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POLYGONAL POSSIBILITIES

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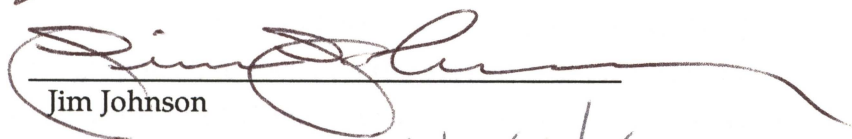
Marilyn D. Nelson

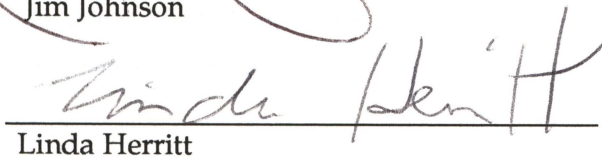
B.F.A., University of Colorado, 1975

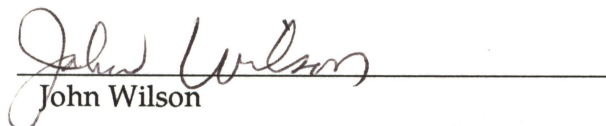
A thesis submitted to the faculty of the Graduate School
of the University of Colorado in partial fulfillment
of the requirements for the degree of
Master of Fine Arts
Department of Fine Arts, Creative Art
1988

This Thesis for the Master of Fine Arts Degree by
Marilyn D. Nelson
has been approved for the
Department of Fine Arts
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Polygonal Possibilities

"Polygonal Possibilities" is a statement about the fundamental relationship of natural form and geometric and mathematical concepts. Mathematics is the study of numbers, their forms, arrangements, relationships and properties, with geometry being a visual manifestation of symmetry and order. Science can be seen as an experimental investigation to discover a provable unity in the variety of nature, of the universe. Aesthetic aims are often deeply involved with a search for ultimate reality, an understanding of nature utilizing intuition. I understand my art as a means to investigate, order, and unify symbols of these disciplines to evoke a sensual response to geometry and nature.

In my previous work I utilized geometrically tessellated patterns to energize a large field, using grid systems as a vehicle for color or to distribute a number system. In a composition where all elements share equally in the construction of a repeated system, figure-ground relationships are suppressed and the field becomes in effect infinite. The non-hierarchical relationships of units can be enforced by maintaining a consistent surface quality. I chose an impersonal surface, rejecting the accidental and auto-biographical, to focus on the system and technical discipline. This systemic approach led me to research the historical origins of the role of geometry and mathematical concepts in the structural make-up of the physical world.

Mondrian stated that "the only problem in art is to achieve a balance between the subjective and the objective. It is of the utmost importance that this problem be solved, in the realm of plastic art - technically - and not in the realm of thought. The work of art must be 'produced', 'constructed' . . . Such work can never be empty because the opposition of its constructive elements and its execution arouse emotion." My Thesis presents an embodiment of the history of geometric images and mathematical concepts from the time of Pythagoras to modern scientific diagrams. I have worked

to refine technical skills including precise pencil drawing, expressiveness of paint application and a more forceful use of color. I am utilizing these tools on a variety of surfaces and at multiple scales to create a balance between conceptual and perceptual stimulation.

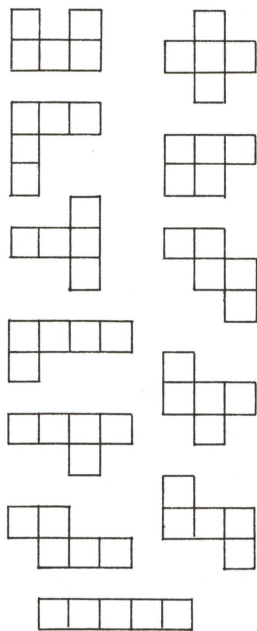
Representing the exhibition's title, "Polygonal Possibilities", 80" x 114", offers a synthesis of conceptual and perceptual concerns. Included in this piece is a visual explanation of the "Platonic Solids", which represent Plato's attempt to explain the universe by use of geometric form. Plato assigned solid forms to represent the basic elements: the sharply pointed tetrahedron represented the molecules of fire; the cube, the earth; the



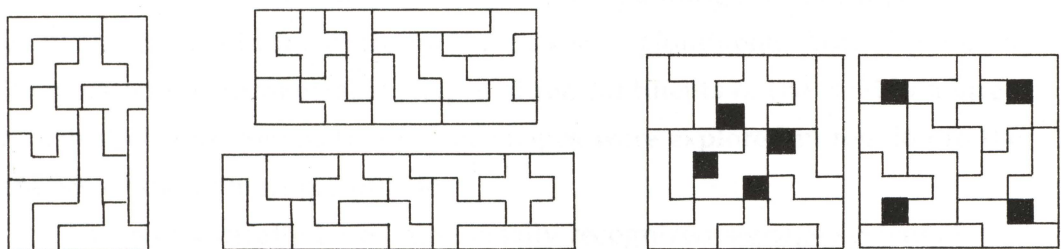
octahedron, the atmosphere; and the more rounded icosahedron represented water. I have included a mathematical theorem (Polygonal Numbers) which produces a number sequence, the discovery of which is attributed to Pythagoras. This sequence visually translates to a regular ordering of polygonal forms. Other subjects in this painting include basic geometric structures, the golden mean spiral, the pentomino puzzle, patterns developed from a repeated use of a basic polygon, and images developed from observations of nature or derived from modern scientific representations. While presenting this varied content it has been necessary to solve many formal problems. The painting is composed of six panels containing separate information, each functioning as a unit of the whole. Information is distributed according to a basic grid format, and a juxtaposition of surfaces is created by presenting information in a variety of approaches to execution. By this distribution I have tried to maintain a democracy of parts so that no unit dominates the composition. Color choice is intuitive, but used to define patterns, structures, or used more playfully within a structure to create an illusion of transparency.

The idea of working within a strict formal discipline reflects the fact that order is inherent in the proportions and patterns in nature. Through

the limits of discipline one can begin to experience a reflection not of the visible world, but of the perfected world of the ideal. Although I am working within formal boundaries, much of my work is composed by visual trial and error, adjusting and revising elements to confirm my feelings. To me, beauty does not arise necessarily from particular forms or units, but from their interrelation with each other in the composition. Matisse dreamed of an art of balance, of purity, and created art stimulated by nature. His study of nature's rhythm and his intuitive approach to color brought about a harmony of conception which I admire. When speaking of compositional balance Matisse stated, "I merely try to find a color that will fit my sensation. There is an impelling proportion of tones that can induce me to . . . transform my composition. Until I have achieved this proportion in all the parts of a composition I strive towards it and keep working. Then a moment comes when every part has found its definite relationship and from then on it would be impossible for me to add a stroke to my picture. . ."



The Pentomino Puzzle which has intrigued me since the age of twelve often appears in my work. It is based upon a square grid system, and contains twelve pieces, each made of five square units. It is possible to fit the pieces into several rectangular shapes with many solutions per shape. "The Earth as Pentomino Puzzle", 72" x 72", juxtaposes mathematic and natural form, with the inclusion of aesthetic concerns. The puzzle pieces are superimposed on the world map and rearranged into a square format. The pentomino puzzle, not tessellating perfectly into a square, leaves four centrally located "blank" squares. By use of color value and scale alterations, the



The twelve pentominos and puzzle solutions in different configurations.

identical puzzle solution and map juxtaposition form a repeated and rotated fractal image within these smaller squares. The paint application energizes the surface of large areas of color. Although the colors work within a defined system of tints and shades, initial colors were chosen intuitively and adjusted as necessary to harmonize the composition.

My relation to nature and interest in field pattern perception extends to the finding of and using four-leaf clovers as a surface on which, and a boundary within which, to explore geometric, mathematic and cultural relationships. Since childhood I have found and collected multi-leaved clovers (four through eight leaves), a perceptual problem of identifying an irregularity within the patterned field. The process of picking, counting, ordering and labeling the found clovers reflects my interest in number systems and the systematic distribution of shape within my work. Four-leaf clovers are a freak deviation from the normal three-lobed leaf and are highly prized as lucky charms. History and legend are filled with allusions to their benign powers, the oldest of which dates to the Druids. Whoever found a four-leaf clover was believed to have supernatural sight and be able to see evil beings not visible to ordinary persons. Being able to avoid evil-doers was considered good luck.

"Four-Leaf Clover Geometry" imposes tiny man made geometric diagrams upon the natural clover form. The specific geometric drawings were determined individually for the size and shape of each four-leaf clover and drawn to fit within the natural geometry of that clover. The Golden Mean spiral is drawn on one of the clovers which can be seen at a larger scale in the painting "Polygonal Possibilities".

Relating to the painting "The Earth as Pentomino Puzzle" are two clover pieces, "Continents Adrift" and "Pentomino Puzzle on Five-Leaf Clovers". Because "pentomino" refers to a five unit grid system, I have painted puzzle solutions on 15 five-leaf clovers. The same basic colors for each puzzle piece as are used in the 72" x 72" painting are used again to paint the puzzle in miniature on the clovers. "Continents Adrift" presents fragmented but recognizable shapes of the continents of the world on large four-leaf clovers, just as these same shapes were explored in relation to the shapes of the pentomino puzzle.

The geometrically based, universally recognized signage system of national flags can be seen in "Four-Leaf Clover National Flags". Com-

posed of 174 painted four-leaf clovers, each flag design is fragmented according to the shape of the clover, but maintains its identity. The clover flags are tagged according to country and grouped within frames according to their geographic location. These clover flags create a superimposition of a strong cultural statement upon a tiny object of natural and random growth.

"Circle, Triangle, Square", 8' x 25', is a modular painting constructed to fill a gallery wall. Surrounding a 5' x 15' area of canvas are 192 ten inch square painted units. The format and design contains the underlying geometric structure of the basic circle, triangle or square which governs the positions and directions of elements within. The painting explores a controlled use of color to solve specific problems and create specific visual sensations. Different from my previous work is the combination of geometric form and stylized naturalistic images (horses, dogs, clovers, magpies, snowflakes) as a vehicle for color. Each square unit contains the above elements, and when seen together a strong repeated pattern emerges. This painting has been composed conceptually, with much detail and concern for individual units, but with no visual feedback of the whole. It is presented in the spirit of a thesis, and like a performance, I will not see "Circle, Triangle, Square" in totality until it is installed for the exhibition. It is my hypothesis that by combining the structural elements of the overall grid, basic geometry, fractal geometry, the stylized images on individual units, with the deliberate use of color and pattern, that the result will be a non-hierarchical synthesis of content. In theory, at close range, the viewer will be confronted by a wall of vibrating color within and around the images. From a distance, however, the large scale field pattern will emerge, somewhat suppressing the intense color and figure-ground relationships. Because of my strong background in geometric and systemic painting, I can conceptualize this visual manifestation, but as with any work of art the final product will contain visual surprises.

My thesis work has involved a study of art history and theory enabling me to analyze my present role as an artist. It has involved technical explorations facilitating the translation of ideas to the visual realm. I have begun to integrate the intellect with emotional response. The two artists I quoted in this paper, Mondrian and Matisse, represent these contrasting interests. Although different in approach, they possess overlapping qualities (the

importance of nature and universe, the purity of means, concern of line, shape, and color relationships, the necessity for discipline, the applied intelligence) inherent in their shared goal of the representation of harmony and universal beauty. Throughout history art has meant a gradual change in this expression. Similarly, my personal means of expression has evolved toward a synthesis of conceptual and perceptual concerns.

Addendum

After seeing "Circle, Triangle, Square", I feel that the painting succeeds as intended and does contain a few surprises. At close range the painting does create a wall of vibrating color, which from a distance radiates a beauty of color harmony. This color which glows from a dark background, the repetition of units and shapes therein, and the scale of the piece resembles a stained glass window. This presents a mood and connection with the spiritual which, although a possible reflection of my association with nature, was unplanned.

I have realized that the obsessive nature of collecting, categorizing and painting four-leaf clovers and of painting detailed pattern systems is repeated in the production of the 192 hand painted units of "Circle, Triangle, Square". I have also realized the the decorative aspect of my work is a means to audience response, an access to a deeper investigation.

In partial fulfillment of the requirements
for the degree Master of Fine Arts
Marilyn D. Nelson
has submitted this written thesis
as a supplement to the creative thesis
and ten slides
which are in the permanent possession of the
University of Colorado and recorded with the
Department of Fine Arts

Approved by 
Chair of the Committee


Member of the Committee


Member of the Committee


Member of the Committee


Chair, Department of Fine Arts

Ten Slides, Painting and Mixed Media

1. Mixed media/canvas, 80" x 114", "Polygonal Possibilities".
2. Mixed media/canvas, 80" x 114", "Polygonal Possibilities", detail.
3. Mixed media/canvas, 80" x 114", "Polygonal Possibilities", detail.
4. Oil/canvas and board, 8' x 25', "Circle, Triangle, Square".
5. Oil/canvas and board, 8' x 25', "Circle, Triangle, Square", detail.
6. Oil/canvas and board, 8' x 25', "Circle, Triangle, Square", detail.
7. Oil/canvas, 72" x 72", "The World as Pentomino Puzzle".
8. Gouache on five-leaf clovers, 14" x 18", "Pentomino Puzzle on Five-Leaf Clovers".
9. Gouache on four-leaf clovers, 12" x 16", "Four-Leaf Clover Color Studies".
10. Pencil/four-leaf clovers, 12" x 16", "Four-Leaf Clover Geometry".

