Modern Church Architecture

with special reference to

Denominational Requirements

A Thesis

by

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Foreword

As a forword the aim of this short thesis is to dwell on Church Architecture from the point of view of our modern requirements; Spiritual, Social, Hygienic and Aesthetic. In a word to consider our Church Architecture as an expression of the Age in which we live.

Art is a measure of civilisation. Our modern Church Architecture should then be the natural religious expression of a progressive and civilised people and be just as vital, genuine and spontaneous as that of the Egyptians, the Greeks, the Eastern races or the Mediaeval Cathedral builders.

Modern Christian worship has broadly divided itself into two forms of expression. The old type of Ritualistic or Liturgical church, in which the building is a shelter for the Altar, the Mysteries of the service take the foremost place and the speaker or

preacher is of lesser importance.

The new type of non-ritualistic church gives precedence to the pulpit and the building is in the nature of an assembly hall or auditorium.

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The requirements of the Ritualistic Church have changed very little in thousands of years and the planning and disposition have but few modern innovations.

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The modern non-ritualistic Church however has no strong precedent and unfortunately has not given that serious attention to the question of planning and designing the buildings in which they meet, that the growing importance of the various denominations demands. There have been signs during the last few years of a movement forward on better lines, and with the widening of the church programme to include many social, recreational and educational activities the nonconformist church bids fair

to develop a religious Architecture worthy and representative of our modern times. It is felt that the secret of such a successful nonconform-ist church architecture lies in the closer study of the ancient and eternal principles of ecclesiastical architec-ture and their sympathetic app-lication to modern requirements.

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The aim then, is to make a study of the modern tendency in church requirements of all denominations as evidenced in the more successful buildings of recent years and the influence which our modern Social System has had and will have on ecclesiastical planning, furnishing and design in the future.

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Part. 1

Ritualistic or Liturgical Churches

Chapter. 1. Historical
General.

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Confessionals
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Chap. 1.

Historical

For the first fifteen hundred years Christianity was essentially sacra-mental and it so remains to-day as far as the Roman, Eastern and Anglican churches are concerned.

The seven great sacraments together with the prophetic function of preach-ing largely controlled the development of the organism of church buildings.

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Of these sacraments the Holy Eucha-rist or Mass was and is supreme in a very particular way and its nature, the ceremonies that surround it and its relation to the whole body of the faithful, practically determined the essential elements in a church plan.

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In the earliest days after the Liberation two plans struggled for mastery.

The centralised with the dome as its controlling feature and the basilican with its nave and aisles.

So far as Europe was concerned

the latter was victorious and when in the 11th. century the fully develop-ed centralised church such as San Vitale Ravenna or the Royal Chapel at Aix was cut in two and one half fixed to a Basilican nave and trancepts, so giving the germ of the chevet, the standard type of plan was fixed for 500 years; the type which has lasted, indeed, until our own day and has given us as its organism was fully worked out and its character established by various races, all the great churches of Mediaeval Christendom.

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A Christian Church was for fifteen hundred years a place where -

(a) Mass was said and the people came together for public worship that centred around this supreme fact of ritualistic religion.

(b) A commodious house where five of the six sacraments could be administered

(c) An auditorium where many people could be gathered together to listen to the preaching of the gospel.

(d) A communal home, blended of art gallery, theatre, library, school and public forum.

(e) A burial place for Saints & heroes and the worthy men of earth.

(f) By no means least a sort of dwelling place for God incarnate and his saints and angels and therefore the most beautiful thing that could be made by the hands of man.

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Now the question comes of course, as to how far the type of church which satisfied these requirements for 1500 years is applicable to-day. To those historic churches that retain in substance the liturgical worship of the Church of the past, the answer is, in every particular. Of those denominations which have diverged from this mode of worship we will deal in Part II.

There are four qualities, according to R. A. Cram, inherent in a Ritualistic Church.

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(a) A church should be a perfect sanctuary, a house of God, a place for his earthly habitation, a visible type of heaven itself. i.e reverent in atmosphere.

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(b) A perfect temple to shelter the altar and subordinate to it, leading up to it as to the centre of honour, growing richer and more splendid as it approaches the sanctuary where is concentrated all the wealth of obedient and loving workmanship that may be obtained by means of personal sacrifice through the years that gather into centuries.

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(c) It should create a spiritual emotion through the ministry of all possible beauty of environment; the using of art to lift men's minds from secular things to spiritual, that

their souls may be brought into harmony with God. The agency of art to this end is immeasurable and until the time of the Reformers this fact was always recognised.

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d) The fourth aspect in Ritualistic church building, and one which is generally considered exclusively, and is precisely the last in import-ance of the four, is the arrange-ment of a building where a congreg-ation may conveniently listen to the instruction of its spiritual leaders. This quality is not necess-arily sacrificed to the others.

A church, if it is properly designed may be a perfect sanctuary, a perfect temple and a perfect auditorium.

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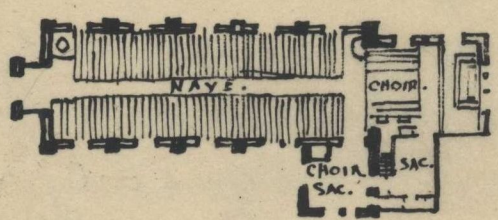

SUCCESSFUL BRICK DESIGN FOR A SMALL CHURCH

·BY·

CRAM. WENTWORTH & GOODHUE

NOTE: SOLID PIERS WITH 9" CAVITY IN BRICK WALLS
TO MAKE DEEP WINDOW REVEALS.

Chap. 2.
Requirements & Plan Suggestions

The Small Church

There is just one way to build a small church or country chapel and that is to build it as simply as possible and of as durable material as may be obtained. It may turn out to be bald and ugly, but ugliness is better than impudence. A plain and ugly church may be dignified and religious while a cosey home-like little place never can.

Plan

In such a church as we are considering there could hardly be a vested choir, therefore the chancel is solely for the altar and clergy. This does not mean that a little recess is enough. More space is necessary than is actually demanded by the function of a sanctuary, for there must be a due proportion between nave and chancel. If we cannot obtain dignity through size we can through relation, therefore the chancel should be deep even

if narrow. The plan of the chancel should be as simple as possible, three steps at the entrance, one at the communion rail and three at the foot-pace of the altar giving the right elevation in a church of the size we are considering. The Sanctuary should be rectangular not polygonal, this latter form is dangerous and but seldom used to good effect except in Cathedrals or churches of great size. In a small church it is inevitably mean and trivial in effect.

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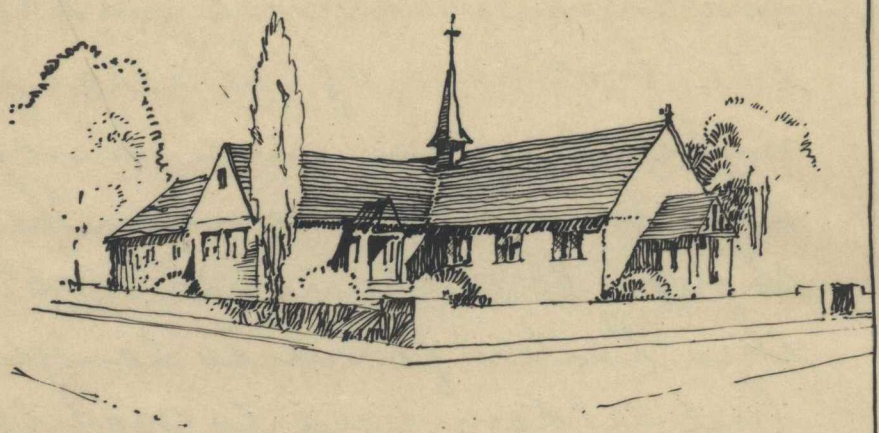
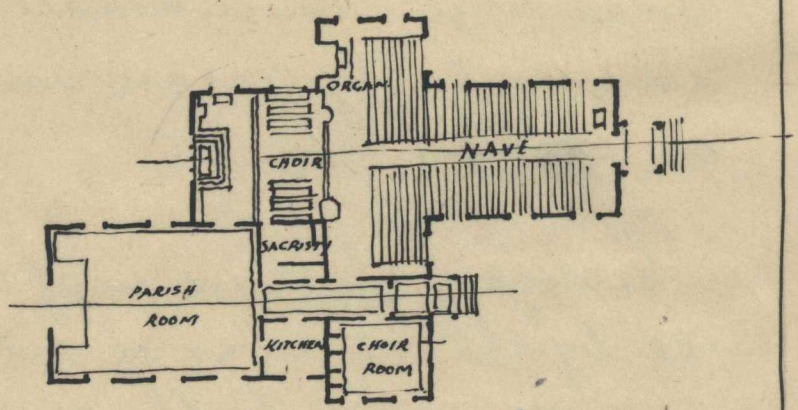
The size of the nave is of course determin-ed by the number of sittings but as a general rule the narrower it is, in ritualistic churches, the better for acoustics, appearance and economy of construction. Twenty feet in the clear is about the minimum, this gives two pews each seating five persons on each side of a four foot six central passage. A nave 20'x65' would seat 200 persons and is a satisfactory proportion.





SUCCESSFUL DESIGN FOR SMALL FRAME CHURCH

NOTE. ARRANGEMENT OF PLAN GROUP.

In a small church the basis of plan must be a long and narrow rectangle covered with a simple roof unbroken from end to end. Square plans and complicated roofs lose all repose, all dignity and all effect. A tower is fatal unless it can be large enough to be respectable. The little square erections with or without wooden spires are an offence. A central tower is impossible unless the church is of good size.

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East window

The lighting of the chancel should be from high windows on one or both sides. In so small a structure a window over the altar is hardly advisable. In a small church it is difficult to have a reredos and window without overcrowding. It is far better to fill the whole end with a dorsal reaching to the ceiling than it is to confuse the eye by spots of light and dark; complications of glass, wood and drapery. Again the east window is apt to be dazzling and detract the eye from the altar.

High walls and a low pitched roof, the walls being a few feet more in height than the width of the nave, should be aimed at. The windows can then be kept high in the walls. With low walls and a high pitched roof keep the window cills high even if it means reducing the lighting, a condition that will not injure the religious atmosphere. Iron tie rods should not be used. With steep roofs a proper roof truss should be constructed while if the pitch is sufficiently flat, collars can be placed at the wall plate level

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The larger Church

In plan the church should be long and narrow, not only on account of acoustics but for emotional and artistic effect as well. The walls of the nave should never be less than the width between the columns and should indeed be a little more.

The choir and sanctuary should be deep, if possible twice their width. The sanctuary cannot be less than

twelve feet from east wall to comm-union rail where the foot pace of the Altar is raised three steps above the sacrarium floor. The depth of the choir is dependant on the number of choristers. In addition to the length required by the choir, ten feet is necessary to provide for the alleys at either end of the stalls, the kneeling space in front of the commun-ion rail and the three steps to this level from the choir pavement. Each row of stalls should be raised a step at least above the one in front.

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The plan of the body of the church will almost inevitably be the old fashion of a central nave, long, narrow and high, with low and still narrower aisles on either side.

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A cruciform plan demands a central tower, since it is impossible to treat open intersecting roofs in any good architectural fashion.

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The three aisle type of plan is by

for the best and may be varied almost infinitely. The aisles may be wide and low and filled with pews, or they may be high and narrow and used only as ambulatories.

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The things most carefully to be avoided in planning purely ritualistic churches are modern innovations, because in these denominations the essentials of the service have remained for centuries. The Mediae-val builders worked at their problems as did the Greeks and like them they succeeded in finding exactly the solution for their requirements.

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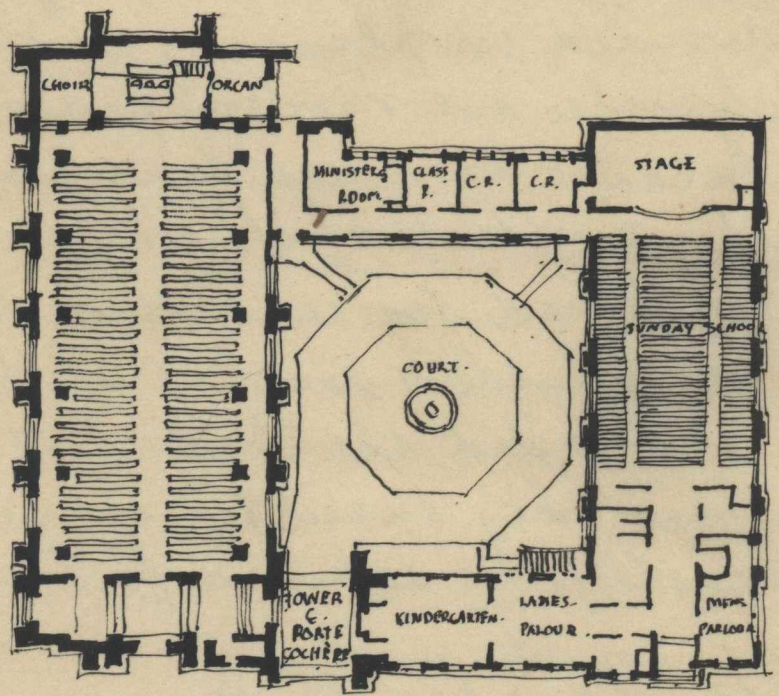
The City Church

The City church offers an entirely modern problem to the Church Architect. The city church must hold its own with all comers and should indeed be architecturally the dominating structure in any group. To accomplish this its walls must rise to the highest possible elevation, that is the walls of the nave itself. It does no good



· MODERN · GROUP · PLANNING · ON · TRADITIONAL · LINES ·

to build a low church and try to lift it to dominance by a towering spire. The nave, the main body of the church, is what tells. Designs should be lofty, massive and comm-anding. Spaciousness and large-ness of proportion are essential in city churches. By the very nature of things the ritual is more varied than in the village church and it is imperative that the chancels and particularly the sanctuaries should be very large.

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This spaciousness and largeness of design applies as well to all other portions of the city church, to the piers and arches of the arcades, the side chapels, the windows and doors and to other elements. Indeed to every portion of the interior.

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Chap. 3.

Details of the Plan

The Altar

In reality the Ritualistic Church is primarily a shelter for the altar and this should be the focal point of the whole building.

A good effect is obtained if the altar is brought well away from the east wall. If using an apse the altar should be placed under the chord of the apse. The length of the altar and the height of the raised portion depend on the the size of the church.

8'-0" x 1'-8" are the main dimensions of the table top. Top of the table height should be 3'-3" to 3'-6". The general dimensions of the altar are 10'-0" x 2'-3" except in large churches or cathedrals when it is bigger.

The altar was generally a stone or marble structure carried on from earlier symbolic sacrifices. The actual table is sometimes hidden by the coverings of needlework, tapestries or damasks. Flowers should not be placed on the altar

but crosses, preferably of silver, are placed on top. These have a better effect than when of gold.

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To realise the aim of making the altar the dominating object and focal point in the church, has taken centuries of time and the combined efforts of some of the worlds greatest architects, goldsmiths and painters.

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The altar in R.C. Churches

The altar in the Roman catholic church is raised upon steps, three for high altars, five for a Cathedral high altar, or sometimes although very rarely seven steps are used. One step only (i.e the predella) may be used for side altars. Other means are also employed to draw attention to the altar. Among these are; the tabernacle, crucifix and candlesticks, the last being sometimes placed on a candle step or gradine. Yet all of this does not suffice, at least not in a church of some pretentions, and accordingly

it has become customary to intro-duce in addition a framework or setting for the altar which may take the form of a reredos, ciborium, baldachino, tester, canopy, triptych or dorsal. To choose wisely from among these various schemes of altar settings, it is obvious that one must take into consideration the importance, size, splendour and style of the particular church or chapel in question.

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Reredos. The Reredos - is a feature of lavish skill and craftsmanship. The proportion and size depend only on artistic taste to harmonise with church proportions. There are many examples of framed paintings, in the reredos, by the Italian masters and of these the Medici Society reproductions are quite suitable for modern church use.

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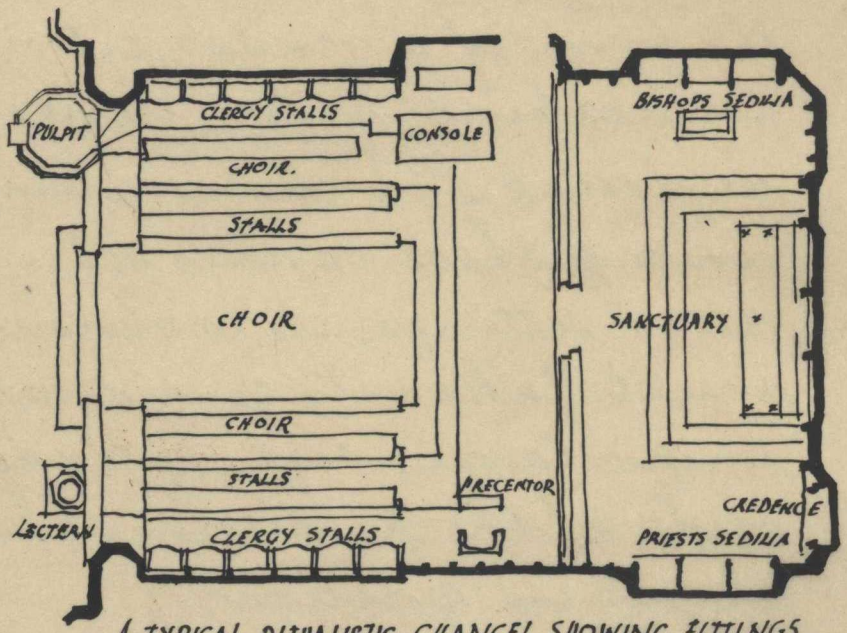
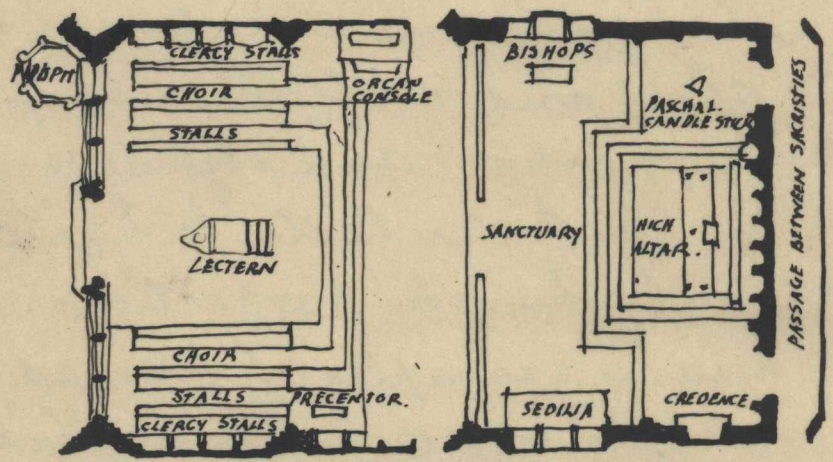
Dorsal The use of the Dorsal of hanging tapestries or damasks and indeed the general use of carpets and hangings



A TYPICAL RITUALISTIC CHANCEL SHOWING FITTINGS



A TYPICAL RITUALISTIC CHANCEL

takes away from the hardness of stone and wood, gives colour and richness and is less expensive.

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Dimensions etc. The Chancel & its fittings.

There should be one step, and one only, between the sanctuary and choir for the communion rail. None of the steps in the sanctuary should be more than 6" rise and 18" tread. If there are any extra steps required, for instance in a longer or larger church, then the altar is raised on three steps. There should be 4:6" between the back of the communion rail and the bottom of the altar steps. If these altar steps return to the wall around the altar, then there should be at least 6:0" between them and the side walls. The landing of the altar should be 3:0" wide all round at least. Thus the width of the Chancel is determined by these dimensions. The communion rail is 2:3 above the step on which it stands. The opening in this rail should be at least 5:0" wide and open inwards.

Choir

From the end of the choir stalls to the step on which the communion rail stands should be at least 4'·6".

Each member of the choir should be allowed 2'·0". Two rows of choir stalls only should be allowed each side of the chancel. The stalls should not be too elaborate. The front row of stalls are on a level with the choir, the second row is raised about 6". There are common-ly three steps from the nave to the choir. If the site slopes, the advantage may be utilised to raise the choir and place the sacristy and vestry underneath.

Lectern

The lectern is placed in the centre at the top of the steps to the choir.

Font.

The font is placed near the west door as a rule, sometimes in a bap-tistry. It should be lined with lead and drained. The cover of oak generally may take the form of an elaborate canopy raised or lowered by counterbalances.

Choir Screen

The choir screen in mediaval churches was of elaborately carved

wood. carrying a gallery over which was placed the Rood.

The Pulpit

The Pulpit was generally placed in the nave, not in the chancel. It is generally 3'-0" above the nave floor level but in galleried churches is much higher. The wall pulpit of the Italian refect-ories may be used with effect in certain cases. The pulpit should be made a structural feature in stone or marble.

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Sedilia

The Sedilia or three seats for the celebrants are sometimes of different levels. In Gothic churches these were often carved in the wall.

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Credence

The Credence table upon which the sacred elements and vessels are placed, may be also a shelf or recess.

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Piscana

The Piscana is east of this and in it the basins are washed the pipes from this should run straight into the earth.

Side Chapels — Side Chapels or Lady Chapels are used for small gatherings or for week services.

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Vestries — Vestries:-

(a) for the minister and entered from the choir and not from the sanctuary, with a strong room.

(b) for the vested choir.

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Sacristies — Sacristies may be separate or included in the Ministers vestry.

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Vestibules — Vestibules should be provided for hats, coats etc. also water closets and lavatories.

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Fittings in R.C. Churches — In Roman Catholic churches the

Confessional — confessional consisted originally of.

(a) A seat for the confessor

(b) A kneeling desk for the penitent placed at right angles to the seat.

(c) Separating the two a high screen, pierced by a number of holes at a point near the ear of the confessor administering

the sacrament of penance.

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Later it became customary to dignify the confessional by placing a canopy or protection over the head of the priest, and by adding, for another penitent, an additional kneeling desk and screen on the opposite side of the priests seat. With this installation it became necessary to install sliding shutters across the holes or gratings to prevent distraction and the conveyance of the whispered confession from one penitent to the other. Not a great period elapsed before the designers had the kneeling desks surrounded by partitions and covered over like the confessors booth. In such form they are now almost invariably built.

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The confessional is in general lightly constructed of wood and if one compartment only is desired, it should be towards the entrance of the church, so that penitents

will not be required to turn their back to the Altar when entering the confessional.

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Confessionals can also be built or recessed in thick walls or built to project outside the walls.

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The partition between the booths should be soundproof. The booth are sometimes arranged so that the priest enters his booth from a clergy ambulatory at the back of the confessionals.

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A comfortable seat shaped to the form of a sloping back should be install-ed in the Priests booth, together with an arm rest at each side placed in a line with the bottom of the small gratings through which the penitent talks. There should be in the Priests booth an electric light high up on the left for reading and an electric radiator to be used for heating purposes in cold weather.

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In the penitents booth a wide kneeler 5½" high and a comfortable arm rest are required. The metal or wood grating must be placed near the priests ear and it must, if there is more than one penitents booth, have a sliding door over it.

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The entrances to the compartments can be fitted with grilles, doors or curtains. When curtains are chosen, the Priests compartment is generally fitted with a half or Dutch door.

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The Holy Oil Case is placed on the sanctuary wall to the Gospel side of the altar. It is sometimes called a Chrismatory from the Holy Chrism or Sanctum Chrisma which it contains.

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The cloth for the use of the communicants is to hang on the inside of the rail, although this cloth is now generally superceded by a pall carried by the altar-boys

or passed from communicant to communicant. Communion rails in a great many churches are entirely too long and spoil all artistic effect.

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The Holy Rood is often suspended from the Rood Beam to make a more pro-nounced demarkation between the nave and choir. It represents the crucifix with the figure of the Christ and sometimes of the apostles. The correct way to place the symbols is:- St Andrew on Our Lords right, St John at the top, St Mark at the left, and St Luke at the foot. At the back of the cross was often painted at the extremities the four great Doctors of the church, with an image of Our Lady in the centre. From the ceiling of the new Westminster Cathedral in London hangs a rood of great artistic merit which measures 30 feet in length.

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The Credence table in Roman Catholic churches is about 20" x 40" correct size. except for episcopal ceremonies when a larger table should be used, wood

marble, metal, or other satisfactory material can be used. 3'0" is a satisfactory height. The Credence should be placed on the South end of the Altar, near the wall or against it.

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The Sedilia can be a low wooden bench with a back (i.e a Scamnium). It stands on the epistle side of the sanctuary, and there must be ample room on it for the three Saered ministers, as separate chairs are not permitted.

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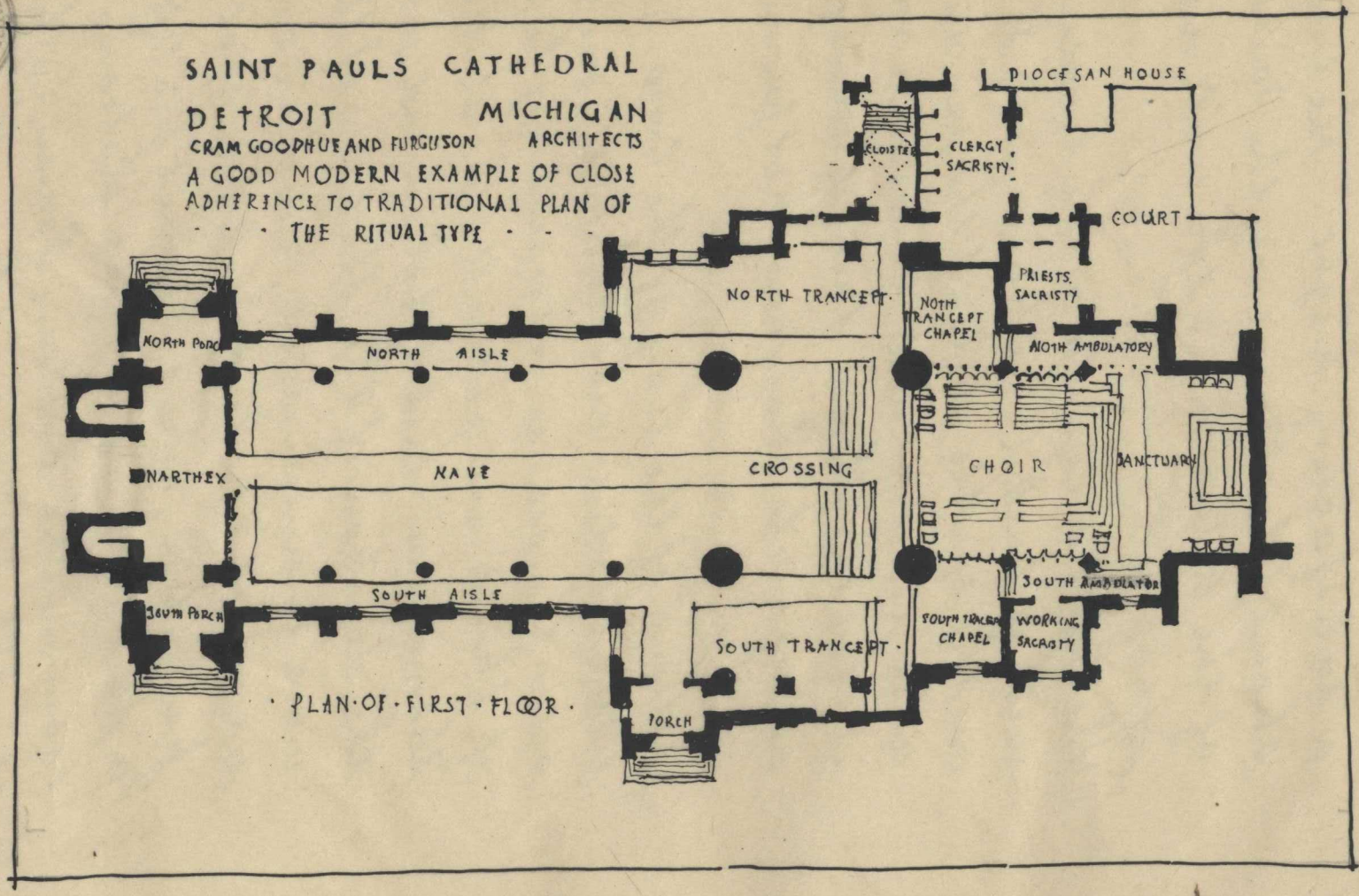
Stations of the way of the Cross. The little wooden crosses which one beholds over the scenes representing the passions of Christ are actually the stations themselves. In the Holy Land where the devotion of the Stations of the Cross were inaugurated, wooden crosses were set up to mark the spot where Jesus fell, where he met his Afflicted Mother and soon. The stations of the cross in the modern Roman Catholic churches are copied from the stations in the Holy Land. The wooden cross is all that is essential. The pictures


SAINT PAULS CATHEDRAL
DETROIT MICHIGAN
CRAM GOODHUE AND FURGUSON ARCHITECTS
A GOOD MODERN EXAMPLE OF CLOSE
ADHERINCE TO TRADITIONAL PLAN OF
THE RITUAL TYPE
DIOCESAN HOUSE
CLOISTER
CLERGY SACRISTY
COURT
PRIESTS SACRISTY
NORTH TRANCEPT
NOTH TRANCEPT CHAPEL
NOTH AMBULATORY
NORTH PORCH
NORTH AISLE
NARTHEX
NAVE
CROSSING
CHOIR
SANCTUARY
SOUTH AMBULATOR
SOUTH AISLE
SOUTH PORCH
SOUTH TRANCEPT CHAPEL
WORKING SACRISTY
SOUTH TRANCEPT
PORCH
PLAN OF FIRST FLOOR

are not required. It is well in design-ing a church to take early precautions in the development of the plans to have proper places for the orderly placing of the stations whether accompanied by pictures or sculptures or not. The fourteen representations of Christs journey to Calvary and crucifixion and their frames and appurtenances should all be in harmony with the remainder of the church and its furniture. The architect should be employed to take charge of the designing of this very important part of the regular appointments of the Roman Catholic Church.

Part 2.

Non-ritualistic, Nonconformist, Conventicle or Evangelistic Churches

Chapter 1. General Requirements & Plan Suggestions
Types of Plan
Types of Modern Churches

Chapter 2. Plan & Design of Christian Science Churches

Chapter 3. Plan & Design of Jewish Temples & Synagogues

Chapter 4. Details of the Plan - Non-ritualistic Churches
The Pulpit
The Communion for:-
Congregationalists & Baptists
Methodists
Choir
Font
Baptisteries in Baptist Churches
Seats
Chairs
Galleries
Vestibules etc.

Chapter 5. Sunday Schools, their planning & design

Chap. 1.

The problems of Non-ritualistic Church building have been very much neglected and the results of the building of these denominations have been, on the whole, far from satisfactory. Churchmen have been largely ignorant of Architectural values, and modern requirements have been solved in too many cases in an entirely unsympathetic and unsuccessful manner.

There are many kinds of Church buildings even in one particular denomination and to solve a given programme a practitioner must get down to real and serious study of the needs of the congregation as related to its intra-organisations and its community. There are rural chapels, rural community churches, outback bush churches, city mission buildings, churches for city manufacturing districts, for residential communities

of at least two or three kinds, the city or business district church, and possibly several other tippes.

Manifestly the very special require-ments of these various congregations cannot be satisfied by one standard type of plan, but each must be solved for its own particular social and religious curriculum. However suitable the old Gothic churches were to the worship of those old times, however adapted the Gothic plan may be to the Ritualistic Church of the present day, it is a type, unless largely modified, that is absolutely unsuitable to the requirements of worship as the Non-conformists understand it, in which the sermon plays such an important part in the service and where every member of the congregation must see as well as hear the preacher.

The nonconformist church plan centres about the pulpit, a motive not endued with an inherent

sacredness in the same sense as the altar although it may radiate the influence of a fine personality.

Nonconformist churches do not in most cases require space for processions, beyond the small needs of circulation, other than those accompanying the irregular occasion of the christening, the marriage ceremony or the funeral and these functions are not integral parts of the formal mode of group worship. The great choir and its tributary features, chapels and ambulatory, inseparable from the tradition of the ~~the~~ ritualistic building, is likewise decreased in size and a small chancel suffices for ministerial and choral demands.

The body of singers is smaller, the organ less significant and the importance of the chant or of music generally as an incentive to right thinking is much reduced in the service until finally it is radically classified into the hymns rendered

by the body of the congregation and anthems or solo singing rendered by hired trained voices. Thus the holy part of the church which is the throbbing heart of the ritual edifice is despoiled of its many accessory features and as each is removed, a corresponding stimulation and appeal falls away until finally in the non-ritualistic building it retains no more than a semblance of the greatness encouraged for centuries.

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All this modification brings with it certain arbitrary demands which will automatically limit the size of the plan under average conditions.

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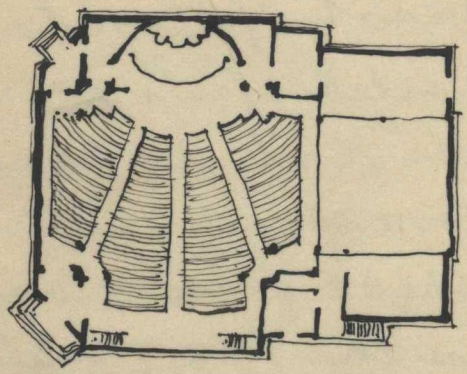
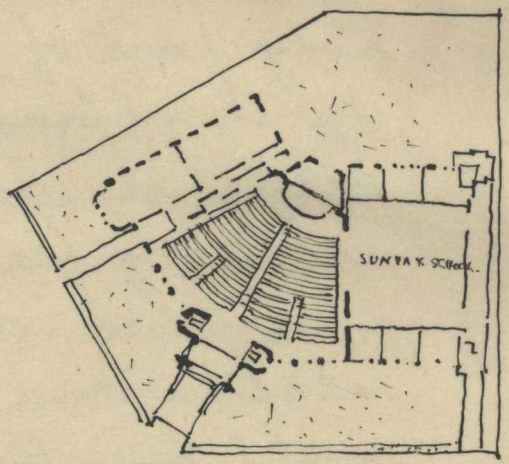
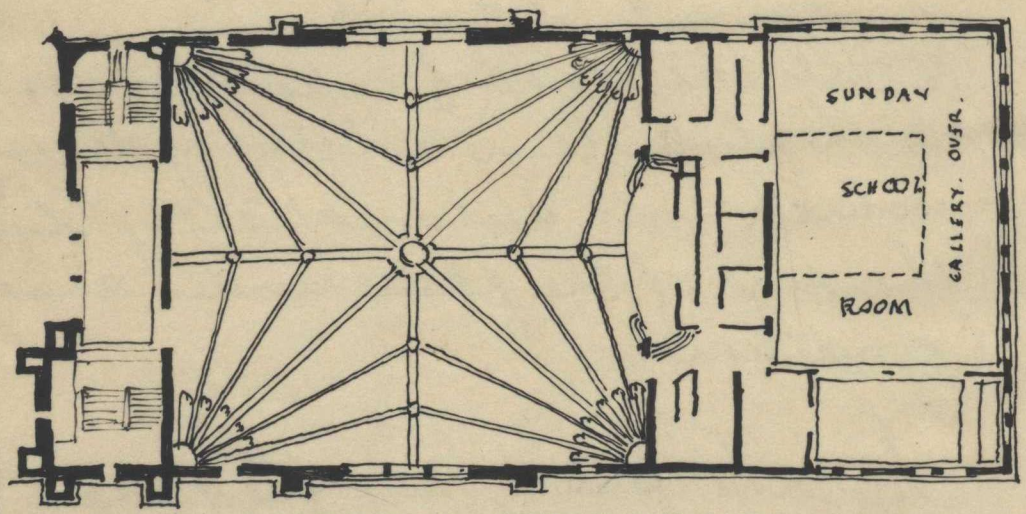
In the first place the pulpit must be so located, the plan so arranged and the structure so built that the minister shall be readily heard and easily visible. This implies the elimination of supports which obstruct the view



A TYPICAL GREEK CROSS
AUDIENCE HALL PLAN.



SUCCESSFUL AND TYPICAL NON-CONFORMIST CHUCH WITH PLAN SUGGESTED BY THE EXINGENCIES OF THE SITE.



A RECTANGULAR AUDIENCE HALL PLAN

and impede hearing and results in a general arrangement on the basis of a rectangular or octagonal hall and of such dimensions that the normal voice will carry to all parts of the building providing seating accommodation.

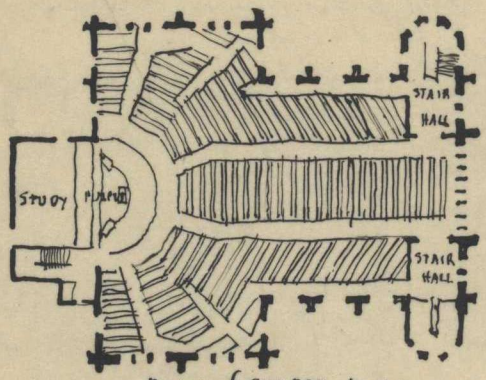
o o o

The splendid vistas of the old cathedral nave, aisles and trancept are impossible, likewise the quality of perspective and line harmony obtained by duplicating the verticals of supporting masses.

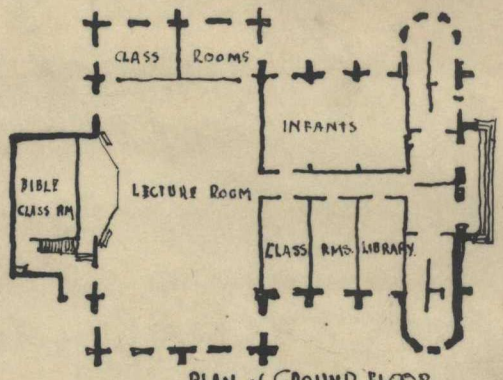
o o o

Greek Cross Type

An interesting combination of old and new tendencies is seen in the plan of Greek Cross type suggesting a modification of the liturgical Latin Cross plan for modern congregational needs. We have spoken of the cross as the basis of the Gothic type of plan. Apart from its symbolic character it will easily be seen that the cross is a form of plan that would naturally occur to an Architect who desires

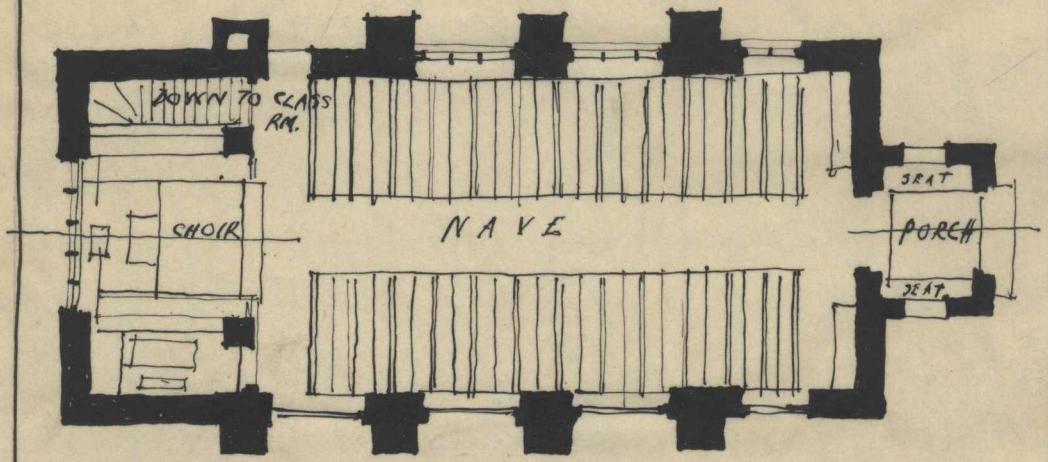


PLAN of CHURCH FLOOR



PLAN of GROUND FLOOR

SUGGESTED TRADITIONAL PLAN FOR DENOMINATIONAL PURPOSES
NOTE: EXAGGERATION OF TRANCEPT TO INCREASE SEATING CAPACITY; ABSENCE OF INTERIOR SUPPORTS; PROPORTION OF WIDTH TO LENGTH.



SIMPLE MODERN PLAN WITHOUT PROJECTION IN BODY OF STRUCTURE. TOO SMALL TO MAKE CONCESSION TO TRADITION.

BERTRAM G. GOODHUE . . . ARCHITECT.

to increase the size of his building without making it unmanageable in length or width. The simple oblong soon becomes difficult to deal with. The limit of the carrying power of the voice of the ordinary preacher is 65 to 75 feet and any extraordinary widening of the building renders roofing difficult and proportion impossible.

* * *

Trancepts

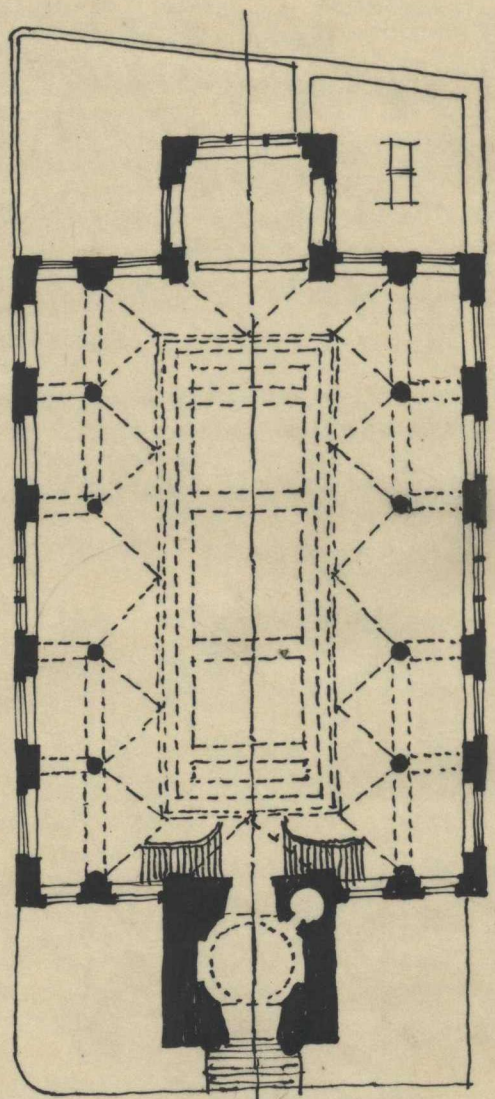
The addition of an annex or trancepts on either side provides additional accommodation without widening the main walls or making the problem of roofing a difficult one. This was not the particular origin of the Gothic trancept but it has a distinct advantage from a modern standpoint

* * *

Modified Gothic Types

There are four main plan types which can be adopted with modifications from the Gothic form:-

1. Nave, Trancepts and Chancel
2. Nave, Aisles and Chancel
3. Nave, Aisle and Chancel



ST. JAMES PICCADILLY · LONDON ·
BY
· SIR CHRISTOPHER WREN ·

4. Nave and Chancel

Keeping always in mind the special requirements of the denomination concerned.

* * *

Renaissance Types.

Apart from Gothic types which are doubtless more successful from a Ritualistic point of view; many styles have been used by the modern church architect. Perhaps the greatest of these influences was that of the Renaissance as it affected Church planning and design in Wren's city churches. In the reign of Charles II the Great fire destroyed nearly all the old Pre-Reformation Churches in the City of London and the genius of Sir Christopher Wren was called upon to replace the loss. These churches form an admirable example to architects in Classic and Renaissance style.

* * *

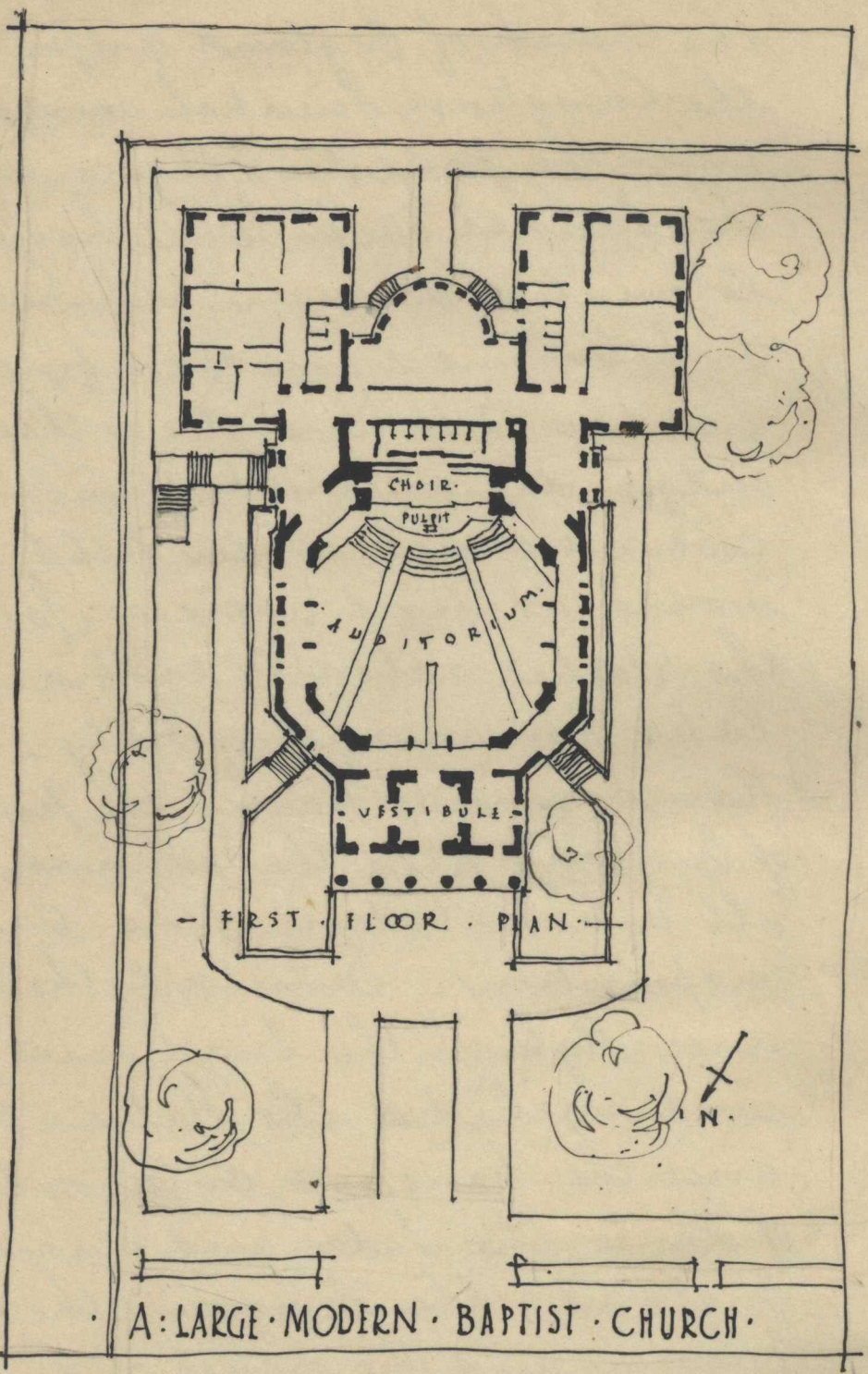
Other Styles

Certain denominations have very decided views on what they consider a churchly design. Some like

the Church of England prefer Gothic, the Christian Scientist seems to prefer the majestic Classic while the Baptist sticks to the homely Colonial or Georgian. Church Architecture seems to confine itself broadly to three styles or their outgrowths and adaptions. This covers a much wider field than would at first appear. For instance the Gothic actually embraces the later Romanesque of Italy, the Flamboyant of France, the Perpendicular of England and the Spanish Gothic all interpretations of the same inspiration. Similarly the Renaiss-ance style in the broad sense of the word included the Italian Renaiss-ance the Francois I or Henri II periods of France the Tudor and Stuart of England, the Georgian, the Spanish Mission and the French and Dutch Contemporaries, however widely these differ from each other.

* * *

So Church design actually resolves itself into a matter of taste

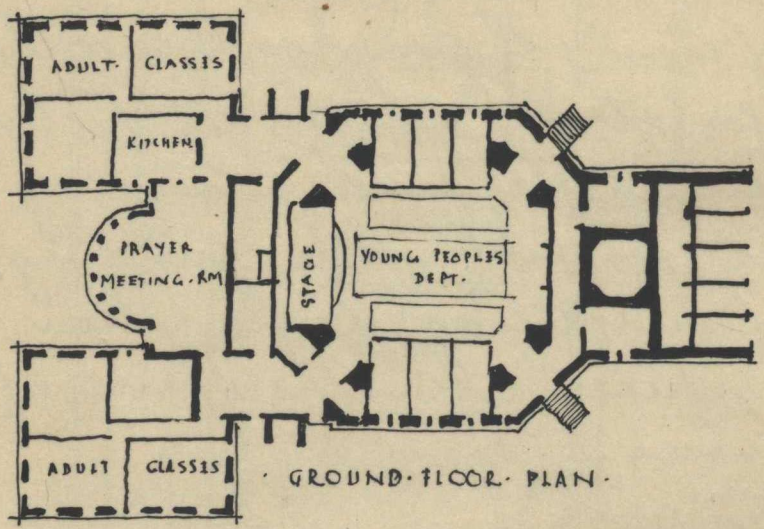


A · LARGE · MODERN · BAPTIST · CHURCH ·

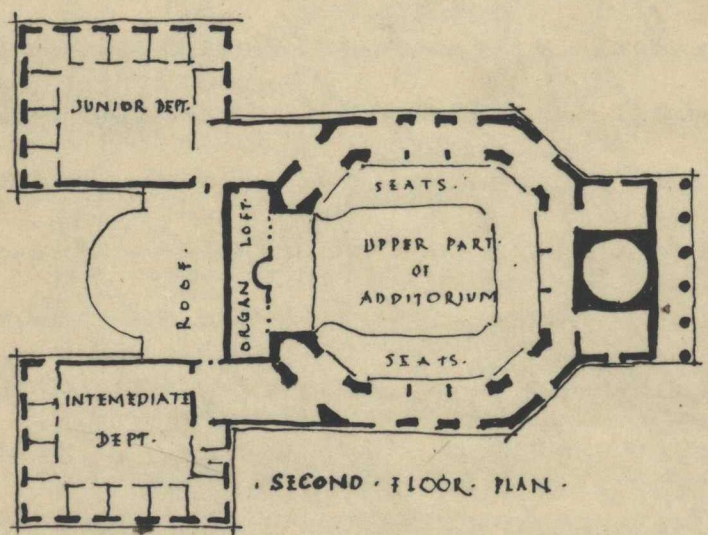
in choosing from these styles and the periods they embrace. But principles of design, the relation of form to structure and the elements of unity throughout are the fundamentals on which all historic styles are based and providing these are present in a building it will, if fulfilling its function, be infused with the spirit of modern times.

Institutional Churches.

A type of church which is essentially modern but which is of growing importance in social life, is what may be termed the Institutional Church, we mean that type of church existing in almost every non-liturgical denomination which is primarily devoted to some kind of social usefulness; a church which conscious of its obligations to society no less than to the individual, does not confine its activities to public worship and the administration of the sacraments, but actively fosters every



GROUND FLOOR PLAN



SECOND FLOOR PLAN

A LARGE MODERN BAPTIST CHURCH

good tendency in human thought and feeling. Like the Mediaeval Church therefore it is concerned with every activity of life, with social intercourse, teaching, entertainment, recreation, organ-ised charity, music art and the drama. The church of the past century which comprised little else than a great meeting hall embellished with the sentimental vagaries of the "Gothic Revival" are wholly inadequate for this new usefulness. Even less adequ-ate are the churches which are designed after the models of Mediaeval churches, primarily as a setting for the liturgy. The modern Christian Conventicle or Evangelical church is inclined to be a little impatient with an architecture of symbolism, even a beautiful and ancient symbolism, if it is found to be costly, ineffective and troub-lesome. Especially is it impatient with an architectural symbolism which no longer possesses any

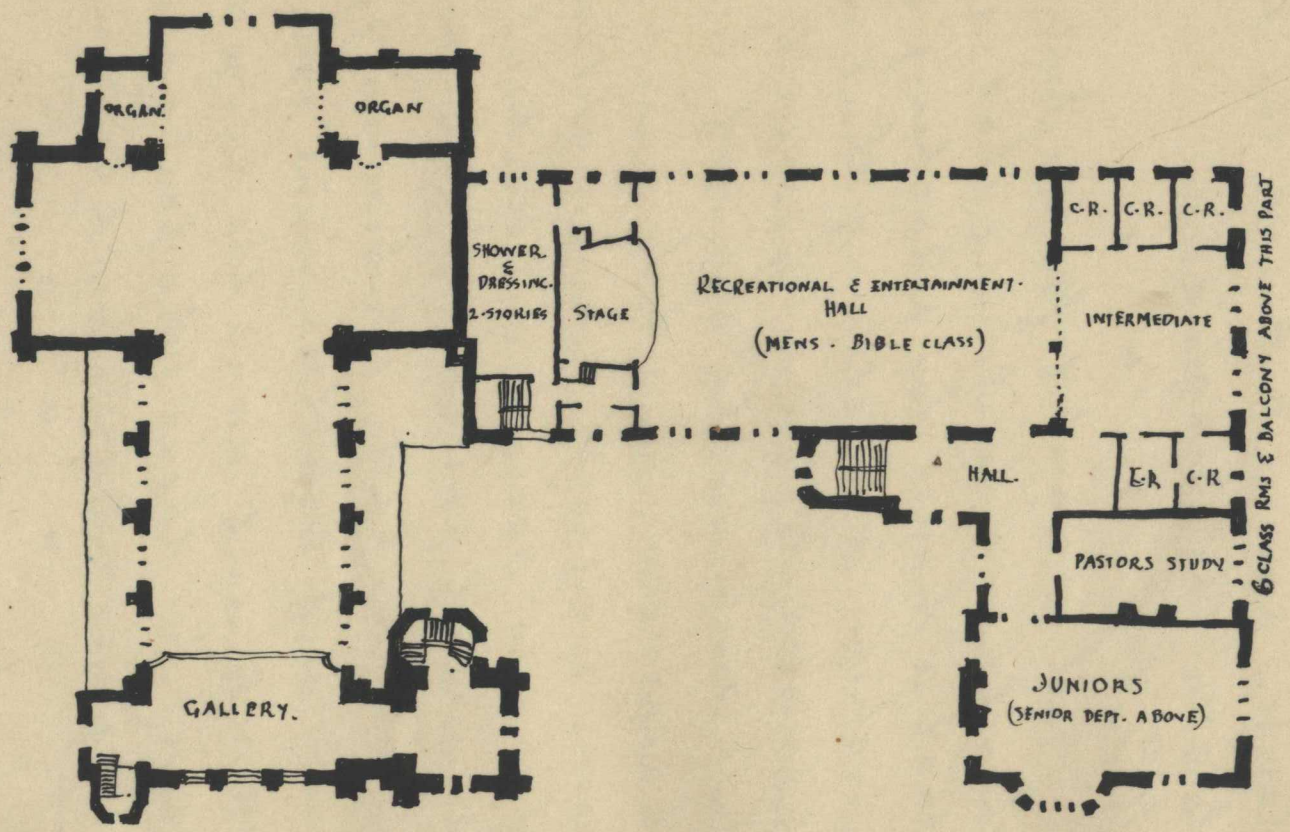
meaning which can be understood by the congregation of our own day or which, being understood, has no longer power to kindle the soul or to stir the imagination.

* * *

What is wanted for the Institutional church is a building that is more that a house for preaching and for worship, a building that may be dedicated to every good work that can embrace the sum of human happiness. It is to be associated in some way with every right exercise of mans social, intellectual and physical powers. School rooms, recreation halls, clubrooms, gymnas-ium and entertainement rooms are as relevant as is the large assembly room for those who participate in religious rites enjoyed in common.

* * *

This type of Christian Church does not require a great edifice, a mighty symbol, a consummation of art, wherein the individual is able to enter the divine presence with



UPPER FLOOR OF A LARGE NON-RITUALISTIC CHURCH

the aid of mediaeval symbolism.

They are content, from their point of view, to regard their church buildings as a group of educational, social and recreational facilities. It is to be a social centre, a composition of a hundred rooms, various in size arrangement and design, as are the social energies of man, but fused together by a common spirit and a common dedication.

The point of view of this type of church is a practical and immediate one.

Those concerned want a useful building, organised like any other useful building of our own day in a straightforward and simple way. They want the arrangement of rooms, the circulation, the construction and the decoration to be governed by the requirements of the particular usefulness which they have in mind. They argue that Christianity is a practical doctrine closely related to life and that it demands in Architecture neither a traditional posture nor a romantic expression.

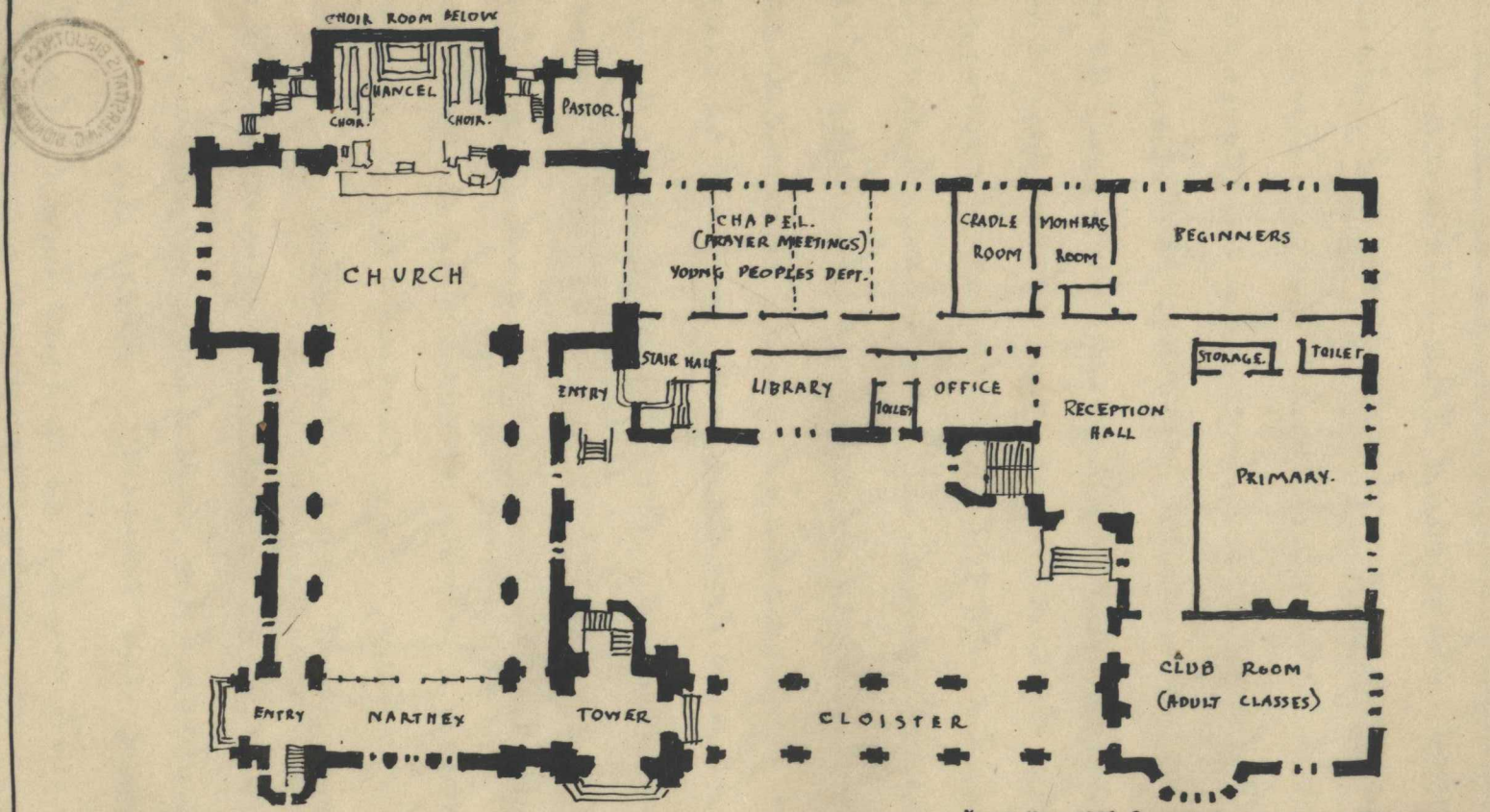


DIAGRAM OF MAIN FLOOR OF A LARGE NON-RITUALISTIC CHURCH

Modernising Church design

A plea might well be made for the installation of modern conveniences in nonconformist churches. Contrast the prevailing type of church where piers obstruct the floor, lighting, heating and ventilation, especially, are imperfect, either draughts or stuffiness cause distraction and annoyance; kneeling is a difficulty, no provision is made for umbrellas and raincoats, amateur music, insufficiently rehearsed, is presented.

What wonder that a public accustomed to lavish considerations in such matters elsewhere, votes church going an uninviting business.

* * *

There are many reasons for this state of affairs says a writer in "The American Architect" but the chief is false mediaevalism. It is easy to understand that when in the nineteenth Century the Church of England rose in revolt against smug conventionality and looked back for inspiration to the middle ages, the mediaeval church was

studied with enthusiasm and closely imitated; so much so that it remains to this day the standard, despite the attempts, happy or otherwise, of a handful of innovators. But it was forgotten that in old times the church was not only the most lovingly executed building in the parish but was also the most luxurious. An oak bench although it might present a sharp moulding to the shoulder blades, gave delicious ease to a man used, perhaps, to sitting with dogs on a dirty floor, and to whom a sound roof and glazed windows were the last words in solid comfort. While lack of lavatory accommodation troubled our ancestors little or not at all.

* * *

Indeed though mortification of the flesh might be undertaken under special direction for special ends, discomfort was no part of Mediaeval piety and the lurking and

not uncommon fear that comfort is sinful is really rank heathenry.

The Mediaeval builder was above all things up to date and progressive and hastened to adopt improved construction methods and novel fittings as they became known. The dead hand in art does not exist for him. Modern churches, then, should be at least representative and worthy of our advanced knowledge and facilities for good hygiene, comfort and efficiency.

* * *

There is no reason, in the modern church, why seats should not be arm-chair stalls with cushion tip-up seats, the invention we believe of the old monks or canons.

A vacuum cleaner is a simple necessity, while cloakrooms and one or two water closets should be provided. No one can pray in a constant fuss over hat or umbrella.

The body must be set at ease before the mind can be directed to spiritual concentration.

Central Bureaus.

Most denominations have established Bureaus whose purpose is to assist congregations who are planning new buildings or remodelling old structures, to advise pastors, sessions, Boards of trustees, committees and architects as to the best way of planning buildings for worship, evangelism, religious education and social work. To improve the architecture of churches and to arouse new en-thusiasm for a worthy modern Church Architecture.

* * *

From them all information as to the conventional requirements of the various denominations can be obtained. A questionnaire is generally issued which includes:-

(a) Character of the Community
(b) Nature of the site
(c) Environment
(d) Membership of the church
(e) Size of the Sabbath School
(f) Probable growth of congregation and Sabbath School.

(g) Nature of programme of the Church
(h) Financial strength of congregation and its ability to construct the edifice that is needed without assuming obligations that are too heavy.

* * *

From this questionnaire the Bureau makes sketch plan suggestions which after they are passed by the pastor are given to the architect as a programme of requirements and suggested layout.

* * *

Such denominations as the Christian Scientists and, although not a Christian church, that of the Jews, have very special requirements; with these we will deal in a separate chapter.

* * *

Chap 2

Plan & Design of Christian Science Churches

To properly plan and design Christian Science Churches it is necessary to under-stand something of the fundamentally destinctive manner in which its organ-isation functions.

* * *

The Christian Scientists claim to return to the teachings of primitive Christian-ity with an entire absence of formal-ism.

* * *

In their organisation each of the branch churches is a pure democracy. The Church organisation comprises a board of trustees or directors, elected for three years, so that a majority remain in office from year to year; two readers, a clerk and a treasurer.

* * *

The readers are also elected triennially and are precluded from more than one term of service. There are no professional pastors or priests all the officers being elected for stated

terms by secret ballot in annual meetings. There are various committees to which the actual work of the church is delegated:- ushers, house, public-ation etc. all selected annually and usually non-succeeding.

* * *

Another great divergence lies in the complete lack of all forms of so-called "social service" which has grown to such an extent in the orthodox churches as to be of importance almost equal to the religious services, so that it has become necessary to make a sharp distinction between religious and secular work. The Christian Science church work lies rather along outside welfare lines, as instanced in the activities attending the Japanese and Halifax disasters and the World War; thus the work does not require special equipment, thereby obviating the necessity of providing for guilds, cadet corps, parish house activities, and other forms of purely secular services.

* * *

There is another feature of the Christian Science services which is not commonly met with elsewhere; that is the practice of "visiting" or meeting which goes on before and after the services; But the greatest distinction to be noted, is the custom of giving public testimony at the Wednesday evening services and, as has been said before, the entire lack of ritual and form in the conducting of the service itself.

* * *

Planning As the chief feature of the service is the reading of the Bible and Mrs. Eddy's "Science of Health with Key to the Scriptures," from the desk by the readers, the building must be planned to make the platform the focal point of the design. This does away with all possibility of the use of what has been termed the traditional elongated plan.

* * *

This difference in the scheme of worship does away with any need for chancels, transepts, naves, choirs etc so necessary

to the ritualistic form of worship.

* * *

Square type of plan

The requirements of the Christian Science service lead rather to the square plan of auditorium, similar to one type of denominational plan which does not make extreme length a feature; so that in consequence in the first analysis, a plan in which all the seats would be at an equal distance from the reading desk thereby attaining equal sight and hearing for all, would be ideal from all points of view.

* * *

At the testimonial meetings anyone in the congregation may arise as he or she desires and speak on subjects relative to Christian Science. This brings out the absolute necessity for the greatest degree of acoustical development to make a serviceable church, and it is this requirement which in the final analysis gives us the ideal plan; a semi-circular space with the readers in the centre. As a general precept one might say

that the church plan of the audit-orium or audience hall type, as shown in accompanying plans should be the basis of all planning for Christian Science places of worship.

* * *

Sloping Floor Plans. There should be an entire absence of supports which would break the vision and interfere with hearing or reading and this has led through various ramifications to the use of the sloping floor plan in which the entire body of the church is comprised on one floor, sloping towards the readers desk with ramps and stepped aisles and without the use of galleries. This plan is an individual feature of Christian Science churches. It has several claims for attention; firstly that the entire congregation is on one floor, secondly that the view of the individual is, by means of the sloping floor, well taken care of. Thirdly it eliminates galleries with their resultant reverberations. It is however very difficult to make a

successful interior design with this scheme. also the sloping floor is not comfortable to stand on in the visiting periods referred to previously.

* * *

Basilican type. The Basilican type plan has been used but is not entirely satisfactory.

* * *

circular or Octagonal plans. A circular or Octagonal plan is finding more favour and there are several successful modern instances. This scheme traces its lineage to the Pantheon in Rome, the Temple of Vesta and other circular temples.

* * *

"visiting" The feature of "visiting" has brought about the incorporation of generously large foyers, as it is here that a great deal of the healing work can be done.

* * *

Instead of sacristies and vestries there must be provided behind the platform:-

(a) Small rooms for two readers.
(b) One or two rooms for organist and

soloist with adjoining toilet facilities.

* * *

The organ is generally arranged in a gallery above the reading platform and in size this platform is reduced to a minimum; space to accommodate readers desk and chairs being all that is required.

* * *

In some cases the soloist, a choir not being customary, also occupies a chair on the platform and the organ console is concealed below the platform level.

* * *

As there are no formal services for christenings, weddings, or funerals, connection between platform and church need not be direct

* * *

Off the foyer must be provided:-

(a) Ample coat room and toilet space

(b) A board room of such size as will accommodate the requisite number of directors or trustees

(c) An Usher's room where they

may hold their preliminary services

(d) A treasurers room or committee rm.

(e) Reading rooms

(f) Sales rooms.

The two latter, for the dissemination of church literature.

* * *

Sunday School

The relation of the Sunday School to the church is of extreme importance. The ideal arrangement consists of a separate building connected by corridors to the church proper. In this wing should be provided space for:-

(a) The infants class

(b) Certain individual classes

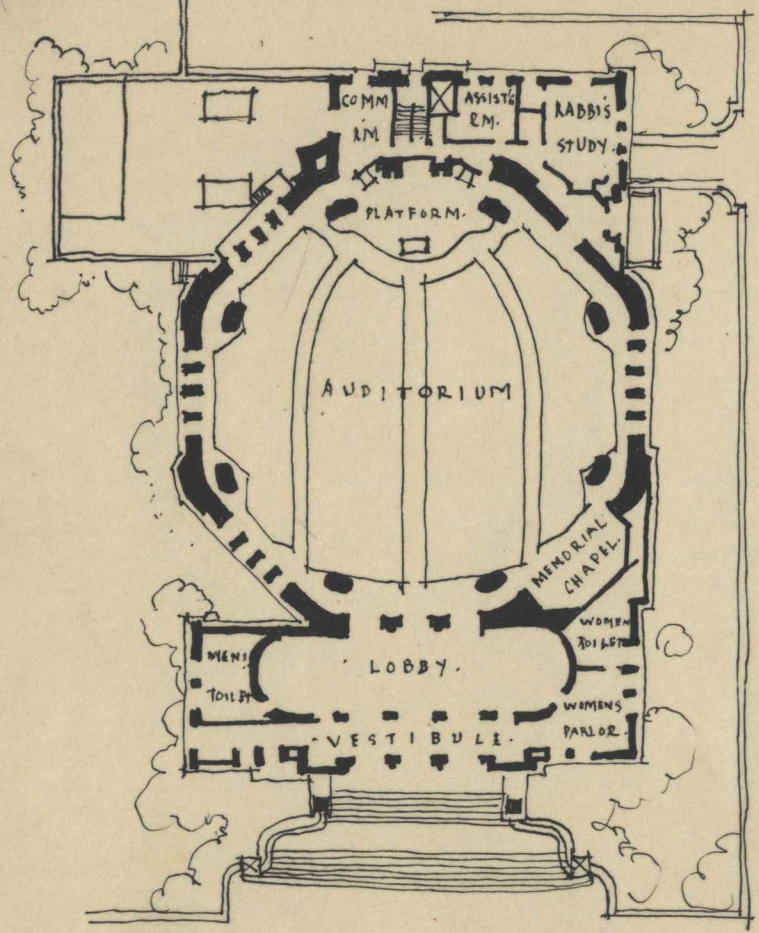
(c) A general auditorium to be used by arrangement for class instruction as well as for services before and after Study periods.

* * *

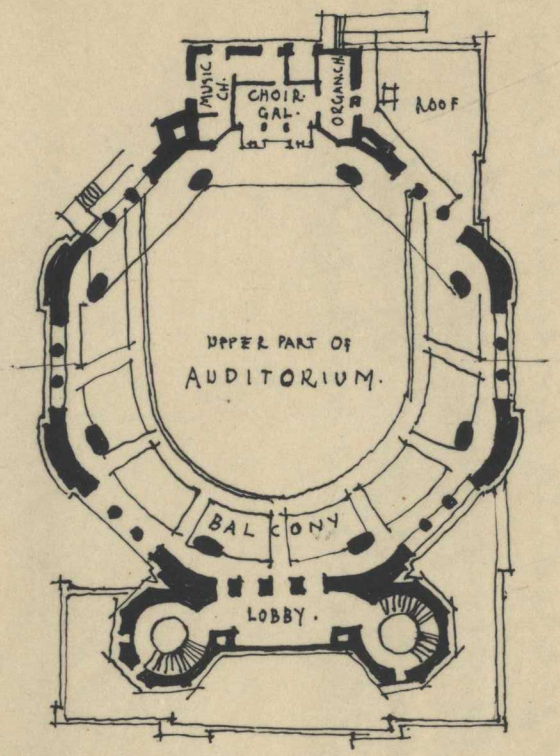
Style

The Christian Scientists prefer the the classic Roman with its variants Colonial, Georgian etc. Symbolism is eschewed entirely but the limited use of quotations in lettering is approved. The classic

severity of the generality of the church designs makes simplicity of decor-ation and colouring rather to be preferred to presumptuousness of carving and enrichment of moulding and quiet dignity to multifarious interest.



· GROUND · FLOOR · PLAN ·



· BALCONY · PLAN ·

· A MODERN · JEWISH · SYNAGOGUE ·

· ISIAH TEMPLE. CHICAGO · ILL · BY · A.S. ALSCHULER ·

Chap 3.

Plan & Design of Jewish Synagogues

Centuries of persecution so scattered the Jewish race that no great ancient edifices stand definitely to point the way to the development of a distinctly Jewish style.

* * *

It is reasonable to assume that the development of the Byzantine style of Architecture embraced and incorporated existing themes of Jewish origin. Fragments from an ancient Hebrew Temple recently unearthed in Palestine contain motifs that closely resemble those used in the Architecture of the Byzantine period.

* * *

Many Jewish Temples and Synagogues erected in the last few decades have been in too many instances without Architectural individuality and even those designed and executed masterfully in the Greek, Roman, Gothic or Renaissance styles seem upon consideration neither well

suited to, nor properly expressive of their function.

* * *

Recent successful Jewish temple designed with full regard to modern Jewish requirements is the Isiah Temple Chicago Ill. by Alfred S Alschuler, Architect, the plans of which are shown in the accompany-ing figure. The plan adopted is very similar and probably influ-enced by that of the Synagogue at Essen en Ruhr, Germany, one of the few really meritorious examples of Jewish Temple Architecture.

* * *

Plan The general features of this type of plan are :-

(a) The octagonal main room or auditorium, surmounted by a lofty dome supported on penetrating vaults, springing from eight piers freestanding within.

(b) In order to develop the necessary seating capacity and still main-tain a room whose dimensions

would not place any part of the congregation too remote from the pulpit, a balcony is introduced. This is planned semi-circular in form following the centre of the dome and being kept shallow in projection to preserve, at the main floor level, vision of the arches and piers from which the dome would spring.

(c) The Ark correspondingly important in the Jewish ritual to the Altar in liturgical churches, is placed, in this type of church, below the vaulted penetration at the east end of the temple, directly opposite the main entrance and placed below the front of the choir balcony which is placed facing the main auditorium similarly to that in the large baptist church illustrated in the accompaning figure.

(d) The Grille treatment screening the organ forms a pleasing frame for the whole of this east end unit.

* * *

Chap. 4.

Details of the Plan. Non-ritualistic Churches.

Apart from general principles in planning, there are many features which must be taken into consideration if the whole is to be a success.

* * *

By-laws and local building laws relating to churches and public halls must be complied with.

* * *

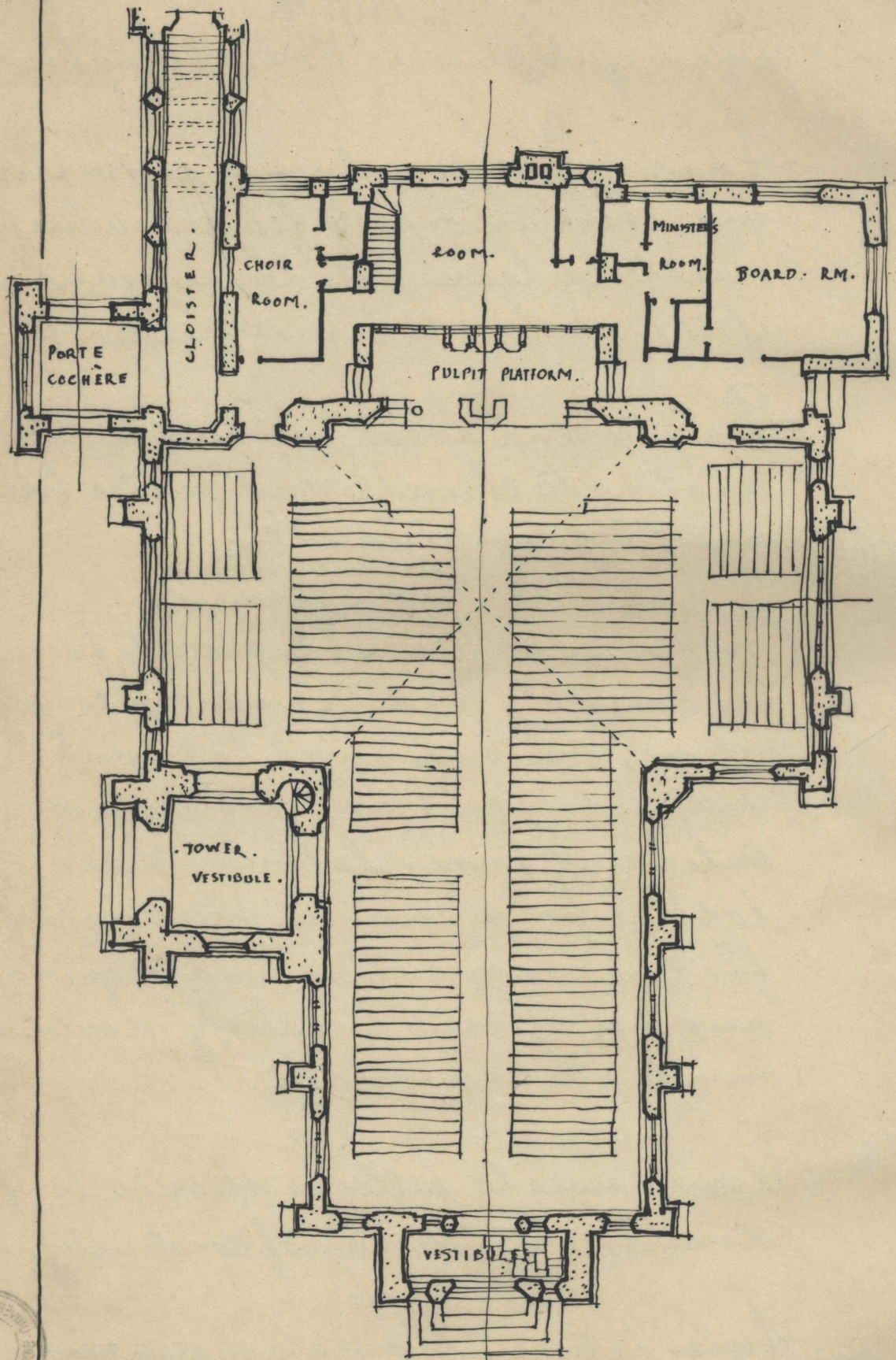
Entrances sufficient to provide facility for assembly and dismissal of congregation; doors arranged to prevent draughts of cold air; provision of Outer and Inner lobbies, Outer lobbies for a common meeting place for the congregation and required number of exits to satisfy regulations must all be provided.

* * *

Staircaseses to galleries should be of stone or other fireproof construction

* * *

Aisles between the seats should never be less than 3'-6".



SUCCESSFUL APPLICATION OF GOTHIC PLAN TO A MODERN PRESBYTERIAN CHURCH

The Pulpit:-

Pulpit Position:- See under various denominational requirements.

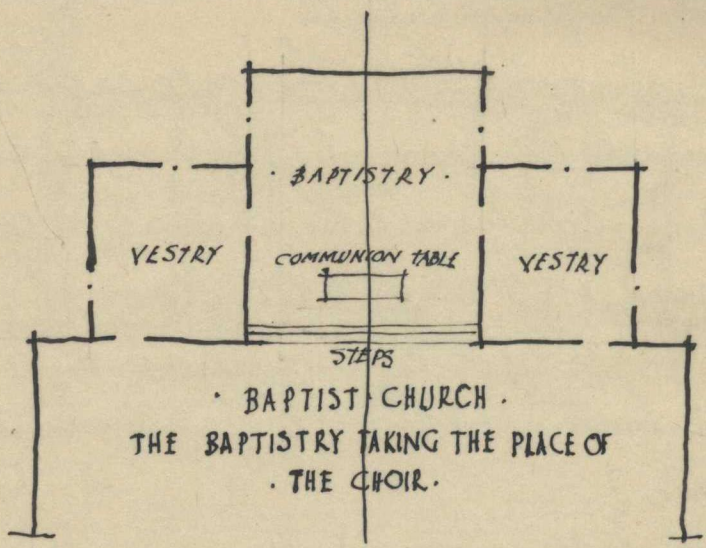
Height & Size:- The rule is that the preacher must be seen by all members of the congregation when seated in their pews. 5'-6" is ht. of floor of pulpit for a galleried church and 4'-0" for a church without galleries

* * *

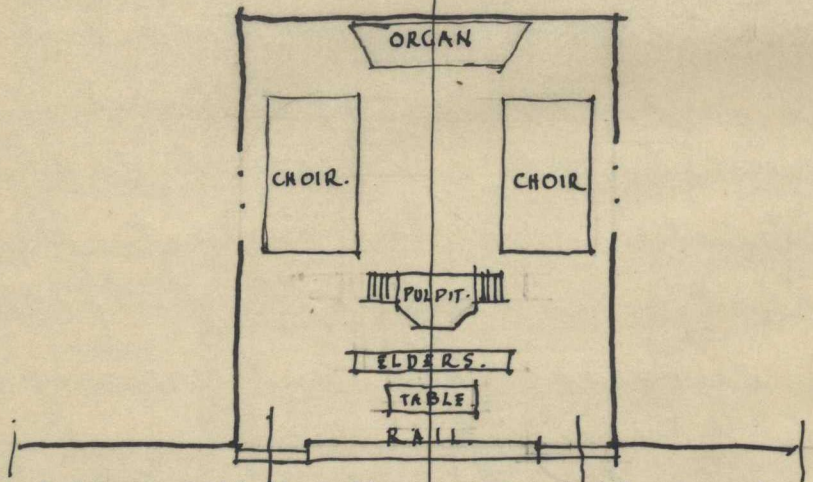
The difficulty in designing a pulpit is to construct it in such a way as to suit speakers of different stature and habits in respect to their elevation in the pulpit. Movable platforms inside the pulpit are not a success. The best arrangement is to keep the front comparatively low and to provide a suitable arrangement for raising and lowering the desk position, which must be large enough to accommodate the open Bible.

* * *

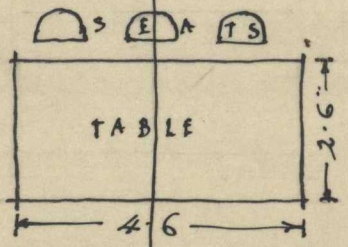
In many ancient churches especially on the continent of Europe, outside pulpits were not uncommon. They



BAPTIST CHURCH.
THE BAPTISTRY TAKING THE PLACE OF THE CHOIR.



A SATISFACTORY ARRANGEMENT FOR A NON-CONFORMIST EAST END.



would be particularly adaptable in many communities in Australia where the open space in front of the church could form a delightful open air auditorium for the summer months.

* * *

The Communion

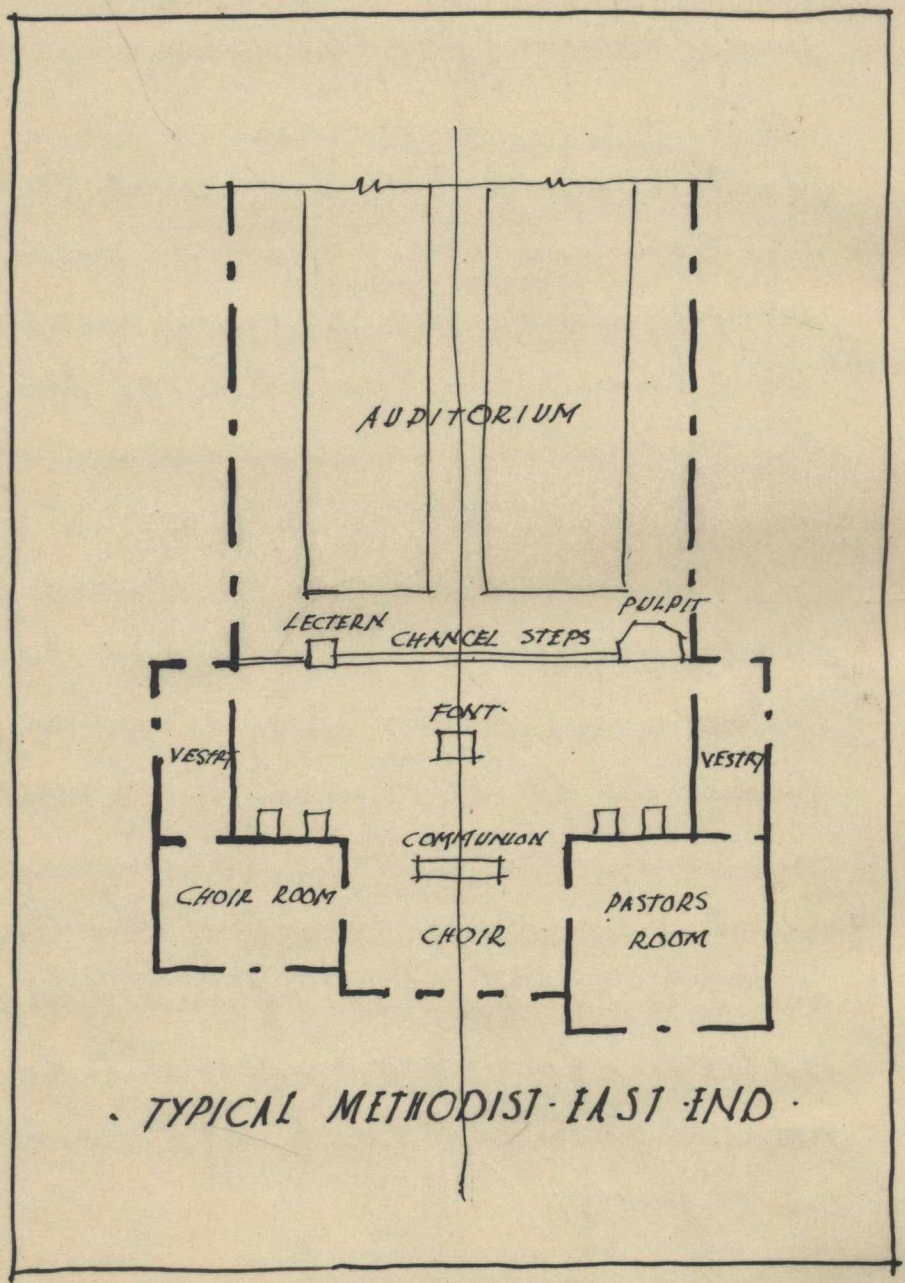
Congregationalists & Baptists

With Congregationalists and Baptists, the Communion preserves much of the simplicity of the family meal, and the elements are partaken of seated. The ministers and deacons are seated at a table about 4'-0" x 2'-6". This is often placed on a raised platform in front of the pulpit, the platform being about 1'-0" or 1'-6" above the floor of the church. A railing encloses the table, allowing sufficient space in front of the table for the celebration of marriages. A satisfactory arrangement for a nonconformist last end is shown in figure.

* * *

Methodists

The Methodists have continued the practice of the Anglican church and partake of the Sacrament kneeling. In many cases the Communion table is placed



. TYPICAL METHODIST · EAST END ·

on a raised platform in front of the pulpit and provision is made for the communicants to receive the bread and wine kneeling, whilst supported by leaning against what is known as the communion rails, which are continued all round the platform. In older Methodist churches this is usually the arrangement; in mod-ern Methodist churches it is becom-ing more common to place the communion table at the end of the chancel after the manner of the Anglican church, an arrangement which lends itself to a more satis-factory treatment from an architec-tural point of view.

* * *

Choir There is no sanctuary in a nonconform-ist church, the choir generally taking its place. The choir and organ should be kept as close as possible which is fully referred to in the Chapter on Pipe Organs. The choir and organ have generally been placed on a platform at the back of the preacher. This arrangement is not most satisfactory

as these features are not usually an architectural embellishment and are not things that the congreg-ation assembles to look at; consequent-ly they are often unduly obtrusive.

* * *

From an architectural point of view the arrangement of the Chancel with Choir seats on either side and a Chamber for the Organ is most to be preferred

* * *

Font — Unlike the Anglican church which often has the font near the western entrance, the nonconformist den-ominations give it a more prominent position in view of the whole congreg-ation and near the Communion table. In the nonconformist service the whole congregation takes part in the ceremony.

* * *

Baptisteries & Baptist Churches — The Baptist denomination still preserves the ancient method of baptism by immersion when receiving converts into church membership. The Baptistery should be placed in a position

as central as possible and easy of approach from the vestries on either side. An ideal arrangement is for the baptistery to take the place of the ritualistic chancel.

* * *

Owing to the possible unfamiliarity of some Architects with the rite of baptism by immersion, it may be permissable to offer some suggestions here that will be of value in plann-ing buildings for churches that practice this ordinance. The baptistery should not be overelab-orated nor planned for any false or theatrical effects, such as is often advocated, by the use of potted plants, scenic background and lighting effects.

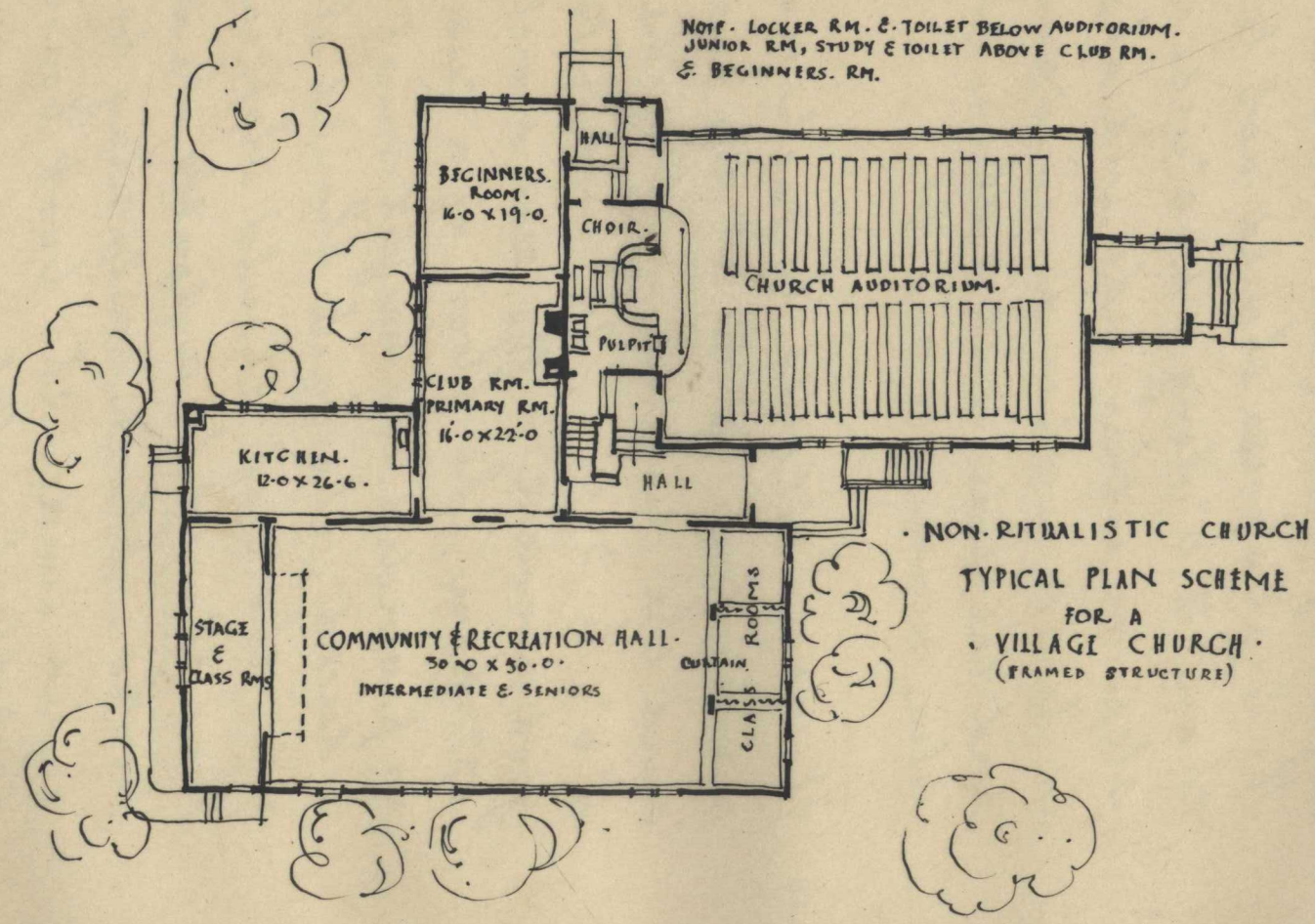
* * *

Immersion is a symbol of death and resurrection as well as of cleansing and to emphasise that thought the baptistery might be more app-ropriately given the simplicity, even the austerity of a tomb. Entrances to baptisteries should be by ramps sufficiently concealed to permit the

candidates and minister to come into view after being in the full depth of water (about 3'-0" to 3'-6"). The baptisteries should not be less than 7'-0" long x 4'-0" wide with steps on either side and should be lined with impervious cement and the sides and bottom with tiles, mosaic or marble.

* * *

Seats The space allotted to each person varies from 18" to 21" per person, and the distance apart of the pews 2'-6" to 3'-0". 20" and 2'-10" is good average. The seat should be 17" from the floor, if a cushion is provided the height must be reduced; the back should slope and the seat should slope inwards. There should be a double shelf for books. Cloak rails may be pro-vided under the book boards on suitable brackets and wooden ledges to support the hats just above the floor level. The framing of the seats should be carried down to the floor level to prevent draughts.


NOTE · LOCKER RM. & TOILET BELOW AUDITORIUM.
JUNIOR RM, STUDY & TOILET ABOVE CLUB RM.
& BEGINNERS. RM.
BEGINNERS. ROOM. 16·0 X 19·0.
HALL
CHOIR.
CHURCH AUDITORIUM.
PULPIT
CLUB RM. PRIMARY RM. 16·0 X 22·0
KITCHEN. 12·0 X 26·6.
HALL
STAGE & CLASS RMS
COMMUNITY & RECREATION HALL · 30·0 X 50·0 ·
INTERMEDIATE & SENIORS
CURTAIN
ROOMS
CLA
· NON·RITUALISTIC CHURCH ·
TYPICAL PLAN SCHEME
FOR A
· VILLAGE CHURCH ·
(FRAMED STRUCTURE)

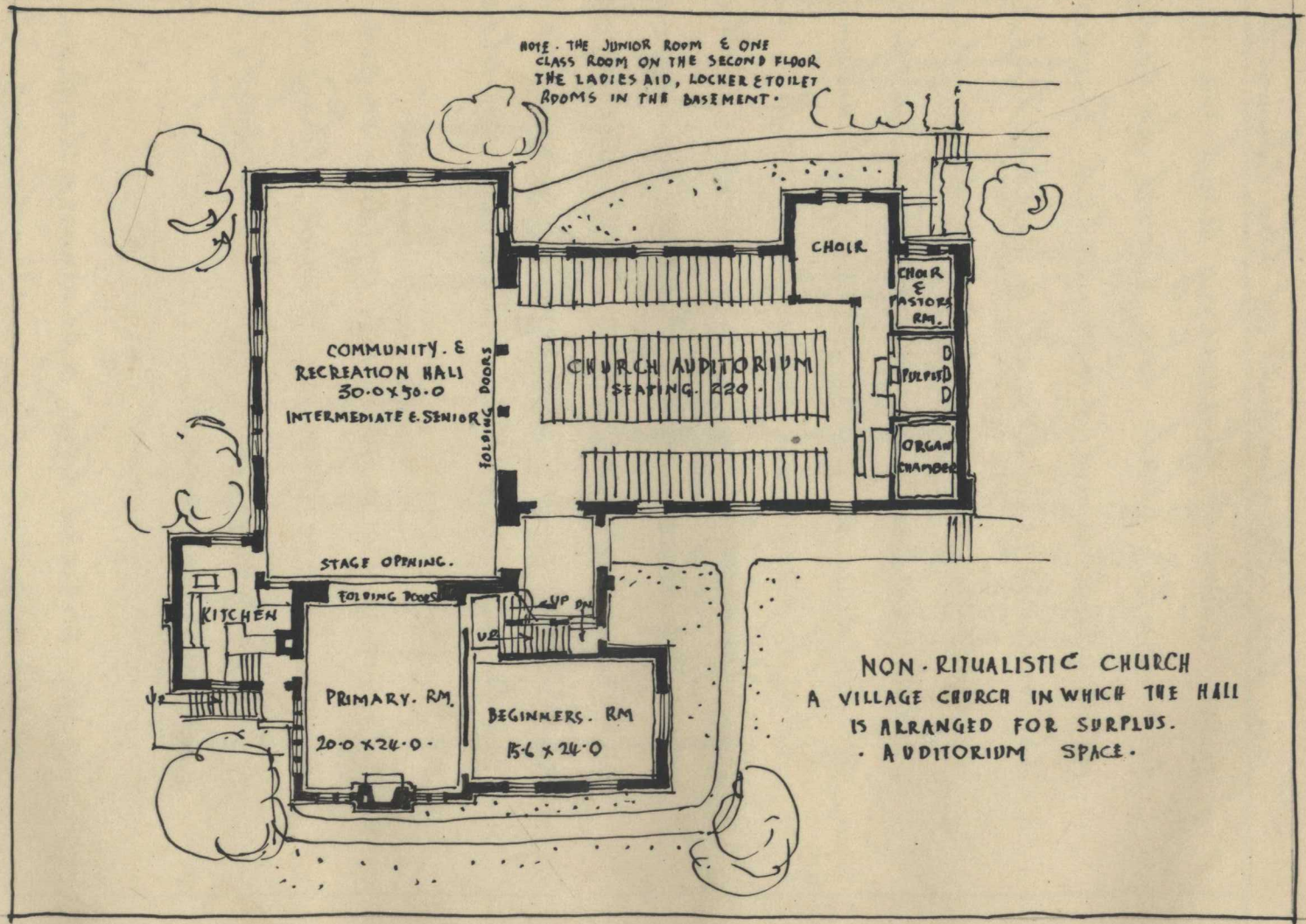
Design of the seat ends will depend on the treatment of the church interior. Avoid staining and varnishing the seats. Let the wood be carefully selected and then oiled twice; allowing at least a week to pass between the first and second coats and then finish with a good rubbing of beeswax. The dull polishing of the beeswax gives full value to the texture of the wood and if the pews are rubbed and polished annually with beeswax and turpentine, they will acquire a rich warm tone and texture unobtainable in any other way.

* * *

Chairs Church chairs are often more desirable than fixed pews, they are inexpensive, comfortable and neat in appearance.

* * *

Galleries To increase the accommodation galleries are often introduced. In the gothic type of plan they are successful if placed in the end facing the pulpit. They may also be placed in the transepts. The transept forming a natural bay for a gallery.


NOTE. THE JUNIOR ROOM & ONE CLASS ROOM ON THE SECOND FLOOR THE LADIES AID, LOCKER & TOILET ROOMS IN THE BASEMENT.
CHOIR
CHOIR & PASTORS RM.
COMMUNITY. & RECREATION HALL 30-0 x 30-0 INTERMEDIATE & SENIOR
FOLDING DOORS
CHURCH AUDITORIUM SEATING 220.
PULPIT
ORGAN CHAMBER
STAGE OPENING.
FOLDING DOORS
KITCHEN
UP
DN
PRIMARY. RM. 20-0 x 24-0.
BEGINNERS. RM 15-6 x 24-0
NON-RITUALISTIC CHURCH
A VILLAGE CHURCH IN WHICH THE HALL IS ARRANGED FOR SURPLUS. AUDITORIUM SPACE.

The construction of seats in the gallery should be so that the preacher is visible to each member when seated. A lesson can be learned from the levels of seats in a theatre. The seats should be raised away from the pulpit as well as from front to rear. A steel girder construction is usually necessary for safety in galleries.

* * *

Vestries

Two vestries at least are necessary in nonconformist churches.

(1) for the minister
(2) for deacons, stewards or elders.

The ministers vestry need not be large, the other should be large enough for committee meetings during the week.

* * *

Other necessary provisions are:-

(1) A ladies church parlor
(2) Lecture Hall.

Apart from the Sunday School with which we will now deal.

* * *

Chap. 5.

Sunday Schools

Perhaps the most revolutionary changes in church planning in recent years, relate to that part of church work that has come to be looked on by church leaders from a technical view point - namely religious educat-ion, or to use a more familiar nomenclature - the Sunday School.

The modern conception of religious education is based on psychology and pedagogy. The lesson material is graded to suit the mental capac-ities of the various age groups in the school. Not only is the lesson mat-erial graded but the devotional and inspirational parts of the pro-gramme as well. It will be seen at once that this change minimises the importance of mass gatherings of the school.

The modern church school is divided into seven departments.

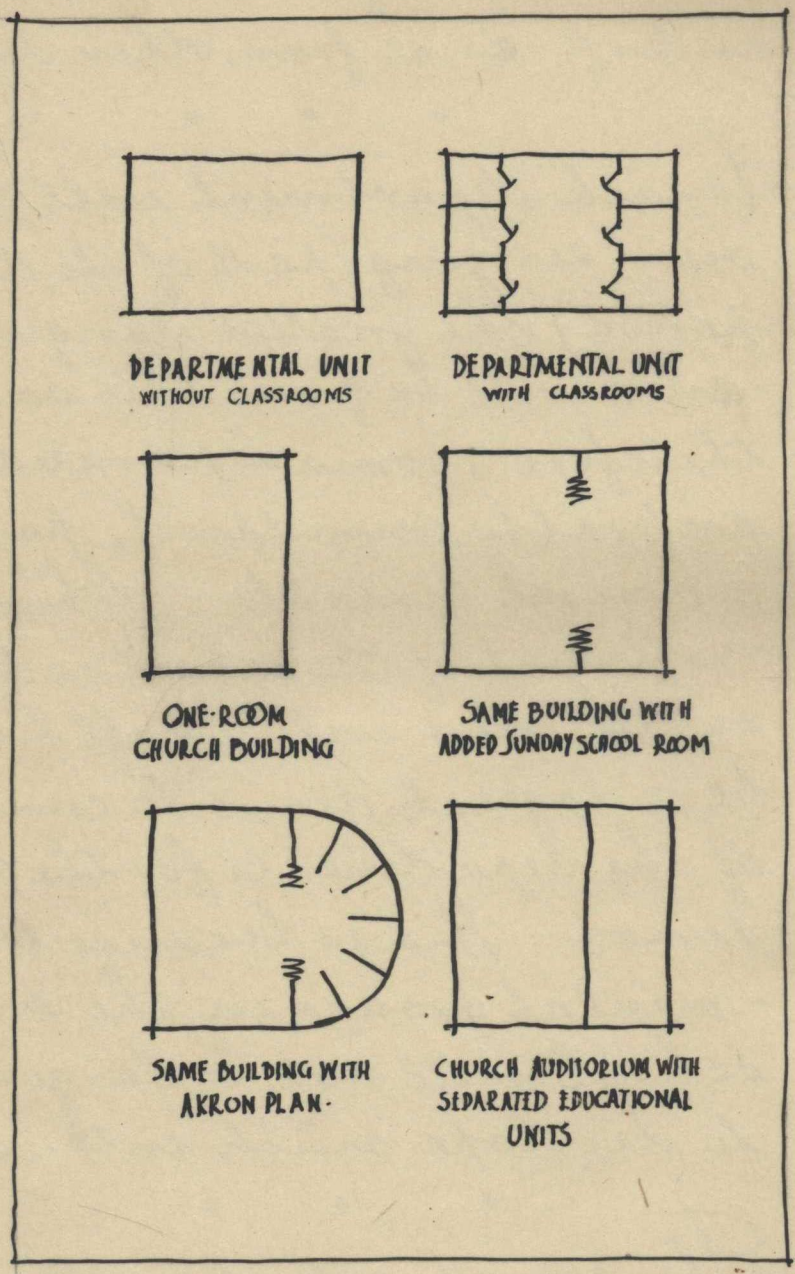
Each of these departments must be provided with means of following its own programme without interference from other departments.

* * *

As each department will have its own singing (part of its devotional period) the greatest danger of interfer-ence will be from this source; therefore rooms separated by solid, preferably soundproof, partitions are most suitable. Where the en-rollment of the school is two hundred or less there will, in all likelihood, be a logical desire to combine some of the departments for the devotional period. This is because the depart-mental groups in the smaller school will not be large enough to develope much enthusiasm.

* * *

The social activities of the church, even when the school is small, will require one large room. This can be used very well for the union of departments for their devotional service (see plans).


DEPARTMENTAL UNIT
WITHOUT CLASSROOMS
DEPARTMENTAL UNIT
WITH CLASSROOMS
ONE-ROOM
CHURCH BUILDING
SAME BUILDING WITH
ADDED SUNDAY SCHOOL ROOM
SAME BUILDING WITH
AKRON PLAN.
CHURCH AUDITORIUM WITH
SEPARATED EDUCATIONAL
UNITS

There is some difference of opinion regarding the value of individual class cubicles within the department rooms. A modern tendency is:-

Scheme I

Department

Assembly Space	Class rooms
7 sq. ft. per person	8 sq. ft. per person.

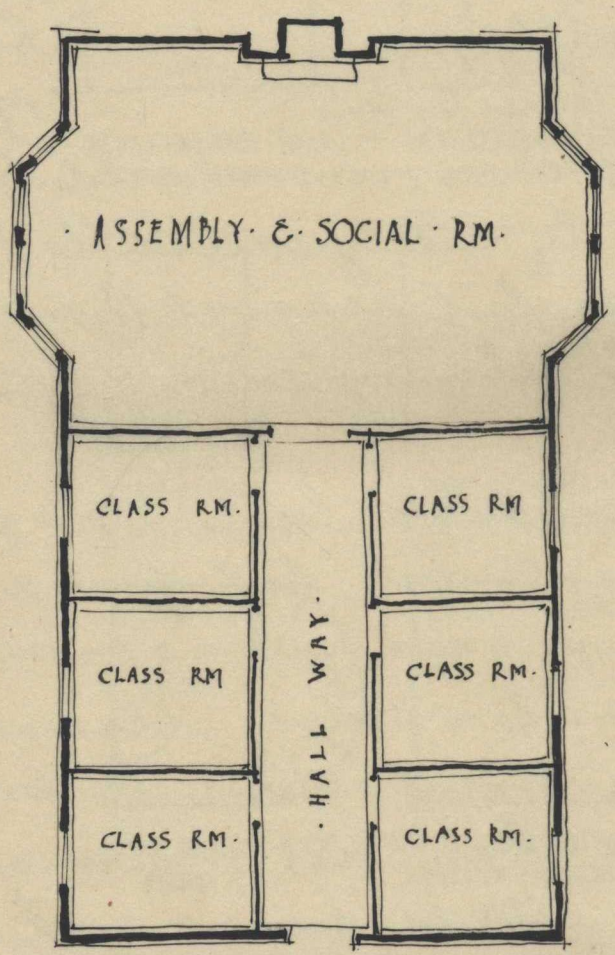
These class rooms should be so arranged as to be easily accessible to the assembly space but separated from it and from each other by solid partitions.

* * *

Scheme II

No separate class rooms for each department, but just a large general room giving more supervision and more order. Classes in an open department must be small, not more than five or six in each and should have a circular table three feet in diameter for each group. In this scheme 15 square feet per person should be allowed for good circulation and suitable equipment. This scheme gives more attractive quarters and allows rooms to be used for social functions.

* * *



AN ARRANGEMENT FOR DEPARTMENT SHOWING SEPARATE CLASS ROOMS ESPECIALLY SUITED TO INTERMEDIATES & SENIORS.

The relative sizes of the various departments can be judged by the per centage of the total enrolments derived from a survey of over a thousand schools by one authority.

Beginners -	10 %.
Primary	12 %.
Junior	14 %.
Intermediate	12 %.
Senior	10 %.
Young People.	12 %.
Adults.	30 %.

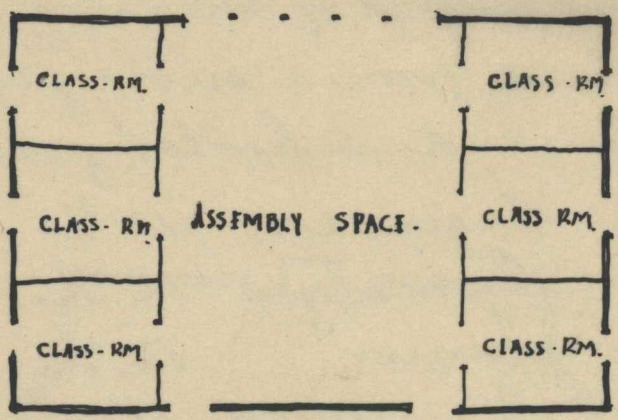
* * *

Department rooms should be arranged in plan so that there will be an orderly progression through the grades and thus help to convey the school idea to the minds of the pupils.

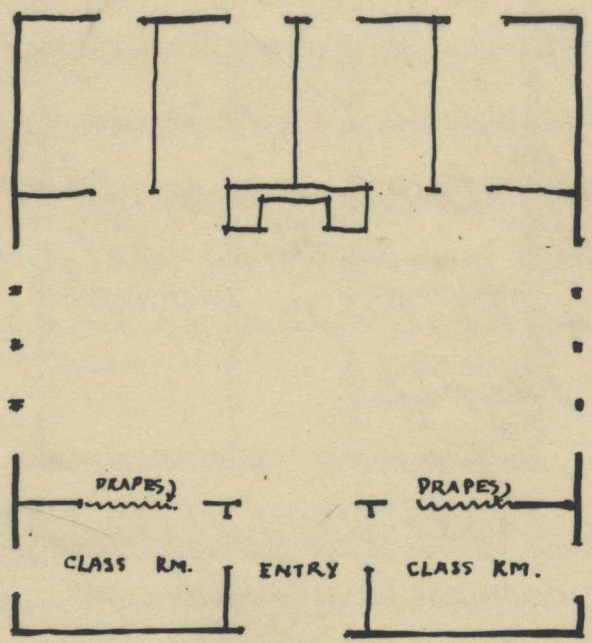
* * *

It is especially desirable to group the elementary departments and to provide:-

(a) A nursery for children less than four years and a parents room, ~~&~~ two according to the size of the school.



MODERN DEPARTMENT UNIT SUGGESTED BY.
DR. H.E TRALLE. A WELL-KNOWN AUTHORITY.



A VARIATION OF THE ABOVE SCHEME IN WHICH THE STUDENTS DO NOT ENTER FACING A GLARE.

(b) Toilet rooms with junior fixtures for beginners.
(c) Boy- and Girl toilet rooms convenient to other elementary departments
(d) Also for each department:
Storage rooms
Supply cases
Drinking fountains
Coat rooms.
(e) Individual class rooms for pupils of higher grades.
(f) Library.

* * *

Another authority states:
(a). There should be no less than three rooms in addition to the church auditorium. a min-imum of five rooms if possible.
(b) Walls and floors to be as nearly sound proof as possible.
(c) In at least three of the depart-ment rooms, provide 14 square feet per pupil.
(d) Provide proper heating, lighting and ventilation; do not have pupils facing a glare.
(e) If the basement floor must be

used, same must not be more than 3'-0" below grade.

(f) At least one room to be arranged for use for special gatherings of church and community.

(g) Sanitary and drinking facil-ities of the best quality, to be provided and of proper height.

(h) Plan built-in cabinets for care of books, supplies etc.

(i) Make provisions for coats etc.

(j) Have walls and woodwork carefully planned as to colour schemes, light, and general aesthetic value.

(k) Plan for proper hangings and pictures, eliminating all un-sightly objections.

(l) Employ competant architectural service for the smallest building.

Part 3.

General

Chapter 1. The Relation of Pipe Organ to Church Architecture

Chapter 2. Lighting in Churches.

Chapter 3. Ventilating and Heating Churches

Chapter 4. Acoustics in Churches.

Chapter 5. Site and Cost of Churches.

Chap. 1.

The Relation of Pipe Organs to Church Architecture

Position

We find that tradition has influenced to a large extent the placing of pipe organs in churches. It may seem strange to say, but is nevertheless true, that following tradition often results most unfortunately; for the organ of to-day is wholly different mechanically and tonally from the old continental organs which so firmly established precedent.

* * * *

It may be taken as an axiomatic proposition that the organ should be as close as possible to the singers or choir, or at any rate the console and organist should be so placed, while the actual instrument may be at some distance, fitted with electric action.

* * *

The Organ Chamber

The ceiling of the organ chamber wherever located should be continuous with the main auditorium or as nearly so as possible, for it is well known that sound has a tendency to follow a flat surface and any arch

in front of the chamber which is below the line of the chamber ceiling tends to catch the sound and reflect it back into the chamber.

* * *

A safe rule to follow is that the chamber should be twice as wide as it is deep, and as high as it is wide. Structural conditions sometimes render this impossible but it is a good starting place and one which should be striven for.

* * *

Again an organ massed together (fig 2.) is always most effective, more so than when divided, and yet when divided this handicap can be overcome to a large extent by having the openings of each chamber opposite to each other.

* * *

Chamber Openings

A chamber should never open into a trancept for in that case the tone from this section will travel in a direct line down the trancept and will not assimilate with the remainder of the instrument placed elsewhere and its tone will be the impression received by those sitting in that area, the

rest of the organ being lost to them (fig 1.) It is especially bad for the organist when the console is in the chancel, for he cannot possibly hear the tone as it is heard in the church, neither can he form any adequate estimate as to how it balances with the rest of the organ.

* * *

Where there are side galleries no opening from a chamber should abut therein, otherwise the sittings there will be found to be untenantable.

* * *

Scheme I. Beyond any question the most satisfactory results are obtained when the tone is delivered and directed at the singers or choir. An organ "divided", and on either side of the chancel, with openings into the chancel will always pave the way for a successful installation, for the tone will intermingle and go into the nave as one solid sound and an organ so placed will be tremendously effective in antiphonal work either choral or instrumental.

* * *

Scheme II: The effectiveness and solidity which characterises so called "West end" organs are due not so much to their contents, but to the fact that they are ideally located. They are high up in the church, in what is practically an open space with no obstruction in front of them, hence the tone must of necessity come out into the nave in one unity or body and there is no chance for interference with it in any way. With modern electric action this arrangement is entirely feasible even with a Chancel choir, provided as stated before that the console is in the Chancel

* * *

Scheme III We have in mind a location which is seldom found but which is most satisfactory musically, writes Calib W. Cameron in the "Architectural Review", and that is for the Chamber to be behind the Chancel, the tone coming out well up over the Altar. In this case the opening must be treated architecturally with a decorative screen thus adding to the

mystery of the installation.

* * *

Swell Boxes

Swell boxes of course must be provided and care should be taken in their placing. A structural swell box is by far the most effective and should be planned and built as part of the building. Its walls may be of concrete or of terra cotta block or lathed and plastered the finishing coat to be of Keen's cement, thoroughly smoothed over with all corners rounded in order to ensure the best possible reflecting surface for the sound. The floors should be of concrete and have two coats of oil deck coat applied. The doors should be of the "refrigerator" type with bevelled jambs to prevent any leakage of tone and there should be a 4" x 4" wood frame set around all four sides of the opening at the front, fastened solidly to the walls and floor with expansion bolts to which the organ builder may affix the swell shades and their motors. As these shades must move oftimes with great rapidity, absolute

rigidity in the frame is of primary importance.

* * *

If the chamber should be of necessity very deep and narrow, which is unfortunate, the ceiling must be sloped upwards from the rear with a minimum height at that part of 12'-0" and if structural conditions at the front are such that there is a pocket at the front of the interior of the chamber (fig 4.) between the top of the opening and the ceiling, the face of the wall should be perfo-rated at that point to prevent the catching and reflecting back of the tone. Of course the higher the floor of the chamber is in relation to that of the church, the flatter the ceiling of the chamber must be. But it must be remembered that it is not possible to place one swell box in front of another. They must be side by side, or one superimposed. The former position is by far the best in every way. The unenclosed division can be located in front of

a swell box without doing any injury to the tone from the latter and no obstruction is incurred to the free "speech" thereby.

* * *

Conduits etc. Thought should be given in the preparation of the structural plans to provision for conveying wind from the blower to the organ chambers. Each should have its individual supply and the ducts for these should be installed as the building progresses, thus avoiding subsequent cutting and patching or having to run them on the outside of walls or ceilings. This also applies to the conduits for the requisite electric cables, running from the console location to each chamber and to the motor room, for action, work and control of the remote starter.

* * *

The Blower The blower should never be located in the organ chamber; it should be placed in a clean dry dust-proof room in a basement or cellar with a concrete floor say 8'-0" x 10'-0" where

the mechanism will be easily accessable for observation, oiling and general care. The air which is sent from this room to the organ must be dry and of about the same temperature as that maintained in the chambers for cold air sent in will immediately put the instrument out of tune. This can be regulated by the installation of a radiator under thermostatic control.

* * *

In the case of a large organ which has an echo division, that chamber should be located as far as possible from the main organ and as high in the building as can be managed.

* * *

Radiator steam mains, ventilating ducts, rain pipes, or waste pipes must under no circumstances be run through the space allotted to the organ. Plumbing pipes or water mains must not be run above the hung ceiling of the organ chamber, the danger of damage to the organ in the case of a burst pipe

is too great, as nothing save absolute destruction will so damage an organ as water. Roofing and flashings should be particularly sound over the organ chambers. There should be no windows to the chambers, but they should be equipped with base plugs for electric lighting.

* * *

appearance As to the appearance of the instrument after installation, that depends largely on the style of the interior of the Church. In many instances the openings are hidden from observ-ation by the insertions of screens, more or less ornate as desired, of plaster or wood. If of plaster care should be taken to avoid masses of solid areas lest the tone be inter-fered with. The openings in the screen should predominate. A copper wire mesh applied at the rear of the screen will prevent those in the auditorium seeing the movements of the louvres. This will in time, by reason of the atmos-pheric influences take on a lovely patina with a varigated colour of

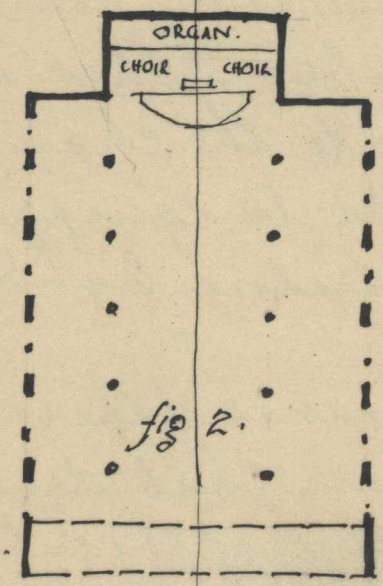


fig 2.

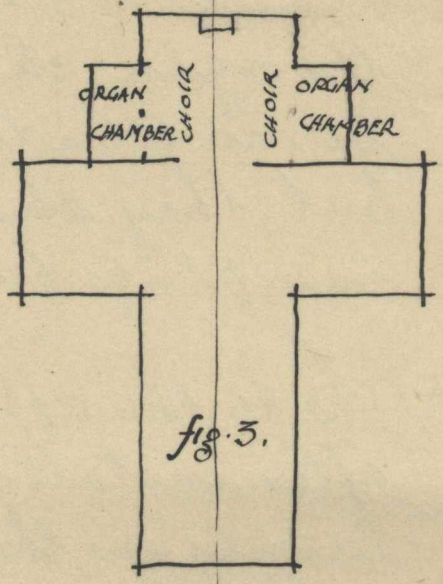
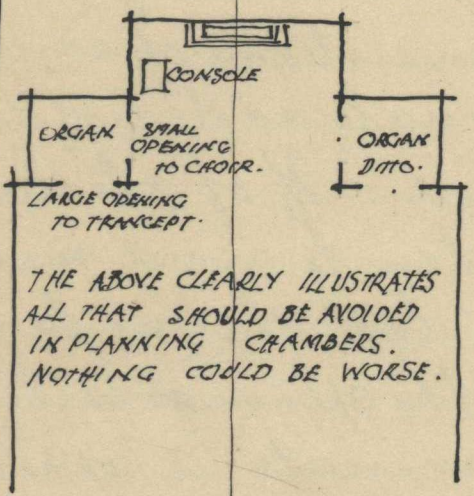


fig. 3.



THE ABOVE CLEARLY ILLUSTRATES ALL THAT SHOULD BE AVOIDED IN PLANNING CHAMBERS. NOTHING COULD BE WORSE.

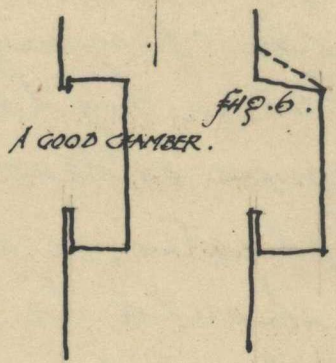


fig. 6.

A GOOD CHAMBER.

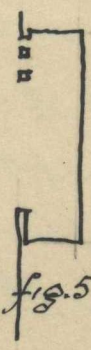


fig. 5.

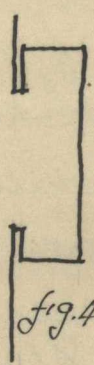


fig. 4.

red, yellow, purple etc which will be very satisfactory to the eye.

* * *

The Console. The location of the console has, in the last analysis, a great deal to do with the success of the installation, for the organist must be in a position to hear what effects he is producing. This is sometimes difficult but worthy of study. The ideal location with a divided organ is in the centre of the chancel i.e with the pulpit in nonconformist churches, but in liturgical services this is impossible and it must be placed at one side of the chancel. It should never be placed under the organ or, worst of all, outside the auditorium. In the console a space approximately six feet square must be apportioned and it should if possible face the singers.

* * *

Chap. 2.

Lighting in Churches

One of the most important and at the same time subtle, influences that lend atmosphere to the church interior is the lighting artificial or otherwise.

* * *

In Ritualistic Churches where the Altar is the centre of interest and should stand out in radiant contrast with the rest of the church, it is a delicate problem indeed to furnish adequate illumination without detracting from the glory of the Sanctuary.

* * *

An east window although common enough in small churches is distinctly disadvantageous on this account. The congregation faces directly the source of light and the illumination on the Altar is not apparent.

* * *

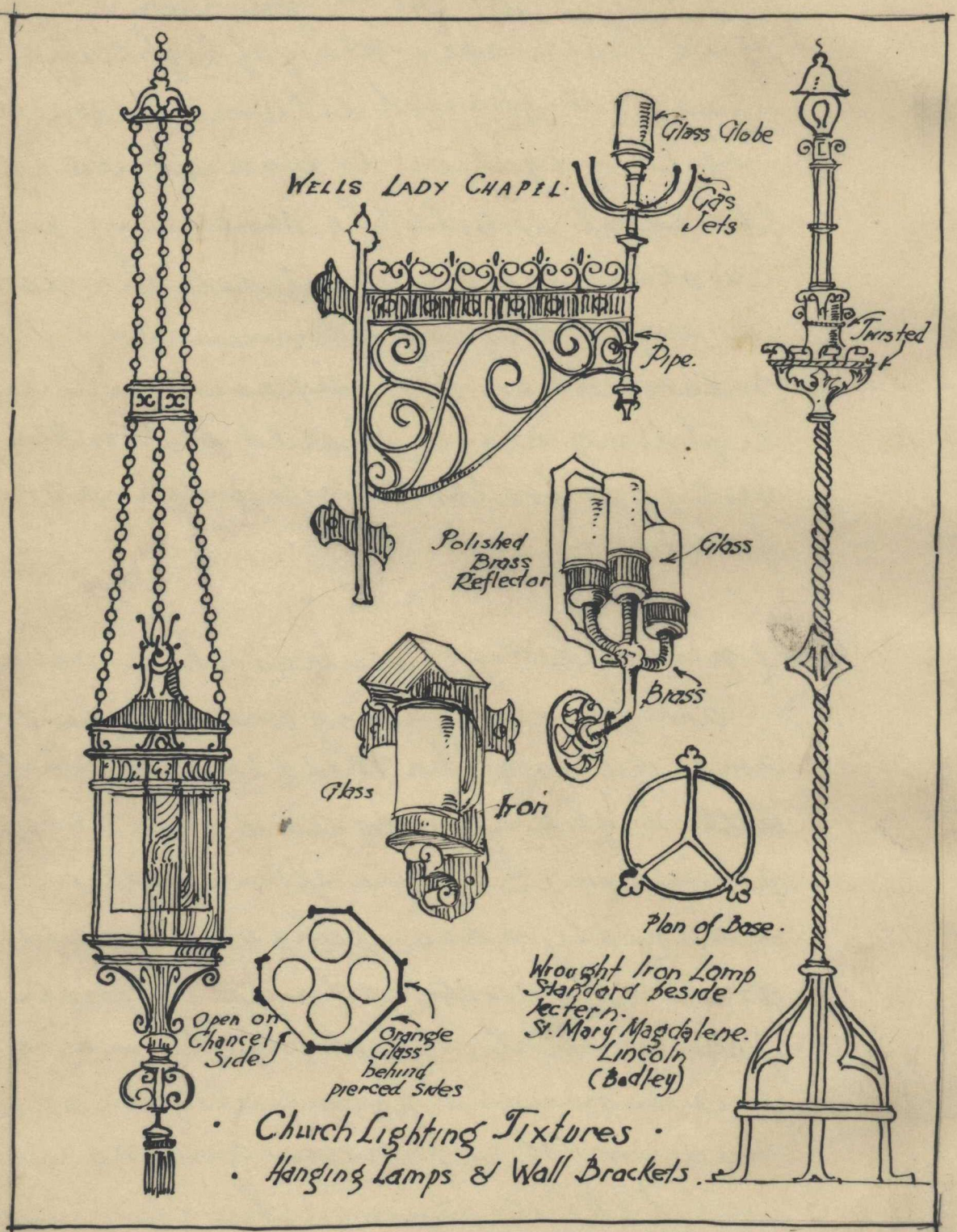
Too much lighting, says "Lutheran Church Art" destroys the devotional atmosphere which all churches ought to have. Small windows high above

the floor and electric lights of the lantern type for night use will give the proper play of light and shade. Sufficient illumination for the congregation to read would be the ideal while the sanctuary, pulpit or other centre of interest should be more highly illuminated. This means that two separate artificial lighting plans should be worked out, one for the sanctuary and one for the nave.

* * *

In the early centuries there was no artificial lighting in our churches and during the Middle Ages what little lighting was used was very primitive. Electric illumination is a rapidly advancing science and great difficulty is found in keeping pace with it. Electric illumination has enormous potentialities as a medium of expression and no doubt will take its place in church ritual. Next to music light is perhaps the most powerful agency that can keep the congregation in a state of emotional accord

* * *


Glass Globe
WELLS LADY CHAPEL.
Gas Jets
Pipe.
Twisted
Polished Brass Reflector
Glass
Brass
Glass
Iron
Plan of Base.
Wrought Iron Lamp Standard beside lectern. St. Mary Magdalene. Lincoln (Bodley)
Open on Chancel Side
Orangle Glass behind pierced sides
· Church Lighting Tixtures ·
· Hanging Lamps & Wall Brackets ·

Methods

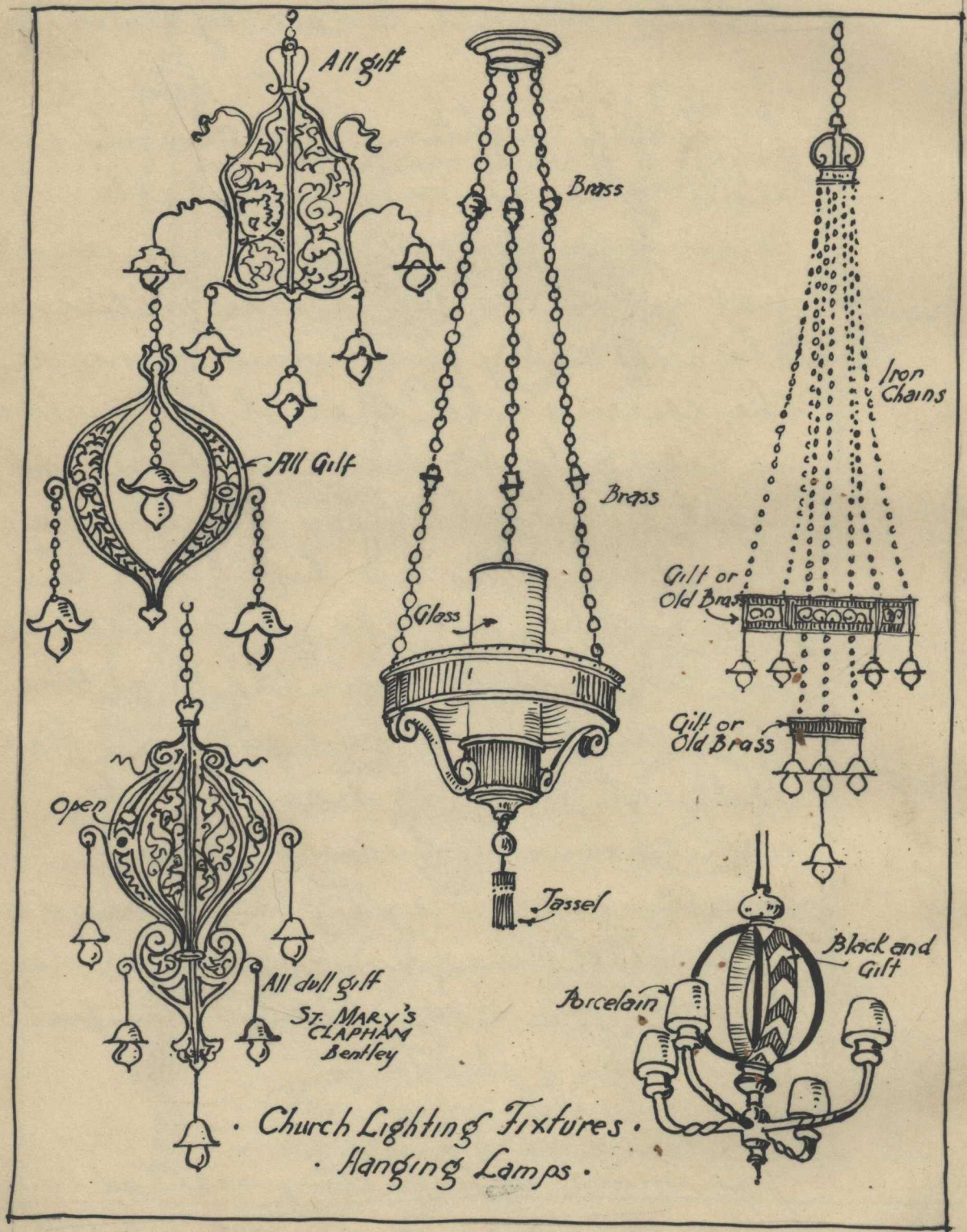
There are many methods of nave lighting in use. They range from totally indirect to totally direct lighting.

* * *

Indirect lighting for a church is as a general rule unsuitable. The ceiling is generally too high and not white and the ratio between the intensity of illumination on the ceiling and that at the pew level is usually so great that the illum-ination on the floor is inadequate. Most churches are lofty and the higher they are the greater will be the contrast between the brightness of the ceiling and the light on the floor. Indirect lighting has distinctly utilitarian advantages in a drafting room and other places where absence of shadows is an advantage, but no good architecture is improved by killing shadows.

* * *

The most satisfactory method is by pendant fixtures emitting light in all directions, creating a sufficient intensity at pew level for comfortable



· Church Lighting Fixtures ·

· Hanging Lamps ·

reading and lighting the remainder of the Church with relatively dim light, two rows of fixtures being much more satisfactory than a central row.

* * *

To summarise the points which the architect and illuminating engineer should both strive for in the artificial lighting of churches, we have essentially these:-

(a) The lighting should contribute to the Church atmosphere in such a way as to create a harmonious background for the service.

(b) It should preserve the aesthetic appeal of the architecture and the decorations and present them in their proper relationship.

(c) It should be designed for the absolute comfort of the congregation.

* * *

Chap. 3.

Ventilating & Heating Churches

Many a good sermon is neutralised by faulty ventilation. The introduction of a certain amount of fresh air and the removal of the vitiated air is essential to the complete usefulness of any public building In the old days when walls were not air tight and windows fitted loosely, this was not much of a problem in the country church, but today some of the most poorly vent-ilated buildings in the nation are country and suburban churches.

* * *

There are three points to consider.

(a) The area of floor for each person

(b) The number of cubic feet of air required by each occupant.

(c) The quantity of fresh air to be brought in and old air extracted.

* * *

The means of securing adequate ventilation are three:-

(a) Inlets for fresh air,

(b) outlets for vitiated air
(c) motive force to produce movement.

* * *

Natural Ventilation

In a small building such as the average suburban or country church natural ventilation does very well and all that is required is to design suitable openings in the walls or ceiling so that the air does not at any time contain more than seven or eight parts by volume of carbon dioxide in ten thousand parts of air.

* * *

Artificial Ventilation

In a larger church seating a bigger congregation some artificial means must be resorted to in order to keep the air in circulation. If a hot air plant is being used, in the winter time, registers are constantly pouring out a supply of fresh warmed air. Gratings in the ceiling or cornice in communication with flues leading to the open are sufficient to remove the used air

* * *

Inlets

There are various forms of inlets, the

simplest is a board or piece of cloth stretched on a frame, the width of the windows in the position which the screen occupies in the summer. This allows fresh air to enter but breaks its force. Such contrivances can be placed at windows away from where the people usually sit.

* * *

The Sheringham inlet is an amplification of this principle. It forms a wedge shaped projection into the room and admits air in an upward stream through its open top; the size of the opening can be regulated.

* * *

Systems

There are various artificial ventilating systems, including the vacuum, plenum and fan systems. These are designed for large buildings. Any church large enough to need such a system will do wisely to make a thorough study of the whole question.

* * *

The real need for proper ventilation which is so easy to secure is in the small church particularly on special occasions.

Heating

There are not many districts in Australia where heating is of sufficiently vital importance as to necessitate the installation of a Church heating plant. In the colder localities, however, in the winter such would be a great asset and would certainly tend to increase church attendance in the winter months.

* * *

Types

Central heating is the most satisfactory in all but small churches where a stove or open fireplace may suffice.

* * *

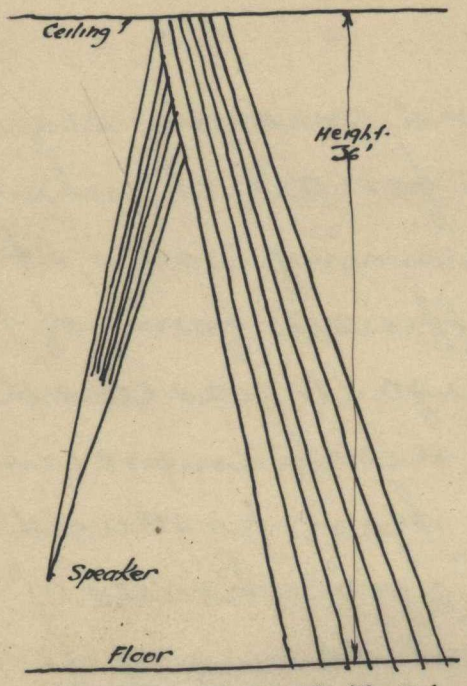
If the plant is to be used during the week, or at least if the fire is to be kept up continuously, steam heating is expensive from the fuel standpoint. The fire must be hot enough to generate steam before any results are obtained, it has the advantage over the hot water heating in obviating the necessity of draining

the pipes when the fire is allowed to go out.

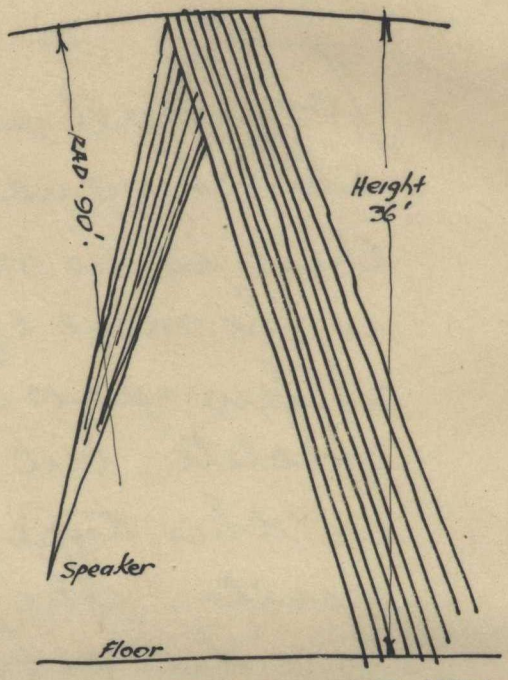
* * *

For small and medium sized churches and for all churches where there is no running water, hot air is the more efficient form of heating. A few years ago it was considered obsolete, but recent improvements in this type have produced splendid results. The "Forbes heater" of this type has a fuel saving of from 20 % to 40 % of the old central heating type.

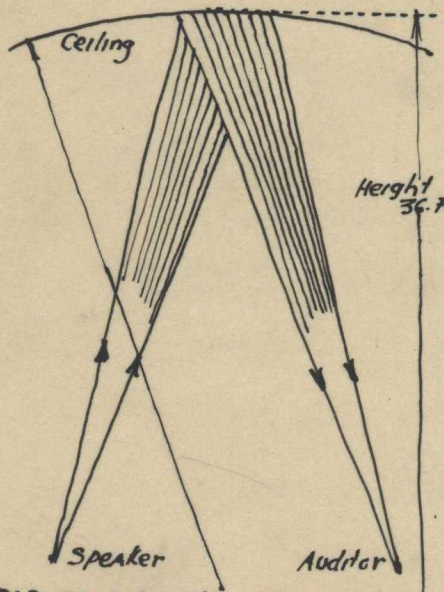
* * *



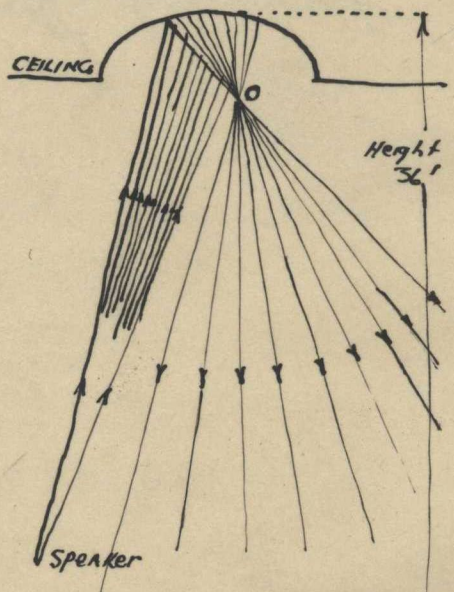
REFLECTION OF SOUND FROM A FLAT CEILING.
NO. DEFECTS



RADIUS OF CURVATURE MORE THAN TWICE CEILING HEIGHT.
NO DEFECTS



RAD. OF CURVATURE OF CEILING NEARLY EQUALS CEILING HEIGHT
MARKED ECHO



RAD LESS THAN HALF HEIGHT OF CEILING.
NO MARKED DEFECT.

FLOOR LEVEL

DIAGRAMS SHOWING THAT CURVED CEILINGS WILL NOT PRODUCE DEFECTS IF RADIUS OF CURVATURE IS MORE THAN TWICE OR LESS THAN HALF THE CEILING HEIGHT.

Chap. 4.

Acoustics in Churches

In church auditoriums the sources of sound are three:-

(a) Speaking
(b) Vocal music
(c) Instrumental music, usually the pipe organ.

The first question to consider is the cubage or volume of the room. Music requires a bigger volume than speaking and consequently a compromise between the two must be made. The correct volume of the interior for good acoustics depends on the materials of the walls, ceiling etc, and also on the number of people present. The main points to consider are:-

1. Volume of auditorium
2. Shape of Auditorium

in order to eliminate echoes, reverberations, dead spots etc.

3. Materials composing the interior
4. number of people present

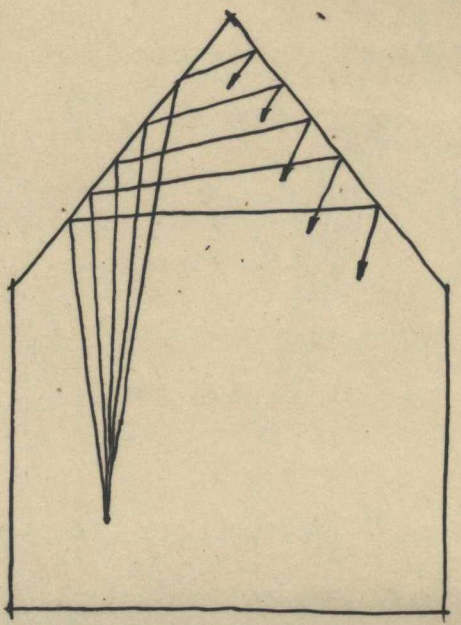
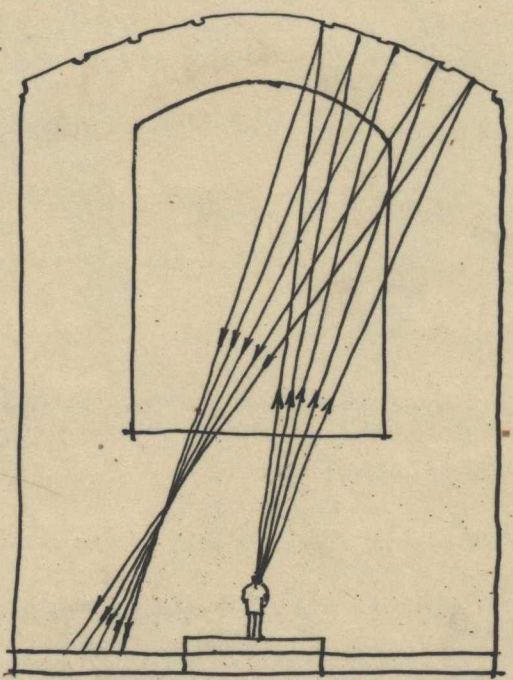


DIAGRAM OF A GOTHIC CEILING SHOWING DOUBLE ABSORBSION WITH SMALL CHANCE FOR ECHOES.



REFLECTION OF SOUND FROM A CHURCH AUDITORIUM CEILING
∴ ECHO FORMED

in order to ascertain the amount of sound absorbant necessary.

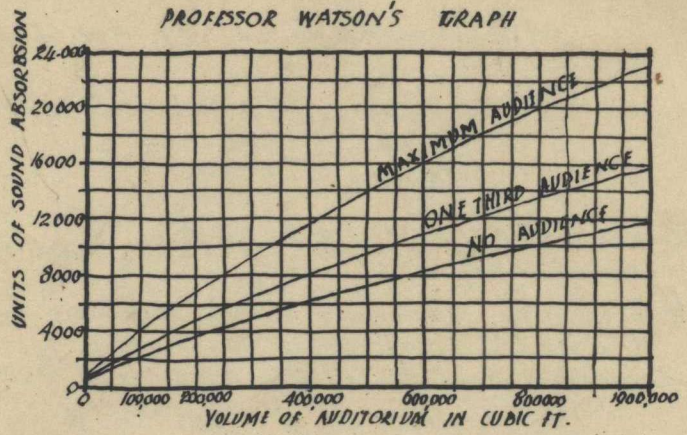
5. The purpose of the auditorium whether it is to be used for speaking, singing or instrumental music.

As an example, the Rochester Theatre New York, may be taken which has a volume of 790,000 cubic feet and an accommodation for 3,340 and -itors and is satisfactory for pipe organ music as well as for speakers.

* * *

As regards the shape of the auditorium, the main geometrical sections should be studied. Curved walls, arches and domes concentrate and reflect the sound to give echoes, dead spots or excessively loud spots. This does not mean that curved surfaces must not be used but they must be specially designed and placed to avoid these defects. For instance curved surfaces may be curved providing the radius of curvature is more than twice, or less than half the total ceiling height. (see fig).

PROFESSOR WATSON'S GRAPH



SHOWING SOUND ABSORBING MATERIAL NEEDED FOR A PARTICULAR VOLUME FOR GOOD GENERAL RESULTS.

THE UNITS MAY BE BROUGHT TO THE DESIRED FIGURE BY ADDITION OF SOUND ABSORBANT TO THE CEILING OR WALLS OR BOTH. BY PLACING CUSHIONS ON SEATS, CARPETS ON FLOORS OR CURTAINS OR TAPES TRIES ON THE WALLS.

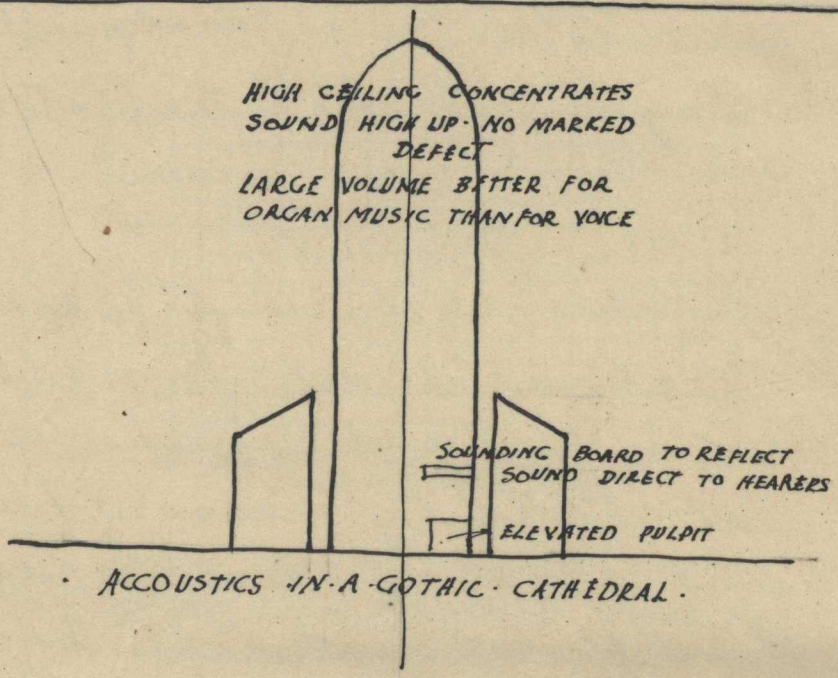
Curved walls are more likely to produce defects than curved ceilings (see fig.). Consequently an octagon is more satisfactory than a circular auditorium

* * *

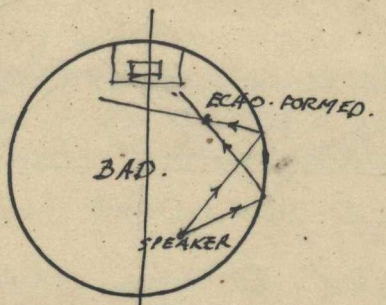
The amount of sound absorbing material needed for a particular volume for good acoustics can be calculated by means of formulae and a table of absorbing coefficients for different materials. The accompanying graph by Professor Watson, shows the sound absorbant needed in an auditorium of given volume for good general results. The units may be brought to the desired figure by addition of sound absorbent to the ceiling or walls or both; by placing cushions on the seats, carpets on the floors or curtains or tapestries on the walls. It will be noted that the units required vary inversely with the number of the audience present.

* * *

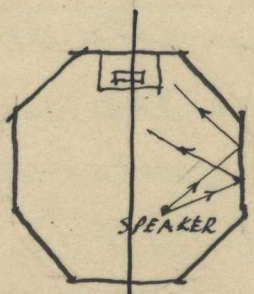
An expert architect will not be satisfied with simply designing a building



· ACCOUSTICS · IN · A · GOTHIC · CATHEDRAL ·



CIRCULAR PLAN IN CHRISTIAN SCIENCE CHURCHES.
BAD.



· FLAT · SIDES · AN IMPROVEMENT ·

free from actual faults, nor should he be satisfied unless he produces a building that will furnish the highest possible acoustical results.

* * *

A low roof as far as is consistant with good proportion will be a great help to acoustics, especially does this apply to that portion over the speakers head. Sounding boards are often a great help and can be treated architecturally so that they do not suggest an extinguisher.

* * *

The study of acoustics is of particular importance in nonconformist churches where speech from the pulpit must be perfectly audible in all parts of the building.

* * *

In the Gothic type of church a long narrow plan is an aid to good acoustics whereas a steep timber roof with its double absorbsion offers little chance for echoes. In cathedrals or large churches with high stone vaulting the sound is concentrated high above the hearers and there is no apparant defect. The large volume of these churches is more satisfactory for the organ than for the voice.

Chap 5.

Site & Cost of Churches

Site

It is very rarely that the architect has the good fortune to assist in the the selection of a site and in all too many instances has to make the best of that which the building committee offers him.

* * *

For economical building the site should not be below the footpath level if possible. The subsoil should be virgin earth while steep gradients in the land or road are as a rule costly although if sufficiently steep advantage may be taken in getting extra accommodation below the main floor. When the question of the plan comes to be considered the shape of the site will depend on the type of plan it is proposed to adopt.

* * *

The size of the site required to accommodate the proposed church may be figured from the rules given by the Congregational Chapel Building Society:-

Omitting vestries or schoolrooms but allowing for thicknesses of walls and for vacant space in lobbies and passages about 7 square feet of ground will be required for each adult on the ground floor. Galleries will add from 1/4 to 2/3 to the ground floor according to their proportionate extent. Five childrens sittings occupy the same room as three for adults. Future extension should also be considered and allowed for. If the funds at hand do not meet the needs, the building should be designed so that it can be added to in the future.

Cost The cost of churches varies with the locality. The following ruling prices apply to the capital cities although these vary; prices in Brisbane being 10% more than those in Sydney. Those in the country districts vide Canberra at the present time, may be taken as 25% more than Sydney prices. Churches are measured and priced per foot cube or per seat.

* * *

A small simply designed English type church may be taken approx-imately at 1/6 to 1/8 per cu. ft.

* * *

A Gothic church with stone walls and stone trimmings at 1/11 to 2/1 per cu ft.

* * *

A simple church with detail in wood rather than stone, a simple design characteristic of Colonial or Georgian. at 1/8 to 1/10½ per foot cube.

* * *

A more pretentious Georgian design 1/9 to 3/8 per foot cube.

* * *

From the following outline specifications and prices, the cost of a proposed church can be fairly closely estimated.

* * *

Outline Specification:-

General Construction:- fireproof, steel trusses, floor beams and tower frame, hollow tile and brick walls, reinforced concrete floor slab.

Exterior materials:- Weatherboards-woodtrim.

Roof:- slate,

Windows: double hung, tinted glass

Floors - cork tile on concrete

Electrical equipment- concealed cove lighting in auditorium.

Interior Joinery:- white wood painted, doors- mahogany.

Interior wall finish - paint

Decorative treatment - panelled walls run plaster moulds.

Seating capacity:- about 520

Approx foot cubage:- 356,500

Cost:- 2/3½ per cu.ft. approx.

Completed:- April 1925.

* * *

Outline Specifications:-

Basement:- brick and frame above wood frame, steel construction in tower.

Exterior materials:- weather boards.

Roof:- slate, windows:- double-hung, wood.

Floors:- maple.

Plumbing:- toilets in basement.

Electric equipment:- lighting and blower for organ.

Interior joinery:- pine

Plaster:- decorative treatment, paint.

Seating 280, cubage, 192,157.

Cost:- 9¢ per foot cube.· 1916

* * *

Outline Specification for a temporary structure for a new parish:-

General construction:- Non fireproof. Concrete foundations, frame superstructure.

Exterior materials:- shingles.

Roof:- grey shingles

Windows:- double hung wood.

Floors:- oak.

Plumbing:- usual installation and good fixtures.

Electrical equipment:- conduit.

Interior joinery : poplar. painted.
Interior wall : sand finished plaster.
Decorative treatment : Stained wood
ceiling, plain plaster walls.
Seating capacity :- 100
Cubage : 62,000
Cost : 1/- per cu.ft. 1925.

Outline Specifications :-
General construction :- brick
Roof : tile
windows :- wood sash and frame, cathedral
glass.
Floors :- oak and tile in lobby
Plumbing : enameled fixtures.
Electric equipment- lighting
Joinery : oak and pine.
Interior wall finish :- plaster painted.
Decorative treatment :- main auditorium
white and grey, social room
oak, and tan plaster.
Seating Capacity :- main auditorium 374
Main balcony 217
Sunday school rm. 400
Approx. square footage :- 8,584
Cost per square foot : £2/11/4. June 1922.

Outline specification :-
General construction :- stone
Exterior materials - stone ; roof :- slate
Windows :- cast stone
Floors :- cork and rubber
Plumbing :- open fixtures
Electrical equipment :- lighting.
Interior joinery - cypress pine.
Interior wall finish - plaster
Seating capacity :- 450
Cost :- £15,000 ; £33 per seat.
Completed - June 1925

* * *

Outline Specification :-
General construction :- reinforced hollow concrete.
Exterior materials :- white washed concrete.
Roof :- Hand made Roman tiles.
Windows :- No sash in church proper, sash in vestry.
Floors :- tile
Electrical equipment :- lighting.
Interior wall finish :- white washed concrete.

Seating :- 120
Cubage 14,800
Cost exclusive of furniture :- ~~24 cents~~ 2/- /ft³
Completed :- May 1925.

* * *