A METHOD OF TEXTILE DESIGNING
FOR BEGINNING STUDENTS

by

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A METHOD OF TEXTILE DESIGNING
FOR BEGINNING STUDENTS

CHAPTER I
INTRODUCTION

Handweaving of fabrics is a part of our civilization that presents not only an interesting background, but a background that reaches into the period of early civilized man. Handweaving takes its place with the early crafts of implement making and shelter making, and as gradually as man's desire to cover his body with material other than animal skins evolved, so did the practice of handweaving evolve. But man was not always content only with material that served to cover him. The fundamental human desires for beauty and individuality expressed themselves. And gradually fabrics woven with pleasing color, appealing texture and attractive design appeared to serve this desire for beauty. History provides us with a wealth of interesting and beautiful fabrics, fabrics which have been used not only for covering our bodies, but fabrics which have served as decoration in our homes, automobiles, even in our industry and certainly in our entertainment fields.

Although new inventions have changed the fabric weaving industry, weaving fundamentals have not changed. As the power loom developed, it took the place of the hand loom only from the standpoint of mass production. The hand
loom still plays an important role in the creation of fabrics within the textile industry.

Contemporary designers of woven fabrics will design a piece of fabric first on a hand loom but with power loom potentialities. By using this method, any commercial designer is able to try several versions of his design on a trial basis. He makes necessary changes in his design before it is put into power loom production.

The hand loom affords those persons who do not design for commercial purposes a chance to express their creative ability, and the presence of a challenging, inspiring hobby in our era of increased leisure time is of unquestionable importance.

This writer became interested in the subject of designing fabrics not only because of a general interest in handweaving, but also because of a specific challenge that was offered, inadvertently as it might be, by beginning weaving students at Oregon State College. Several times different beginning weaving students were heard to say, "I'm not original," "I can't think up a design," "I don't know where or how to get an idea for weaving a piece of fabric." This author is of the opinion that a person who is interested in handweaving as a hobby need not possess outstanding artistic abilities. Any novice is reasonably prepared to embark on a handweaving experience if properly armed, so to speak. The beginner in the textile designing
field should have had a fundamental course in setting up a loom. He should have had some instruction in the proper use of color and texture as color and texture apply to fabric design. Then with some instruction in basic weaving techniques, our novice is quite well prepared to begin work.

This writer's experience and experimentation have offered sufficient evidence to bear out the contention that once an individual has been given the primary instruction mentioned above he is sufficiently prepared to develop some particular type of designing method, and thus practically any interested person is capable of creating lovely original fabrics. A factor of prime importance is that the individual is certainly not restricted to using a pattern that someone else has worked out. Some critics of our present American culture deplore the absence of individuality, especially in use of leisure time. Certainly here is an opportunity for the full exploitation of the individual's creative ability.

Seldom will two persons be creative in the same way. Each will have his own method, and the method itself will be an expression of that person's creativity. "Weavers have or create patterns that differ with their experiences, study and travel. So with weavers, as among the Guatemalan Indians, one can tell from what village a person comes by the design of the fabric he weaves." (7)
A design in any field of endeavor does not "just happen." Rather the real basis for the design is a particular method, and seldom would the uninitiated realize the frustrations, near-successes and almost total failures that one pleasing, original weaving pattern might well represent. This work will deal with the particular method and the development of that method used by the writer.

Purpose of the Study

In this study an attempt will be made to show one method that a designer may follow in creating fabric design through hand weaving.

It is recognized that one source of inspiration may suggest many possibilities for fabric designs. This study will show some of these possibilities as applied to hand-weaving.

The method for creating fabric design used in this study will be further clarified by the inclusion of illustrations of the writer's handwoven fabrics created from one inspirational source, a Balinese basket.

Limitations of the Study

The limitations of this study are:

1. The designs illustrated in this study were limited to hand weaving with no intention that they were to be reproduced on a power loom.
2. The size of the woven patterns was limited for the sake of illustration.

3. To reduce the variables possible when creating designs, only one inspirational source was chosen to represent actual color, texture and pattern and a variety of possible designs and materials was taken and illustrated from this source.

4. The source of the design is limited to one from which not only color and texture but also pattern could be taken and reproduced on a two, four or eight harness loom.

5. Because of the nature of this study, the variety of weaves used in the illustrations was limited to tabby weave with two exceptions: a satin weave for one fabric and the writer's own loom tie-up was used on the pattern designs.
1. Dent  Single space in the reed. The size of the reed is designated by the number of spaces or dents per inch.

2. Draft  Diagram showing the treadling, tie-up, and treadling for a particular pattern or design.

3. Harness  Frame to support heddles.

4. Heddles  Cord, wire, or flat strips of metal, with eyes in the center through which the warp ends are threaded.

5. Hue  Color of a pigment.

6. Intensity  The brightness or dullness of a color.

7. Loom  Any device for holding the warp in place while weaving.

8. Nub  A form of novelty yarn having intermittent knobs or knops.

9. Pick  One throw of the shuttle, or one filler yarn; also called "shot."

10. Reed  Comblike device used to hold warp ends in place which, when drawn forward with the beater, pushes the filler yarn ahead making the web.

11. Satin weave  Warp and filler yarns interlaced irregularly to produce a smooth surface.

12. Shed  The V-shaped opening formed in the warp yarns allowing the shuttle to pass through.

13. Shuttle  Device that passes the filler yarn back and forth through the warp shed.

14. Tabby  The simplest of all weaves in which the filling yarn passes over and under successive warp yarns.

15. Tie-up  The selective order in which treadles are attached to the lams.
16. Treadles  Foot pedals that operate the harnesses.
17. Value     Lightness or darkness of a color.
18. Warp      Series of yarns extending from front to back of the loom; these form the firm foundation of woven fabrics.
19. Weft      Yarn interwoven with warp yarns to make cloth.
CHAPTER II

AN INSPIRATIONAL SOURCE USED AS A BASIS FOR THE SELECTION OF COLOR, TEXTURE AND PATTERN

To suppose that the design of our modern automobiles, railroad locomotives and jet aircraft is a result of a spontaneous outburst by one designer would be an expression of extreme naivete. Designs of the above-mentioned elements of our society are the result of painstaking effort and long hours of hard work and intensive study. The designer of the World War II British fighter aircraft, the "Spitfire," is said to have taken his first idea from a sea gull in flight, but the later structural elements were patterned from anything but a bird. The above examples are offered to illustrate the fact that design is the result of several interacting forces, and, basically, weaving designs which are perfectly satisfactory to the designer will result only after hard work, careful planning and concentrated study.

The method of designing followed by this writer will take into consideration elements such as color, texture and pattern. Supplemental to these elements must be included the designer's imagination. It stands to reason then, that before proceeding with a method of designing, the prospective designer must understand as much as possible about the field he is about to enter.
Consequently when the following material deals with color, texture and pattern and with items such as an inspirational source, the reader must remember that all these things are not to be divorced from the method being developed, and although the relationship might at times seem vague, the affinity is always there.

Selecting a Source or Subject for a Design Inspiration

Designing a piece of fabric is an individual art. Even though close similarity might exist between some elements of the method two different designers choose to follow, the interpretation of an inspirational source will seldom, if ever, be exactly the same for two different persons. The inspirational source then, marks itself as a very important consideration in developing a method of handweaving, for practical limitations must be considered in interpreting the inspirational source. Individuality is one of the handweaver's hallmarks, for each fabric designer will be inspired by some particular source or sources when he is ready to create a new piece of fabric. Sometimes this source will be a particular object of some kind; sometimes the source will be intangible, such as a view of a natural setting at a particular time of day. Portions of this work are intended to indicate that the writer relied not only on a specific tangible inspirational
source, but on a definite amount of imagination as well. We accept the fact that man's whole heritage, tradition and make-up are based on and are tremendously influenced by his surroundings.

Authentic pieces of art often serve as a source of inspiration to many designers. As Alan Priest describes it:

"The fundamentals of good design and color are universal. Their application to specific materials and to modern techniques may come about as a result of the fertilization of creative thinking or an intelligent adaptation. We hold no belief for mere copy-book duplication, but at the same time it would be folly to deny the beautiful and useful motifs and design passages which authentic art pieces provide. Ideas, motifs, combinations will quickly suggest themselves to the more imaginative designer. Whether in translating or transcribing, modern industry continually needs to be fed from the wellspring of art."

(10)

Although the relationship between present day world affairs and fabric design at first might seem vague, actually domestic and international events exert decided influence on trends in the design of fabrics. There is evidence to show that the designer will pick up and use in his own way a motif or colors of countries that are prominently in the news. "For example, when Queen Elizabeth II was crowned, the textile designers were ready to bring out thousands of garments symbolizing the event." (2)
The Tillets, English weavers, illustrated the unique influence which history exerts on fabric design when they undertook printing on woolens. In preparing for a job for Hanora fabrics, the Tillets chose the medieval period as a source of design inspiration because, in their opinions, this historical period has a close affinity to wool. "In addition to these, there is a whole group which derives its inspiration from thirteenth century needle work and another group inspired by playing cards of that century." (5)

As in practically every other form of art, nature is one of the more commonly used sources for inspiration. Some of our more prominent textile designers are quoted as saying:

Vera Neuman, "Design, I feel, is no closed world, but moves with fashion. I draw on nature for inspiration."

Claud J. Harndon, "I design, as I paint, and the things I love and remember: roadside flowers, a strutting cock, all in bright country colors."

Doris and Leslie Tillett, "We are deeply concerned with textures which we like to translate into design: the surface of wood, the lining of a shell, the feeling of tree bark." (8)

"More than twenty-five years ago, in the spring of 1924 the research department of Lincoln cars made a study of the birds in the collection of the American Museum of Natural History. Twelve of the most colorful combinations were used as inspiration for a series of Lincoln cars, which created a sensation when shown." (6)
Design inspiration is all about us. Even the most inexperienced designer can learn to be aware of design sources and the ways in which they can be used and interpreted, but the beginning designer must recognize the fact that his powers of observation must be put in tune with the work he is attempting.

"Museums and art collections contain much inspirational material. Ancient ceramics and paintings, prehistoric drawings, historic costumes all suggest motifs which, with original innovations, can become modern and saleable. Designers are often found at the Museum of Modern Art, the Metropolitan, the Museum of Natural History or their equivalents in your own community, armed with sketch pad, watercolors and colored pencils, seeking ideas." (2)

Exactly where a person looks or what he uses for inspiration is relatively unimportant. However, the inexperienced designer should provide himself with some form of security, and the best form of security is to have something specific as an inspirational source for every piece of fabric which he designs.

Some experienced designers may create fabrics without making reference to any particular inspirational source. They would rely entirely on their imaginative creativeness. However, the beginner must realize that not using any particular inspirational source is a method used only by the expert designer. This writer suggests that the inexperienced weaver should always take care to get his inspiration from some particular visible source. The beginner's
failure to realize the limitations of his grandiose expectations coupled with his lack of experience in the use of yarns and material could easily result in discouragement that would put a sudden and complete end to his attempts at weaving.

According to sources at Oregon State College, the basket used as an inspirational source for this study is an authentic piece of native handiwork and came from the Island of Bali in East Indonesia. The basket is a thing of remarkable beauty. Although the main construction is of bamboo and raffia, gold colored metal and white beads were used in decorating the basket. The basket was used to provide a container for fruit for a temple offering. The Balinese are rather well known for their physical beauty and their high level of culture which includes forms of music, folk drama and architecture. The basket is the property of Oregon State College and is displayed in the Historic Textiles laboratory at Oregon State College. It was in the Historic Textiles laboratory where this writer first saw this form of native art which was to become the inspiration for this work. (Plate I)
Plate I

Balinese Basket

The Inspirational Source for Illustrations in this Study
Taking Color, Texture and Pattern from an Inspirational Source

Once the inspirational source for a piece of woven fabric has been discovered, the designer has an important decision to make. He should decide whether to emphasize the color, the texture or the pattern of the source in his fabric. Possibilities include using any one of the three above mentioned factors, or a combination of all three. The method which the designer might use to reproduce color, texture or pattern from the inspirational source is suggested below.

COLOR. The method of obtaining and using color from an inspirational source employed by this writer is suggested by one of America's more famous fabric designers, Dorothy Liebes.

"The most difficult thing for most weavers to grasp is that seventy-five per cent of fine creative weaving takes place away from the loom. Most of our time and imagination should be employed in getting ready for the loom. After the idea, comes the cartoon (the working sketch). Even if you can't draw you must make a cartoon. First make a small rough sketch with pastel chalks to plan your color combinations." (4)
We must first accept the idea that no color is bad, because the manner in which any color is used will either kill it or make it sing. Liebes (4) rarely uses more than three colors in any one composition. These hues are represented by a light and a dark value plus one intense or bright color. Contrary to what one might believe, this use of three colors is not limiting to the designer. If a monochromatic or multichromatic scheme is chosen, the materials woven can be constructed to show light, dark and bright. Several values of any of the colors as well as neutrals and metallic yarns could be added to the fabric.

A single pastel chalk can seldom be used to reproduce colors from any source. Colors nearly always are combinations of several hues and to get the exact reproduction of colors desired, the designer will probably find it necessary to blend several chalks.

The cartoon used by this writer could be compared to a small section of a rainbow in that the colors are sketched next to each other in varying widths, thus showing the dominant, secondary and accent colors represented in the inspirational source. Use of a fixitive over the color cartoon keeps the pastel chalks from rubbing off, giving the cartoon a more permanent character, preserving it for possible future use.

White, maroon, black, red, orange and copper and gold
metal are the colors found in the Balinese basket. A color cartoon was drawn by this designer with the proper representation of the colors included to the designer's satisfaction. (Plate II)
From the colors represented in the basket, three of the colors, maroon, black, and red were chosen by this writer to represent the dominant, the secondary and the accent colors. In all the fabrics designed for illustrative purposes in this thesis, maroon is the dominant color, black is the secondary color, and red is the accent color. It can be noticed that white, orange and the metallic yarns are represented in each piece of fabric, but there was no concern for their proportion in relation to the basket except to make a pleasing design in the woven fabric.

The first fabric was designed to show how the dominant, secondary or accent color from the inspirational source might appear as the most predominant color in the fabric. (Plate III) One does not always use the dominant color as the predominant color in a piece of fabric. By substituting one weft yarn, the entire over-all color of the fabric is changed.

The top example shows use of the dominant color from the inspirational source. The center example shows the secondary color appearing as the dominant color in the fabric, and the lower example illustrates the accent color in the same manner.

The fabric in Plate III illustrates the writer's design when using only the color from the inspirational source. No textured yarns were used, nor was a definite
Plate III

Color

Plate IV

Warp Arrangement for Fabric Showing Color
pattern employed. When more than one color is present in a piece of fabric, some type of design will naturally result. However, the writer attempted in this instance, to put together all the necessary colors in such a manner as to give an all-over effect.

To eliminate texture, all yarns used in both warp and weft were the same size. Even the metallic yarns were selected to correspond to the size of the cotton yarns, but in spite of this precaution, the very presence of the metallic yarn caused texture, to a certain extent.

Warp. To show that inspiration can come from more than one source, the writer used a piece of upholstery fabric with several colors in the warp to get the distribution of warp yarns for this fabric. The five colors from the Balinese basket were represented with 5/2 cotton pearl. There is a one inch repeat with 16 threads to the inch. (Plate IV)

Weft. For the weft, 5/2 cotton pearl was also used with the addition of Bucilla tinsel metallic yarn. Three shuttles were used, one with the color that would appear in the largest amount in the fabric; one with white pearl cotton, and one with the metallic yarn. The following order of the shots in the weft was used with tabby weave: two shots of the main color, one shot of metallic yarn, one shot of white, then repeat. There were 18 picks per
inch. The plan was that all the necessary colors would be put into the warp so that the color desired for the all-over color effect of the fabric could be controlled by the weft yarns.

Tabby weave was used because the nature of any other type of weave created textural third dimensional effects.

TEXTURE.

"Almost as important as good color balance is the balance of the textures.... To show how texture affects color, we can cut squares from one homogeneous sheet of red (or any other color, for that matter) vinyl plastic, and apply to their surfaces a variety of different embossings which produce varied textures. Suddenly, the squares all seem to be of slightly different colors: the surface texture has made a significant change in the apparent color. This is something to be aware of in choosing colors where fabrics or other textured effects are to be used." (3)

Were the painter and the textile designer to be compared, it could be assumed first that the painter is concerned with reproducing the great variety of textures in nature, because by reproducing these textures, he enriches his design and gives it what appears to be a tactile quality. The textile designer ceaselessly studies texture because it enriches the fabric and gives depth and appeal to his creations. To achieve their results, both the painter and textile designer are working in terms of color and depth, of visual and the tactile, or the emotional and functional.
"How does one achieve texture? It is obtained by the use of different weight threads, or mixed threads of different fibers, using a double-warp weave with the threads of one beam pulled up with a little rod to form a pile. This can be controlled to form any pattern. One can also achieve texture by using additional treatment, like tied-in fringe with the Ghordes or Senna knot; or by the use of the Swedish Rya pile-knot embroidery technique, done while the fabric is still stretched on the loom; or again, by surface applique or embroidery. And Texture may be obtained by any number of other devices which give an irregular surface to the cloth." (4)

When considering the relationship between texture and the inspirational source, we assume that the designer will attempt to repeat the texture of his source in a piece of fabric, and to achieve this end, the designer will select the proper yarns or materials so that his end result will be a similarity in texture between his source and his completed fabric. In other words, his fabric will give him the same feeling as the texture in the selected source. The very nature of yarns crossing each other in fabric causes texture, and by using his imagination, and by relying on the trial and error method, the designer can achieve his desire of attaining similarity between inspirational source and actual fabric.

To represent texture and to use the Balinese basket as a source for that texture, the colors will also be used in the following illustration.

In this study, the writer represented the texture of
the Balinese basket by using wide and narrow bamboo sticks and by using textured yarns to resemble the bead work of the basket. The color distribution is in keeping with the color cartoon. (Plate II) The color and texture were emphasized here with no definite pattern in mind. The illustration is one half the size which an actual place mat would be. (Plate V)

**Warp.** Working out the distribution of warp yarns to be used with bamboo is largely trial and error for the inexperienced weaver. Here, the trial sample is very important before the final material is done. (This trial sample will be explained later in this study.) The warp was planned by putting small pieces of yarn through an eight dent reed. The width of the yarn areas can be determined in this way.

Black and white chenille, black and yellow Frostone, red Knit-Cro-Sheen, white novelty yarn, and gold tinsel, and red rayon novelty yarns were selected to represent varied textures and to duplicate the textures of the Balinese basket.

**Weft.** The natural bamboo was dyed with a vegetable dye to resemble the color of the basket. The large and small sticks were laid in alternately.
Plate V

Color and Texture
PATTERN. That reproduction of the pattern from an inspirational source may take more time and more extensive use of imagination on the part of the designer was discovered by this writer. But reproducing the pattern is not impossible, and when once completed, such an accomplishment gives the designer a great deal of personal satisfaction.

One objection to the reproduction of patterns is that the undeniable limitations presented by set patterns sometimes become barriers to creative growth.

Two ways are suggested here whereby pattern might be taken from an inspirational source:

1. Select a color cartoon that represents the inspirational source to the designer's satisfaction.

"When you have a plan you like, make an accurate, full-sized sketch (on wrapping paper) of the fabric you are going to weave, showing your color pattern and the placement of various fibers, beads, braid, whatever materials you are going to use to weave the fabric. If the pattern is to be one of repeated motifs, sketch only one full length of it.... Then cut a strip one and one-half inches wide from the length of the cartoon to use as a guide, unrolling it as the pattern appears in the material on your loom." (4)

2. Some inspirational sources do have a definite design that is applicable to weaving provided the loom tie-up is correct. It is very possible that the designer can gain much satisfaction in creating original patterns of this nature.
Loom tie-up may be worked out satisfactorily by using squared paper as a form of blue-print. Treadles on the loom are numbered, and then the corresponding number can be entered on the squared paper. In this manner, each treadle is represented on the paper. Naturally, the more treadles on the loom, the more varied the design can be.

By following closely the inspirational source, the designer can then plot his pattern. The loom treadles are numbered from left to right at the bottom of the squared paper with two or three repeats so that the pattern can be more clearly defined. As one works vertically up the paper, each row of squares should represent one weft row when weaving. By following this method, the number of the treadle to be used can be noted as well as to which harness that treadle should be tied. Eventually each treadle will be used, and the tie-up for the harnesses thus noted.

A working draft, made from the squared paper and showing the tie-up and the treadling for the pattern, can be taped to the loom in front of the weaver where it can be easily seen and closely followed. After a sample of the pattern is woven, the designer may find it advisable to make a new working sketch which incorporates necessary changes.

As mentioned earlier, one requirement of the inspirational source used for the illustrative fabrics of this
study was that the source must have a design that could be reproduced in some way on a hand loom. The Balinese basket meets this requirement and the following fabric sample represents the color and the pattern from this basket. (Plate VI)

There was to be no texture in this fabric; however, the nature of the woven pattern in combination with lurex yarn caused texture. Use of all smooth yarns served to control the amount of texture which might develop.
Plate VI

Color and Pattern
The pattern was worked out to be used on an eight harness loom. First, the treadles on the loom were numbered one through eight from left to right allowing treadles nine and ten to remain for tabby weaving. Graph paper was then numbered across the bottom one through eight and three repeats made so that the design would be more distinguishable. Working vertically up the paper, each row of squares represents one weft shot when weaving. (Plate VII)

On the left side of the graph paper the type of yarn to be used for each weft shot was noted and on the right side of the paper the number of the treadle for each weft shot was noted plus the tie-up to the harnesses for that treadle. Following closely the design on the Balinese basket the writer created a pattern that represented each design area of the basket. In two design areas the exact reproduction of the pattern on the basket was possible.

The designs within the pattern were numbered and noted on the draft. As the pattern was woven, the width of each design was marked on a one and one-half inch strip of paper. In this manner the pattern could be repeated and woven the exact size each time. (Plate VIII)
Plate VII

Pattern that Represents
Balinese Basket
Plate VIII

Measurement of Design Areas in a Pattern
Warp. Maroon sock and sport wool was warped sixteen yarns per inch with two yarns being put through each heddle together, then singly through each dent in the reed. The purpose of warping in this manner was to spread the pattern horizontally so that it would be more visible.

Sock and sport wool was chosen for the warp for a specific purpose. Sixteen yarns per inch in the warp is a low count for garment fabric. The yarn used is softer and more elastic than weaving yarns, thus it collapses more after being stretched. It was necessary to draw the tension on the warp quite tightly and to allow for the collapsing of the yarns in measuring the woven fabric. Taking this simple precaution insured that after the fabric was removed from the loom, it was the proper weight for garment fabric.

Weft. The yarns used for the weft pattern were four-ply white wool, red and black Fabri and lurex.

The draft for weaving the pattern was taken from the squared paper plan and the draft includes the tie-up of the loom and the order of treadling. Notation was also made of the different yarns to be used. The entire draft is found on the following page.
### Working Draft for Original Pattern

#### TIE-UP

<table>
<thead>
<tr>
<th>Heddles</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>8</th>
<th>4</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Treadles</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
</tbody>
</table>

#### TREADLING

<table>
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<th>Yarn Treadle</th>
<th>Yarn Treadle</th>
<th>Yarn Treadle</th>
<th>Yarn Treadle</th>
<th>Yarn Treadle</th>
</tr>
</thead>
<tbody>
<tr>
<td>White 9</td>
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<td></td>
</tr>
<tr>
<td>White 10</td>
<td>Gold 1</td>
<td>Black 10</td>
<td>Gold 7</td>
<td></td>
</tr>
<tr>
<td>White 9</td>
<td>Black 9</td>
<td>Black 10</td>
<td>White 10</td>
<td></td>
</tr>
<tr>
<td>Gold 10</td>
<td>Black 6</td>
<td>Black 9</td>
<td>White 7</td>
<td></td>
</tr>
<tr>
<td>White 9</td>
<td>Black 9</td>
<td>Black 10</td>
<td>Black 9</td>
<td></td>
</tr>
<tr>
<td>Gold 10</td>
<td>Black 10</td>
<td>Black 10</td>
<td>Black 9</td>
<td></td>
</tr>
<tr>
<td>White 9</td>
<td>Gold 7</td>
<td>Black 10</td>
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<td></td>
</tr>
<tr>
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<td>Black 9</td>
<td>Black 10</td>
<td>White 10</td>
<td></td>
</tr>
<tr>
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<td>Black 10</td>
<td>White 8</td>
<td></td>
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<td>Black 10</td>
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<td></td>
</tr>
<tr>
<td>White 10</td>
<td>Gold 1</td>
<td>Black 10</td>
<td>White 8</td>
<td></td>
</tr>
<tr>
<td>White 9</td>
<td>Black 9</td>
<td>Black 10</td>
<td>White 8</td>
<td></td>
</tr>
<tr>
<td>Red 3</td>
<td>Gold 6</td>
<td>White 4</td>
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<td></td>
</tr>
<tr>
<td>Red 3</td>
<td>Black 10</td>
<td>Black 10</td>
<td>White 7</td>
<td></td>
</tr>
<tr>
<td>White 2</td>
<td>Gold 7</td>
<td>Black 10</td>
<td>White 3</td>
<td></td>
</tr>
<tr>
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<td>Black 10</td>
<td>Black 10</td>
<td>White 3</td>
<td></td>
</tr>
<tr>
<td>Red 3</td>
<td>Black 9</td>
<td>White 8</td>
<td>Weave 3&quot;</td>
<td></td>
</tr>
<tr>
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<td>Black 10</td>
<td>Black 9</td>
<td>Plain Maroon</td>
<td></td>
</tr>
<tr>
<td>Red 3</td>
<td>Black 9</td>
<td>Black 10</td>
<td>Repeat No. V</td>
<td></td>
</tr>
<tr>
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<td>Black 9</td>
<td>Reverse</td>
<td></td>
</tr>
<tr>
<td>White 10</td>
<td>Black 9</td>
<td>Black 10</td>
<td>Repeat No. I</td>
<td></td>
</tr>
<tr>
<td>Black 9</td>
<td>White 9</td>
<td>Black 9</td>
<td>Gold 3</td>
<td></td>
</tr>
<tr>
<td>Black 10</td>
<td>White 9</td>
<td>Black 9</td>
<td>Gold 3</td>
<td></td>
</tr>
<tr>
<td>Black 9</td>
<td>White 9</td>
<td>Black 9</td>
<td>Gold 3</td>
<td></td>
</tr>
</tbody>
</table>
COLOR, TEXTURE AND PATTERN. Not only can the color, texture and pattern be taken separately from the inspirational source but at times, depending upon the source selected, all three, color, texture and pattern, may be combined in a piece of fabric and designed in such a manner as to represent the source of inspiration very closely.

The color, texture and pattern from the Balinese basket were all combined to form a design for the border pattern of a wool skirt. (Plate IX) This fabric shows how particular yarns were selected to represent as closely as possible the bead work on the basket.

Warp. The selection of yarns and the threading of the loom for the warp in this fabric has been explained earlier. (page 33) The same principles apply for this illustration.

Weft. The same working draft (page 34) applies for this pattern as it does for the previously explained pattern. White cotton and rayon chenille yarn was chosen to represent the bead work on the basket. Red, black and orange Fabri yarn added the necessary colors and lurex and copper tinsel were used to simulate the metallic yarns of the basket.
Plate IX

Color, Texture and Design
Selecting the Yarns Before Weaving

This writer is convinced that careful consideration must be given to the selection of the yarns which are to be used for the fabric desired if a successful method of design is to be developed. Experimentation with several types of yarns has supported this conviction.

Of primary concern to the designer is the use to which the fabric will be put. What is the intended purpose of the fabric? Is the fabric to be garment material? Is the fabric to be used as upholstery or drapery yardage? Does the designer intend to create a rug fabric or a novelty fabric? Is the fabric to be of cotton, wool, linen, man-made fibers? Does the designer contemplate using a combination of the fibers? Often the designer will have selected the fibers or will have a general idea concerning the type of fibers to be used when the decision is first made concerning the fabric to be woven, and here again one must note the important influence of the inspirational source. Certainly a general harmony must exist between the inspirational source and the ultimate creation.

Whatever the fabric, the designer must follow closely the color cartoon when he selects his yarns. By paying strict attention to his cartoon pattern the designer will be able to match colors much more accurately than if he did not have the pattern to follow. Where a certain
texture is desired to represent definite colors, the proper
yarns can be chosen if an accurate guide is followed. The
color source and the yarns combine to achieve the final
effect, and to enable the designer to prepare the weaving
plan.

Each selection of yarn is chosen for a specific pur-
pose, and each yarn will serve a specific function in the
fabric. For instance, nubby yarns will create texture,
novelty yarns will impart highlights, and smooth yarns
will provide strength, and metallic yarns will add variety.
Regardless of what the yarn is, its purpose and function
are vitally important and this importance must be realized.

It stands to reason that the decision concerning the
type of fabric desired is of utmost importance, and for
the professional weaver or for the hobbyist, the type of
fabric to be woven will have been decided upon before any
weaving takes place. Some of the variables which will
affect one's decision concerning the type of fabric to de-
sign might be: (1) the size of the loom available,
(2) the availability of certain types of yarns, (3) the
use to be made of the fabric (as an example, is sunfastness
necessary in the chosen colors), (4) how durable the fab-
ric must be.

After taking into consideration all possible limita-
tions, the weaver is ready to design.
Weaving a Sample Before the Final Fabric

Weaving the sample is the final step in planning a piece of fabric. By weaving the sample, the designer is able, at nominal expense, to determine the exact plan which he wishes to employ in creating his piece of fabric. For the hobbyist, the initial planning and weaving the sample are very important, because the fabric designed must suit its purpose exactly, and thus satisfy the designer in practically every way.

Enough warp for several samples should be put on the loom. The samples need not be more than six inches wide. The weaver should not be content with only one or two samples, but should turn out several samples, each about six and one-half inches in length. By varying the weft threads, tie-up and density of the fabric in each of these samples, the weaver is better able to compare results and thus improve the chances for a completely satisfactory finished product.

A form of record keeping is essential as the weaver creates each sample, and individual notations should be kept for each sample woven. For example, a three by five inch index card could be made for each sample, and could include the following information:
Warp yarn arrangement:

Tie-up:

Weft on the loom
Order of yarns:
Picks per inch:
Size of sample:

The finished fabric
Shrinkage per inch:
Warp:
Weft:

Satisfactory weight:
Yes:
No:

Changes necessary:
Warp:
Weft:

The index card, when attached to the completed sample provides a complete record of that particular phase of the work, and thus constitutes a necessary record for the weaver's later reference.

Before the index card is attached to the completed sample, the weaver must take final precautions in analyzing his work. Each sample should be either hand washed, machine washed, steam pressed, ironed, or, in short, exposed to the approximate conditions to which the actual fabric would be exposed when completed. By following a fairly rigid testing procedure, the designer will be better able to determine the final actual appearance of the proposed fabric.

Assuming that the yarn for a particular fabric to be woven must be purchased, i.e., that the designer does not
have a supply of that particular yarn on hand, the completed sample will serve another valuable purpose. The designer will be able to estimate the total amount of yarn that will be necessary for his completed fabric product. Not only has a factor such as shrinkage been specifically considered and the possibilities noted, but the warp threads per inch and the picks per inch have been recorded for future reference. An obvious advantage in using the sample techniques is that excess expense can be eliminated, and an abundance of surplus yarns will seldom, if ever, harass the weaver.

The author holds the firm conviction that the time and minor expense involved in creating the sample are negligible when compared to the satisfactory piece of fabric which will result, and this conviction applies to the professional weaver as well as to the hobbyist.
CHAPTER III

AN INSPIRATIONAL SOURCE USED AS A BASIS TO CREATE VARIATIONS OF THE COLOR, TEXTURE OR PATTERN

Thus far in this study, illustrations have been given to demonstrate some of the design possibilities which result when the designer will hold himself to a strict interpretation of his physical inspirational source. For instance, color, pattern and texture, used singly or in combinations were relied on for the designer's creation, and the method of employing these visible elements was explained.

Actually, two designers using the same inspirational source would very probably present designs of close similarity if they were to rely only on color, pattern and texture. The element that imparts real originality to the design and to the method of design, however, is the artist's imagination: imagination as applied to the three basic features mentioned above.

The impressionistic painter considers the reproduction of a physical entity in its exact form a rather poor copy of the original. He would claim that a photographic process would be far more accurate. However, when the painter transmits his inspiration to the canvas, the resulting work is entirely his own. He has relied on certain sources
(color, shape, etc.) but his imagination has been responsible for the details. So be it with the weaver-designer. That the designer's ultimate creation might bear little likeness to the inspirational source is no valid criticism if the designer has relied on his imaginative ability as well as one of the basic elements in the inspirational source. In the following section of this study, the color, texture or pattern might be the only apparent link between the source and the creation, but the explanation of the method is intended to explain further how the design really came into being.

Color from Basket Source, Original Texture

One element that has appeared in each piece of fabrics illustrated in this study is the color, inspiration for which was taken from the Balinese basket. The following fabric (Plate X) is garment weight, and the color distribution for the fabric was taken from the color cartoon (Plate II). Maroon is the dominant color, black is the secondary color, and red is the accent color. The texture of the fabric has been created without making reference to the Balinese basket. In other words, the color is the only feature of this sample which bears resemblance to the basket, and the writer has used her imagination to develop the texture. Because a general all-over color was desired,
the yarns were distributed so that no definite pattern would appear.

The texture of this material was achieved in three different ways. First, the use of the large and small yarns gave a three dimensional effect to the fabrics. The yarns used are maroon, knitting worsted, four-ply white wool, red and black Fabri, Woodpecker, and a novelty rayon and gold tinsel. Second, texture was created by the use of textured yarns (the novelty rayon and gold tinsel) in the weft. Third, texture was created by using a tabby weave and three shuttles allowing six shots of weft to be thrown before a repeat occurred. The use of the white wool Woodpecker with a yellow-orange nub added the fifth color required. Note that the fifth color (orange) has been added in a slightly different manner than by having one solid colored thread included in the fabric.

**Warp.** Various sizes of wool yarns were used in the warp, as explained in the preceding paragraph. There is a one-half inch repeat in the distribution of yarns (Plate XI) with eighteen threads to the inch. The fabric was woven on a four harness loom and an eight dent reed was used. Four of the five representative colors, maroon, red, black, and white, were used in the warp.

**Weft.** As stated previously, three shuttles were used in the weft. One shuttle contained the maroon knitting
worsted, one shuttle contained the white wool Woodpecker with a yellow-orange nub, and the third shuttle was wound with the white rayon and gold tinsel yarn.

Only one inspirational source, the Balinese basket, was relied upon to design this particular fabric. The distribution of warp yarns was original and the creation of the texture in the fabric was also the writer's original work.
Plate X

Color from Basket Source,
Original Texture

Plate XI

Warp Arrangement for Fabric
Showing Color from Basket Source
Original Texture
Color from Basket Source, Design from Additional Source

By using the necessary colors, and by distributing properly the dominant, secondary and accent colors, a plaid fabric was designed. This sample fabric is intended to illustrate that the designer might create a fabric by not using textured yarns, and furthermore, the sample shows that a pattern may be developed, wherein the pattern has no relation to the inspirational source, even though the colors for the fabric were taken from those appearing in the source. (Plate XII)

Reference has been made previously to the fact that more than one inspirational source may be employed to create a pattern, and this piece of fabric illustrates the use of more than one source. As a source of inspiration for the distribution of yarns to create the plaid pattern, the writer referred to a MacDougall Clann Tartan. (1) There appears to be no resemblance between the writer's plaid creation and the Tartan reference. The colors are different; the Tartan is woven with much finer yarns and with a twill weave; the size of the pattern repeats is smaller in the Tartan than in the writer's creation, and the weight of the two pieces of fabric is different.

Warp. Fabri yarn and supported lurex were used in both the warp and weft of this fabric. The pattern repeat
is as follows:

<table>
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<th>Number of Yarns</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>maroon</td>
</tr>
<tr>
<td>2</td>
<td>red</td>
</tr>
<tr>
<td>2</td>
<td>orange</td>
</tr>
<tr>
<td>8</td>
<td>maroon</td>
</tr>
<tr>
<td>2</td>
<td>orange</td>
</tr>
<tr>
<td>2</td>
<td>red</td>
</tr>
<tr>
<td>28</td>
<td>maroon</td>
</tr>
<tr>
<td>8</td>
<td>black</td>
</tr>
<tr>
<td>2</td>
<td>red</td>
</tr>
<tr>
<td>2</td>
<td>orange</td>
</tr>
<tr>
<td>8</td>
<td>maroon</td>
</tr>
<tr>
<td>2</td>
<td>orange</td>
</tr>
<tr>
<td>2</td>
<td>red</td>
</tr>
<tr>
<td>11</td>
<td>white</td>
</tr>
<tr>
<td>2</td>
<td>lurex</td>
</tr>
<tr>
<td>11</td>
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</tr>
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<td>4</td>
<td>maroon</td>
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<tr>
<td>2</td>
<td>orange</td>
</tr>
<tr>
<td>2</td>
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<tr>
<td>8</td>
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</tr>
<tr>
<td>2</td>
<td>red</td>
</tr>
<tr>
<td>2</td>
<td>orange</td>
</tr>
<tr>
<td>4</td>
<td>maroon</td>
</tr>
<tr>
<td>Number of Yarns</td>
<td>Color</td>
</tr>
<tr>
<td>----------------</td>
<td>---------</td>
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<td>red</td>
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<tr>
<td>2</td>
<td>orange</td>
</tr>
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</tr>
<tr>
<td>2</td>
<td>red</td>
</tr>
<tr>
<td>8</td>
<td>maroon</td>
</tr>
</tbody>
</table>

repeat.

The thread count for the warp is 26 yarns to one inch, and one pattern repeat measures 8-1/2 inches.

Weft. The weft pattern was a left to right exact repeat of the warp pattern. There were 22 picks per inch. Tabby weave was used to prevent appearance of texture.

This fabric is garment weight. A four harness loom was used to weave the fabric.
Plate XII

Color from Basket Source,
Design from Additional Source
Color from Basket Source, Original Design and Texture

The previous two fabric samples have illustrated how a designer may create either texture or pattern relying on his own imagination without making reference to his color source.

The writer has included the next illustration to demonstrate how texture and pattern may be combined in one fabric, and in this instance no reference was made to the texture or pattern of the Balinese basket. The designer chose to weave a linen rug to illustrate the particular problem. A color photograph (Plate XIII) of the rug has been substituted in this thesis for an actual fabric sample because inclusion of fabric as heavy as that of which the rug consists seemed impractical.

As mentioned previously, the texture and pattern of this illustration bear no resemblance to the inspirational source, but the Balinese basket was referred to as a source for color selection. Because metallic yarns do not wear well in a rug, they were not included in this sample.

Warp. 6/3 natural linen tow was warped six yarns per inch. A four harness loom and six dent reed were used.

Weft. Linoleum illustrations in a Sears, Roebuck and Company catalog provided the inspiration for the pattern
of this three foot by five foot linen rug. The linoleum sample in the catalog showed squares irregularly placed, and small strips of color were laid in among the blocks.
Plate XIII

Color from Basket Source, Original Design and Texture
In developing the pattern for the rug, the writer used squared paper as a basis for planning the design. (Plate XIV) The size which the blocks would be was determined, and then the blocks were marked in an irregular fashion on the squared paper, forming what the writer considered a somewhat modernistic design. The writer decided that some squares would be solid in color and a raised texture, and other squares would be what can be termed as textured blocks. Although several attempts were made to achieve completely satisfactory pictorial results to illustrate the difference between the solid-color, raised textured blocks and the textured-blocks, photographic limitations prevented the graphic illustrations desired. By way of explanation, the solid-color, raised textured blocks present a solid raised block on the rug, each block being perhaps 1/4 inch higher than the rest of the rug. The textured blocks do not present the solid appearance, but the white textured areas were achieved by laying in double strands of 1-1/2 lea white rug linen and by pulling it up to form occasional uncut loops. The solid blocks were achieved by tying 1-1/2 lea maroon rug linen in Ghiordes knots, and the loops were left to form an uncut pile.

Not only was the pattern worked out on squared paper, but it can be noticed that maroon, black and white were
variegated throughout the weft so that a color distribution plan was necessary. (Plate XV) Color crayolas were used, although colored chalk or water colors would have served the same purpose. It was necessary to indicate the size of the different colors so that a pleasing distribution would be developed. This plan was completed before any weaving was done on the rug. 1-1/2 lea rug linen was used for the weft.

Throughout the rug, but not visible in the photograph, small pieces about four inches in length of 1-1/2 lea red and orange rug linen were laid in. The distribution of these colors can be seen on the color plan. (Plate XV) The red and orange colors added interest to the design, as well as providing a method of including all the necessary colors in the rug.
Plate XIV

Pattern Layout for Rug
Key 1 = 1 inch
Plate XV

Color Plan for Rug
Color and Texture from Basket Source
Original Pattern

As explained in Chapter II of this thesis, more than one element can be taken from the inspirational source. The next fabric illustrates how color and texture were taken from the Balinese basket, and how the writer used her imagination to create a pattern that made no direct reference to the basket. (Plate XVI)

The color distribution is in keeping with the original color cartoon (Plate II) and the texture from the basket was duplicated by the proper selection of yarns. Raffia was chosen to represent the bamboo texture of the basket, and a satin weave brought the rayon novelty and smooth warp yarn to the surface to simulate the bead work on the basket. Supported lurex and Bucilla tinsel represent the metal in the basket.

The pattern was formed by employing vertical strips of red and yellow rayon yarn, and by employing horizontal strips of maroon raffia, maroon chenille, black rayon novelty yarn and supported lurex and Bucilla tinsel. The use of the satin weave created a diagonal effect. This fabric (Plate XVI) is the only fabric used in this study wherein a weave other than tabby was used, or wherein a specific pattern tie-up was used. The fabric was woven on a four harness loom and a sixteen dent reed was used.
Warp. The entire warp is made up of smooth and nubby rayon yarns. Two smooth yarns were treated as one by putting them together through one heddle and one dent in the reed, and the nubby yarns were put through singly. There were sixteen threads per inch in the warp. At each inch the yellow and red threads were alternated.

Weft. One repeat included two shots of wine chenille, two shots of wine raffia, two shots of black rayon novelty yarn, and two shots of mixed supported lurex and Bucilla tinsel.

This fabric might be used in making a hand or knitting bag, and the material could be used in making place mats.
Plate XVI

Color and Texture from Basket Source, Original Pattern
Color and Pattern from Basket Source
Original Texture

The final fabric illustration demonstrates how color and pattern can be taken from an inspirational source, and how texture can be created without reference to the inspirational source. (Plate XVII) Also, the writer has illustrated with this fabric how a variety of novelty materials may be used to create an interesting texture.

Since the pattern for this fabric was taken from the Balinese basket, and since the method which the writer has used to create the pattern has been fully explained in Chapter II, reference should be made to page 30 for the complete explanation of method.

The warp arrangement is the same as that listed on page 33, and the working draft for the weft is set forth also on page 33.

A slight variation was made in the weft draft to prevent the design from becoming too large. The pattern was not changed, only the number of shots in some designs was reduced. The appearance of the pattern remains somewhat the same. The following materials were used to create the different and unusual texture: white rayon soutache, gold sequins, strips of red plastic, gold cord, white cotton novelty yarn, black rayon, and cotton and metallic yarn. This fabric would be useful in making a hand or
knitting bag, or place mats, and the material could be used as a border pattern for a lady's skirt.

The preceding section has shown that by taking color, texture or design or any combination of the three factors, and then by adding the element of imagination, the designer can produce an original fabric design which any designer, commercial or hobbyist, could be proud of, and from which the original designer will gain much personal satisfaction. Very often the fabric will bear little likeness to the original source of inspiration, but this lack of similarity is not a fault with the creation. The designer did not intend to copy the inspirational source, but intended to use her source in the truest sense of the term inspirational.
Plate XVII

Color and Pattern from Basket Source, Original Texture
CHAPTER VI
CONCLUSION

Handweaving of fabrics holds a very important place in the field of commercial weaving, for it is on the handloom that designs are first created. Once the design is satisfactory, mass production techniques are employed for the wider production of the fabric. The importance of handweaving as a hobby should not be minimized, for through handweaving the individual is given the opportunity to express individuality and creativeness.

A particular method to be followed is of paramount importance to the professional weaver as well as to the novice. The development of a method is one of the best illustrations of individuality.

The method employed by this writer can be divided into four general areas.

(1) Select a source or subject for inspiration. This source may be something in nature, a work of art (either painting or sculpture) or even an event concerning domestic or international affairs, to name but a few.

(2) Select color, texture or pattern from an inspirational source. Any one or all three of the above elements may be chosen, and they may be an exact duplicate of the original source or they may be a product of the weaver's imagination, stimulated by the inspiration.
(3) Select yarns properly. In every instance, the texture of woven materials will depend upon the yarn used in the fabric. Close attention should be given to the colors selected, and in this respect the inspirational source is of major importance.

(4) Weave a sample. Only by creating a miniature of the intended finished product will the weaver be able to judge such things as cost, amount of yarn to be purchased, etc. The sample satisfies far more requirements than just the determination of cost. The sample can be subjected to the same conditions to which the completed fabric will be subjected, and the results of tests will determine the feasibility of continuing along any given line. Furthermore, by creating a sample, the weaver will be better able to produce in quantity the exact type of fabric which is desired.

Variations in method and technique will exist in handweaving as in everything else, but certain basic principles apply, and this thesis is intended to illustrate the possibilities existent in one particular method of handweaving.
Recommendations

Because this thesis was prompted, in part, by comments from discouraged beginning weavers who deplored their lack of imagination and resourcefulness, the writer has attempted to include material that would be of definite assistance in the classroom. Although the work has been slanted to the beginning student, it was the writer's intention that both beginning and advanced students might profit from some of the suggestions and reports on research which are included in this work.

Actual fabric illustrations, pictorial material and graphs and charts have been included, and this visual material combined with the explanatory material might well be of service to the hobbyist who wishes to expand his knowledge of handweaving, and develop his interest in what is certainly a fascinating and highly rewarding hobby. The method included here is designed for self-instruction as much as for regular supervised instruction.

The writer harbors the hope that experienced designers might be able to get additional ideas for greater creativity by examining some of the work included here.

And finally, the material within this thesis could help anyone develop a greater understanding of the way in which fabrics are designed.
BIBLIOGRAPHY

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