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Rochester Institute of Technology

A thesis Submitted to the Faculty of
The College of Imaging Arts and Sciences
in Candidacy for the Degree of
MASTER OF FINE ARTS

Furniture Design from Geometrical Shapes

BY
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January 27, 2002

To Eunhea and Jessica

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INTRODUCTION

“Throughout history, people have used elementary symbols such as the circle, the square, and the line to communicate with each other or express their inner feelings.”¹ These elementary geometric symbols, mathematically precise, found in modern artworks of the early twentieth century, nature, and the human environment, intrigue me greatly because of the ways in which they reflect the image of our world and many aspects of our daily lives.

“Geometric abstraction, in our discussion here, is used to describe purely abstract painting and sculpture which is chiefly concerned with the square, the rectangle, the triangle, the circle, and geometric volumes such as

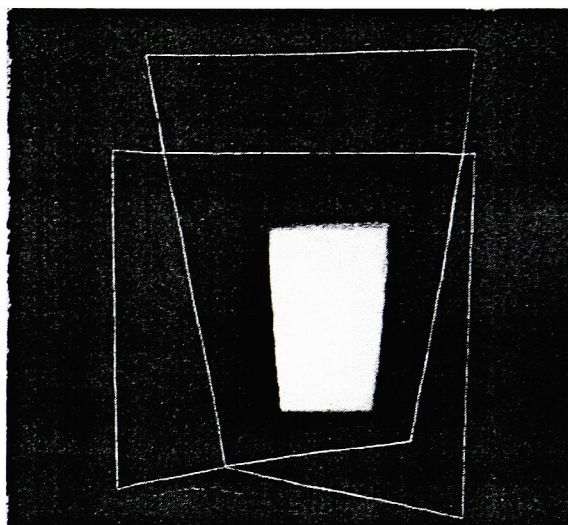


Figure 1. **Josef Albers.** *The Gate.* 1936

the cube, cone, etc. The forms do not usually relate to subject matter. They are often arranged architecturally and suggest geometry. Primary colors are frequently used.”² The compositions of geometric shapes, lines, and primary colors which appeared in geometric abstract

¹ Rene Smeets, Signs, Symbols & Ornaments (New York: Van Nostrand Reinhold Co., 1982), p.85.

² John Gordon, Geometric Abstraction in America (New York: Whitney Museum of American Art, 1962), p.9

painting, sculpture, and architecture that was done during 1917 through 1939 attract me, for example Josef Albers, Piet Mondrian, and Vasily Kandinsky. The art movements which produced these kinds of works were made up of small groups of artists, designers and architects and were usually centered around either a particular journal or art school. Generally, the aim of these movements was to achieve a complete abstraction by means of universal geometric concepts. In doing so, they were working towards a change in the cultural environment of mankind and the redefining of the role of modern art.

The two most important groups which emphasized geometric abstract art during this period, are the Dutch group, De Stijl, named after an art journal, and the Bauhaus, which was located in Germany. These two groups are discussed in further detail later on.

I choose geometric shapes as a source of design for the furniture pieces because I believe that the geometric shape is a fundamental form of the universe. All things in the universe consist of geometric shapes. Furthermore, organic shapes can be recomposed by geometric shapes. Geometric shapes usually look simple, general, passive, motionless, static, and stable, but they can be made to give impressions that are dynamic, spirited, and unstable. I am interested in combining these two aspects in my works: geometric shapes with a sense of dynamic motion.

My artwork explores the possible translation of geometric shapes into furniture design. In so doing I hope to express dynamic movement,

and gain a better understanding the complexities of the design process. In each piece my exploration focuses on issues such as form, space, proportion, color, and texture. The resulting pieces are designed to be mainly functional. Within the exploration process, the visual aspects of geometric abstraction are researched.

Historic Reference of Geometric Abstraction

Aesthetic aims are often deeply involved with a search for ultimate reality, understanding of nature and psychic intuition.³ As Naum Gabo has said, “The search for perfection in the constructive sense is not a state but process; not an ultimate goal but a direction.”⁴ In the early twentieth century, the direction toward aesthetic perfection was to abandon the imitation of natural appearance. To abstract artists, resemblance to nature was at best superfluous and at worst distracting. They were, instead, trying to seek out forces hidden in nature and to realize psychic effects by penetrating more profoundly than naturalistic art ever was able to do.

Geometric abstraction is one form of pure abstraction and is mainly concerned with geometric elements and primary colors. They are often arranged architecturally and suggest geometry. Geometric abstraction often insists on an order and control, not to banish feeling, but to make it significant, as Joset Albers, for example, consistently did.⁵ Geometric abstract art was not initiated by a single pioneer, but by many small groups. The Bauhaus and De Stijl were two sources of

³ John Gordon, Geometric Abstraction in America (New York: Whitney Museum of American Art, 1962), p.9

⁴ Naum Gabo, “Constructive Art_ (an exchange of letters between Gabo and Hebert Read)”, Horizon, July, 1944, p.59

⁵ Statement by George Heard Hamilton in Joset Albers (New Jersey: Yale University Press, 1956), p.43

concept that were based heavily on geometry, they were of special importance to modern art and architecture.

DE STIJL

De Stijl, one of the most influential groups of modern art, was formed in Holland in 1917. This group consisted of painters, sculptors, and architects and revolved around the magazine, De Stijl. Founded by Theo Van Doesburg, a Dutch painter, sculptor, architect, poet and theorist, De Stijl was led by a man as versatile as any figure of the Renaissance. All of the masters, especially Van Doesburg, Mondrian, Van der Leek, and Oud, derived a spiritual nature from this period.

The artistic creed, which the members of De Stijl pledged to observe, was an absolute adherence to abstraction; i.e., a complete elimination of the entire sphere of direct observation of nature. They restricted the means of plastic expression to the straight line and right angle, and to the three primary colors (red, blue, and yellow) and to the three non-colors (black, white, and gray). In other words, two fundamental elements in the work of the De Stijl group were the rectangular form and the primary colors.

They saw, in the consciousness of their period, a tendency towards collectiveness, depersonalization and mathematical exactitude and precision. Based on this, the members of De Stijl tried to establish a new role for art. They felt a need for a universal plastic language based on elementary laws; the laws of balance and harmony. Piet Mondrian, one of the most influential and well-known members of De Stijl, found in the reduction of Cubism a formula which allowed him to

look into the inner substance of things. Gerrit Rietveld, famous for his “Red/ Blue Chair,” (figure 2) became a leading member of the De Stijl.

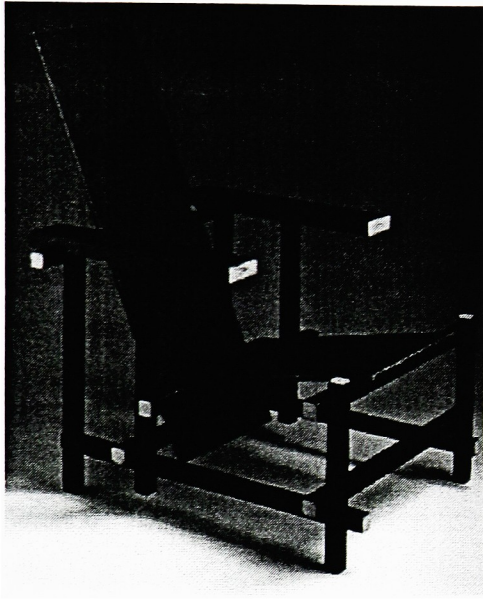


Figure 2. **Gerrit Thomas Rietveld**
Red/Blue chair, 1918-1923

He directed his attention to the use of a geometric vocabulary in order to construct an abstraction of a chair. Rietveld was a precursor of contemporary furniture artists. Because his works was among the first to exploit the strict rectilinear forms of the machine aesthetic which characterized much new architecture in this period.

De Stijl changed the environment of modern man and left its mark on numerous spheres of design and composition. The influence of De Stijl can be traced to all fields of art, whether it be painting, sculpture, craft work, architecture or graphic design for example, Donald Judd’s furniture, Sol Le Witt’s sculpture, and Frank Stella’s painting. The art of De Stijl later dominated the Abstraction-Creation⁶, which was in Paris in the early thirties that proclaimed a renaissance of abstract art.

⁶ Arsen Pohibny, Abstract Painting (Phaidon-Oxford, 1979), p.25-26

THE BAUHAUS

The Bauhaus, founded by the architect, Walter Gropius, in Weimer, Germany, 1919, was the result of the various social-political currents which existed after the First World War. The Bauhaus set out to train a new generation of architects and designers to be able to accept and anticipate the demands of the Twentieth Century. Many contemporary artists, such as Itten, Feininger, Klee, Kandinsky, Moholy-Nagy, and Breuer joined the Bauhaus as professors and collaborated toward the ideal of creating models that would meet all technical, aesthetic, and commercial demands of the Twentieth Century. The Bauhaus, in a sense, was the turning point in the evolution of a philosophy oriented towards civilization and technology. During the fourteen years of its existence, the Bauhaus contributed, more than any other organization, to the reconciliation between man and its man-made environment.

The influence of De Stijl, largely brought about by Theo Van Doesburg, gave rise to a veritable revolution in the character of the Bauhaus. This character transformed from the mysticism and transcendentalism of Expressionism to a clearer, more disciplined and consciously developed style of art. It was, however, Moholy-Nagy's personal interpretation of the constructivist attitude, which contributed to the emergence of a recognizable Bauhaus style: that which was mainly based on the cube, rectangle, and circle. He believed that

mathematically harmonious shapes, executed precisely, were filled with emotional quality and represented the perfect balance between feeling and intellect. Although the Bauhaus was greatly influenced by De Stijl and Constructivism of Russia, it went far beyond both, by accepting the functionalism of design. The Bauhaus tried to utilize all of its resources; technical, scientific, intellectual and aesthetic, to create an environment which would satisfy man's spiritual and material needs. Bauhaus design

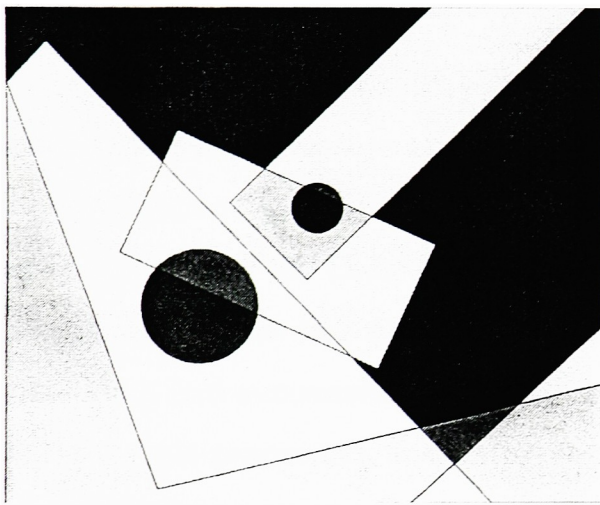


Figure 3. **Laszlo Moholy-Nagy**
Study for AM4. 1926

can be summarized as an eclectic fusion of abstract geometric elements with the new idea of utilitarian functionalism.

As Moholy-Nagy wrote, “not the product, but man, is the end in view.”⁷ It is this essential humanism, based on an attempt to understand man's psychological as well

as his physical needs, that has been the foremost contribution of the Bauhaus to modern design and architecture. As Gropius once described its aim, “the wholeness of its approach has helped to restore the architecture and design of today as a social art.”⁸

⁷ L. Moholy-Nagy, The New Vision and Abstract of an Artist (New York, 1947), p.67-86

⁸ Gillian Naylor, The Bauhaus (London: Studio Vista, 1968), p.156

Impact of Geometric Abstraction on My Design

My work focuses on contemporary furniture which has a distinct relationship with the past and present. The pieces of furniture that I have created are intended to be viewed as one-of-a-kind furniture pieces and are directed toward gallery exhibits. The furniture is designed to stir one's imagination and create a focal point in an architectural space.

The purpose of this body of work has been to create furniture pieces that would express and embody my exploration and interpretation of geometric abstraction. While it is impossible to incorporate all of the ideas behind a movement, I have found that having a reference to a particular movement or style has been motivating and successful. The various compositions of geometric shapes, pure proportion, and primary color have been a focal point in order to express my visual language and my inner feeling.

Geo 1



Geo 1

The title of this cabinet is “Geo 1” (veneered plywood, M.D.F., mahogany, 12”L x 11”D x 63”H). It was my first project for the thesis exhibition. Structurally, the cabinet consists of two parts; the top section has storage space and the bottom section has the legs which support the whole body.

My goal in this design was to express a kind of dynamic movement to furniture design through geometrical shapes. The idea for this cabinet came from a hero in the cartoon (figure 4) that was very famous and popular in my country when I was a little boy. His right hand was as big as his torso. He looked very asymmetrical and unbalanced, but also seemed very dynamic, full of motion, and energetic. When people see the main character of this cartoon, they could expect something very exciting. In this way, I hoped that my piece of furniture would evoke a sense of energy to viewers. To achieve this, I made one leg much



Figure 4. **Wonbin Kim**
Joomuk Daejang. 1967-1972

bigger than other three. Unlike the other legs which were made at a 90-degree angle, it was tilted slightly to the outside. Because of its tilted position, it would give more stability than with all 90-degree legs. I finished this leg with white as opposed to rest of the black legs. This exaggerated and highly contrasted leg makes itself conspicuous and distinct.

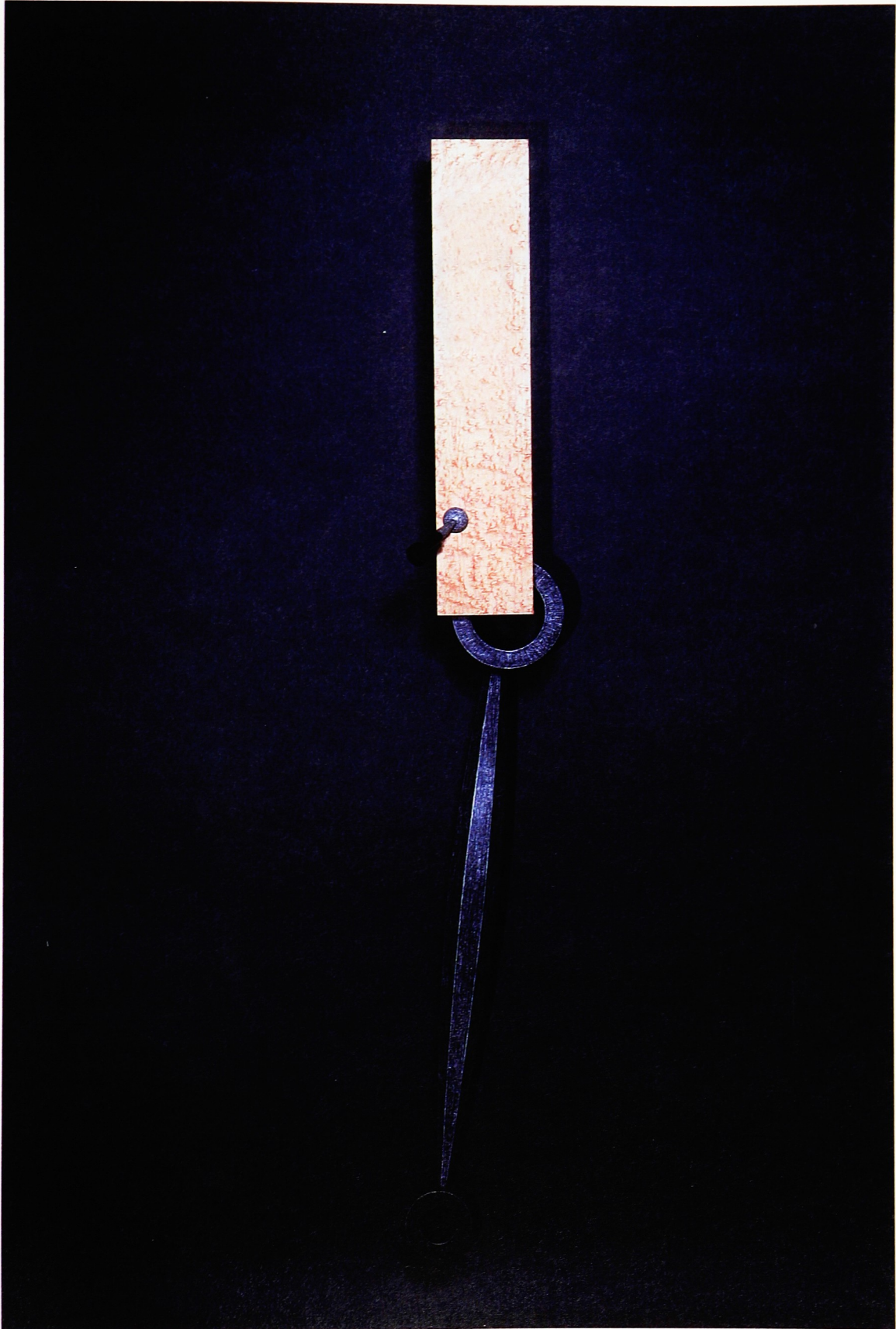
Before proceeding too far with the design of this piece I wanted to explore texturing possibilities. I tried several different texturing techniques to get the unique appearances of the legs. After I did a couple of tests, I used 1/32-inch lacewood veneer to cover the three legs, and then I ebonized these with an alcohol-based stain. After the finishes, the dot patterns of the lacewood revealed themselves faintly. Then I worked on changing the appearance of the bigger white leg. I made a dense scratch on the mahogany surface with a sharpened fork and a steel wire brush. Then I filled it with gesso, and sanded it out slightly to expose the mahogany. On this surface, I sprayed stain made of vinegar and some rusty nails in order to change the color of the mahogany to black. I believe that these white and black legs create an element of balance, and yet create an interesting element of visual emphasis.

I veneered the top of the cabinet with curly maple because I thought that the yellowish maple made a wonderful contrast with the black bottom. When I designed the case, I tried to avoid a rectangle or square, because it would be too passive. On the contrary, lozenges and

trapezoids give us definitely different feelings such as changeable, unstable, and moveable. Thus, I chose trapezoid because I believe that between the two shapes, it created the illusion of movement I was seeking. I used the triangle pattern-another dynamic geometric shape-on the all parts of outside of the case. To avoid a boring repetition of the triangle shapes, I used various sizes, angles, and proportions for this pattern. Therefore, the case exhibited its own illusion of rhythm and movement.

When I attached the case to the legs, I placed it off center to emphasize the effect of asymmetry because my intent was to evoke a dynamic mood of energy, and motion.

Geo 2



Geo 2

The wall-hanging CD cabinet, titled “*Geo 2*” (11”L x 12-1/2”D x 77”H, poplar, M.D.F., birds-eye maple veneer, gesso, acrylic color) was the second piece that I constructed.

Maintaining the same concepts as in “*Geo 1*” was my primary goal in the designing of “*Geo 2*”. As I was doing the sketches for this piece, I focused on how to maintain the asymmetrical geometric balance of unity while taking a different approach to geometric abstraction.

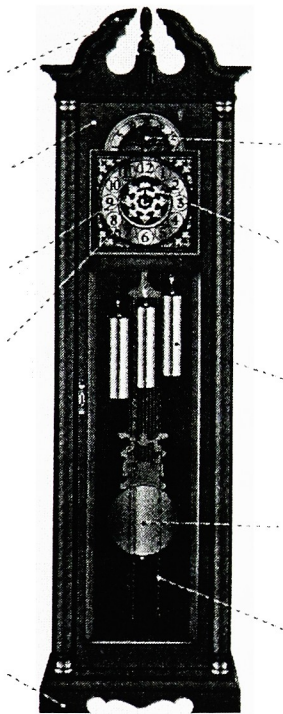


Figure 5.
Grandfather clock

For this piece, I adopted an idea from the grandfather clock (figure 5) which has a moving pendulum. I transformed the dial, the pendulum and the pendulum rod into the leg of “*Geo 2*”. When the clock’s pendulum is at its highest position, it seems motionless-just as a still picture captures a pitcher who is just about to throw a ball. But actually the pendulum is moving down. In the same way, the leg of “*Geo 2*” was tilted to one side to give viewers the same illusion as the

moment captured by the clock. My intent is to have them perceive hidden energy and movement.

I only put one leg support on this piece, which is the same as the clock. I intended that viewers might feel a sense of instability and curiosity. The crystal form of the leg implies a mathematical system. It illustrates a conceptual manner in which adherence of the geometric abstractionist maintains a mathematical sense of geometric shapes. The revealed white gesso line enhances a sense of visual movement.

The door pull, which represents the hand of the clock, indicates change of time. On a clock, unless you stare at it very carefully, you would never be aware of the hand's movement. Nevertheless, it is moving as time goes by. Although the pull is fixed in position, it stimulates viewers to feel a connected sense of dynamic movements. The pull is divided by two different colors; one side has a greater concentration of white, and the other side has a greater concentration of black. This represents two different hands: the hour hand and the minute hand, in other words, the day and the night.

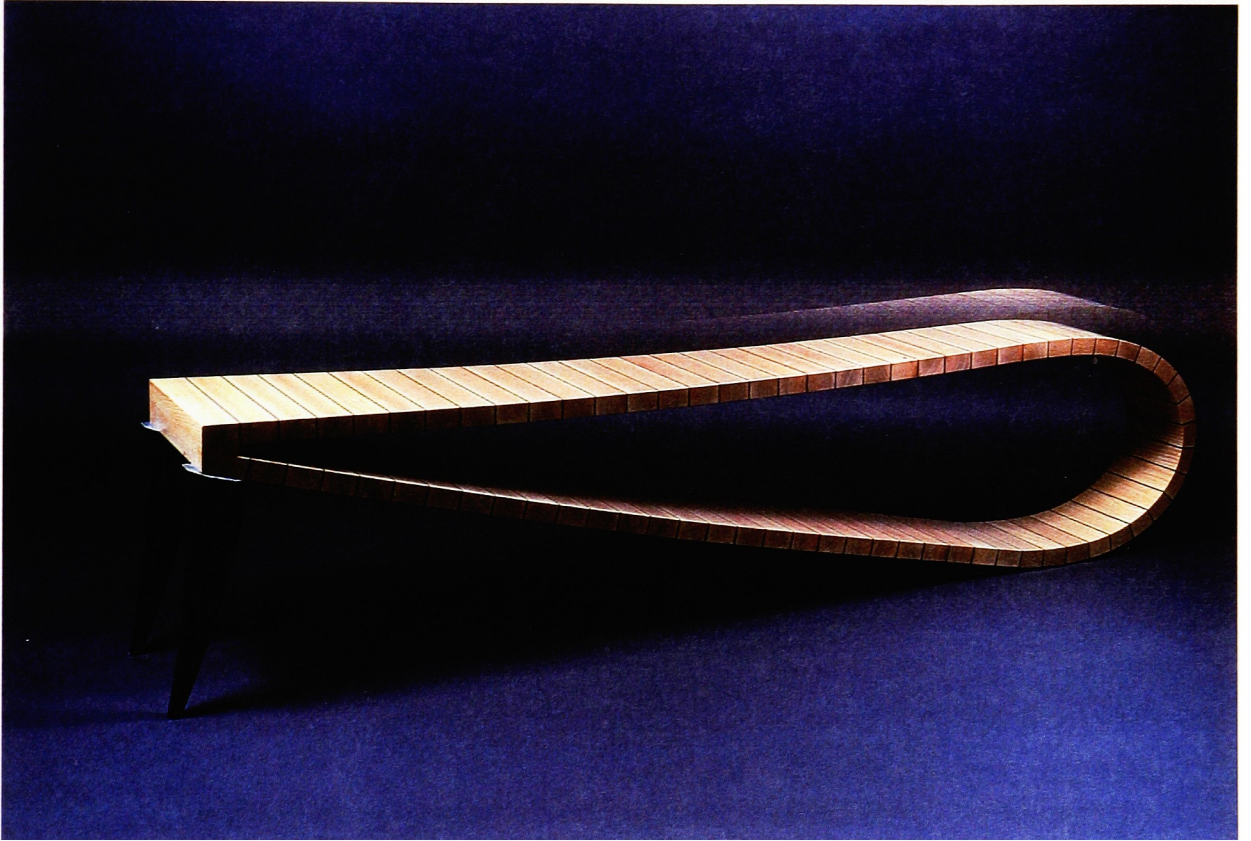
Unlike my first piece "*Geo 1*", I chose the rectangular shape for the case although it is not an exiting shape among geometric shapes. I realized that the first piece (*Geo 1*) was not very functional because I used the trapezoid. Thomas Hucker said, "Furniture consists of objects that perform specific functional tasks. How well an object serves us is a fundamental issue of its design and remains the primary aspect of its value."⁹ As he mentioned, I believe that function is one of the most important aspects of good furniture. Therefore, I focused on function of

⁹ Thomas Hucker, Masterworks (New York: Peter Joseph Gallery, 1991), p30

the CD cabinet, as well as interesting design. I realized my progression from creating “Geo 1” to “Geo 2”, and how much I had learned in the process. Although when the CD cabinet door is opened, its interior space and proportion seemed monotonous and characterless, I chose to solve this dilemma another way. In order to heighten curiosities, I stained only the inside of this cabinet with pure yellow, a primary and noticeable color. It was another innovative approach to achieve the desired visual effects.

The overall asymmetrical composition of the cabinet is visually harmonized and balanced by three elements: the leg, the pull, and the case. All of these elements work structurally, and enhance this conceptual image of the CD cabinet.

Geo 3



Geo 3

This table titled, “Geo 3” (14.5”W x 68”L x 15”H, ash, poplar, black-dyed poplar veneer, and acrylic color), is my final piece of my thesis.

This was inspired by one of Martin Puryear’s sculptures (figure 6). When I encountered this picture in the library, I was fascinated by its fluid contour, rich color, and visual movement.

In order to represent this extensive shape, I tried a new technique I had never used before. I made seventy-two ash blocks in the same size and applied the 1/16” black-dyed poplar veneer on every side of the blocks. Then I put two long screws between each blocks and used glue to join one to another. In the process of building the table, I enjoyed the new skill which helped me to see new opportunities. As I mentioned before, in order to be functional furniture, it must be strong enough for use.

While trying this new joining skill for the table top, I was concerned about its strength against expansion and shrinking of wood since this was a grain direction joint. But the result surpassed my expectation.



Figure 6. **Martin Puryear**
Untitled. 1988

The ash blocks hold the screws very tightly; moreover, the screws between each block worked as additional supporting structures.

This table has a very simple contour that is composed of two

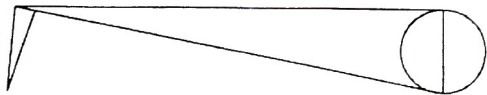


Figure 7. **Shape Modification**

geometric shapes: a circle and a triangle (figure 7). I strived to achieve a sense of animated movement such that the balance and the proportion are used in a

refined and sensuous format with asymmetrical combination of these shapes. The absence of symmetry means the whole piece changes as one views it from different angles. It has a stylishly alert look like a crouching animal as its unique signature, and it becomes more than a three-dimensional piece.

There were many black veneer stripes on the table. Diane Ackerman said, “Once is an instance. Twice may be an accident. But three times or more makes a pattern”. What I liked about these stripes is the repetition and the linear appearance. It makes the table more rhythmical and provides good visual pleasure to viewers.

For the legs, I used the same crystal shape and black and white finish to embrace a sense of unity. I love working with black and white, which are actually not colors, but represent the light and the darkness. I really enjoy the clarity and directness from using strong opposites.

Conclusion

“To design is to plan and to organize, to order, to relate and to control. In short, it embraces all means apposing disorder and accident. Therefore, it signifies a human need and qualifies man’s thinking and doing.”⁹

My final statement is not a conclusion, but rather a point where I stand, both in the process of these works and in the direction of my thesis.

My works have been devoted to the research and development of furniture that has strong ties with geometrical abstraction. I have studied how geometric shapes are used throughout art history and have applied this information and inspiration to create a body of furniture.

I am greatly interested in techniques and disciplines I have used in my works. While I have been working with my pieces, first on paper and then at my workbench, I have enjoyed experimenting with varieties of techniques and materials.

Exact and finite forms served to confirm my attraction to geometric abstract art. Abstract art, one of man’s greatest achievements, allows the totality and the wholeness that could only be grasped partially in nature. In this sense, I hope each one of my pieces reflect on the balance and the harmony of forms with totality and wholeness. I believe that my visual language is not yet rich enough and

¹⁰ Joseph Albers, Despite Straight Lines (Cambridge, Massachusetts: MIT Press, 1977), p.75

free enough to fully express or to communicate my inner feelings. Nonetheless, it has allowed me countless varieties to express the unchangeable structure of consciousness, rhythmical movement, and color interaction.

In the future, I would like to continue to work with asymmetrical design and utilize the relationship of proportion, color and geometric systems, as I have experimented in here. I hope that the reinterpretation and the use of asymmetrical geometric concept will allow my work to mature and develop.

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