



Design and execution of a mosaic tile mural for the Student Union Theatre at Montana State College
by Duane Robert Hagen

A thesis submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree of
MASTER OF APPLIED ART

Montana State University

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Abstract:

The possibility of creating a mural that would be of lasting significance to the interior of the Student Union Theatre intrigued the author. The plain, unadorned wall of the ticket booth offered a location for a mural to provide texture, color, and depth in a cramped and uninteresting space.

The author spent considerable time working in theatre productions which inspired several ideas for the mural. One used a cut tile that fitted into a realistic cartoon. Another idea had large pieces of cut tile that had been painted with glaze. The final design was of an abstract nature with small rectangular tiles being glazed with a variety of colors developed from Hagen V glaze. The Hagen V glaze was tested with five or six different proportions of each of twelve different coloring oxides, to produce many interesting colors. Many of these colors were used in the mural; others showed good possibilities for other ceramic use.

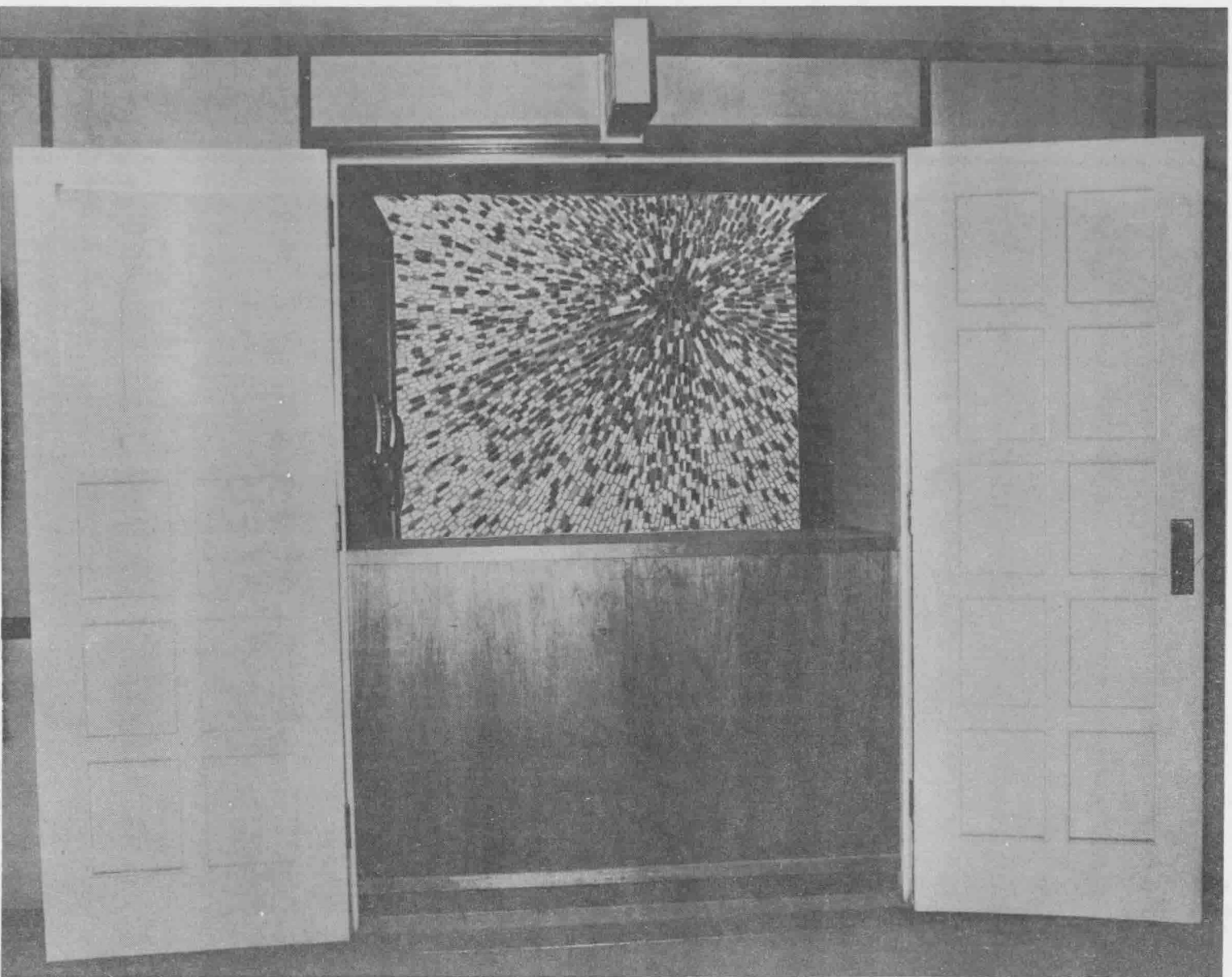


Figure 1. Completed mural

DESIGN AND EXECUTION OF A MOSAIC TILE MURAL FOR THE STUDENT UNION
THEATRE AT MONTANA STATE COLLEGE

by

DUANE ROBERT HAGEN

A thesis submitted to the Graduate Faculty in partial
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MASTER OF APPLIED ART

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Bozeman, Montana

August, 1963

ACKNOWLEDGMENT

In deep appreciation I acknowledge the assistance and encouragement through-out the many summers it has taken to complete this thesis, of the following people; Cyril H. Conrad, Jessie Wilber, Frances Senska, Robert DeWeese, George Conkey, and Joseph C. Fitch.

I also wish to express my gratitude to Michael Conkey and Veris Wessel whose help has been most valuable, and to Robert Dunbar, without whose council this thesis might not have been undertaken.

TABLE OF CONTENTS

	Page
Title Page.	i
Vita.	ii
Acknowledgment.	iii
List of Tables.	v
List of Figures.	vi
Abstract.	vii
Introduction.	viii
Outline Of The Problem.	x
HISTORY OF MOSAIC	2
PRELIMINARY AND SUPPLEMENTARY STUDIES.	5
THE DESIGN.	7
INFLUENCES OF LITERATURE CONSULTED.	16
THE GLAZE	20
CONSTRUCTION OF THE MURAL AND TESSELLATING.	26
MAKING THE TESSERA.	27
SUMMARY AND CONCLUSION.	29
Literature Consulted.	31

LIST OF TABLES

TABLE	PAGE
I China Paint On Bathroom Tile.	21
II High Fire Glaze On Bathroom Tile	21
III China Paint On Hagen V Glaze at 1950 ⁰ F.	23
IV China Paint On Hagen V Glaze at 2380 ⁰ F.	23
V Colors Obtained With Hagen V Glaze	25

LIST OF FIGURES

FIGURE	PAGE
1. Photograph of The Completed Mural.	Frontispiece
2. Photograph of The Student Union Theatre Ticket Booth	xi
3. Photograph of Initial Design	8
4. Photograph of "Tom Sawyer" Example	9
5. Photograph of Close Up of "Tom Sawyer" Example	9
6. Photograph of Early Designs.	11
7. Photograph of Early Designs.	12
8. Photograph of Early Designs.	14
9. Photograph of Early Designs.	15

ABSTRACT

The possibility of creating a mural that would be of lasting significance to the interior of the Student Union Theatre intrigued the author. The plain, unadorned wall of the ticket booth offered a location for a mural to provide texture, color, and depth in a cramped and uninteresting space.

The author spent considerable time working in theatre productions which inspired several ideas for the mural. One used a cut tile that fitted into a realistic cartoon. Another idea had large pieces of cut tile that had been painted with glaze. The final design was of an abstract nature with small rectangular tiles being glazed with a variety of colors developed from Hagen V glaze.

The Hagen V glaze was tested with five or six different proportions of each of twelve different coloring oxides to produce many interesting colors. Many of these colors were used in the mural; others showed good possibilities for other ceramic use.

INTRODUCTION

During the summer of nineteen fifty-six, Montana State College was in the midst of an expansion development. The Student Union was enlarged to provide better facilities to accommodate the students at the college. The ballroom was converted from a dance and banquet area into a student theatre and extensive work was done to provide a home for the offices of the college theatre department. During the redevelopment, the front hallway connecting the student lounge with the east entrance was not changed, and three sets of double doors that had served as entrances for the ballroom were now used for the theatre. The space behind the center set of double doors was converted into a ticket booth and storage area, thus utilizing space under a former balcony that was converted into offices and a projection room. When the center set of double doors was opened, a counter was revealed which covered half of the space within the door frame. Two side partitions enclosed the ticket booth area and there was blank wall in back.

At the time of the expansion, I was doing graduate work and my interest in the theatre had just been revived. I was offered the opportunity to create a mural for the ticket booth. The bleakness of the wall, the cramped space, and the limited visual quality of the booth were all stimulating challenges in meeting the problem.

At the time of formulation of the thesis, I was intrigued by the qualities of a glaze that I had developed in a Special Topics class in ceramics. It seemed logical to me to combine the two problems. My experience in

theatre and ceramics led me to feel that a mosaic mural would offer stimulating research in glaze color and texture and experience in mural execution, with the final result of enhancing the theatre.

OUTLINE OF THE PROBLEM

1. A mural for the ticket booth of the Student Union Theatre.
2. Solve the problem of a cramped, bleak, visually limited wall space with brightness, depth, and interesting textures.
3. Solve the problem of a ticket seller dominating the visual space within the booth.
4. Design a mural consistent with the artist's interpretation of theatre.
5. Develop a glaze and a variety of colors from it that would fit a high fire clay.

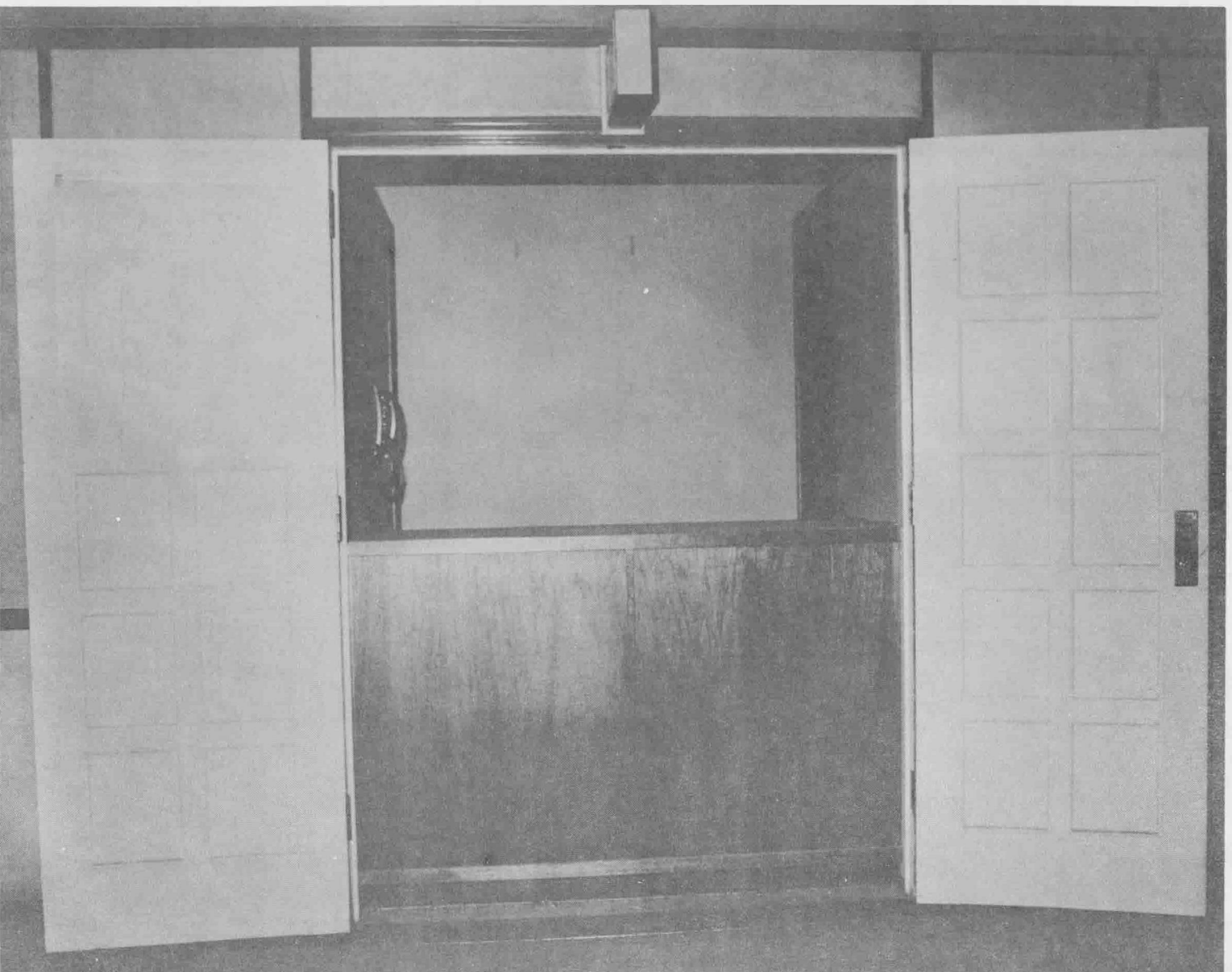


Figure 2. Photograph of the Student Union Theatre Ticket Booth

HISTORY

Today the use of mosaic in the field of art and architecture is displaying a strong comeback. Contemporary designers, architects, interior designers, and craftsmen looking for a new art medium to relate art to architecture have turned to mosaic. (6) (14) (34)

A mosaic, in its broadest interpretation, may be termed a method of placing small pieces of differently colored materials closely together so as to form a surface, usually with a pattern or a pictorial representation. (1)

The beginning of mosaic is mysterious. Most authorities believe that the earliest artists worked around Damascus, Cairo, and the Near East. (15) Inlay was used by Mesopotamians as early as the fourth millennium B.C. (1) The Sumerians five thousand years ago or possibly even earlier had walls covered with mosaics. Houses of the al'Ubaid period are found with cones of baked clay, shaped somewhat like pencils with blunt end painted red or black, or sometimes left plain. These cones were used for wall mosaics. (1)

Some of the earliest methods consisted of inserting colored glass and earthenware into sinkages in tile or stone columns as well as walls. Another early use of the medium was in pavements and the lining of water cisterns. Existing fragments showing early Sumerian war scenes date back more than 1,000 years before Christ. (1) (14) In 1,400 B.C. Ikhnaton built the city of Tel El-Amarna in Egypt. He had the capitals of his temple columns inlaid with fragments of gorgeously colored glass and the

spaces between the tesserae were gilt. (15)

Turning to the Greeks and Romans, we find much evidence of mosaic at a high level of achievement. In Pompeii, some of the finest examples of floor mosaic are to be found, dating as early as 200 B.C. (14) In the third century B.C. the King of Syracuse installed a mosaic floor on his boat! These ancient floor pieces had light or white backgrounds. (15) The floors of sumptuous Roman villas and baths were covered with mosaic designs. The Romans left a multitude of floor mosaics in Italy, North Africa, Syria, France, Germany, and England. (14)

Mosaic reached its highest development as church art in the Byzantine period from the fourth to the fifteenth century after Christ. (15) Mosaic, as used in churches during the Byzantine period, was not mere decoration but a kind of sacred cinema. Employing symbols and dramatic Biblical text, its ultimate purpose was to raise the minds of its beholders to the contemplation of God. Medieval society was illiterate in our modern sense. Illustrative mosaics explained the story. This art flourished before printing and spoke to society in a language all could understand--the language of the graphic symbol. Not only did mosaic carry "news"; it also formed a link between the natural and supernatural worlds. (15) Some of the most outstanding work of the Italian Byzantine mosaicists is to be found in the half-dome mosaics of the apses of Roman basilicas. (14) Ravenna, universally famous throughout the East and West for the number and beauty of the early Christian and Byzantine mosaics which line

its churches and baptisteries, can be said to have upheld the historical tradition of a craft which at its best is a great art. No other city holds within the confines of its walls such a remarkable number of works from the fifth and sixth centuries when mosaic art was at its height.

(4) (5)

Beginning with the middle part of the thirteenth century, Byzantine mosaic began to decline until all traces of it disappeared. One of the major factors responsible was the emergence of the great Italian mural painters. (14) Another was the glass industry, which had so perfected its technique that mosaic glass was available in hundreds of shades. Mosaicists then copied painting and mosaics became overcomplicated. (15) The decline of mosaic was rapid and almost complete. Glass industries ceased manufacturing mosaic glass and they did not produce it again until 1865. (14) However, in Constantinople as well as in Greece, mosaics continued to be used for church ornamentation until the fall of Constantinople. (14) (15) During the Victorian era, mosaics were harshly criticized. Critics at the time could not value what seemed so foreign to them; stark patterns, rigid figures, and limited color range. (15) Some mosaicists continue today a deplorable practice which, beginning in the 15th century, subordinated mosaic qualities to painting; the mosaicist sought to imitate painting in each and every detail with effects of seductive softness. This practice persisted in succeeding centuries, particularly in Rome, Florence, and Venice. (5)

Another highly developed tradition of mosaic art flourished in the western hemisphere among the Aztecs of Mexico. Their ceremonial pieces and sacred structures were covered with precious turquoise, quartz, obsidian and mother of pearl. (11) (14)

Today the art has surprising popularity in our civilization. The mosaics on the buildings at the University of Mexico by Juan O'Gorman, those of Gino Severini in Italy and France and those of Joseph L. Young of Los Angeles are just a few of the contemporary examples in the media. The broad intention of today's mosaics gradually become clear to all of us: to bring a sense of joy, vitality and excitement to public places, and to humanize the stone and steel of modern buildings. (12)

PRELIMINARY AND SUPPLEMENTARY STUDIES

Formal and informal study in Philosophy, Theatre, Aesthetics, Ceramics, Design, Drawing, and Art History, along with teaching the use of mosaic in senior high school, junior high, and adult education classes and a special class for creative children from grades four to six were supplementary investigation for the execution of this thesis. Other informal studies that were helpful were personal execution of various forms of mosaic, observation and planning of a program for mentally defective children and many hours of informal work with Wenona Tomanoczy and Emmy Lou Packard, professional mosaicists.

While working with a selected group of children from the grades four to six, I used mosaic as a climax to a nine-week course of accelerated study in art. The twenty-eight children out of two-hundred who tried out for the class were selected for their creative abilities and were directed in the use of many art materials such as paper, clay, sculpture, wire, watercolor and pastels. The problems were presented to them with the possibility of two approaches; they could either create a pattern on their boards by drawing in any media, or they could create the design from the materials they had collected by direct application. It was found that those who were not hampered by a cartoon were more successful in their mosaics. This same problem was presented to mentally defective children, and it was found that the lack of manual dexterity and imagination were not serious handicaps to them. Their mosaics were usually very colorful, decorative, and provided the children with a sense of accomplishment

that many other problems failed to achieve.

Mosaic was also used as a final problem for high school and junior high school art classes. I found that it is an excellent way to test students on the development of good art fundamentals, since not only is design of utmost importance, but also color, texture, balance and harmony are all necessary for successful completion of a mosaic problem. It is a wonderful lesson in discovering the unique bits of organic and inorganic materials that make up our universe. The combination of these materials creates all kinds of visual excitement.

THE DESIGN

The design to be executed for the ticket booth mural at the Montana State College theatre presented a difficult challenge. I felt that the best possible way to expose myself to the theatre was to be on the stage itself as a performer or backstage working on the technological aspects of the stage. I secured roles in several productions and took my sketch book with me to make drawings of what I saw and felt. The artist in the theatre brings to it visions awake in him that are asleep in us. He arouses our sleeping vision. (16) Much time was spent in drawing the actors to see if they might give me some inner feeling as to the meaning of theatre and stage. These models, as well as other figure studies, served as the formulative conception of my first design.

In the summer of 1960, I chose from among my sketches a group of three figures representing different plays in which I had participated. Sketches were made with water color on illustration board. Black poster board was cut in one-inch widths and was used to simulate steel bands that would frame the individual mosaics. These three mosaics would then be hung on the back of the ticket booth wall in an informal manner and the rest of the wall space would be broken up with more use of the steel bands. The entire wall space of 8' by 8' was to be utilized.

The second phase of the development of the design began in the summer of 1961 when I was again involved in theatre work and earning graduate credit in a course called History of The Theatre. The children's production of Tom Sawyer was produced that year by the theatre

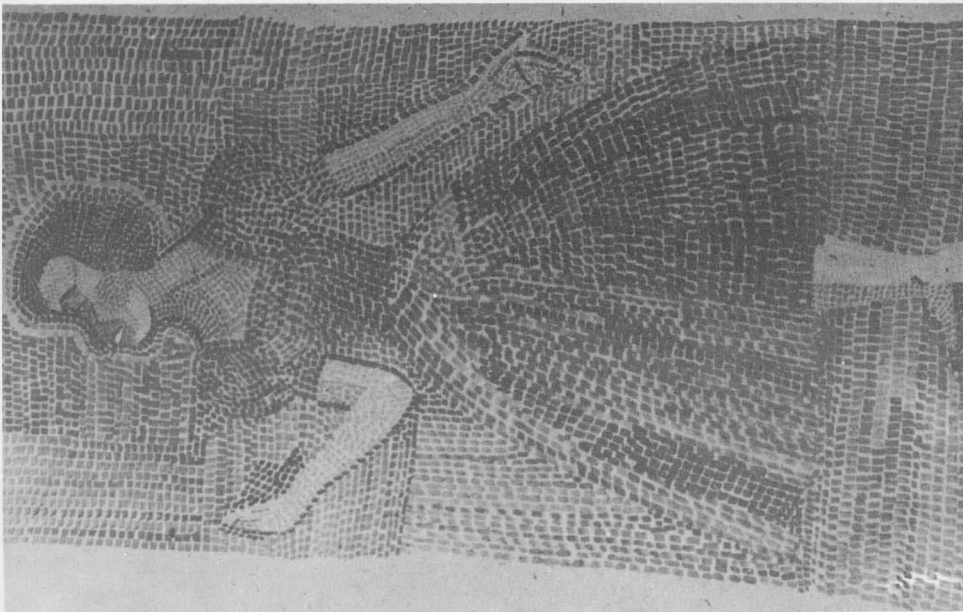
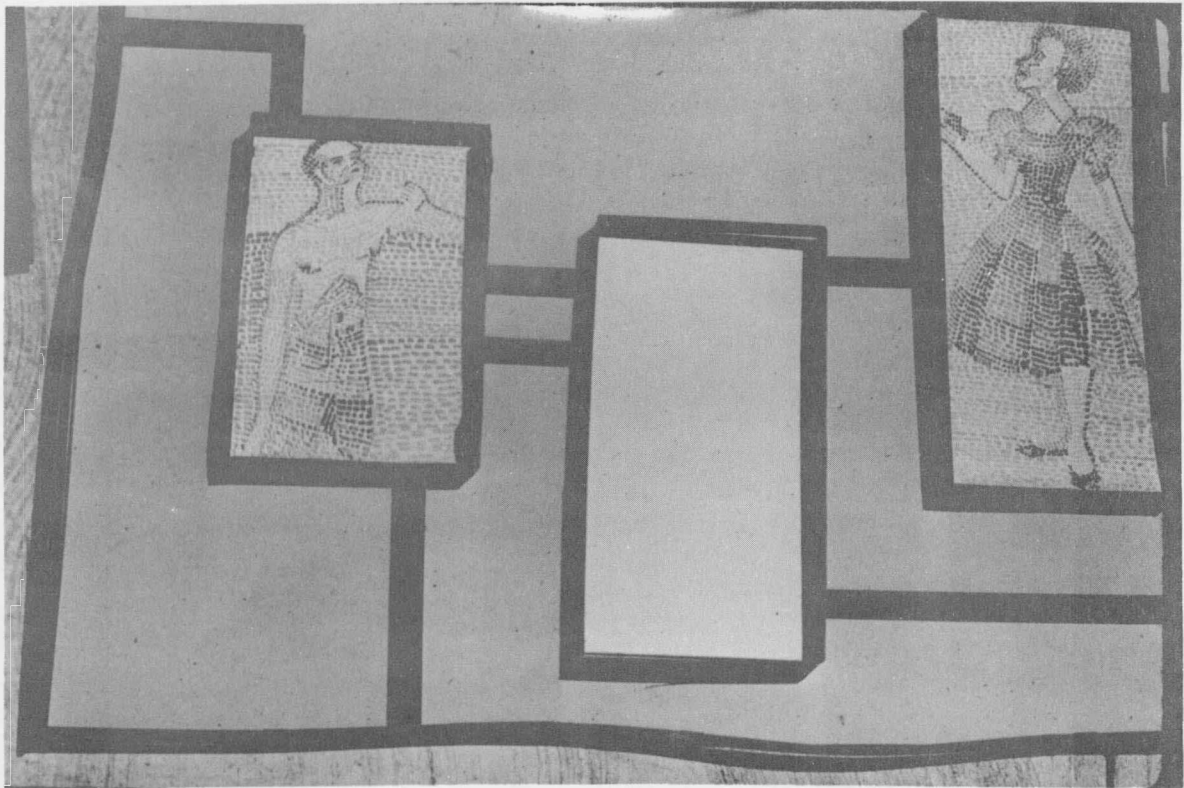


Figure 3. Photograph of Initial Design



Figure 4. Photograph of "Tom Sawyer" Example



Figure 5. Photograph of Close Up of "Tom Sawyer" Example

department and I made sketches of the children involved in the play. At this stage of the development of my design, I wanted to see if it would be possible to revise my previous design because I felt that the studies of the actors themselves were not sufficient to convey my feelings.

I chose to symbolize a single production feeling that it might be indicative of the mood of theatre. Different ways of approaching mosaics were tried. From a single design of Huck Finn painting a fence, two 18" by 24" mosaics were made. One involved the practice of cutting each piece of tile to fit a specific space on the cartoon. A large slab of Lewistown pink clay was dried to leather hardness, and placed over the cartoon, which was drawn on a quarter-inch plywood board that was used as a base for the tile. (13) (21) (27) (30) (35) Each piece of tile was numbered and corresponding numbers were placed on the cartoon. After the tile had been fired at 1950°F (22) they were coated with Hagen V glaze in different tones and colors and again fired at 2380°F. (22) The base-board was varnished and the tile was then glued to the plywood with Wilhold white glue. (18) The glue was dry in 24 hours and the mosaic was grouted with water putty that had been tinted with manganese oxide. (22) (35) The second mosaic sample of Huck Finn was made in much the same way as the first except that after the Lewistown pink clay had been laid over the cartoon it was cut out in larger slabs that incorporated more of the design. The cartoon was drawn on the slabs and the colors painted directly on the raw clay with different tones and colors of the Hagen V glaze, much as you

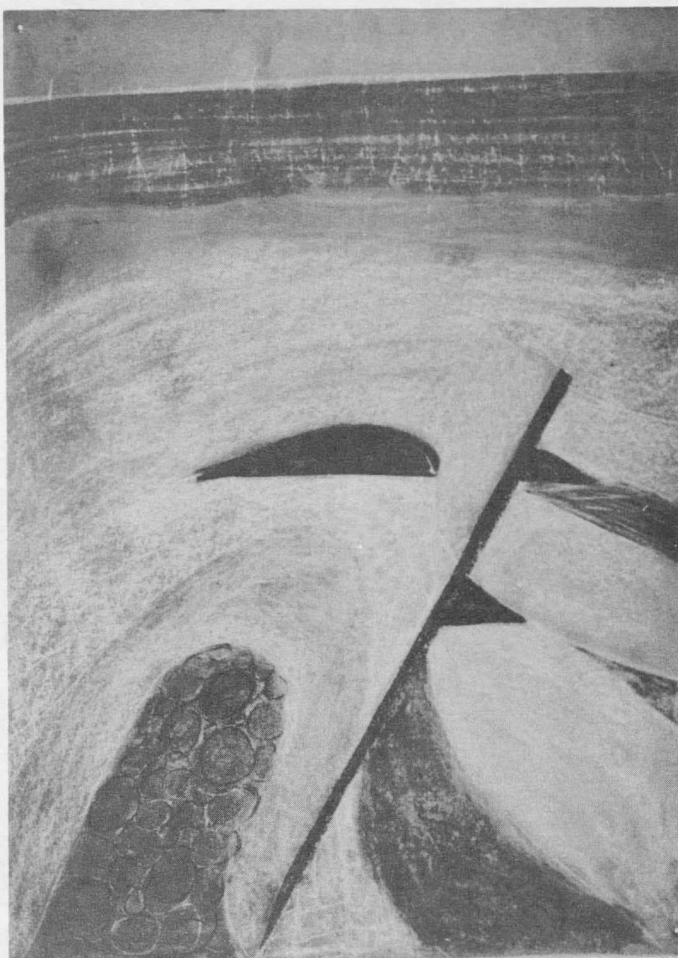


Figure 6. Photograph of Early Designs

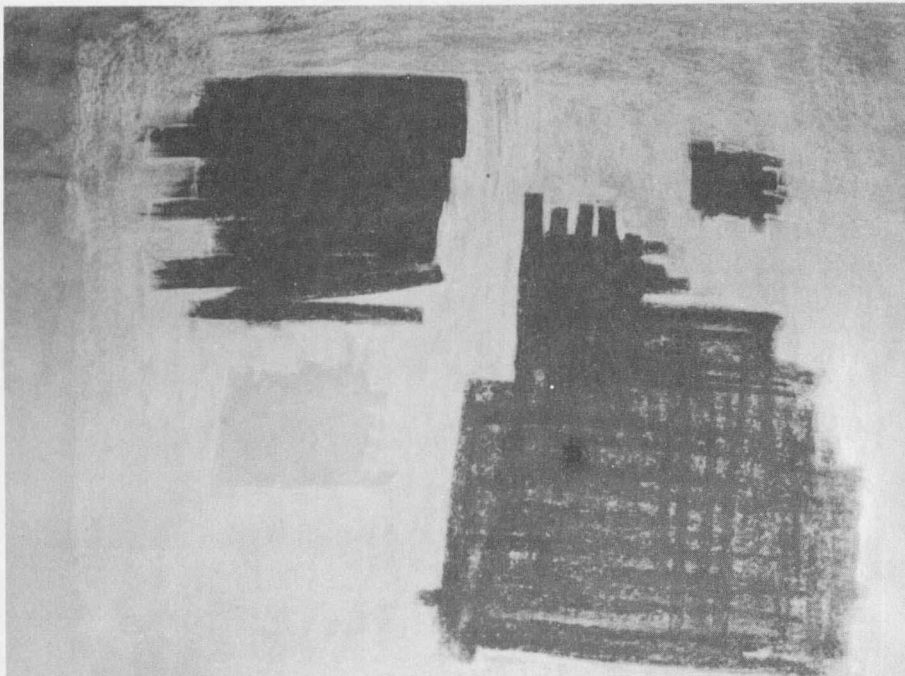
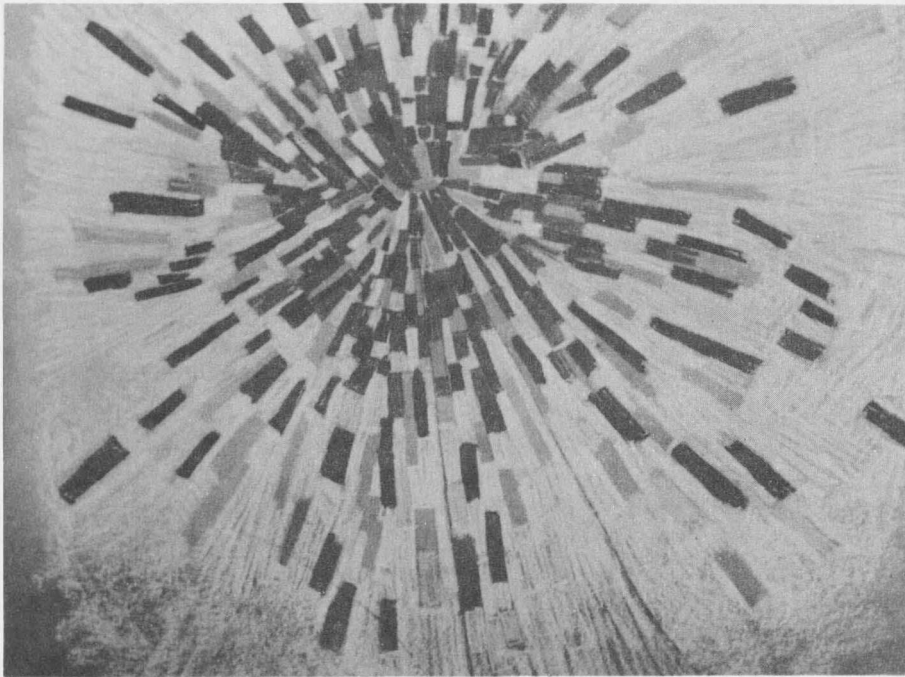


Figure 7. Photograph of Early Designs

would paint with water-color or oil paint, and then fired at 2380⁰F. (17)
(22) (32)

The third phase of the design began in the summer of 1962. After much consideration and further reading about theatre, I felt my first two efforts were incomplete for I thought that neither of them was symbolic enough of theatre or related enough to the architectural site. I made five sketches 3' by 4' with colored chalk on brown wrapping paper and hung them separately on the back wall of the ticket booth for visual effect, and four sketches were made to scale to fit a model of the ticket booth. (17) Several possible symbols of the theatre were explored that might be added to the over-all design. One possibility that was tried was a small plaque made of ceramics that would represent the history of drama, such as masks, the alphabet in Hebrew, or cave drawings. These could be placed on top of the tesserae or the tile could be incorporated with them. Another idea was to use simple line figures made either of ceramics or steel bands painted black. These would be placed on the base-board and the tesserae would be laid around them. A third idea was to use simple steel or iron bands that would follow the natural shape of the star-burst design of one of the sketches; small metal figures in theatre poses might be placed on the bands, the tesserae being laid around the bands. The final idea was to use only the background of tesserae since any additional material only seemed to clutter an already crowded area. I felt that part of the purpose of the mural was to enhance the ticket seller who dominates the space in front of the mural whenever the ticket booth is in use.

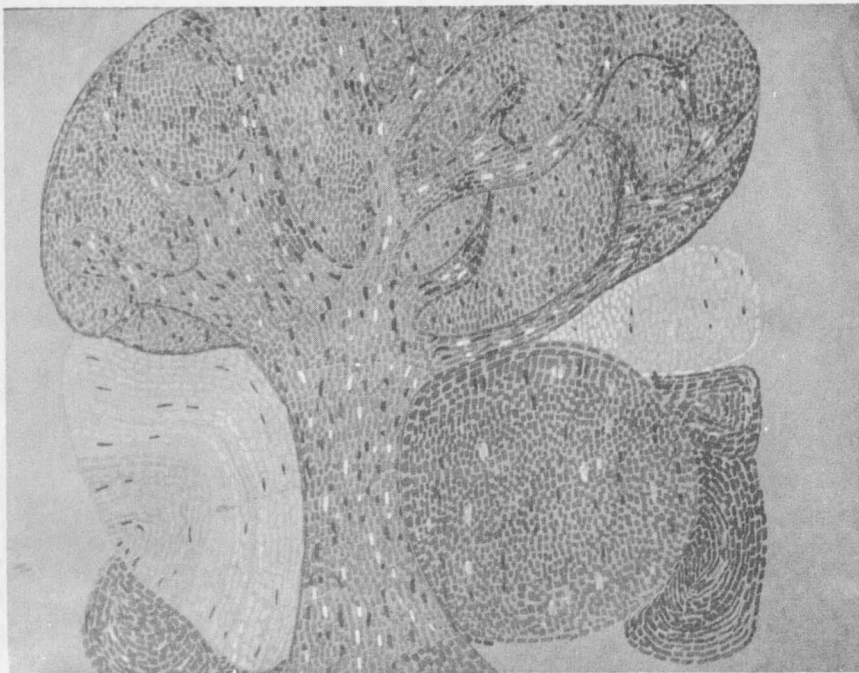
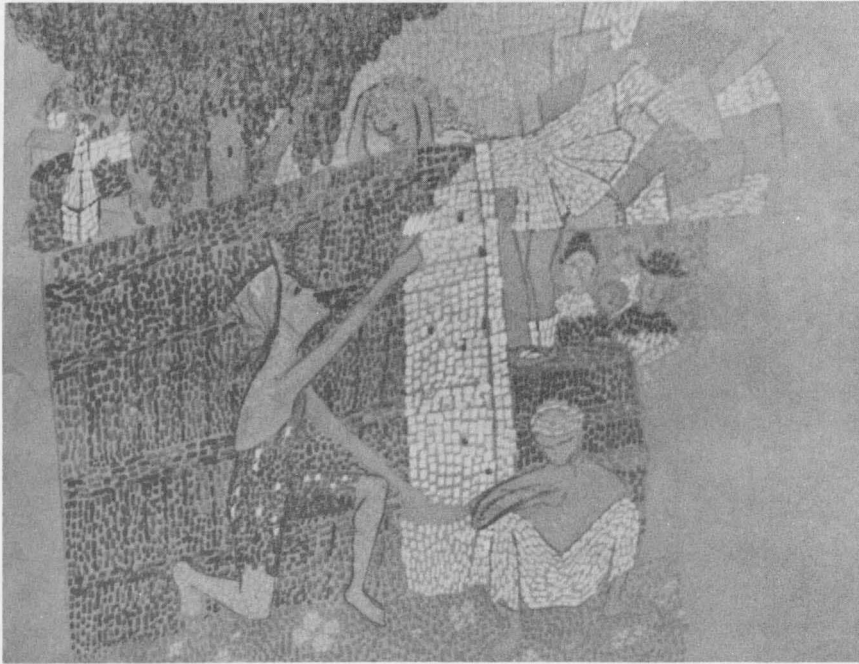


Figure 8. Photographs of Early Designs

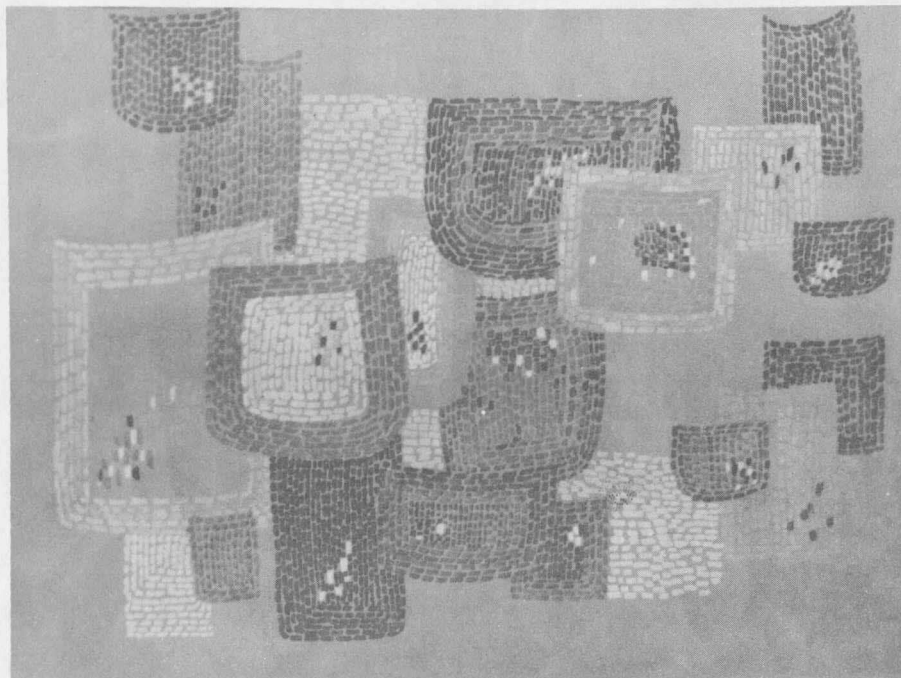
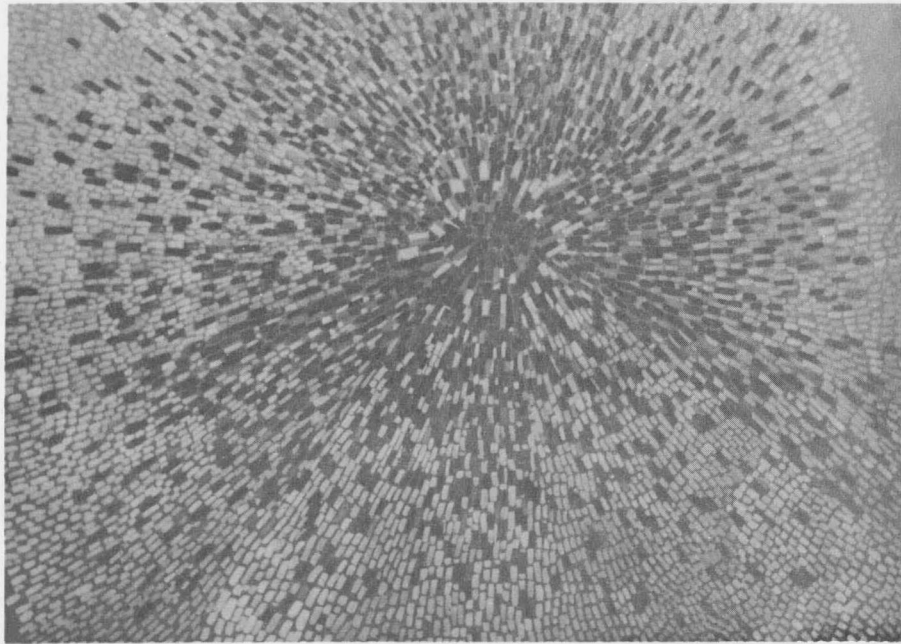


Figure 9. Photographs of Early Designs

INFLUENCES OF LITERATURE CONSULTED

After reviewing my plans for the mural, I was not satisfied with my previous sketches and wanted to do further research into the history of the theatre. Space was provided for me on the second floor of the Student Union by the theatre department and between making tesserae and acting, I did research into several theories which helped develop my thinking. I reevaluated my design using figures in the mural. In themselves, they were not inclusive enough to reveal the general feeling that I had in mind. Several of the authors that I encountered presented feelings of the theatre that equaled religious reverence.

"...Freeing ourselves from our own limitations and then in turn practicing the art of dreaming. The play is a living dream, your dream, my dream. Dreams must not be blurred or darkened but the actors must be transparent to it. They must not exhibit; their task is to reveal; acting is a process of incarnation. Acting itself is not imitation of what a director thinks about a character; it is the gradual, half conscious unfolding and flowering of self into a new personality." (17)

Another author speaks of the theatre as the result and influence of a holiday.

"We go not only to see the show but to be part of the show ourself to show off." (29)

"The show is not the show, but they that go." (29)

"Set man in an empty house and you throttle his capacity for emotion and more than half destroy the satisfaction he can feel only when elbow to elbow and knee to knee with a mob." (29)

The similarity between the artist of the theatre and that of the canvas is shown in how each convinces his audience of the truth of what he

sees and feels. Each artist embodies the familiar, homely times of his day-to-day existence and expresses the unknown, unseen feeling that is compressed within his vision of space. His desire to do this is the reward of his initiative.

"There is an instinctive belief in the human heart that by invoking the name, or by making or even touching the image of a desired thing we draw to ourselves the virtue inherent in that thing." (7)

The expression of an artist can be an honest experience. He interprets his ideas that expose his emotion, thereby causing a reaction in his audience. In Drawings For The Theatre the author presents the opinion that;

"The artist's urge is to reveal to himself, and through himself to others, the world within man that cannot be expressed in three dimensional terms. The artist finds truth by submerging himself in an emotional experience. He has no rational way of checking this truth except as he may find confirmation in the similar experience of another person." (16)

It is held by Robert Jones that beneath the surface of everyday, casual and conscious existence there lies a vast dynamic world of impulse and dream, a hinterland of energy which has an independent existence of its own and laws of its own; laws which motivate all our thoughts and our actions. This energy expresses itself to us in our conscious life in a never-ending stream of images, running incessantly through our minds from the cradle to the grave, and perhaps beyond. (17) All art in the theatre should be not descriptive but evocative. (17)

"Truth in the theatre, as the masters of the theatre have always known, stands above and beyond mere accuracy to fact. In the theatre the actual thing is never the exciting thing. The artist should omit the details, and the prose of nature and vie us with the spirit and splendor. The air of the theatre is filled with extravagant and wheeling emotions which H. L. Mencken called "the grand crash and glitter of things." When we listen to what artists tell us in their work, when we look at what the artist looks at and try to see, then and only then do we learn from them." (17)

Nature has endowed us all with a special faculty called imagination by means of which we can form mental images of things not immediately present to our senses. (17) In expressing this imagination we must use symbols to voice our thoughts. Emerson tells us that art teaches to convey a larger sense by simpler symbols. (17)

"A symbol is the best possible representation of an unknown fact. Symbols are a language developed by the artists to convey an idea to the beholder directly. Certain basic forms seem to have attracted man and remained significant during all ages and cultures, such as the cross, square, circle, with different interpretation, have been repeated since the beginning of man." (15)

Man's concept of the unknown changes. Each age must speak for itself, and no two ages are alike. Sometimes the artist has too little experience of the vital impact of the relationship between symbol and what is symbolized. Without this experience, the symbol he draws has no power. (15) I chose not to use symbols already in existence or well known to the public, but rather to express an inner feeling, one of imagination, drawing from the statement of a noted theatre writer Robert E. Jones:

"Imagination is the peculiar power of seeing with the eye of the mind and that is the essence of the theatre. Leonardo da Vinci declared that the human eye not only receives but projects rays of light. Imagination gleams and flashes and glitters. Glitter is the real word. It sparkles and twinkles and blares with gold and silver and color and spangles and jewels. It transforms the actor into a being of legend. It becomes iridescent, becomes radiant, it glows and shines. Livingness of light. That is why we go to the theatre, to dwell for an hour in this unusual world and draw new life from it." (17)

THE GLAZE

Experimentation to find an inexpensive form of tessera started early in the project. The first type used was commercial bathroom tile collected from scraps left by building contractors engaged in construction of the new dormitories on the Montana State College campus. This tile is produced by commercial tile manufacturers for use in interior wall decorations. (9) (20) (23) (33) It is mostly employed in bathrooms and kitchens because it is so easily cleaned. The tile ordinarily comes in $1 \frac{3}{16}$ inches by $1 \frac{3}{16}$ inches and is $\frac{3}{16}$ of an inch thick. It shatters easily with a hammer and the breaking can be controlled by use of a sharp chisel or clip-pers. (9) (20) (23) Three colors of this tile were found and used in the experimentation; yellow, tan with brown specks, and white with gray specks. Experiments with china paint were made because it might adhere to the tile and therefore a larger variety of colors could be produced. Seventy different colors of porcelain overglazes were tried on each of the three types of tile and each of the colors of overglaze was given a number which was painted on each of the three types of tile. The overglaze comes in powdered form and had to be mixed with water. After all the colors had been applied to the tile it was fired at 1950°F . (9) (10) The combination of the two worked well and all colors produced the expected color. Note Table I.

Eight liquid luster colors, also used in decorating porcelain china, were used on the three types of colored tile. The result was quite different than expected. On the yellow tile the colors opal, mother of

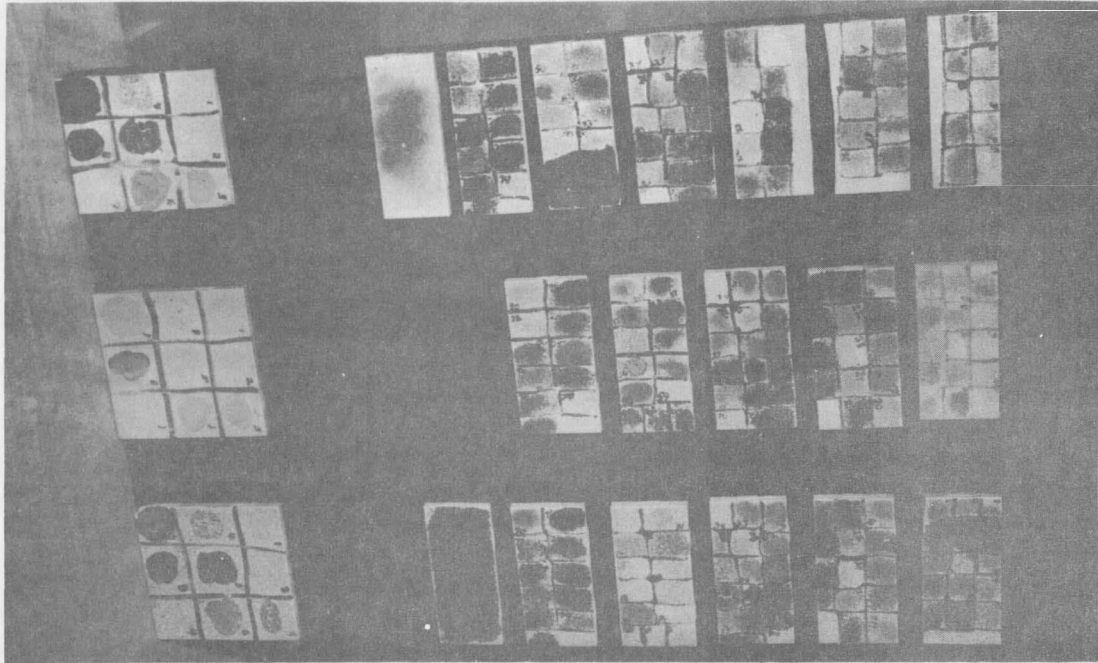


Table I. China Paint On Bathroom Tile

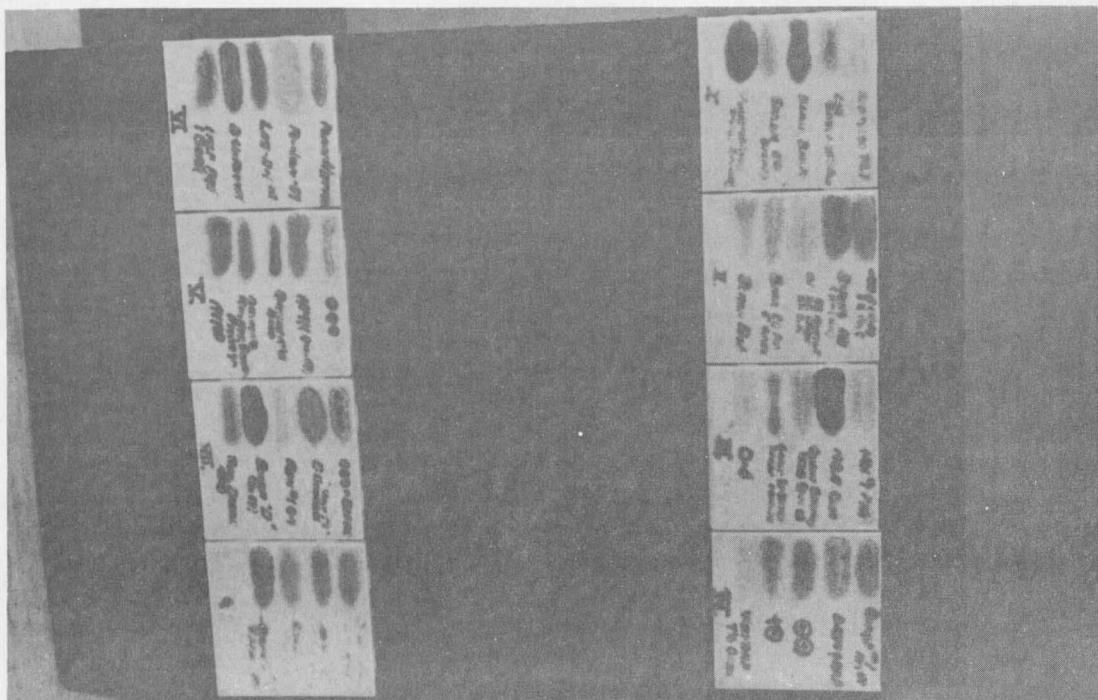


Table II. High Fire Glaze On Bathroom Tile

pearl and orange produced no color at all. This was true of the other two colors of tile as well. Copper luster produced a rich maroon color on both the white and tan tile, and deep blue-green luster was a rich maroon only on the white-gray tile. Note Table I.

The color experimentation was further developed by the use of stone-ware glazes used in the ceramics department at Montana State College. These glazes fire at 2380⁰F. (22) These colors also mature on the tile well but their original character was often altered by the presence of the speckles in the tile. Note Table II.

Porcelain overglazes were also tried on my own Hagen V glaze. This is a dull gray, matt-type glaze. Bisque pieces of Lewistown pink clay were used and Hagen V glaze was painted over them. Thirteen samples of different porcelain overglazes in red color series were placed on the tile and fired at 1950⁰F. The glaze did not mature since Hagen V is a high fire glaze, but many chalky reds were obtained. The same procedure was repeated and fired at 2380⁰F, and this time, many of the colors were burned off or produced the same brick-red color, although several nice plum and yellow-gold colors were produced. Note Table III and Table IV.

This same procedure was tried on Hagen W glaze, a glossy transparent glaze and Mitschke #3, a high gloss glaze, with much the same result.

The development of the Hagen V glaze took place in the summer of 1961. I was interested in developing this glaze to see what colors were possible with it. I chose fifteen different types of coloring oxides to

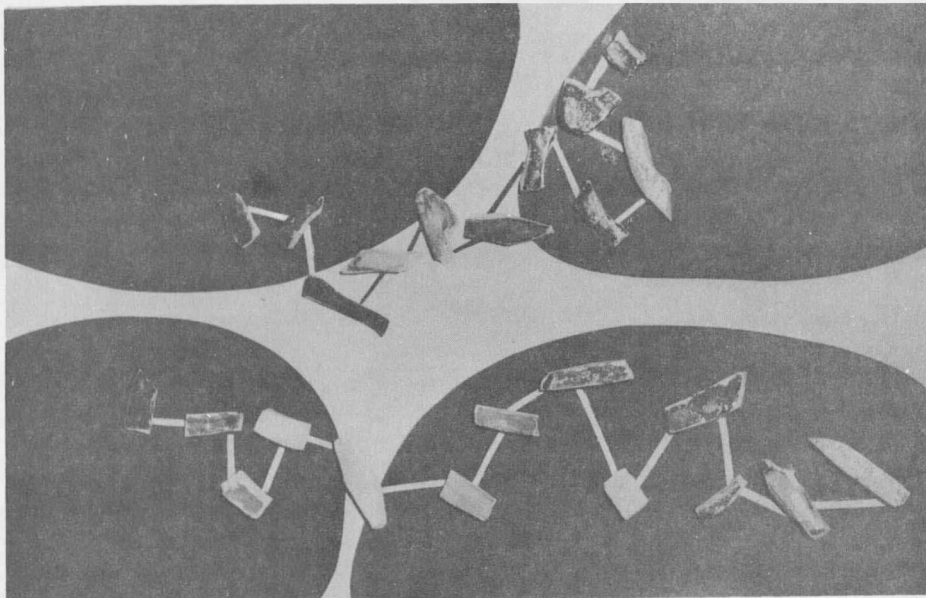


Table III. China Paint On Hagen V Glaze at 1950° F

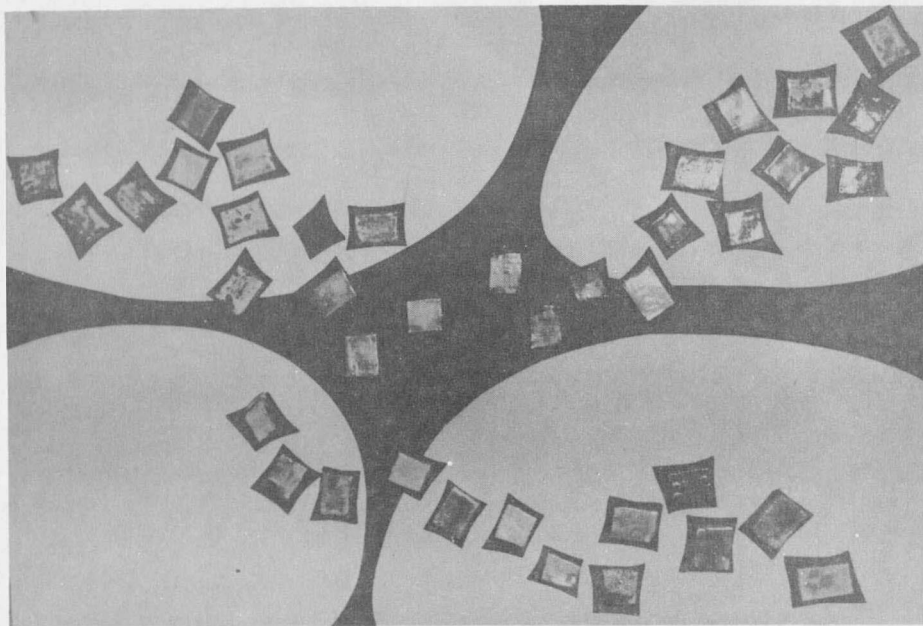


Table IV. China Paint On Hagen V Glaze at 2380° F

be combined with the Hagen V glaze and proceeded to make samples. The glaze samples were fired at a high temperature and some of the outstanding colors were; cobalt oxide which made a bright blue, copper carbonate, a dark blue-green, iron chromate, a reddish tan, iron oxide, a reddish tan, nickel oxide, a yellow-green, and potassium bichromate, a grayish-tan. The result of this experimentation is found in Table V. Several combinations of color oxides were fired and they all turned out quite successfully. The combination of all the colorants produced a very rich reddish-tan. All the sample glazes were made on Lewistown pink clay.

In order to give the mosaic a variety of colors a glossy glaze was also experimented with. After taking samples of seven shiny glazes developed by the ceramics department, I used Mitschke #3 and made samples of it with sixteen coloring oxides. Colors produced were white, tan, brown, blue, and three shades of green. Mitschke #3 was also used with six colored slips. The glaze is very consistent but was discarded for another Hagen glaze.

The next part of the experiment involved the use of Hagen W glaze, a glossy transparent glaze. Six samples were made over slip colors and all matured well with small hints of color suggested. Hagen W was also mixed with Naples yellow and a clearer color effect was achieved.

$\frac{1}{2}$	1	2	3	4	5	10	percentages
							chromium oxide
							cobalt oxide
							copper carbonate
							crocus martis
							iron chromate
							iron oxide
							manganese dioxide
							nickel oxide
							potassium bichromate
							potassium dichromate
							rutile

Table V. Colors Obtained With Hagen V Glaze

CONSTRUCTION OF THE MURAL AND TESSELLATING

The dimensions of the mural, eight feet by eight feet, were determined by the area of the wall space that would be visible when the doors of the ticket booth were open.

Two sheets of one inch plywood, 4' by 8' were acquired and placed in room 316 of the art department where they would be handy to assemble the tesserae on. Every 13 inches, a two-inch space was drawn from the top to the bottom of the base-board. This space was left uncovered so that holes could be drilled in the board to attach bolts to the 2' by 4' stud-ding of the back wall of the ticket booth.

The colored tesserae was laid out on boards in color groups and placed around the baseboard so that I could have clear vision in my selection of tile. Laying out the tile like this also helped determine the amount of tile that would be needed to cover the entire mural.

There was no cartoon drawn on the base-board but I used my poster paint color sketch to help in determining the color design of the mural. Rather than follow the sketch exactly, I let the shapes and textures of the tesserae determine their placement, and they were glued to the board with Wilhold white glue.

Once the entire mural was assembled it was taken to the theatre department and attached to the wall of the ticket booth.

MAKING THE TESSERAE

Making the tesserae was not an easy task and many hours were consumed in their preparation. I used Lewistown pink clay whose formula is:

Lewistown pink clay.	65 pounds
Ball clay.	10 pounds
Denver Fire clay	10 pounds
40 mesh grog	10 pounds
Nepheline Syenite.	5 pounds
Barium carbonate.	$\frac{1}{2}$ pound
	100 pounds

This mixture was soaked in three buckets of hot water for approximately 24 hours, after which it was blended by blunging for another 12 hours before it was ready to use.

The clay was then placed on drying bats made of plaster which hold approximately 7 pounds of moist clay. It was left to dry for 48 hours, or more, depending on how dry the plaster bats were. The clay was next wedged on a canvas-covered plaster wedging table approximately 30 times and a good deal of 20 mesh grog was kneaded into the clay to make the tesserae less apt to warp. Then the clay was stomped with a wooden mallet and later rolled flat with a rolling pin into different thicknesses and cut into rectangular shapes of different lengths and widths. Some of the clay sheets were impressed with designs to give texture to the tile.

After the tesserae had been cut from the clay sheets they were placed on drying racks that allowed the air to circulate around them. They were frequently turned to allow equal drying and the process took approximately 24 hours. The raw tiles were then fired at 1950⁰F.

Hagen V glaze was the final choice for the mural. Hagen V glaze was mixed in a 305.60 gram batch, and then weighed out into 50.96 gram batches. Percentages of the coloring oxides were added to these batches to gain the desired colors needed for the tesserae. Its formula is:

Feldspar	222.40 grams
Zinc oxide	32.56 grams
Barium carbonate	38.88 grams
Tin oxide.	11.76 grams
	<u>305.60 grams</u>

The white tiles were sprayed with glaze by an air gun rather than painted since this was a faster process. They were given several coats of the glaze since this glaze must be used quite thick in order to get the desired matt texture.

The colors used in the mural can be found on Table V. I also used a new clay discovered in Lewistown called Giltedge. This clay has a gray appearance when raw, and white coloring in the bisque. It is very good for making white tiles since the Lewistown pink fires a light gray at high temperature and this often "toned" the tile colors if the glaze wasn't on thick enough.

The bottom of each of the sprayed tile was wiped clean with a damp sponge before being placed in the kiln so as not to stick to the kiln shelf. They were fired at 2380⁰F.

SUMMARY AND CONCLUSION

Throughout the execution of this thesis I have endeavored to maintain in the mosaic its primitive nature and highly decorative and esthetic function, by being true to the material without forcing it and thus retaining its simplicity of color and form. The final result has been personally gratifying. I believe I have solved the problems as stated at the beginning of this thesis by:

1. Providing a mural for the ticket booth of the Student Union Theatre at Montana State College.
2. Developing the feeling of depth through the movement of the eye being led to the central focusing area of blue tesserae. The wall is adorned with bright bits of colored tessera made with a variety of textures.
3. The ticket seller remains dominant within the space of the ticket booth, but I feel that the mural is an effective background for the human figure.
4. My interpretation of the theatre remains to be judged by time and those who view the mural.
5. The successful use of Hagen V glaze as evidenced in the variety of shades and colors obtained.

When I first encountered the problem of creating a mural I was naive enough to think that I would be able to complete my work in one summer quarter of school, but as the mural developed, I found myself

exploring further and further into the possibilities that presented themselves. Each discovery led to another series of problems and each of these seemed stimulating. Finally a decision had to be made and the work completed, but there are still many facets of the work that would be intriguing investigation. I conclude this thesis with a statement by Pope Pius XII; "The function of art is to break the agonizing circle of the finite in which man is enclosed in this life and to open a window of his mind for the infinite." (15)

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