mathematical representation of natural geometries, measurement (Cook, T.) (Boys, C.)

c. Human imagination, infinite never ending possibility

(Da Vinci, L.) (Brunn, F.) (Kahn, L.)

2. Building,

- a. Models, experiments, balancing forces in space in various scales. Aerial structure. Flying columns, etc.
- b. Reduction/clarification of ideas by building/action. (Drew, P.) (Lee, B.)

#### B Examining the structures aesthetic affects

- 1. Soaring structure, unnerving structure, seemingly defying physical laws. Flying columns, high tensile strands, transparent membranes (Drew, P.) (Otto, F.)
  - a. Transparency (Tanizaki, J.)
  - b. Mathematical harmonies with nature, (Le Corbusier)
- 2. Experiences of wonder/terror disturbance of our psyche creating sublime experiences. (Kant, E.) (Roland, B.) (Artaud, A.)

### III. Beauty and the Funambulist: A desire to dance with gravity.

#### A. Philippe Petit, and the quest for immobility.

- 1. Dynamic equilibrium
  - a. The impossibility of stillness upon a wire. (Petit, P.) (Burgess, H.)
  - b. The infinite possibilities of the pose. (Petit, P.) (Brunn, F.)
- 2. Reduction of movement toward beauty and purpose
  - a. Time on the wire, mastery of physical acts through devotion/practice. (Lee, B.) (Brunn, F.)
  - b. Discarding embellishment/ornamentation — Physical mastery as undoing (Lee, B.) (Petit, P.) (Nietzsche F.) (Le Ricolais, R.)

#### B. Personal experiences in balance/rope walking

- 1. Minimum effort motion, yielding most stability/grace.
- 2. Working without judgement, working towards silence of mind/body.
  - a. Unification of mind and body, heaven and earth, metaphor of the rope. (Eliade, M.)
  - b. Dissolution/reduction, of the actor through action, the experiencer through experience. (Lee, B.) (Petit, P.) (Artaud A.)

IV. Conclusion: As the line between economizing/soaring and failure/falling is neared, a vibration in the observer begins between the sensation of delight and terror, attraction and repulsion. This experience has — in words of many thinkers/writers (Barthes, Artaud, Kant, and Nietzsche) — been described as the essence of a sublime moments. As one works for the most simple, most economical solution in problems of structure and balance by reducing materials and movements to a minimum, a journey of devotion towards the distillation of actions or of objects, a grace and beauty which harmonizes with nature and spirit is born.

## Bibliography

Artaud, A. (1958). *The Theater and Its Double*. Grove Press Inc.: New York, NY.

(An investigation into the essential nature of theater and its power in communication of human desire. It attacks the conventions and banality of the mainstream stage productions and instead offers a view of theater and performance as “the notion of a kind of unique language half-way between gesture and thought.” )

Barthes, R. (1980). *Camera Lucida*. Hill and Wang.: New York, NY.

(Barthes inquiry into photography and its effects on the human spirit. His central theme is an investigation of the twin nature of photography’s effect on the view. The studium is the cultural political and linguistic interpretation of a photo’s content by the mind. More interesting to Barthes are photos which also contain a Punctum, which directly relates the photo to the viewer through something wounding, something which has a visceral touch.)

Bonner, J. (1952). *Morphogenesis, An Essay On Development*. The Murray Printing Company.: Forge Village, Mass.

(A text dealing with examining the questions of developmental evolution of living organism. This text has been useful in my research as it looks into organism’s behaviors in development clearly in the interest of survival and other essential issue facing living organisms.)

Burgess, H. (1983). *Circus Techniques*, Brian Dubé, Inc.: New York, NY.

(Gives exercises in the training of balance and posture for live circus performance. Hover also talks about using gravity working within its laws to achieve grace and beauty in the postures of the body.)

Cook, T. (1979). *The Curves Of Life*. Dover Publications Inc.: New York, NY.

(I have not read the entire text, but will summarize what I understand of it. This book examines the relationship of mathematics to natural spiral forms. In looking into the forms of shells, Cook bring to our attention of spirals from a cosmic scale to the micro. But he also looks at the imperfections of nature, i.e. its deviation from math and meditates on the implications of this. He argues that it is in these imperfections that beauty arises.)

Da Vinci, L. (1983). *On the Human Body*. Dover Publications.: New York, NY.

(A definitive treatise on the forms and structures of the human body. Da Vinci believes that the workings of the human body and the cosmos are analogous. In the words *cosmografia del minor mondo*, meaning cosmography of the microcosm, Da Vinci explored the geometries and forms which exist through nature regardless of vessel or scales. These ideas have had countless influences through time. For Example, Theodore Cook’s *The Curves of Life*, was inspired by the ideas of Da Vinci. One has to only read to the second sentence in D’arcy Thompson, *On Growth and Form*, to find reference to the ideas of Da Vinci’s observation of mathematics and structuralism in nature.)

Drew, P. (1976). *Form and Structure*. Westview Press.: Boulder, Colorado.

(A biography of the pioneering engineer of light weight building, Frei Otto, a study of life and work. Drew investigates and critiques his philosophies practices, and the design and

construction of his building and proposed projects)

Eliade, M. (1962). *The Two And The One*. Harper & Row, Published, Inc.: New York, NY.

(The forth section called “Rope and Puppets,” talks about symbolic reference of ropes and chains to link man to the heavens and for means of magical transcendence. Eliade gives example in the stories and myths of Eastern and Western culture, exploring areas of theology, mysticism, and philosophy in which ropes have profound purposes, meanings and symbolisms.)

Kant, E. (1914). *Critique Of Judgement*. Macmillan and Co.: London.

(I have investigated sections *Of The Mathematically Sublime*, and *Of the Dynamically Sublime In Nature*, to find historic and philosophical grounding for my investigations into ideas of grace and beauty and their relation to mathematics and nature. Kant tells us about the relationship of the sublime to the ideas of measure and definition. To Kant the sublime exist in the mind as an experience because of the very fact of man imagination being infinite.)

Lee, B. (1975). *The Tao of Jeet Kune Do*. Ohara Publications Inc.: Burbank California.

(Mostly written while Bruce Lee was recovering from a broken back, it was later arranged and published by his widowed wife Linda Lee and his student Gilbert L. Johnson. It contains Lee’s meditations on art, life, and the spiritual significances in martial arts. It also documents Bruce Lees fighting style know as Jeet Kune Do. It is an inspection of movements in martial arts and describing ways of reducing these actions to states of efficiency, sublime action without uncertainty.)

Le Corbusier,. (1985). Le Corbusier. *Towards a New Architecture*. Dover Publications.

(Le Corbusier writes Polemically about the need for architecture to consider its own function as paramount in design not style or aesthetics. Corbusier tells us that the beauty of architecture of the future will be created by function and pure form. His first chapter speaks of the importance of the engineer, who working with new materials and notions of economy and function will guide the new aesthetic, one of vitality and relevance.)

Le Ricolais, R. (1973). *Things Themselves Are Lying And So Are Their Image*. Graduate School of Fine Arts University of Pennsylvania, PA.

(Interviews of Le Ricolais, in which he speaks on his ideas of lightweight construction and engineering. He meditates on the limitations of conventional processes, implications of beauty from economy and aspects of the creative process of design and discovery.)

Nietzsche, F. (?). *Thus Spoke Zarathustra*.

(The Prologue has a section on a rope dancer, his performance during which he falls to his death which cause is related to Nietzsche’s philosophies of man and his transcendence towards ubermensch.)

Otto, F. et. al., IL8 Nets in Nature and Technics, Stuttgart, Germany, Institute for Lightweight Structure (IL), University of Stuttgart, 1975.

(Frei Otto’s and his colleagues text with many photos and drawing on their study on forms of nature and the integration of these lessons into the building of large scale tensile buildings.)

Otto, Frei, et. al., IL5 Convertible Roofs, Stuttgart, Germany, Institut for Lightweight Structure

(IL), University of Stuttgart, 1972.

(Frei Ottos and his colleagues study and development of systems of convertible tensile roofs. This includes roofs for arenas, open markets and sport stadiums. The text has many picture and drawings. They included studies of nature, buildings and other structures such as sails and shells. It also documents the works that Otto and his firm team of engineers and architects created.)

Petit, P. (1985). *On The High Wire*. Random House.: New York, NY.

(The only treatise written on high wire practice and rigging. Philippe offers his insight and techniques in the art of rigging and performing upon high wires. He also shares his philosophies of simplicity and grace as a means towards freedom)

Tanizaki, J. (1977). *In Praise of Shadows*. Leete's Island Books, Inc.: Stony Creek, Ct.

(Tanizaki's meditation on the differences between Eastern and WEstern aesthetics. He speaks to the beauty of shadow, subdued forms, and the accumulation of touch. He contrasts this sharply with the aesthetics of modernity which are about=shine, light, and cleanliness, which he says destroys many of the subtleties of traditional Japanese culture.)

Thompson D. (1961). *On Growth and Form*. Cambridge University Press.: New York, NY.

(A texts on the development of forms in nature and the similitude of shapes and patterns of growth. Thompson speaks of the over emphasis(in his day) of evolution in defining forms of life. Rather, he argues that formative characteristics are born from intrinsic physical laws, defined by structure, stresses, and mathematics.)