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The paper stencil method of silk screen printing

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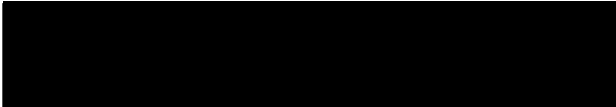
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AN ABSTRACT OF THE THESIS OF Niles Brian Martens
for the Master of Science in Teaching presented
May 12, 1969.

Title: The Paper Stencil Method of
Silk Screen Printing.

APPROVED BY MEMBERS OF THE THESIS COMMITTEE:


James S. Hibbard, Chairman


Leonard B. Kimbrell


Richard J. Frasch


James L. Hansen

The materials of this thesis are concerned with
the stencil method of silk screen printing. They are
intended for use by high school teachers.

The research examines both the creative and
technical aspects of printing designs and compositions

on a large scale. Paper stencil variations are examined as applied to silk screen reproductions. These methods are discussed in relation to the art classroom. The descriptions of classroom processes are based on the application of the stencil method in Sunset High School, Beaverton, Oregon.

THE PAPER STENCIL METHOD OF SILK SCREEN PRINTING

by

NILES BRIAN MARTENS

A thesis submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE
in
TEACHING

Portland State University
1969

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CHAPTER I

INTRODUCTION

This thesis describes the paper stencil method of silk screen printing. The research involved techniques of creative silk screen printing which the art teacher can apply in the classroom.

My intended teaching objectives were, to apply this material in a classroom situation, and gain feedback information concerning this method of printing.

Classroom Demonstration and Application

A classroom demonstration and application of the thesis material was held at Sunset High School through the cooperation and assistance of Mrs. Lee Perron and Mr. Gary Mueller.

The sixteen students in the classroom printed for four weeks. Due to a limited number of silk screens, the students worked in pairs. This allowed eight students to print, while their partners were planning and creating paper stencils.

The division of the class allowed for each student, one day for planning and preparing, and the following day for printing.

The succeeding is a description of my teaching experiences at Sunset High School.

1. A silk screen printing demonstration was presented to familiarize the students with the printing process and the paper stencil.
2. Various techniques of creating images with the paper stencil were discussed. Each student created several stencils, applying a different technique in each stencil (cutting, tearing, etc.).
3. Using the created stencils as examples, various methods of adhering stencils to the screen were presented.
4. Students mixed opaque and transparent colors, and practiced printing images from their stencils (#2, above section).
5. Repeat printing of one stencil image to form a design or pattern on a large printing surface was introduced. Potato prints, textile and graphic designs were discussed as examples of repeated images.
6. The "progressive stencil-series" composition was explained. An abstract composition, which expressed the character of (1) a beach house, (2) an office building, (3) or psychedelic

supermarket was assigned. Shape, composition and transparent color relationships were discussed and related to this assignment.

Detailed descriptions explaining the printing process, cleaning the printing equipment, and the storage of equipment, supplies and silk screen prints have not been examined in this thesis. The books listed in the Bibliography deal with this material fully. For a classroom reference text, Kenneth Auvil's Serigraphy, Silk Screen Techniques for the Artist is recommended.

CHAPTER II

THE PAPER STENCIL METHOD

The paper stencil method of silk screen printing is a basic technique for creating a printed image. It can be described as a paper surface attached to the screen which closes or blocks out specific areas, allowing only the open areas of the screen to print.

The paper stencil is the most spontaneous silk screen technique the student can use. He can create the desired form or design with paper, and promptly adhere his stencil design to the silk screen and print the resulting image on paper.

The immediacy of paper stencil development, and building a composition by combining a series of images through overlaying colors, offers a unique printing experience for the student.

Techniques of Creating Images

The techniques for creating printed images with a paper stencil are both simple and complex. Every student should create stencils and print images from each of the techniques discussed. The following descriptions do not exhaust all the possible ways of

creating silk screen images with paper. Other possibilities may be discovered by the students during the process.

Cut Paper Stencil

A cut paper stencil is a piece of paper with parts cut away. The openings created by cutting into the stencil allow the color to pass through the screen and become the printed image. A mat knife is suitable for cutting a paper stencil.

Figure 1. The cut paper stencil has a characteristic visual quality of fine, sharp lines and uniform flat color (page 6).

Torn Paper Stencil

Many varied and interesting line qualities can be achieved by means of the torn paper stencil. The irregular and oftentimes fuzzy quality of the edges contrast the sharp, clear, linear quality of the cut paper stencil. The spontaneous tearing of paper lends itself to stencils of abstract shapes.

Figure 2. The image from a torn paper stencil (page 7).

Absorbent Paper Stencil

This stencil is composed of rice paper or other absorbent papers. The fine, thin areas will readily absorb the color mixture. Heavier sections will block out the color mixture. This combination relates to

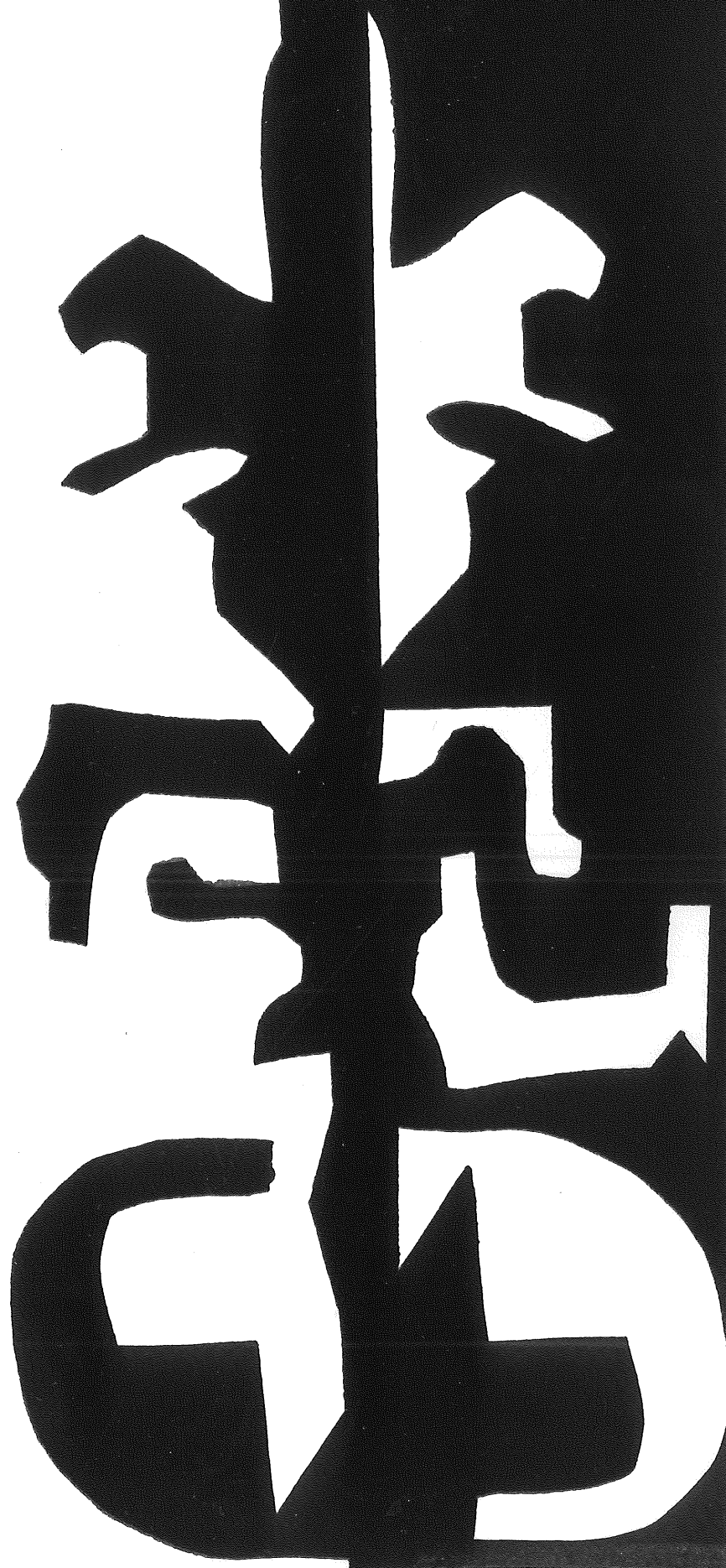


Figure No. 1




Figure No. 2

optical mixing, and produces an imagery not unlike pointalism (i.e., various sizes of color spots).

Color will be absorbed by this stencil during printing. The rate of absorbency will not affect the small number of prints (under 30) produced in the art classroom. A very thin color mixture will absorb rapidly into the paper stencil and may destroy the "pointalist" effect.

Figure 3. Absorbent paper stencil image
(page 9).

Wrinkled Paper Stencil

A stencil which has been creased, crushed or wrinkled contains a variety of thin, vein-like lines. These lines will absorb color and print an image. A more positive image will result if the crushed stencil is rubbed with sandpaper. A knife can be used to cut into the vein-like lines. This will produce a stronger image.

Absorbent lines add rhythm and textural change to a cut or torn stencil. This stencil can be taken from a wrinkled sheet of paper, or the stencil, already cut or torn, may itself be wrinkled.

Every stencil should be "proofed", especially the wrinkled stencil. A few practice prints are necessary to allow the fine lines to become fully loaded with color. The trial proofs will aid in planning the next



Figure No. 3

screen of a particular composition.

Figure 4. A wrinkled stencil image (page 11).

Sanded Paper Stencil

A textured surface can be produced by sanding a stencil. The paper stencil is placed on a textured surface, such as corrugated cardboard, and rubbed with coarse sandpaper. The sandpaper striking the high points will wear a porous texture in the stencil, which allows the paint to pass through. It is also used to soften the well-defined edges of cut or torn paper stencils. The sanded edge resembles a halftone. It provides a transition from the negative stencil area to the positive paint area.

Figure 5. A sanded paper stencil image created by sanding the stencil over corrugated cardboard (page 12).

Punctured Paper Stencil

A vibrant, staccato effect is produced by punching holes in the stencil. Nails, knife blades, and scissors are used. Small punctures will be precise and sharp, larger holes have coarse edges.

A cardboard cushions the stencil and protects the table surface.

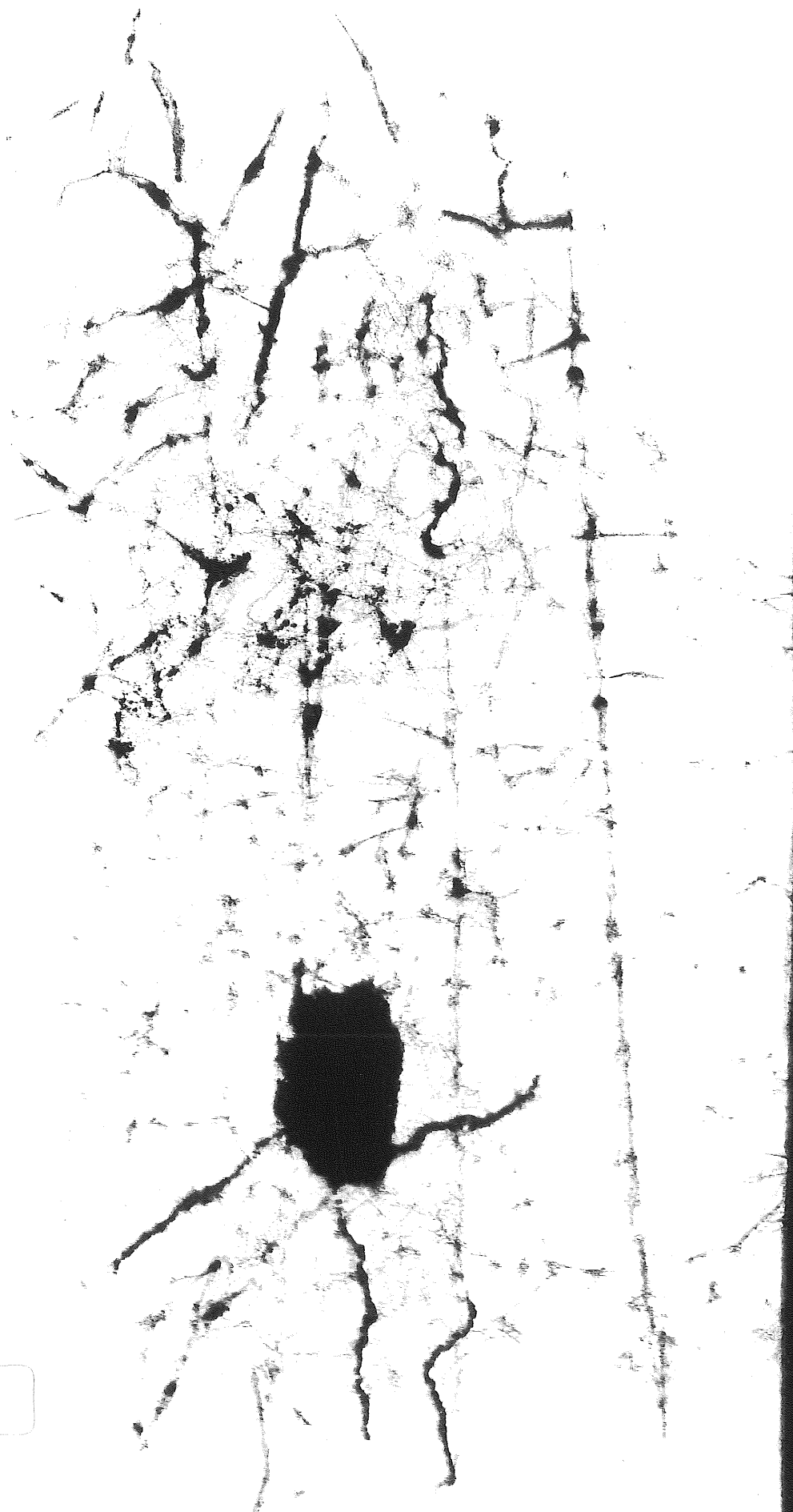


Figure No. 4



Figure No. 5

Figure 6. A punctured paper stencil image showing the results of scissors, a knife blade and a nail (page 14).

Ready-made Paper Stencil

Paper doilies and place mats are good examples of ready-made stencils. They combine well with other stencils. Printing with this type of stencil demands a light pressure on the squeegee. A doily is very thin and excessive squeegee pressure will force color under the stencil, reducing the clarity of the printed image.

Figure 7. A ready-made stencil image, created from a paper doily and a paper place mat (page 15).

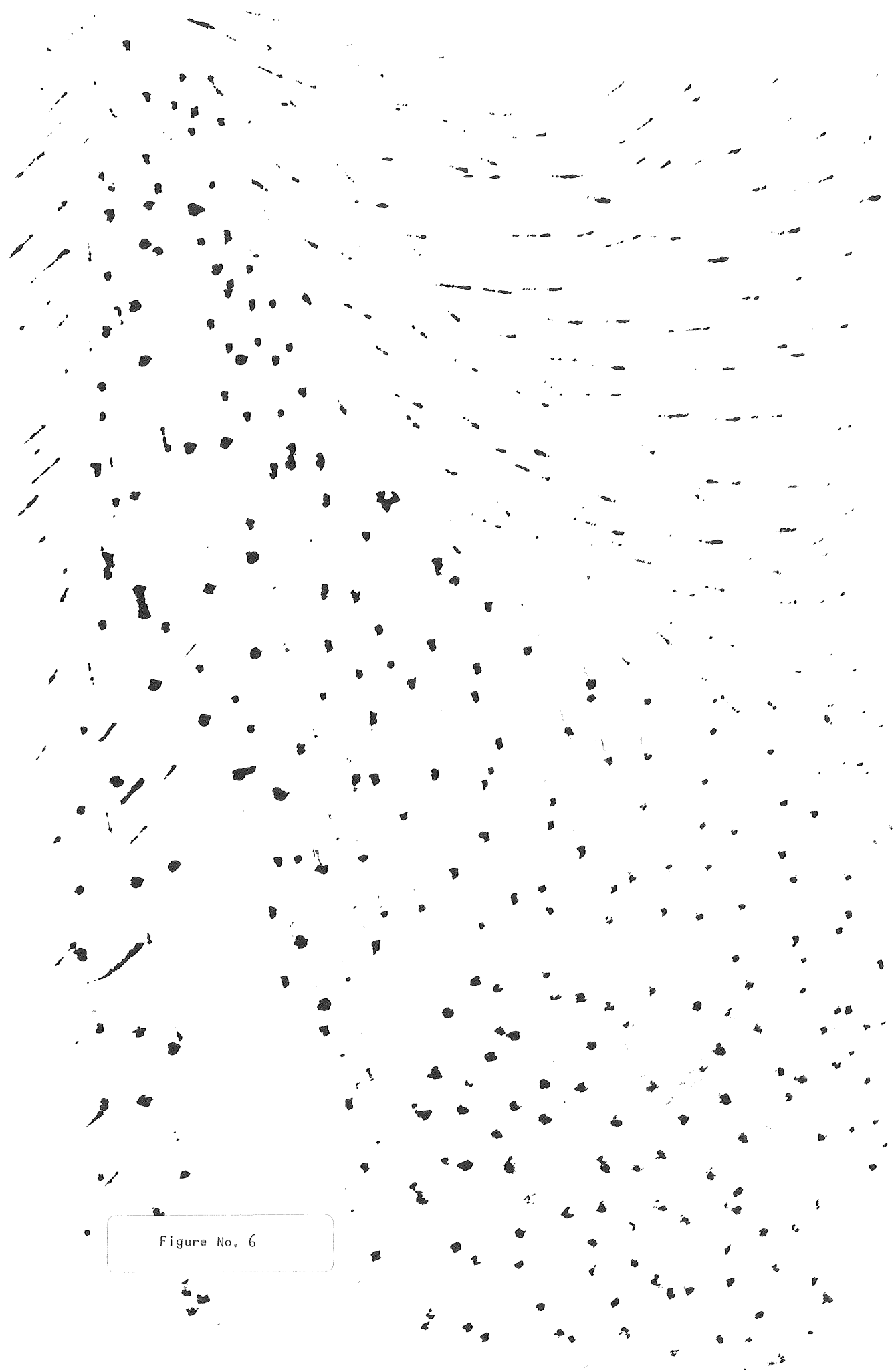


Figure No. 6

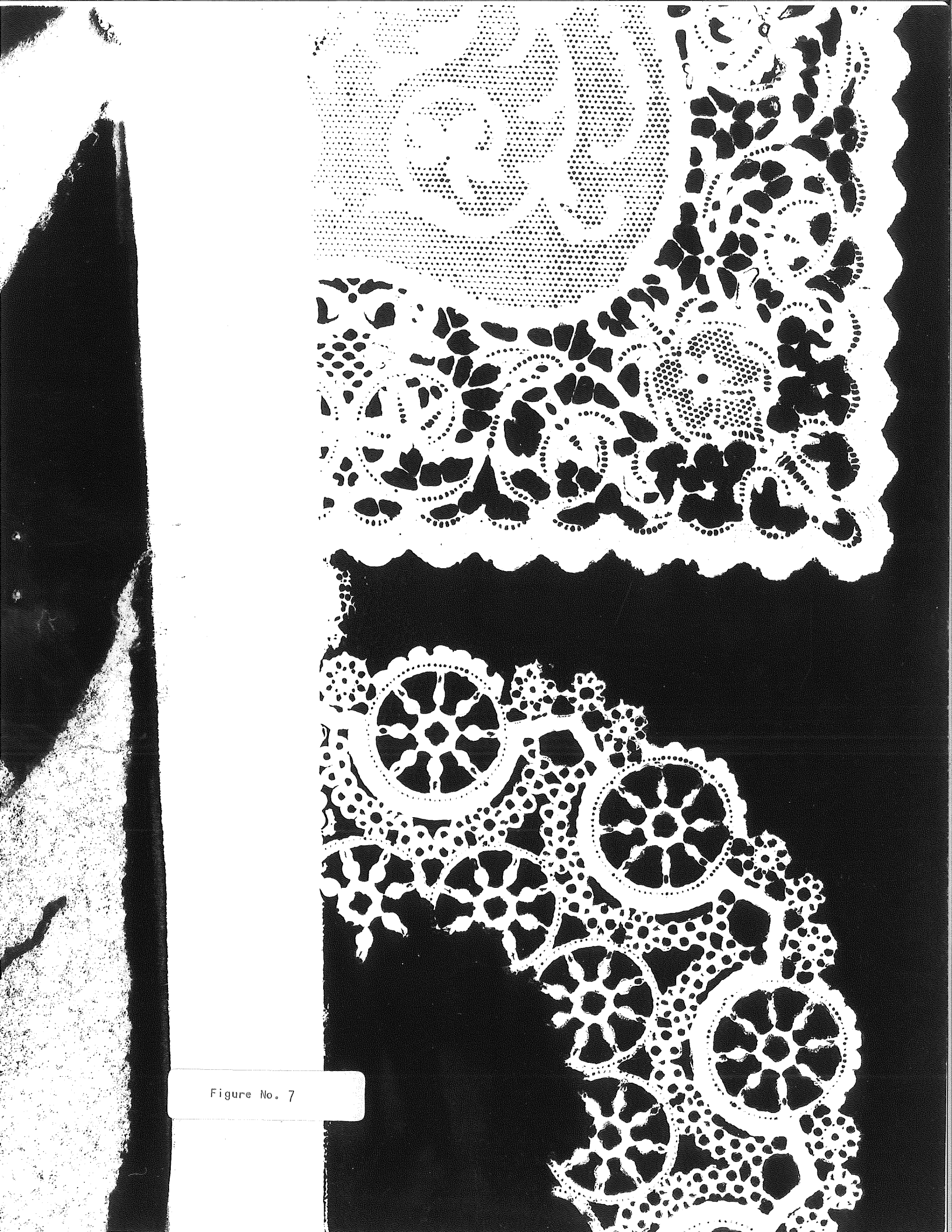


Figure No. 7

CHAPTER III

PRINTING IMAGES WITH THE PAPER STENCIL

Attaching the Paper Stencil

A paper stencil is easily attached to the silk screen. The screen is placed over the paper stencil, color mixture is added on the screen, and the first image is printed. This action causes the paper stencil to adhere to the color mixture in the screen.

Thick paper does not adhere well and it may not remain attached to the screen during the printing process.

A wrinkled paper stencil will not adhere to the silk screen as will "flat" paper stencils. It is advisable to attach this stencil to the screen with masking tape or water soluble glue.

The printer should tape or glue those parts of a stencil requiring additional adhering strength to the margins of the screen. Tape should not overlap onto the exposed screen surface. It would produce an image.

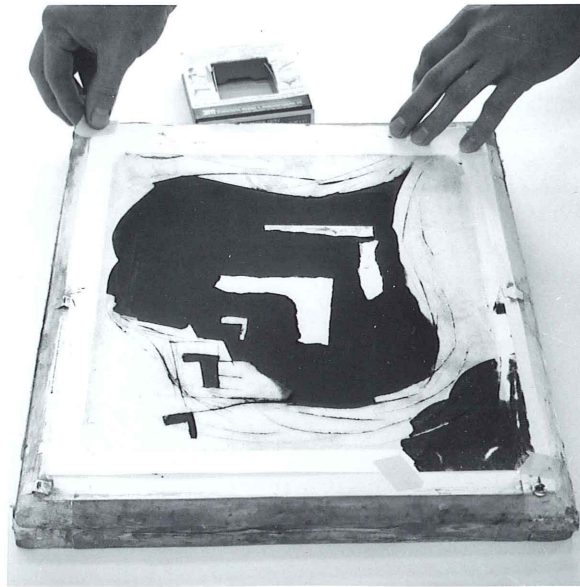


Figure 8. Adhering the paper stencil to the screen with masking tape.

If the paper stencil is an "isolated area," i.e., stencil areas that are detached from the rest of the stencil, masking tape will attach it to the screen through a hole in the stencil.

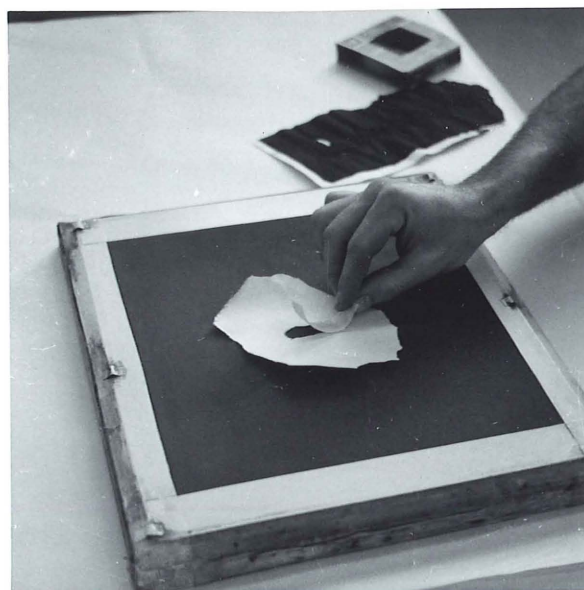


Figure 9. Adhering an isolated shape to the screen with masking tape.

An isolated stencil can be attached to the screen with water soluble glue. Le Page's Strength Glue, Original Glue, Mucilage, or Wheatpaste are among the glues used to adhere a paper stencil. By placing the screen over the stencil, adding small dots of glue to the necessary areas and allowing the glue to dry, the stencil will be secured. The glue will dissolve in water when the screen is cleaned.

The Opaque Color Mixture

Silk screen process colors, taken directly from the can, may require some thinning. Students can thin color to a printing consistency by adding transparent base, paint thinner or turpentine. Five parts transparent base will not alter the opacity of one part color.

The printer should thin his color by adding no more than tablespoon amounts of a thinning agent. Properly thinned paint resembles the consistency of thick cream.

A fast dry varnish will add gloss and reduce the drying time of a color. Often the varnish dries too rapidly, clogging the screen before the printing is finished. If this occurs, the stencil must be removed and the screen cleaned.

Transparent Color Mixing

Transparent color mixture can be obtained by combining one part (tablespoonful) of opaque color with ten parts of transparent base. Transparent base diminishes the intensity of a color mixture.

The base will mix with all silk screen process colors, tinting colors and all oil pigments. Different pigments will vary in tinting strength. Generally the

phthalocyanine and oxide pigments are high in tinting strength, the cadmium and earth pigments are medium to low in tinting strength.

The transparency of a color can be tested by smearing a sample on paper. Frequently, the more reliable method of trial printing is used to test the color mixture.

CHAPTER IV

REPEATING A PRINTED STENCIL IMAGE

The paper stencil method of printing is used in two ways: as a repeated stencil design and a "progressive series" composition. Both methods involve a repetition of the image over a large surface.

Creating a Repeated Image Design

A repeated image design is achieved in the manner of a potato print design, wallpaper design, or fabric design, by repeating the image across the format. To create a coherent pattern, a composition of three images wide and five images in length should be used.



Figure 10. Repeating a single image to form a total design.

The single, repeated stencil (Figure 10) has attractions. However, we are interested in the development of a multi-stencil design.

The final design is evolved from sequential stages. Each stage is a single stencil repeated across the surface. Figure 10 is the first stage of a multi-stencil design. Other stages, each comprised of distinct designs, will form the total composition.

Transparent colors are advantageous for this design. Each overlapping color allows exposure of the colors beneath. This makes many effects possible.

Creating a Progressive Series Composition

This method is similar to the repeated image design, i.e., a multi-stencil design, evolved from sequential stages and comprised of transparent color overlays.

It involves alteration of the paper stencil through addition and subtraction of stencil sections. The progressive stencil should be created in sections, not unlike a collage. This will simplify the succession of stencil parts.

The first stage of a progressive series composition (Figure 11) should not be limited to the dimensional requirements of a repeat stencil design. Although the example shown is rectangular, many compositional possibilities exist.

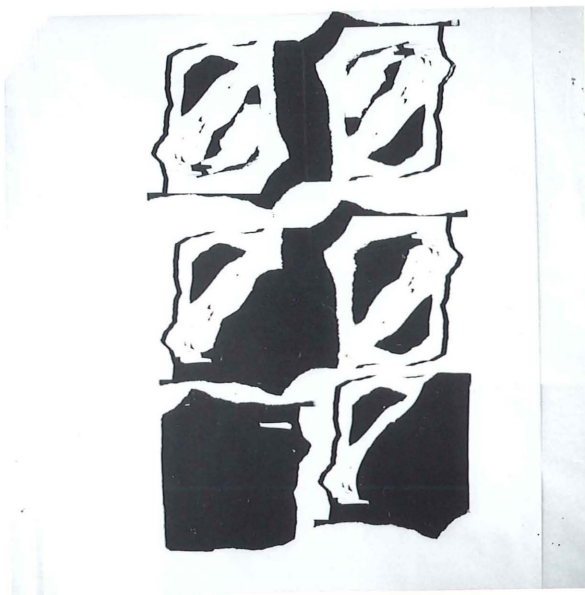


Figure 11. The first stage of a progressive stencil composition was created by removing segments from the stencil.

CHAPTER V

CONCLUSION

A summary of the classroom presentation at Sunset High School.

1. The paper stencil method related to the functions of the classroom.
2. Students had little difficulty utilizing techniques and producing images.
3. Student knowledge of two dimensional shape relationships was increased.
4. Student silk screen production was successful, often exceptional.
5. Characteristics of transparent color overlays were realized during the final week of printing.

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APPENDIX A

SILK SCREEN MATERIALS

1. A silk screen size of approximately 11" x 13" is suitable for classroom printing and inexpensive to construct. After taping the borders, the printing size is approximately 9" x 11".

I recommend the addition of "elevation" tacks or screws to the bottom of the screen frame. The purpose of the quarter-round tacks or screws is to raise the frame 1/4" above the printing surface. This is intended to prevent the frame from smearing a previous print.

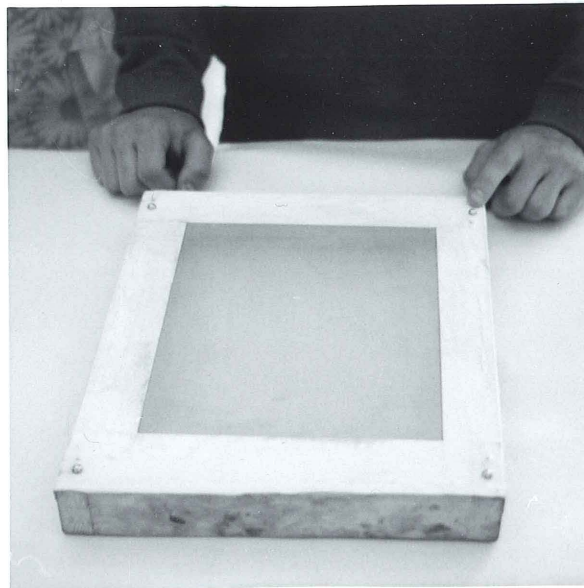


Figure 12. A portable silk screen with four "elevation" tacks.

2. Squeegees can be made from rubber or silicone belting. Belting which is $1/4$ " in thickness and 2" wide is recommended. The school woodshop is a source for construction of wooden handles to hold the rubber belting.

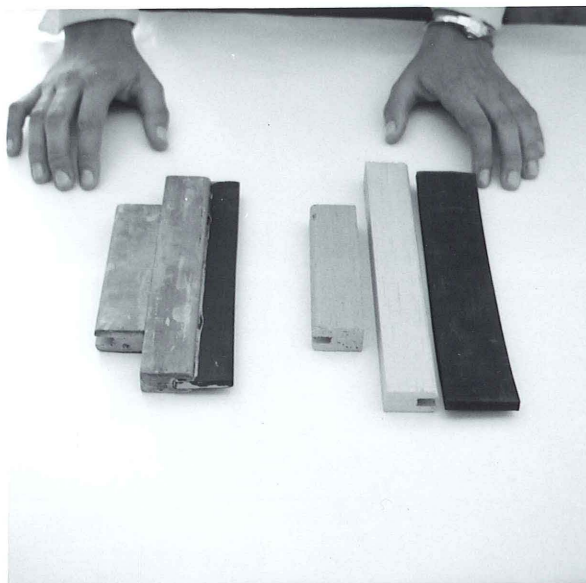


Figure 13. A squeegee and the materials used for construction: wooden handle and rubber belting.

3. Silk screen paints in quart cans will cost approximately \$3.50, a gallon of transparent base or "extender" is the same price. Artist oil paints and oil tints may also be used with the transparent base.

4. Thinners such as paint thinner, turpentine or kerosene are used to clean the printing equipment and thin colors. Paint thinner is probably the least expensive.

5. Printing surfaces are limited to flat surfaces. For classroom purposes a roll of white wrapping paper (untreated, "butcher" paper) is the most adequate and inexpensive printing surface. Wrapping paper was used in this research. It is sold in rolls; the wide roll (36" x 48") is recommended. Colored rolls are also available. Aluminum foil, cotton yardage and other surfaces may be used.

6. Silk, screen process colors and other printing supplies may be purchased from: Ralph Leber Company, 1520 S. W. 12th, Portland, Oregon, and Sherman Williams Company, 1725 N. E. 40th, Portland, Oregon.

A checklist of materials and supplies for a class of sixteen students, used during four weeks of printing.

- 8 silk screens, (11" x 13" ea.)
silk size, (12" x 14" ea.), 12xx silk mesh
- 8 squeegees, (9" long, ea.)
rubber belting, (1/4" x 2" x 9" ea.)
wood handles, (9" ea.)
- 2 gallons of transparent base
- 1 quart of Cobalt Blue
- 1 quart of Fire Red
- 1 quart of Medium Yellow
- 1 quart of Opaque White
- 3 gallons of paint thinner
- 1 roll of white wrapping paper, 36" wide
- 1 roll of masking tape
- 1 small bottle of art glue, (water soluble)
- 1 box of thumb tacks
- 35 tin mixing containers
- 50 large, wooden tongue depressors
 - old newspapers
 - cotton rags

APPENDIX B

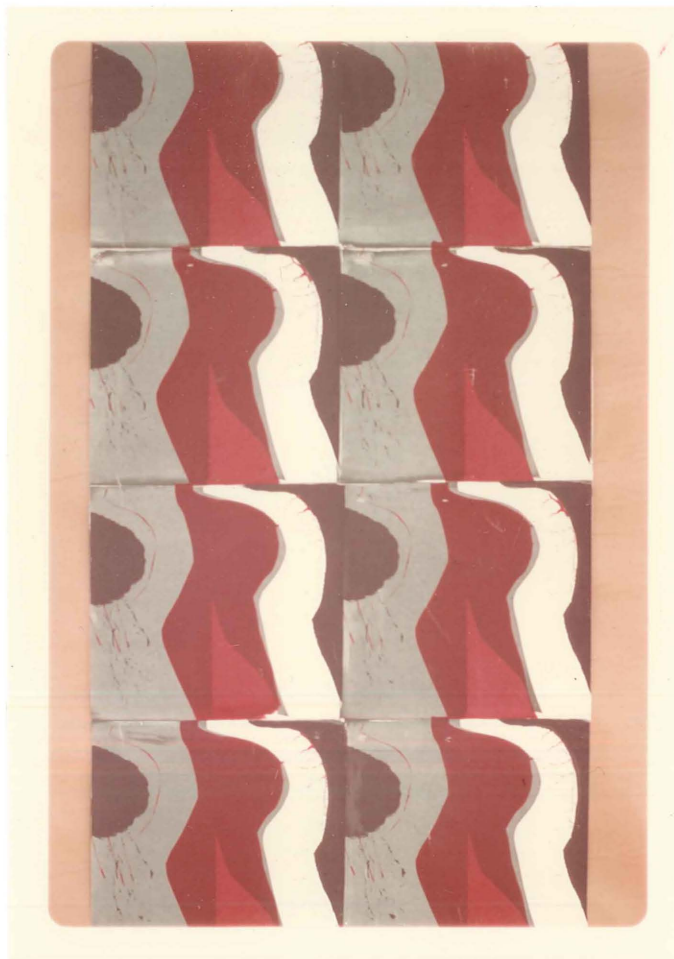
SILK SCREEN DESIGNS AND COMPOSITIONS

BY THE AUTHOR

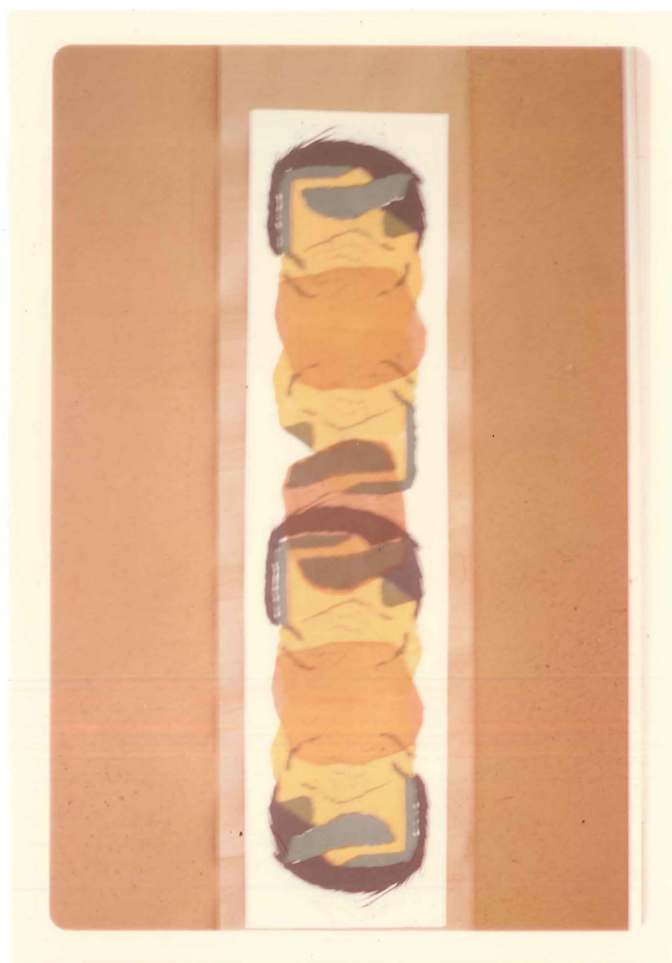
(1968)



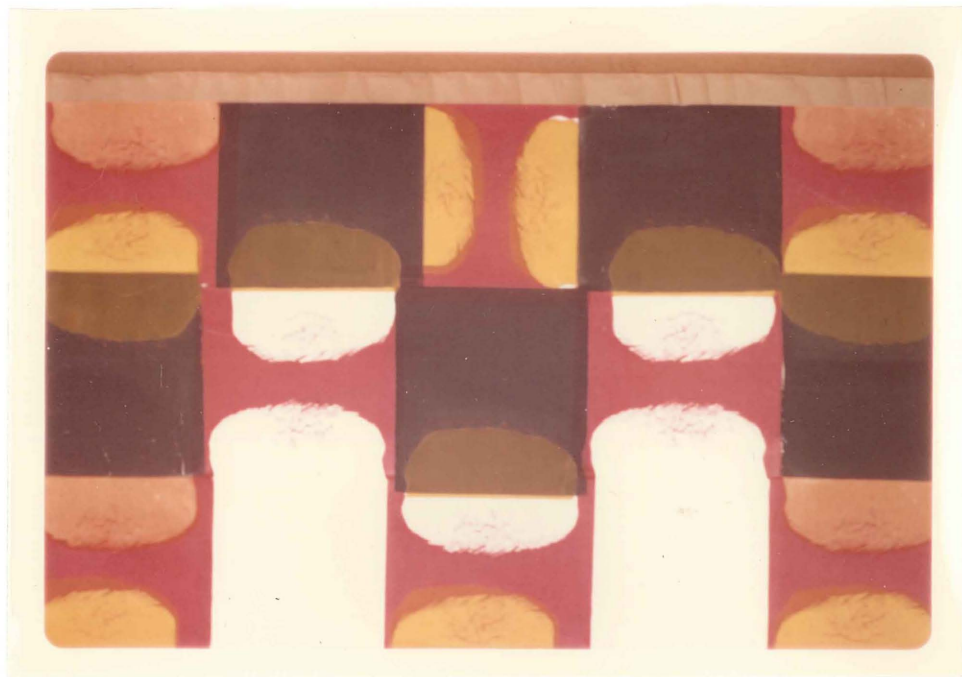
Composition #1, (31" x 48")



Repeat Design #2, (24" x 45")



Composition #3, (16" x 58")



Composition #4, (33" x 53")



Composition #5, (33" x 50")