CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

FROM ZERO TO ONE

An abstract submitted in partial satisfaction
of the requirements for the degree of Master of Arts

Special Interdisciplinary Major

Art

Computer Science

Psychology

by

Eudice Feder-Menkin

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For Mama

For Mel and the children
Hannah, Joseph and Sarah

the grandchildren
Dubi and Irit

and to all my family who cheered me on

Dedicated to the memory of my teacher
Lazlo Moholy-Nagy

Special acknowledgment to
Charles A. Bearchell, Dean
Graduate Studies and Research

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ABSTRACT

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Simple curiosity had attracted me to a demonstration of computer-assisted graphics and I found the idea immensly exciting. As an experienced painter with a strong interest in color and design, the challenge of programming imagery on my own terms was irresistable.

Art, science, technology, formalism, philosophy, subjective thoughts, feelings, the sacred and profane are all

incorporated into a loop of ideas, tools and expression. This is not a simple linear process, but a complex one of multiple interacting synaptic connections triggering impulses and responses. These occur within the human brain and with a probable "100 trillion synapses in every brain" (Hubel, 1979), the uniqueness of each individual becomes apparent.

With new tools, a way opens up to new knowledge, new ideas and new opportunities to re-examine the world and re-interpret it in another way. FROM ZERO TO ONE is an art exhibit using the computer as a tool. These drawings/paintings/graphics are called "plots" in computer terminology and are a culmination of over two years experimentation.

The electronic machinery involved is the CDC 3170, a very large computer on the Northridge campus, and the Calcomp plotter 936 which does the actual drawing with ballpoint pens or liquid ink. Limitations of computer time, type of paper and choice of colors are constant realities that effectively teach patience, humility and resourcefulness. Strategies in programming to outwit a time

factor and to overcome the difficulties of using only three standardised colors must be devised.

Interesting problems in visual perception also occurred. These had evolved out of the peculiarities of the plotter itself which can only draw straight lines. Eventually, I discovered moire patterns as a useful means of expression. Moires are created by overlapping two sets of parallel lines or circles. The kind of design obtained is dependent on the angle of the displacement. Moires are found naturally in the surface reflections in pools of water, in overlapping screens or bamboo blinds, in folds of loosely woven cloth. They are deliberately manufactured into "moire silks" by pressing together slightly misaligned parallel cords of a fabric with a pronounced weave (Oster and Nishijima, 1963).

Engineers view moires as interference patterns and use them to analyze strain. Moires are part of every plot in the exhibit. They have been manipulated and bent to conform to the idea of each individual plot contrary to the aim of the engineer. However, inasmuch as a moire is an optical visualization of stress, it enhances the idea of

moire as a metaphor.

The exhibit began with six typewritten statements, each one mounted on computer printout paper and fastened to the wall with pushpins. They are a guide to the form, content and presentation of the work in the show, and are as follows:

FROM ZERO TO ONE

THE FORMAL CONCERNS OF THIS EXHIBIT RELFECT THE IDEAS I FIRST ENCOUNTERED AS A YOUNG STUDENT OF MOHOLY-NAGY AT THIS CHICAGO BAUHAUS (INSTITUTE OF DESIGN). THE CONTENT REFLECTS A PERSONAL OUTLOOK IN RESPONSE TO THE PARADOX OF OUR AGE IN WHICH EXTRAORDINARY SCIENTIFIC AND TECHNICAL ACHIEVEMENT IS COUPLED WITH UNSURPASSED HUMAN DESTRUCTION.

MOHOLY'S LEGACY

INCLUDED IN MOHOLY'S LEGACY WERE THE TRADITIONS OF CONSTRUCTIVISM, THE PHILOSOPHY "TRUTH TO MATERIALS", AND THE PRINCIPLE "INTELLECTUAL INTEGRATION". ALL HAVE CONTRIBUTED TO THE WORK SHOWN HERE.

CONSTRUCTIVISM

"...THE FIRST MOVEMENT IN ART WHICH HAS DECLARED THE ACCEPTANCE OF THE SCIENTIFIC AGE AND ITS SPIRIT AS A BASIS FOR ITS PERCEPTIONS OF THE WORLD OUTSIDE AND INSIDE HUMAN LIFE."

NAUM GABO (CA. 1920)

TRUTH TO MATERIALS

IN THIS CASE, A COMPLEX INTERPLAY BETWEEN HARDWARE, SOFTWARE, AND PERSONAL VISION. THE ARTIST AS PROGRAMMER, ASSISTED BY COMPUTER, CREATES AN OBJECT THAT MUST STAND NAKED AND ALONE, UNMATTED, UNFRAMED AND UNGLASSED.

INTELLECTUAL INTEGRATION

AN APPROACH TO VISUAL DESIGN THROUGH INQUIRY INTO OTHER SYSTEMS OR STRUCTURES OF HUMAN ACHIEVEMENT; ENCOURAGEMENT TO SYNTHESIZE RELATIONSHIPS OF DIFFERENT MEDIA OR DISPARATE DISCIPLINES.

WOULD LEONARDO LIKE IT?

WOULD EL LISSITZKY LIKE IT?

WOULD MOHOLY-NAGY LIKE IT?

WOULD SPINOZA LIKE IT?

WOULD THE BA'AL SHEM TOVE LIKE IT?

WOULD WITTGENSTEIN LIKE IT?

EUDICE FEDER

NOV. 9, 1980

The plots exhibited were hung in the following order:

1. Homage to Moholy-Nagy
2. In the Beginning
3. Darkness
4. Separation
5. The Water Above and Below
6. The Waters Gathered
7. Morning
8. Evening
9. Firmament
10. Pillars of Solomon
11. Three Days Darkness

12. Pillar of Cloud
13. Columns of Smoke and Fire
14. Rephidim
15. Desert
16. The Red Sea
17. Red Sea Series: Permutations
18. Imago Mundi
19. One
20. Shekinah*

*This plot was not hung, but was included together with additional work in computer folders and placed on a pedestal.

The titles indicate the focus of the work and the human involvement in the ideas. But the procedure from idea to finished plot is indirect. Instructions are in SIMPLOT, a computer graphics system written in the programming language SIMULA. The primary graphics facilities are STRINGS and FIGURES. These components are manipulated and positioned into a space corresponding to a Cartesian grid with X, Y and Z coordinates. This method is in a sense similar to collage and could be called "Cybernetic Simulage"

(Abbott and Feder, 1980).

At this point the computer (CDC 3170) takes over. If the program works, the program data is transferred to tape. The plotter follows the instructions on the tape and plots the program. Once again the human element enters in the shape of a plotter operator who functions like any printer of conventional graphic techniques. It was most satisfying for me to be the artist, programmer and plotter operator for this exhibit.

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