

TWO STAINED GLASS WINDOWS DESIGNED FOR THE LITTLE-CHAPEL-IN-
THE-WOODS, TEXAS STATE COLLEGE FOR WOMEN, DENTON, TEXAS:
AN HISTORICAL SURVEY OF THE CRAFT, AND PROBLEMS
OF DESIGN AND TECHNIQUE

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I hereby recommend that the thesis prepared
under my supervision by Beatrice Hogue Paschall
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PREFACE

The aim of this study has been twofold: first, to secure a background of information concerning stained glass, a medium entirely new to the writer; second, to develop designs for stained glass which were true to the limitations of colored glass, lead and enamel, as acted upon by light, and which were appropriate to the building of which they were to be a part.

Sincere appreciation is felt for the co-operation and assistance received from numerous members of the faculty and student body of the Texas State College for Women, particularly: members of the staff of Hygeia, the college hospital, who posed for drawings and who gave valuable suggestions concerning the Nurse Window; Miss Mamie Walker, who suggested the quotation for the inscription in the Nurse Window; Miss Anne Schley Duggan, Miss Mary Katharine Boone, and other members of the faculty of the Physical Education Department who pointed out the most authoritative books on the subject of the dance and who gave helpful criticism concerning the iconography for the Dance Window; Miss Jeanette Schlottman, President of the Modern Dance Club, and other members of the club who posed for drawings of both the historical and the modern figures of the Dance Window; and the students who have spent many hours assisting in the mechanical work of drafting patterns, waxing up and cleaning glass, preparing the kiln for firing, and doing other tasks

related to the execution of a stained glass window.

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PART ONE

HISTORICAL DEVELOPMENT OF THE STAINED GLASS WINDOW

CHAPTER I

ORIGIN, TECHNIQUE, AND EARLY THEORY

The history of the stained glass window has its beginning, according to earliest records, sometime during the ninth century A. D.¹ However, man's experience with the materials of which the stained glass window is composed—glass, enamel, and lead—extends far beyond that time; and in a measure, the stained glass window is the logical outgrowth of this experience.

The most essential of these materials, glass, was known to the Egyptian in ancient times and was moulded by him into beads, amulets, and vessels. According to some sources, the Egyptian also originated the art of blowing glass, and reference is given to certain representations of this activity in tomb paintings;² however, this is contradicted by others according to whom the art of glass-blowing was not discovered until the first century B. C. in the Phoenician city of Sidon.³ As early as the second century A. D. glass works were operating in Italy, Spain, France, and in various places in the Rhineland; nearly all technical processes of any value were by this time known—

¹Alfred Werck, Stained Glass (New York: Adelphi Company, 1926), p. 57.

²Hugh Arnold and Lawrence B. Saint, Stained Glass of the Middle Ages in England and France (London: A. & C. Black, Ltd., 1925), p. 17. "Glass," Encyclopaedia Britannica, 14th ed., XII, 688.

³"Glass," Encyclopaedia Britannica, 14th ed., X, 401.

freehand blowing, blowing into the mould, working of glass while plastic with tongs and with other instruments, production of imitation jewels and of cameos, as well as the making of small window panes.¹

Enamel, the second material mentioned above, made its appearance in history at a time as remote as that of glass, for its application to tile had been known by the Egyptian from prehistoric times.² Its use on metal and on tile was practiced by numerous peoples in antiquity. Byzantine developments brought cloissonne to a highly finished stage; enameling was also practiced in the monasteries in Europe almost from the time of their introduction from the East in 526. Just when enamel was first applied to glass is apparently unknown, as no references to the matter could be found; it probably was used first on glass vessels and is one of the processes mentioned as being practiced by the glassworkers of the 2nd century A. D.

The third material, lead, is of as ancient a tradition as the other two. It is mentioned no less than seven times in the Old Testament alone and was a material common to nearly all peoples from prehistoric times. When the soldering of lead was first arrived at is not known, but an alloy of lead and

¹"Glass," Encyclopaedia Britannica, 14th ed., X, 401.

²Helen Gardner, Art through the Ages (New York: Harcourt Brace and Co., 1936), p. 67.

tin was used for this purpose by the Romans in joining lead water pipes as early as the second century B. C.¹

Considering this background of experience with the three materials, it is somewhat surprising that stained and painted glass windows did not appear long before they did. However, in the warm countries bordering the Mediterranean there was little or no need for closing window openings, while civilization in the colder northern countries did not arrive at a sufficiently settled stage for the development of such an art until after the period of the barbarian invasions.

Probably the first use in window openings of glass in any form occurred in pierced stone screens whose openings were filled with cubes of colored glass paste. These are found in various Eastern countries and seem to be the expression of an ancient tradition, the home of which was in all probability Persia. The Romans made some use of glass in window openings but only as a luxury. Caligula (12-41 A. D.) had his palace windows glazed and Seneca mentions it in his writings. Remains at Pompeii show small panes of glass set in wooden or in bronze lattices, or sometimes directly in plaster.²

The use of lead to hold glass in windows was introduced sometime before the sixth century A. D. It was a development to be expected, for use of stone or wood was rather clumsy due to

¹"Lead," Encyclopaedia Britannica, 14th ed., XIII, 817.

²Saint and Arnold, Stained Glass of the Middle Ages in England and France, p. 17.

the difficulty of shaping the glass to fit the rigid lattice work. Craftsmen who understood the nature of lead would readily conceive the idea of substituting for the rigid frame-work a flexible material which could be made to follow the irregular edges of the glass; this also gave a much lighter window construction.

Even with this new development, however, glazed windows did not become common in Italy. The chief use of such windows appears in ecclesiastical buildings, particularly those in the more northern countries of France and England. It is recorded that St. Gregory of Tours placed colored windows in the church of St. Martin in that city in the sixth century.¹ Likewise, Bede writes that in 680 Benedict Biscop, the Abbot, sent to Gaul for workers in glass to glaze the windows of the monastery at Wearmouth.² These were not stained glass windows, however, but were merely examples of "plain glazing," that is, glass leaded together, usually without definite pattern and without any painted parts.

The earliest reference to an actually stained and painted glass window is found in the writings of Benigne de Dijon, monastic chronicler, who recorded that in his monastery was a window illustrating the martyrdom of St. Prascasia, adding that this

¹Saint and Arnold, Stained Glass of the Middle Ages in England and France, p. 20.

²Ross William Collins, A History of Medieval Civilization in Europe (Boston: Ginn and Company, 1936), pp. 478-488, 568-571.

window had been transferred from an older church restored by Charles the Bald about 820 A. D., shortly after the death of Charlemagne. There is also a reference to a later painted window, circa 990, in the monastery at Tegernsee, Bavaria.¹ Whether enamel was employed for the painting in either of these windows is not certain. One writer would infer that the earliest figure subjects were painted in unfired pigment, with the painted areas covered by additional pieces of glass for protection;² this was such a cumbersome method, and so complicated the leading of the window, that it led to the use of enamel for painting, fused to the glass and thus needing no protection. This was a logical step and was easily accomplished by craftsmen among the monks, who were accustomed to working with enamel on metal and on glass vessels.

We know that enamel was in general use for painting by the middle of the eleventh century, for it is found on extant windows dating from approximately 1065 in the Augsburg Cathedral. This is also true of the "Ascension" window at Le Mans, which is given the date of 1090.

The first designer in stained glass was the artist monk; this might be expected since the monastery was almost the only place during the ninth and tenth centuries which offered sufficient stability to permit the practice and development of any

¹Alfred Werck, Stained Glass, p. 57.

²Caryl Coleman, "Stained Glass," Catholic Encyclopedia, XIV, 241.

art. Formulas for the making of glass as well as other technical information had been cherished in the monasteries during the confusion of the barbarian invasions; this information was put to use by monks who, in the making of stained glass windows, followed the Benedictine recommendation that they devote themselves to the practice of the arts. Those monks who had been the illuminators of manuscripts made the first drawings for the windows; a series of such drawings, the Guthlac Roll, is preserved even now in the British Museum.¹ The windows were probably executed and designed by the monks, although this is not certain, as there may have been lay brothers to perform the manual labor. However, association of lay members with the monastery was a feature peculiar to the Cistercian order, who did not follow the craft of stained glass.² From this it is assumed that the monk was both artist and craftsman, for the early windows.

The German monk, who called himself Theophilus, gives us information concerning early technical methods. In the manuscript, "Schedula diversarum artium," which was written sometime near the close of the eleventh century, he gives specific directions concerning preparation of brushes, making of glass, tending the kiln, casting of lead-comes, soldering, etc.³

¹"Stained Glass," Encyclopaedia Britannica, XXI, 291.

²Ross William Collins, A History of Medieval Civilization in Europe, p. 483.

³Alfred Werck, Stained Glass, p. 69.

Recipes were known for the production of different colors of glass, but the production of any given color was difficult since the hue was greatly influenced by the degree of heat of the furnace, a factor hard to regulate. Yellow was one of the most difficult of colors, and largely secured by chance, for, Theophilus, in speaking of colorless glass, remarks:

If you notice a pot of melted glass turning yellow, let it boil for three hours and you will have a clear yellow. If you wish, let it boil for six hours and you will have a red yellow. If you notice, however, that a pot is turning reddish, so that it resembles flesh, take from it and use it for flesh color. Boil the rest for two hours and you will have a bright purple, and another three hours, a real red purple.¹

Blue was produced by adding oxide of cobalt and copper, violet by use of unpurified ore of manganese.² Red could have been produced by copper in a state of colloidal suspension or by gold.³ The very uncertainty in the production of color meant that the craftsman was supplied with a wide and varied palette.

In the actual process of building the window, the cartoon, according to Theophilus, was drawn on one end of a white-washed board, the vacant end of which was used for laying out

¹Alfred Werck, Stained Glass, p. 75.

²Ibid., p. 24.

³E. W. Twining, The Art and Craft of Stained Glass (London: Sir Isaac Pitman and Sons, Ltd., 1928), p. 3.

glass and the general business of glazing. Glass was roughly shaped to fit the cartoon by means of a hot iron; edges were then trimmed somewhat more accurately by means of a "grozing" iron, which was merely a piece of iron with a notch in one end similar to the notches appearing on a present day glass-cutting tool. Details of drawing were then painted with the enamel mentioned above, the glass fired, refired if necessary, and finally the various pieces joined by means of H-shaped leads. Charles Connick points out that Theophilus makes no mention of any type of easel arrangement whereby the craftsman might study the effect of light through the various colors of glass which he had chosen to use together.¹ Mr. Connick suggests that perhaps the worker in glass used the cathedral itself as his studio and experiment station. However, even though this is probably true, without large pieces of glass against which to fasten the smaller colored pieces, the effect of light through the pieces selected could not be studied until after they had been leaded together. If at this point the craftsman wished to change certain colors, it would be difficult indeed for it would mean tearing into part of the lead work as well as shaping of new glass to fit the place of that discarded—no mean task in view of the inaccurate glass-cutting methods. It would seem then that any experiments which the craftsmen may have found necessary to make must have been backed by a thorough knowledge of

¹Charles J. Connick, Adventures in Light and Color (New York: Random House, 1937), p. 46.

the qualities of glass available and of its action in light.

That twelfth century understanding of the action of various colors in light was sufficiently keen to have evolved into a fairly definite theory, is an idea presented by the French architect and restorer, Viollet-le-Duc, in his discussion of stained glass as presented in the Dictionnaire Raisonne de l'Architecture, 1875.¹ By studying and analyzing early windows, Viollet-le-Duc found that certain basic principles seem to have been widely followed. All of these, he says, are based upon the fact that different colors of glass have different radiating qualities. Certain blues, for example, spread the light rays to such an extent that they appear to cast a bluish film over surrounding areas. Red, on the other hand, converges the rays so that at a distance the color appears more intense but smaller in area; this is true, however, only of a streaky red, for an even red loses almost all color at a distance, becoming, according to Viollet-le-Duc, a livid brown. Yellow neither spreads nor converges the light rays, remaining of about the same comparative area and intensity at a distance. Radiation of secondary colors varies with the proportions of the primary colors present in them, approaching the characteristics of the

¹Viollet-le-Duc (1814-1879) was a contemporary of Chevreul (1786-1889), the French chemist who experimented with light and color. Le-Duc refers to "studies recently made on light" in the article "Vitrail, a Treatise on the Theory and Practice of Stained Glass Window Design in France during the Middle Ages," translated by Leicester B. Holland from the Dictionnaire Raisonne de l'Architecture Francaise and reprinted in Stained Glass Bulletin, April, 1931-August, 1932.

dominant primary as set forth above.

Viollet-le-Duc finds that the twelfth century craftsman, through his observation of qualities inherent in glass, developed certain traditions which were almost invariably followed in early work. For example, to keep blue grounds from radiating beyond their own perimeters, a red fillet was first placed around the ground, then a white one. The white, having a radiation almost equal that of the blue, kept the red from being turned violet by the blue and thus appeared to limit the extent of the blue. White and yellow were used to frame in and to give sharp boundaries to the principal divisions of a window, and especially for narrow borders around the whole to separate the glass panels from the wall surfaces or mullions of masonry. Background areas are ordinarily of either blue or red, the only colors which, according to Le-Duc, can be used without painting and not appear empty; yellow is too brilliant for this use, and secondary colors, without painting, do not make themselves felt. Furthermore, the blue, especially that called "limpid" blue, has such powerful radiation that it would have caused painted lines to almost disappear so was never used for draperies or other painted parts; however, a lighter blue was frequently used in this respect. Painting on blue, white, and yellow is larger and firmer than on red, yet no matter how heavy the net work of shading, bits of pure color are allowed to pierce through, for painting which completely covers a colored glass gives at a distance an opaque tone which does not partake of

the real color of the glass. For inscriptions appearing on glass, black letters on a light ground are rarely used, for at a distance the letters would be swallowed up by the encroaching radiation of the light; accordingly, the letters are scratched out light against dark painted grounds, a combination which can be read at a fairly great distance. According to Le-Duc, in the early period treatment of each part of the window was guided by the radiating qualities of the various colors of glass employed.

Because of both the technical achievements and the spiritual content of early windows, one historian characterizes the period of the eleventh, twelfth, and thirteenth centuries as an "Age of Reason."¹ He points out that these achievements in Gothic art are paralleled by St. Thomas Aquinas' achievement in medieval philosophy with his attempt to reconcile divine revelation with reason—"an extraordinarily intellectual effort."² To further clarify this similarity he points out that achievements in Gothic art are the result of reconciling "two distinct tendencies—toward abstraction and toward naturalism. . . . Gothic art is definite in form; mystical,

¹Herbert Read, "Stained Glass," Encyclopaedia Britannica, XXI, 291-297. (Mr. Read is Assistant Keeper at the Victoria and Albert Museum, London.)

²A. W. Colton, "Review of English Stained Glass by H. Read," Architectural Record, March, 1938, p. 285.

spiritual, or symbolic in meaning; and it has a powerful intellectual content."¹

The windows produced by the Gothic craftsman are discussed in the following chapter.

¹A. W. Colton, "Review of English Stained Glass by H. Read," Architectural Record, March, 1938, p. 285.

CHAPTER II

STYLE OF THE ELEVENTH, TWELFTH, AND THIRTEENTH CENTURIES

The window most generally referred to as the oldest extant stained glass window is the "Ascension" window (Plate I) at Le Mans,¹ the probable date of which is given as 1090; however, by several authorities,² it is claimed that certain figures of prophets in the south clerestory of Augsburg Cathedral (Plate II) are of an older date, circa 1065. Both of these are built of surprisingly large pieces of glass and are treated in a simple and dignified way. The window at Le Mans shows the twelve Apostles and the Virgin looking upward, while the figure of the ascending Christ has either been left to the imagination, or, more likely, was destroyed during one of the two fires which devastated the church in 1134 and in 1136.³ The figures in white and colored draperies appear against a ground of plain color in alternate panels of red and blue. The whole is treated as definitely flat pattern and, according to

¹ References made by Sidney F. Eden, Ancient Stained and Painted Glass (Cambridge: The University Press, 1933), p. 43; Charles Hitchcock Sherrill, Stained Glass Tours in France (New York: J. Lane Company, 1908), p. 24.

² Alfred Werck, Stained Glass, p. 91; Franz L. Muller, "World's Oldest Stained Glass Windows," Art and Archaeology, January, 1929, p. 44; Herbert Read, "Stained Glass," Encyclopaedia Britannica, 14th ed., XXI, 291.

³ Eden, Ancient Stained and Painted Glass, p. 44.

Arnold¹ and Eden,² Byzantine traditions are followed more closely in the drawing of figures and drapery than in any subsequent work. As Arnold points out, the approach followed in the building of these two eleventh century windows is precisely that which prevailed for nearly three hundred years. That is, in so far as possible, the effect desired was obtained in the cutting and leading of the glass, with the leads defining the boundaries of forms rather than cutting through haphazardly. Details of drawing, such as features and draperies, were painted in with strong sweeping lines of enamel.

All windows, before the appearance of stone tracery, consist of separate leaded panels inserted into a massive metal framework. At first this framework was formed of only upright and horizontal bars of a T-shaped section, the head of the "T" being outward, with the glass held in place by light iron bars thrust through staples on the inner rib. Since the framework was quite heavy it could not be disregarded in the design of the window; consequently, in figure-subjects, craftsmen treated it in one of two ways: either the figures were made large enough to be independent of the framework, or else they were made small enough to fit into one opening of the framework as at Le Mans. Sometimes the bars were manipulated so as to fit the design but more usually the

¹Arnold and Lawrence, Stained Glass of the Middle Ages in England and France, p. 27.

²Eden, Ancient Stained and Painted Glass, p. 45.

subject was fitted to the regularly spaced bars.¹

According to Herbert Read, most of the early windows were of the single figure, monumental type.² About the middle of the twelfth century, however, the potentialities of the window as a didactic instrument came to be strongly felt.³ Sculpture played this role also, but it could not rival the subtleties of a highly detailed window. Feeling the necessity, then, of telling a story in each window, the craftsman began to divide the window into a series of medallions into each of which he might place one incident of his narrative. In the first medallion windows, the iron framework became a series of regular squares, each of which alternately was filled with a square and a circular figure subject; spaces between the medallions were filled with a leafy scroll work. During the first part of the thirteenth century, the iron work itself was bent into elaborate armatures showing skillful interplay of circles, squares, lozenges, and quatrefoils, into which areas the medallions were fitted. By the second half of the century, there was a return to the straight framework, partly from motives of economy, and partly because stone tracery had by this time evolved into such elaborate patterns that there was

¹Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 36.

²"Stained Glass," Encyclopaedia Britannica, 14th ed., XXI, 292.

³A. W. Colton, "Review of English Stained Glass by H. Read," Architectural Record, March, 1928, p. 286.

less need of a massive supporting framework of metal; however, the medallions in their shapes still showed the influence of the elaborate lattices, although they were no longer outlined by the iron-work.¹ The development of stone tracery is presented in a later paragraph. For diagrams indicating successive changes in both iron-work and stone tracery, see Plate III.

As the narrative treatment of subjects caused the windows to be executed in greater detail, it became necessary to use smaller and smaller pieces of glass. In the twelfth century window from the north choir aisle of Canterbury over fifty pieces of glass form the figures of Noah and the Arc in an area of less than one square foot. In general, during this time, pieces vary in size from those of less than an inch in length to pieces almost as large as the palm of the hand. The use of such small areas of color resulted in a jewel-like glow which reached its climax in the early thirteenth century.

As has been mentioned, the earliest extant windows closely followed Byzantine traditions of drawing. According to Viollet-le-Duc, a breaking away from the Byzantine was inevitable when the art of stained glass was taken up by the secular schools.² That the first important secular school of stained glass workers arose during the first half of the twelfth

¹Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 37.

²Viollet-le-Duc, "Vitrail," Stained Glass Bulletin, XXVI, 386.

century and is responsible for the twelfth and early thirteenth century windows of Chartres, St. Denis, Canterbury, and Sens, is a theory supported by Hugh Arnold.¹ He points out that the windows of the churches named bear such close resemblance to each other that there is little doubt of their common origin. As these windows cover a period of approximately seventy years, all were probably executed by a group of men working together under a master who had been trained by his predecessor and who in turn was succeeded by the most able of the group under him. Evidently they settled in whatever city their work happened to be for the time being, remained until the work was finished, and then moved on to the next undertaking. The first important extant work of this school consists of windows glazed at Chartres for the western facade and at St. Denis between 1145 and 1155. Fragments in York Minster may indicate the scene of their next work, then the earliest windows in Canterbury, and four windows at Sens. Then the group was called back to Chartres where a fire in 1194 had destroyed all save the west windows.

The three western windows of Chartres which escaped destruction were those mentioned above as having been glazed during the middle of the twelfth century; they are the largest and most perfect windows of that century which remain today. They are typical of the period with regard to their subject

¹Stained Glass of the Middle Ages in England and France, p. 44.

matter which was selected with but a single purpose—to set forth Christian doctrine. Two windows, of which the largest is ten feet wide and thirty feet high, depict scenes from the life of Christ, while the third is a "Tree of Jesse," (Plate IV, Figure 1) setting forth the human descent of Christ, an essential feature to the medieval mind. In drawing they give only the beginning of the change from the Byzantine which was to be accomplished by later members of the same group of craftsmen. There is here still a restraining dignity and a monumental character lacking to later work.

The remaining Chartres windows are of the thirteenth century and later, with the exception of the central portion of the window known as "La Belle Verriere" (Plate VI) which is twelfth century work hastily rescued from the conflagration of 1194. These later windows offer interesting contrasts to the earlier work and reveal clearly the developments which had taken place during the half century, 1150-1200. Gestures have lost their archaic turn,¹ figures are less tall, and drapery is no longer straight and severe but agitated and flowing.² There is the first echo of the return to observation of nature. A more outstanding change, however, is in the new attitude of the artist toward subject matter. The twelfth century windows are

¹Viollet-le-Duc, "Vitrail," Stained Glass Bulletin, XXVI, 386.

²Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 69.

impersonal and didactic in nature; no human agency, nothing of contemporary life is present.¹ The thirteenth century windows, however, reflect the very spirit which made the rebuilding of the cathedral possible, and in them can be read the enthusiasm and devotion of nobles, merchants, craftsmen, and peasants. The craftsman seems to feel less awe of the divine in selecting his subject; in addition to setting forth the Christian doctrines, he must express the part that the community has played in the reconstruction of the church. For the first time does the craftsman feel the munificence of the donors to such an extent that he must give account of them in the glass.² The only reference found of the portrayal of the donor in glass previous to this is of the twelfth century windows at St. Denis where two figures of Abbe Suger appear, both quite small and unassuming—one prostrate at the Virgin's feet, the other holding the model of a Jesse window.³ However, among the thirteenth century windows of Chartres, few are without references to the donor.

Forty-seven windows bear medallions showing them to have been given by the Guilds of Chartres—Wine-merchants, Shoemakers, Water-carriers, Grocers, Bakers, Pastry Cooks,

¹Henry Adams, Mont St. Michel and Chartres (Boston: Houghton Mifflin Company, 1933), p. 136.

²Saint and Arnold, Stained Glass of the Middle Ages in England and France, p. 98.

³Arthur de Bles, "Pictorial Element in Stained Glass," Art and Archaeology, November, 1925, p. 263.

Turners, Weavers, Curriers, Money-changers, Drapers, Butchers, Bankers, Teamsters, etc. Each Guild is identified, not by portraits as in the case of Abbe Suger, but by little figures engaged in the activities typical of the particular Guild. The Guild medallions are not pretentious, but neither are they unassuming; the middle classes here represented were well organized, comparatively wealthy, and proud of the services they performed for the community. As Sherrill aptly comments, since the cathedral was the work of society, the occupations of the social groups are "in place because they are of the place."¹ If Chartres is the work of the middle classes it is also the work of bishops, nobles, and kings, and they too are present. Many of the noble donors are represented by portraits of themselves either kneeling at the foot of the window, or else armed and on horseback as are those in the rose lights of the tracery in the choir clerestory. However, the technique of glass painting at that time made it almost impossible to secure a faithful likeness; accordingly the individual was further identified by inclusion of his coat of arms.²

This portrayal of the donor is not the only change in subject matter to be found in the thirteenth century; there is a corresponding change in the main themes chosen. No longer are subjects strictly biblical, but saints, prophets, and martyrs

¹Stained Glass Tours in France, p. 70.

²Read, "Stained Glass," Encyclopaedia Britannica, XXI, 294.

of all ages and all countries appear. The story of a local saint, Lubin, Bishop of Chartres, appears next to that of Noah, while the legend of St. Eustace is placed next the story of Joseph. Even Charlemagne (Plate IV, Figure 2) and the legendary Roland form the theme of the window given by the Fur Merchants.¹ In the religious themes elements of humor appear especially in details such as the droll little devils which harrass the Prodigal Son or in the gayly colored pigs which he feeds. Rossiter Howard, Educational Director of the Pennsylvania Art Museum, even refers to certain portions of windows as "the comic strip of the times," and as an outstanding example he gives the "monkey funeral" from a York Minster window.²

The same changes of attitude which have been traced at Chartres as opening the thirteenth century became prevalent wherever the mainstream of Gothic flowed. As Read points out, distinctions of nationality can scarcely at this time be made with regard to stained glass.³ As has been inferred a single band of craftsmen operating at Chartres, Canterbury, Sens, etc., may even have been responsible for nearly all the stained glass produced in England and in France during the twelfth and

¹Adams, Mont St. Michel and Chartres, p. 168.

²Quoted in editorial, Stained Glass Bulletin, April, 1931, p. 131.

³"Stained Glass," Encyclopaedia Britannica, XXI, 294.

early thirteenth centuries. After this time, however, the increased demand for glazing causes certain far reaching changes.

About the year 1200 had begun the gradual evolution of window tracery. First, two lancets had been grouped under a rose light above; gradually each lancet was divided again into a pair of lights and a rose, the spandrils were pierced, and before the end of the century windows were divided by slender mullions into a row of narrow lancets above which was an elaborate mass of tracery containing roses, quatrefoils, trefoils, and smaller openings of all shapes and sizes (Plate III).¹ The stone mullions broke up the large fields of glass, making the iron lattice no longer needed; all that was necessary now for the support of the glass was a series of horizontal bars connecting the mullions. This made it possible for windows to be constructed as large as desired. With this development, the Gothic builder conceived the idea of converting the cathedral into a structure of translucent glass merely supported and held together by a stone framework.²

As a result, the areas to be glazed became so extensive that the glass craftsman found himself faced with an enormous demand. Because of this demand a great many bands of craftsmen arose, all deriving from the school of Chartres, St. Denis,

¹Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 129.

²Arthur Kingsley Porter, Medieval Architecture (New Haven: Yale University Press, 1912), II, 267.

and Canterbury.¹ Methods of production had to be speeded up as well as made more economical when possible. Accordingly, the twelfth century method of applying enamel in darks and half-tones with two separate firings was abandoned for a more simple painting requiring but a single firing.² Grounds of "mosaic diaper," which could be produced by an apprentice in great volume and kept in stock, soon superceded the elaborate grounds of scroll work. Leading of this period is often clumsy and shows signs of haste; bent iron work is altogether abandoned.

Although the window areas had now become proportionately much larger, nevertheless, the colors and the large amount of leading rendered interiors very dark; especially was this noticeable in England where the sunlight was not brilliant. The first attempts to introduce more light appear in the clerestory windows; by using single figures of great size to fill each window, larger pieces of glass could be used with a consequent reduction in the amount of leading needed as well as in the areas covered by detail.³ Thus a brighter light was secured from above to compensate for the dim light of the lower windows. In many instances, however, the monks found even this light insufficient, particularly in the choir, and removed

¹Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 111.

²Viollet-le-Duc, "Vitrail," Stained Glass Bulletin, XXVI, 386.

³Eden, Ancient Stained and Painted Glass, p. 56; Sherrill, Stained Glass Tours in France, p. 33.

colored panels for which they substituted white glass; often only so much stained glass was removed as to leave a large white cross upon the window.¹ The worker in glass, then, to prevent such treatment of his windows, had to develop a type of window which would solve the problem of lighting. The result was the window described by the term "grisaille" (literally, "gray stuff") in which the bulk of the glass is white.

The Cistercians, who in 1134 had adopted a rule prohibiting use of color in their monasteries,² had already shown what could be done with patterns of white glass and lead alone (Plate VII, Figure 1). It was an obvious step then for the craftsman to combine color with large areas of white. Arnold points out that the earliest grisaille seems to have been conceived as a white pattern on a colored ground with the pattern, as it were, almost entirely hiding the ground; later this conception is reversed.³ In one type of grisaille narrow "straps" of white glass seem to interlace, while in others the leads form a flat geometrical pattern. The painted parts consist of delicate line work forming designs of foliage; frequently parts are covered with fine cross-hatching giving at

¹Eden, Ancient Stained and Painted Glass, p. 35.

²Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 117.

³Werck, Stained Glass, p. 94.

a distance a pearly gray against which the scroll work stands out in white.¹ Motives of economy led the craftsman in some instances to fill large areas of grisaille windows with painted "quarries" or small diamond shaped panes which could be quickly turned out in great numbers.² Toward the end of the thirteenth century there is occasionally found the combination of colored figures with a ground of grisaille (Plate VII, Figure 3); this is not fully developed, however, until the fourteenth century.

It can be seen from the above that there is a broad unity characteristic of stained glass of the eleventh, twelfth, and thirteenth centuries. There are, it is true, distinctions between the styles of the three centuries; the eleventh century being marked by use of large pieces of glass and strongly Byzantine drawing; the twelfth by smaller pieces of glass, by the initial breaking away from the Byzantine, as well as by impersonal treatment of subject matter; and the thirteenth by the introduction of the personal element in subject matter, by the growing effort to secure more light, and by certain technical innovations due to the increased demand for glazing. As a whole, however, the three centuries are easily classified

¹Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 117.

²Ibid., p. 120.

together as the "First Period" in the development of stained glass.¹ Marked by rich and jewel-like color, and by flat treatment of pattern growing out of familiarity with Byzantine traditions, this period is felt by many² to exhibit not only great sympathy and understanding of themes portrayed but also the most perfect understanding of the limitations of the materials.

¹Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 31.

²Opinions expressed by Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 40; Viollet-le-Duc, "Vitrail," Stained Glass Bulletin, XXVI, 147, 154, 190; Connick, Adventures in Light and Color, pp. 35, 41; R. A. Cram, "Stained Glass," Art and Decoration, February, 1924, p. 11.

CHAPTER III

TRANSITIONAL STYLE OF THE FOURTEENTH AND FIFTEENTH CENTURIES

Fourteenth century stained glass is marked by a definite breaking away from ideals which had motivated earlier work. Various causes brought about far-reaching changes which affected traditions of style as well as of technique.

To begin with, there was a definite change in the attitude of society. The religious enthusiasm which had reached a climax in the thirteenth century was overshadowed in the fourteenth century by the movement toward humanism begun in the previous century with St. Francis of Assisi.¹ People no longer felt life to be mere preparation for the life to come, but began to look about them, to find an interest in nature, and in man himself. Never again did a whole community enthusiastically neglect personal affairs in order to build and decorate a great place of worship.² Not only was the layman uninterested, but the clergy was becoming apathetic.

No longer did the craftsman feel zest for telling a story in order to teach a Christian principle since he would have only an indifferent audience; consequently, narrative subjects are much more rare. Instead, there is an endless

¹Read, "Stained Glass," Encyclopaedia Britannica, 14th ed., XXI, 293.

²Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 126.

train of large single figures of saints. Since he had now become interested in the world about him, the craftsman looked to nature for plant forms to use in ornament.¹ Along with the artists in other media, he abandoned the more or less fixed types of early Gothic art for the living models before him.² The late thirteenth century artist had already made an effort to capture something of vigorous and naturalistic movement and in that effort had neglected grace of gesture. The fourteenth century designer, then, in an attempt to secure grace adopted an S-like pose for figures, and although he made a direct study of actual drapery, he exaggerated long and sweeping folds.³ Figures now appeared in contemporary costumes in contrast to the twelfth and thirteenth century garments which had been of classical derivation except when ecclesiastical or military.⁴ The dress of saints was still depicted, however, in idealized form.⁵

With religion no longer his chief interest, the artist became absorbed in practical and in technical problems. The

¹Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 127.

²Read, "Stained Glass," Encyclopaedia Britannica, 14th ed., XXVI, 293.

³Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 143.

⁴Read, "Stained Glass," p. 293.

⁵Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 143.

problem of lighting, which had been at least partly solved in the preceding century, was constantly in his mind. As a result, fourteenth century windows, particularly in France, reveal an abrupt change from the rich thirteenth century color to what one writer refers to as "the early fourteenth century glare."¹ That this shift is not so abrupt in England is due to the fact that from the beginning the English glazier had struggled with the problem of light, since he lived in a country of little sunshine; consequently he had not allowed his enthusiasm for color to permit him to exclude light to the extent that French glazing of the first period did. The English had maintained a certain balance of light as compared to the French lack of illumination which was responsible for the new emphasis on light at any cost.²

In addition to desire for light, the fact that windows were growing ever wider and higher made the artist feel that his glazing must not be too heavy for the wide expanse to be filled.³ Thus the fourteenth century came to be marked by the full exploitation of white glass; nearly every window of any size contained a large proportion of grisaille. At first figure work and grisaille were combined in such a way as to give vertical bands of alternate white and color; however, the later

¹Sherrill, Stained Glass Tours in England, p. 68.

²Ibid., p. 69.

³Read, "Stained Glass," Encyclopaedia Britannica, 14th ed., XXI, 293.

and more usual method was for the colored parts to form one or more horizontal bands across all of the lower lights of the window.¹

One of the most important technical advances at this time was the discovery of silver stain. Probably by accident it was found that either oxide or chloride of silver might be applied to glass and would produce when fired a yellow varying from a light lemon to a deep orange, depending upon the amount used and upon the composition of the glass. One story would ascribe this discovery to Blessed James of Ulm, a Dominican brother who later became the patron saint of stained glass workers. However, one of the first appearances of silver stain is to be found in York Minster in windows dated approximately 1308, more than 100 years before the birth of James of Ulm.² Exactly when and where it was discovered, is unknown. It appears with certainty in France by 1310 but may have been used there at an earlier date in examples no longer extant. Its first use was limited to details such as hair or crowns, but rapidly spread until by the middle of the century it was freely used in all parts of the window.

Another technical innovation of the fourteenth century appears in the developments pertaining to "flushed glass."

¹Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 133.

²Stained Glass Bulletin, June, 1932, p. 171.

Ruby glass had been of this type from almost the beginning; that is, a thin layer of red had been coated on colorless glass, since red the full thickness of the glass would have been too dark to permit passage of sufficient light to reveal the color. At this time, however, the craftsman greatly increased the range of his palette by flashing together two hues which when placed in light produced a third. Various reds and blues combined to produce a wide range of purples; blues and yellows gave greens, etc. Nor did the craftsman stop with combinations of two colors, but in his eagerness for new hues fused together sometimes five or six layers of different colors.¹ This last practice, however, was more widespread during the fifteenth century than during the fourteenth century.

The craftsman early in the fourteenth century learned that by grinding away parts of one coat of flashing he could secure two colors on one piece of glass, depending, of course, upon the hues composing its layers. This, in combination with silver stain, meant that at least three changes of color could be secured, if desired, without having leads surround each area of different color.² This was the beginning of a new attitude toward leading—the artist was no longer forced to draw with lead, a fact which helped create finally an absolute disregard

¹Eden, Ancient Stained and Painted Glass, p. 95.

²Werck, Stained Glass, p. 84.

of leading in the sixteenth century.¹

As has been pointed out, these various technical developments appeared largely because the artist had no other absorbing interests. This same want of an underlying and unifying motive produced a certain distortion in the artist's outlook.² To this cause may be partly attributed at least the development of the canopy to such proportions that it became more important than the figure under it. The canopy had originated in the twelfth century as a simple architectural unit, frequently an arch, used to indicate an interior scene.³ In the thirteenth century single figures had canopies similar in design to the niches on the outside of the building in which sculptured figures were placed. In the fourteenth century the artist had become "canopy mad" as it were.⁴ There was perhaps some justification for use of the tall canopy as a means of elongating a design, since the human figure was very short and broad in proportion to the tall narrow shape of the lights; however, as Arnold says, the craftsman "developed it . . . out of all reason, filling it with fantastic detail—angels looking out of windows, birds perching on the pinnacles, and miniature figures standing like

¹Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 219.

²Ibid., p. 126.

³Read, "Stained Glass," Encyclopaedia Britannica, 14th ed., XXI, 293.

⁴Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 137.

statues in the niches of it—till it quite reduced the figures below it to insignificance."¹ At first it was rendered in one dimension but by the beginning of the fifteenth century there was a definite use of perspective.² The canopy continued in use throughout the fifteenth century, becoming ever more involved with gables, mullioned windows, rosettes, crockets, and pinnacles.³ It is always largely white or yellow against a colored ground, thus fitting admirably with the designer's purpose of admitting light, which may be one explanation of its extended use.

Midway in the fourteenth century came two forces which spelled disorganization for craftsmen all over Europe—the worst plague of history, and the beginning of the Hundred Years' War. As a result, signs of poverty appeared; among other evidences of this, glass had a thinner and less streaky quality. In addition there was more and more divergence among local schools and after the end of the century the styles of England and France became markedly different.⁴

During the first half of the fifteenth century, English

¹Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 138.

²Read, "Stained Glass," Encyclopaedia Britannica, 14th ed., XXI, 293.

³Viollet-le-Duc, "Vitrail," Stained Glass Bulletin, XXVI, 84.

⁴Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 213.

glass was, according to some authorities,¹ at its height. At this same time in France, where war had laid waste the country, very little glass was being produced; when the art was finally revived in the sixteenth century, it was with very different ideals. In England, the fifteenth century is largely the continuation and elaboration of the fourteenth century style. Natural plant forms were abandoned in ornament, however, and were replaced by stylized diapers and by the "seaweed pattern," a rather shapelessly indented leaf painted usually on a blue or ruby glass in great quantities so as to be on hand when needed.² More than ever is white used in both figures and canopies, making unnecessary the fourteenth century division of the window into panels of alternate grisaille and color. In addition pieces of glass used were gradually made larger and larger until by the end of the century the jewel-like quality of early glass was entirely gone.³ Also, the attempt of the glass painter to secure the effects of modelling by his treatment of forms can be traced. By the beginning of the sixteenth century England was experiencing an influx of artists from the Continent where new ideals had grown up.

¹Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 213; Sherrill, Stained Glass Tours in England, p. 140.

²Head, "Stained Glass," Encyclopaedia Britannica, 14th ed., XXI, 293.

³Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 219.

CHAPTER IV

THE PICTORIAL IDEAL FROM THE SIXTEENTH TO NINETEENTH CENTURY

With the Renaissance, and shifting of the dominant emphasis of artistic effort from architecture to painting, the glass-painter found himself in a dilemma. He had to adapt his art to the new conditions, or suffer from the general neglect of arts subordinate to architecture. He attempted to save himself by adopting the aesthetics of painting.
.....¹

Thus it is that we find stained glass after the fifteenth century exhibiting ideals entirely at variance with those of preceding periods. True, there had been hints in the fifteenth century of the developments to come, for there had been definite use of perspective as well as attempts at modeling. Also, classical details indicative of the infiltration of Renaissance ideas had begun to appear in architectural canopies. Finally, as has been pointed out, the craftsman had begun to ignore lead lines and to depend more upon devices such as silver stain, abrasion of flashed glass, and paint; in other words, the craftsman had already given evidences of becoming less interested in glass itself than in what he put on the glass.

The sixteenth century brought two forces to bear upon the stained-glass worker which made it inevitable that he should follow the pictorial ideal—the invention of colored enamels for glass, and the influence of Italian Renaissance painting.

¹Read, "Stained Glass," Encyclopaedia Britannica, 14th ed., XXI, 293.

The opening of the century saw the Italian campaigns of Louis XII and of Francis I; French soldiers on returning home naturally brought Italian ideas, while Francis I actually induced Italian artists to come to France and execute commissions for him. Architecture was the first art to reflect the Italian taste;¹ and the stained glass craftsman, in searching for a style of glazing which he felt suitable for Renaissance buildings, turned for inspiration to the Italian Renaissance school of painting.

As long, however, as he worked with lead, pot-metal, yellow stain, and brown enamel only, he could not produce the results for which he was striving. Midway in the sixteenth century his problem was solved by the coming into general use of enamel colors for glass.² This freed him from the limitations of pot-metal; no longer was it necessary to cut each color from a separate piece of glass and laboriously lead the whole together. The whole window, if small, might be painted upon a single piece of white glass. In large windows the glass-painter attempted to make the leads interfere with the design as little as possible; consequently, large pieces of glass of shapes varying according to the painter's convenience were used, or, in some cases, the window was made up of large squares of glass of almost uniform size.³ Mullions, as well as leads, were ignored, and the whole

¹Sherrill, Stained Glass Tours in France, p. 198.

²Eden, Ancient Stained and Painted Glass, p. 135.

³Ibid., p. 136.

window regarded as one huge canvas. Knowledge of perspective was put to elaborate use as well as subtle transitions from light to dark in order to obtain a three dimensional effect. (For an example of this type of window see Plate IX.)

Changes in subject matter at this time consist of the gradual replacement of the canopy by forms derived from classical architecture with distant landscapes seen between the columns, or else by stretches of sky with painted cloud forms. Another outstanding feature of the century lies in the importance given to the donor, who usually quite overshadowed the theme of the window.¹

In Switzerland, Holland, and Flanders, enamel painting of a domestic character was developed. Small window panels of minute detail, but intended for nearness and intimacy, were produced, which, according to Read, represent the only appropriate technique and use of enamel painting.² It was from this school of enamel painting rather than from the Italian-influenced French that the new style was introduced into England.³ In England, however, there was little demand for painted glass for domestic use; nevertheless, the glass painters attempted to apply this type of glass to the needs of ecclesiastical buildings, with results which are termed by Read as "generally

¹Eden, Ancient Stained and Painted Glass, p. 144.

²"Stained Glass," Encyclopaedia Britannica, 14th ed., XXI, 295.

³Arnold and Saint, Stained Glass of the Middle Ages in England and France, p. 257.

ludicrous and always inappropriate,"¹ and by Cram as "preposterous."² As the crowning example of this type of window both writers refer to the window designed for New College Chapel, Oxford, by Sir Joshua Reynolds, which was actually executed by a china painter.

Very little painted glass was produced during the seventeenth and eighteenth centuries except by isolated groups or individuals who achieved little of significance. Heraldic glass for secular use was produced regularly, however, throughout this period in England.

The Gothic revival in the late eighteenth and early nineteenth centuries caused a reconstruction of styles and methods of the early Gothic period; however, these were soon reduced to sterile formulas and easily commercialized. Particularly in Germany, factories sprang up for the manufacture of windows of "any size, any subject, and colors to taste."³ Against this situation the Pre-Raphaelites, and especially William Morris and Burne-Jones, made an attempt to evolve a style and technique appropriate to their own age. Concerning the style of Morris, the following has been written:

. . . there was a certain freshness of attitude and a revolt against the dead conventions of the times.

¹"Stained Glass," Encyclopaedia Britannica, 14th ed., XXI, 295.

²"Stained Glass: an Art Restored," Arts and Decoration, XX, 11.

³Read, "Stained Glass," p. 295.

. . . His selection and disposition of colours is admirable, and he was not afraid of using new colours to achieve effects unknown to previous ages. In the use of leads to emphasize design he is masterly, and we must go back to the 14th century for an adequate comparison.¹

Morris and Burne-Jones produced windows not only for use in churches but also for domestic or secular use. For the latter, they confined themselves in subject matter to the romantic and literary choices of the Pre-Raphaelite circle.² Read acknowledges that "they made a feeling for design once again a vital force in the social life of England — and, indeed eventually of Europe;"³ yet in a following paragraph he says of their stained glass that "it lacked the immediacy and the reality which we are entitled to expect from any contemporary expression of ideals."⁴ The bulk of English glass since the time of Morris, until recent years, apparently relapsed into "period work"—mere imitation of past styles.⁵

¹Read, "Stained Glass," Encyclopaedia Britannica, 14th ed., XXI, 295

²Ibid., p. 297.

³Ibid., p. 295.

⁴Ibid., p. 297.

⁵Ibid.

CHAPTER V

STAINED GLASS IN AMERICA

The first windows used in America were either imported or else made by the few craftsmen who had come, most of them from England, to establish small shops.¹ The first stained glass craftsman in America of whom there is record, was Evert Duyckingh, who came to New Amsterdam from Borken in Westphalia, as early as 1640. He glazed windows for the Church at New Amsterdam, demanding two and one-half beavers in payment for each window.² According to Connick, Duyckingh's windows were probably simple patterns of oblongs and diamonds with possible accents of painted ornament or heraldic devices.³ Records of Duyckingh's work are scattered as are records of other early glass craftsmen. These early workers apparently "confined themselves principally to reproductions of grisaille with an occasional figure somewhat raw in color under a canopy, the whole made with an inferior type of glass, often backed with a coating of white to modify its transparency."⁴

Of the imported windows, the largest number were brought

¹Charles J. Connick, "Modern Glass—A Review," International Studio, LXXX, 46.

²"Notes, Correspondence, and Comments," Stained Glass Bulletin, November, 1931, p. 401.

³Connick, Adventures in Light and Color, p. 403.

⁴Connick, "Modern Glass—A Review," p. 46.

from France, Germany, England, and Belgium.¹ However, the imported glass seemed thin and transparent since it had been designed and assembled by foreign craftsmen who had no knowledge of the intense light common to most parts of America as compared with that of Europe.²

Thus matters stood until the second half of the nineteenth century when, in America, the craft of stained glass entered upon a period of change and development. John La Farge, American painter and designer, who had spent much time in Europe and who greatly admired the windows of Chartres, desired to produce windows adjusted to the brilliant light of this continent. He had worked with glass from foreign markets but could find none of as great density as he desired. After almost abandoning designs for glass, he finally arrived at the idea of having glass made to meet his own specific desires.³ With the aid of a master glass-maker of Philadelphia he worked out the following innovations. Varying degrees of opacity were produced within a single sheet of glass by adding to the molten glass a substance similar to porcelain which produced a refraction of the light and an "opalescent" quality.⁴ Furthermore,

¹Connick, "Modern Glass—A Review," International Studio, LXXX, 46.

²Ibid.

³H. E. Wright, "Letter from Kokomo Opalescent Glass Company," Stained Glass Bulletin, July, 1932, p. 219.

⁴Charles H. Dorr, "Art of Making a Stained Glass Window and the Work of Clara M. Burd," Architectural Record, XXV, 163.

variations of color within a single sheet were secured by swirling together different hues of glass while still in a molten state. These sheets of glass at first represented simple combinations such as red and yellow, blue and yellow, violet and green, or else were gradations of a single hue; later, the combinations grew into "rainbow splashes."¹

La Farge, whose training had been that of a painter, saw his new glass not only as a means of subduing light, but also as a means of securing pictorial effects of modelling through the changes of dark and light in the glass itself rather than through painting on the glass. He arrived at still another method of building desired changes of tone through plating or superimposing one piece of colored glass upon another, a practice sometimes carried to the extreme of six or eight layers of glass.² These new methods, according to Connick, led La Farge "into frank duplications of the effects he obtained on canvas, and resulted in transparent pictures rather than windows as architectural units."³ (See Plate X, Figure 1.)

The discoveries of La Farge were further developed by

¹Connick, Adventures in Light and Color, p. 119.

²Dorr, "Art of Making a Stained Glass Window," Architectural Record, XXXV, 162.

³Connick, "Modern Glass—A Review," International Studio, LXXX, 46.

Louis Tiffany (Plate X, Figure 2) and by others. New effects were secured with glass drawn into fold-like ridges in imitation of drapery.¹ Popular demand for "picture windows" increased until "art glass" production was widespread, and inexpensive and quick effects were sought for in glass. "Glass for ground, for foliage, for skies, for the backs of sheep, for flesh," was devised "so that inexpensive experiments could be eliminated and art made safe for moneymakers."² Art glass emporiums brought forth the landscape window with realistic leaves and shadows, flowers, rocks, and reflecting pools all produced in the manipulation of molten glass and coloring matter.³ Furthermore, well-known paintings by both old masters and contemporary painters were often reproduced in glass.⁴ So popular was the pictorial window and so great was the demand that, for a time, America "led the world in realistic picture windows."⁵

In contrast to the popular approval of opalescent windows was the dislike many architects had for them. Even those

¹W. H. Thomas, "Coloured Glass Windows—the Supremacy of the Modern School," International Studio, XXIX, 46.

²Connick, Adventures in Light and Color, p. 121.

³Ibid., p. 124.

⁴Cram, "Stained Glass—an Art Restored," Arts and Decoration, XX, 13.

⁵Connick, "Modern Glass—A Review," International Studio, LXXX, 40.

architects who did not object to the interior effect were displeased by the outward gray-white appearance of opalescent glass.¹ Many churches being erected at the time were adapted from the Gothic style and the opalescent window was felt to be inconsistent with the spirit of these buildings. Furthermore, the opalescent window was frequently so designed that tracery planned by the architect would have to be removed if the window were to have a clear field for its picture.² The protesting architects turned to Europe for glass, particularly to England, where, as a result of the Pre-Raphaelite movement, there had been a return to the Gothic technique and style.³ This caused at first a great influx of windows from English craftsmen, namely, Kemp, Hardman, Powell, Heaton, Butler and Bayne, Clayton and Bell, and Christopher Whall;⁴ however, it led eventually to the development of different standards for American glassmen.

Partly because the imported windows revealed to American craftsmen the inactivity in light of their own semi-opaque windows, and partly because of desire to meet the

¹Connick, Adventures in Light and Color, p. 124.

²Cram, "Stained Glass—an Art Restored," Arts and Decoration, IX, 12.

³Connick, "Modern Glass—A Review," International Studio, LXXX, 41, 46.

⁴Cram, "Stained Glass—an Art Restored," p. 12.

demands of the architect, many American glassmen gradually followed the English return to the medieval style and technique. Some craftsmen only partly adopted the new standard, as in the case of Clara M. Burd, who combined opalescent with antique glass.¹ Others continued in the opalescent style, and particularly did small shops removed from Eastern centers continue to cater to popular demands, so that Cram could write in 1924:

Pretty gardens of Easter lilies, with birds and butterflies floating against cumulous clouds or forest scenes and sunset effects done in opalescent glass . . . still hold . . . in Gopher Prairie and Zenith City, but not elsewhere. Instead you find only the sound tradition of medieval art but adapted in many ways to changed conditions.²

According to both Cram and Connick, Otto Heinicke, or Heinigke (1850-1915), was one of the first to urge a return to the "ideals, the spirit and the craft of glassmaking as it was from the twelfth to the sixteenth centuries."³ Other glassmen, many of whom are producing windows today and all of whom adapt both style and technique from medieval windows are mentioned in the following paragraphs.

Harry Eldridge Goodhue of Cambridge, brother of the

¹Dorr, "Art of Making a Stained Glass Window," Architectural Record, XXV, 164.

²Cram, "Stained Glass—an Art Restored," Arts and Decoration, XX, 15.

³Ibid., p. 12.

architect, Bertram Goodhue, is referred to as another pioneer against the pictorial influence.¹ Henry Wynd Young, who was born in Scotland, worked for some time in the Goodhue studio; he later established his own shop in New York. Mention is made by Connick of Young's "use of line, color, and especially of whites, his appreciation of surfaces and textures and of the varying, subtle qualities of transparency and opacity revealed by light playing through paint and glass together."² Connick further states that Young "recreated with sensitiveness and charm the forms familiar to students of fifteenth century glass in England."³ Some of his best known windows are in the following buildings: St. Bartholomew's Church, New York City; Newark Cathedral, Newark, New Jersey; Emanuel Church, Newport, Rhode Island; House of Hope Presbyterian Church, St. Paul, Minnesota. Following his death, Young was succeeded in his studio by J. Jordan Guthrie.

William Willet of Philadelphia did much to encourage younger craftsmen in their revolt against opalescent glass,⁴ among these being Connick who worked under him for a short time.⁵

¹Connick, "Modern Glass—A Review," International Studio, LXXX, 53.

²Ibid., p. 52.

³Connick, Adventures in Light and Color, p. 176.

⁴Connick, "Modern Glass—A Review," p. 53.

⁵Connick, Adventures in Light and Color, p. 404.

Although he had been a student of La Farge, Willet "followed precedents in a manner of his own and combined traditions of early work in France and England with an exquisite detail in painted figures and faces that showed the influence of later schools."¹ Since his death, his wife, Anne Lee Willet, and son, Henry Lee Willet, have carried on the style of his work.

Charles J. Connick was, according to Cram, one of the first to "take up the reform initiated by Otto Heinecke. . . . Brilliancy, radiance, the jewelled gleam of precious gems are rather his forte, though his later work has broadened out into more of the calmness and serenity of Bourges and LeMans. Perhaps he now and then uses more complicated color schemes than are absolutely necessary."² Mr. Connick, who has for some years been President of the Stained Glass Association of America, is generally recognized as the Dean of American glassmen. He is probably the most widely known of the group of craftsmen who today follow the medieval style.³ (See Plate

¹Connick, Adventures in Light and Color, p. 404.

²Cram, "Stained Glass—an Art Restored," Arts and Decoration, XX, 13. Mr. Cram's view concerning color in stained glass is presented in the following quotation from the same source: "After all, comparatively few are imperative, with blue, red, tawny and white predominant, the yellows, greens and purples much subordinated, with grays and half-tones used not at all."

³For a list of buildings in which Connick windows have been placed see Connick, Adventures in Light and Color, pp. 349-377.

XI, Figure 1.)

Nicola D'Ascenzo, who was born in Italy and is now of Philadelphia, "has brought to his work in glass a poet's fancy, a thorough artistic training, an exuberant love for color and a sturdy sense of form."¹ Probably his best known windows are in the Washington Memorial Chapel, Valley Forge, Pennsylvania (Plate XI, Figure 2). Cram remarks:

There is a certain kinship between his Valley Forge glass and that of the chevet chapels at Amiens, though the tone is deeper; too deep, perhaps, on account of the prescribed subjects which were much too crowded with small figures. . . . The general effect of this Valley Forge glass is enormously impressive in its thundering blues and violets.²

Among other outstanding craftsmen who are working to-day in the medieval style are: Wilbur Herbert Burnham of Boston; G. Owen Bonawit of New York who has added to his larger commissions interesting work for residences, public buildings, and business houses;³ Reynolds, Francis, and Rohnstock of Boston, all of whom were trained in Connick's

¹Connick, "Modern Glass—A Review," International Studio, LXXX, 35.

²Cram, "Stained Glass—an Art Restored," Arts and Decoration, XX, 13.

³Secular use of stained glass is apparently more highly developed in Europe than in America. According to Read, "Stained Glass," Encyclopaedia Britannica, XXI, 297, a railway station at Hagen has modern glass by Jan Thorn-Prikker, while in Paris the offices of a large newspaper concern have modern designs in leaded glass. Also, according to Connick, "Modern Glass—A Review," p. 52, an export house in Hamburg has windows designed by John Nickelson, now of New York.

studio or served apprenticeship there;¹ and others.²

Among craftsmen who have recognized and adopted medieval technique as being true to the limitations of the medium, but who have attempted to evolve a style belonging to their own century, are Harold Rambusch of New York, and Emil Frei of St. Louis (Plate XII).

The periods in the development of stained glass in America have been: first, a period of comparatively little activity which extended from approximately 1650 to the second half of the nineteenth century, during which time European styles were copied with materials of rather poor quality; second, the period of the opalescent window, beginning in 1888 and continuing to the present in some regions, a development which began as an interesting experiment by a painter but which degenerated into the stylistic forms of "art glass"; third, the period of return to medieval style and technique, a movement which began to take form in the opening years of the twentieth century and which continues at present.

Glassmen of the third period have adopted medieval

¹Cram, "Stained Glass—an Art Restored," Arts and Decoration, XX, 13.

²For a more detailed list of craftsmen, and for illustrations of windows by craftsmen here mentioned, see: Cram, "Stained Glass—an Art Restored," Arts and Decoration, XX, 11-13; Connick, "Modern Glass—A Review," International Studio, LXXX, 40-53; "Stained Glass has U. S. Renaissance," Life, April 3, 1939, pp. 30-32.

technique as being a direct and appropriate use of the materials of glass, enamel, and lead. They admired the Gothic craftsman for this direct use of materials and also for his interpretation of the religious and philosophical themes of his day in terms of his own experience. In this admiration, the craftsmen of today turned to medieval themes and styles for inspiration, although they were not motivated by medieval concepts and ideals; in imitating a style from the past they failed to achieve an expression of their own age.

Developments can be traced at present indicating the beginning of a fourth period of stained glass in America, as well as in Europe,—a period marked by themes derived from present-day concepts and interpreted in forms derived from present-day life, a period which, if reaching the most desirable expression, would be marked by the complete integration of theme, style, and material.

PART TWO

TWO STAINED GLASS WINDOWS FOR THE
LITTLE CHAPEL IN THE WOODS

CHAPTER VI

APPROACH, PROBLEMS OF DESIGNING, AND TECHNIQUE

The first step in preparing stained glass window designs for the Chapel was a study of past developments of style and technique in stained glass as revealed in available books and articles by craftsmen, critics, and historians. The results of this survey comprise Part I of this thesis.

Next, observations were made of stained glass in Denton and neighboring cities, particularly Dallas, by visits to the churches in which it had been placed. Very little of the glass seen could be termed true mosaic style stained glass, most of that observed being of the opalescent or "art glass" variety.

Following this study of the history, technique, and present use locally of stained glass, another type of investigation was carried out in experimentation with the actual materials for a stained glass window. Several hundred samples of colored glass were secured and studied in relation to their action in light. The technique of cutting glass was acquired by making a geometric pattern of antique glass in red, blue, and "white" or gray. The shaped pieces of glass were attached with a mixture of beeswax and resin to a sheet of clear glass and the whole placed on an easel against light to observe the interaction of one color on another. Following this, experiments were made to study the effects of shutting out varying

amounts of light with patterns of opaque paint (Plate XIII) and further to note the comparative radiating qualities of the various hues of glass.

After these experiments had been made, work was begun on the actual designs for the windows. In the preparation of the cartoons, drawings and sketches were made from subjects in real life; from these studies patterns were stylized for glass. Plate XIV represents studies made for this purpose.

Just as the designs for the windows were evolved from studies in real life, so the colors selected for the windows are those seen in the reality of the Texas landscape—hazy blues, slate blue, sage greens, strong blue-greens, warm grays, and tawny reds and yellows. Furthermore, the values and intensities of the hues selected were determined by a consideration of the very real problem of admitting sufficient light to the nave of the Chapel. The experiments discussed in detail in the following paragraph were made with antique glass of intense blue, red, amber, and green, with the addition of neutral grays. The experiments indicated that the use of these colors would not only render the nave dark, but would also produce so strong a vibration as to be unsuited to the staggered geometric style of the window designs with their comparatively large pieces of glass. The glass chosen for the windows was selected with the following aims in mind: to counteract brilliant sunlight without causing the nave to be too dark; and to produce a sensation of soft, glowing color.

When the first cartoon had reached an almost completed stage, the experiments mentioned above were made as follows: Templets (patterns of stiff paper for each piece of glass to be cut allowing approximately 1/8" for the heart of the H-shaped leads between pieces of glass) were prepared for more than half of the cartoon. Glass was cut according to these shapes and was waxed up against light in an easel arrangement permitting eight feet of glass to be seen at once. The sections composing the easel were small enough to be lifted by one person; in this way the disadvantage of not having a large easel and a group of workmen to lift it up or down was partly overcome. Enamel composed of ground glass and pigment was then applied to the glass according to the painted details suggested in the cartoon. It was found through numerous trials that the best results could be obtained both in application of the enamel and in firing if the enamel were mixed to a thick paste with glycerin, then thinned enough to be manipulated with a brush with a two and one-half per cent solution of acetic acid. A pottery kiln was made practical for firing of glass by the stacking of cast iron trays in a framework placed within the kiln, each tray being covered with asbestos and filled with a layer of glass. (For illustrations of these various technical steps, see Plates XV and XVI.) The above experiments gave evidence that the greatest part of the execution of the windows could be carried out on the Texas State College for Women campus by students.

The first cartoon to be completed was that of the window portraying woman as she ministers to human needs through the art of nursing. This cartoon was taken to a stained glass plant¹ for criticism and advice from a designer experienced in the craft.² Certain revisions were then made in the cartoon for the window and in the color palette. Templates for the window were prepared, samples of glass representing the color palette were selected, and the glass for the window was cut by a professional worker.³ The glass for the entire window was then waxed up and studied as a whole against light for the first time. The parts composing the upper sections of the window were felt to be satisfactory in their relationships; however, this was not felt to be true of the glass pieces making up the lower sections. Accordingly, nearly all of the light blues and blue-greens in the lower sections were re-cut in darker values. The glass was then shipped to the Texas State College for Women campus where it was waxed up, painted, and fired according to the procedure explained above. Following this, an experienced workman was brought to the campus to join the glass by H-shaped leads (Plate XVI, Figures 3 and 4) and

¹Emil Frei Incorporated, St. Louis, Missouri.

²Mr. Emil Frei, Jr.

³A member of the Frei Company, who cut all of the glass for the Nurse window with the exception of a few pieces which were re-cut by the writer.

to install the five sections of the window into the openings of the iron framework in the window aperture.¹

¹A workman from the United Plate Glass and Mirror Company, Dallas, Texas.

CHAPTER VII

EXPLANATION OF THE SUBJECT MATTER OF THE DESIGNS

The general theme of the windows for the Chapel is that of woman ministering to the needs of humanity. This was suggested by Dr. L. H. Hubbard, President of the Texas State College for Women. The selection of the specific activities of women to complete the theme in detail was carried out as partial fulfillment of the requirements of this thesis.

After considering the fields in which the services of women have been of unique value, and also those fields for which women are being prepared at this College, the following were chosen as subjects for the eight nave windows: for the west windows, the more practical services of nursing, teaching, science, and social service; for the east windows, the more intangible ministrations to aesthetic needs through the arts of literature, speech, dance, and music. Texas flower forms were selected as the subject for the rose window, while for the chancel window was reserved the theme of woman's devotion as wife and mother.

Two complete window designs were prepared as a part of this thesis—the patterns for the windows dedicated to Nursing and to the Dance. The selection of subject matter to be included in these windows was made after an investigation of books and articles presenting woman's achievements and ideals

in the two fields, and after interviews with persons on this campus who were associated with these activities. The iconographies for the two windows are presented in the following pages.

THE NURSE WINDOW

The first window to the left as one enters the Chapel is dedicated to woman as she serves humanity through the art of nursing (Plate XVII). This pattern, the first to be designed, established for all of the nave windows the general plan of incorporating a large central figure with smaller figures and symbols below and above. In the nurse window, the large figure represents an effort to express the essential qualities of the universal nurse, while the smaller symbols are based upon figures from our own campus and upon historical figures whose achievements were a part of the development of the work and ideals of the present-day nurse. The women of history whose life work finally succeeded in establishing the humanitarian service of nursing are presented in the design chronologically because their work was cumulative, the earlier services laying the foundation for the later developments.

The first historical figure is that of a Sister of St. John who represents the military nursing orders of the middle ages. She appears in the lower right corner of the window. The Order of St. John was originally organized for the care of two hospitals, one for men, one for women, which had been founded at Jerusalem about 1050 A. D. by wealthy Italian

merchants and dedicated respectively to St. John the Almoner and Mary Magdalene. Both Knights and Sisters of St. John wore a black habit on which appeared a white eight-pointed cross symbolizing the eight virtues professed by the order; later the white cross was set upon a red ground. (At this time a red cross was worn by the order of Knights Templars who were not a nursing order.) The cross appears in a pointed device near the nurse. Due to their excellent nursing service, gifts were showered upon the order, making them quite wealthy and enabling them to found branch hospitals in many countries. Their services remained of comparatively excellent quality until the end of the thirteenth century, after which time their efficiency gradually waned. Hospital regulations worked out by this order during the highest period of their service were adopted by practically all city hospitals or Maisons-Dieu in Europe.¹

A minor figure appearing near the Sister of St. John is that of Hildegarde, called "Sybil of the Rhine," who trained women to carry on hospital nursing. One of the first to recognize the importance of scientific training, she herself carried on dissections of animal and possibly of human bodies. However, so great was the objection of the Church to dissection as an outrage to the body which was looked upon as the temple of the Holy Spirit, and so great was popular aversion because of belief in the doctrine of bodily resurrection, that she was

¹Lavinia L. Dock and Isabel M. Stewart, A Short History of Nursing (New York: G. P. Putnam's Sons, 1925), p. 62.

compelled to conceal her work and to claim divine revelation as the source of her knowledge. After her death she was refused canonization because of her scientific learning. In the window this conflict is symbolized in the figure of Hildegarde who continues her scientific investigation while in the background the tiara of the Pope obscures the nimbus of sainthood which might have been hers.¹

A second minor figure appearing just above Hildegarde is Elizabeth, Queen of Portugal during the early fourteenth century, who endowed a hospital and later entered it to spend her life in service there.² She is portrayed as holding a small model of the building which housed the hospital.

In 1633, Mlle de Gras, one of St. Vincent de Paul's co-workers in the hospitals of Paris, organized the Dames de Charite. In the window the figure representing the "Sister of Charity" is accompanied by a small figure of St. Vincent, seated on the millstone with which he was martyred. It was from him that the wise regulations adopted by the Sisters emanated. Because of his rules, the nurses were not to take vows or binding promises but remained secular, for, as he said, "Nuns must need have a cloister, but the Sister of Charity must needs go everywhere."³ Other advances in this

¹Dock and Stewart, A Short History of Nursing, pp. 50, 56.

²Ibid., p. 79.

³Ibid., p. 100.

profession for women came about through his insistence that nurses give implicit obedience to physicians in regard to medical matters rather than to priests, as had been true of the strictly religious nursing orders, and also that they be professionally instructed by physicians and form classes among themselves to question one another on the lectures which they heard. Symbolizing this new cooperation with the medical profession is the caduceus, symbol of the physician, which appears at the side of the Dame de Charite. The Sisters of Charity brought a new spirit into the field of nursing, and so excellent was their service that they were in time adopted by the French army. They served during the Napoleonic wars as well as others; at the Crimea their services were pointed out by war correspondents describing the deplorable conditions of the English regiments. The order was introduced into the United States in 1808 at Emmittsburg, Maryland. At present they have many training schools both in this country and in Ireland.¹

The next historical figure is that of Florence Nightingale who was called upon during the Crimean War as the only woman in England fitted to take a staff of nurses to the war district. Just beneath her figure is represented the building which served as hospital in the Crimea. In her period of service here she not only succeeded in systematizing a nursing service for the army, but also, with her intelligent and

¹Dock and Stewart, A Short History of Nursing, p. 101.

unsparing criticism, practically overthrew the whole method of managing the British army. She established besides nursing service, laundries, diet kitchens, sanitary engineering works, a post office and a savings fund for soldiers, rest and recreation rooms, convalescent camps, as well as systematic care for the families of soldiers. Nursing to her was a more far-reaching thing than just caring for the ill, and was definitely linked with life in all of its aspects. Perhaps her most outstanding characteristics were those of graciousness toward and sympathy for those under her care, for it was qualities such as these which were most frequently praised by the soldiers who remembered "the lady with the lamp."¹ With regard to nursing methods she might in her youth have been called revolutionary; in later life, however, she opposed all of the more progressive movements inaugurated by younger nurses, nor did she ever accept the "germ theory" as proved by the work of Pasteur and others. However, this reactionary element of her nature does not render her achievement any the less significant, and she is justly called the "Founder of Modern Nursing."² As such she is one of the most significant figures in the world. Her attitude toward nursing is expressed in her own words, "Nursing is an art; and if it is to be made an art requires as exclusive devotion as any painter's or sculptor's work; for what is the having to do with

¹Annette Fiske, "Florence Nightingale,—Where is her Modern Counterpart," Hygeia, May, 1936, p. 394.

²Dock and Stewart, A Short History of Nursing, p. 117.

dead canvas or cold marble compared with having to do with the living body, the temple of God's spirit! Nursing is one of the fine arts; I had almost said the finest of the fine arts."¹ The underscored words are painted near her figure as an inscription in the window.

The spirit of Florence Nightingale's work was carried on by the energy of Clara Barton who appears on the right side of the window just beneath the central figure. Her contribution to the development of nursing consists of her work for the Red Cross Service. She succeeded in having the plan of a Swiss Humanitarian² for an International Red Cross Commission finally ratified by a hesitant United States Congress who had feared international complications. She was made president of the American Red Cross Commission, that position being declined by President Arthur. At the Genoa Conference, 1884, she supported the view that relief should not be restricted to war service but should also include service in pestilence, famine, fire, flood, and other disasters. Her influence aided greatly in securing the acceptance of these principles in what have sometimes been called the "American amendments."³

Above the large central figure and in the uppermost section of the window appears Hygeia, the College hospital,

¹Elmer C. Adams and Warren Durham Foster, Heroines of Modern Progress (New York: Sturgis and Walton Co., 1913), p. 146.

²Henri Dunant.

³Dock and Stewart, A Short History of Nursing, p. 138.

the symbol of medical care and nursing on our own campus. At the right, approaching the building, are three students representing those who need aid. The success of health care with emphasis on preventive measures as followed by the college is attested by the four beds appearing at the left, three of which are empty.¹

Growing out of small historical symbols below and serving the symbols above related to our own campus, the central figure represents the ideal nurse. As such, she must reveal her liking for people, for, as one nurse herself points out, the whole reason for her existence is people.² With her love of humanity she must have an admixture of the impersonal quality of one who carries routine through promptly and regularly and who gives needed care with skill. In other words, she must represent a balance of the qualities bringing a response to human suffering and those qualities which make it possible for her to minister to that suffering with scientific exactness. In an effort to express something of these qualities, the central figure has been drawn with a certain dignity signifying the impersonal quality of the nurse. Her carriage suggests alertness and readiness, while her gesture is one of offering needed service. Her costume is generalized,

¹On the day the writer visited Hygeia to make sketches of hospital beds, only one patient was to be found.

²Katharine R. N. Faville, "So She wants to be a Nurse," Survey, April, 1932, p. 35.

so that she does not represent any one specific type of nurse but may stand for the entire profession.

THE DANCE WINDOW

The design of the dance window presents: historical figures responsible for developments in modern dance; figures representing modern dance on our own campus; and a central figure which symbolizes present-day ideals of the dance (Plate XVIII).

The first of the historical figures is that of Isadora Duncan, since, according to John Martin, "the technique of the modern dance. . . in all its manifestations is still essentially Isadora's technique rationalized, stripped of its Victorian romanticism and mysticism, and broadened by contacts with the advancing times."¹ As representative of the beginning of modern dance she is surrounded by smaller figures which present the development of the ballet—the force against which she rebelled. The first of these minor figures represents the court dance with the dancer assuming a "deferential frontal position" before the king;² and out of court dancing grows the ballet, which, in the cartoon, is represented by two figures or a figure depending on final revision of dance cartoon in

¹John Martin, America Dancing (New York: Dodge Publishing Company, 1936), p. 141.

²Elizabeth Seldon, The Dancer's Quest (Berkeley: The University of California Press, 1935), p. 18.

formal ballet positions. In the midst of these small figures Isadora Duncan appears in informal dancing position characteristic of her return to the natural movements of the body itself as the basis for the dance.¹ Her costume is the simple Greek tunic adopted because of her own enthusiasm for the Greek approach to the dance, and suggestive of her influence in the attitude toward costuming which prevails today—"that the dancer is essentially a nude figure upon which is placed the minimum of costume required to obtain a desired theatrical effect."² Because she danced barefoot, and as it were, "took the slippers off the dance," in the window, ballet slippers may be found discarded at her feet.

The second of the larger figures is that of Ruth St. Denis, selected because of her work in the Denishawn school which is referred to by Martin as "the parent organization of the American dance, if such can be said ever to have existed."³ She felt the spirit of Oriental peace and poise to be her guiding force, and this influence is symbolized in the window by her Oriental costume.

Above the large central dancer, is a figure symbolizing outstanding contemporary women in the field of dance—such as Martha Graham, Loris Humphrey, and others. They have not been

¹Martin, America Dancing, p. 79.

²Ibid., p. 134.

³Ibid., p. 150.

presented as individuals, for, their contributions, though definitely recognized, are still in a state of active development.

The central figure is an attempt to symbolize the ideals of modern dance. Her position, with one arm raised and head to one side, is used rather than a formal bi-symmetric position as expressive of the flexibility of modern dance which has no formal set of movements. As representative of one who frankly accepts the human body as her medium, she is dressed in a simple costume which would in no way distort or conceal her movements.

Briefly, the dance window presents woman as she has followed her desire to find an expression of beauty through movement. The emotions she expresses through dance are closely akin to religious feeling. The quality which we have tried to present as the epitome of her art is that which has caused one historian to refer to the dance as a "living expression" of "the victory over gravity, over all that weighs down and oppresses, the change of body into spirit, the elevation of creature into creator, the merging with the infinite, the divine."¹

Six small figures in contemporary dance costume, posed by students in the modern dance group on this campus appear three at the foot of the window and three at the top. Their

¹Curt Sachs, World History of the Dance (New York: W. W. Norton and Company, Incorporated, 1937), p. 448.

gestures are those of reverence, exultation and praise which might well interpret the spirit of the words from the 149th Psalm which are used as an inscription in the window: "Praise ye the Lord. . . Let them praise his name in the dance."

I L L U S T R A T I O N S

PLATE I. ASCENSION WINDOW, LE MANS CATHEDRAL*

This window is one of the oldest examples of stained glass and is given a probable date of 1090 A. D. It represents the application of Byzantine enamel traditions to stained glass.

*Photograph from color reproduction of Paul Claudel, Vitraux des Cathedrales de France, Paris, Librairie Plon, 1937.

PLATE I.



PLATE II. THE PROPHETS DANIEL AND MOSES, AUGSBURG
CATHEDRAL*

This window is claimed by some authorities to be even older than the Ascension Window—circa 1065. The geometric quality of the pattern and the clarity of the painted detail causes Connick to remark that these windows "may be called modern or ancient with equal force."*

*Connick, Adventures in Light and Color, Collotype XXXIX.

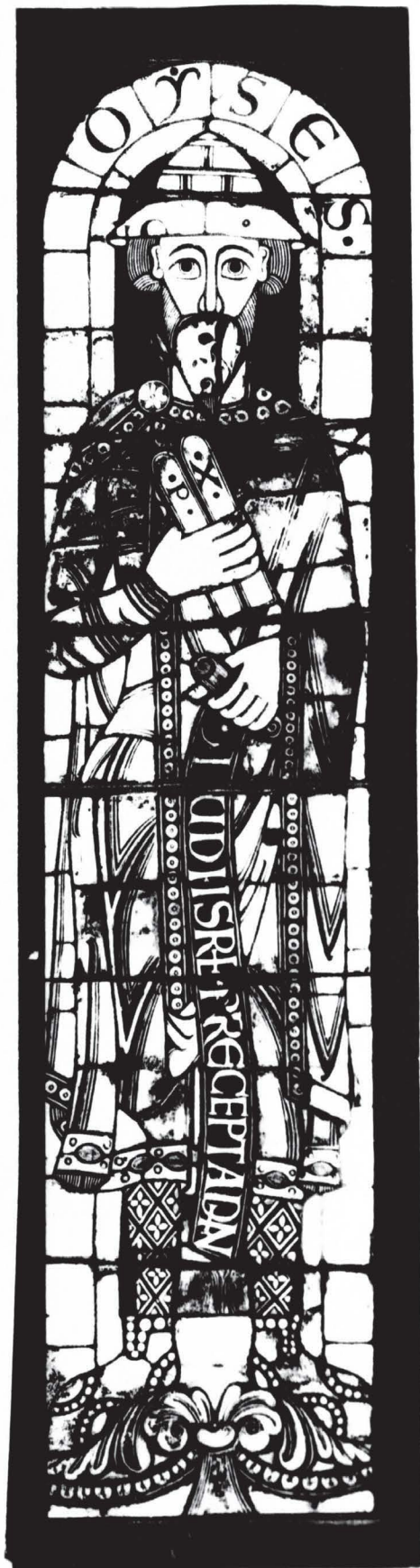


PLATE III. DEVELOPMENT OF IRON FRAMEWORK AND OF STONE
TRACERY

Figure 1. The first iron framework consisted of vertical and horizontal bars to support the glass.

Figure 2. About the middle of the twelfth century the craftsman began to bend the iron framework into elaborate geometrical openings.

Figure 3. The development of stone tracery began with the grouping of two lancets under a rose light. With stone-work to help support the glass the craftsman returned to the less involved straight iron framework.

Figure 4. Tracery evolved into an elaborate supporting stone framework making the iron framework unnecessary except for a series of horizontal bars connecting the mullions.

PLATE III.

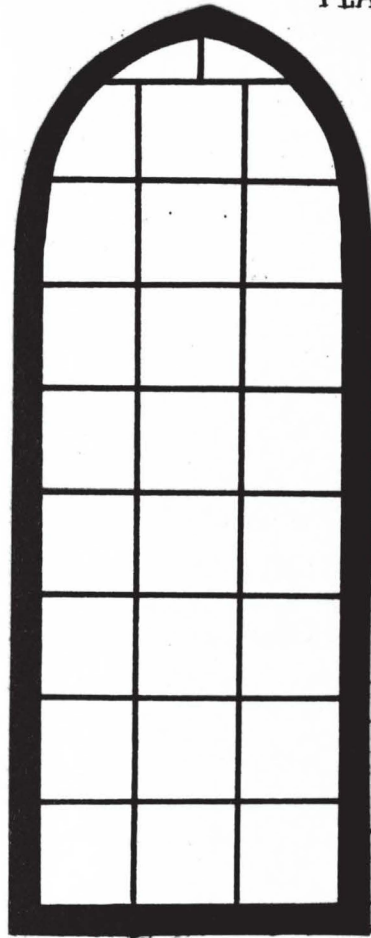


Fig. 1.

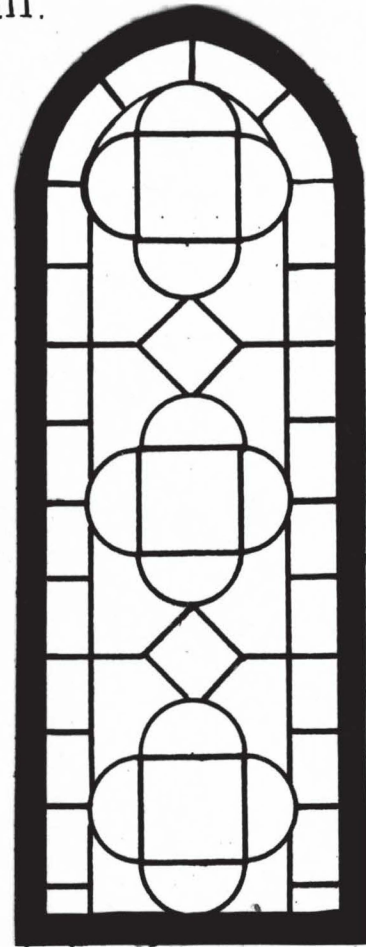


Fig. 2.



Fig. 3.



Fig. 4.

PLATE IV. WINDOWS OF THE TWELFTH AND THIRTEENTH
CENTURIES

Figure 1. Tree of Jesse Window, Chartres Cathedral*

This window is an example of twelfth century glazing. Typical of this century is the strictly religious theme of the window—the human descent of Christ—which is treated in an impersonal and didactic manner. Also characteristic is the Byzantine character of the pattern and the use of the straight iron framework.

Figure 2. Window Donated by the Fur Merchants, Chartres Cathedral**

This thirteenth century window shows the beginning of a return to observation of nature and a breaking away from Byzantine traditions. In subject matter it represents the introduction of themes which are not biblical—Charlemagne and the legendary Roland.

*Drawing from Connick.

**Drawing from Malé.

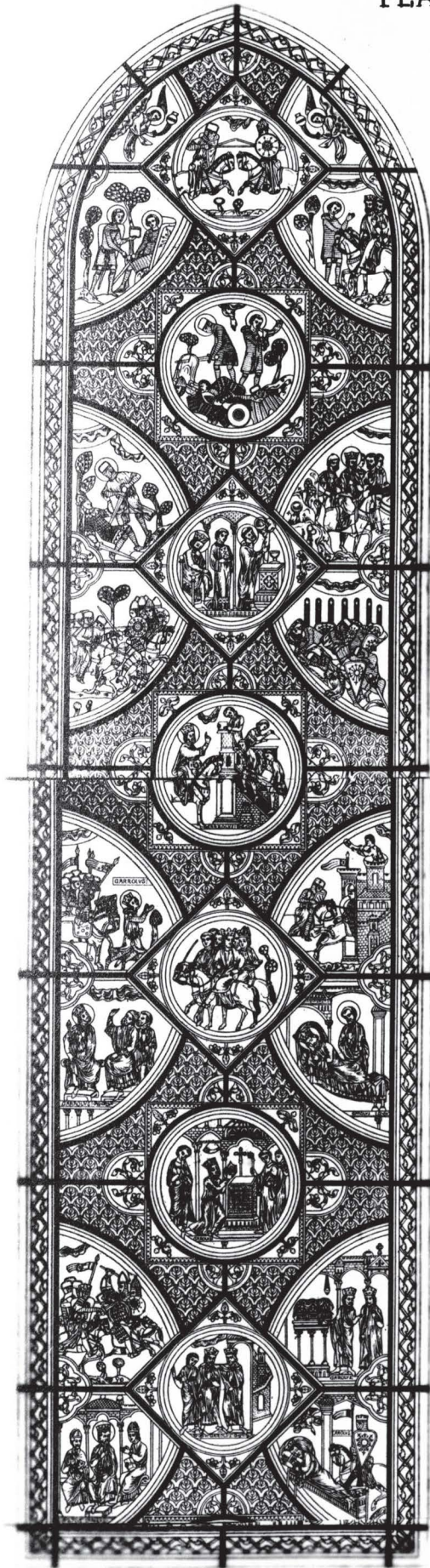


Fig. 2.



Fig. 1.

PLATE V. DETAILS OF PLATE IV

Figure 1. Detail of Tree of Jesse, Chartres*

Plate IV, Figure 1 is from a drawing representing the cartoon for the window, while this reproduction is from a photograph of the actual glass in the window.

Figure 2. Detail of Fur Merchant's Window, Chartres**

The medallion representing the signature of the Fur Merchants may be seen in the lower section of the photograph.

*Photograph from Houvet, Pl. III.

**Photograph from Houvet, Pl. CVI.

PLATE V.

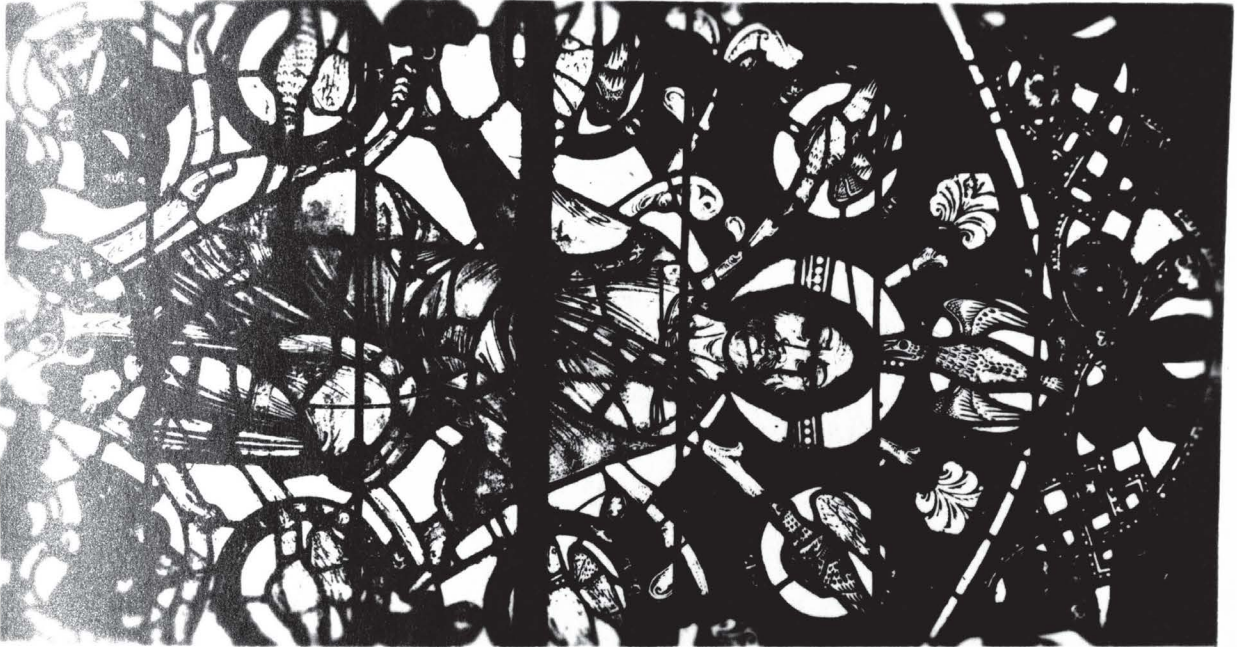


Fig. 1.

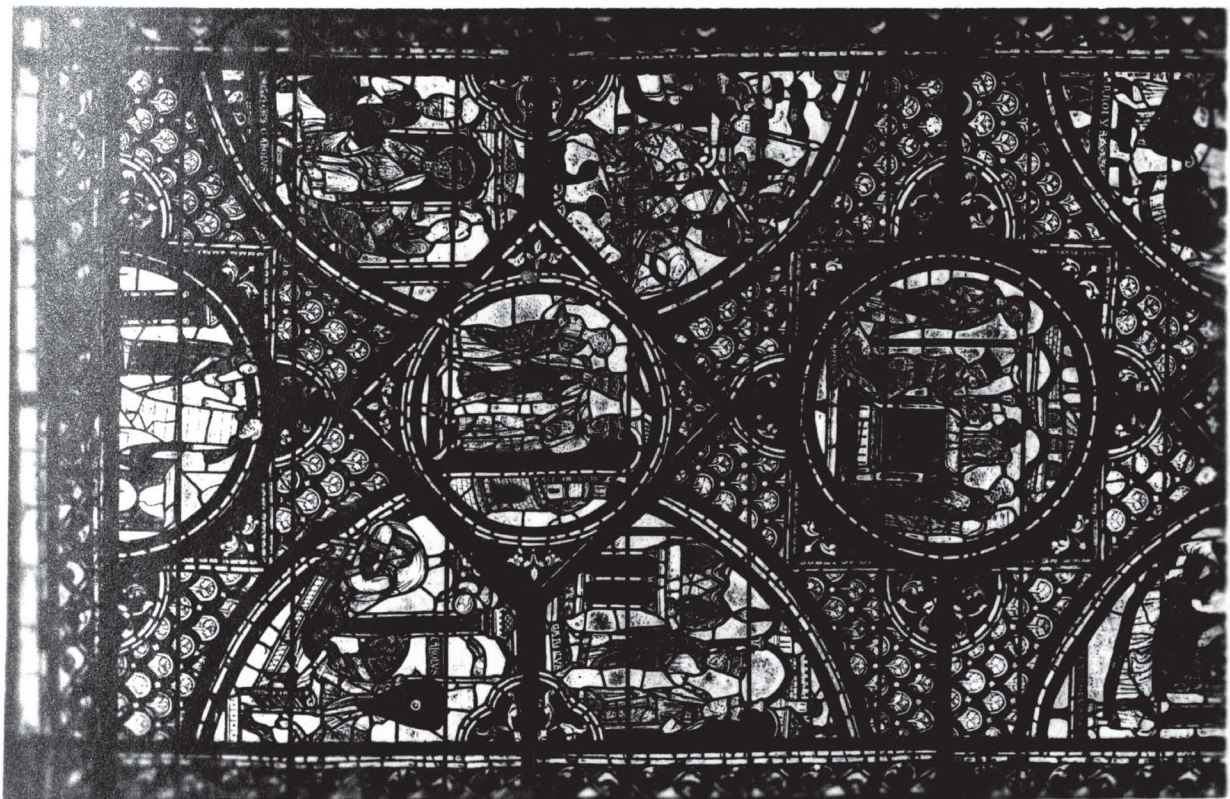


Fig. 2.

PLATE VI. NOTRE DAME DE LA BELLE VERRIERE, CHANTRES
CATHEDRAL*

This photograph represents the upper portion of "La Belle Verriere." The central panel is twelfth century glass while the surrounding panels are of the thirteenth century.

*From color plate by Claudel.

PLATE VI.



PLATE VII. GRISAILLE

Figure 1. Cistercian Panel, French, Twelfth Century*

This window represents a grisaille pattern of white glass and lead. The Cistercians did not use color or painted detail because of their regulations forbidding sumptuous decoration in their monasteries.

Figure 2. Grisaille Panel, French, Thirteenth Century*

In this panel use is made of both color and painted detail.

Figure 3. "Grisaille ornamentale; L'Annonciation," Chartres**

This panel represents the use of grisaille as a ground for colored figures.

*Photographs from Liturgical Arts, Vol. III, No. 1, 1934, p. 48.

**Photograph from Houvet, Pl. LIII.

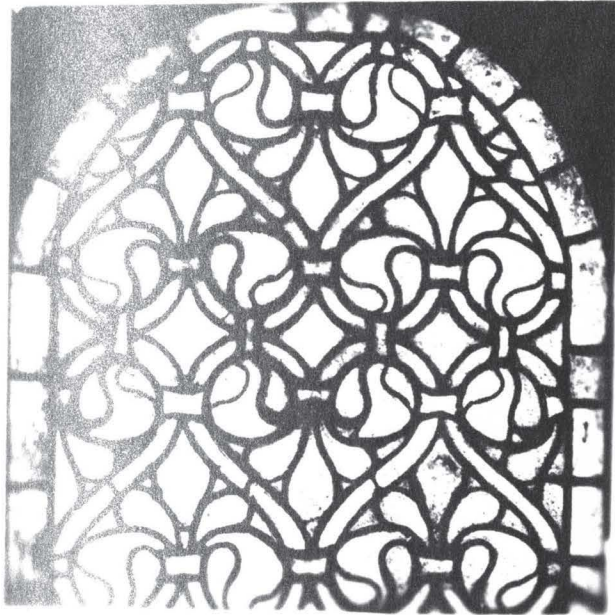


Fig. 1.

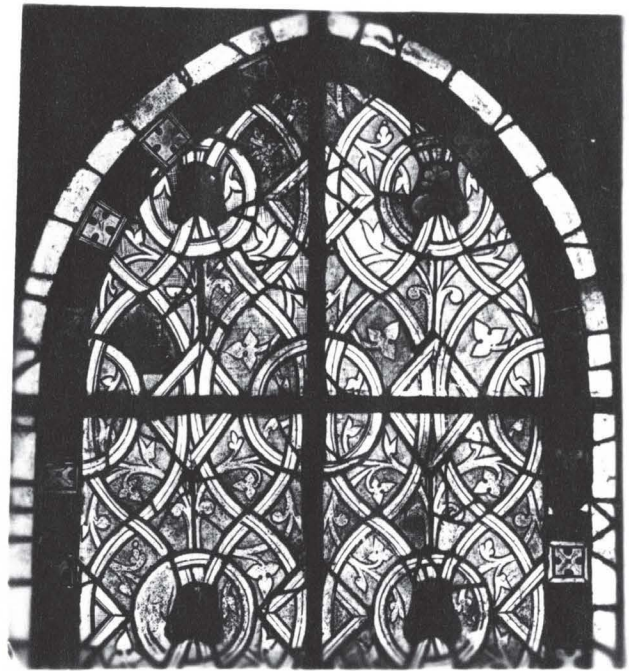


Fig. 2.

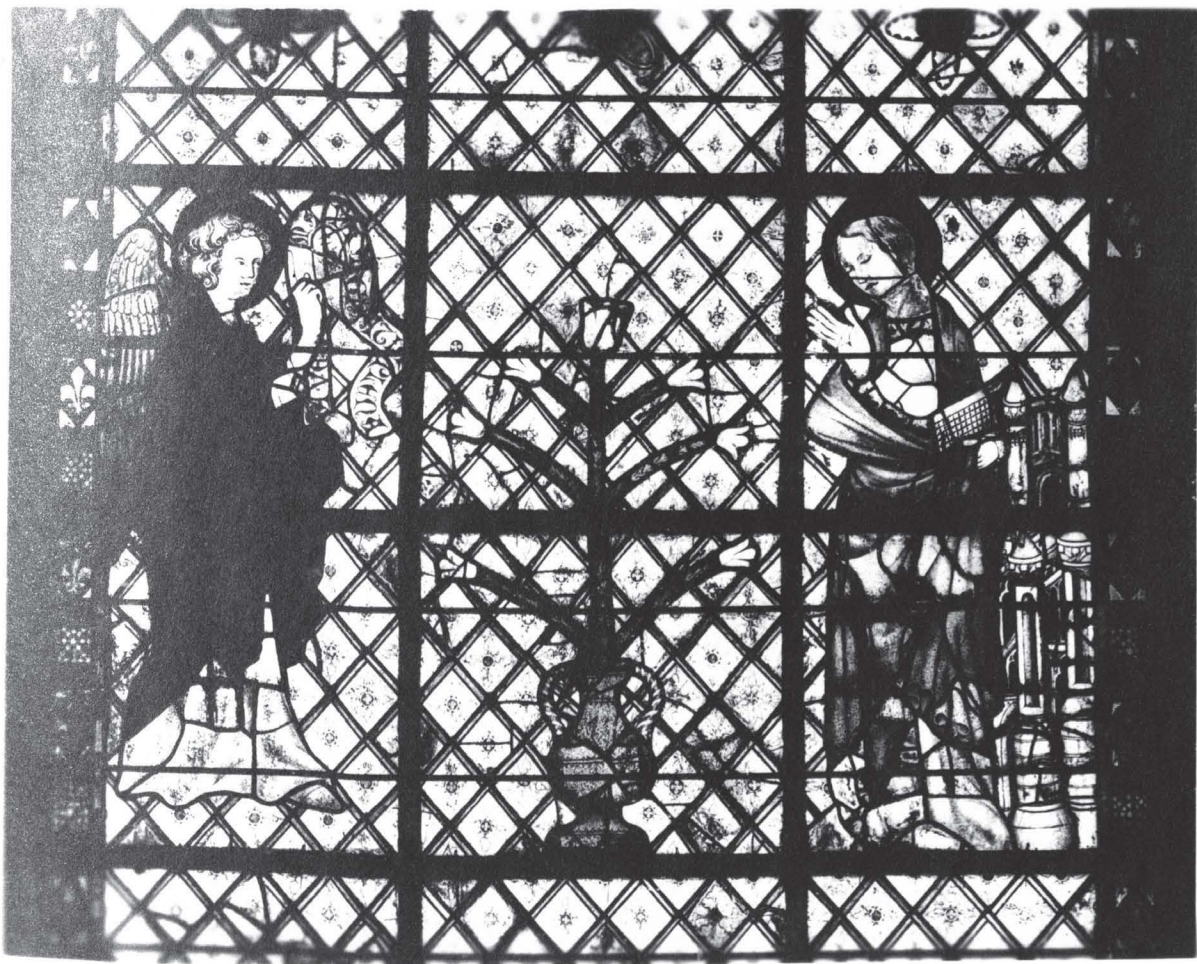


Fig. 3.

PLATE VIII. FOURTEENTH CENTURY WINDOW, CHARTRES
CATHEDRAL*

The use of elaborate canopies over the figures in this window is typical of the fourteenth century. There can also be seen the beginning of characteristics which became pronounced in the fifteenth century, namely: the adoption of an S-like pose for figures; long and sweeping folds of drapery; the attempt to secure a three-dimensional effect in the modelling of the forms; and use of perspective, especially in canopies.

*Photograph from Houvet, Pl. XXVII.

PLATE VIII.

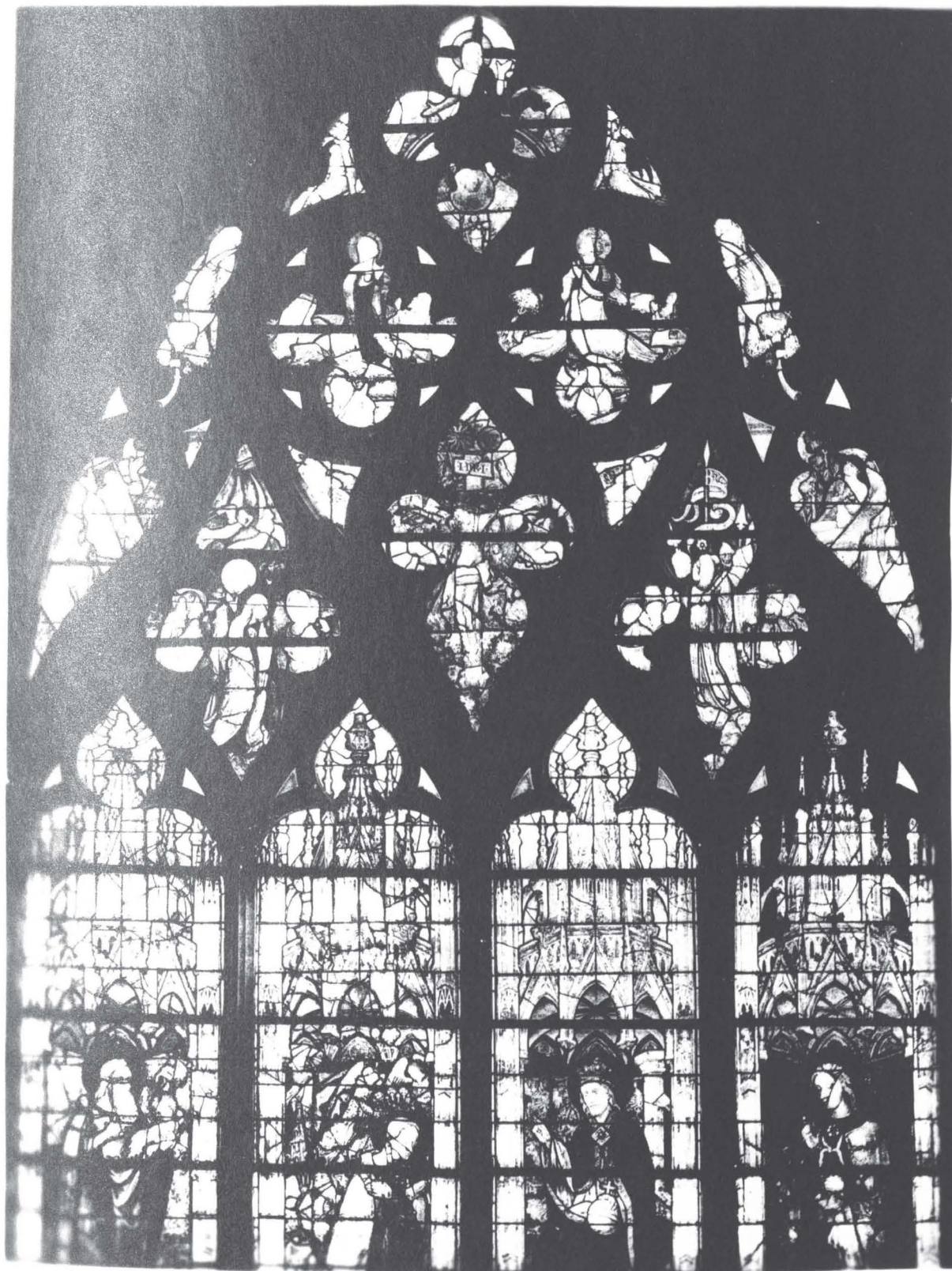


PLATE IX. FIGURES FROM THE "CRUCIFIXION," ST. MARGARETS,
WESTMINSTER*

This sixteenth century window represents the imitation of the effects of Italian Renaissance easel painting. Leads are reduced to a minimum and are made as inconspicuous as possible. A three dimensional effect is secured through the modelling of the forms in colored enamels. Figures are crowded together and often placed one behind another. The canopy has been replaced by distant landscape and stretches of sky.

*Photograph from Christopher Woodforde, "Stained and Painted Glass in England," London, Society for Promoting Christian Knowledge, 1937.



PLATE X. AMERICAN OPALESCENT WINDOWS

Figure 1. Oakes Ames Memorial Window, Unity Church, North Easton, Massachusetts*

This window represents the innovations of John LaFarge, American designer and painter, who created "opalescent" glass and used it to secure effects similar to those he could secure in easel painting.

Figure 2. Benjamin Harrison Memorial Window, First Presbyterian Church, Indianapolis, Indiana**

This opalescent window was designed by Frederick Wilson and executed by the Tiffany Studios, New York. It represents the continuation of ideas and ideals begun by LaFarge.

*Photograph from Connick, Collotype XIII.

**Photograph from Thomas.

PLATE X.



Fig. 2.

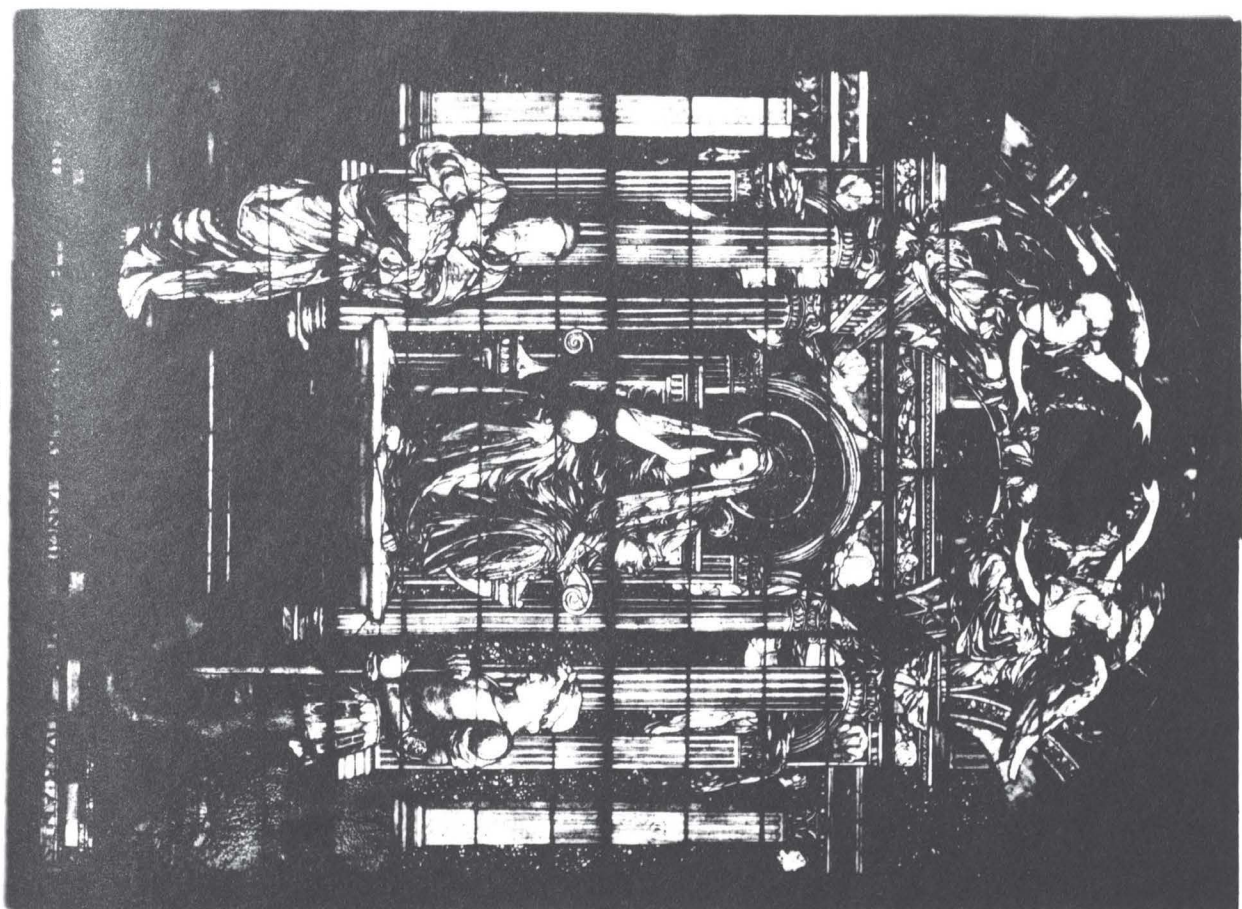


Fig. 1.

PLATE XI. AMERICAN WINDOWS BY CONNICK AND BY D'ASCENZO

Figure 1. Central Portion of Cartoon for the Great East Window, Princeton University Chapel*

This cartoon by Connick represents the adaptation of the medieval style and technique.

Figure 2. Central Panels from the "Washington Window," Washington Memorial Chapel, Valley Forge, Pennsylvania**

This window by Nicola D'Ascenzo is also an adaptation of medieval style. The numerous figures included in the medallions are part of the prescribed historical theme as planned by Rev. W. Herbert Burk, Rector of the Chapel.

*Photograph of cartoon from Connick, Collotype XXX.

**From photograph taken by D'Ascenzo.

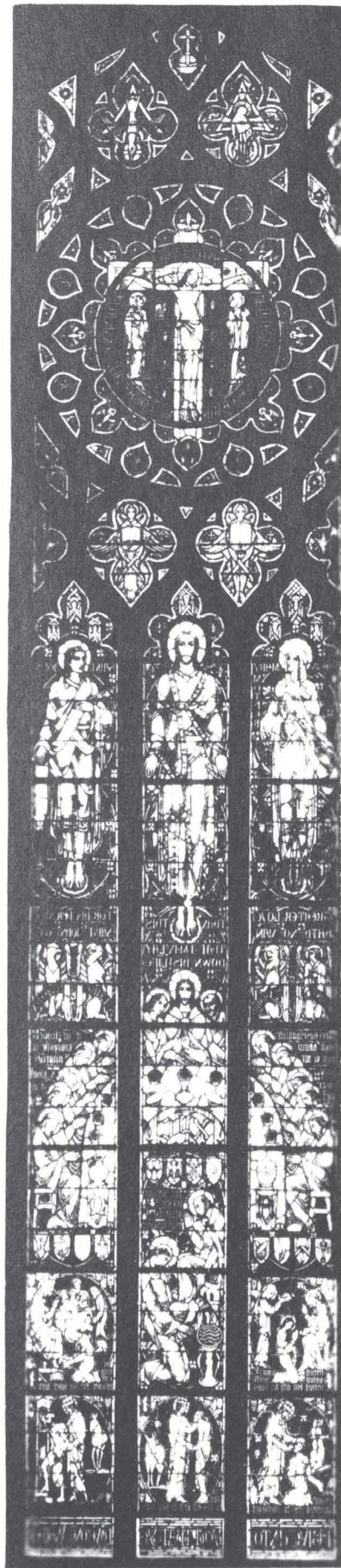


Fig. 1.

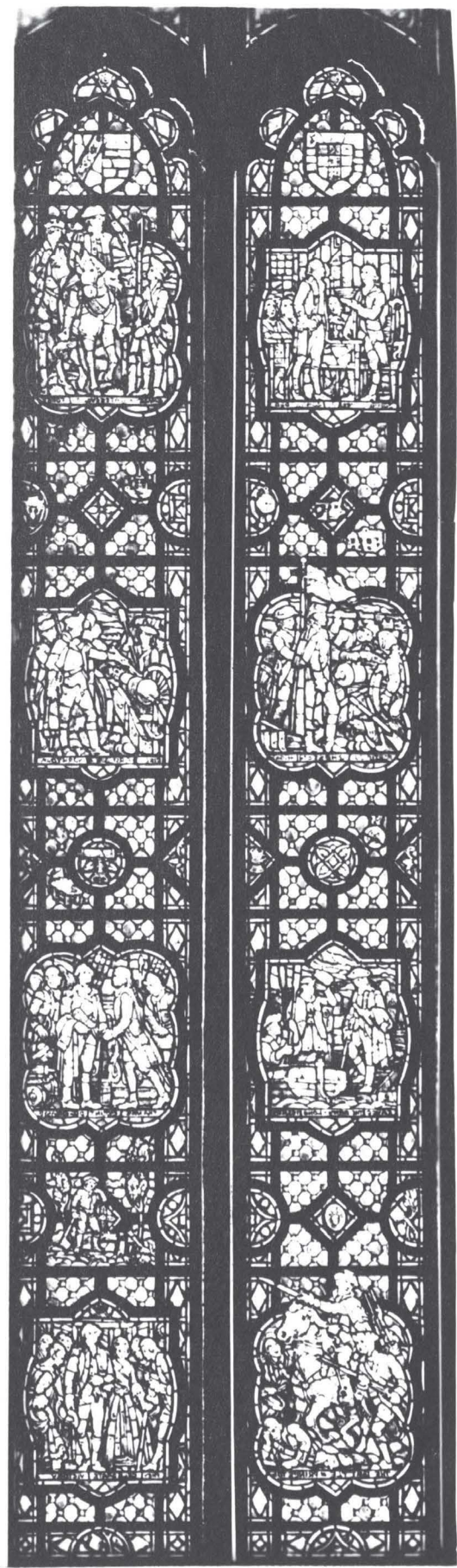


Fig. 2.

PLATE XII. AMERICAN WINDOWS BY RAMBUSCH AND BY FREI

Figure 1. Window, Church of Saint Bernadette, Brooklyn, New York, designed and executed by Rambusch, New York*

Figure 2. Window for Church of Saint Charles Borromeo, Newark, New Jersey, by Frei, St. Louis**

These two windows represent attempts to create designs suitable to the medium of stained glass and expressive of the present day.

*Photographs from Liturgical Arts, Vol. VI, No. 3, 1938.



Fig. 1.

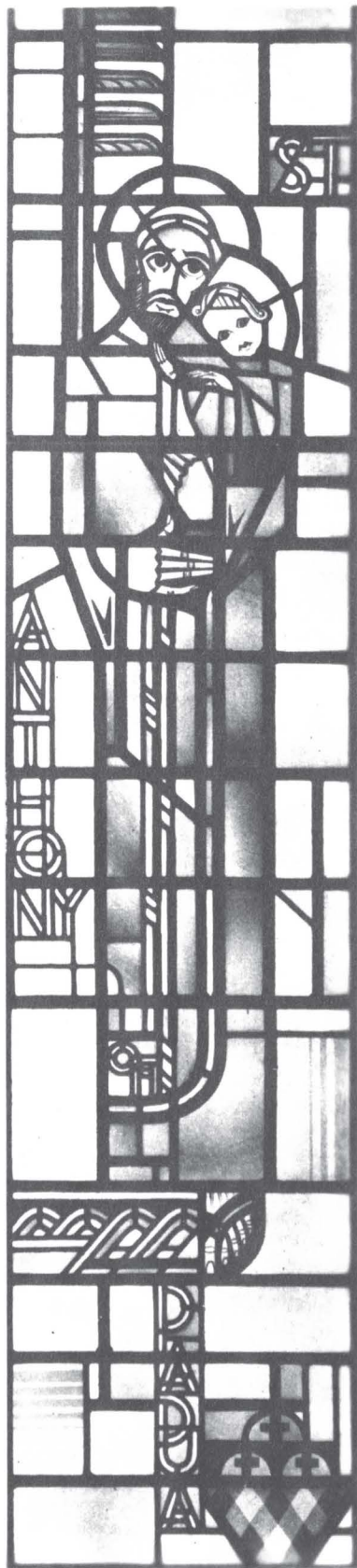


Fig. 2.

PLATE XIII. EXPERIMENTS WITH PAINT ON GLASS

These figures represent two small pieces from the first geometrical pattern cut in glass by the writer. The painted patterns on the pieces represent two of the variations made in order to observe the effects of shutting out varying amounts of light.

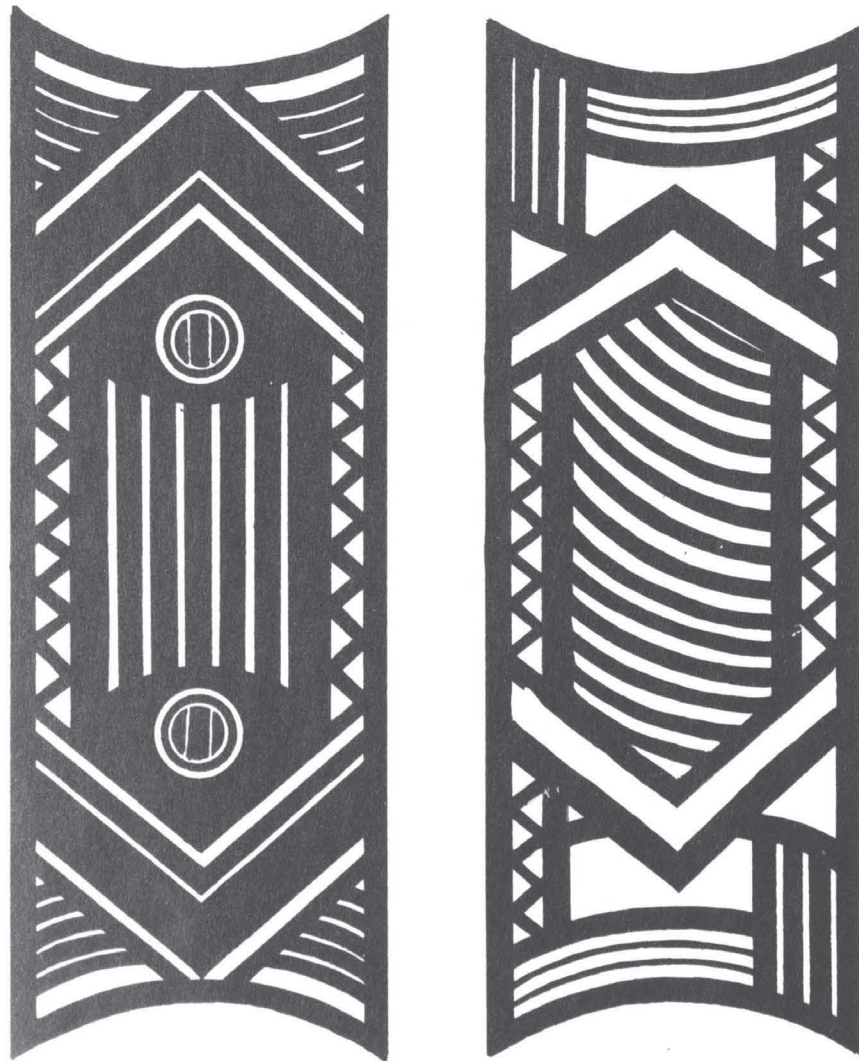


PLATE XIV. STUDIES FROM LIFE MODELS

These figures by the writer represent two from numerous studies made of subjects in real life. From such studies stylized patterns for the chapel windows were derived.



PLATES XV AND XVI. STEPS IN THE EXECUTION OF A STAINED
GLASS WINDOW

PLATE XV

Figure 1. After the cartoon is prepared, templets are cut the size and shape of each piece of glass in the window.

Figure 2. Glass of the various colors selected is cut according to the templets.

Figure 3. The pieces of glass are then attached with a mixture of beeswax and resin to a sheet of clear glass.

Figure 4. The glass is then placed against light, either on a tracing table, as pictured here, or else in an upright easel arrangement. Details are then painted with enamel.

PLATE XVI

Figure 5. The painted pieces of glass are then placed on asbestos which is set into cast iron trays.

Figure 6. The trays holding the glass are slipped into an iron framework within the kiln, the kiln is closed, and the painted pieces fired.

Figure 7. The pieces of glass composing the window are then fitted together with H-shaped leads between each of the pieces.

Figure 8. The joints or points of contact of the various pieces of lead are then soldered. Cement is forced into the spaces between the overlapping edges of the lead and the glass, and the finished panel is then ready to be inserted into the window opening.

PLATE XV .



Fig. 1.

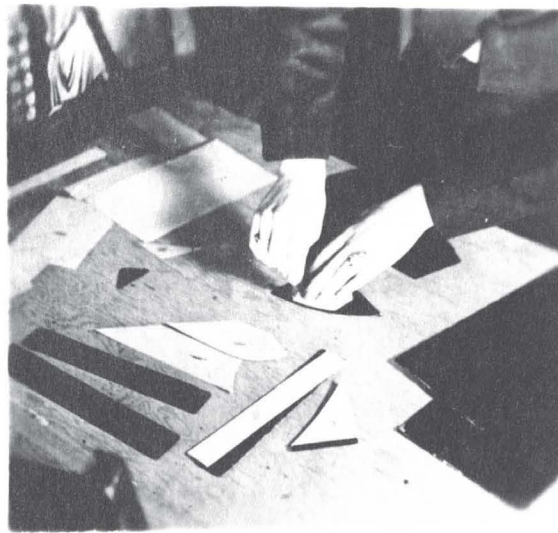


Fig. 2.

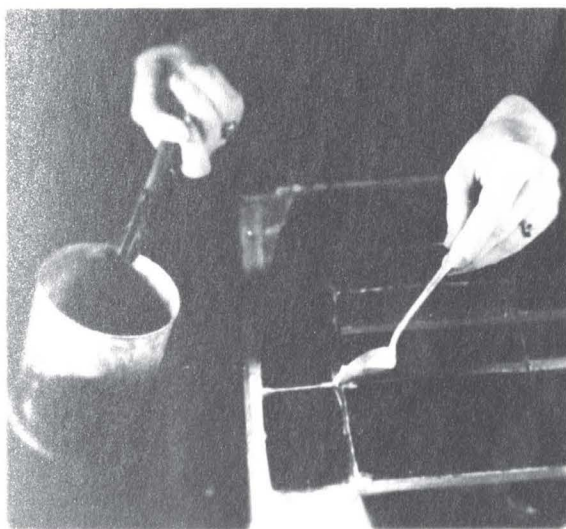


Fig. 3.



Fig. 4.

PLATE XVI .



Fig. 5.

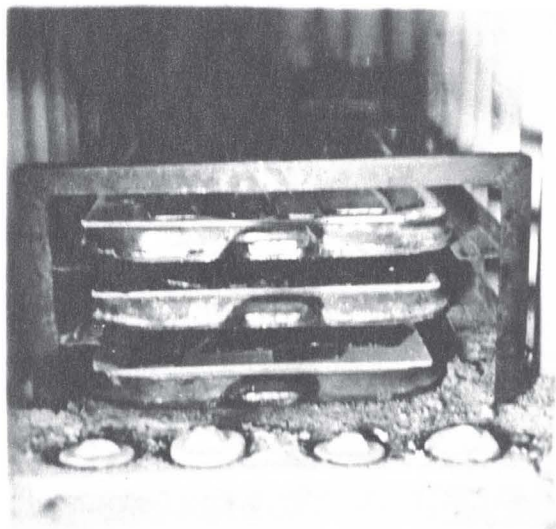


Fig. 6.

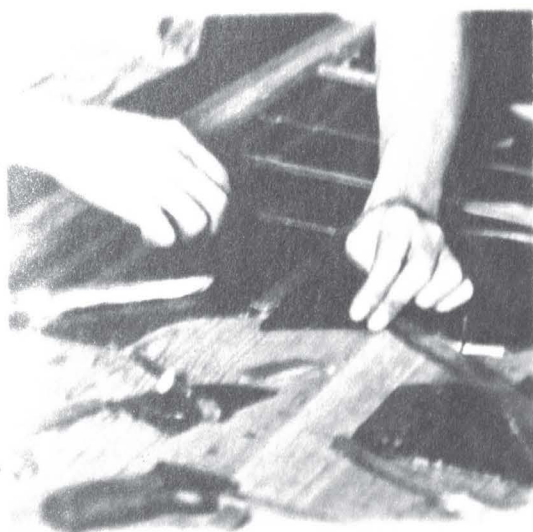


Fig. 7.

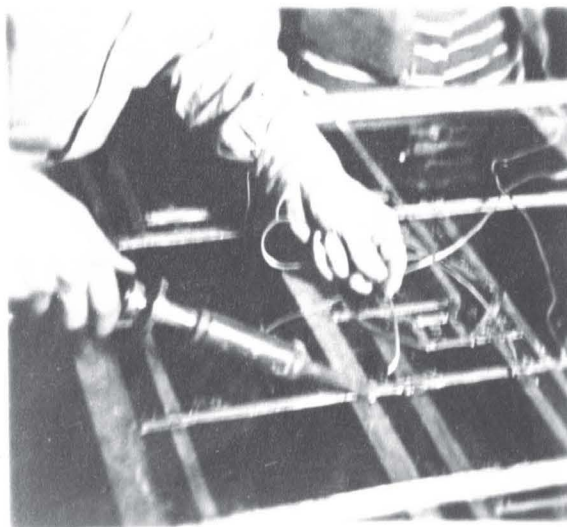


Fig. 8.

PLATE XVII. THE NURSE WINDOW, CHAPEL-IN-THE-WOODS,
TEXAS STATE COLLEGE FOR WOMEN,
DENTON, TEXAS

PLATE XVIII. PHOTOGRAPH OF THE CARTOON FOR THE
DANCE WINDOW

PLATE XIX. THE DANCE WINDOW, CHAPEL IN THE WOODS,
TEXAS STATE COLLEGE FOR WOMEN,
DENTON, TEXAS

B I B L I O G R A P H Y

BIBLIOGRAPHY

BOOKS

- Arnold, Hugh and Saint, Lawrence B. Stained Glass of the Middle Ages in England and France. London: A. & C. Black Co., 1913.
- Collins, Ross William. A History of Medieval Civilization in Europe. Boston: Ginn and Co., 1936.
- Connick, Chas. J. Adventures in Light and Color. New York: Random House, 1937.
- Delaporte, L'Abbey and Houvet, Etienne. Les Vitraux de la Cathédrale de Chartres. Chartres: E. Houvet, 1926.
- Dock, Lavinia L, Maitland, Isabel, and Stewart, A. M. A Short History of Nursing. New York and London: G. P. Putnam's Sons, 1925.
- Eden, Sidney F. Ancient Stained and Painted Glass. Cambridge: The University Press, 1933.
- Ellis, Havelock. The Dance of Life. Boston and New York: Houghton Mifflin Co., 1923.
- Gardner, Helen. Art through the Ages. New York: Harcourt, Brace and Co, 1936.
- Kirstein, Lincoln. Dance, A Short History of Classic Theatrical Dancing. New York: G. P. Putnam's Sons, 1935.
- Martin, John. America Dancing. New York: Dodge Publishing Co., 1936.
- Mollet, Ralph. Leaded Glass Work. London: Sir Isaac Pitman and Sons, Ltd., 1933.
- Sachs, Curt. World History of the Dance. Translated by Bessie Schonberg. New York: W. W. Norton and Co., Inc., 1937.
- Seldon, Elizabeth. The Dancer's Quest. Berkeley: University of California Press, 1935.
- Sherrill, Chas. Hitchcock. Stained Glass Tours in England. New York: J. Lane Co., 1909.

Sherrill, Chas. Hitchcock. Stained Glass Tours in France. New York: J. Lane Co., 1908.

_____. Stained Glass Tours in Spain and Flanders. New York: Dodd Mead and Co., 1924.

Twining, E. W. The Art and Craft of Stained Glass. London: Sir Isaac Pitman and Sons, Ltd., 1928.

Webber, F. R. The Small Church. Cleveland: J. H. Jansen Co., 1937.

Werck, Alfred. Stained Glass. New York: Adelphi Co., 1926.

Whall, C. W. Stained Glass Work. New York: D. Appleton and Co., 1914.

ARTICLES

Becker, M. L. "Bibliography on Stained Glass," Saturday Review of Literature, Vol. 8, p. 786.

Best, E. "New Deals for Nurses," Survey, Vol. 71, pp. 169-170.

"Blessed James of Ulm, Patron of Stained Glass Workers."
Translated by Murray Pease from Comment Representes les Saints Dominicains by M. C. De Canay. Stained Glass Bulletin, June, 1932, p. 171.

Burgess, Elizabeth C. "I Speak as a Nurse," Survey Graphic, Vol. 23, pp. 600-601.

Burgess, Ida J. "Stained Glass," Mentor, Vol. 7, pp. 1-12.

Campana, D. M. "Make Your Own Stained Glass Windows," Popular Mechanic, Vol. 60, pp. 610-613.

Coburn, F. W. "Harry E. Goodhue, Worker in Stained Glass," International Studio, Vol. 41, pp. 37-40.

Colton, A. W. "Review of English Stained Glass by H. Read," Architectural Record, Vol. 63, pp. 285-286.

Connick, Chas. J. "Modern Glass: A Review," International Studio, Vol. 80, pp. 40-53.

Cowles, G. A. "Building a Stained Glass Window," Craftsman, Vol. 15, pp. 97-103.

Cram, Ralph Adams. "Stained Glass: an Art Restored," Arts and Decoration, Vol. 20, pp. 11-13.

_____. "Stained Glass in Church Architecture," Stained Glass Bulletin, July, 1931, pp. 223-229.

"Dance," Encyclopaedia Britannica, 14th ed., Vol. 7, pp. 13-24.

De Bles, Arthur. "Pictorial Element in Stained Glass," Art and Archaeology, Vol. 20, pp. 263-276.

"Dietarians, Theologians, and Stained Glass," Outlook, Vol. 106, pp. 122-124.

Dorr, Charles H. "Art of Making a Stained Glass Window and the Work of Clara M. Burd," Architectural Record, Vol. 35, pp. 162-169.

Dutel, P. "Dazzling Charm of Painted Glass," Arts and Decoration, Vol. 29, pp. 48-49.

"Enamel," Encyclopaedia Britannica, 14th ed., Vol. 8, p. 416.

Faville, Katharine, R. N. "New Deals for Nurses," Survey, Vol. 71, pp. 137-138.

_____. "So She Wants to be a Nurse," Survey, April 1, 1932, p. 5.

Fiske, Annette. "Florence Nightingale,—Where is her Modern Counterpart," Hygeia, May, 1936, pp. 394-396.

Gahlen, C. "Beginnings of Glass Painting," American Ceramic Society Journal, Vol. 14, p. 93.

"Glass," Encyclopedia Americana, Vol. 12, pp. 687-703.

"Glass," Encyclopaedia Britannica, 14th ed., Vol. 10, pp. 400-401.

"Glories of Mankind Told in Art-glass Windows," Popular Mechanic, Vol. 41, pp. 54-57.

Goodrich, Annie W. "Modern Trends in Nursing Education," American Journal of Public Health, August, 1936, p. 764.

Heaton, Clement. "Influence of Glass upon Gothic Cathedral Architecture," Art and Archaeology, Vol. 24, pp. 76-82.

"How to Cut Glass," Literary Digest, Vol. 113, p. 26.

- "Jeweled Art of the Medieval Glassmen at Galleries of Paul S. von Baarn," Art Digest, Vol. 12, p. 10.
- Lamb, F. S. "Making of a Modern Stained Glass Window: Its History and Process," Craftsman, Vol. 10, pp. 18-31.
- Law, Margaret Lathrop. "Glory that is Glass, Past and Present," Art and Archaeology, Vol. 20, pp. 232-242.
- "Lawrence Collection of Gothic Stained Glass at the American Art Galleries," Art and Archaeology, Vol. 11, pp. 71-73.
- "Lead," Encyclopaedia Britannica, 14th ed., Vol. 13, p. 817.
- Martin, M. "Stained, Leaded, and Painted Glass," Arts and Decoration, Vol. 28, p. 73.
- Muller, Franz L. "World's Oldest Stained Glass Windows," Art and Archaeology, Vol. 27, pp. 41-45.
- "Notes," Stained Glass Bulletin, July, 1931, p. 255.
- "Notes-Correspondence-Comment," Stained Glass Bulletin, July, 1932, p. 219.
- "Nursing," Encyclopaedia Britannica, 14th ed., Vol. 16, p. 643.
- "Painted and Leaded Windows in New Designs; Photographs," Arts and Decoration, Vol. 35, p. 55.
- "Plants that Eat Away Church Windows," Literary Digest, Vol. 79, pp. 77-79.
- Poole, Ernest. "Nurses on Horseback," Survey, April, 1932, p.
- Read, Herbert. "Stained Glass," Encyclopaedia Britannica, Vol. 21, pp. 291-297.
- Review of Connick's "Adventures in Light and Color," Art Digest, Vol. 11, p. 31.
- Review of Connick's "Adventures in Light and Color," Magazine of Art, Vol. 30, p. 394.
- Saint, Lawrence. "Stained Glass Creed," American Ceramic Society Bulletin, Vol. 15, pp. 238-241.
- _____. "Is Stained Glass a Lost Art?" American Ceramic Society Bulletin, Vol. 15, pp. 375-382.

"Stained Glass," The Catholic Encyclopedia, Vol. 14, p. 2413.

"Stained Glass," New International Encyclopedia, Vol. 21, p. 439.

"Stained Glass for the House," Architectural Record, Vol. 72, pp. 342-344.

Stohlman, W. F. "Stained Glass Windows of the 13th Century," Art and Archaeology, Vol. 20, pp. 134-135.

Thomas, W. H. "Coloured Glass Windows—the Supremacy of the Modern School," International Studio, Vol. 29, pp. 44-50.

Titus, I. "She Paints Antique Glass," Mentor, Vol. 15, pp. 16-17.

Viollet-le-Duc. "Vitrail," Dictionnaire Raisonne de L'architecture Francaise. Translated by Leicester B. Holland. Stained Glass Bulletin, April, 1931-August, 1932.

Wald, Lillian D. "What Keeps the Nurses Going," Survey, Vol. 68, p. 590.

Willet, Anne Lee. "Window," Art and Archaeology, Vol. 28, pp. 206-209.

Winslow, C. E. A. "Nurses Show the Way," Survey Graphic, Vol. 23, pp. 156-159.

Wroot, H. E. "Pre-Raphaelite Windows at Bradford," International Studio, Vol. 63, pp. 69-73.