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### Various combinations of fibers and anodized aluminum

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ROCHESTER INSTITUTE OF TECHNOLOGY

A Thesis Submitted to the Faculty of  
The College of Fine and Applied Arts  
in Candidacy for the Degree of

MASTER OF FINE ARTS

VARIOUS COMBINATIONS OF FIBERS AND ANODIZED  
ALUMINUM

By

In-Won Jung

May, 1990

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Date: May, 1990

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## INTRODUCTION

Very few artists have attempted to integrate metallic materials and fiber in representing their creative ideas, as it is hard to combine "cold-feeling" metallic materials and "warm-feeling" fibers harmoniously. However, anodized aluminum is a unique metallic material, and has been used in architectural materials, hardware, and housewares. It is light, inexpensive, and most importantly, very colorful.

My thesis originated from my recognition that anodized aluminum is an ideal metallic material which can be harmoniously integrated with various kinds of fibers. Because of its endless color palette one can use it in combination with fibers, not only to achieve a contrasting effect but also to alleviate the sometimes monotonous impression of fiber works. The rich texture of fibers makes a stark contrast with polished, light reflecting, colorful anodized aluminum. And the flexibility represented by fibers and the rigidity expressed by the anodized aluminum also create a contrasting effect. These contrasts and overall balance between the two materials give a strong impression. When they are combined harmoniously, metallic materials and fibers tend to complement each other. The strong point of the combination between fibers and anodized aluminum also lies in the light reflection from the aluminum form. Light reflection is not a material constituting the piece. It is merely a side-effect caused by the aluminum

form. Nevertheless, it clearly adds the feeling of dimensionality to the piece. The multi-dimensional impression, instead of the monotonous impression of fibers, could be achieved from combining fibers with anodized aluminum harmoniously.

I have designed and woven a series of three-dimensional tapestries, in combination with various types of anodized aluminum. I have used different fibers and forms of anodized aluminum to show the enormous potential of such combination. I have used cotton, silk noil, wool, and sisal to make the tapestries. Various forms of anodized aluminum were used such as plate, window screen, and rod to show different images of them, and to be integrated into the tapestries.

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## Chapter One

### ART, CRAFT, AND CREATION

Some people call me a fiber artist. Others call me a craftswoman, specifically, a weaver. I believe that what I have produced for this thesis are artistic pieces, which are not merely products of craftsmanship. Unfortunately, the fiber arts, even when they are clearly beyond the realm of craft, are generally assigned a lower status than the "fine" art. I think that such a belief rests on a purely dogmatic conception of art. It seems that many people's misguided perceptions of fiber art are often due to their confusion between art and craftsmanship. Thus I started with the clarification of these two closely related concepts.

According to Webster's Dictionary, art is "skill in performance, acquired by experience, study or observation", or the result produced by such a skill. Typically, craft refers to such skill or ability in the arts. What exactly does craft imply in this definition of art? What is the relationship between art and craft? First, it should be noted that art is the product of human activity. A beautiful scene may evoke feelings in some people that are similar to their response to art, but scenery is not art. Secondly, craft implies an ability that is not acquired automatically and equally by all people, but rather an ability that must be developed by the individual.

Some people are more skillful than others. One person's interests and opportunities may predispose him or her to acquire a great amount of skill, more than another person, for a particular activity. Finally, craft is not an all-or-nothing quality. There is in every medium a continuum of skill ranging from those who have a great degree of skill to those who possess little. That is, skill is always a matter of relative degree.

I think that those things considered to be art, and made by humans in any visual or auditory media, require a relatively high degree of skill on the part of their maker. If craft plays such an important role in creating art, what differentiates the craft maker from artist? One way of capturing the crucial difference between them is to recognize that "craft" refers to mastery of material and technique to produce an object by hand. On the other hand, art includes "the essential elements emanating from a work that goes 'beyond craft'." That is, "the distinction between the craft maker and the true artist is precisely that the former knows what he can do and the latter pursues the unknown."<sup>1</sup> Thus, a rug ceases to be a rug and becomes a work of art when the artist's statement emanating from it transcends utility. This implies that not all craftsman is an artist. This also implies that not all skillful work is an artistic piece. The aesthetic value of a work depends on an artist's "poetic vision" in addition to his or her

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<sup>1</sup> These quotes are from Mildred Constantine and Jack Lenor Larsen, *The Art Fabric: Mainstream*, p.8

mastery of materials and techniques.

What does this poetic vision amount to? Of course, it is by means of the senses that the artist discovers the existence and properties of the external world. However, the artist does not only discover things as they are, but also express his vision through his creative imagination. The artist's perceptual sense experience constitutes the basis for his creative imagination. However, without imagination, the artist would be a mere craftsman. In order to be a creative artist, one must be original in interpreting and understanding his own perceptual experiences. Imagination is the process by which the artist creates his own understanding of the world beyond his sensory experience. That is, imagination is the ultimate source of the artist's creativity and poetic vision, and, in turn, it is the outcome of such creative imagination.

By expressing his creative vision of the world by means of the artistic product, the artist recreates and changes the perception of the world. The artist is not only a portraitist of the world as it is, but also a creator of the new perceptual framework of the world. In summary, craft is a necessary skill or ability for the artist. The artist and the craftsman are different in that the former needs not only craftsmanship but also creativity in order to achieve his aesthetic goal. Not every craftsman is an artist. Not all well-crafted works deserve to be called art.

However, unfortunately, the fiber arts, even when clearly outside the

category of mere craft, are generally assigned a lower status than fine art. I believe that Lawrence Alloway is right in contending that "this [phenomenon] is due to a prejudice against craft as the residue of an earlier manual phase of culture. No general theory of art as a form of communication can afford to leave the area of craft out of account."<sup>2</sup> Clearly, whether they are made of fiber or paint, all form of creativity must be recognized as valid aesthetic statements.

Among others two concepts of art are relevant to my works. They are design and material. My pieces are abstract in their designs and unusual in their materials. I want to explain the motives behind using abstract designs and unusual materials in my pieces.

Art can be said to represent objects in the world or in the artist's mind. For example, a painting presents a series of colors and shapes which we interpret or construe as representations of various objects from the artist's experience or imagination. In this sense, art is described as a symbolic representation of human feeling.

Symbolic representations involve certain images and meanings made relevant by the intention of the creator and understanding of the viewer. But symbolic representations are not merely replacements for the object. Symbolic representations are vehicles for grasping the essential experience

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<sup>2</sup> See Lawrence Alloway, "The Artist Count: In Praise of Plenty,"  
Art in America, Sep/Oct 1977

of the object and allowing a manipulation of the conception of that object. One subject might be represented by several symbolic expressions, and several objects could also be generalized into one symbolic expression. Because of this symbolic nature of art, arts need not be restricted by the concrete images of their objects. Sometimes, abstract representations are more effective in grasping the essential experience of the object.

My pieces are not concrete in their images. Rather, they represent abstractly my understanding and feeling of the objects. They are the reflections of my inner mental state which happens to be abstract in these cases. I do not believe that there is a fixed way of representing or expressing our inner mental images. Sometimes, it can be abstract and sometimes it can be concrete. What matters is not whether the work in question is abstract or concrete. As long as it enables the people to communicate inter-culturally and timelessly about the piece, the design of the piece, whether abstract or concrete, serves its function well. In other words, good representation consists partly in good design, and that enables us to express our inner mental state.

Of course, there are some standard ways of expressing one's understanding. Suppose that you are asked to create a wardrobe for a fat lady. What you have to recognize is the fact that the horizontal lines generally make a person look wider. Hence, by emphasizing a vertical look, you may succeed in making the lady look thinner. A good designer will

optimize the situation by finding the very best solution to a problem within the given limitations which confront him.

Are there timeless ways of representing objects? There might be a few. But the value of most representations depends on various factors of interests. A beautiful nightgown for Mary may not be a good design for Tom. What was good design yesterday may not be good design today. There are many principles which help us evaluate good representation: making things 'look nice' is one. Simplicity, appropriate form, function and economics are examples of other important design principles. But there are no rules which may not be broken to produce a better result under certain conditions. After all, representation is finding the optimum in a particular set of circumstances.

As for materials, my sentiment concurs with Larry Kirkland's view: "I love material, but I am not in love with material. People who work in clay talk about the "clayness" of clay. Weavers talk about the elemental thread. For them, the material and the way they work with it contributes to the end form. But for me, the end form determines what materials I will use. I am not necessarily seduced by the material itself, but more by the work it can make possible." <sup>3</sup>

My pieces are made of two different materials; fibers and aluminum.

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<sup>3</sup> See Larry Kirkland, *Fiberarts*, Nov/Dec 88, p.26

I believe that to make representations of one's feelings effective, sometimes it is necessary to allow contrasting materials to push against one another. I try to express my mental images by combining cold-feeling anodized aluminum and warm-feeling fibers harmoniously. For instance, in making the first piece, I tried to diminish the boring feeling often associated with plain tapestries by light reflecting anodized aluminum. A three-dimensional effect is created by reflected light, even when the works themselves are essentially flat tapestries. In dim spaces, with a controlled source of light, the works have an encompassing aura, gently but powerfully defining space. To add the effect of three-dimensionality, I also made the anodized aluminum plates so that they would swivel.

I believe that my attitude toward using new materials is well justified. An artist becomes innovative and creative when he or she abandons a style that is safe, repetitive, and predictable. While there is nothing wrong with making pieces with traditional materials, the accepted means of creation should not be more important than any personal artistic vision. Controversial arts, whether because of their contents, forms, or materials, should be able to be presented. For what is unusual is often the source of a new way of creating beauty.

## Chapter Two

### A BRIEF HISTORY OF THE MODERN FIBER ART

The past is, by definition, that which has been said, occurred, or thought. It is not something that is happening or something that will happen. It is an unchangeable and fixed part of history. However, the past is one of the important sources of creativity.

Artists' creativity is largely based on the rich and valuable history of art. It is partly due to the fact that we have continuously been influenced by our enormous artistic heritage. We have been continuously guided and effected by the ideas, technologies, and spirits of those artists and art that precede our own. An artist develops his ability to create through his own experience and heritage.

Furthermore, without recognizing our own artistic heritage we can not even talk about creativity itself. The concept, creativity, can only make sense in the context of a certain heritage of artistic continuum. "Creativity" is a relative concept. We cannot judge whether an artist is creative unless we have a proper background which represents our heritage of art. Likewise, we know that an artistic piece represents the artist's creativity, only when it is compared with each other pieces we already know of. In what follows I shall briefly sketch the history of the modern fiber art.

It is a well known fact that the contemporary history of fiber art started with William Morris in the 1870's. "Morris had started the movement by reviving handicraft as an art worthy of the best men's efforts."<sup>4</sup> Then, in 1919, Walter Gropius opened an academy for the craft and the art. Its name was Staatliche Bauhaus. The significance of the Bauhaus in the history of fiber art mainly lies in its effort to combine diverse artistic efforts. Not only abstract painters but also master craftsmen and architects all worked together with a shared community spirit to create new forms of art. In fact, the movement generated by the Bauhaus has played a significant role in most areas of art.

During the worldwide economic depression and subsequent World Wars, it was inevitable that fiber arts lost their place in society. There no longer were the private fortunes that supported unique works. The majority of those who were working in craft were forced to make prototypes for production, instead of making a single unique object. However, fiber art in the U.S. survived partly because master weavers from all over the world came to the United States. They helped to shape major craft-oriented schools such as Cranbrook Academy of Art and Black Mountain College.

The '50s was dominated by the Abstract Expressionist Movement. Art became a 'chaotic adventure' free from all restraints. The painters, for

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<sup>4</sup> See Nikolaus Pevsner, *Pioneers of Modern Design*,  
The Museum of Modern Art, New York, 1949, p.18-19

instance, abandoned the conventional way of painting. They refused to use easel, canvas, oil, and brush. Influenced by this revolutionary movement, fiber artists in the 50's mainly focused on texture and structure; image was subordinate to them. The fiber artists of the 50's are to be remembered as the adventurers who first departed from the traditional craft of weaving.

If the 50's is characterized by its departure from the image-oriented fiber arts, the 60's is distinguishable from the rest by its soft-sculptures. The fiber arts of the 60's were often non-rectangular, which was a traditional format of weaving. Many were free of the wall. They did not hang, but were self-supporting structures. Some wall-hanging pieces were high reliefs and fully three-dimensional.

In the 60's the artist produced many large architectural scale pieces. These pieces created an increase toward larger fiber wall units. For instance, "typical materials of the 60's were sisal in ropes and cords or as a loose fiber, and loosely spun raw wools." <sup>5</sup> Some of these large producers were Magdalena Abakanowicz, Lenora Towney and Gerhart Knodel.

The 1970s was an important decade which deserves special recognition from the historians of fiber art. The artists of the 1970s broke away from the past by utilizing a broader technological and media mix approach. Professor Arturo Alonzo Sandoval describes this era as follows:

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<sup>5</sup> Mildred Constantine and Jack Lenor Larsen,  
The Art Fabric: Mainstream, p.22

"If it can be said that fiber work of the '60s moved fiber art from the wall to sculptural space, then I feel the fiber work of the '70s initiated a new sense of artistic freedom that moved fiber art further away from traditional material and processes to crossover content and techniques."<sup>6</sup> Since the emergence of this new way of expressing their artistic visions, many artists have explored new technologies and expanded their sources for materials. Their newly found technologies and sources for materials include the computer, commercial fabrics, wood, metal, and some garbage bags. Among others, Debra E. Rapoport,<sup>7</sup> Gerhardt Knodel,<sup>8</sup> Sherrie Smith, and Lia Cook have created some exciting pieces by combining various new materials with each other.

However, unfortunately, this innovative artistic movement is no longer a dominant fashion in current fiber art. During the 1980s "crossover" fiber art has virtually disappeared from craft exhibitions. Not many fiber artists have recently attempted to integrate new materials and fiber in

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<sup>6</sup> The importance of the '70s "crossover" movement in the history of fiber art is well explicated by Professor Arturo Alonzo Sandoval's short article "Weaving: The Artist as Revelator." in *Fiberarts*, Vol.16, No.4 (Jan/Feb 1990) p.48-50

<sup>7</sup> A brief sketch of Debra Rapoport's life and work and that of Sherri Smith are in *Beyond Craft: The Art Fabric*, edited by Mildred Constantine and Jack Lenor Larsen, Tokyo: Kodansha International (1986)

<sup>8</sup> Gerhardt Knodel's career and work is well articulated in *Gerhardt Knodel: Makes Places to be*, edited by Patricia Beach Smith, Cranbrook, MI.: Cranbrook Academy of Art (1982)

representing their creative ideas. As an artist who believes that adventurous crossover expressions in fiber art are essential in its development, I hope that this thesis and the pieces I made with anodized aluminum and fibers can be used as a small step for reviving the innovative spirit of the '70s.

## Chapter Three

### VARIOUS COMBINATIONS OF FIBER AND METAL

Using metallic materials as thread has been common throughout fiber art history. We have historical examples in "the bronze wire basket of China and Japan, in medieval armor, and in Celtic strapwork."<sup>9</sup> However, despite their resistance to fire and water, soil and abuse, and their historical background, fiber artists who are utilizing metallic threads as their main sources are rare.

My major interest in this thesis, however, does not lie in those fiber artists who are utilizing metallic materials as their main sources, for my pieces are not exclusively made of metallic material. They are compositions, combinations, or integrations of fiber and a specific metallic material, i.e., aluminum. Combining fiber and metallic material is, in a sense, harder than simply 'weaving' metallic materials, as it is hard to combine "cold-feeling" metallic materials and "warm-feeling" fibers harmoniously. Of course, not many fiber artists have recently attempted to integrate metallic materials and fiber in representing their creative ideas. Fiber artists who attempted to combine aluminum with fiber are even more

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<sup>9</sup> Mildred Constantine and Jack Lenor Larsen, *The Art Fabric: Mainstream*, p.68

rare.

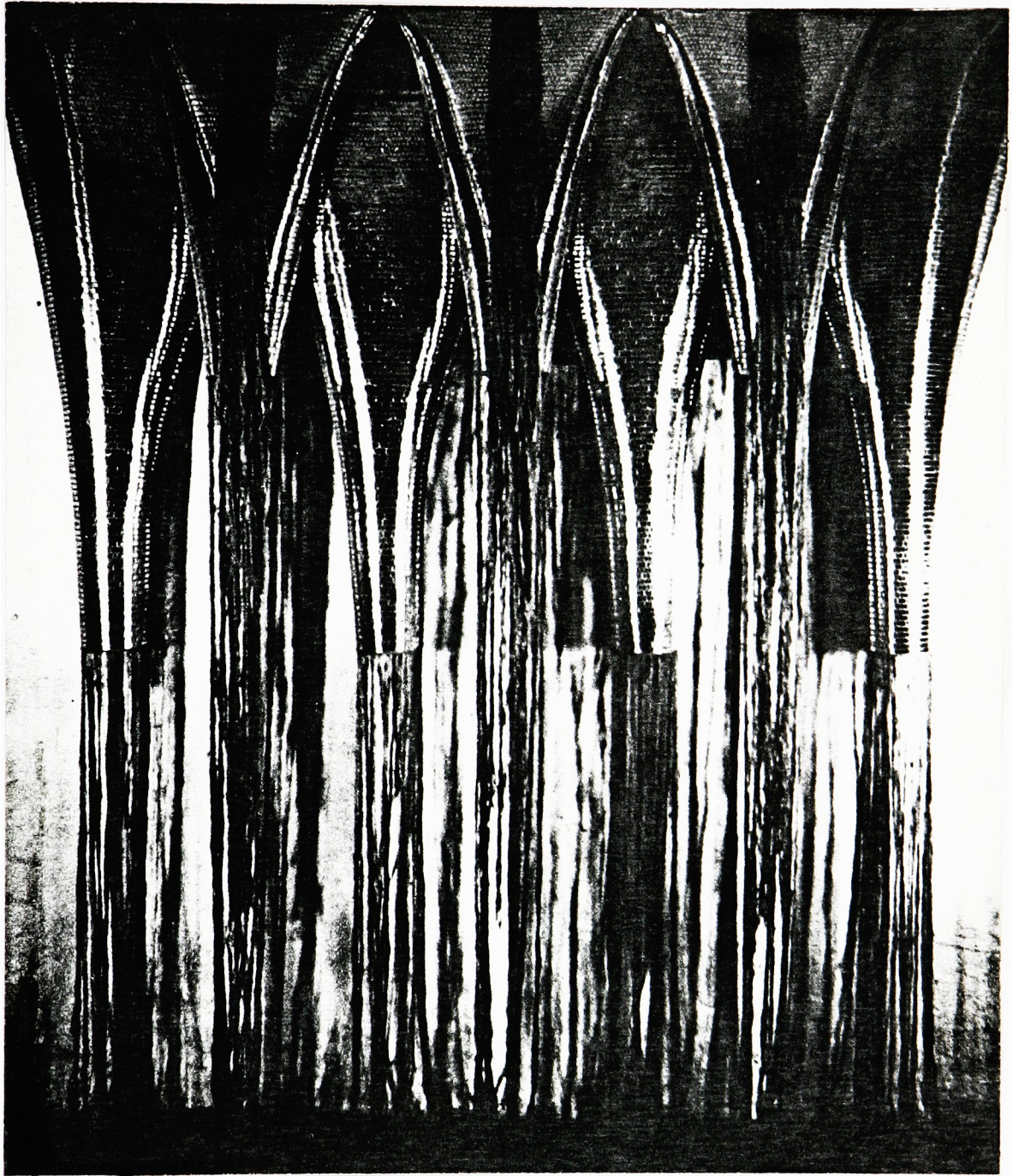
Those who have attempted to integrate fiber and metallic materials can be categorized into two groups in respect to their principle usage of the metallic material. Most fiber artists have used metallic materials as their sources for making threads. Relatively few fiber artists have tried to use metallic materials in some forms other than threads.

Cynthia Schira's "Four and Three" shows how to utilize metallic materials as threads. (Picture #1) Mildred Constantine describes it as follows: "Schira wove flat aluminum strips through linen warps, then pulled the lower portions into cylindrical forms. The play of slubby grey linen against the polished metal is beautiful; the formality of her composition is appropriate to the dressy surface. ... In addition to holding the strips in place, the linen yarn "filters" the metallic glare; the casual rhythm of the linen slubs subtly breaks the monotonous metal surfaces and heightens the contrast in reflectivity between the flat, rounded surfaces."<sup>10</sup>

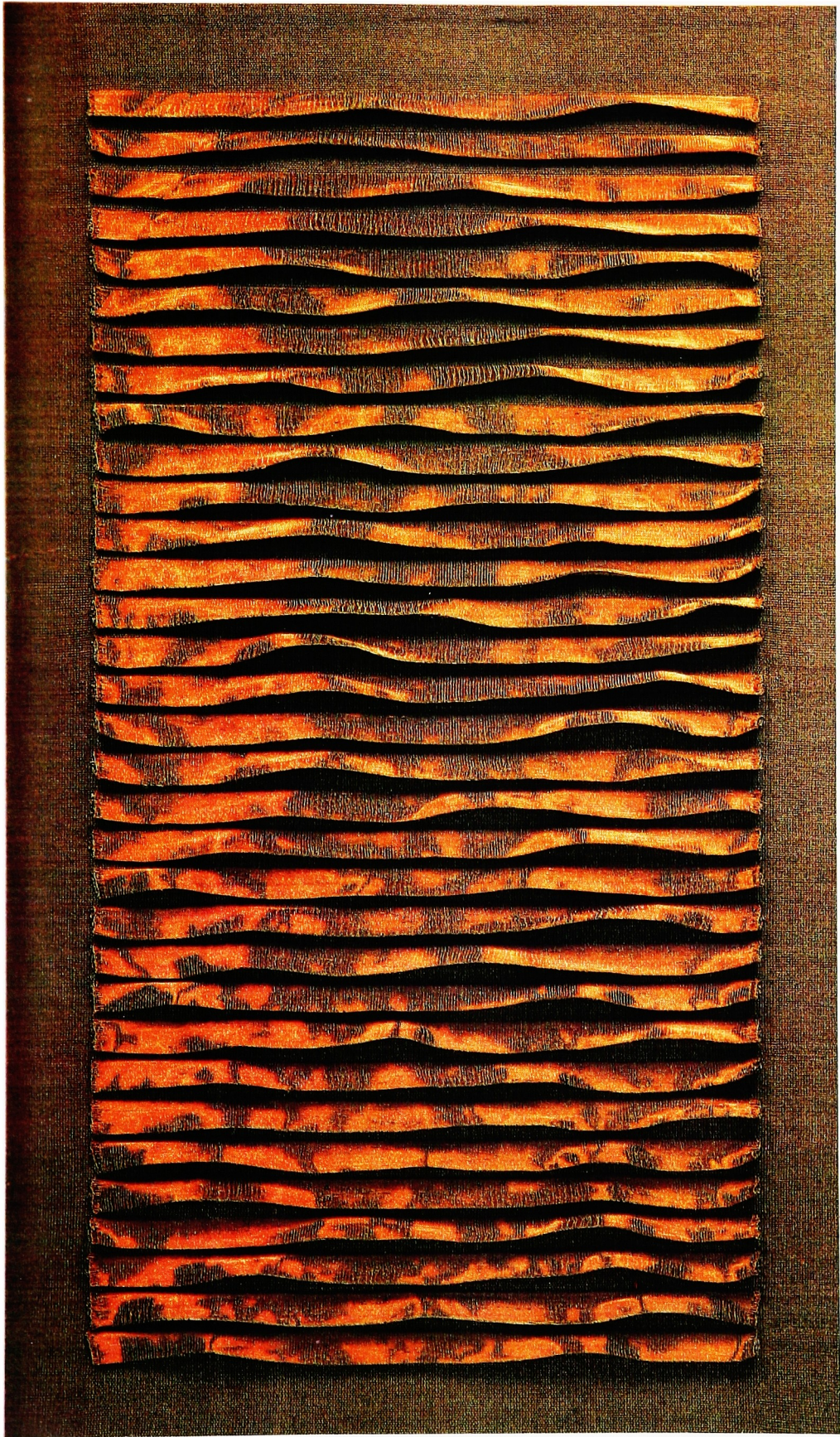
Another artist who uses metallic material as a medium for making thread is Nancy Guay. In her untitled work (Picture #2) She used malleable copper wire for its weft. Continuous waves of copper pleats give the piece constant vitality. The rigidly woven backside conveys the contrasting impression of stability. Motion and stability is the contrast

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<sup>10</sup> Mildred Constantine and Jack Lenor Larsen, *The Art Fabric: Mainstream*, p.68



PICTURE #1



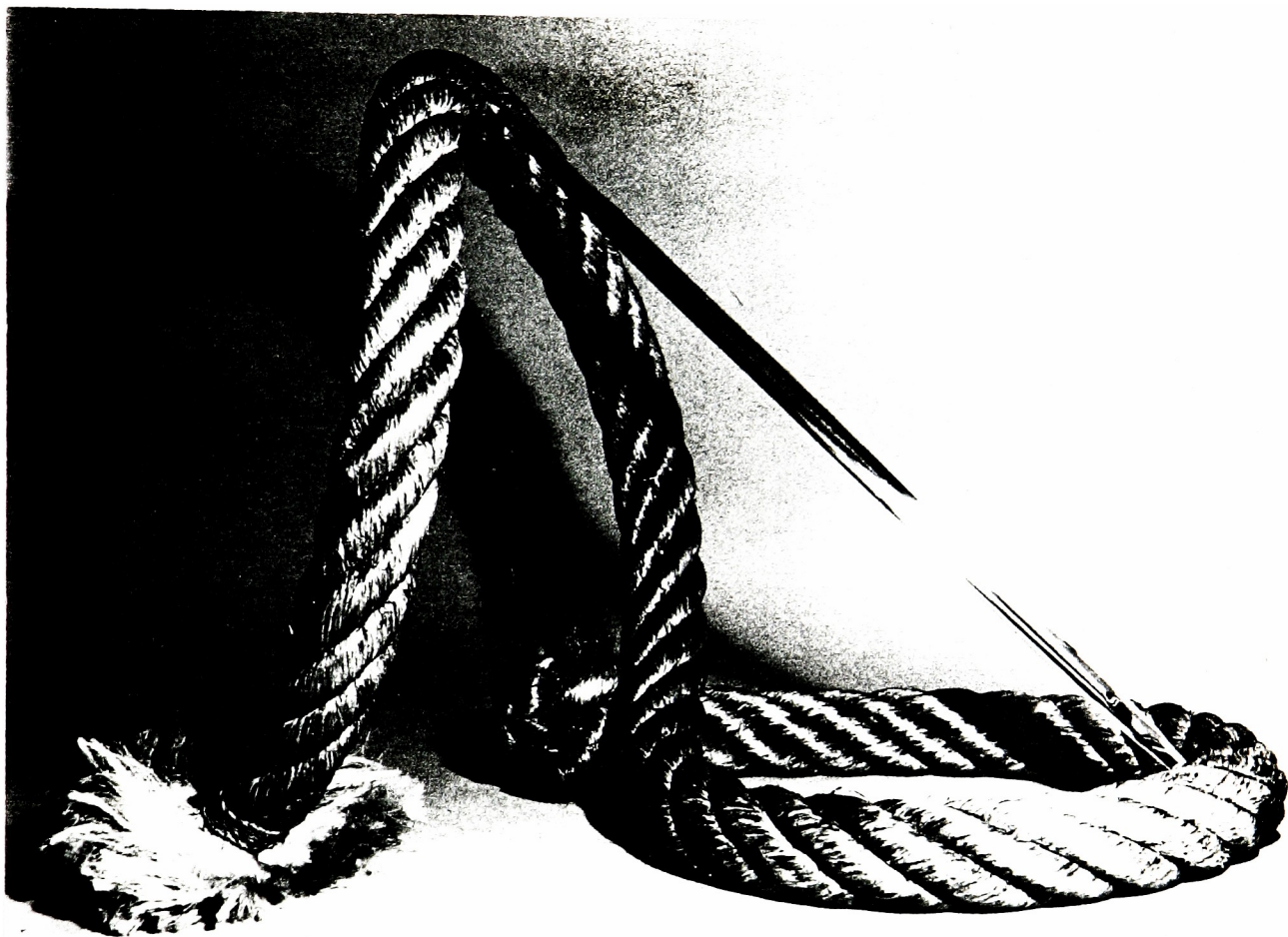
PICTURE #2

Nancy Guay portrays by combining fibers and luminescent copper wires.

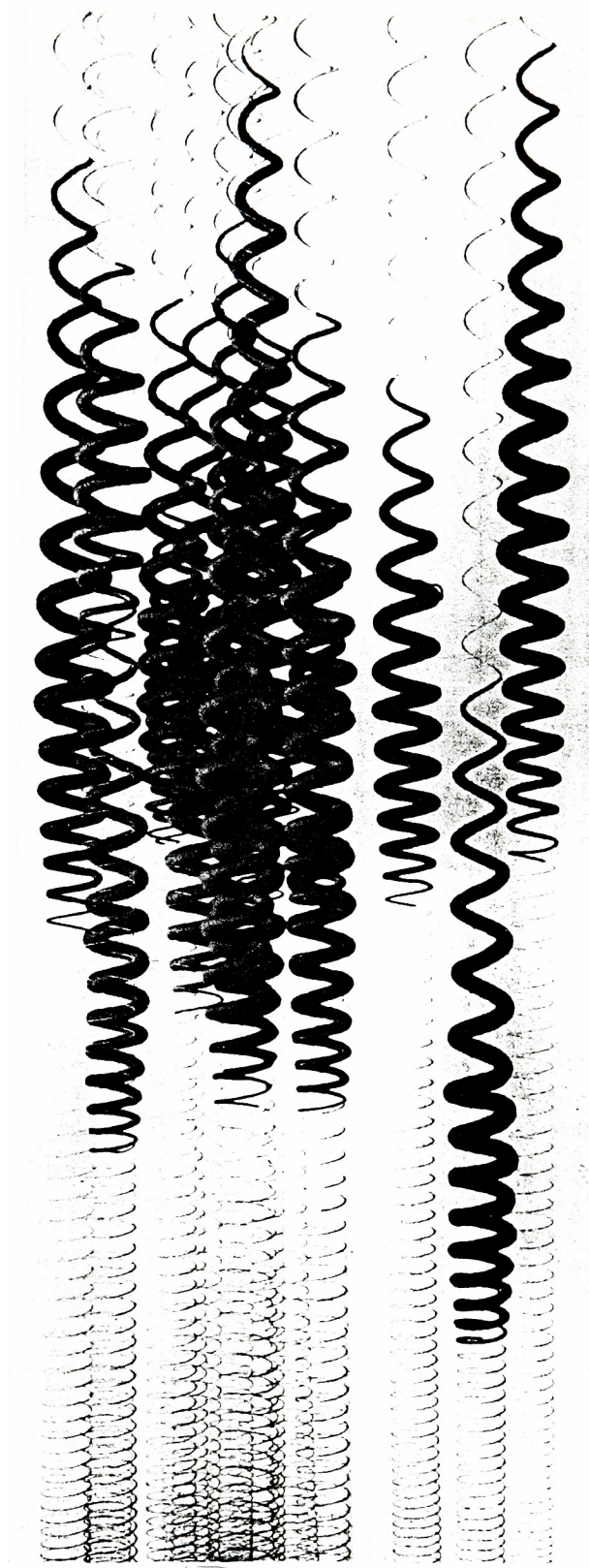
Among those who have tried to use metallic materials in some forms other than threads, I find that the following pieces are extraordinary in one way or another.

Mariyo Yagi has been famous for her combination of polished metal forms and fiber ropes. For instance, "Flexible Work-1" (Picture #3) combines hemp rope with a mirror-finished aluminum form. The rich texture of hemp rope makes a stark contrast with the polished, light reflecting aluminum form. Also notice the flexibility represented by the rope and the rigidity expressed by the aluminum form. These contrasts and the overall balance between the two materials give a strong impression. This piece reveals that without much complication, metallic materials and fibers can be used to complement each other. Another strong point of this piece also lies in the light reflection from the aluminum form. Light reflection is not a material constituting the piece. It is merely a side-effect caused by the aluminum form. Nevertheless, it clearly adds the feeling of dimensionality to the piece. In general, one advantage of using metallic forms is their reflecting light, which always gives a strong and unique impression, and adds more dimension to the piece.

Another impressive combination of fiber and metallic material was created by Clare Zeisler. Her "Red Slinky" (Picture #4) is unique in that it is the wrapped cotton that produces the moving effect in this piece.



PICTURE #3



PICTURE #4

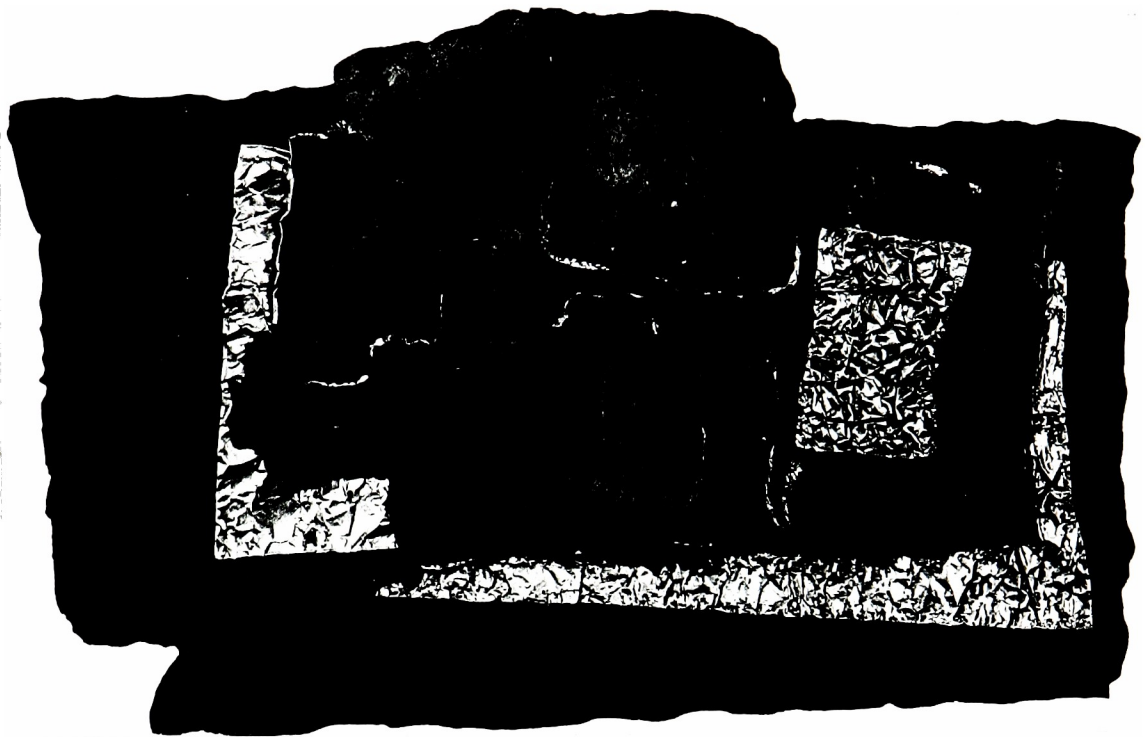
Of course, "Slinky" is a child's toy and is made up of a long thin coil. Slinky is appealing because it is a moving toy. Zeisler emphasized the mobility of this toy by wrapping part of the coil with red cotton. This piece is unique and illuminating in that the mobility of "Slinky" is not diminished by the wrapping. A typical image associated with fibers is a static one. However, this piece shows that when appropriately used, fibers can represent the mobility of the object.

Gayle Luchessa' "Red Felt" (Picture #5) shows another way of accommodating metallic materials in fiber art. She "combines wool, dog hair, and brass foil to create exciting contrasts of color, texture, and material."<sup>11</sup> Felting allows great freedom not only in manipulating forms, but also in expressing textures. It is, therefore, easy to understand why she uses brass foil in her piece. Additions of brass foil make the texture of the piece more rich. By reflecting light, brass foil also adds dimension to the piece.

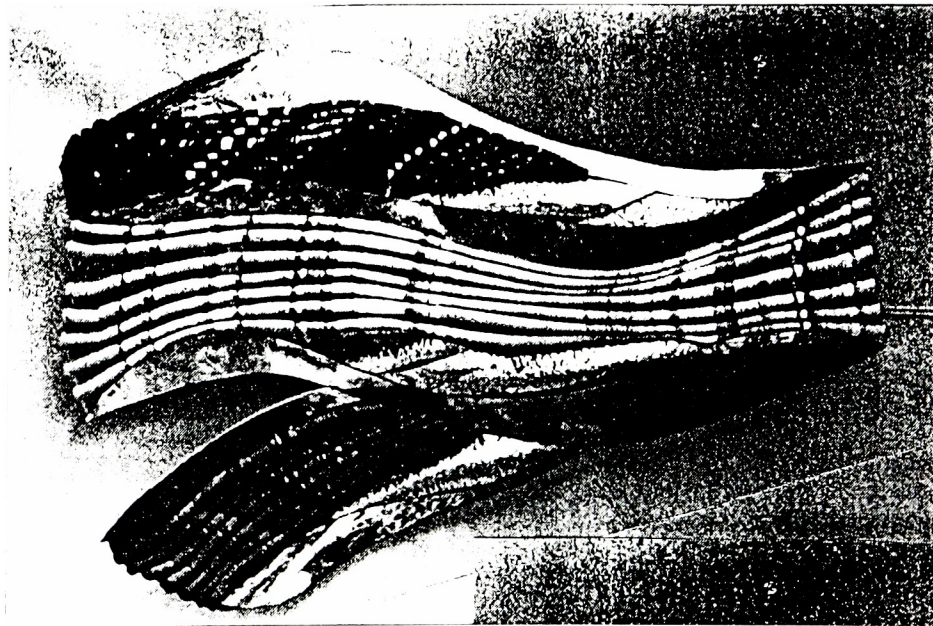
Sally McKenna Walker's choice of media and process make it possible to convey a strong feeling in her series of pieces. (Picture #6) Her three-dimensional relief sculptures are usually made of hammered brass, polished steel and woven fiber. Her main interest is in expressing the textural qualities of the object. She says, "one of my early mentors told me

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<sup>11</sup> See Shirley E. Held, *Weaving: A Handbook of the Fiber Arts*, p.342



PICTURE #5



PICTURE #6

that when you actually feel things—that is, touch them and pay attention to their textual qualities—you become more sensitive to your own feelings as well."<sup>12</sup> Consequently, her pieces reveal the textural richness of steel, brass, and different types of fibers.

Lastly, Terry Jarrard Dimond's pieces are also significant in that they show the natural and harmonious combination of various materials. The depth of wire boxes in her "The Valentine" (Picture #7), for instance, is created by harmonious strips of cloth and aluminum. Sharyn Hyatt and Teresa Mangun describe this piece as follows: "Cloth enfolds metal, fabric strains into lines and metal flows into curves. Painting adds new dimensions to commercially printed fabric while those fabrics define the strength of wire. The consequence is a formal symmetry that speaks an enigmatic language."<sup>13</sup>

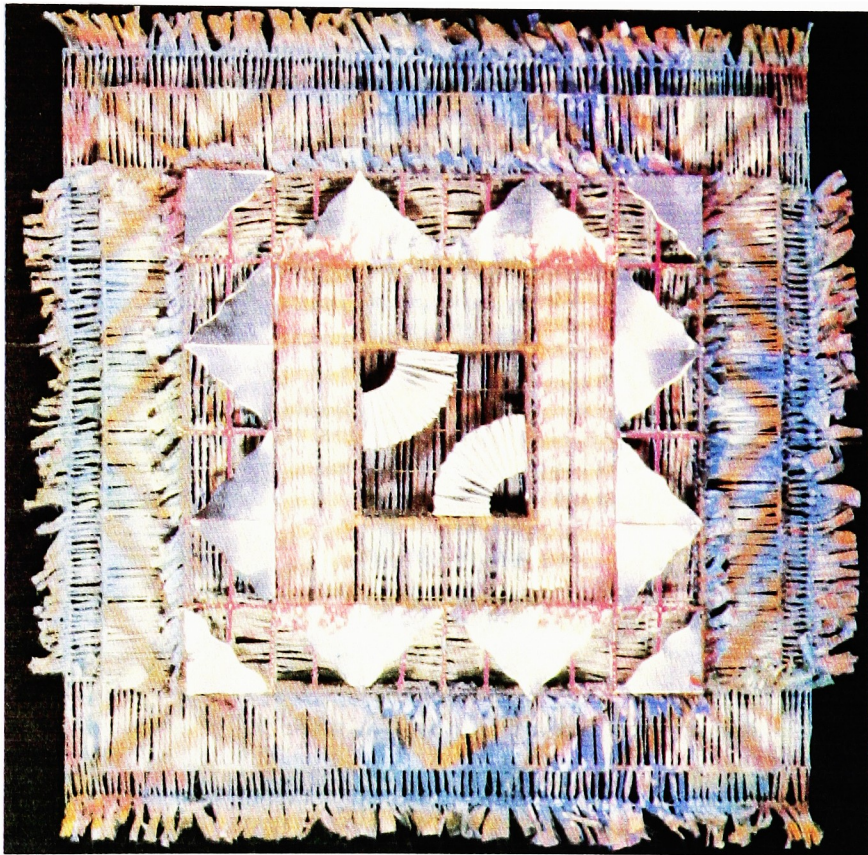
In this chapter, I have introduced several fiber artists' pieces which combine fiber with metallic materials. There are many potential advantages in combining these two quite different materials. Even if no one artist's work has directly influenced my work and my pieces do not closely resemble any work I know of, I hope that a brief sketch of these pieces can

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<sup>12</sup> This quote is from Candice St. Jacques Miles, "Sally McKenna Walker's Sculpture: Tension Resolved Through Balance," *Fiberarts*, July/Aug'84 p.14-15

<sup>13</sup> See Sharyn Hyatt and Teresa Mangun, "The Ceremonial Structure: Thinking clearly in terms of emotion," *Fiberarts*, July/Aug'82, p.66-68

help readers to understand the place of my work in contemporary fiber art.



PICTURE #7

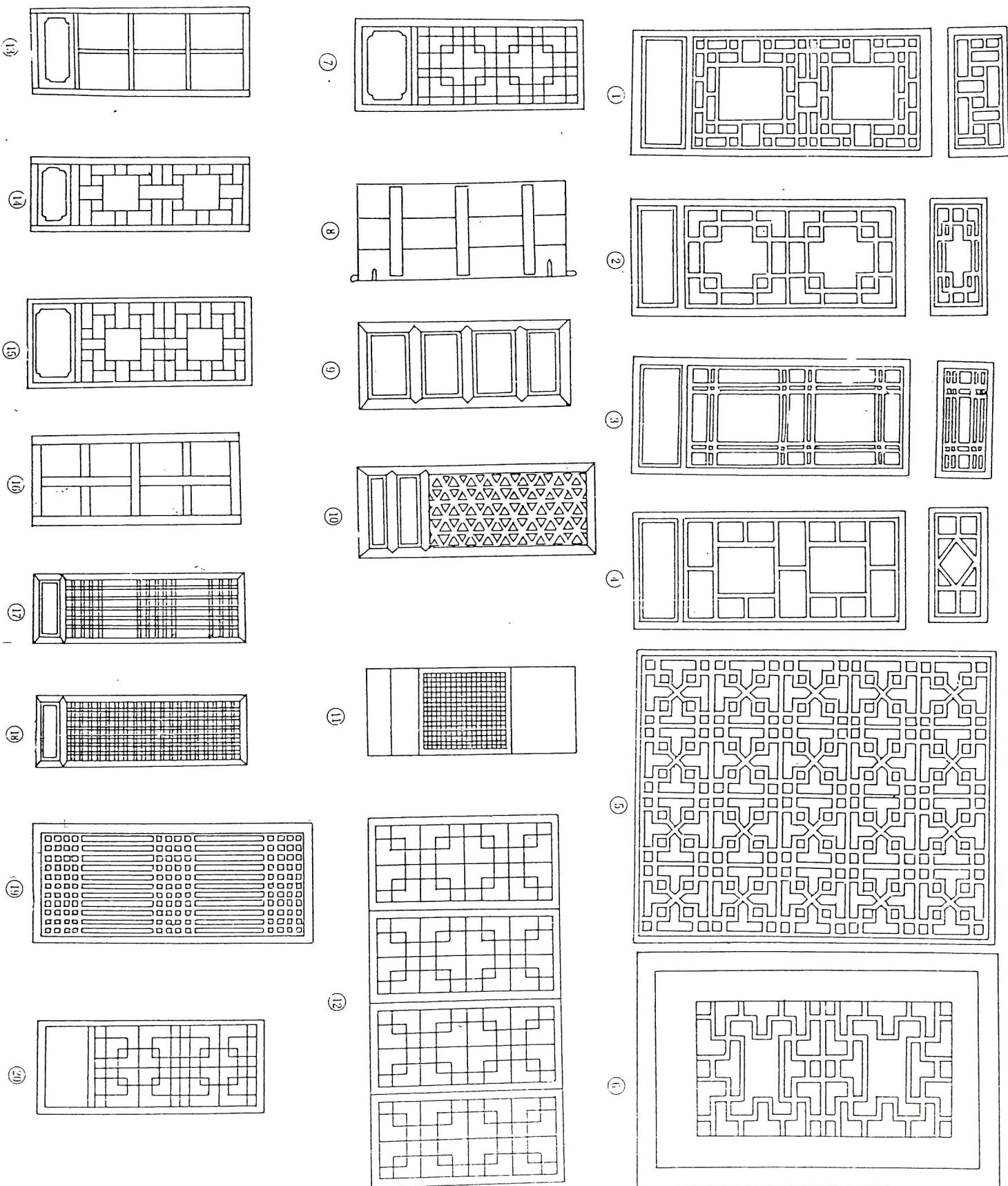
## Chapter Four

### MY WORKS

#### (1). A Life with Windows

The creation of "A Life with Windows" is largely due to two things: first, as for the design of the piece, the pattern I used was originated from my love of square forms. I have always been fascinated by the traditional Korean doors. As we can see in Picture #8, hundreds of patterns have been used in designing these doors. However, one of the dominant characteristics which many of these doors share with each other lies in their utilization of square forms. Geographical patterns, especially compositions of various square forms, represent longevity, wealth, and happiness. However, the personal impressions I have from the square patterns are stability and completeness. I have always liked to use these patterns to create the harmonious images. Many previous works that I have made reflect this tendency.

Secondly, as for the material of this piece, the idea of using anodized aluminum plates is largely due to my interests in metal arts. A couple of years ago, I had a chance to study the anodizing process. Anodized aluminum is a fascinating and colorful metallic material. Unlike



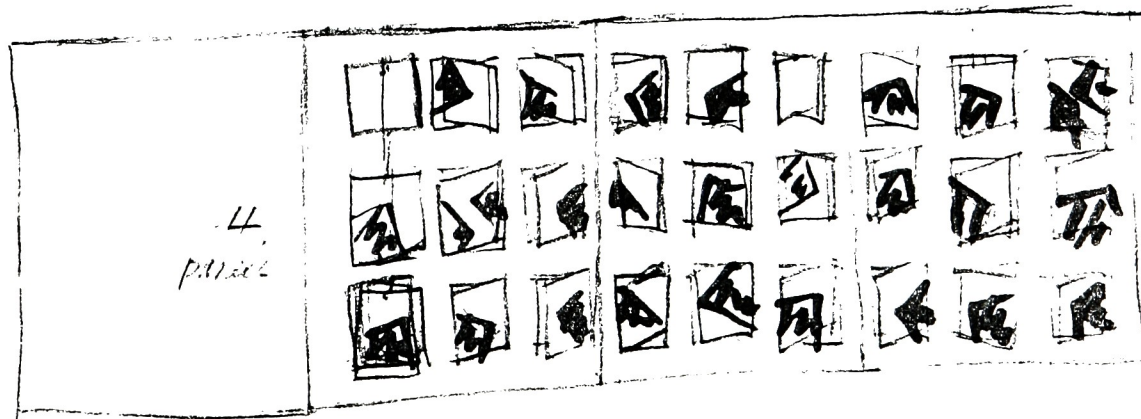
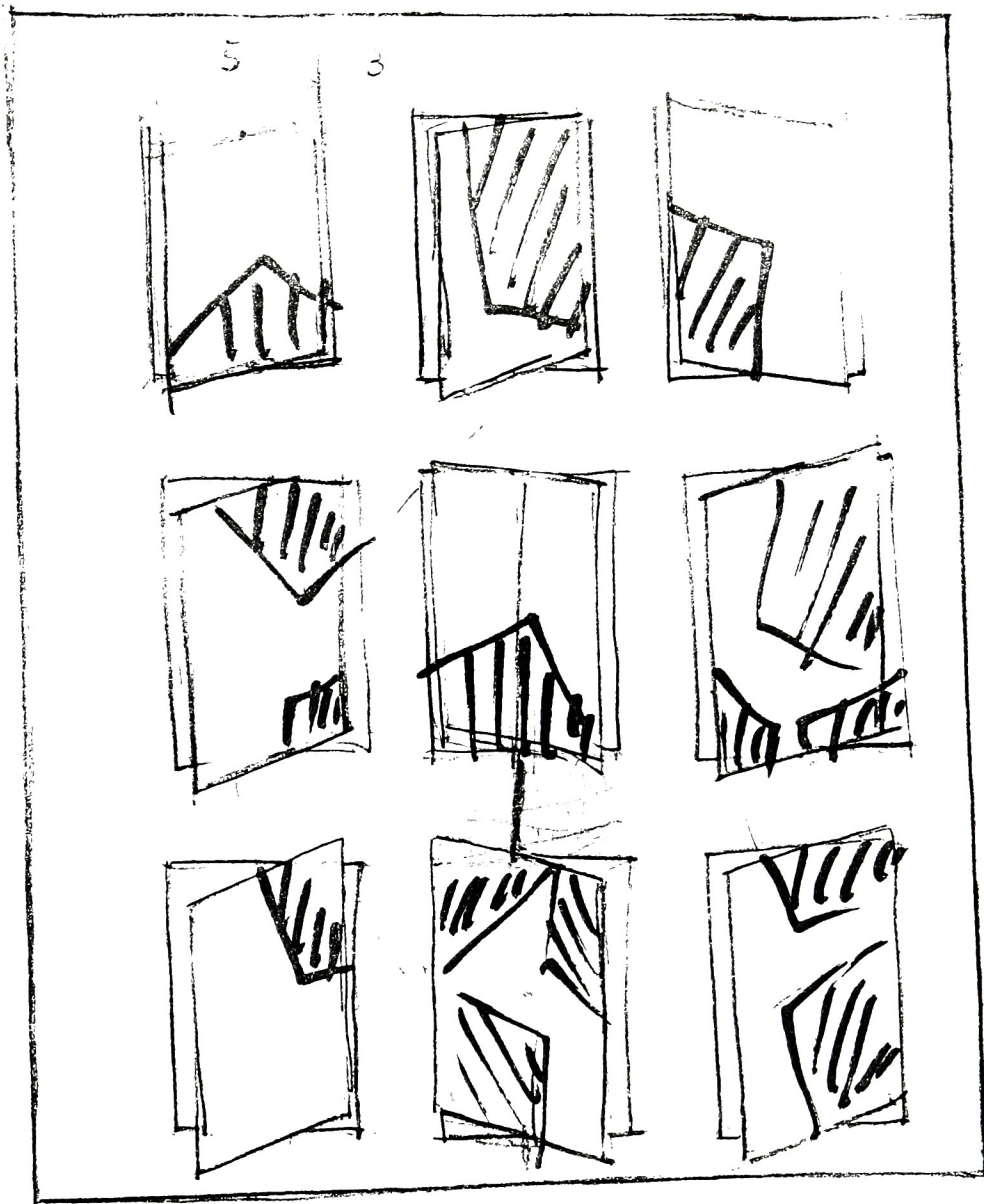
PICTURE #8

other metallic materials, anodized aluminum has almost an infinite color palette. When I was thinking about the thesis pieces, it struck me that anodized aluminum could be harmoniously integrated with various kinds of fibers.

After I decided to make soft-sculptures as thesis pieces by combining tapestry with anodized aluminum, I wanted to make a piece based on various patterns utilizing square forms. One day I came up with a concept.(Picture #9) However, this initial design was not satisfactory, it gave me a crowded and unstable impression. To provide the piece with stability I removed most of the squares from the bottom area. This change also seemed to solve the problem of congestion. After several minor changes, I was satisfied with the design. (Picture #10).

"A Life with Windows" consists of four individual panels which are separately woven. Each panel is basically a flat woven tapestry with several squares of anodized aluminum. In weaving each tapestry, the materials I used were cotton and silk noil. Cotton was used as the warp, and silk noil was used as the weft. I used acid dyes to dye the weft yarn. I used a weft-faced plain weaving technique.

Weft-faced weaving refers to the various weaving techniques which are used to produce woven tapestries, in which the weft yarns cover the warp completely, so the weft alone forms the color, design and texture. Among these weft-faced weaving techniques, I have mainly used weft-faced



PICTURE #9



PICTURE #10

plain weaving technique, in which the weft runs from selvage to selvage, in making the first two pieces.<sup>14</sup>

However, in order to leave spaces for the aluminum plates, I also used a technique in which the weft does not run from selvage to selvage. To create the spaces for swinging anodized aluminum plates, I used cotton threads and toilet paper as a filler in the square spaces. After finishing the weaving, I removed the toilet paper, cut the warp threads, then folded back the remaining wefts threads, and stitched them by hand.

After finishing all four tapestries, I started to complete the anodize aluminum squares. Anodized aluminum is a unique metallic material, and has been used in architectural materials, hardware, and housewares. It is light, inexpensive, and most importantly, very colorful. Because of its endless color palette, one can use it in combination with fibers, not only to achieve a contrasting effect, but also to accommodate the sometimes tedious impression of fiber works.

The anodizing process is relatively simple. Anodizing is a process that produces a stable oxide film on the surface of aluminum. David Tisdale describes the anodizing process as follows:

"The work piece is attached to an aluminum hook or wire and then immersed in an acid bath (electrolyte solution). It receives the positive (anodic) current, as oxygen is released an oxide film containing billions of pores similar to that of a honeycomb structure is produced on the metal

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<sup>14</sup> For detailed descriptions of other weft-face weaving techniques see Peter Collingwood, *The Techniques of Rug Weaving*.

surface. These pores will then accept dye. Once sealed, the metal is strengthened and protected from corrosion and is resistant to water, oil, salt, weather and general wear. For bright, clear colors on relatively pure aluminum the sulfuric acid process is used. A chromic acid process, which produces a less clear, thinner coating and color, is used for less pure aluminum alloys."<sup>15</sup>

In making anodized aluminum for my pieces I used the sulfuric acid process exclusively, for it tends to produce bright and clear colors. And to avoiding color fading, I used Sandoz dyes. They are highly rated in colorfastness. One significant advantage of using anodized aluminum is that by controlling the variables of time and temperature of the acid bath and dyes, the same color in a wide range of hues can be produced. In making the series of anodized aluminum squares for "A Life with Windows", I relied heavily on this feature of the anodizing process.

An unprotected aluminum plate cannot resist being dyed once it is put into the acid bath. Thus in order to save the patterns on the aluminum plates, I tried several materials such as masking tape, scotch tape, and nail polish. Among these various dye-resisting materials, I found that scotch tape worked the best.

The spaces I reserved for the anodized aluminum squares were larger than the sizes of the squares themselves. The purpose of maintaining such marginal space is to give the squares mobility. I attached the anodized aluminum squares with fish swivels so that they would allow the squares to

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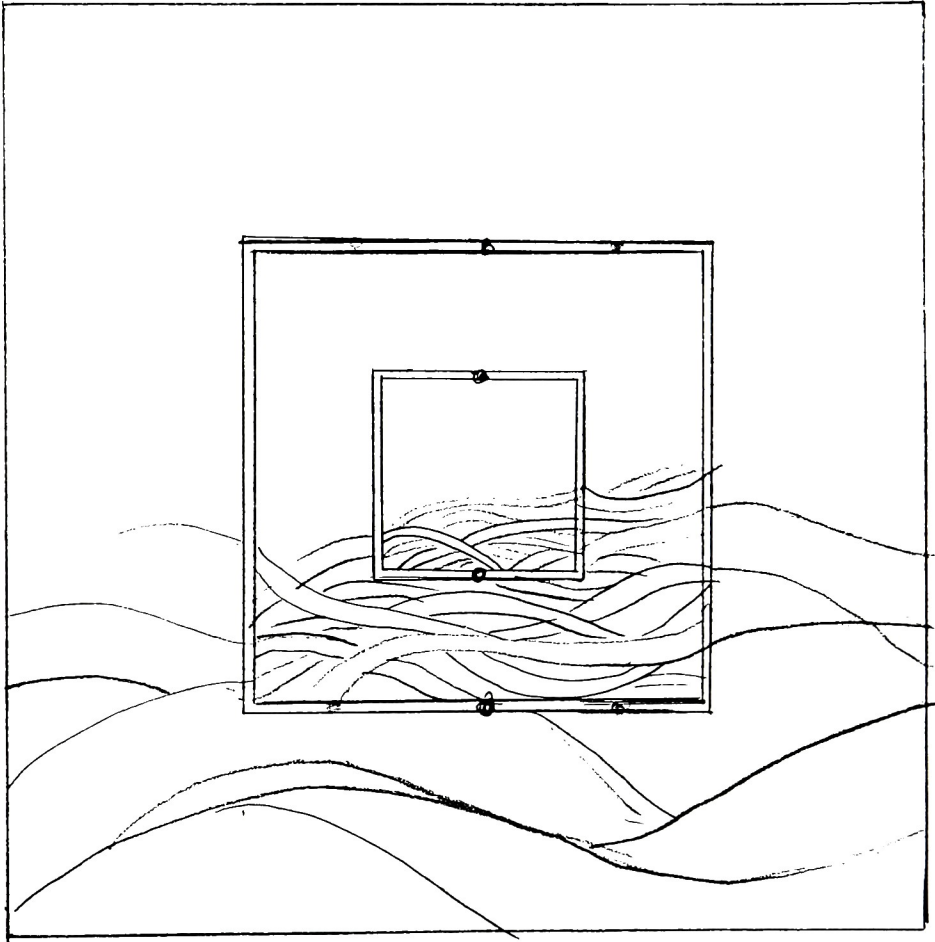
<sup>15</sup> See David Tisdale, "Anodizing Aluminum," *Metalsmith*, Spring 1985 p.27

turn freely. The advantage of having moving squares is obvious. Because of the motions created by the swiveling squares, this piece projects many different looks. "A Life with Windows" is not only three-dimensional but it is constantly changing with this movement.

Lastly, after joining these finished panels, an air brush technique was used with French Dyes to create an overall continuity. Even if the color and pattern of squares collectively represent one coherent theme, the overall continuity created by the extending line of dark shades which runs across all the panels is essential in creating a stable and complete image.

## (2) Beyond the Reach

After I finished "A Life With Windows," I was busy in pondering two interesting ideas. First, I was impressed by the mobility created by the swiveling anodized aluminum squares of the first piece. I wondered "what if I put an aluminum square inside a larger square? Can two swiveling squares create more mobility?" The second concept was about the dyeing of aluminum plates. Whenever I tried to create a gradation on the fabric, I used bees wax and gutta. I wondered whether I could create similar gradations on an aluminum plate by using dye-resistant materials. To answer these questions I planned to make a small-scale tapestry with two aluminum squares. (Picture #11).



PICTURE #11

The materials and the technique which I used in making "Beyond the Reach" are the same as those that I used in making "A Life with Windows." In weaving the tapestry part, the materials I used were cotton and silk noil. Cotton was used as the warp and silk noil was used as the weft. I used acid dyes to dye the weft yarns, and again, I used the weft-faced plain weaving technique.

After I completed the tapestry, I once again started to make the anodized aluminum squares. This time the aluminum squares were different in their sizes and shapes. Strictly speaking, the larger one is not a square. Rather, the small square is to be inside the larger one. In making these squares I used the sulfuric acid process exclusively, as I did in the first piece, and also the Sandoz dyes.

As mentioned, one of the questions I pondered was whether I could create a gradation on an aluminum plate by using dye-resistant materials. To find an answer I designed a pattern which required a gradual gradation effect. The larger square has bigger waves and the smaller one has smaller waves.

In order to save the patterns on the aluminum plates, I needed to use dye-resistant materials such as masking tape, scotch tape, and nail polish. Due to the nature of the pattern, I chose nail polish for this piece. The result was satisfactory, and the aluminum plate showed considerable gradations. Even if it may not be possible to make such a fine gradation as

on fabric, creating a gradation on an aluminum plate is not only possible, but also achievable in a relatively high degree of sophistication.

As for the second question of whether the two swiveling squares can create more mobility, the answer, unfortunately, had to be suspended. I designed this piece in such a way that the top and bottom of the larger square were to be connected with the tapestry by a single swivel to obtain mobility. But unfortunately, the material I used in making the tapestry was too soft. I had to use two swivels, instead of one, to connect each side of the larger square with the tapestry.

Lastly, after putting together two squares with the tapestry, the air brush technique was used with French Dyes to create an overall continuity.

### (3) The Four Seasons and the Night

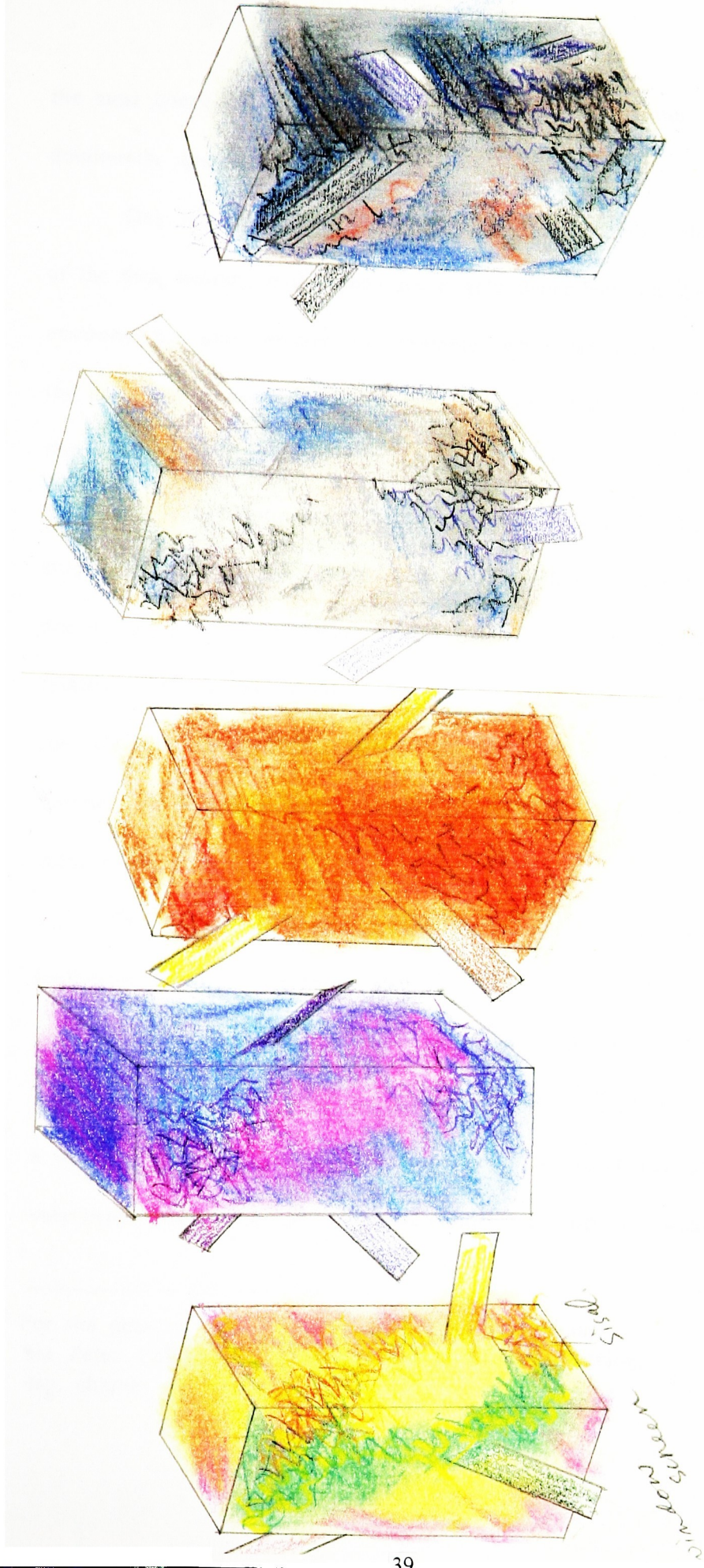
After I finished "A Life with Windows" and "Beyond the Reach," I planned to make a soft sculpture. By making these two pieces I increased my confidence that anodized aluminum is an ideal metallic material which can be harmoniously integrated with fibers. However, I questioned whether anodized aluminum could be integrated with fiber structure. To find an answer to this question I decided to make a soft-sculpture with fibers and anodized aluminum.

I chose a cubic form for the general structure, for the simplicity and

stability associated with the cubic form seemed to make it easy to see the effect of the addition of anodized aluminum to the piece. To start the project, a paper model was designed.(Picture # 12) I planned to make five cubic sculptures for the project. The number of sculptures was determined after numerous experiments. I thought about not only the number of sculptures but also the overall configuration of them.

The design of the sculptures were based on the images of the four seasons and the night. People often associate each season with its representative color. For example, many people associate the winter with the image of snow and white. I thought that the images of four seasons fitted well with the number and the overall configuration of the sculptures. I had a special reason for taking the night as the theme of the last sculpture. I have experienced four winters in Rochester. The nights of these long cloudy snowy winters have given me a distinctive image of the winter. I have always wanted to visualize this distinctive image of the Rochester winter. So, I chose the night, i.e., the night of the Rochester winter.

To decide the colors for this work I asked my friends about their conceptions of the four seasons and the night. I asked them, for instance, "Which color do you see in your mind when you think of the spring?" Various answers were given. Light blue, light yellow, lilac, and green were thought of as the colors of the spring. Red, dark yellow, hot pink, and blue were believed to be the colors of the summer. Yellow, red, and brown were



PICTURE #12

the most commonly shared color-images of the fall. Winter colors were dominantly grey and white.

One interesting result of this "survey" of people's color conceptions of the four seasons is that they are largely dependent on their environments and cultures. For example, whenever I think of the summer, the dominant image I come to have has always been a blue ocean. I think that it is largely due to the fact that my country is a peninsular. When I grew up, I had plenty of chances to see blue oceans. To the contrary, most students from New York State seem to think that red, green or hot pink are the colors of the summer. I think that it is largely because they are not familiar with the sea. Whether my guess was right or not, I was surprised at the fact that many different colors were thought of as the colors of the summer. In designing the sculptures, I tried to incorporate these various color conceptions.

The primary technique I used in weaving the fiber structures of the sculptures was the warp-faced plain weaving technique. In a warp-faced weaving the closely-crammed warp completely hides the weft whereas in a weft-faced weaving, the weft hides the wide warp.<sup>16</sup> More importantly, in a warp-faced weaving the warp threads are so compact that shedding is very hard. One of the unique characteristics of warp-face weaving is that it

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<sup>16</sup> For the detailed description of the warp-face weaving, see Peter Collingwood, *The Techniques of Rug Weaving*, esp. chapter 11.

tends to produce relatively stiff woven fabric. This was the major reason for me to use this weaving technique in making "The Four Seasons and the Night." Clearly, stiff fabrics are easy to transform into parts of the sculptures. In making a soft-sculpture, it is much better to use fibers that can support the structure of the entire piece. However, in general, fibers, by themselves, cannot maintain the stress of the sculpture. Thus to enhance the supporting power of the sculpture, I inserted anodized aluminum rods into every nine inches of woven fabric and later added form-boards behind each side of the sculpture. The other reason why I used the warp-faced weaving technique is that painting on the warp is better than painting on the weft in visualizing my abstract design.

The material I used for producing the fiber structure of the sculpture was wool. Initially, I chose wool as the warp yarn and thick sisal as the weft yarn. However, after I made a sample of the fiber structure with wool and sisal, I realized that the surface was uneven and rough. Thus I decided to use rug wool instead of sisal. However, I also used sisal occasionally to add texture.

To paint on the warp I used fiber reactive dyes. They were relatively cheap and were readily available at the time when I made the piece. As for the weft, I chose cushioning dyes. They were chosen because they worked well with sisal. After I finished weaving and dying, I set the dye by using steam.

The most vital part of this project was to integrate anodized

aluminum with the fiber structure. Initially, I was thinking about combining anodized aluminum plates with the fiber sculpture. However, one day when I was walking through a hardware store, I found aluminum window screens. I thought that if I could anodize these aluminum screens, they could be nicely integrated with the sisal. Unlike aluminum plates, aluminum screens allow us to see through the texture and design of the fiber structures. Thus I decided to see whether I could anodize aluminum screen. It worked well. I also consulted my advisors' and friends' opinions on the screening. They all preferred screens to plates.

As soon as I finished anodizing aluminum screens, I attached them to the fiber structures by stitching. Finally, to make the fiber structures self-supportive I inserted form-board inside them. And to hide the white surfaces of the form-boards I glued patches of wool and sisal onto them.

#### (4) The Bridge to the Milky Way

While I was making individual fiber structures for "The Four Seasons and The Night," I continuously got friendly comments and suggestions from many people. Among them, I was particularly interested in one comment. Those who did not know what I planned to do with the woven fabrics for the fiber structures often thought that these woven fabrics were plain tapestries. They often said, "This is a nice looking

tapestry." Their comments made me think about making a plain tapestry by the same method and materials I used in producing the woven fabrics for the third project. However, to incorporate a plain tapestry into the theme of the thesis project, which is combining anodized aluminum with fibers harmoniously, I needed to make it rather different not only from the typical plain tapestry, but also from the three pieces I had already made for the thesis.

As an overall form of the project, I decided to use the accordion form. The accordion form was chosen because I thought that it could accommodate the anodized aluminum rods I wanted to use in this project. Since I had already used aluminum plates and aluminum screens in the previous projects, I wanted to use a new form of anodized aluminum for this project. The obvious choice was aluminum rods. Aluminum rods are better than aluminum plates and aluminum screen in that their colors are more bright. Moreover, I could use aluminum rods with various thickness. I used four different sizes of aluminum in this project.

The materials and the technique I used for this project were almost the same as those that I used for the third project. The primary technique I used in weaving the fiber part is the warp-faced plain weaving technique. The material I used for producing the fiber part was wool. And I used sisal occasionally to add texture. To paint on the warp I used fiber reactive dyes. As for the weft I chose cushioning dyes. After I finished weaving and dying, I

set the dye by using steam. Finally, to enhance the supporting power of the sculpture, I inserted anodized aluminum rods into every nine inches of woven fabric.

Since this piece could not stand by itself, I used anodized aluminum bars to support it. It was not easy to find an appropriate way to use these bars. However, after many experiments I found a way to support the piece with anodized aluminum bars. First, I made holes in the aluminum bars so that they could be penetrated by the aluminum rods which I inserted into the woven fabric. Then, to secure the connection between them I used set-screws.

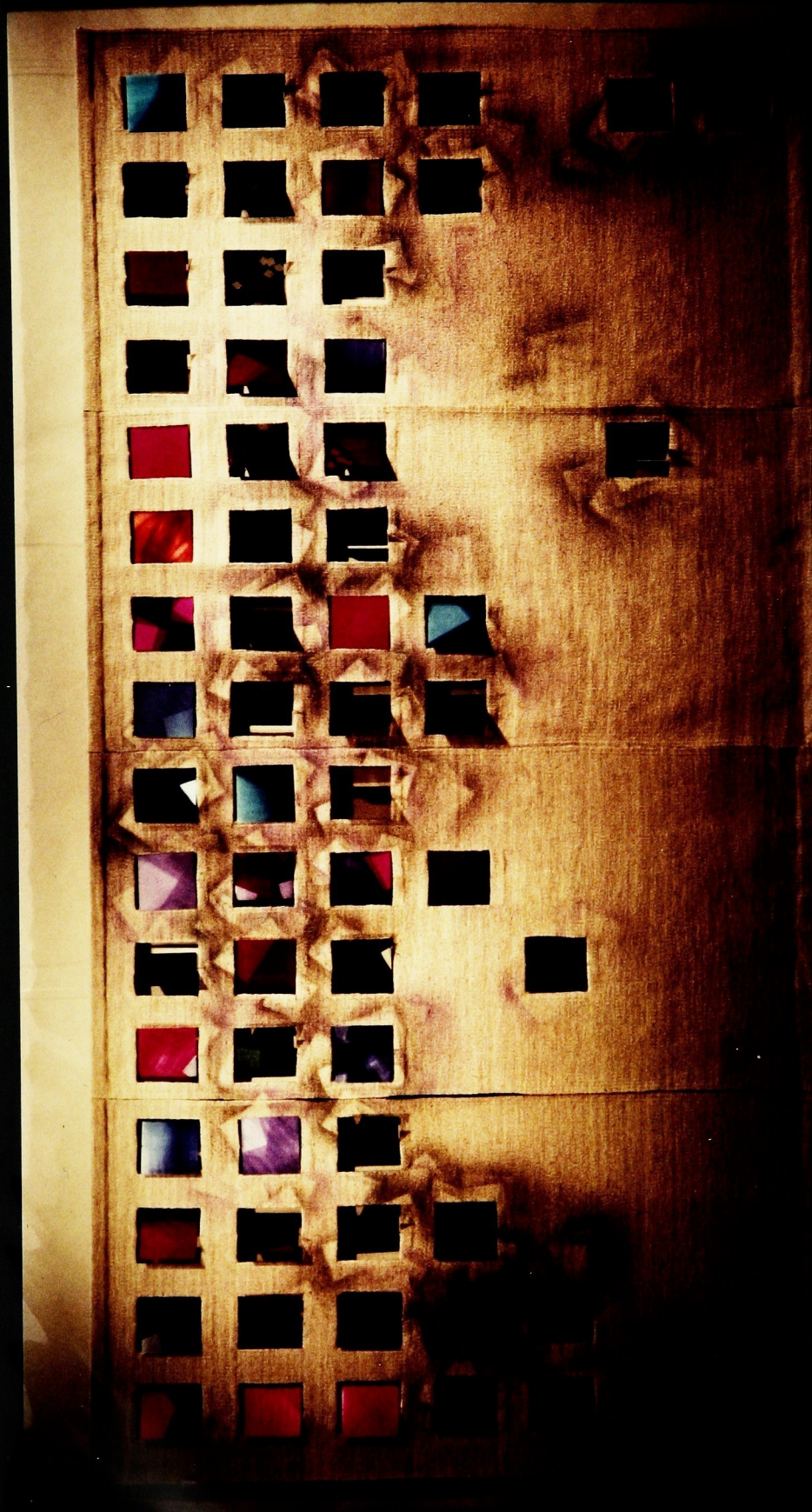
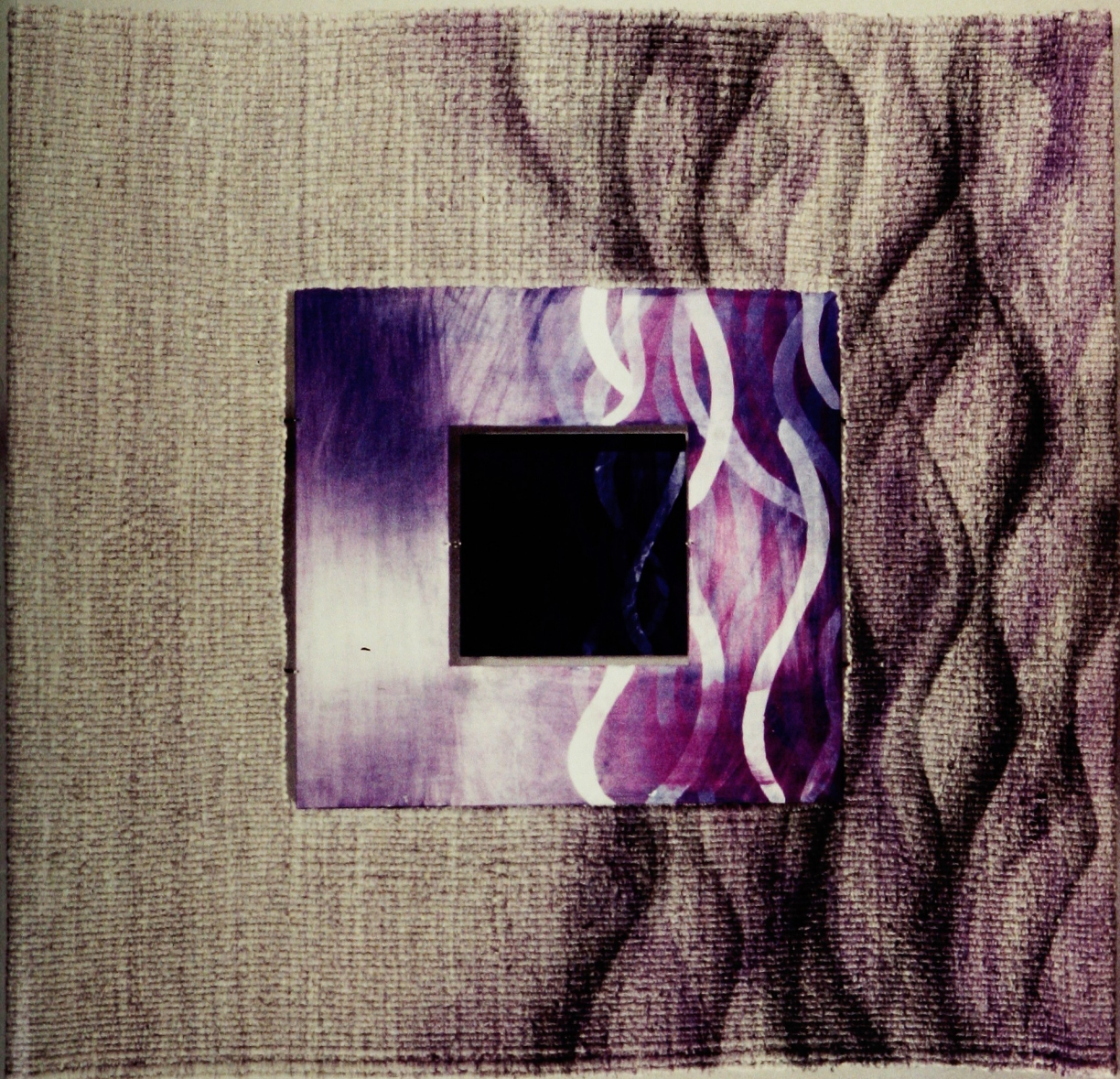


PLATE #1





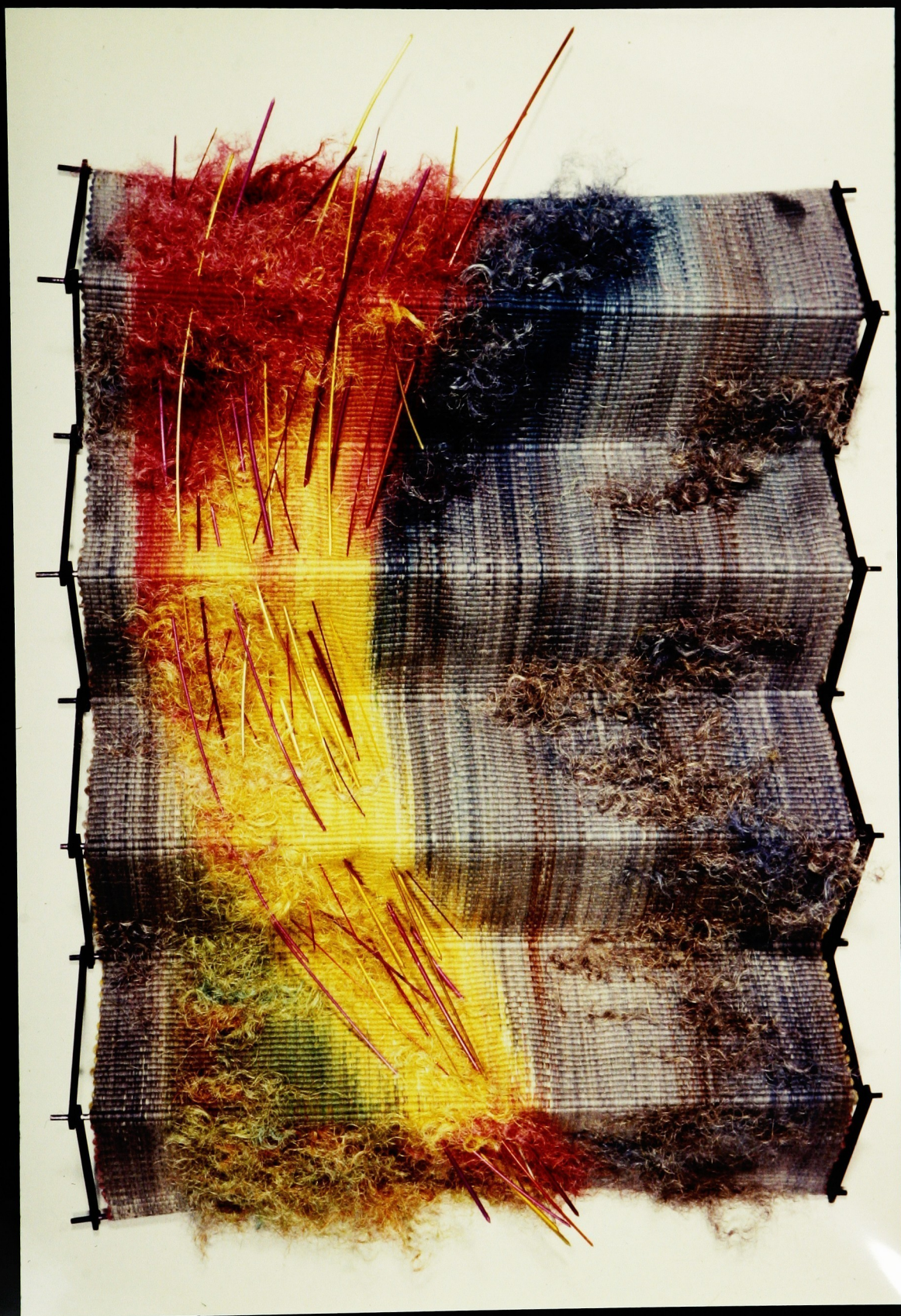


PLATE #4

## CONCLUSIONS

In reflecting back upon my thesis work, I recognize that my work is a small step toward the revival of the innovative spirit of the '70s. I believe that a new sense of artistic freedom can be achieved by moving fiber art away from traditional material and proceeding to crossover content and techniques. That is, adventurous crossover expressions in fiber art seem to be essential in its development. By finding new technologies and sources for materials a new way of expressing one's artistic vision can be explored and expanded.

Thus I will continue to experiment on the harmonious combination of fibers and anodized aluminum. But I will not confine myself to anodized aluminum. As an artist who strongly believes that there is no fixed way of representing or expressing one's artistic vision, I will not limit myself to the traditional materials and techniques of fiber art. I will let the end form determine what materials I will use.

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