SPONTANEOUS INSTALLATIONS OF FLEXIBLE COMBINATIONS OF WOVEN MODULAR FORMS

PROBLEM IN LIEU OF THESIS

Presented to the Graduate Council of the
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MASTER OF FINE ARTS

By

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CHAPTER I

INTRODUCTION

Throughout history fiber structures have possessed three-dimensional qualities. Obvious examples include clothing and baskets. In the course of my experiences of weaving on a floor loom, I became interested in the possibilities of manipulating flat woven fabric into modular, sculptural forms. The purpose of this project was to investigate the possibilities of reorganizing space by arranging woven modules. These units were to be separable and flexible in regard to their spacial relationships and interrelatedness in any installation.

This problem was examined in these specific ways:

1) Is it possible to create a sense of volume in forms woven flat on a standard floor loom as simple, single-layer or double-layer fabrics and later manipulate them into three-dimensional structures?
2) How can fundamentally simple, fibrous materials be utilized to achieve an effect of scale without overpowering their intrinsic qualities?

3) To what extent, if any, will lighting interact with woven fabric to create the illusion of an expanded space?

4) Can woven modules be created with enough flexibility of form to be responsive to varying relationships to each other and to specific installation spaces?

Five pieces, each consisting of two to seven woven modules, were constructed and installed in varying configurations to provide data for response to the preceding questions. Throughout the weaving and the installations, a written journal of notes and sketches was kept as a record of my ideas and processes. Each installation was documented photographically. The collected visual and written materials were analyzed for their application to the problem and to each specific question.

A standard four harness floor loom was used for all of the weaving. White polyethylene and polypropylene fibers comprise the woven modules. During the actual weaving processes, my primary concern was the potential relationship between space and form.

Two series of woven modular pieces were exhibited in April in the Cox Gallery at Drury College in Springfield, Missouri. A subsequent installation of three additional series was completed in the same gallery in June. This

rectangular gallery measures sixty-two feet by nineteen feet and has a ceiling height of fourteen feet. The ceiling is black; the walls and floor are a dark gray, neutral color.

In July five series of modular pieces were exhibited in the North Texas State University Art Department Gallery. This gallery is fifty by sixty feet in dimensions, which include rectangular alcoves along each side running to a depth of ten feet. The open baffle ceiling is ten feet high. Terrazzo in the alcoves and gray carpeting in the central area divide the floor area into symmetrically balanced units.

The distinctive architectural design and sophisticated lighting system of the North Texas State University Gallery contrasted significantly with the adequate, but more basic, facility at Drury College. The two spaces provided pronounced differences in spacial configuration, lighting potential, and color and types of background materials. These variable factors provided the necessary unique exhibition facilities in which to test the effectiveness of spontaneous installations of the modular forms in various configurations responsive to each different space.

CHAPTER II

THE WOVEN MODULES

I had previously worked with polyethylene tape for a short period of time. Unfortunately, all of the pieces resulting from those early efforts, with one exception, were totally destroyed during storage. I liked working with the qualities of this synthetic fiber. It has a glossy surface, is lightweight, and has a thin, slightly brittle quality which may be compared to tissue paper. Although it is extremely strong lengthwise, it may be easily shredded by pulling crosswise on the tape.

I wished to weave with polyethylene tape again, but it proved difficult to find a supplier in the area where I live. After numerous inquiries, a dealer was located in Kansas City, Missouri. While searching for a supply source for the polyethylene tape, I discovered a paper company in Springfield, Missouri, which regularly stocks polypropylene cord. It is also translucent white and has a glossy finish. Much thicker in diameter than the polyethylene tape, it has a harsh, coarse texture. I decided to use it as weft material for one piece.

After obtaining a supply of polyethelene and polypropylene fibers, I made many sketches. Chosen designs were

constructed on a small scale with muslin and string to provide a better idea of the three-dimensional form and of possibilities for manipulating the fabric after it had been woven. I wove a sample of polyethylene tape to help determine the ratio of warp to weft. Six warp ends per inch for each layer of fabric seemed to provide an appropriate density.

Modular Series A

Description: five tubes with extended weft fringe
Flat dimensions: 12½" x 60" each
Materials: polypropylene cord, polyethylene tape

Five tubular modules were woven simultaneously on a sixty inch wide warp. The weft material, polypropylene cord, was difficult to work with because it was stiff and springy. It proved to have an interesting textural quality when shredded, and I wished to utilize this feature in the design of the modules. I decided to extend some of the weft shots to form a fringe along the sides of the tubes. This was accomplished by cutting uniform lengths of the polypropylene cord. Each length formed the weft extension on one side, went across the width of the tube three times, and formed an extension for fringe on the other side. It was necessary to alternate sides as the starting point to achieve a balance between the top and bottom layers. Half

of the weft shots went around the edges of the tubes; the other half formed the fringes.

The warp sett was six ends per inch for each layer, but the stiffness of the weft material prevented it from packing close together with use of the beater on the loom. I used a large tapestry beater to move the weft shots closer together. Even when using the tapestry beater, space remained between the weft fibers. When the piece was displayed so that the viewer could see through both layers, a moiré effect resulted.

The warp threads tended to slide and bunch up on the slippery weft cord. This uneven spacing was also caused by using the tapestry beater. When the tubes were removed from the loom, I partially redistributed them using a darning needle. I shredded the cord in the weft extensions at the same time.

The completed tubes were difficult to expand to cylindrical forms, but proved to be effective in a flat wall installation. However, by suspending them in a vertical position under tension, the forms were held open. During the installation process in the Drury gallery, wide variations in the height and the spacing of these modules were not visually effective. The units were most successful presented in a pattern of regular repetition in a row or a

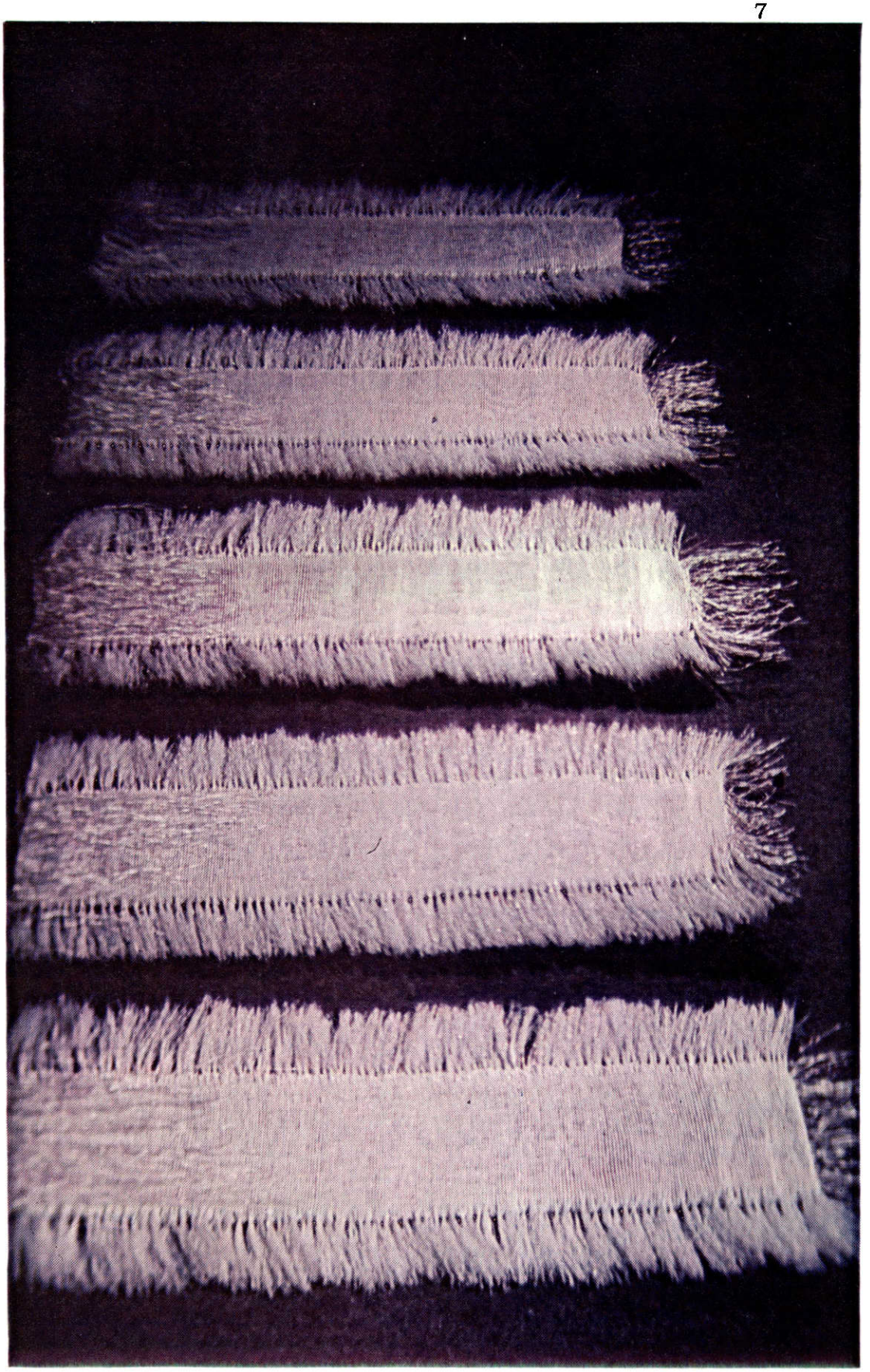

Fig. 1--Modular Series A

circle. They were installed as flat units in an evenly spaced row in the gallery at North Texas State University. (See Figure 1 on the preceding page.)

Modular Series B

Description:	seven twill squares with extended wefts along one side
Flat dimensions:	36" x 240" each
Material:	polyethylene tape

These pieces were woven consecutively on a thirty-six inch wide warp with six ends per inch. Four strands of polyethylene tape were used in each weft shot to provide thickness and result in a heavier fabric. Alternating pairs of weft shots were extended twenty feet on one side of each square. This volume of polyethylene tape prevented the fabric from being wound on the cloth beam of the loom and made it necessary to remove each module as it was completed.

A diagonal pattern on the surface of the fabric was caused by the twill weave. The extended weft shots of polyethylene tape provided volume and a textural contrast to the woven areas.

These units were suspended by one corner, causing the woven area to roll around itself (Figure 2). In another installation, the squares were positioned vertically. The

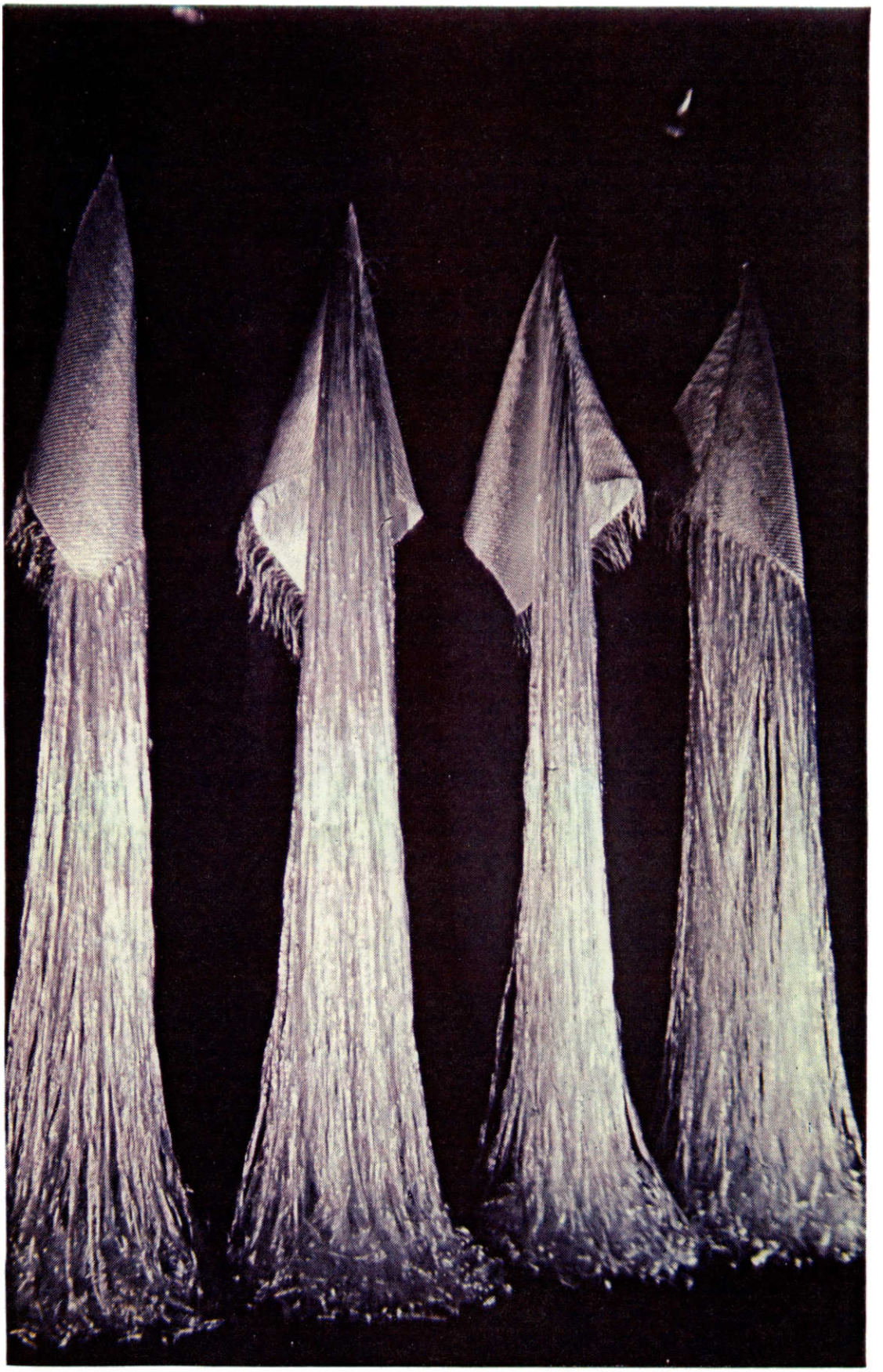

Fig. 2--Modular Series B

pieces may extend to a height of twenty feet; the scale in relationship to human size gives a sense of presence.

Modular Series C

Description:	three squares with a circular area of dropped weft
Flat dimensions:	45" x 180" to 300" each
Material:	polyethylene tape

The modules in Series C were woven as flat squares in plain weave with a warp sett of six ends per inch. A negative space in the center formed an open circular area where the shuttle was removed from the warp threads and the weft was allowed to extend for a length of approximately twenty feet. These units were woven consecutively on the warp. As in Series B, each completed square was removed from the loom before weaving the next one because of the volume of extended polyethylene tapes. A single thickness of tape was used for the weft, resulting in a lighter weight fabric than in Series B.

These modules were installed in an asymmetrical configuration in combination with Series D in the gallery at Drury College (Figures 3 and 4). At North Texas State University, Series C was presented as a separate piece with each module as a soft columnar form. These installations were influenced by the interior space of the respective galleries. An asymmetrical arrangement was effective in the rectangular Drury gallery; the square, cross-shaped

Fig. 3--Modular Series C and Modular Series D (View 1).

Fig. 4--Modular Series C and Modular Series D (View 2).

gallery at North Texas State University imposed a strong sense of formality upon any composition of forms within it.

Modular Series D

Description:	one square with a central, circular area of dropped weft
	one square with a circular area of dropped weft toward one corner and extended weft along one side
Flat dimensions:	45" x 180" to 240" each
Material:	polyethylene tape

Related in design to the units in Series C, these modules were also woven as flat squares with a sett of six warp ends per inch. The negative, circular spaces were formed by removing the shuttle from the warp during the weaving process as in Series C. The extended weft tapes measured fifteen to twenty feet long. A single thickness of polyethylene tape was used for weft.

These units were installed in combination with Series C at Drury College (Figures 3 and 4) and as an individual piece at North Texas State University. Although the design of the asymmetrical module will always prescribe occult balance in the total configuration, many variations of arrangement are possible with these units.

Modular Series E

Description:	two oval shaped tubes with warp extensions two long, divided rectangles
Flat dimensions:	ovals - 15" to 60" x 90" each rectangles - 15" x 144" each
Material:	polyethylene tape

This series consisted of four separately woven units which combined to make two similar modules or which were used separately in other compositions. The bottom units were each a semi-oval tube graduating in size from fifteen inch side openings at each end to a sixty inch width in the middle area. Each of these was manipulated into a three-dimensional shape by turning half of the fabric tube into itself. The large end was placed on the floor, and the double layers of material were self-supporting. The ovals were shaped by dropping and adding a sequence of warp threads during the weaving process with insertion of the shuttle through the top layer of the shed. The unused warp threads tended to sag unless woven with scrap filler. This was unraveled when the pieces were removed from the loom.

The dropped warp threads along the sides of the forms were retained as an integral part of the design. Small, overhand knots secured the positions of the interlaced fibers where the warp threads left the woven area. The fringe created by the warp extensions around the openings at both ends of the oval shapes was also retained as part of the design.

The top sections were long strips of woven fabric which were tubes fifteen inches wide at the lower end but divided into smaller widths toward the top. The warp sett was twelve ends per inch to allow six ends per inch in each layer. As the weaving on these sections progressed, I varied the texture by changing from a tube to a flat area woven with twelve ends per inch. The combination of these two densities of woven structure provided textural interest. The top sections of these were not designed to function as expanded cylindrical forms. They became three-dimensional as they were spread out in an installation. The extending warp ends at the top ends of these strips were wrapped to hold the subsequently interlaced fibers securely and to visually, as well as technically, finish the piece.

During assembly of the modular sections, the plain tubular edges of the long strips were held open in a circular shape by wire hoops. These were inserted into the fringed opening and secured by overhand knots.

These modules may be installed with the base units on the floor or on the wall. The long, narrow units may also be hung from the ceiling with the narrow divisions on the bottom. Series E took on a surrealistic aspect when it was installed as in Figure 5.

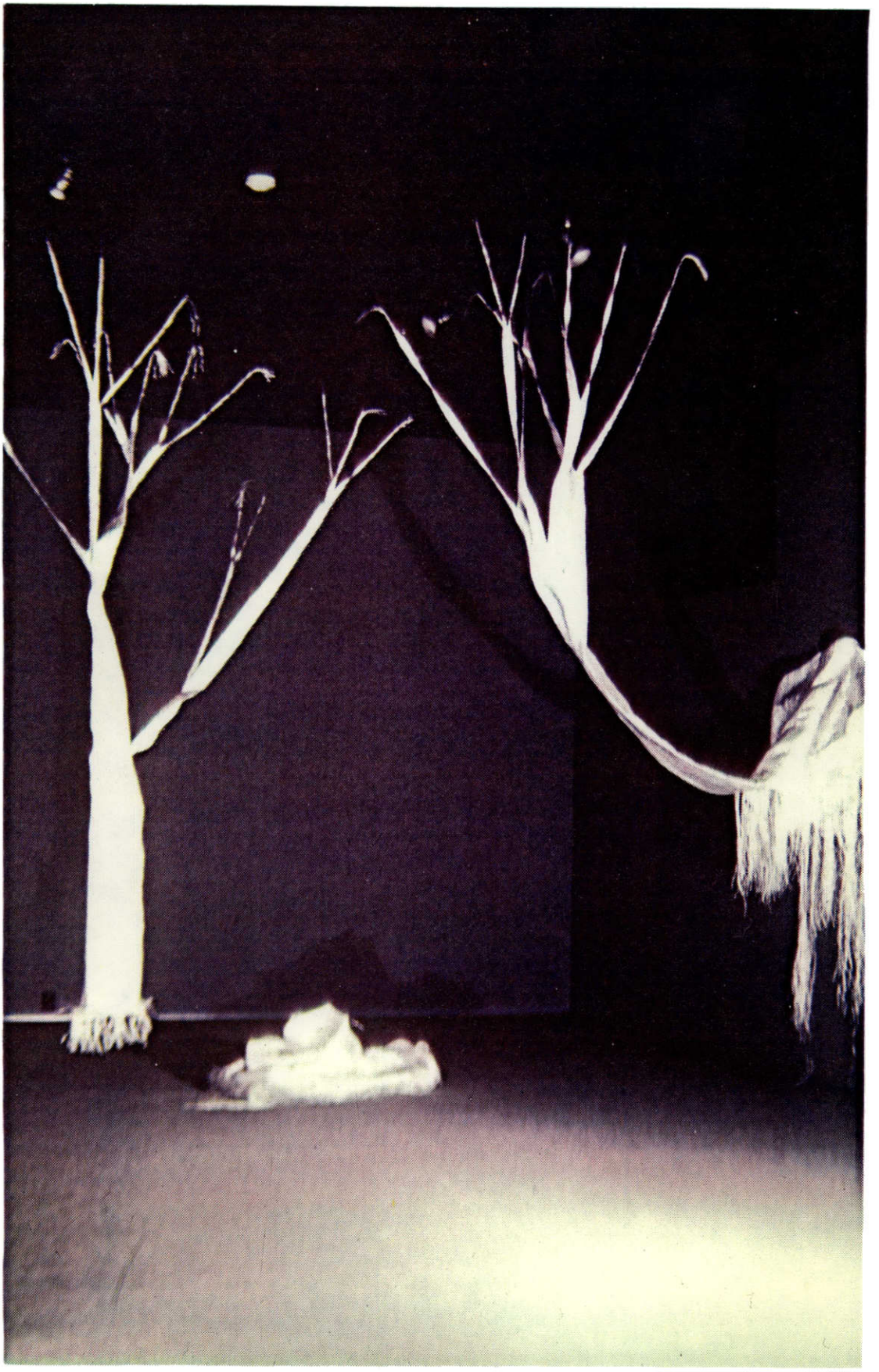

Fig. 5--Modular Series E

CHAPTER III

SUMMARY AND CONCLUSION

This study focused on the concept of weaving fiber modules on a standard floor loom and later manipulating them into three-dimensional forms with the attribute of flexibility in relating to each other and to specific spaces. Sufficient data were collected and analyzed to answer the questions considered relevant at the beginning of the project.

Fabric woven on a floor loom is basically flat. I examined three methods of changing flat woven, fabric shapes into three-dimensional forms. Expansion of tubes into cylindrical shapes was investigated in Modular Series A. In Series B, Series C, and Series D, flat squares of a single layer of fabric were suspended in a way that transformed them into three-dimensional shapes. Additional volume and potential for spacial relationships were achieved through the use of long, weft fringe. The traditional rectangular format of loom weaving was altered in Series E by dropping warp threads to shape oval tubular forms. Turned back into themselves, the fabric shapes had sufficient substance to become self-supporting, three-dimensional forms although the large sizes of the flat pieces were diminished.

These modules were designed to work with long, narrow units which divided into smaller woven strips toward one end. The extensions became three-dimensional when spread out in different directions as the piece was installed. All of these methods of giving flat fabric shapes a sense of volume were potentially effective, depending on the design and proportions of a specific piece and the particular installation.

A significant part of this problem was to utilize the innate characteristics of the polyethylene and polypropylene fibers while constructing large, three-dimensional forms. Properties of these fibers taken into account included stringy tenuousness, a propensity to be woven, translucence, lightness in weight, a brilliant reflecting and refracting surface, and white color. The woven areas presented a simple surface texture of grid patterns created by plain or twill weaves. These small geometric designs, the result of the interlacement of the warp and weft, formed small light reflecting facets which provided interest and were characteristic of woven fabrics, but they did not overwhelm or detract from the three-dimensional form. The fibers left unwoven retained their natural characteristics and were utilized as an integral part of each design.

White polyethylene tape, both flat and twisted, and white polypropylene cord were chosen as materials because of their brilliant reflectance and lightweight qualities.

Translucent in a single layer, these fibers became opaque and white when several thicknesses were compressed. The translucent property was apparent in the free-falling weft of some of the pieces, providing a contrast with the surface of the woven areas where the fibers were compacted by interlacement. The fabric woven from these lucent materials stopped light by reflection and refraction. This combination resulted in a visual spreading effect.

Changes in lighting provided a varied range of visual emphases for all of the pieces. Cool, blue-white light enhanced the polyethylene and polypropylene surfaces more than pink-white light. Many possibilities for developing lighting schemes existed at the gallery in Texas because of the extensive and flexible track-lighting system. One flood lamp situated on the floor was used in conjunction with the ceiling fixtures. The track lights were set up in three groups with one switch controlling each group. Switch Number One regulated lamps directed toward the corners of the gallery and provided a diffused effect. Switch Number Two highlighted all of the white pieces, and Switch Number Three lighted colored works included in the installation. The floor lamp provided extra emphasis on one polyethylene column from Series D. The lighting effects at Drury were achieved by positioning spot lamps on the floor in combination with a more basic system of track-lighting.

The rectangular space of the Drury gallery did not restrict the possibilities for arrangement as much as the symmetrical cross-shape of the North Texas State University gallery. In the latter, the extremely formal nature of this total space influenced the positioning and the configuration of each piece. The black ceilings, gray walls, and gray floors of the gallery in Missouri effectively contrasted with the white, synthetic materials more than did the neutral, beige-colored background in the Texas gallery. The ceilings of the Drury gallery were three feet higher than those at North Texas State University. Although I prefer to extend the forms to the height of fourteen feet or more whenever possible, the installations in the Texas gallery were visually effective.

All of the woven modules proved to be flexible enough to be successful in more than one configuration. They may be arranged in varying proportions according to the space available. Each installation is actually a different work in itself.

An overview of this study shows specifically that flatly woven shapes may be converted into three-dimensional forms, that the materials may be effective in achieving large-scale pieces while emphasizing their innate characteristics, that the effect of lighting is an important factor in the presentation of the pieces, and that it is possible

to weave a series of modular units which are trenchant in a variety of configurations and spaces. The work for this project is characterized by the spontaneous character of installations of flexible combinations of woven modules in which a certain controlled formality is imposed by the limitations of a standard floor loom.

The most important discoveries of this study were the varied solutions to problems of installation due to the flexible nature of the woven modules. I feel that there is much yet to be learned in working with the conceptual aspects of modular forms. Stressing the visual and conceptual aspects of my work, I plan to further investigate different materials, the interaction of forms with white light, and the qualities of monumentality and scale.