

NOTES ON EPIGENETIC ART: THE EZEKIEL SERIES

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Intentions. For over 30 years, as an artist, I have always tried to create well crafted works with icon-like qualities pointing in some evocative way to hidden reality. As early as I can remember I was always awestruck when I took time to really look at something and think about it as "being" and then contemplate whether the opposite was possible — — "not being". "What would it be like", I wondered, "if there were no me - no cloud — no earth? Early on I learned to wonder about the "marvelous" event of things existing just "the way they are". Within commonplace phenomena I learned to see a "hidden" marvelous world filled with mystery. My approach to art grew from this marveling, always holding a reverence for the materials of earth and a sense of wonder about most things. Eventually this came to include circuit boards, computer languages, and the forms one could explore with simple algorithms.

In this essay the terms "code", "software" and "instructions" may be used interchangeably. In general we are referring to coded procedures and algorithms which may be integrated in a program of instructions for a computer.

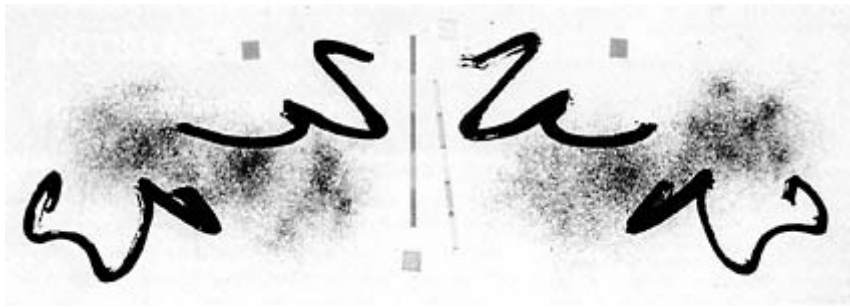
For the past decade I have been writing code and marveling at its power as a procedure for investigating form with a computer. Coded electronic procedures provide artists with a radically new and powerful tool for investigating a marvelous world of unseen form. Those who integrate their art with coded procedures are on the threshold of a new frontier. To tap this frontier as an artist there have been two great hurdles. One has been the task of translating form-generating ideas into a practical working code. The other has been the search for appropriate materials and methods for achieving tangible archival quality work.

The code as a form-generator is only half of the struggle. To succeed as "art" the form must be successfully engendered in something tangible — something one can see, touch, feel or hear. Some years ago an artist friend, standing by an elm tree, asked "What gives this tree such a powerful presence?" And he answered, noting that "you can touch it — feel its surface — its 'being here'"¹. Because aesthetic experience involves the senses one cannot separate "art" from its material embodiment. In my current work the form necessarily includes the paper, surface, texture, color, and manner of presentation — the total experience. The nature and quality of materials have been carefully chosen and transformed in the process. For me, the finished work should have an aura that invites the casual viewer to pause for a moment, sensing that the work, as a human endeavor, goes beyond material concerns.

Studio Workers, Robotniks. Many people who visit my studio are surprised when they see engineering plotters cabled to two computer work stations — one for research and development, the other for creating art. When a plotter is working, visitors often stand with eyes glued on the drawing arm which, with a "seeming intelligence", draws precisely, surprisingly, and without hesitation — executing literally thousands of lines — changing colors — first here and then there. These plotters exude an uncanny presence! They have become members of the studio family — there's Brunelleschi, a nine year old 14 pen plotter, the first one I ever used, then another one named Alberti who executed all the frontispieces for a limited edition of George Boole's "Derivation of the Laws" (198990). Our latest member of the family, Botticelli, has a 36 inch bed and has been executing the recent Ezekiel Series.

These workers, robotniks, tirelessly execute instructions fed to them from computers. The computers interpret the code for them. The code is essentially a set of detailed instructions for making the work, i.e., what steps to take to make a color decision or how to determine control

points. This procedure for making art, which I have called "epigenetic" is employed, to some degree, by a number of artists working today.



Epigenetic Art. The term epigenesis, borrowed from biology, refers to the process whereby a mature plant or phenotype grows from a seed or genotype. By analogy, in my studio, the art work (phenotype) "grows" from the software (genotype). Although the software contains the essential "form generating" information, it requires an appropriate "environment" and "nurturing" if it is to generate a mature work of art. This process of actually "growing" the work in some tangible form is, by analogy, "epigenetic". The mature art form, likened to phenotype, can only be "grown" with tangible materials — paper and inks — and then only with an appropriate set-up of computer and plotter which constitute, as it were, a nurturing environment. The convergence of all these elements is required for "growing" the art work, a process analagous to biological epigenesis.

A Personal Expert System. The software, with a computer and a plotter, constitutes a "personal expert system". The system is capable of generating visual forms of interest to me as an artist - forms whose origins the artist can both reveal and conceal with recursive improvisations. The choice of materials and the evolution of the software grew side by side over a period of ten years. Experimentation with paper, inks and plotting procedures has been extensive. Through trial and error and seemingly endless hours of experimentation, the system has evolved into a unique set of procedures with a language of its own.

Hodos. The software, under ongoing revision, is an integrated network of routines named Hodos taken from the Greek word for "path" or "way". This term best describes the unfolding forms of the first series of plotted works which were conceived as "pathways". Following a period of teaching in China I recognized many analogies between "hodos" and the oriental concept of "dao" (tao, the way). My studio, named "Pathway Studio" has an oriental seal carved by the distinguished shufa master, Wang Dong Ling. Wang, awed by the brush strokes of the computer, chose the classic expression "xiao jing zhai", "little footpath studio", as appropriate for the seal. Many works executed in the studio receive this seal.

Families of form. Hodos is capable of generating a family of forms with each being simultaneously related and "one of a kind". This is possible because the system operates like a chaotic system subject to the "butterfly effect". The "butterfly" effect refers to the observation that even minute phenomena in such a system affect the whole — the flapping of a butterfly wing is said to have an effect on world weather patterns.

The Hodos routines are parameter driven with procedures capable of generating visual form with outcomes subject to similar effects. By "parameter driven" we mean routines that perform a function "not more than" and "not fewer than" so many degrees, pen strokes, or colors. The slightest change, say a .005 change in the initiating seed, affects all the controlling parameters and consequently the final form. The "auto" modes built into the system allow

"Hodos" to alter its variables and to do so within parameters that I may choose to control — or not control. The consequent forms are interrelated by the degree of variation in the program parameters and the way such parameters are controlled — or not controlled. This dialectic between "control" and "uncontrol" has been the centerpiece of my form considerations as an artist for over 30 years.

THE DIAMOND LAKE APOCALYPSE and EZEKIEL SERIES.

The Art Works. I have labeled several distinctive series of works related to program routines and the way those routines have been used: Pathway; Gaia; Scarab; and the Diamond lake Apocalypse (DLA). The most recent DLA works are named the Ezekiel series.

The DLA and Ezekiel Series are code generated scripts and illustrations presented as "illuminated" pages reminiscent of medieval manuscripts. The scripts and illustrations are executed with a multipen plotter coupled to a PC. The plotter draws from an array of technical pens loaded with inks mixed in the studio. All brush strokes are plotted using Chinese brushes adapted to the machine's drawing arm. Each page, plotted on rag paper, is enhanced with a touch of pure gold or silver leaf, applied by hand. However the illuminated "initials" (design elements) are always code generated and machine plotted.

Structure. The "illumination" for each work is realized with code driven improvisations based on a single initiating stroke. This stroke, generated by randomly cast control points, can be seen in the brush strokes. Software procedures provide parameters to create reflecting or mirror strokes on either or both axes or none at all.

The "script" headers and initials are derived algorithmically from the same set of relations; thus a "self-similarity" permeates the whole. More recent routines allow for transformations of form from one set of control points to another. The same algorithm used for asymmetrical works in the Pathway series drives the recursive loops that generate the severely symmetrical "Ezekiel series" illuminations. @body-e = Content and Meaning. Parameter controlled recursive loops are commonly used today in applications and research in practically all disciplines. They provide an awesome means for visualizing the evolution and transformation of form. As we develop an iconology (interpretation) of these forms we will see that they are the icons of those procedures which are shaping our culture.

One could think of the works in all of these series as diagrams or visual analogues to the coded procedures by which they are made. The essential character of the finished work is derived from the "form-generating-procedure" or "algorithm" acting as genotype. For this reason one could say that the finished work is an epiphany, or manifestation, of the artist's code. Each work celebrates its code, especially the recursive routines which shaped its character. It is noteworthy that such procedures hold much in common with processes associated with crystallization and genetics.

These epigenetic works invite us to savor both the beauty and the mystery of their coded procedures — not so much for their stark logic as for the grace and poetry they yield. They provide a window on unseen processes shaping mind and matter. By doing so they become icons illuminating the mysterious nature of Earth and Cosmos.