First Presbyterian Church Orange, Texas Air Conditioned 1908 -1912 ?? or Earlier?? by Bruce L. Flaniken, P.E., Fellow Life Member ASHRAE, Houston Chapter Historian Emeritus Date 03-15-15

Approximate 107 Year Old to 109 Year Old Air Conditioned Church

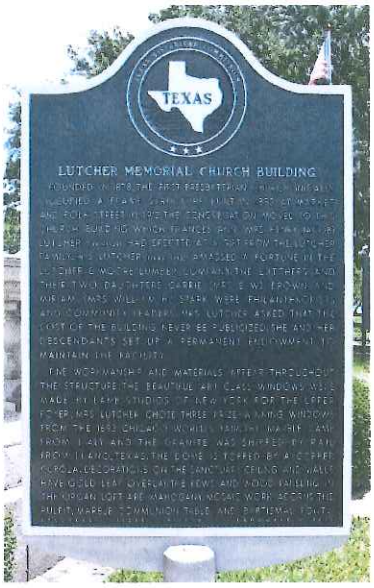


Figure 1 Texas Historical Commission Dedication Plaque



Figure 2 Exterior Photo of Church

The initial interest in this historical research article occurred for me in 1985, when as ASHRAE Houston Chapter Vice President, I volunteered to try to fill the Houston Chapter's enormous gaping hole left by the departure of Clarence Fleming our previous long standing Chapter Historian who had decided he was in full retirement, I chose to become Chapter Historian. Clarence had served as Chapter Historian since the year after he was Chapter President in 1953 through 1985 when Clarence became disillusioned with ASHRAE for a perceived lack of interest in ASHVE/ASHRAE historical interest. Clarence had served on the ASHRAE Society Historical Committee and had helped to shape the Society Historical Committee Guidelines. During that year while going through his memorabilia, I found a reference to an air-conditioned church in Orange, Texas. As part of my attempt to re-create the previous Houston Chapter History written by Clarence Fleming and lost to antiquity, I came across a small trifold brochure describing the church and a little about the A/C system and needing some fill material to make my version of the Chapter History more detailed I clutched at that straw and I included the paragraph below and it was published as an updated version of our Chapter History that year and also, included in our Chapter Roster and Product Directory! Almost 30 years later I was talking to a couple JCI Sales Engineers, Douglas Roden and Andrew Edmundson about Houston Chapter ASHRAE historical articles that I had written, including the 1st Church air conditioned west of the Mississippi in Orange, Texas, when Andrew said "I was married in that church recently" My interest was immediately refocused on this Church and I made arrangements with them to visit the Church for a tour of the building and contents. Mr. Bob West and Ms. Cara Love graciously consented to this process and have been instrumental in providing information about the church facility. I have visited the facility and have conducted Research with the Help of Bernard Nagengast, and others.

Air-conditioned Church: – 1929 (this was thought to be installed in 1929, but since Carrier Corporation was not created until 1931 it had to have been later rather than earlier. However, the construction drawings for the Church have surfaced that indicate 1906 to 1908 as the original construction of the Church with an installed and working A/.C system dedicated in 1912 that was updated several times after that time, by Kroeschell and then Carrier Corporation. Most of the initial published information listed is true and factual with the twists of reality being updated herein, as I have confirmed by independent research.) First Presbyterian Church, Orange, Texas, Carrier air handling unit model#K3963006-154C, Carrier job #3183, was commissioned by Mrs. Henry Jacob (Frances Ann) Lutcher as a family memorial. A central power plant had to be included as part of the construction of the church also to provide power for the heating, cooling and lighting systems of the new church because Orange did not have sufficient electricity at that time to provide power; a full time stationary engineer was employed to operate the power and A/C systems.

Many years may have passed, but the inside of the First Presbyterian Church remains a snapshot in history when the opulence and glory of the early 1900s is frozen in time. (Information is based on multiple sources of published information as noted in the Bibliography.). Construction started on the towering pink granite building began in 1908 (maybe as early as 1906) and took more than three years to complete (as it was dedicated in 1912). The stained-glass windows are not something which can simply be talked about, but must be seen, said Kyle Hood, tour guide of the church.

After walking through the front doors, guests are met with a grand stair case of carved marble. The Italian marble was installed by craftsman from Italy. Along the stairwell there are angels in the opalescent stained glass. The stair windows from the lower foyer to the upper foyer draw on the Sir Edward Conley Burne-Jones' work "Angel Stairway" for their inspiration. At the top of the stairs overlooking the entrance down below are the three famed stained glass windows which are said to have been the starting point for the church.

Frances Ann Robinson Lutcher was married to Henry Jacob Lutcher. He was a butcher and a mill owner in Pennsylvania, Louisiana, and Texas. Together, they had two daughters Mariam and Carrie. Mariam would later marry William Henry Stark while Carrie would marry E.W. Brown.

Mrs. Lutcher and her two daughters attended the Chicago's World Fair in 1893. It was there they saw the three-prize-winning works of Fredrich Lamb and his sister Ella of the J&R Lamb Studios. They were purchased and stored in New York until the day they would be needed. It is not known if there was already a plan to have a church built in Orange, but the windows were definitely a start.

The church building was planned, built and underwritten by Frances Ann Lutcher as a memorial to the Henry Jacob Lutcher family and as a result was named the Lutcher Memorial. She never divulged the costs of the structure, but upon completion established an endowment to provide for the maintenance costs. (As a knowledgeable HVAC&R design engineer I could speculate on Mrs. Lutcher's probable air conditioning cost, but I will honor her quite generous and selfless donation and final wishes by not speculating on the installed systems cost at that point in time.) In addition, The Carrie Lutcher Brown Foundation was established in 1942 by Edgar and Lutcher Brown in memory of their mother. This foundation in conjunction with the original endowment by Mrs. Lutcher continues to maintain the building.

The church, no matter how it started, was built to glorify God with everything the finest of its' type from the Italian marble stairs and banisters and mahogany pews, columns, doors and wall areas from Honduras to the 48 stained glass windows throughout the structure.

James Oliver Hogg, an Architect from Kansas City, Mo. was commissioned to oversee the project under the direction of Mrs. Lutcher. (Scanned copies of the thirty-one Architectural, Mechanical and Electrical plans still exist).

The central window symbolizes religion. It shows an unknown person sitting in a chair holding a Bible, but standing behind them is Michael in blue armor to war against the evil in the world with his followers on the window to the east symbolizing The Church Militant. Gabriel is also standing behind him with his followers to the west window which symbolizes The Church Triumphant. The theme of The Church Militant and The Church Triumphant is continued in the front of the sanctuary on the hymn boards.
Above the doors entering into the sanctuary are tall glass panes. They are intricately designed with clear glass but in the middle of each section are the traditional symbols of the four Evangelists. There is St. Matthew which is a winged man to remind people that Matthew begins his account with Jesus' human genealogy. Then there is St. Mark which has a winged lion to remind people of the nobility, strength and kingship of Christ portrayed in Mark's gospel. A winged ox represents St. Luke to symbolize Christ's sacrificial death. Finally, there is the winged eagle of St. John to remind people of John's gospel which soars in affirming the deity of Christ.

On either side of the entrance are two leaded windows with scripture verses in gold. Seen throughout the church is the egg and dart and the bead and reel which collectively symbolize birth and death and to serve as a reminder "man is mortal."

The story of Jesus is told by the artwork of the windows which weigh about 1,000 pounds each. The artist chose subjects from oil paintings in Europe. They were not historical people, but of their day. The technique of making opalescent stained glass is an American invention by John Lafarge.
"Stained glass is a living art," Hood said. "It needs the light."

Each window of vibrant colors is from two to four layers of glass which is then placed into a kiln and fired together to give it the special effect. OSG contains metallic oxide which gives it the color depth. However, the secret to the unique process was forever gone when Frederick Lamb died. Since then the process has not been successfully duplicated. Some of the parts were painted such as the faces with lifelike details.

The story of Jesus begins with the window, the Annunciation. It features the Arch Angel Gabriel telling Mary she will be the one to carry Jesus.

The second window is The Holy Family which was painted by Fuerstein. Painters began their trades by copying old paintings to learn the techniques. The infant Jesus is vibrant as the afternoon sunlight brightly glows due to the opalescent glass. Each face has a look of adoration, calmness and peacefulness.

Jesus at the age of 12 is on the next window of the story. A copy of the painting hands in a museum. Jesus' family has just been to Jerusalem for Passover. Mary's face show relief while the Pharisees are wondering who the child is. Their headbands shimmer in the sunlight. In the background is a circumcision ceremony in a temple. The ornate walls of the temple are decorated with many crosses.

The fourth window is the Good Shepherd window. It was done by Sibyl Parker. It was the only window done by a woman artist. There are many Christian symbols in the window such as; the cross formed by wooden beams, grapes for communion, doves representing the baptism and the Holy Spirit, the crown of thorns, the pierced hands and feet of Jesus, the open door inwardly beckoning one to enter in, and the sheep. Jesus is depicted holding a lamb which is just as important to the many others even though he may be lost.

Instead of Jesus on the cross, the next window depicts the trial of Jesus when Pontias Pilate authorized the crucifixion of Jesus. In the Bible, she approaches her husband telling him Jesus is an innocent man. The window depicts her coming down some stairs and being comforted by an angel. Jesus is seen in the background. However, what sets this window apart is there are three men which are not of Jesus' time. One of men is John Calvin who was an influential French theologian and pastor during the Protestant Reformation. He was a principal figure in the development of the system of Christian theology which was later called Calvinism. Originally trained as a humanist lawyer, he broke from the Catholic Church around 1530. There is also John Knox who founded the Presbyterian Church. Martin Luther is also seen and was a German monk, priest, professor of theology and important figure of the Protestant Reformation.
Finally, to complete the story, there is The Assentation which shows Christ's resurrection.
From the outside of the church, a copper dome which was installed in the 1950s (to protect the stained glass from hurricane storm damage) can be seen which has oxidized to the color green. It covers which was once a glass dome. It is the only opalescent glass dome in the Unites States. From the inside the 36-foot glass dome is comprised of 16 angelic figures bearing a Christian symbol. Starting counter clockwise from the pulpit, there are the Scroll and Quill, Canticle, Church building, Cross, Chalice, Scepter, Dove, Lamb, Lyre, Organ, Open Bible, Stone Tablets, Sword, Scales, Psalms and Lilies.



Figure 3 FPCO Church Dome with Sixteen Angels

In the fellowship hall beneath the sanctuary which was originally used for the Sunday school class rooms there are still more stained glass windows. On the west side is the Flight into Egypt and Madonna with Jesus and St. John. The east side of the building has Jesus in the Carpenter's Shop and Jesus Blessing the Children.

The building is on the National Register of Historic Places and has been a landmark in the city for a century. The church is one of the leading tourist destinations in the county because of its priceless

Victorian Era stained glass windows. (The stained-glass windows represent a multi-layer fused stained glass technique no longer utilized.)

The first-floor area was a classroom/meeting room area that had vertical pocket doors as partitions in lieu of dividing walls.

Insert Photo

Figure 4 Vertical Pocket Doors to Subdivide the 1st Floor Meeting Room Areas

The summer heat may be sweltering but those wanting to escape the heat have been able to do so for 100 years in Orange with the first public building in the south, the First Presbyterian Church, to have the luxury in August 1912 (really more like 1908).

In 1902, a year after Willis Carrier graduated from Cornell University with a master's degree in engineering; he landed a job at a printing company in New York. They paid him $10 a week. However, the company was struggling with the heat and humidity which caused the colors to run. Carrier invented a device which made printing possible and made him a very valuable employee.

The invention controlled the temperature. Carrier later went into business for himself and was contacted by Frances Ann Lutcher to install air conditioning in the First Presbyterian Church. (Actually, since Carrier Corporation was not founded until 1931, that is when Carrier, Willis Carrier of Carrier Corporation installed the existing AHU made for Carrier Corporation by Buffalo Forge with a direct expansion cooling coil of unknown refrigerant, Buffalo Forge Model number 154C, Job Number 3183, SN K-3096 showing a last patent date of January, 1922 with an electric motor and dual v-belt drive, that is still in operation today.)

The church was organized in April 1878 under the guidance of Dr. W.H. Vernor and Dr. R.H. Byers. The first church building was located at Market and Polk Streets. The current building was planned, erected and paid for by Frances Ann Lutcher. She wanted to build the church as a memorial to the Henry Jacob Lutcher family and it was named the Lutcher Memorial Church Building.

Frances Ann Lutcher took it upon herself to do all the planning and choosing of the windows herself. An architect from Kansas City, Mo., James Oliver Hogg was hired for the design. The granite is a native Texas stone and comes from Llano. However, the marble is from Italy. Construction began in 1908 (probably prior to 1908, or in the 1906-time range as Kroeschell was given a contract in 1908 to install a CO2 compressor system in the church to replace the steam driven ice block a spray chilled water washer's system previously installed as indicated by the original Church Architectural and ME drawings see attached files, because the original system was noted as not working well.) and the glorious structure was completed in 1908. It was formally dedicated in January 1912.

The plans for air conditioning was sic (were) not without hurdles to overcome. But, when there is a will, there is a way.

Church records have been lost over the years and it is not certain which system was first used at the church. (This is illustrated by the various articles written by laymen who did not realize the inconsistencies in what experienced knowledgeable observation would notice.) But, it is believed since Carrier held a patent on an air conditioning system which used ammonia, this was the first system installed in the church. (However, The original system installed was an steam driven coal feed steam boiler with an ammonia compressor not a Carrier System since Carrier Corporation was not created until 1931, steam driven AHU and steam driven cold ice melt water pump spray system that made a block of

ice and then blew 100% OA over the ice block, and recovered the cold water melt from the ice to be collected in a concrete sump and then sprayed through the AHU air stream to wash the dirt from the raw outside air (OA) intake of air and to finish dehumidification of the building cool supply air. A ducted supply and return/relief system with summer/winter manual set dampers installed for heating and cooling (Winter/Summer) operation.

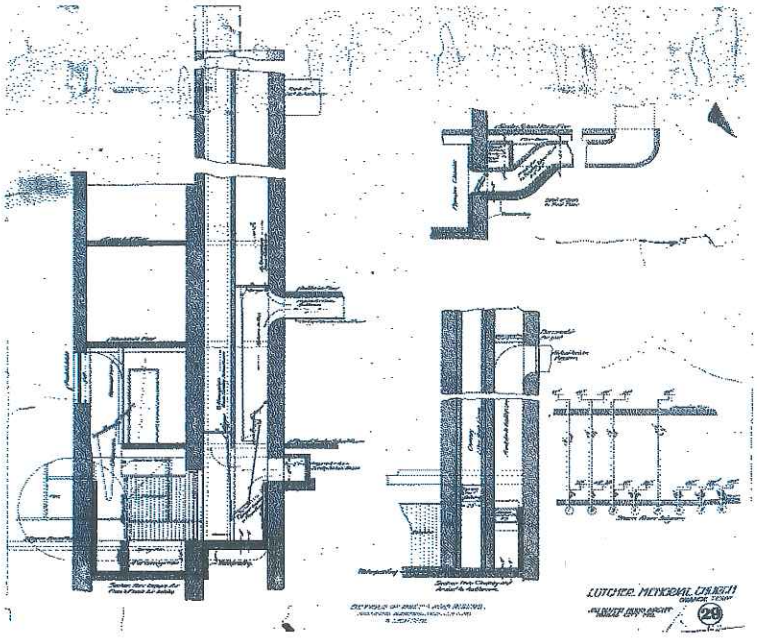


Figure 4 Summer/Winter Manual Damper Arrangement



Figure 5 Coal & Ash Chute to Operate the Steam Boiler Up to Grade Above

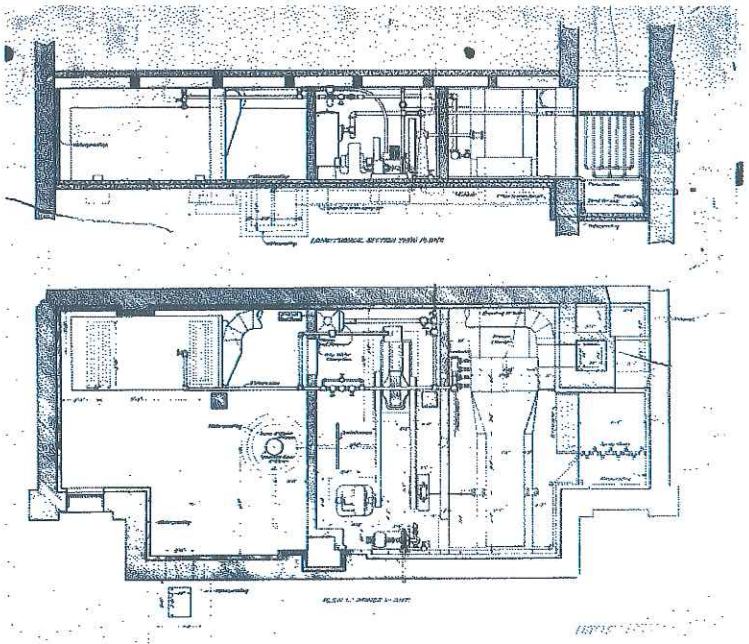


Figure 6 Original Drawings A/C System, Steam Boiler & AHU & Chilled Water Pump. The A/C System (An Ammonia Compressor and Ice Making System) was Toxic, Highly Flammable & Explosive).

Also under consideration is sic (as) the first (second) air conditioning unit may also have been a system which used carbon dioxide CO2. (In reality, the second air conditioning system was a Kroeschell Brothers Ice Machine Company, a 70 ton CO2 compressor and new AHU with CO2 evaporator cooling with 2,500 Lineal feet of 1" diameter black steel piping rated for 1,200 PSIG was installed.) This system would have worked similar to the compressor unit with ammonia, according to record archives (however, the pressure rating for the C02 piping evaporator coils was much higher than the previously installed ammonia system that is the primary reason why a new AHU and evaporator coil and an electric driven fan were installed. The CO2compressor was also electric rather than steam driven, refer to Figure 14 Here-in after).

In addition, electricity would have been a problem. (The existing City of Orange total public electrical supply system capacity could not support the new electrically driven equipment for the First Presbyterian Church air conditioning equipment and the power requirements of the City of Orange, Texas simultaneously). The air conditioning system would have taken two-thirds of the power available in Orange. The solution was to build a power source just for the church.

Carrier built a powerhouse which was built behind the main church building. (However, the power house was built as part of the work by the Kroeschell Company work rather than by Carrier, since it used an electric C02 compressor, electric AHU motor, electric condenser water pump and cooling tower cell with a CO2 to Condenser water heat exchanger to condense the CO2 after the CO2 compressor for re-use of the C02 with a cooling heat transfer medium with a condenser water pump and remote cooling tower required, rather than the previously installed steam driven ammonia equipment system.) Crews installed a 200-horsepower engine (The installed electrical generator rated at 220 V/3/60) which ran on crude oil.

A newer air conditioning system was installed in the church in the late 1920s (more like 1931 or 1932 as Carrier Corporation was formed then with Model # 154C, Job Number 3183 and Serial Number SN K-3096 with a patent date of January, 1922 or later).

As the years rolled by, another, e.g. a 4th A/C system revision (water cooled, semi-hermetic Carrier Compressor using R-12 that was converted to R420a much later) compressor unit was installed in the 1950s (and connected to the existing Carrier AHU and direct expansion cooling coil). Eventually, a 50 (??) ton unit was implemented and still keeps the church cool and visitors comfortable.



Figure 7 Existing Carrier AHU Fan & Electric Motor



Figure 8 1931 Carrier AHU Nameplate

Some of the original duct work and piping are still used in the church as part of the current Carrier system (The existing AHU is a Carrier unit circa 1931 and the present-day Carrier R-12 direct expansion water cooled refrigerant reciprocating semi-hermetic compressor is currently using R-420a refrigerant in lieu of EPA banned R-12 refrigerant).



Figure 9 More Modern Carrier Refrigerant Compressor

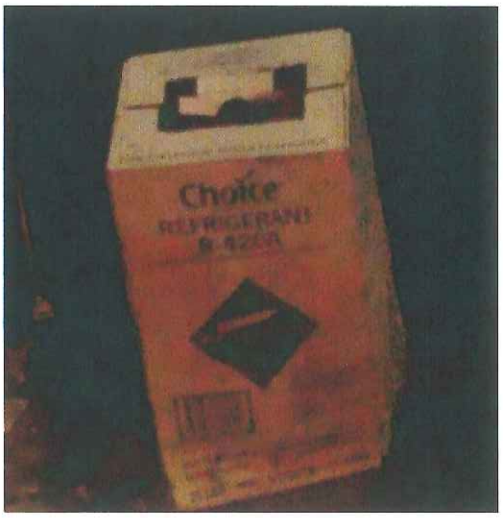


Figure 10 R420a Refrigerant Container

However, some things have changed. The powerhouse where the chief engineer once lived on the top floor now serves another purpose. The remainder of the powerhouse such as the top three floors was removed many years ago,

Throughout the entire project, Frances Ann Lutcher kept costs a secret which also remains in effect to this day. To make sure the building was maintained properly and church members would not be burdened with upkeep, she set up an endowment, according to Record archives.

Few records are left of how the structure came to be. Only a few drawings remain. But, the church still stands as one woman's plan to leave a memorial for future generations while enjoying a little comfort as they gather during the long hot summers of Orange.

Excerpts from Kroeschell Engineering Company History July 14, 1958

1896: In this year, the Kroeschell Bros. Ice Machine Co., was incorporated to design, manufacture and install a full line of refrigeration compressors, together with related equipment, using Carbon Dioxide as a refrigerant. The Julius Sedlacek Austrian patents were purchased, which covered mainly the special stuffing boxes required for high pressure CO2 (roughly 1,200 pounds [sic PSIG], and a complete machine shop was installed. Kroeschell thus were pioneers, becoming the first company, in America to design, manufacture and install CO2 refrigerating equipment in sizes from one to 250 tons capacity, including both horizontal and vertical compressors, together with condensers, chillers, CO2 gas collecting plants, etc.

1901: In this year, the company launched into the marine refrigeration with installations on ships of every size and description. 0riginally, the compressors were all steam driven. The Kroeschell were the first in the field to offer a completely self-contained, factory-assembled unit.

1903: In this year Kroeschell Bros, Ice Machine Co., designed and built equipment for candy factories, blowing air with fans through coolers consisting pf prime surface extra heavy coils with baffles in sheet metal housing for chocolate dipping rooms; and storage. With this application Kroeschell again were pioneers in the United States for cooling with air.

1906: In this -year, which was very important to the Kroeschell Bros, Ice Machine, a contract was entered into with the Congress Hotel Company; to design, build and install an air cooling system, including compressors, condensers, fans, air cooler, and sheet metal ducts for their Pompeian and Gold Rooms. To the best of our knowledge, this was the first system of its kind designed for comfort cooling to be installed in the United States. Incidentally, this system was in continuous use until the end of World War Two. In the same year, we obtained the order to install a complete air cooling system in the Lutcher Memorial Church in Orange, Texas (1).

Inevitably, the first big impetus to air cooling occurred in 1919, when Balaban & Katz, followed by other national theatre chains, entered into a mad race to cool their theatres. In this period, Kroeschell were the leaders in this field and closed contracts in all parts of the country and abroad.

From the time the Kroeschell Ice Machine Company was started, all types, of C02 installations were made, especially where CO2 as a refrigerant was desirable. These jobs included hotels, restaurants, hospitals, cold storage for the food industry, bottling plants, small breweries, candy factories, drinking water circulating systems, special industrial work, marine work, etc.

ICE and REFRIGERATION in June, 1914 CHURCH COOLING

Description of Air Cooling Plant in Lutcher Memorial Church, Orange, Tex.—. Substantial Evidence of the Success of Refrigeration for Churches.

The first church organization to adopt modern methods of cooling, such as have been successfully applied in a number of hotels and some theatres, was the Lutcher Memorial Church at Orange, Tex., a brief account of which was given in the March issue of ICE AND REFRIGERATION. As the success of this innovation promises to open a new field for the further use of mechanical refrigeration, a description of this air cooling apparatus, and its effect as described by the pastor of the church, will be of interest. The "Lutcher Memorial" First Presbyterian Church of Orange, is a handsome structure, as is apparent from the exterior view herewith, reproduced from a photograph. It is built of stone, classic style, beautifully ornamented and decorated in the interior. The church people of Orange evidently believe that ministration to the spiritual needs of the community is an all the year around necessity quite the same as is the supplying of man's secular wants. But the excessive heat of summer thinned the attendance to where the benefits conferred made the advisability of continuous service problematical under the old regime of submitting to weather extremes. Not willing to surrender their warm weather services, the trustees of the Lutcher Memorial, who are wide-awake, progressive businessmen, decided to employ modern methods of refrigeration in summer, just as everybody now employs artificial means of heating in cold weather.



FIG. 1—EXTERIOR VIEW LUTCHER MEMORIAL "REFRIGERATED" CHURCH AT ORANGE, TEX.

Figure 11 FPCO Exterior photo

The old ventilating (air conditioning) system had proved unsatisfactory and after investigation of the air cooling system by means of mechanical refrigeration, such as had been installed by Kroeschell Bros. Ice Machine Co., Chicago, in a number of hotels, it was decided to equip the church with a similar plant. Accordingly, contracts were let for installation of a Kroeschell CO2 refrigerating and air cooling plant large enough to cool 12,000 cubic feet of air per minute from 100° F. to 60° F. To accomplish this, a 60-ton refrigerating machine, driven by belt from a 70-h.p., 110-volt, direct current, slow speed motor was supplied, also a carbonic anhydride condenser of the double-pipe counter-current type, in six sections, and expansion coils placed in a special chamber for cooling the air. This chamber is also provided with air washers, that is, the incoming air, drawn by the air blower that drives the cool air current into the

church auditorium, first passes through a spray of falling water from perforated pipes in the upper part of the chamber. Thus, outside and return air supply air washed and partly cooled, the air is drawn over the expansion coils, which consists of 2,500 lineal feet of 1-inch pipe, over which a spray of water also flows. The cold air is then drawn through an eliminator, or box containing a series of baffles for dehumidifying the air and thence through conduits into the room or rooms to be cooled. The effect is best expressed in a letter from the pastor of the church sent in reply to a request by ICE AND REFRIGERATION as to the success of the cooling system and whether the attendance had been materially increased thereby. The letter is as follows:

Orange, Tex., April 9, 1914. Nickerson & Collins & Co., Chicago, 111.

Gentlemen: - In reply to your request of April fifth, I take pleasure in giving you some facts in regard to our cooling system. In Texas, during July-August and September, the temperature ranges from 98° to 102°, in the shade. The effect that our system has on our entire building reduces that temperature to 70°, in about 45" minutes. We find, however, that such a reduction is most too severe on the average constitution and have raised our thermostat to about 80°. -At this temperature, the people are entirely comfortable and are willing to remain during the longest service.

The attendance I would not say has increased but does not decrease when the hot weather arrives, as is the custom here among the other churches. The advantage given us is a good attendance all the year around instead of a good attendance in winter and a poor attendance in summer. This I consider to be a better argument for the system than, it would be to "say that it had increased the attendance fifty or sixty per cent." This effect is not only produced in the one department of our work but through-out. On the Sabbath School and mid-week services as both the Sabbath School room and the main auditorium may be cooled at the -same time or one may be cut off and the other cooled."

E. T. DRAKE, Minister.

In addition to the air cooling plant, the church was also provided with its own electric generating- plant. A 100-kW generator, operated by a 200-h.p. De La Vergne oil engine using "crude oil for fuel", was included in the power plant, and this supplies current, at 220 volts, for lighting the church, for driving the motors and also for charging a storage battery which supplies power for operating the large pipe organ in the church.

A special building of concrete was erected at the rear of the church to house the power plant and refrigerating machine, so that no noise or vibration from the operation of the machinery is felt in the church at any time. The air cooling apparatus proper is in the basement of the church. The air, washed, cooled and dehumidified, is driven by means of a No. 9 Sturtevant multi-vane blower, forty-one inches in diameter, operated by a 5-h.p. motor, through two main air conduits, one 22 x 32 inches in dimension, the other 22 x18 inches, these branch at the sides and ends of the church, supplying cool air to six registers (on each side of the ceiling mounted that were incorporated into the light chandeliers support base see photo) on each side of the main auditorium, placed in the wall at the floor line, two registers at each end, and two in the organ loft. An exhaust fan of same capacity as the blower exhausts the air from the top of the room, which air can be either exhausted to the atmosphere, or returned to the air washer and cooler for recirculation, as desired. The original supply air register has a more modern supply register deflection shield added, time frame unknown!

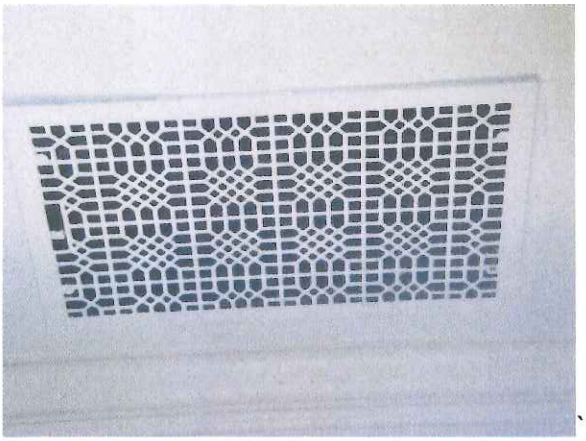


Figure 12 Ceiling Supply Register w/o Diverter Plate



Figure 13 Ceiling Register with a SA Diverter Plate Added at an Unknown Point in Time



Figure 14 Floor Mounted Return/Relief Registers have a Manual Damper Operable from the Face of the Relief/Return floor Mounted Register.

The auditorium is not large, being 52 x 66 feet measurement, and twenty-eight feet high in the center under the dome, or containing in all about 87,000 cubic feet of space. With the (supply and relief/exhaust) fans in operation, therefore, the air in the church is entirely renewed every seven minutes (an approximate 8.57 ACH rate of supply air SA flow or approximate 11,200 CFM of SA for the 2nd floor area of worship). As a further aid to perfect ventilation twenty-eight "mushroom" ventilators are installed under the seats in the church. The ventilating or air circulating system thus used in summer is also used in winter when, however, the air is drawn over steam coils, instead of carbonic anhydride expansion coils. The air is also washed and forced through, the blowers, the "circulation being reversed" refer to Figure 4. The Sunday school room is supplied with cool air circulation in summer and warm air circulation in winter the same as the church auditorium. The cold air ducts in the air cooling room are insulated with cork, furnished by the Armstrong Cork Co., Pittsburgh, Pa., but there is no insulation of the church walls nor of the air mains, which are constructed of concrete. The cork insulation at the existing Carrier AHU with electric motor was replaced after the basement flooded during a recent hurricane. It was replaced

with 1" thick fiberglass fiberboard with Foil-Skrim-Kraft-Laminate (FSKL) vapor barrier.) The satisfactory results obtained by means of this apparatus and the moderate cost of maintenance should prove a strong incentive for other churches to do likewise. Especially when the added comfort is considered, the greater efficiency when not subjected to extreme heat, and the greater attendance. The adoption of this modern method of refrigeration is worthwhile and news of its practical utility should be heralded everywhere.

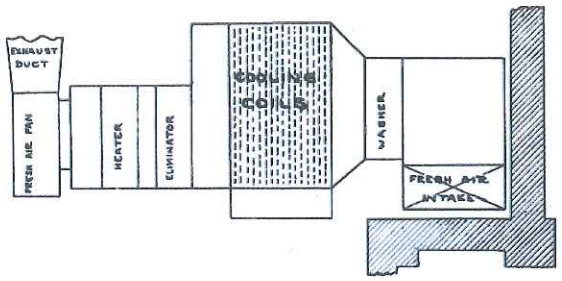


FIG 2—PLAN OF AIR WASHER AND COOLER, LUTCHER MEM. CHURCH.

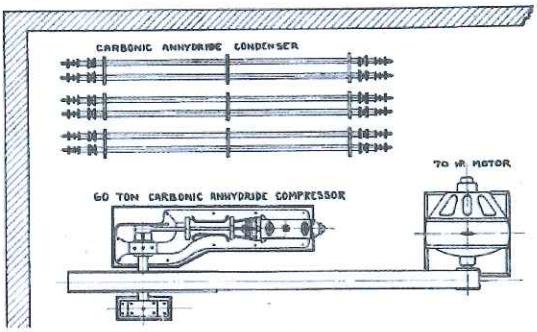


FIG. 3—CO$_2$ COMPRESSOR AND CONDENSER, LUTCHER MEM. CHURCH.

Figure 16 Kroeschell Compressor Co. Drawings Shown Ice & Refrigeration Article June, 1914



Figure 15 Newer Vintage Close Coupled Condenser Water Pump



Figure 16 Original Close Coupled Condenser Water Pump



Figure 17 Refrigerant to Condenser Water Heat Exchanger Unit



Figure 18 Liquid Refrigerant Receiver Tank

Continued Excerpts from Kroeschell Engineering Company History June 14, 1958

1922: In this year, the Kroeschell Brothers Company and the Kroeschell Bros. Ice Machine Co. merged with Brunswick Refrigerating Company of New Brunswick, N.J., manufacturers of small and medium sized ammonia, compressors, related equipment, coils, etc. The result of this consolidation was the Brunswick-Kroeschell Company, and construction was started on a large factory in Chicago at 4221 Diversey Ave.

Obituary Fred Witten

1928: One of the pioneers in the development of the carbonic refrigerating (CO2) machines, in the person of Fred Wittenmeier, passed away at his home in Chicago March 19, 1928. Mr. Wittenmeier was born in Zweibrucken, Germany, May 30, 1863, and came to this country in 1881, settling in Chicago in 1885. He had obtained a thorough mechanical training in Germany and was engaged in the steam fitting business until 1896 when he joined Kroeschell Bros. Co. who, at the time, were in the boiler manufacture and steam fitting business only. In collaboration with others, Mr. Wittenmeier experimented with the Co: Ice Machine and developed it into a commercial success, starting the Kroeschell Bros. Ice Machine Co. in this phase of their business. In 1900 the carbonic machine was commercially unknown in this country and most of the credit for its successful development to the present time must be given to him. He continued as head of the Kroeschell Bros. Ice Machine Co. until 1917, at which time he founded the Wittenmeier Machinery Co., devoted to the exclusive manufacture of carbonic refrigerating machines and apparatus. He was active in the business until five, weeks before his death and will, undoubtedly, be missed by his many friends throughout the country.

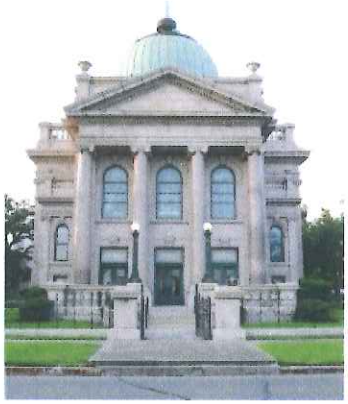
Continued Excerpts from Kroeschell Engineering Company History June 14, 1958

1931: In this year, the Brunswick-Kroeschell Company entered into a merger with the Carrier Engineering Co. of Newark, N.J., and the York Heating & Ventilating Co., of. Philadelphia, Pa., forming, Carrier Corporation.

1932: In November, 1932, Robert and Paul Kroeschell, Arnold Goelz and Hans Stade, resigned from the Carrier Corporation and incorporated the Kroeschell Engineering Co. Simultaneously, several Kroeschell

associates of many years' experience joined the Kroeschell Engineering Co., among them Harry Coesfeld and Wm. Christmann, who are now Vice Presidents of Kroeschell Engineering Co.

100th anniversary for air conditioning in Orange, Texas



August 7, 2012 Orange County News

The summer heat may be sweltering but those wanting to escape the heat have been able to do so for 100 years in Orange with the first public building in the south, the First Presbyterian Church, to have the luxury in August 1912.

In 1902, a year after Willis Carrier graduated from Cornell University with a masters degree in engineering, he landed a job at a printing company in New York. They paid him $10 a week. However, the company was struggling with the heat and humidity which caused the colors to run. Carrier invented a device which made printing possible and made him a very valuable employee. The invention controlled the temperature. Carrier later went into business for himself and was contacted by Frances Ann Lutcher to install air conditioning in the First Presbyterian Church.

The church was organized in April 1878 under the guidance of Dr. W.H. Vernor and Dr. R.H. Byers. The first chuch building was located at Market and Polk Streets. The current building was planned, errected and paid for by Frances Ann Lutcher. She wanted to build the church as a memorial to the Henry Jacob Lutcher family and it was named the Lutcher Memorial Church Building.

Frances Ann Lutcher took it upon herself to do all the planning and choosing of the windows herself. An architect from Kansas City, Mo., James Olver Hogg, was hired for the design. The granite is a native Texas stone and comes from Llano. However, the marble is from Italy. Construction began in 1908 and the glorious structure was completed in 1908. It was formally dedicated in January 1912.

The plan for air conditioning was not without hurdles to overcome. But, when there is a will, there is a way.

Church records have been lost over the years and it is not certain which system was first used at the church. But, it is believed since Carrier held a patent on an air conditioning system which used ammonia, this was the first sytem installed in the church. However, it was toxic and highly flammable. Also under consideration is the first air conditioning unit may also have been a system which used water and carbon dioxide. This system would have worked similiar to the unit with ammonia, according to Record archives.

In addition, electricity would have been a problem. The air conditioning system would have taken two-thirds of the power available in Orange. The solution was to build a power source just for the church.

Carrier built a powerhouse which was built behind the main church building. Crews installed a 200 horsepower engine which ran on crude oil.

A newer air conditioning system was installed in the church in the late 1920s. As the years rolled by, another unit was installed in the 1950s. Eventually, a 50 ton unit was implemented and still keeps the church cool and visitors comfortable.

Some of the original duct work and piping are still used in the church as part of the current Carrier system. However, some things have changed. The powerhouse where the chief engineer once lived on the top floor now serves another purpose. The remainder of the powerhouse such as the top three floors was removed many years ago.

Through out the entire project, Frances Ann Lutcher kept costs a secret which also remains in effect to this day. To make sure the building was maintained properly and church members would not be burdened with upkeep, she set up an endowment, according to Record archives.

Few records are left of how the structure came to be. Only a few drawings remain. But, the church still stands as one woman's plan to leave a memorial for future generations while enjoying a little comfort as they gather during the long hot summers of Orange.

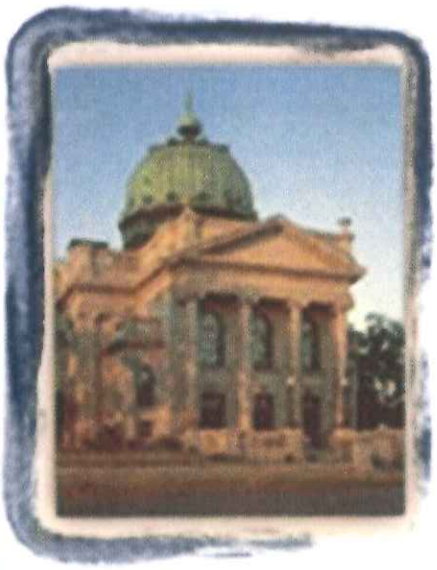


First Presbyterian Church, 902 Green Avenue, Orange, TX 77630



First Presbyterian Church Orange, Texas Air-Conditioned in 1908 to 1912

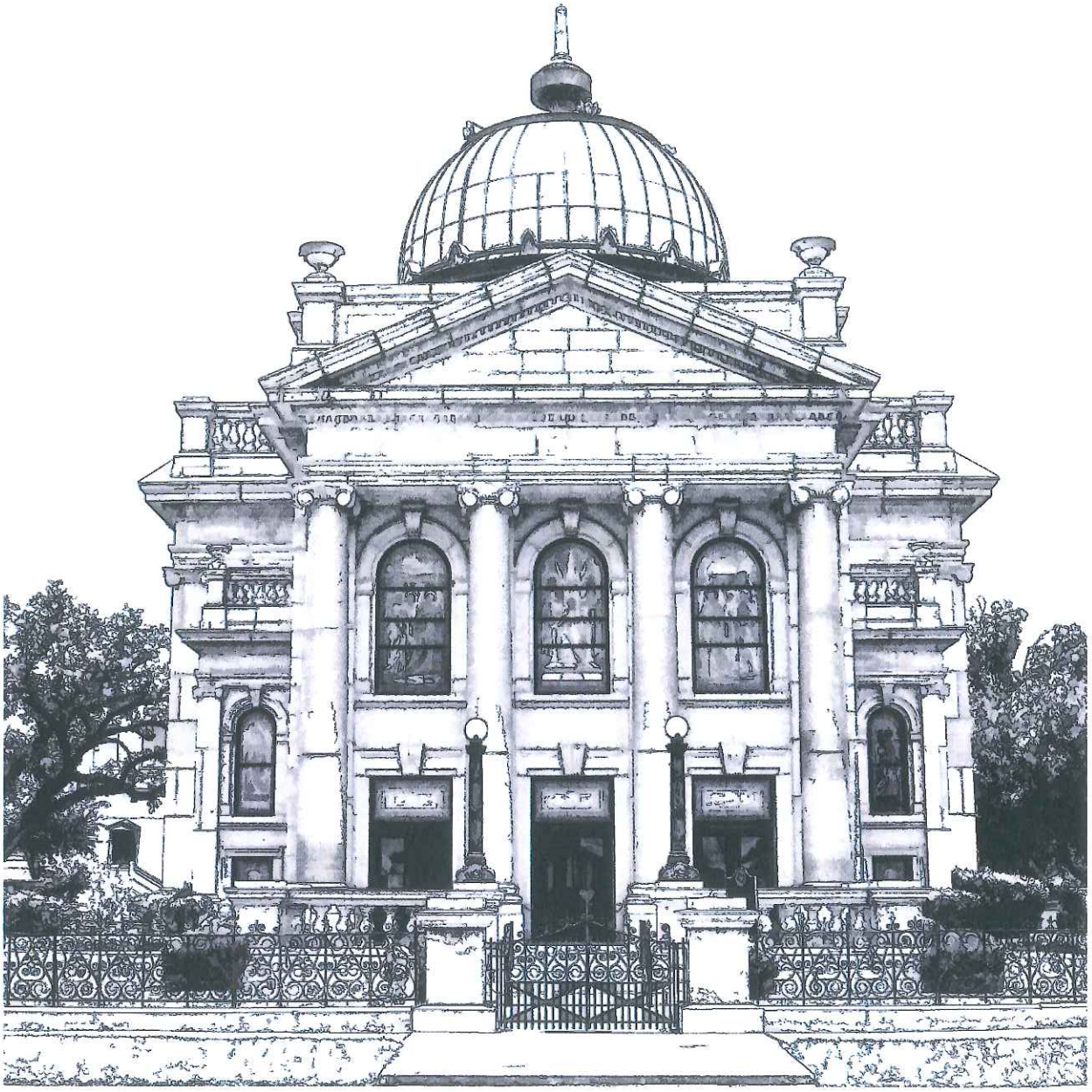







BENCH MARK
U.S. COAST & GEODETIC SURVEY
WASHINGTON, D.C.
FOR PRESERVATION OF THIS MARK
WRITE TO SUPT.
FINE OR IMPRISONMENT FOR DISTURBING
ELEV. 12.
P58
1918


FRANCES ANN LUTCHER
1840 - 1924

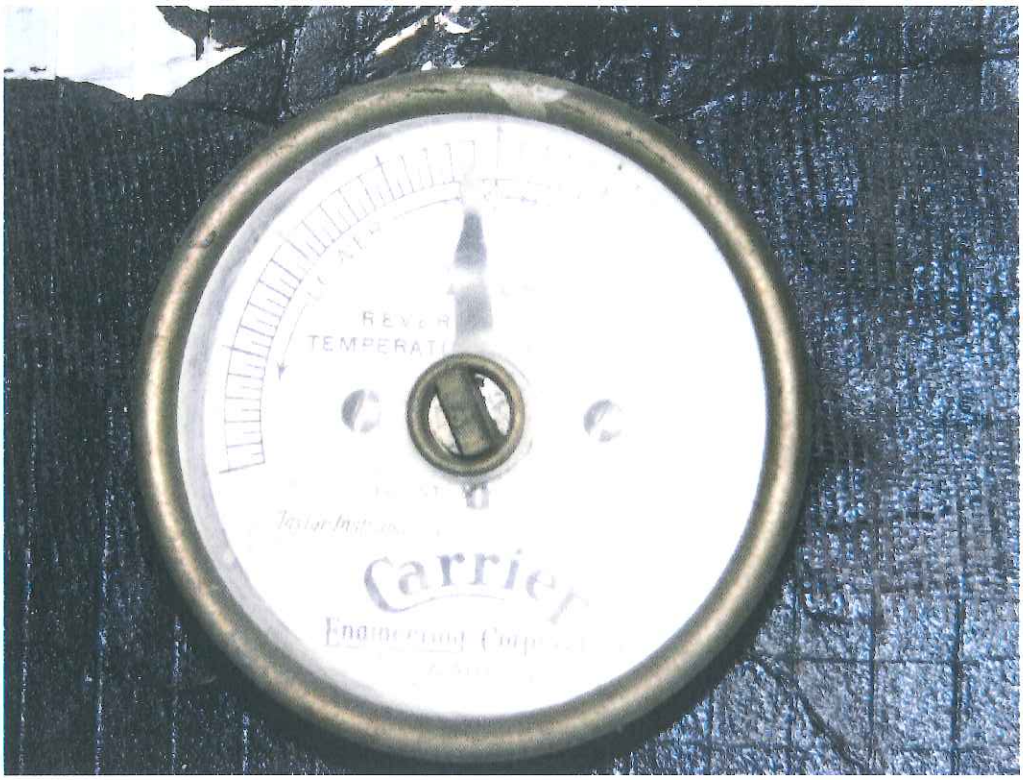


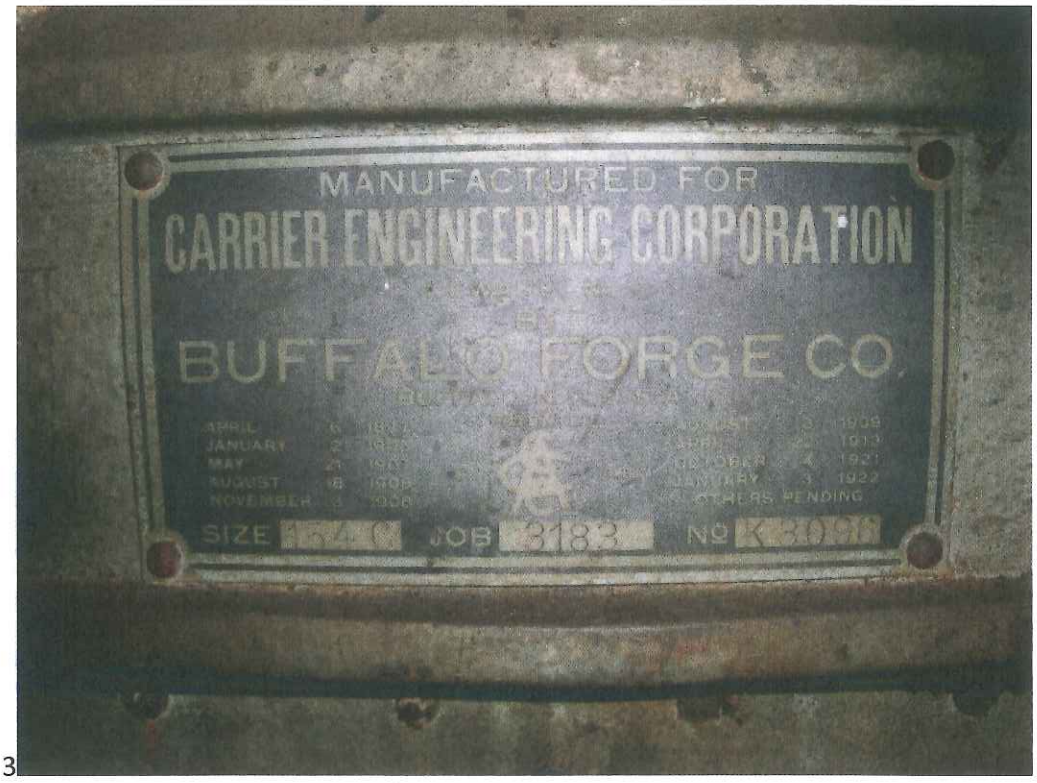







MANUFACTURED FOR
CARRIER ENGINEERING CORPORATION
NEWARK, N. J.
BY
BUFFALO FORGE CO.
BUFFALO, N. Y., U. S. A.
PATENTED
AUGUST
APRIL
OCTOBER
JANUARY
OTHERS PENDING
SIZE
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NO


Carrier


MANUFACTURED FOR
CARRIER ENGINEERING CORPORATION
BUFFALO FORGE CO.
SIZE
JOB 3183
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3



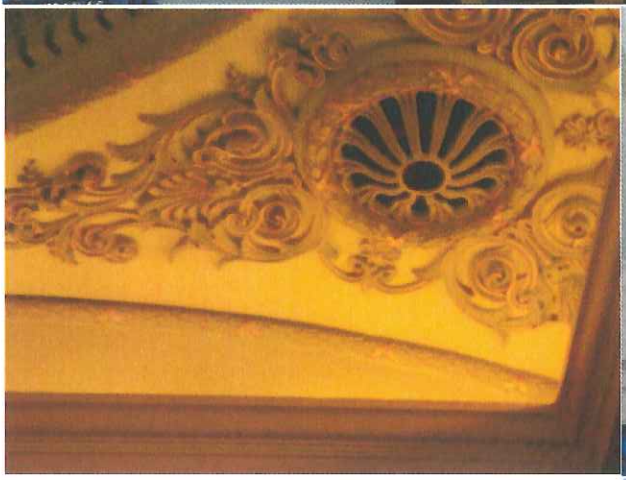








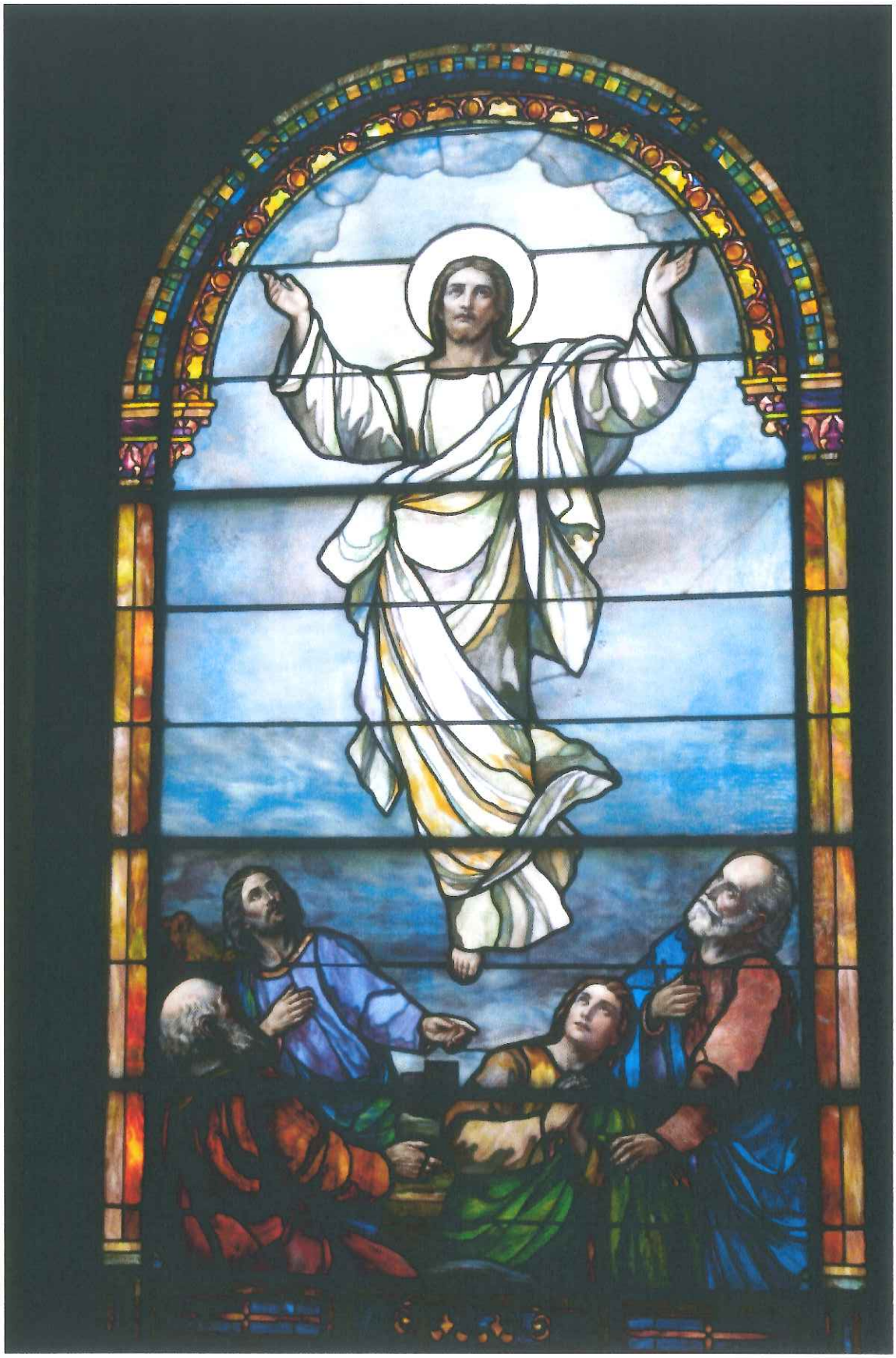








WORD











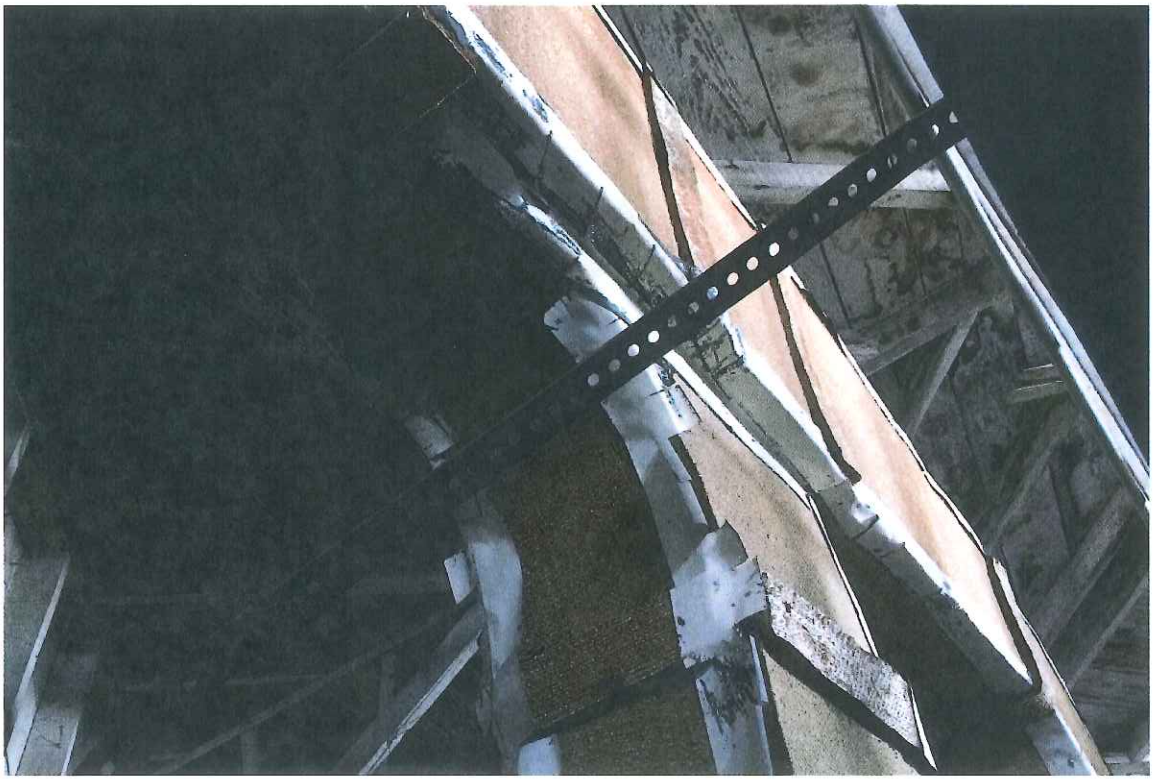


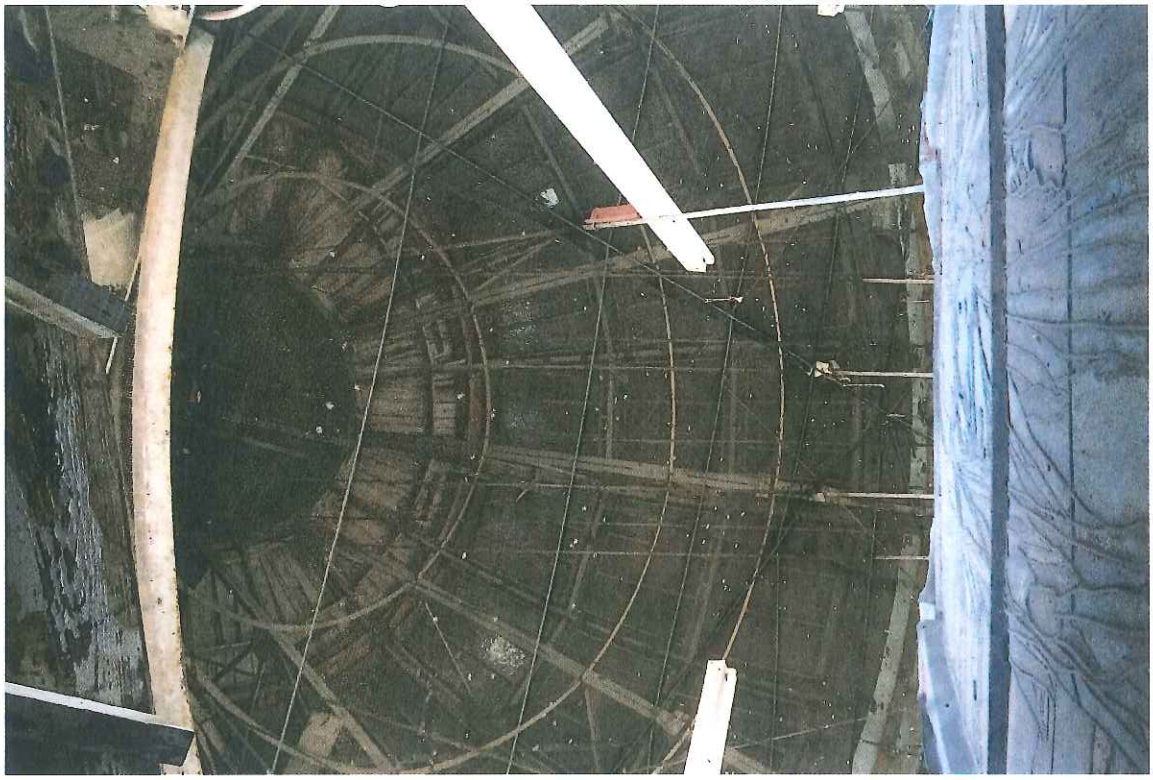


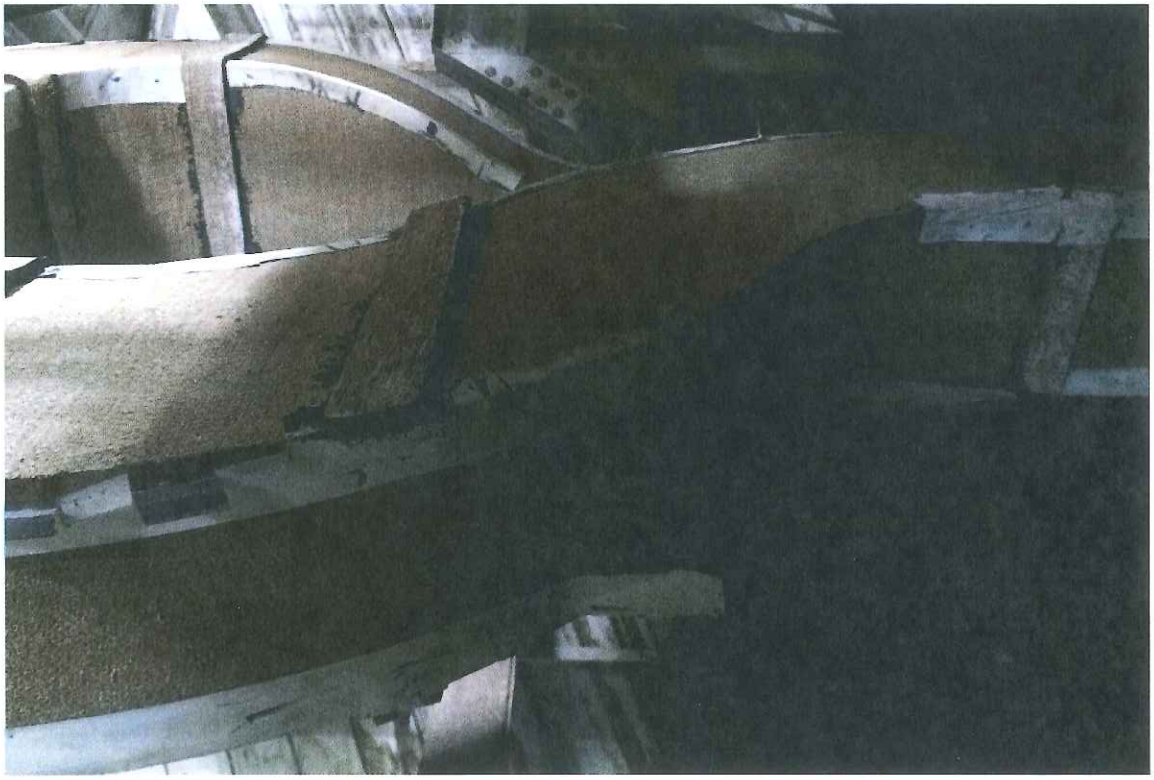








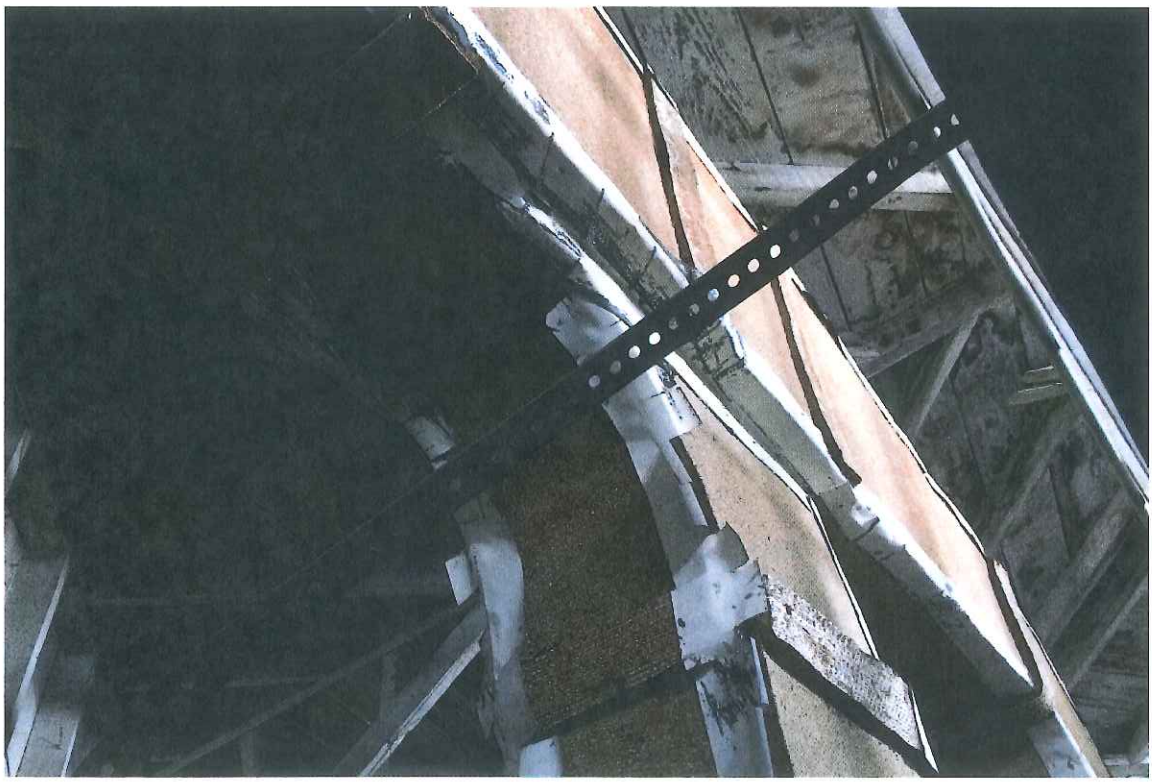






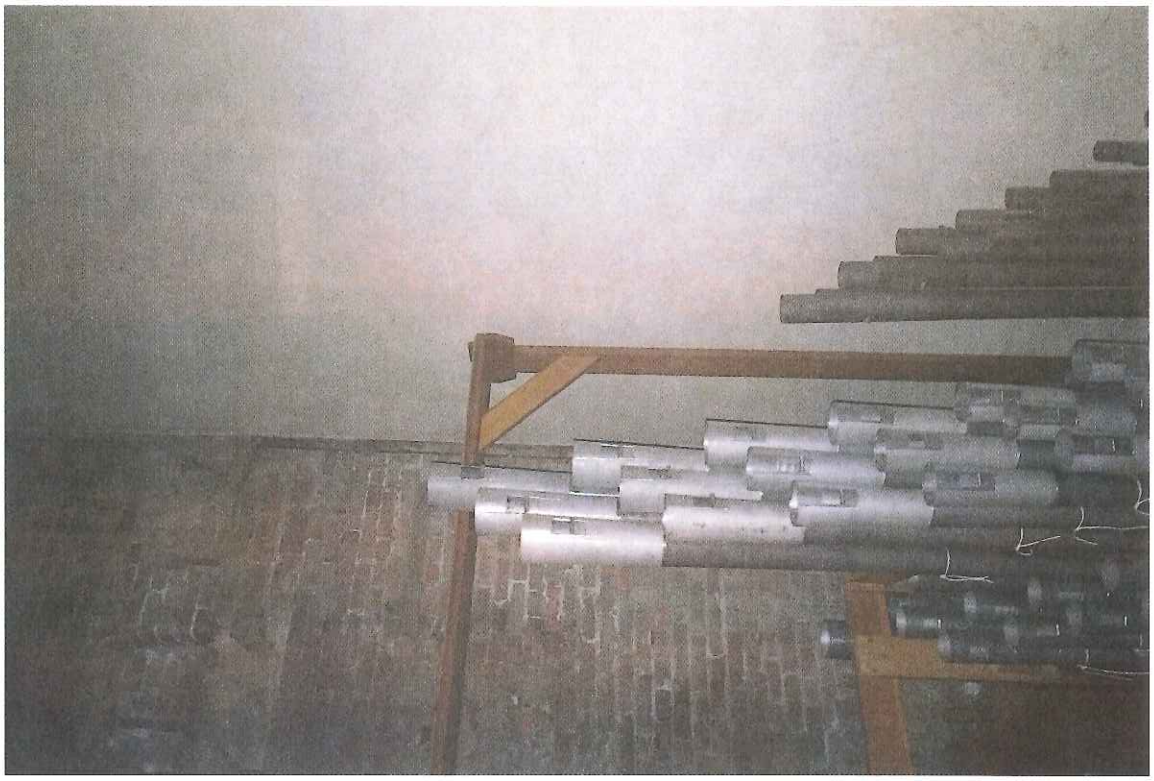






















Bill Schaefer

Photography
6914 Ashmore Drive, Suite 100
Houston, Texas 77069
Telephone: 281-631-0861
Email: bschaeferjr@comcast.net



June 30, 2011
Ms. Cara Love
First Presbyterian Church
902 West Green Ave.
Orange, Texas 77630

Dear Ms. Love,

Yesterday you were kind enough to allow me to photograph the First Presbyterian Church. I've enclosed photographs of the church plus a CD of the photographs that I took on that day. If you find any of the photographs that you like, please feel free to use them as you wish. I'm happy to donate my efforts to the church.

My wife and I are now 18 months into our goal of visiting every historic church in Texas and photographing those, such as yours, that we find interesting. It's a project that we are enjoying and hope to complete within the next 2-3 years.

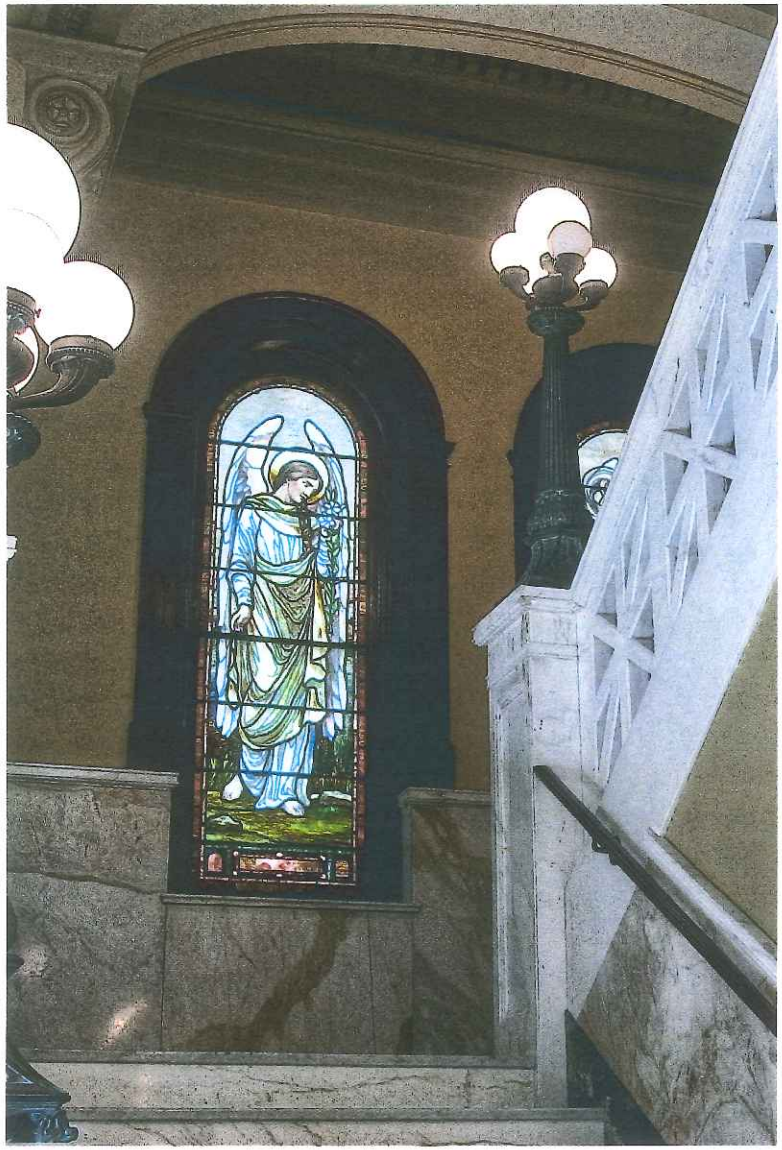
Pam and I hope you had a fast and uneventful recovery after your surgery. Hopefully our prayers helped.

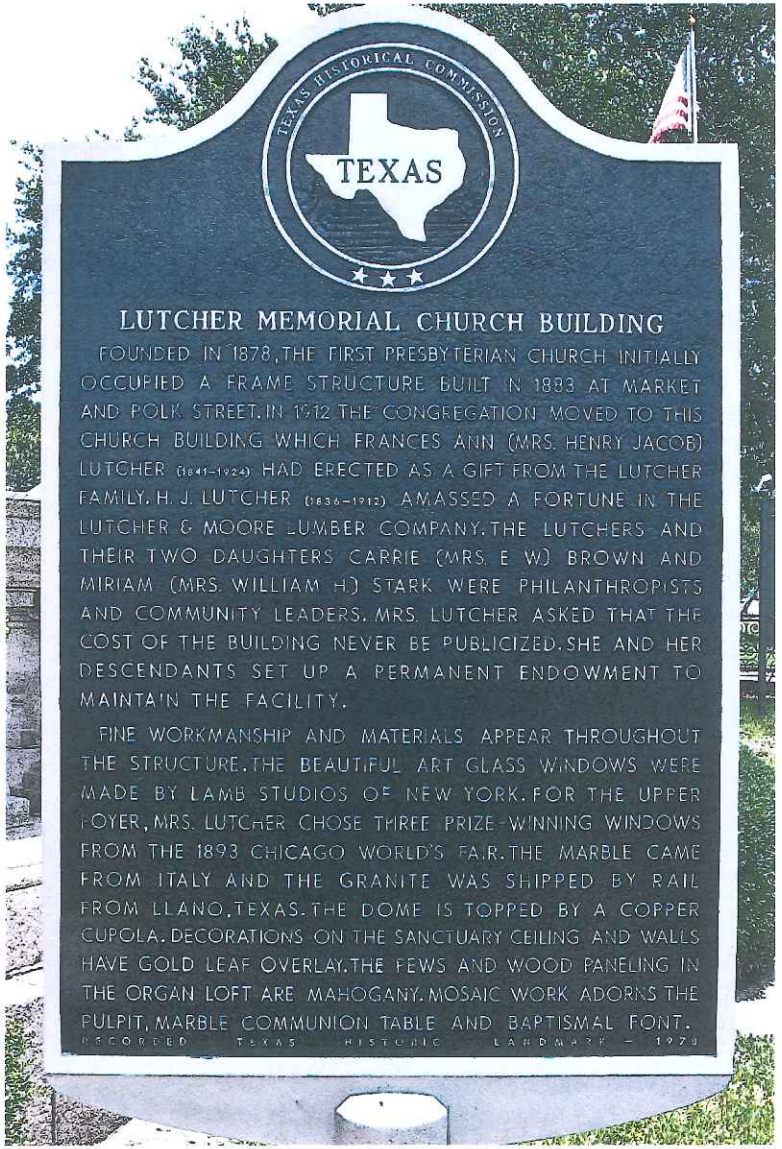
If you have any questions or comments, please feel free to contact me at any time.

Yours truly,

Bill Schaefer

Work URL





LUTCHER MEMORIAL CHURCH BUILDING

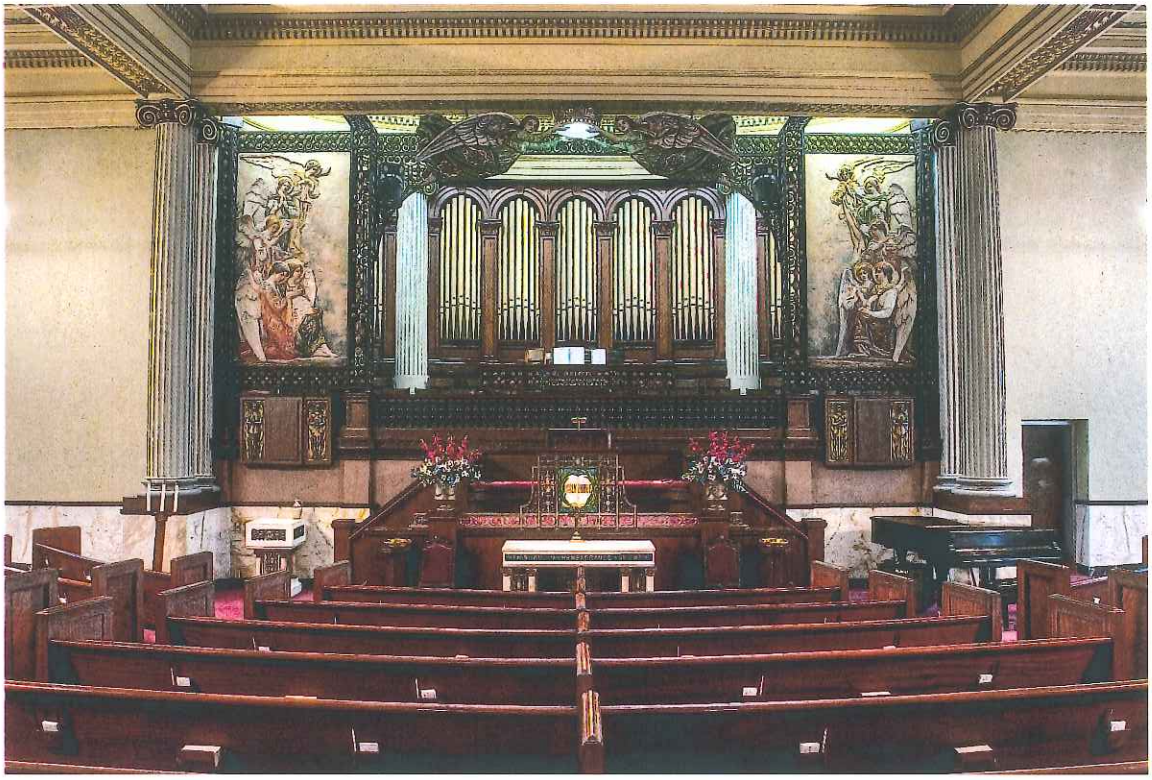
FOUNDED IN 1878, THE FIRST PRESBYTERIAN CHURCH INITIALLY OCCUPIED A FRAME STRUCTURE BUILT IN 1883 AT MARKET AND POLK STREET. IN 1912 THE CONGREGATION MOVED TO THIS CHURCH BUILDING WHICH FRANCES ANN (MRS. HENRY JACOB) LUTCHER (1841–1924) HAD ERECTED AS A GIFT FROM THE LUTCHER FAMILY. H. J. LUTCHER (1836–1912) AMASSED A FORTUNE IN THE LUTCHER & MOORE LUMBER COMPANY. THE LUTCHERS AND THEIR TWO DAUGHTERS CARRIE (MRS. E. W.) BROWN AND MIRIAM (MRS. WILLIAM H.) STARK WERE PHILANTHROPISTS AND COMMUNITY LEADERS. MRS. LUTCHER ASKED THAT THE COST OF THE BUILDING NEVER BE PUBLICIZED. SHE AND HER DESCENDANTS SET UP A PERMANENT ENDOWMENT TO MAINTAIN THE FACILITY.

FINE WORKMANSHIP AND MATERIALS APPEAR THROUGHOUT THE STRUCTURE. THE BEAUTIFUL ART GLASS WINDOWS WERE MADE BY LAMB STUDIOS OF NEW YORK. FOR THE UPPER FOYER, MRS. LUTCHER CHOSE THREE PRIZE-WINNING WINDOWS FROM THE 1893 CHICAGO WORLD'S FAIR. THE MARBLE CAME FROM ITALY AND THE GRANITE WAS SHIPPED BY RAIL FROM LLANO, TEXAS. THE DOME IS TOPPED BY A COPPER CUPOLA. DECORATIONS ON THE SANCTUARY CEILING AND WALLS HAVE GOLD LEAF OVERLAY. THE PEWS AND WOOD PANELING IN THE ORGAN LOFT ARE MAHOGANY. MOSAIC WORK ADORNS THE PULPIT, MARBLE COMMUNION TABLE AND BAPTISMAL FONT.

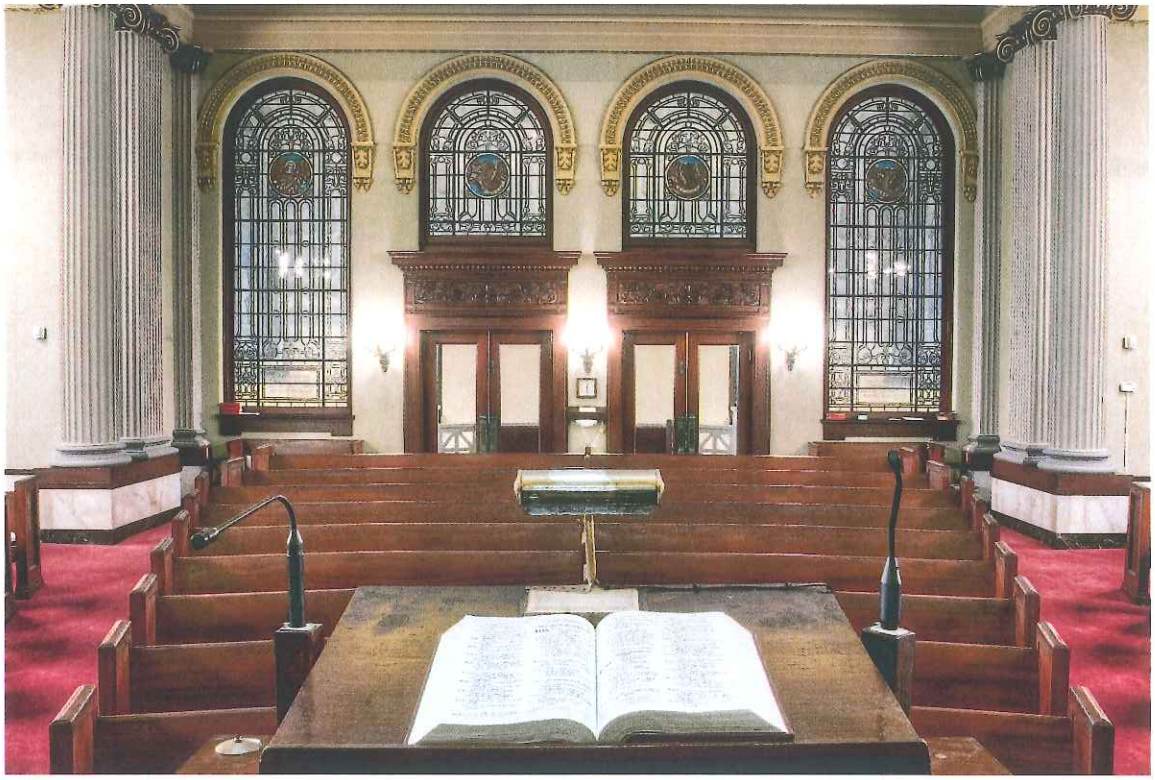
RECORDED TEXAS HISTORIC LANDMARK — 1979



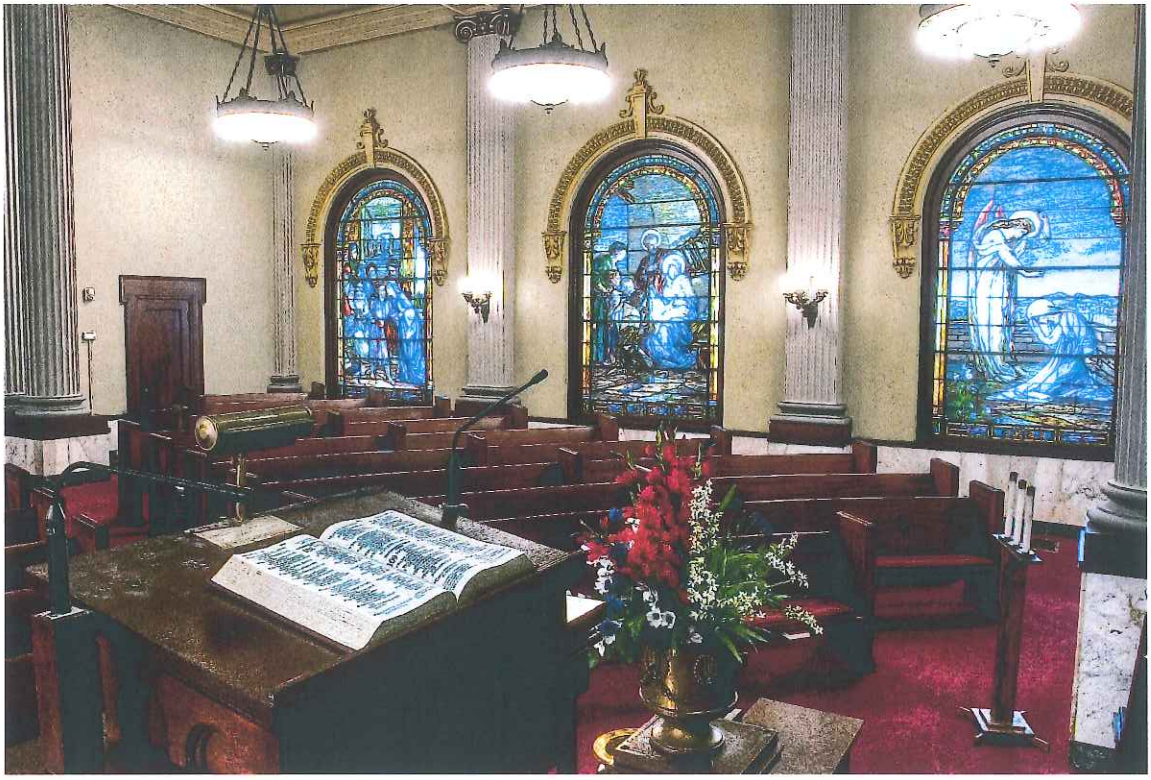


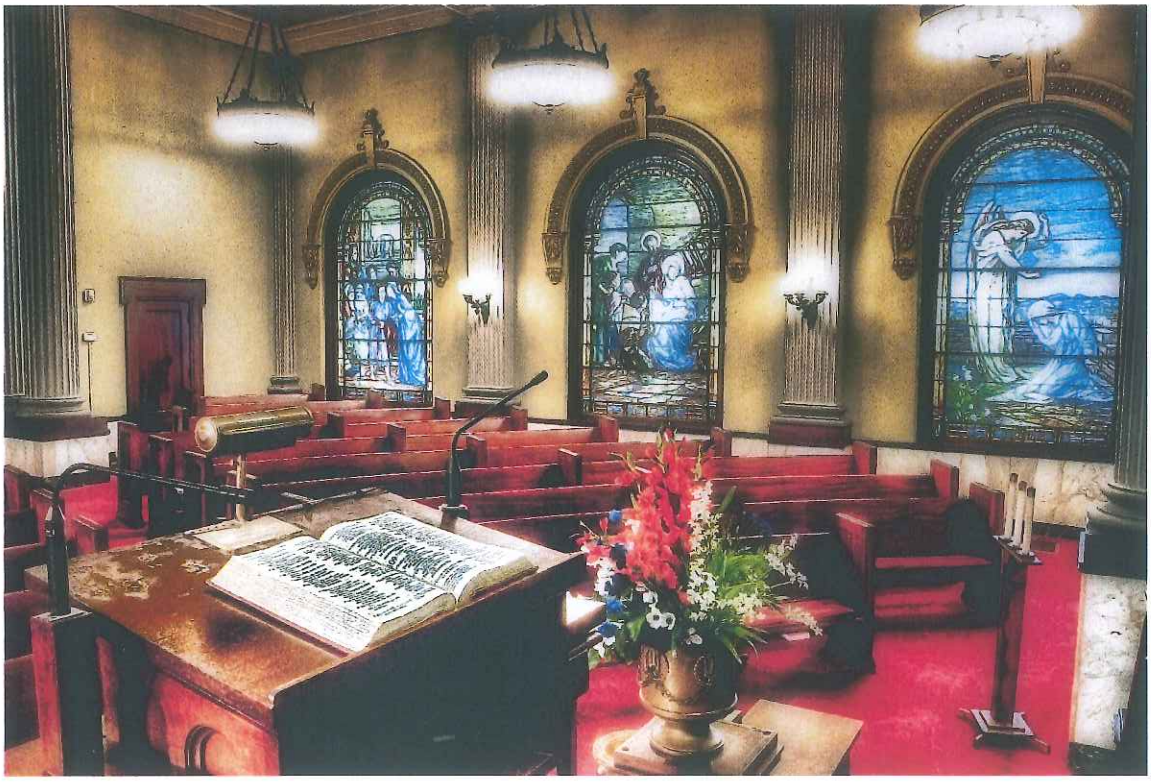




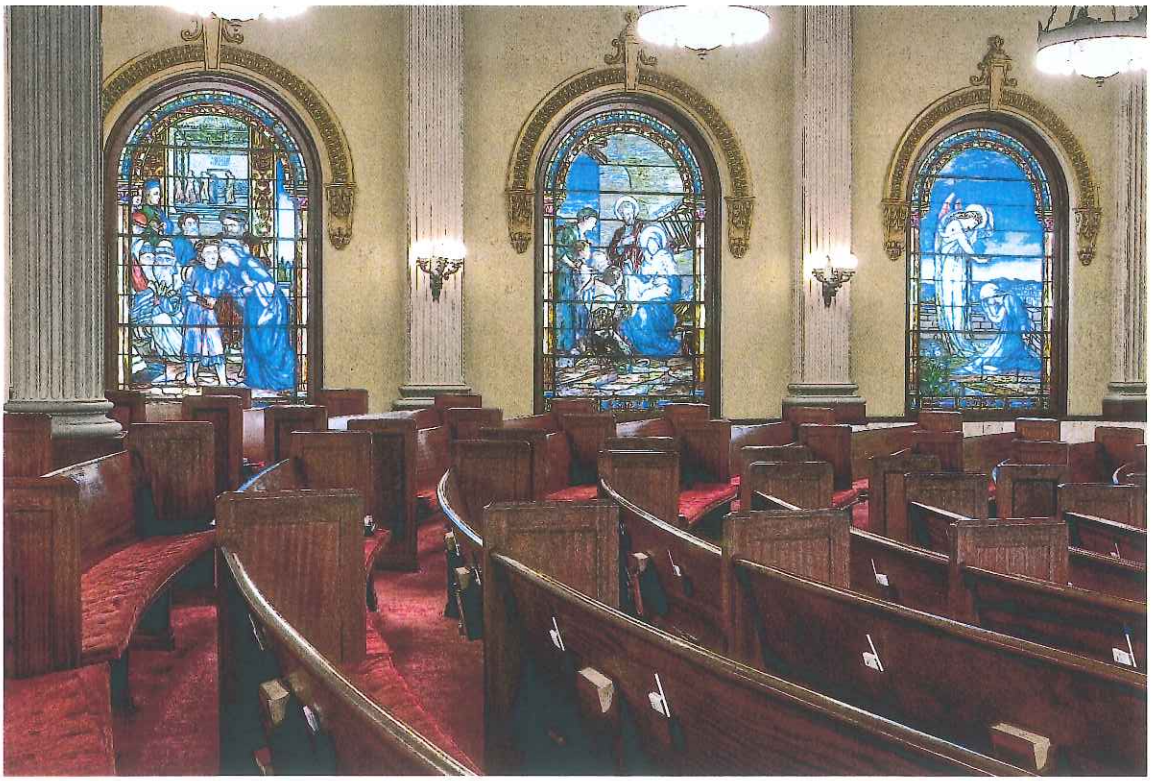


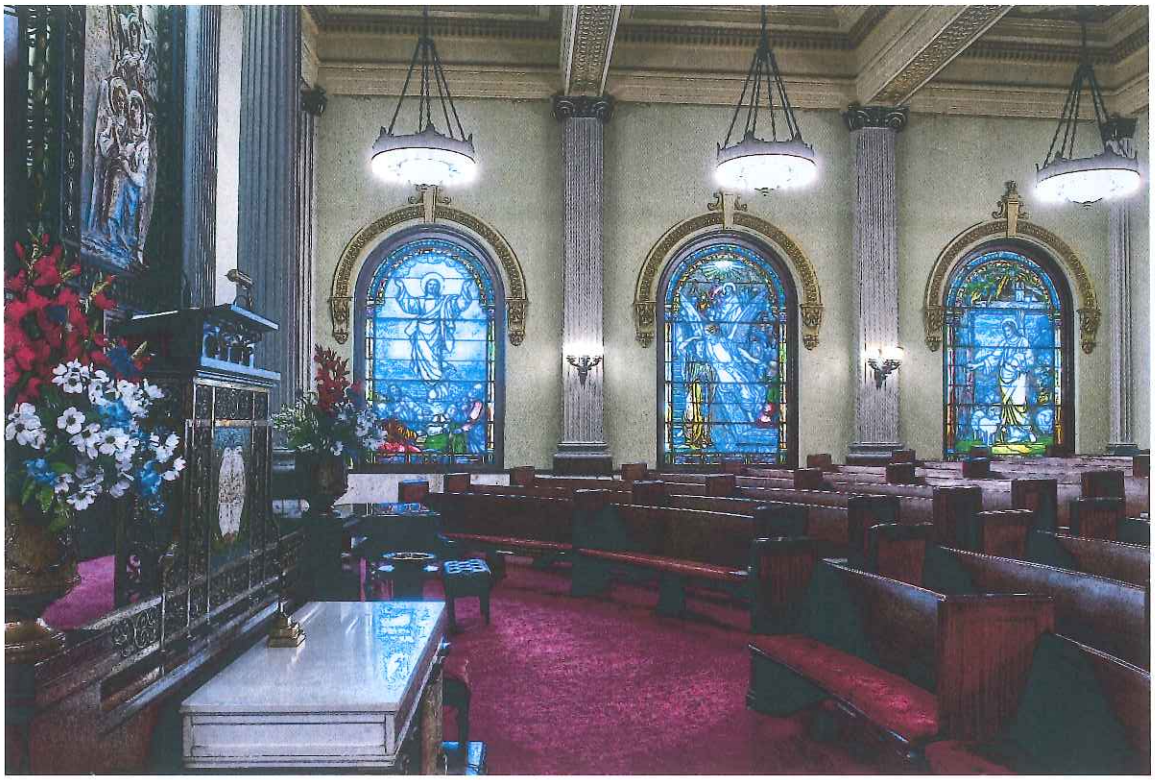


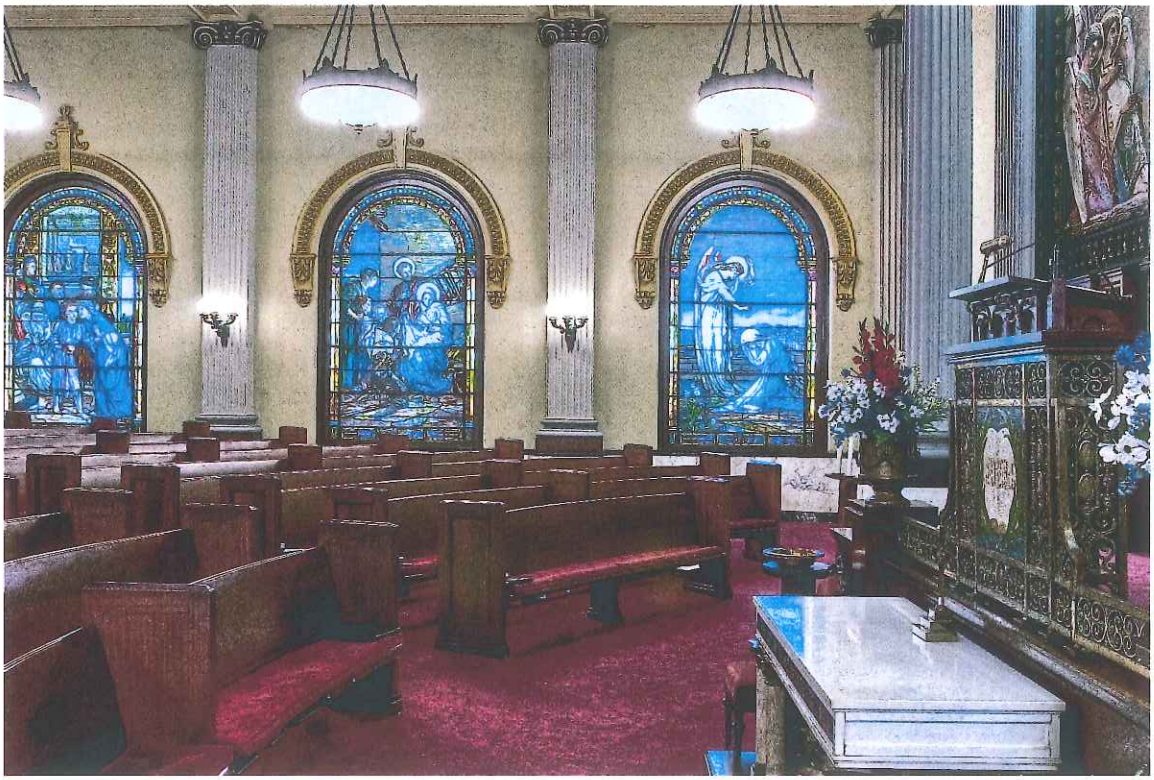


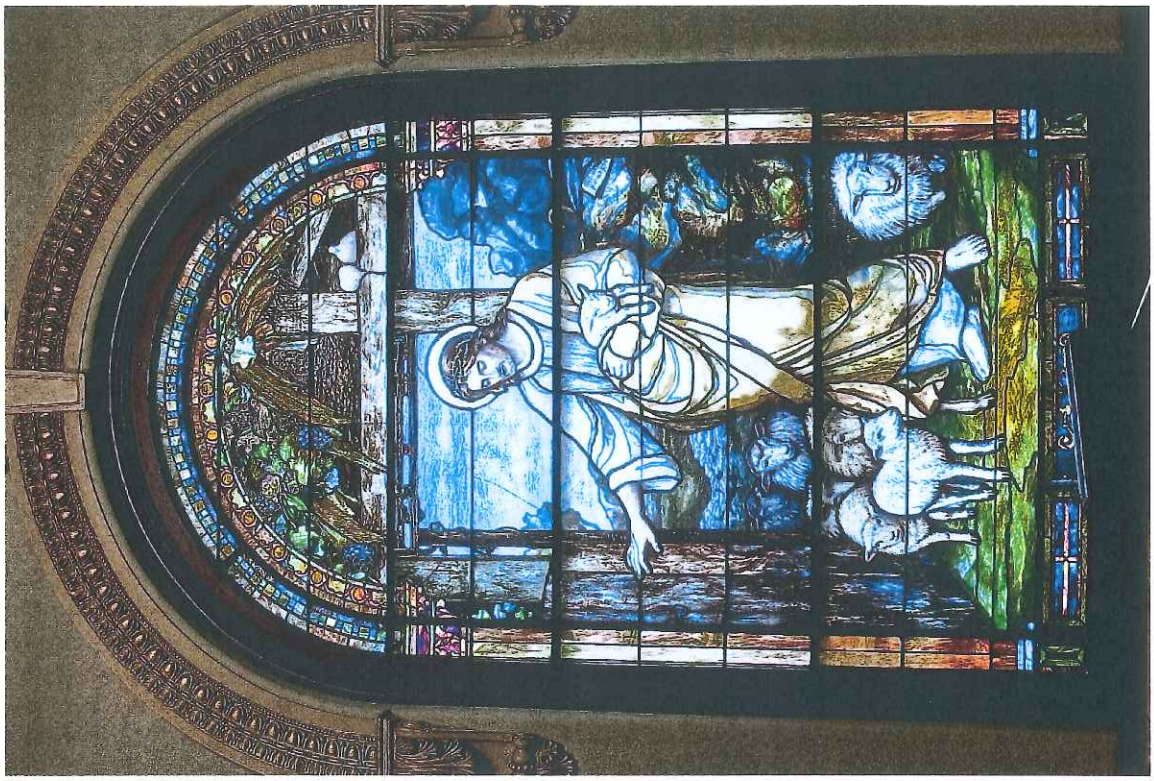




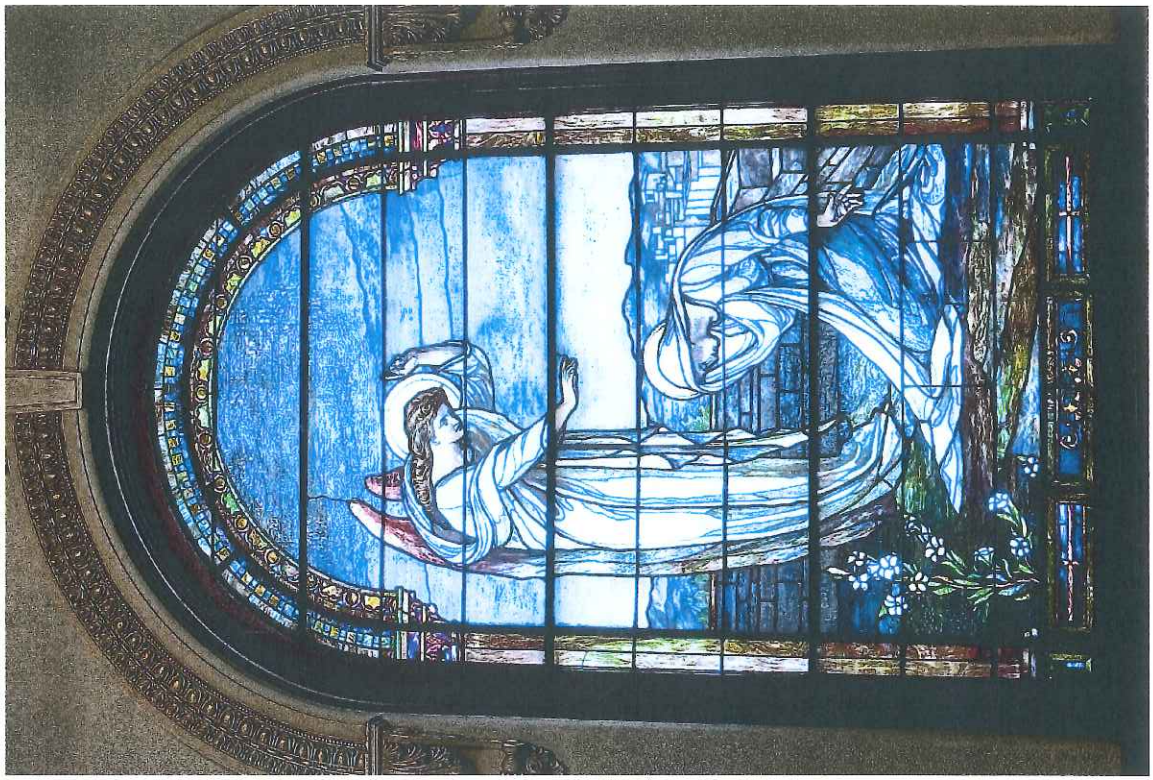






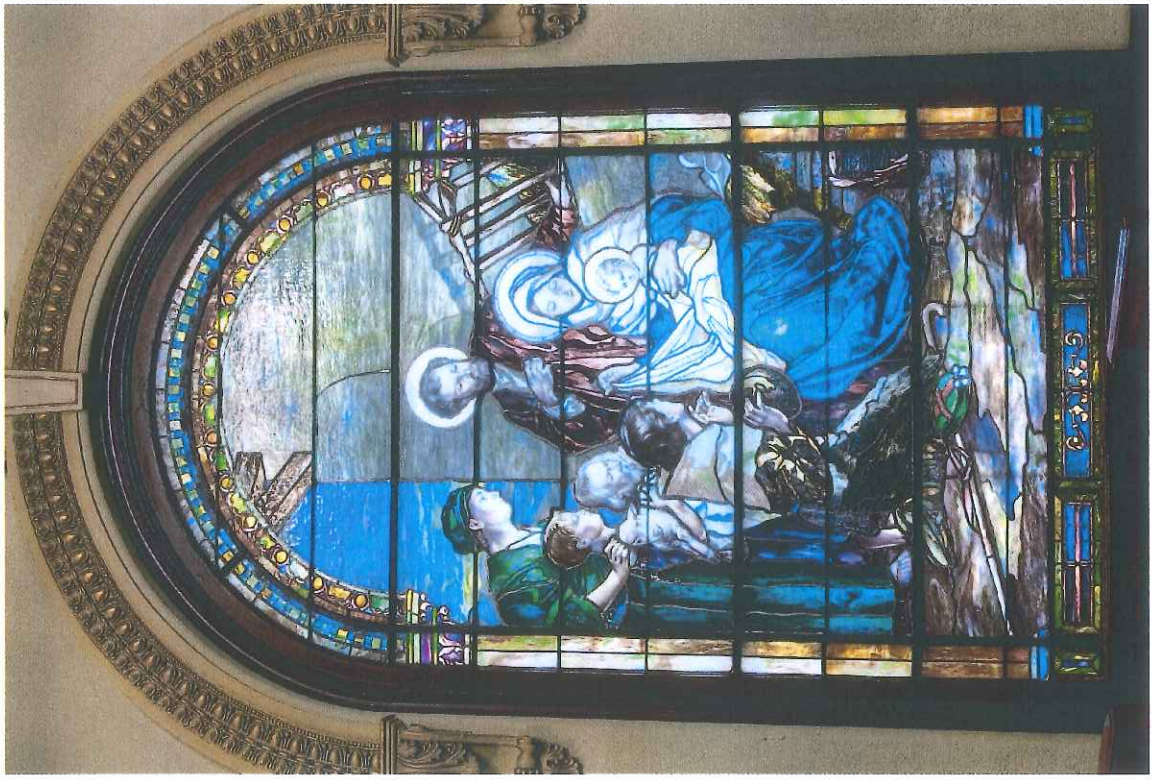






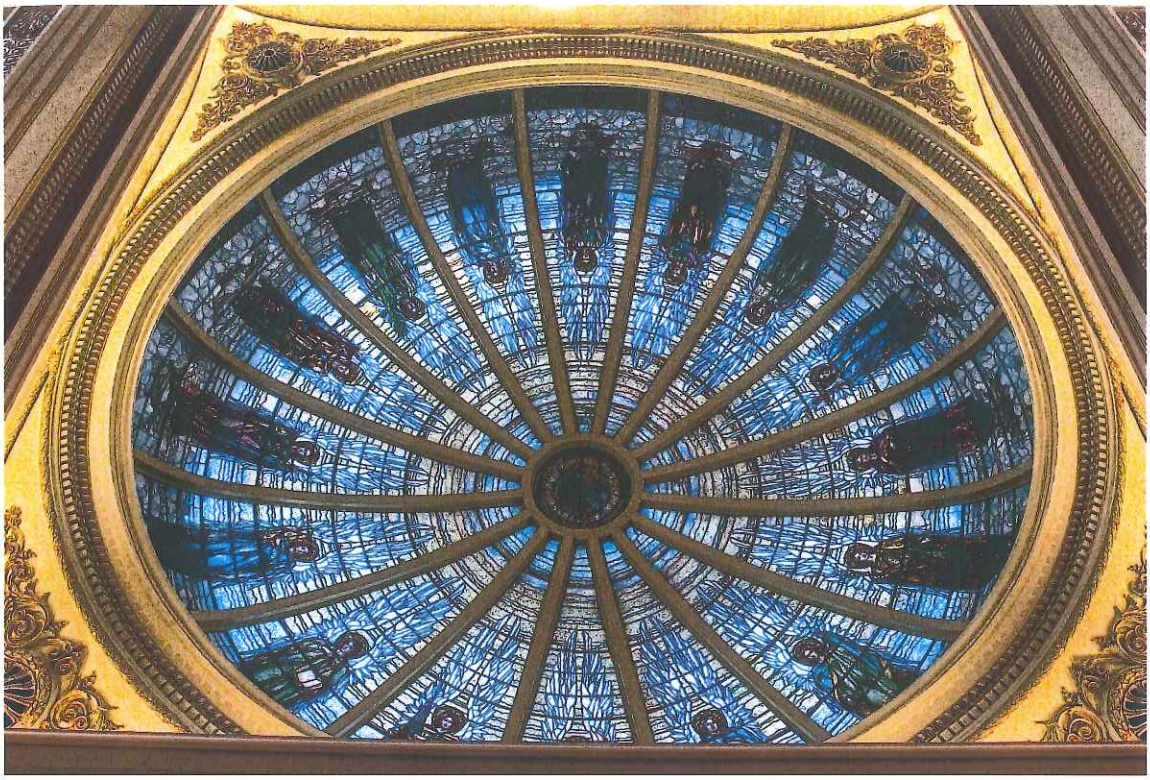


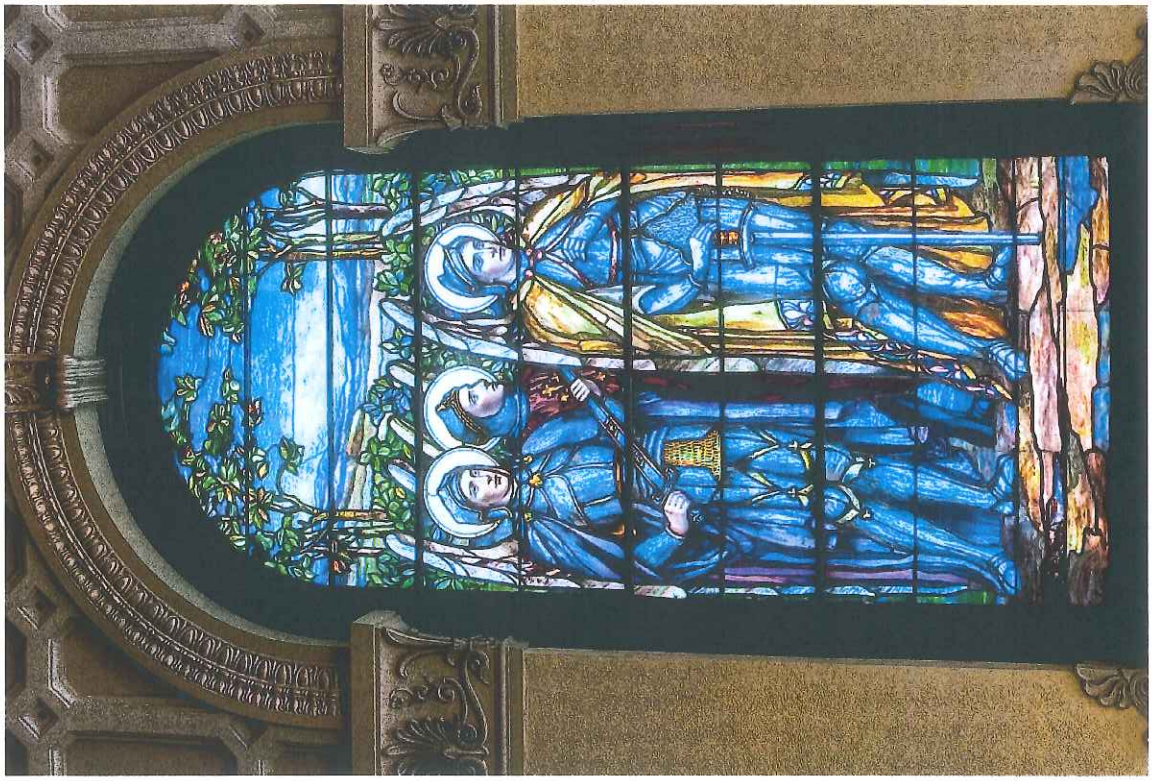




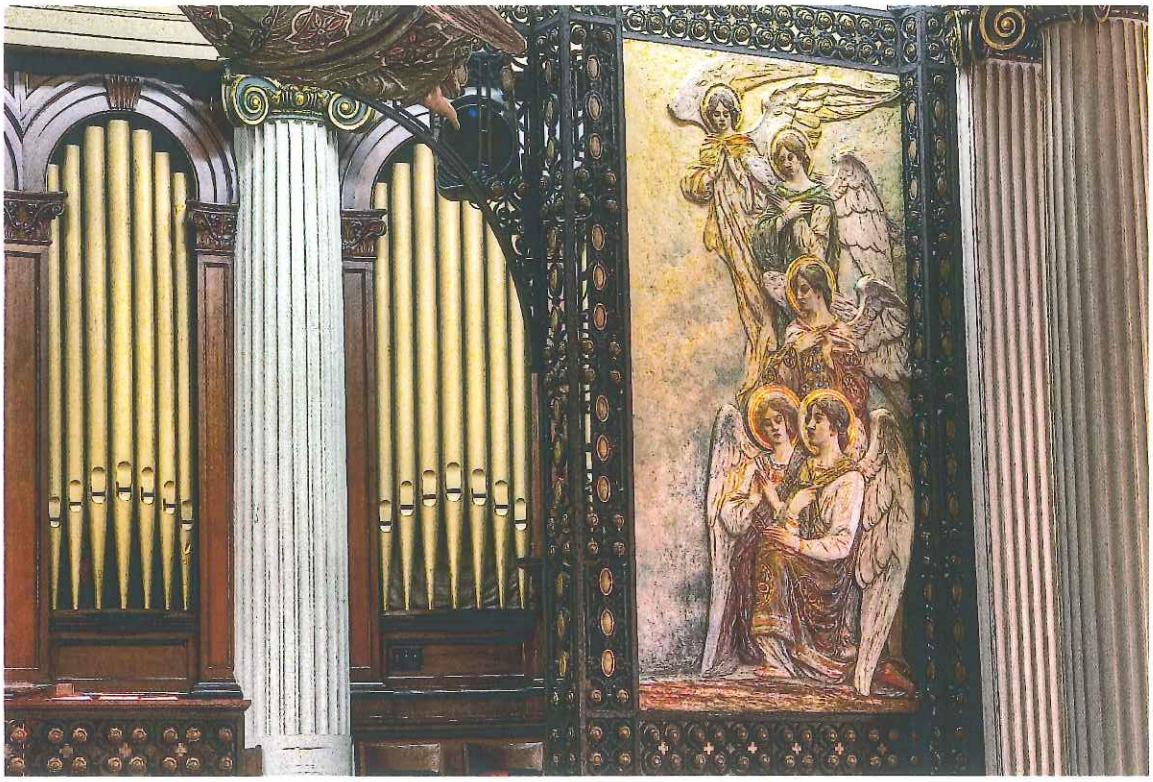




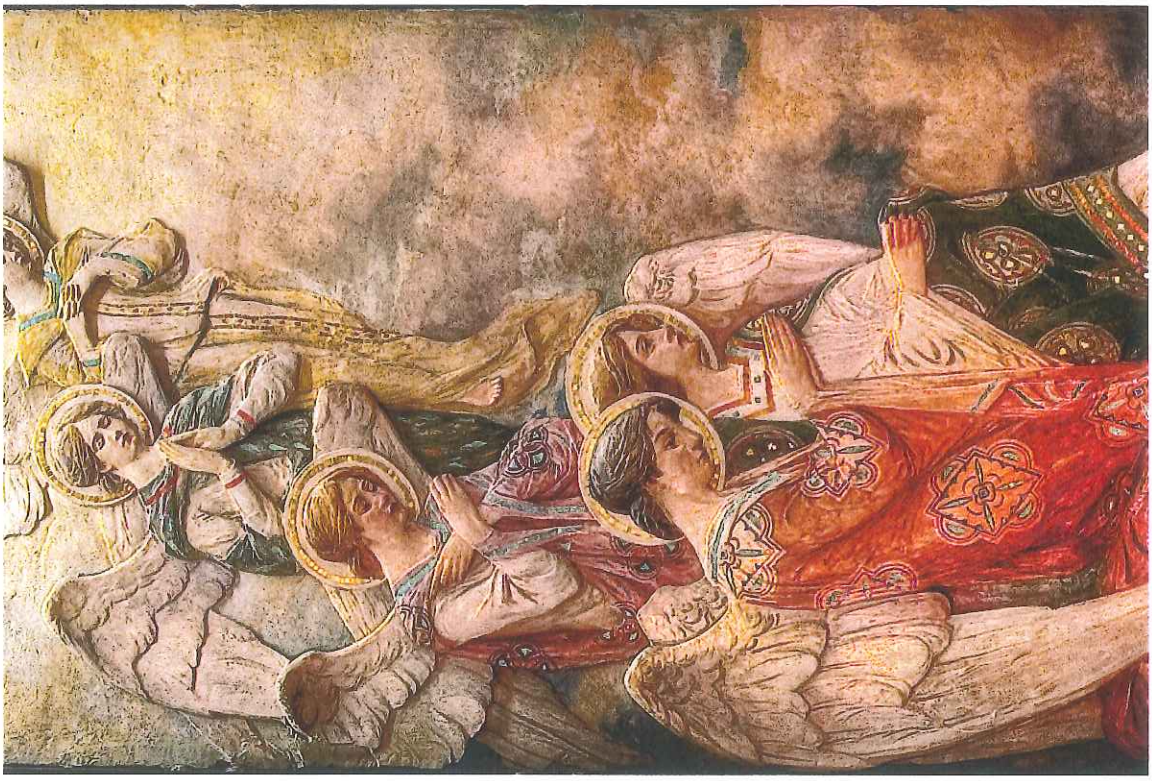




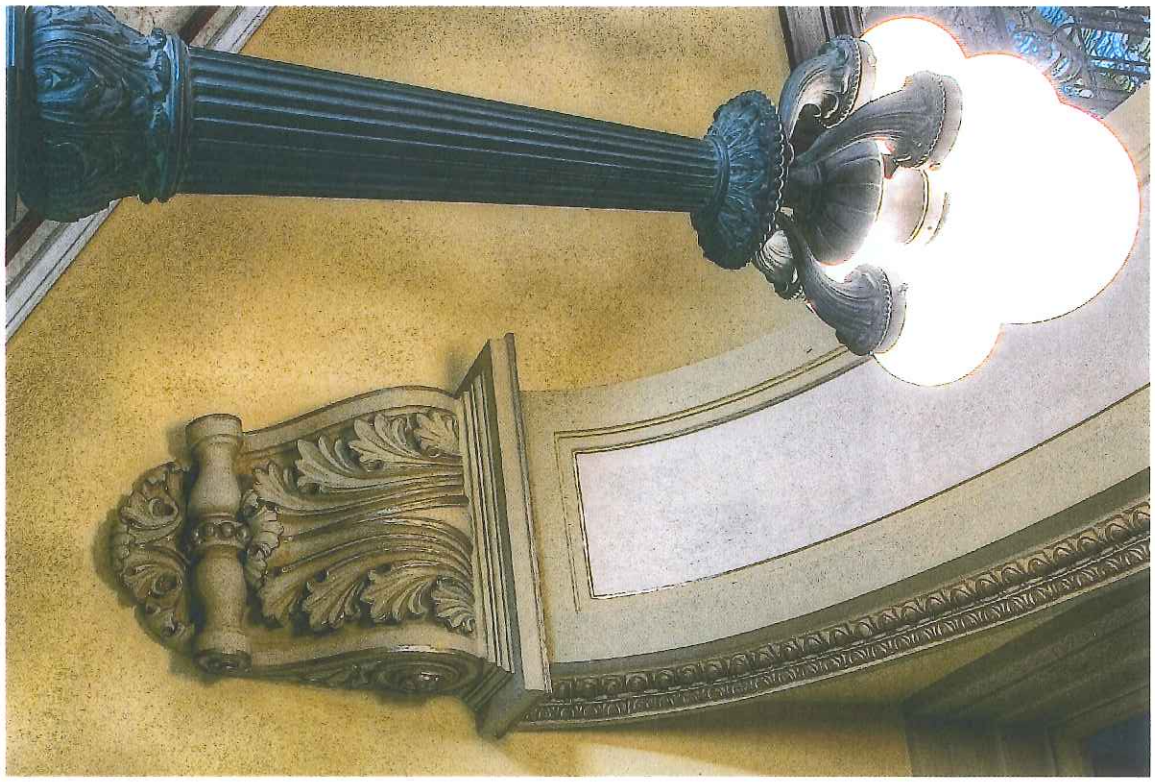


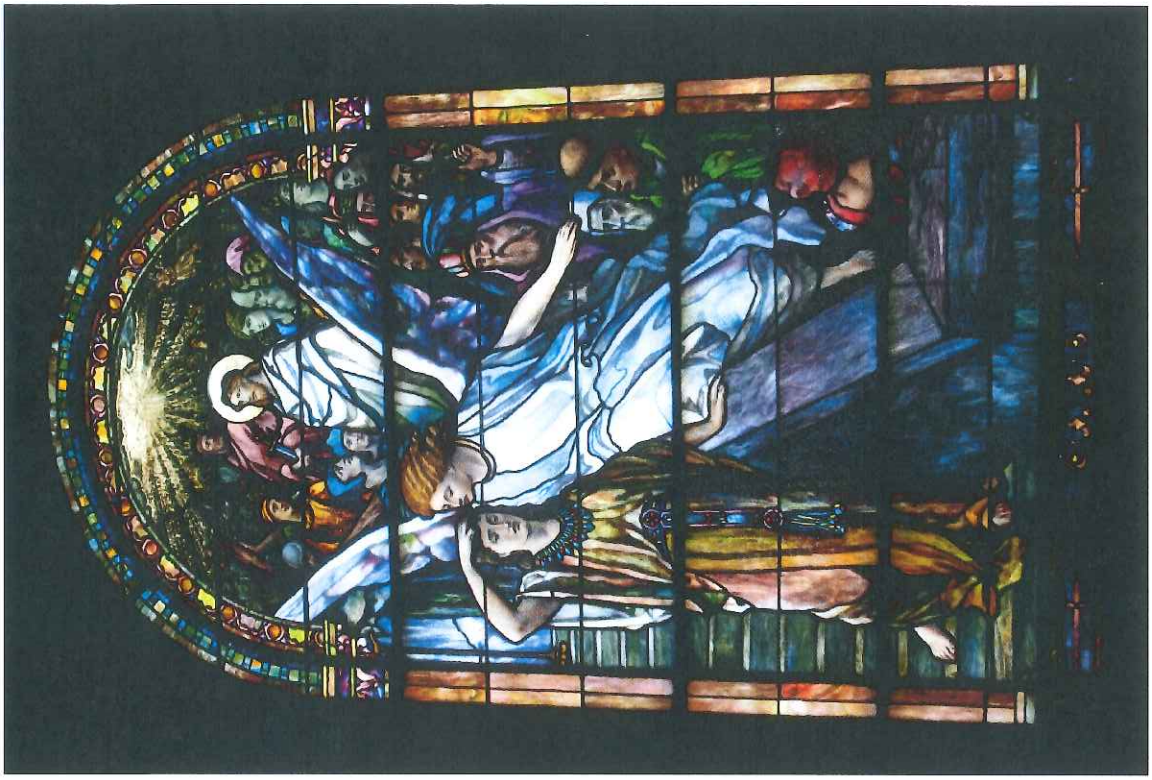












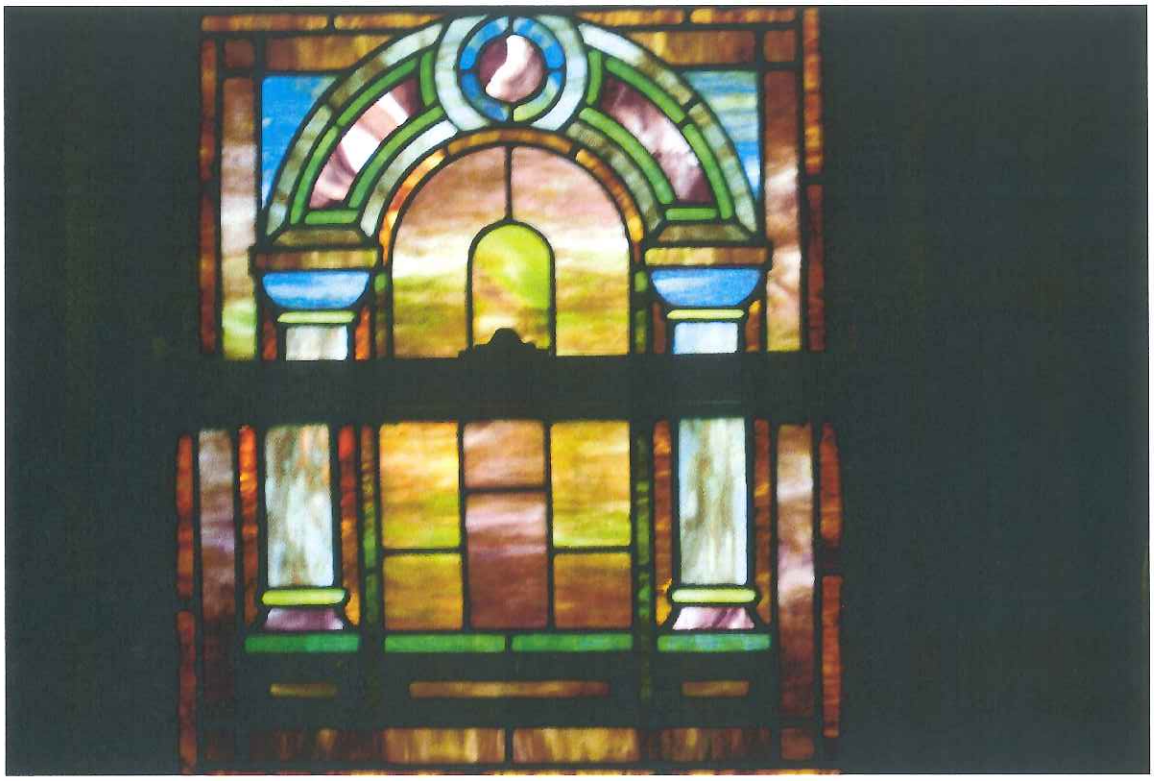


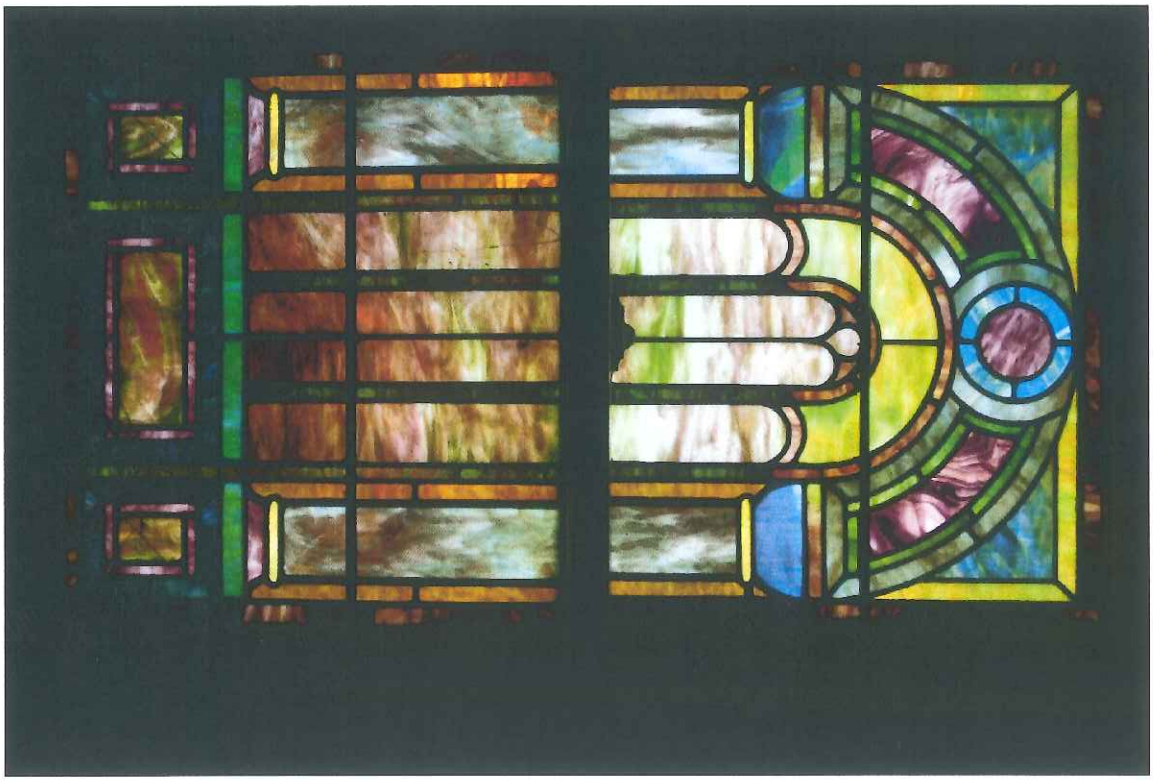


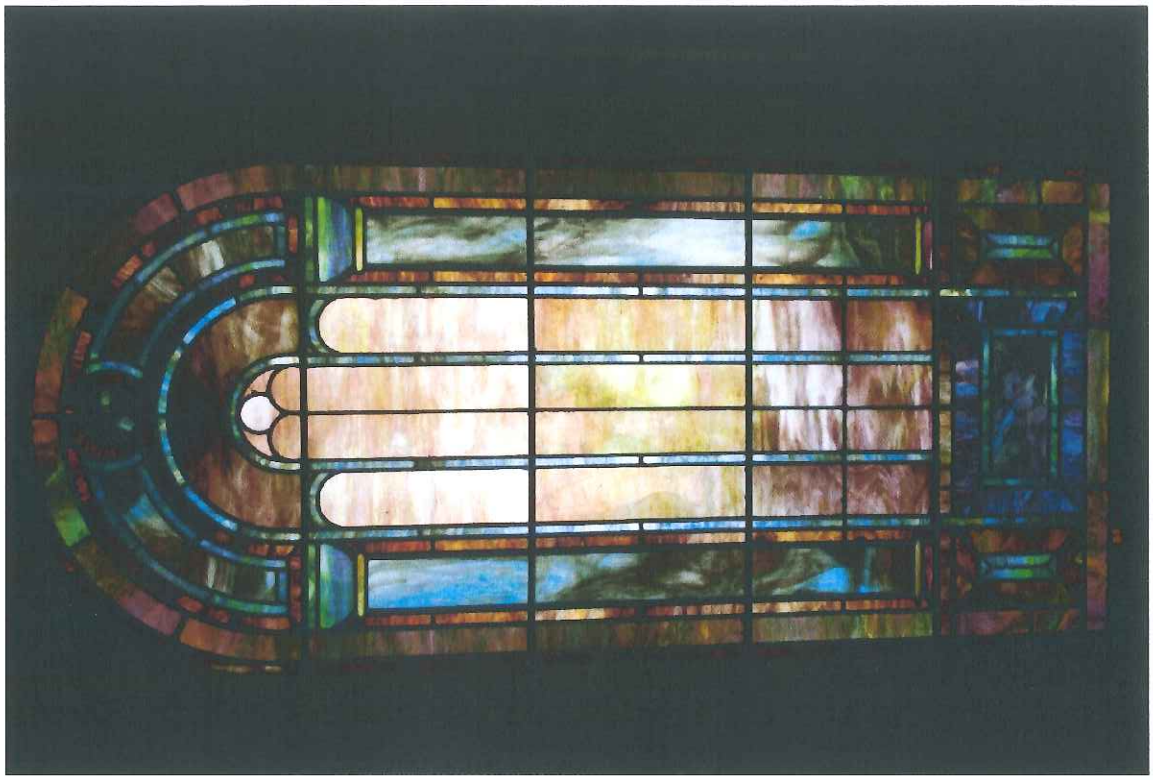


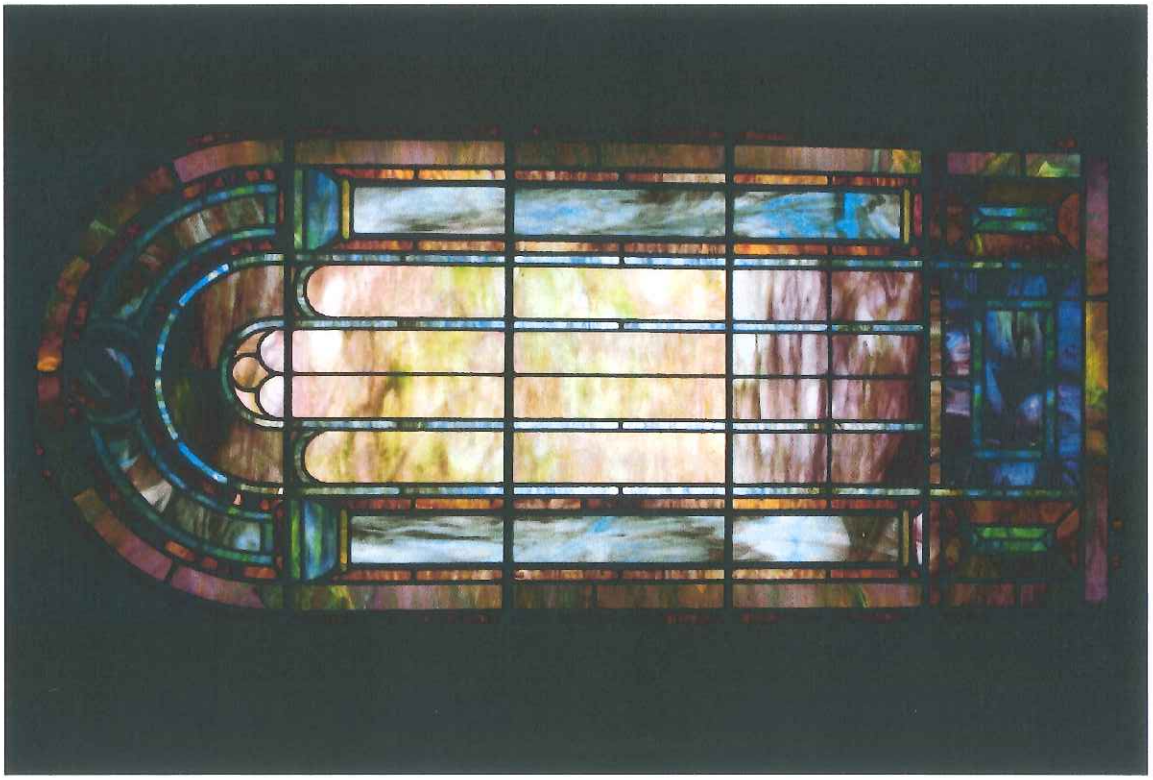








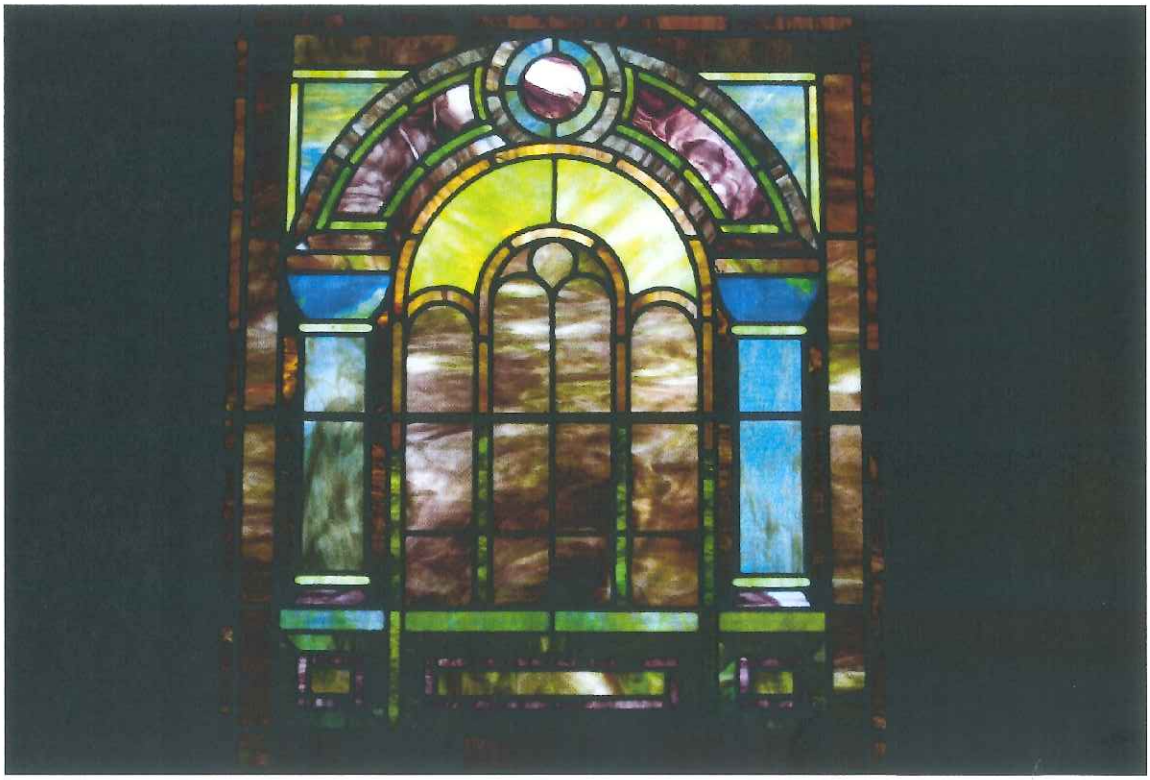


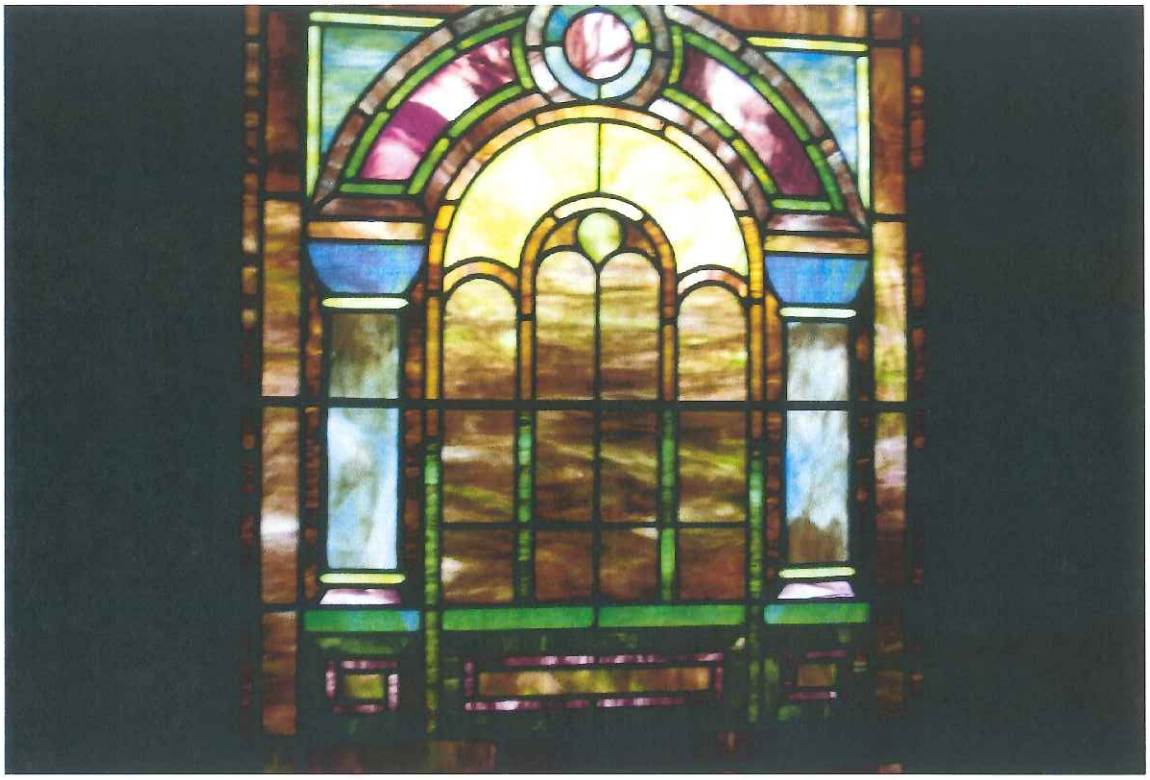


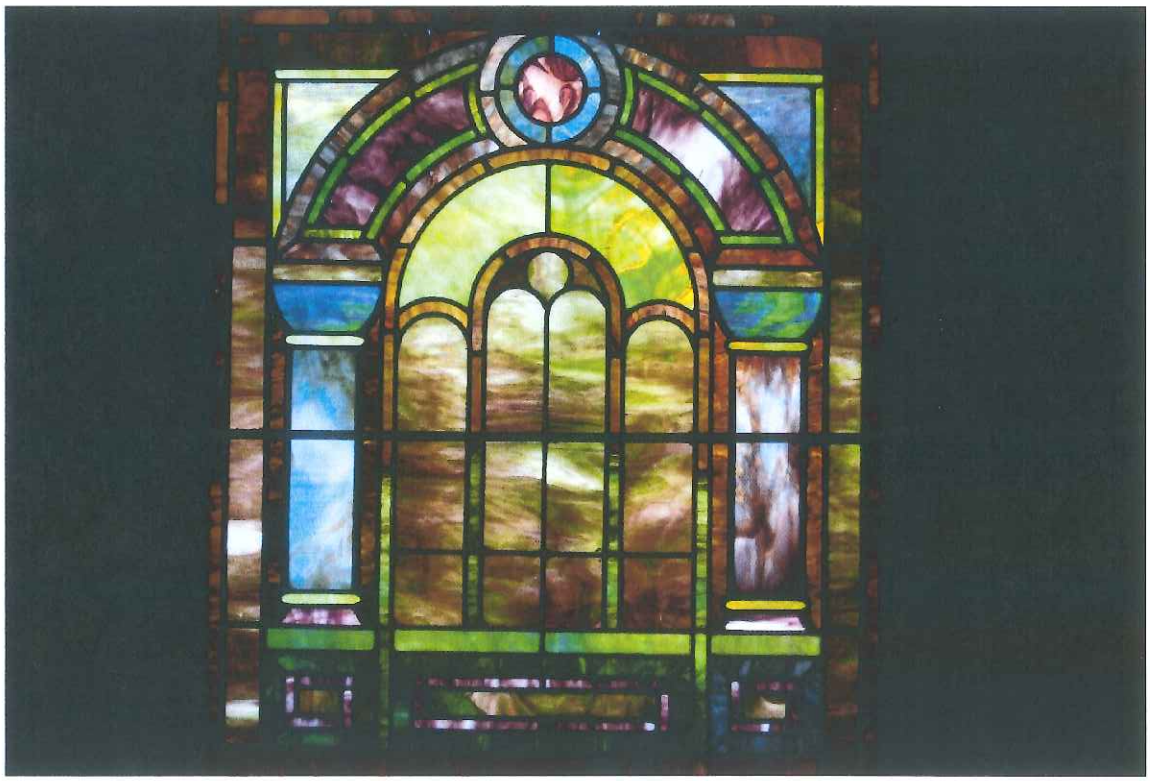


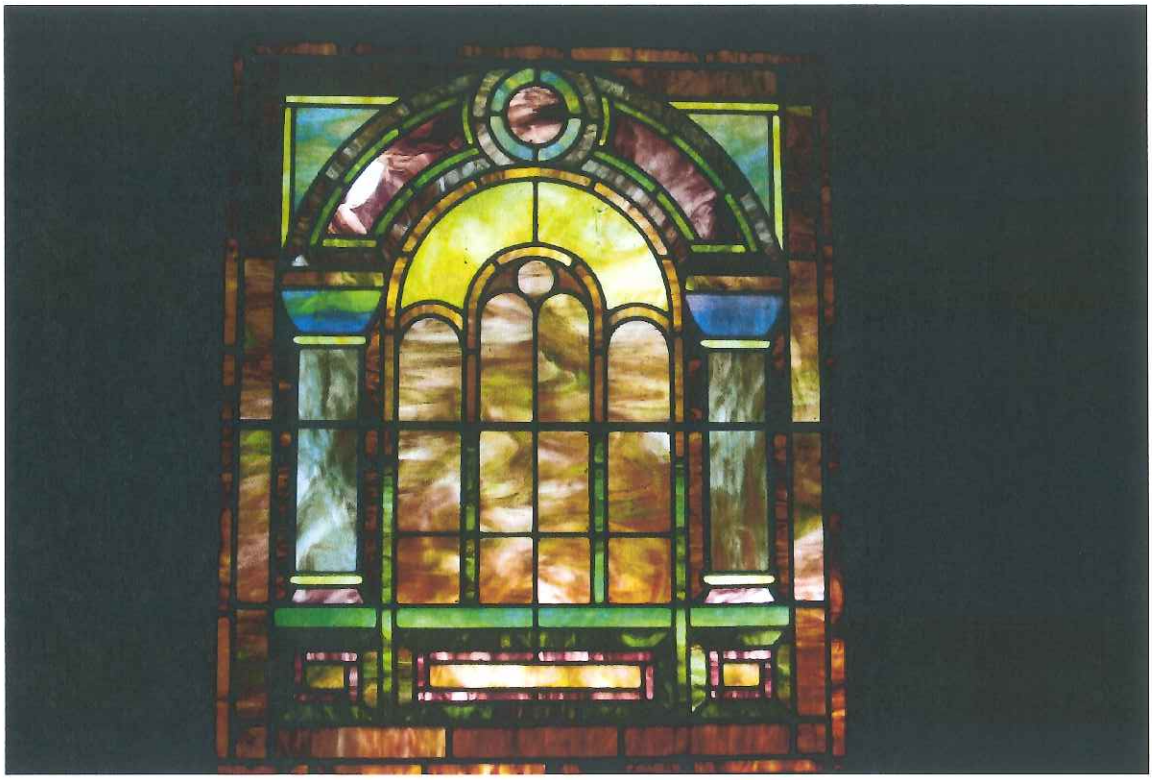


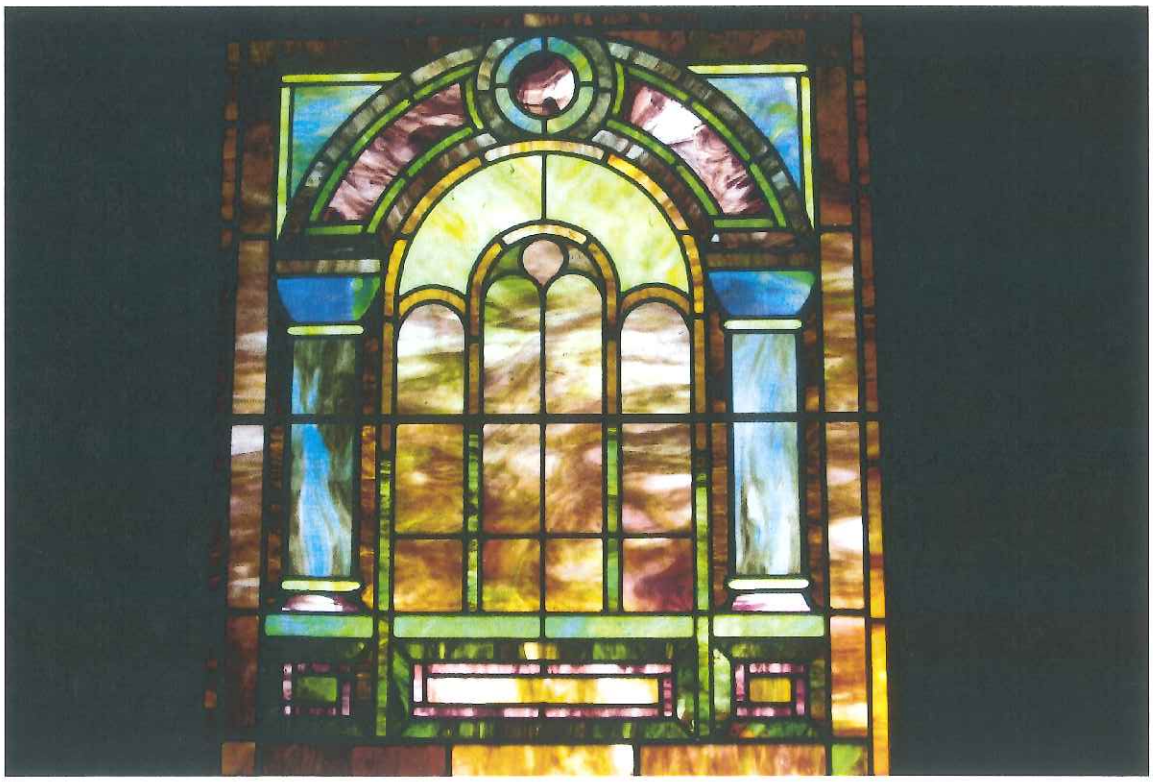


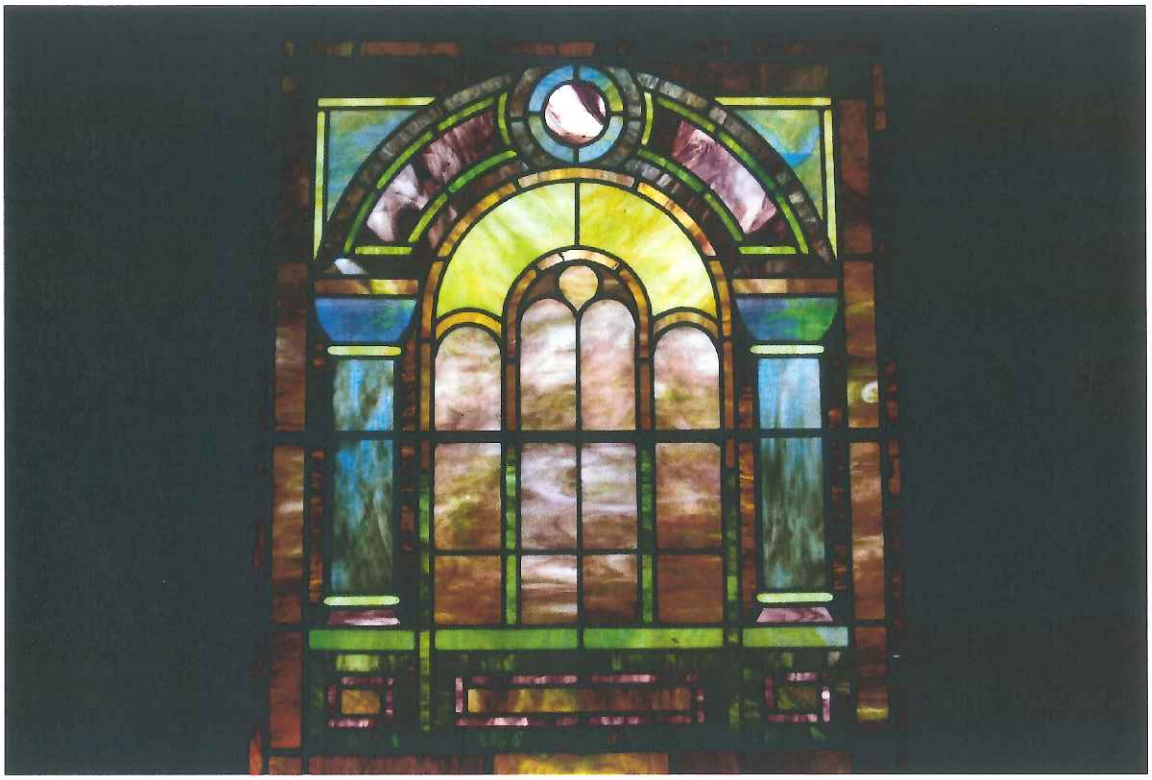


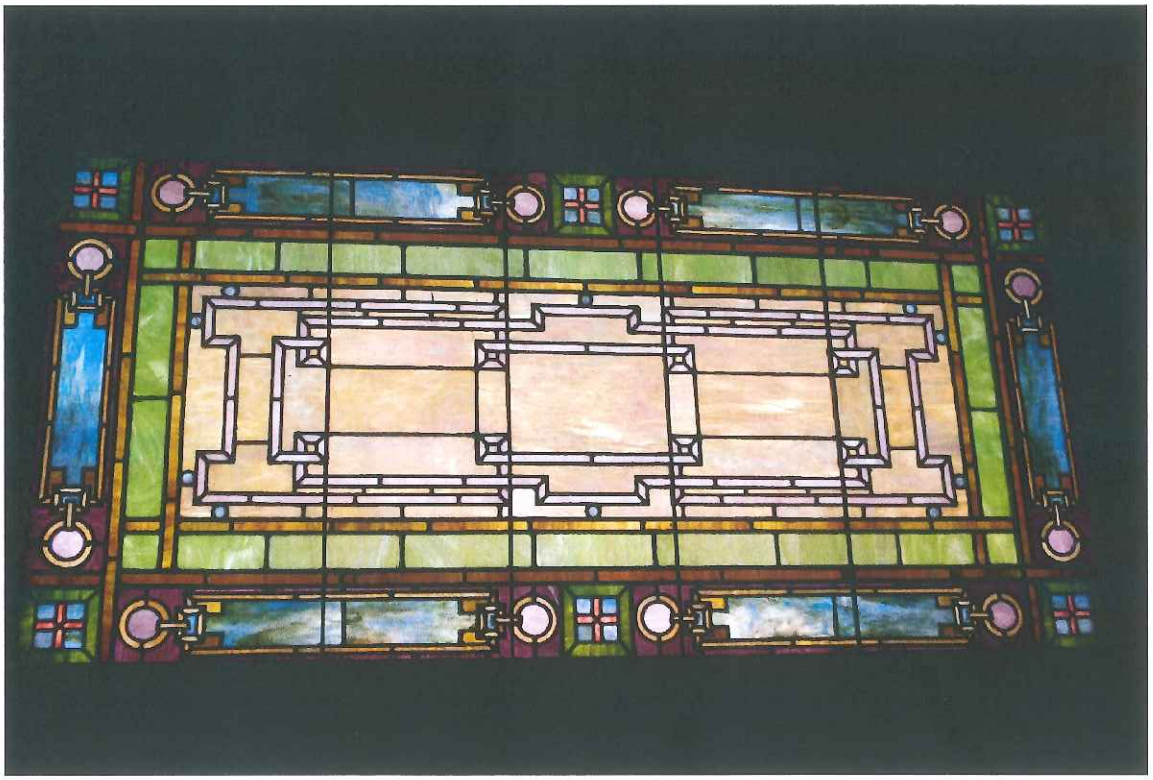


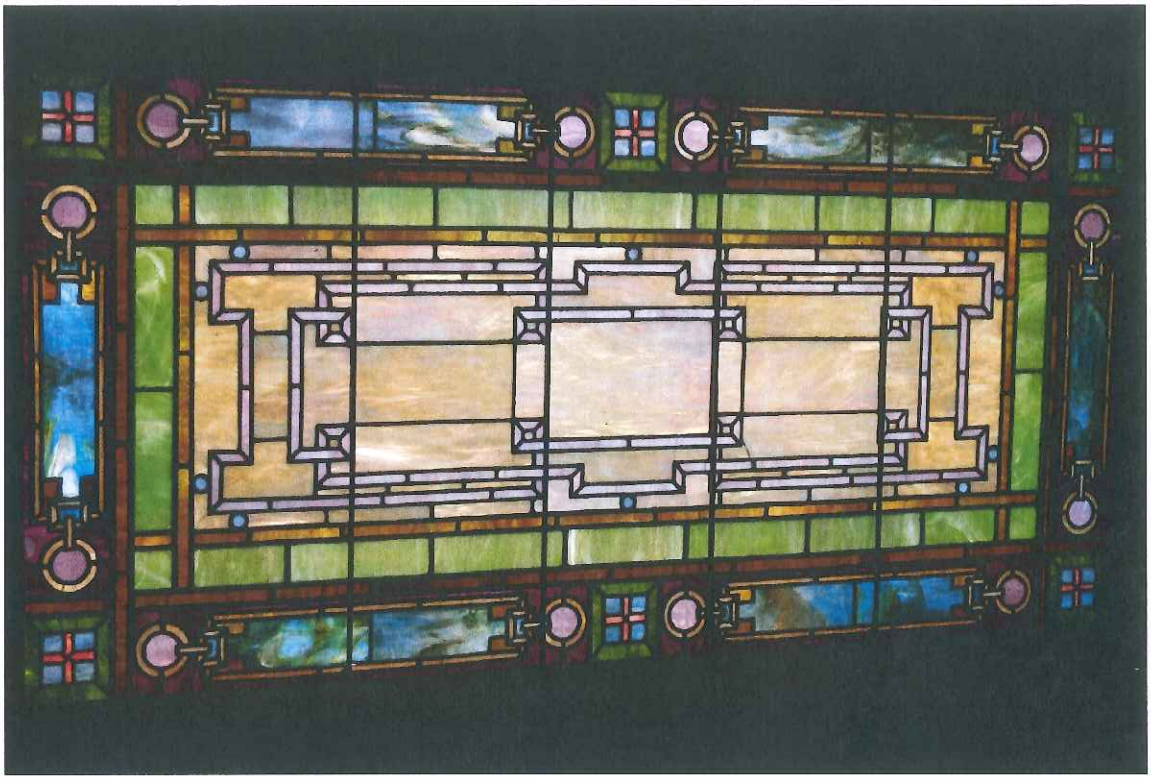


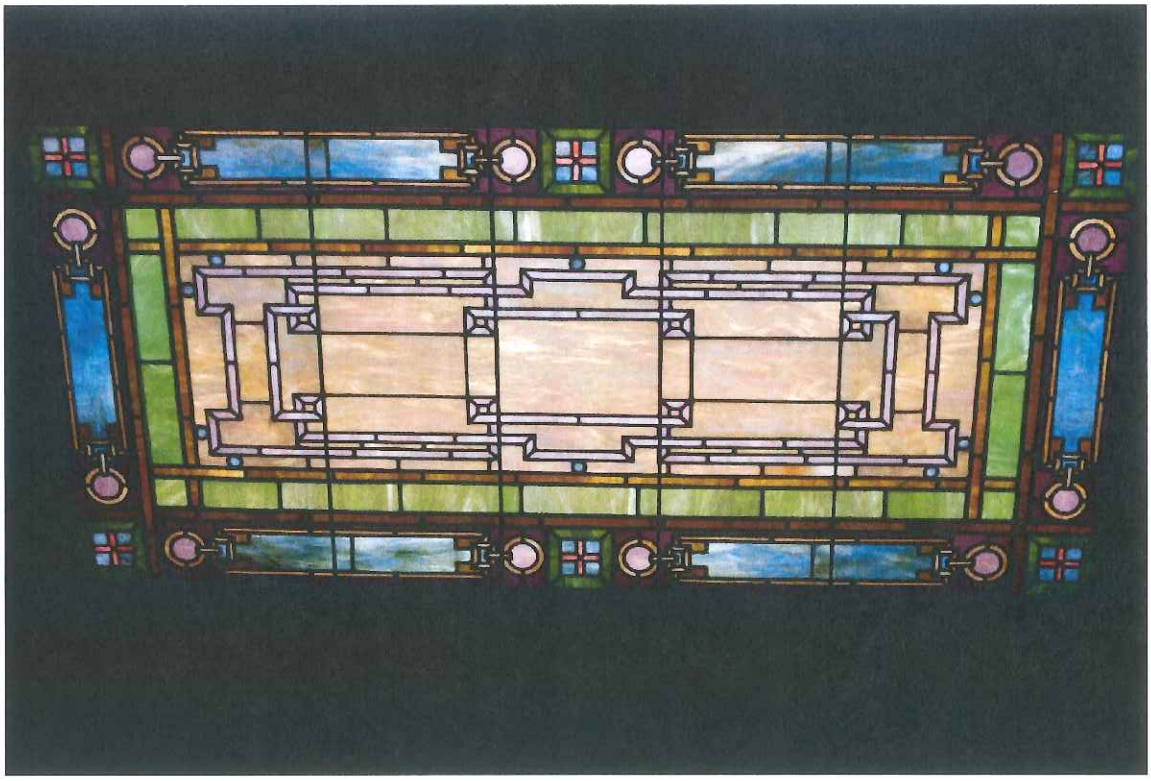


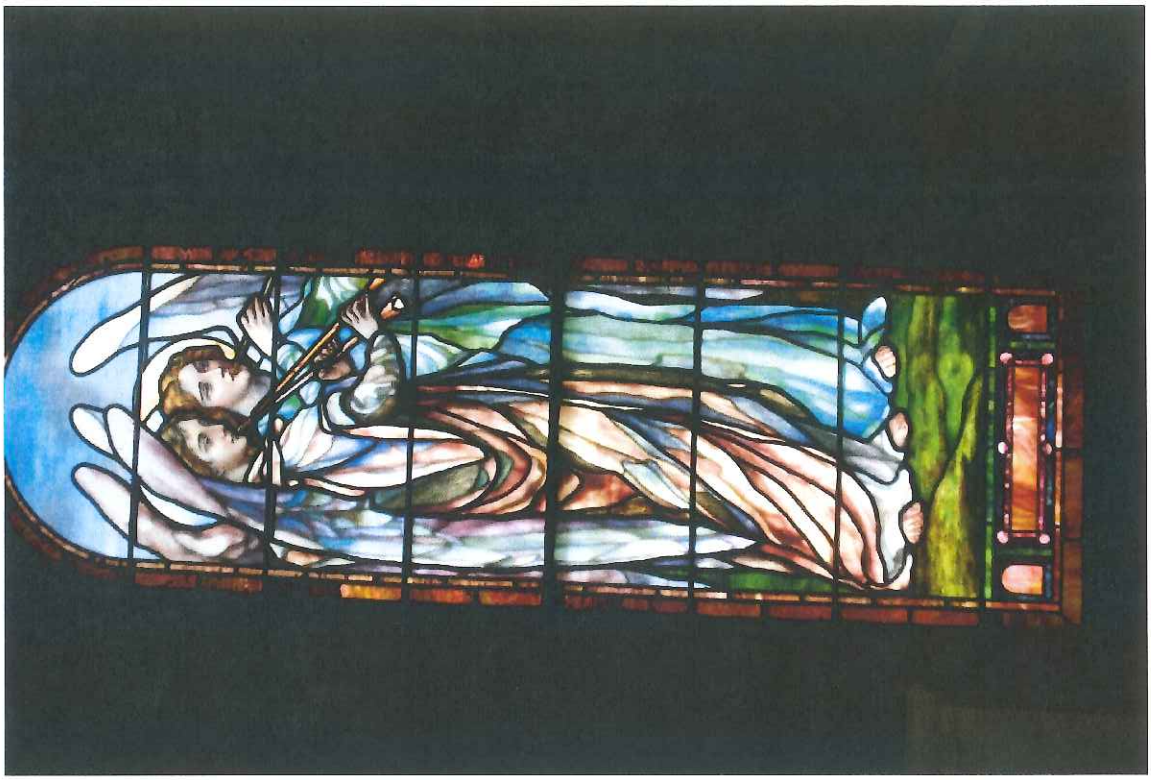




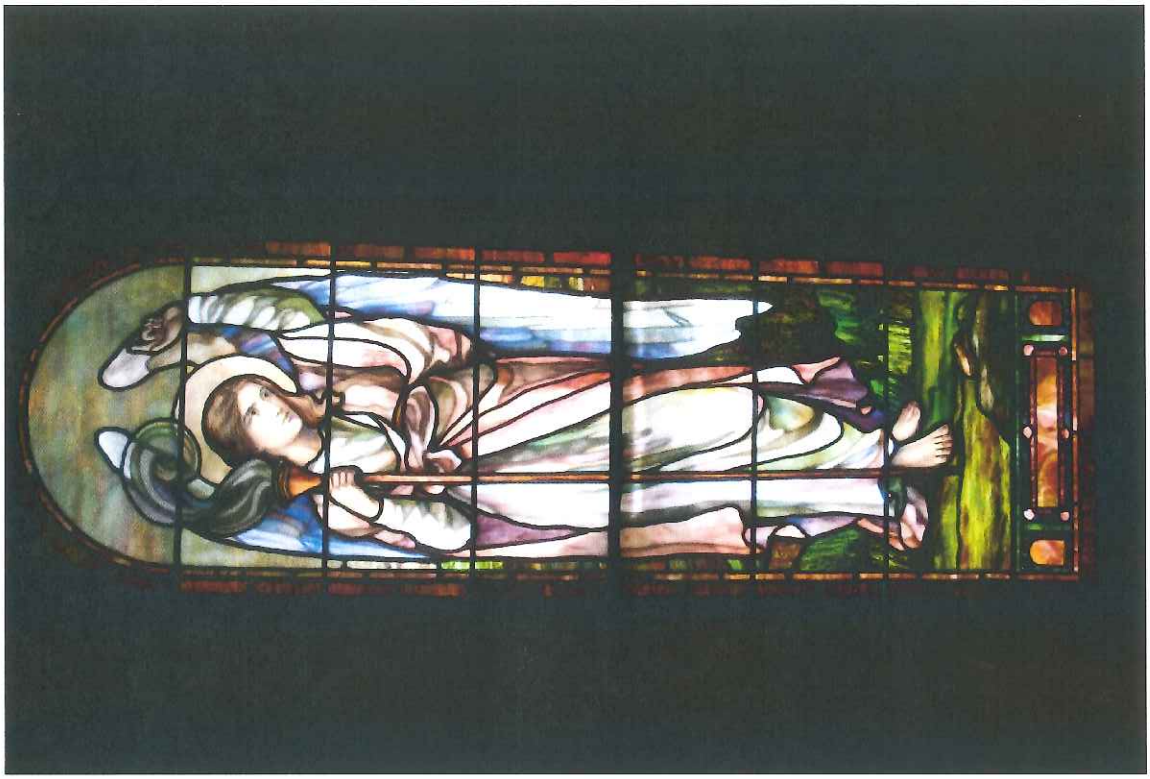


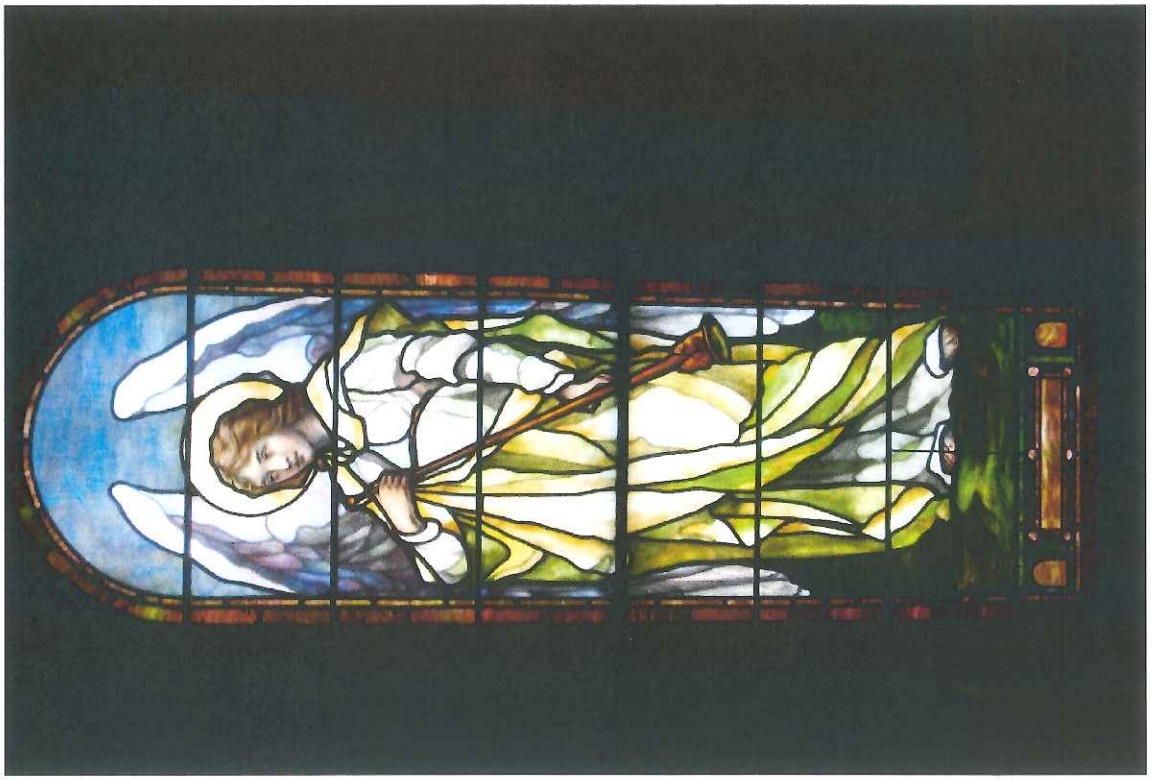


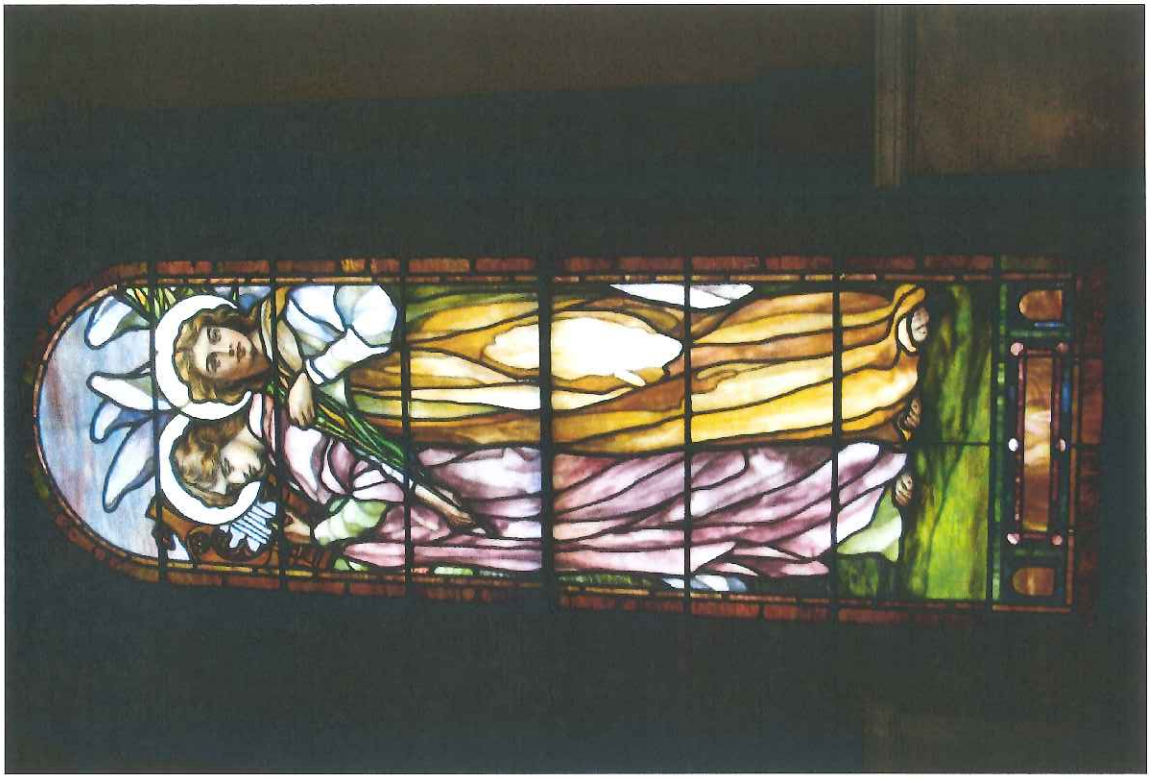


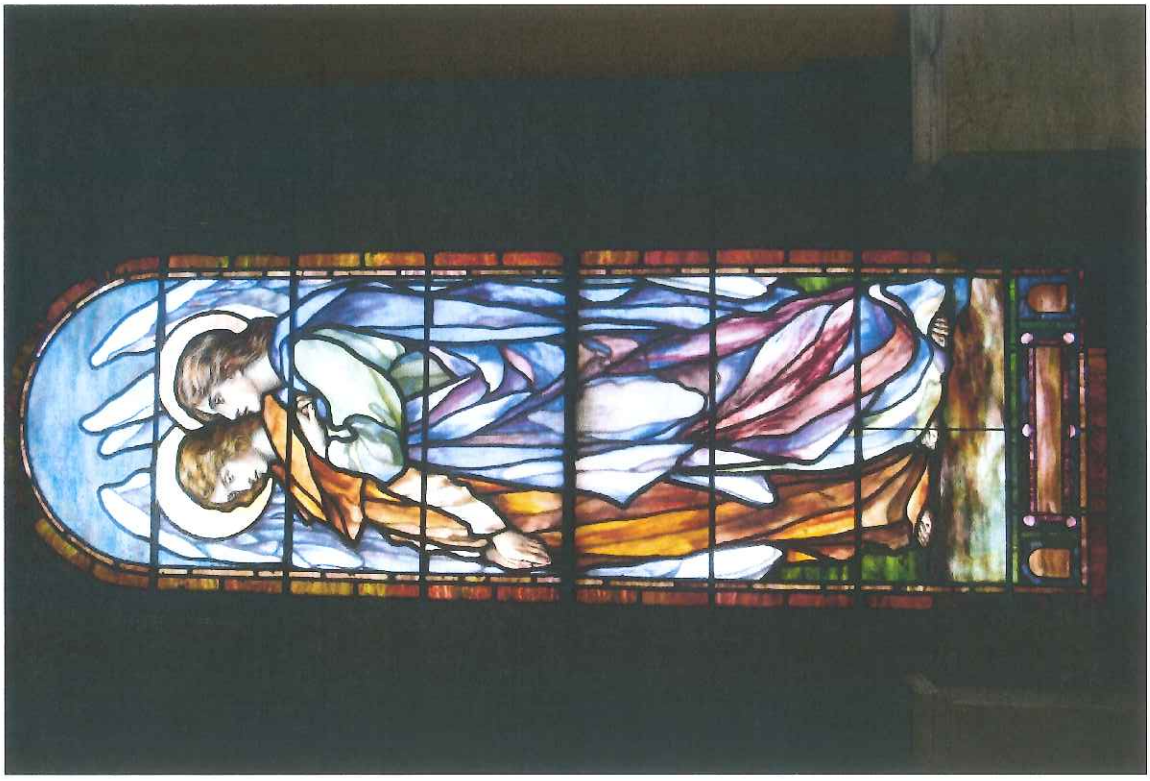






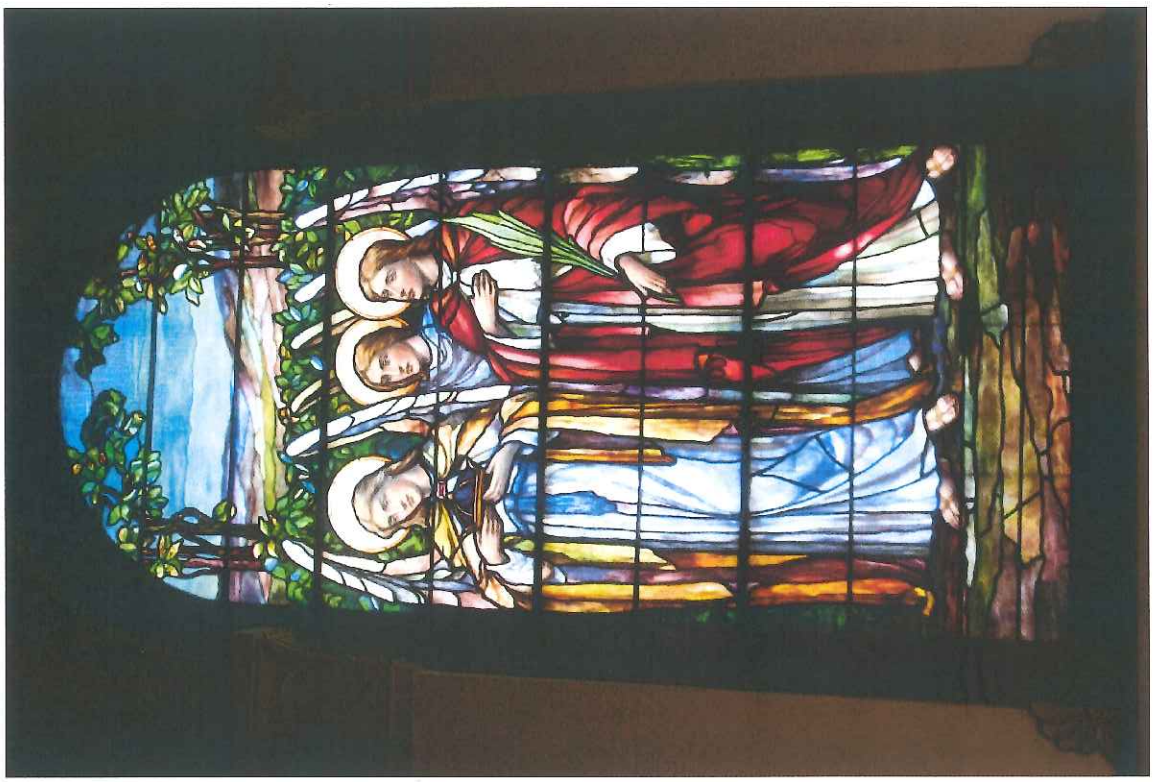




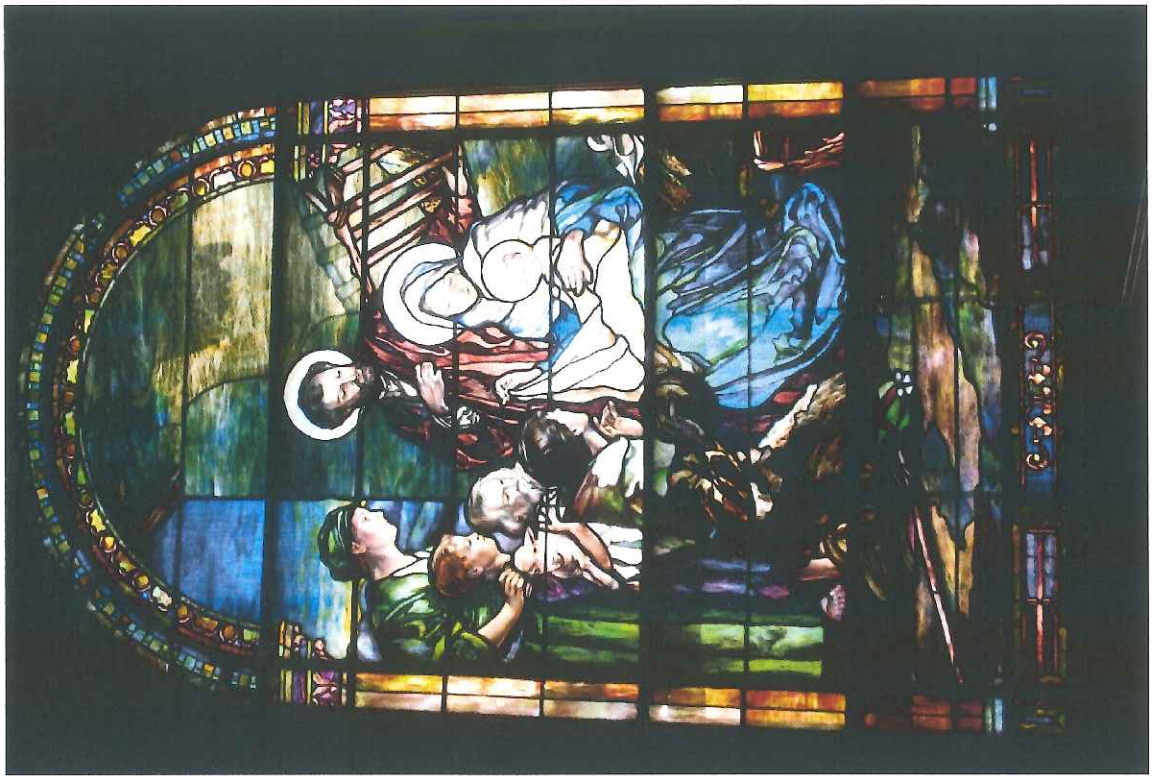




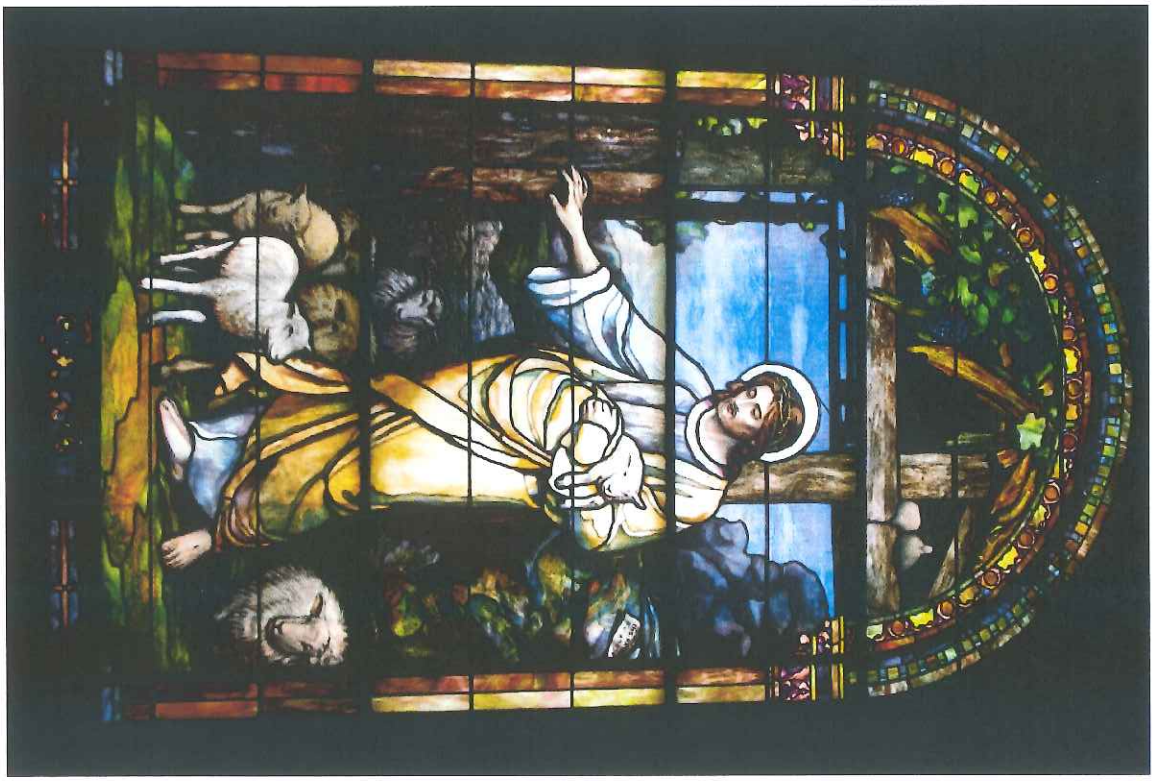




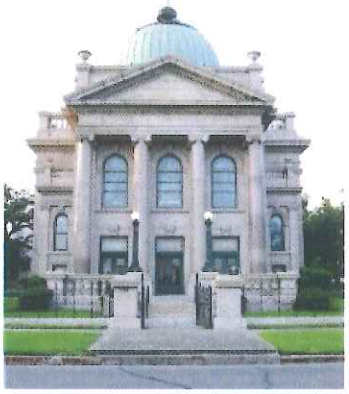








100th anniversary for air conditioning in Orange, Texas



August 7, 2012 Orange County News

The summer heat may be sweltering but those wanting to escape the heat have been able to do so for 100 years in Orange with the first public building in the south, the First Presbyterian Church, to have the luxury in August 1912.

In 1902, a year after Willis Carrier graduated from Cornell University with a masters degree in engineering, he landed a job at a printing company in New York. They paid him $10 a week. However, the company was struggling with the heat and humidity which caused the colors to run. Carrier invented a device which made printing possible and made him a very valuable employee. The invention controlled the temperature. Carrier later went into business for himself and was contacted by Frances Ann Lutcher to install air conditioning in the First Presbyterian Church.

The church was organized in April 1878 under the guidance of Dr. W.H. Vernor and Dr. R.H. Byers. The first chuch building was located at Market and Polk Streets. The current building was planned, errected and paid for by Frances Ann Lutcher. She wanted to build the church as a memorial to the Henry Jacob Lutcher family and it was named the Lutcher Memorial Church Building.

Frances Ann Lutcher took it upon herself to do all the planning and choosing of the windows herself. An architect from Kansas City, Mo., James Olver Hogg, was hired for the design. The granite is a native Texas stone and comes from Llano. However, the marble is from Italy. Construction began in 1908 and the glorious structure was completed in 1908. It was formally dedicated in January 1912.

The plan for air conditioning was not without hurdles to overcome. But, when there is a will, there is a way.

Church records have been lost over the years and it is not certain which system was first used at the church. But, it is believed since Carrier held a patent on an air conditioning system which used ammonia, this was the first sytem installed in the church. However, it was toxic and highly flammable. Also under consideration is the first air conditioning unit may also have been a system which used water and carbon dioxide. This system would have worked similiar to the unit with ammonia, according to Record archives.