



THE ANCIENT THEATRE IN TAORMINO, SICILY.

From a fresco in the Burg Theatre, Vienna.

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CHRISTIAN ALTARS AND THEIR ACCESSORIES.

Part I.



It is evident, even to the superficial observer, that we are now, in this country, at the beginning of a church-building era—a state of affairs brought about through a growing love for the beautiful, the spread of ecclesiasticism and the constantly increasing wealth of the various religious organizations. Old-time prejudices are rapidly disappearing, the meeting-house idea is becoming obsolete, the edifices of the past are no longer good enough or churchly enough; hence there is a general call from all denominations, both in town and country, for new and better or more artistic buildings. In some cases this movement is inspired by doctrine and devotion, and in others it rises from mere emulation and fashion. American architects, with few exceptions, have not as yet shown themselves equal to the occasion; the opportunity to do good work has often been lost, not from their inability, but because they were not in touch with either the ecclesiastical or ecclesiological requirements. The young architect has the time to study the subject in all its many branches, to make himself familiar with the rules, both canonical and traditional, which govern the building, ornamentation and fur-

nishing of churches; but not so his older brother, already overwhelmed with a large and growing practice. Nevertheless, even he, if he aspires to do a good piece of ecclesiastical work, must absolutely take the time in which to acquire that necessary knowledge. No matter how great a genius he may be, he cannot afford to ignore the wonderful architectural monuments of the past, so full of artistic beauty and originality. Therefore this article on one branch of the subject, viz.: the history, construction and decoration of altars, has been written in the hope that it may prove useful—to one as an introduction to further study, to the other as a safe epitome of the essential facts.

It is not an original treatise, but only a careful and conscientious compilation from a large number of notes, which the author has gathered in the course of years from many writers and monuments as the exigencies of an active ecclesiological career called for the information therein contained. There will be no attempt to solve any archæological will-o'-the-wisp, to foster any peculiar religious views, or to advocate any particular ecclesiastical architectural theory, but simply to place before the reader those facts which will be of practical use to him should he be called upon to build an altar.

The English noun *Altar* is the equivalent of the Latin word *Altare*, which in its turn is derived from the adjective *Altus*—high.

Among the pagan Romans, an elevation of wood or stone, or even of earth, raised for the purpose of making thereon a sacrifice, or offering, was named *ara*; this substantive, however, was avoided by the Primitive Christians when speaking of or referring to their own altars, although Tertullian and one or two others use the phrase "*ara dei*," but as a rule it was not employed by the early writers—the word *altare* was the one used to designate a Christian altar. St. Cyprian, writing in the third century, draws a contrast in his 59th Epistle between the *domini altare* and the *diaboli ara*—a distinction in the use of the two words which is strictly adhered to in the Vulgate and all the Latin languages. There was also a similar usage among the Greek Christians.

The altar of the Jews was the object or place appointed to receive the offerings of sacrifice to Jehovah; they also used an altar as a memorial, such was the one spoken of in the seventeenth chapter of Exodus, and sometimes as a testimony: *Behold the pattern of the altar of the Lord, which our fathers made, not for burnt-offerings nor for sacrifices; but it is a witness between us and you* (Joshua xxii., 28).

A Christian altar is a table-like construction, used by the majority of Christians as the place upon which the Eucharistic sacrifice is offered, by others as a table from whence the Lord's Supper is administered, and when fully developed consists of a *mensa* or table, a *pradella* or platform, a *ciborium* or canopy, a *re-table* or step-like shelf, a *reredos* or screen, and, lastly, a *tabernacle* or closet for the Reservation.

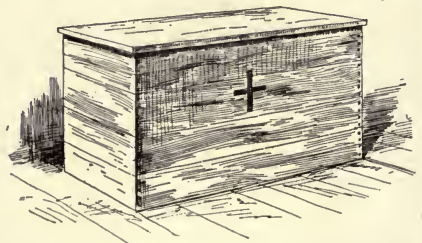
It is the principal object within the church, and is usually erected upon a platform in that part of the building reserved for the clergy, which is generally at the east end of the edifice, but, wherever placed, its position determines the orientation without regard to the points of the compass. It is placed in the east end of the church

for symbolic reasons. Under the old law the entrance to the temple was from the east to the west, which signifies that all before the passion of Christ tended toward the setting sun or death. But the entrance to a church is from the west to the east, which symbolizes our ascent from darkness to the throne of everlasting light and life, through faith in Jesus Christ, who was crucified with his face to the west, and will come on the last day from *the east, with great power and majesty*. It is raised upon a platform above the highest floor of the church, because it is the sacramental throne of Christ, and in order to remind the faithful of the Hill of Calvary.

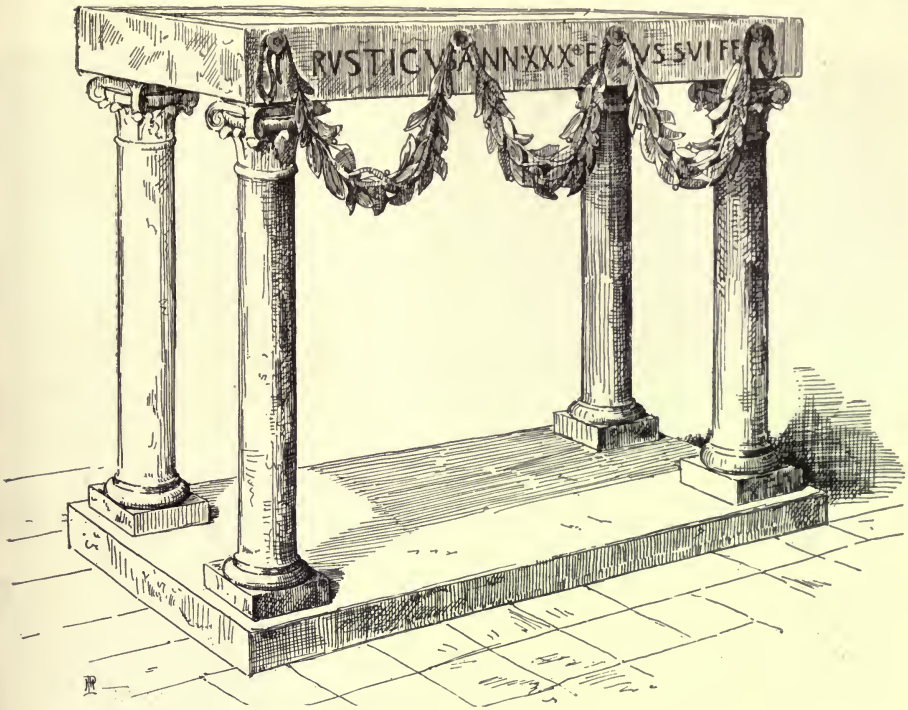
The altar is of more importance than the church itself, inasmuch as "the altar is not for the church, but the church is for the altar." It is the Calvary of the Eucharistic Sacrifice, hence the principal object in a church. The sacrifice can be celebrated anywhere—in a house or in the open air—but not without an altar of some kind; that is essential, even if it is only the hands of a cleric, as in the case of a fifth century bishop, Theodorctus of Cyrrhus, who offered the divine mysteries upon the hands of his deacons when he visited the Hermit Maris at Aparmaca in Syria, where there was neither a church nor an altar.

The first altar of which we have any account is that spoken of in the Book of Genesis in the following words: *Noah builded an altar unto the Lord and took of every clean beast and every clean fowl, and offered burnt-offerings on the altar.*

The first Christian altar was the table of the Last Supper in the guest chamber at Jerusalem, and the oldest



The oldest Christian altar in the world, made of cypress wood. Kept as a relic in St. John Lateran at Rome.

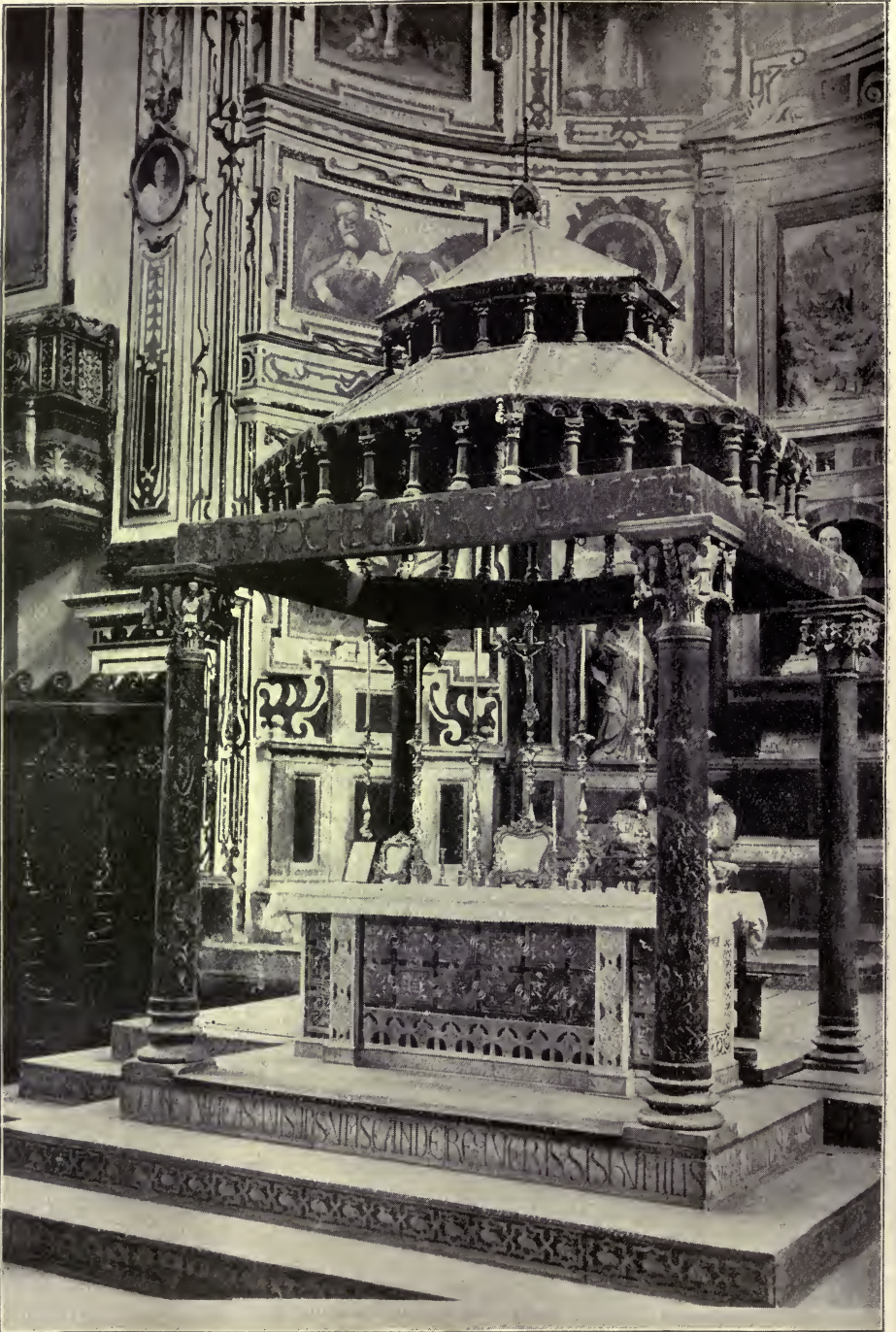


A FIFTH CENTURY ALTAR.

one now in existence is in the church of St. John Lateran at Rome. It is made of cypress wood in the form of a chest, the *mensa* overhanging the four sides. It is supposed to be the one upon which St. Peter celebrated the Holy Mysteries in the house of Pudenziana; at all events its authentic history ante-dates the age of Constantine, and to-day it is the only wooden altar allowed in the Roman Church, and is used exclusively by the Pope.

In the Primitive Church all altars, outside of the Catacombs, were probably made of wood, that is until the time of St. Evaristus, somewhere about the year 112, who is said to have condemned them; we know, however, from the days of St. Sylvester (314-335) their use was discouraged. The earliest canon on the subject is the 26th of the Provincial Council of Epaona, held in the year 517, which forbids the consecration of any but a stone altar; from thence on, wooden altars were disapproved of and stone ones took their place. Nevertheless they are allowed in exceptional cases, but where used, that

is in the West or Latin Church, the part of the *mensa* upon which the chalice and paten are placed is invariably made of stone. In some of the Oriental and Protestant churches they still adhere to wood. The reason of employing stone is a purely symbolic one, which is explained by Durandus, the greatest of mediæval symbolists, in the following words: "*It ought to be stone, not because of the hardness, but the solidity of faith, for by this stone itself is understood Christ, of whom the Apostle saith, 'Jesus Christ Himself being the chief corner-stone.' By the stone indeed the humanity of Christ is denoted. Concerning which we read in Daniel, that a stone was cut out of the rock without hands—because Christ was born of the Blessed Virgin without human agency—becoming a huge mountain, filled the whole earth. Concerning which it is said also by the Psalmist, 'The stone which the builder has refused hath become the head-stone of the corner' since Christ—whom the builders, that is the Jews, refused, saying, 'We will not have this man to reign over us'—hath been made the head of the corner. Because, as saith the Apostle, 'God hath*



HIGH-ALTAR AND CIBORIUM IN THE CHURCH OF ST. NICHOLAS AT BERRI.



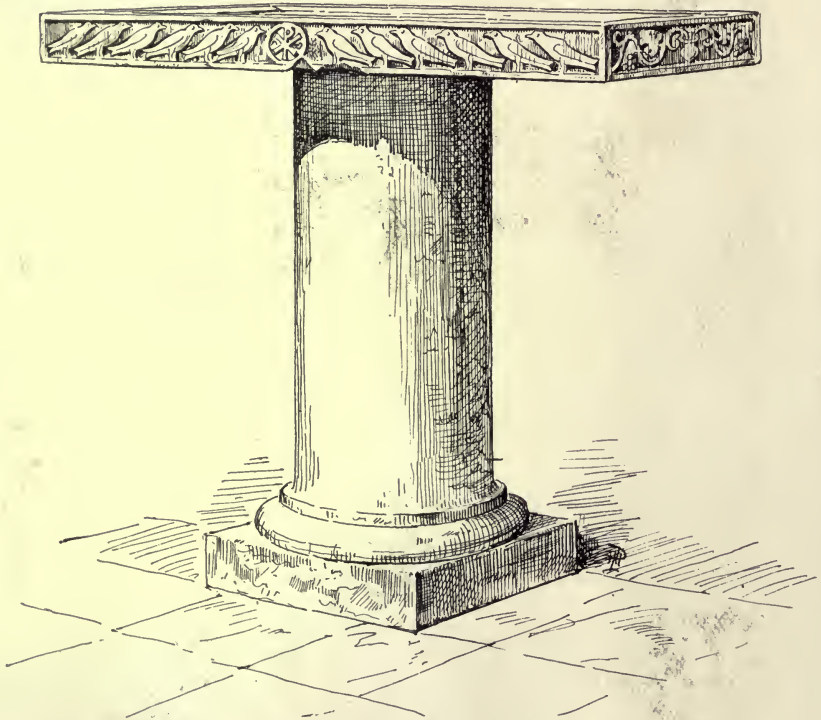
A TWELFTH CENTURY HIGH-ALTAR AND CIBORIUM, CHURCH OF ST. GEORGE, VELABRO.

exalted Him, and given Him,' etc. Or else by this stone, which ought to be great and wide, charity is understood, as was stated before; since the command of charity is wide, extending even unto our enemies; according to that precept of our Lord, 'Love your enemies.'"

All the first altars, whether made of wood, stone, marble or metal, were either in the form of a box, or consisted of a slab or *mensa* resting on one or more legs: generally one, three, four

covered with beautiful stuffs, ornamented with silk embroideries studded with gems or enriched with plates of gold and silver.

In the beginning there was but one altar in a church, after awhile others were introduced, but the principal or high-altar was always built in the chancel, the others were placed here and there and were only shrines, often varied in form from the high-altar, which was usually a parallelogram.



A SIXTH CENTURY ALTAR (FRENCH).

and sometimes five in number. Often the *mensa* was held up by a slab (*stipes*) at each end or by a bracket from the wall of the building. There is no doubt these altars of the Primitive Church were very simple and plain; but no matter how common or precious the material of which they were made might have been, if we are to believe the descriptions, pictures, mosaics and other monuments which have come down to us from the earliest ages, they, when in use, were

After the church emerged from the Roman persecutions, and the Christians were granted by the edict of Milan in 313 the free exercise of their religion, their stone altars consisted of a consecrated slab or *mensa* resting upon four pillars, typical of the four Evangelists; they were always either open or hollow, detached from the wall and stood upon a platform beneath a canopy. As a rule, they were built over a crypt or tomb-like shrine containing the body of a saint or martyr, with apertures



HIGH-ALTAR AND CIBORIUM IN THE CHURCH OF ST. JOHN LATERAN



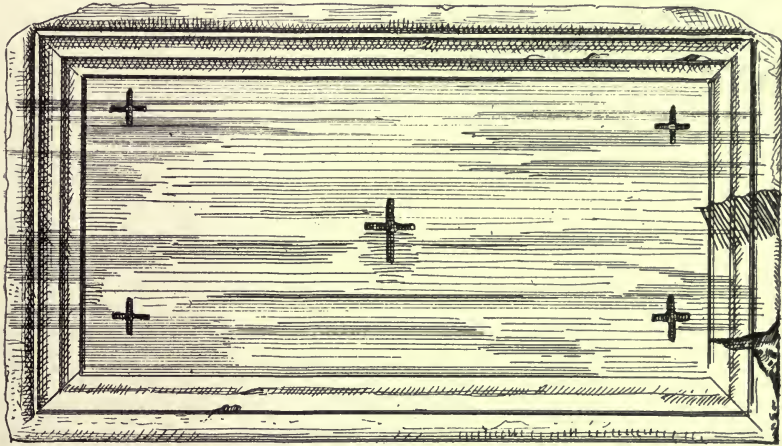
HIGH-ALTAR OF S. MARIA IN TRASTEVERE AT ROME.

into the crypt through which the relics could be seen and even touched. This usage and disposition of relics remained in force until the fifth and so on to the tenth century, when it became necessary from time to time to remove them from place to place, on account of the invasions of the barbarians, which became so frequent in some countries that they were placed in portable shrines. From this custom originated the relic-altars of the middle ages. C̄C̄

As there are a variety of altars, they are distinguished one from another by specific names, as high-altar, side-altar,

It was the all-important part of the altar, as we learn from the writings of the first Christians. Gregory Nyssen, a bishop of the fourth century, says, "this holy altar at which we stand is a common stone by nature, differing in no respect from any other slab of stone with which our walls and pavements are adorned; but since it is dedicated and consecrated to the worship of God and hath received a benediction, it is a holy table, an immaculate altar, which no longer is to be touched by all, but by the priest."

To protect the relics or reliquaries beneath their altars the early Christians



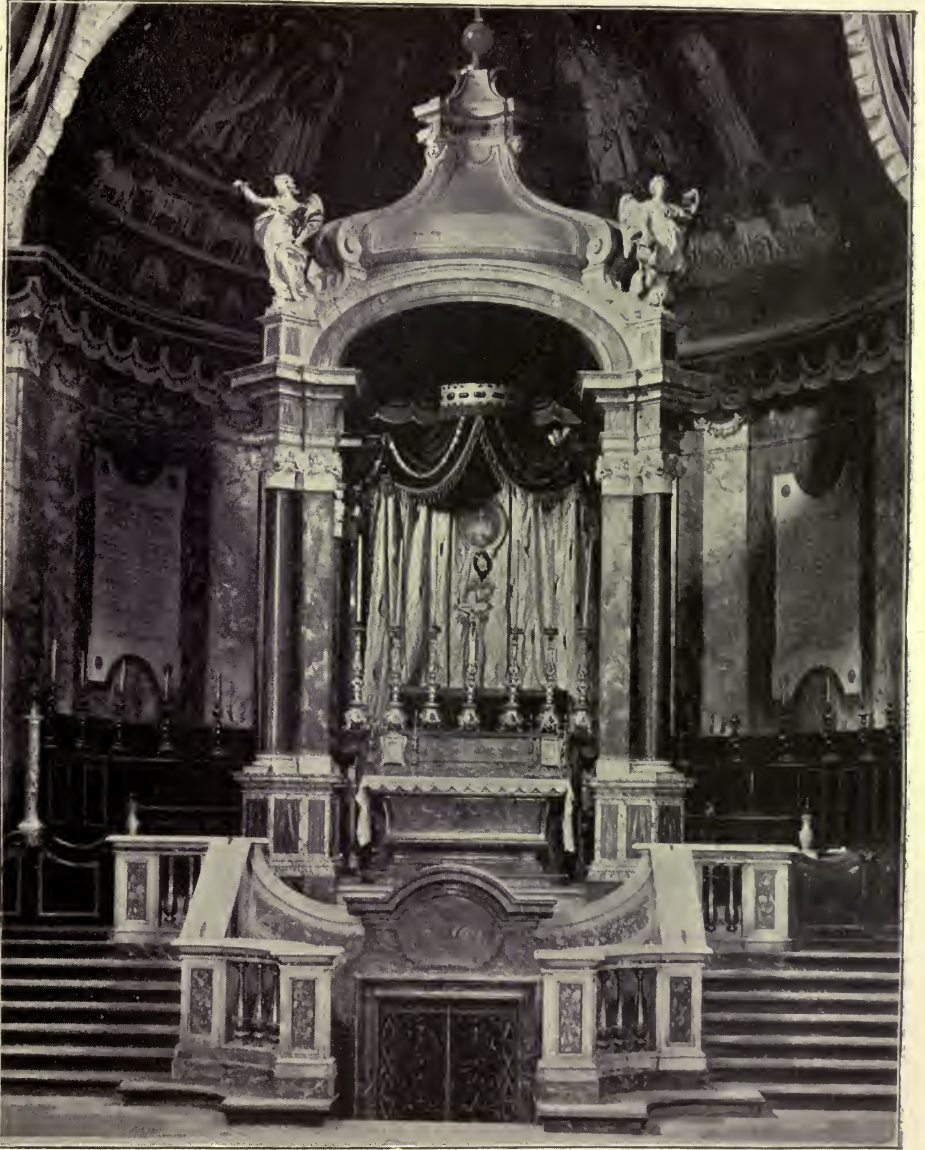
THE UPPER SURFACE OF A SIXTH CENTURY MENSA.

shrine-altar, relic-altar and portable-altar. A high-altar is the chief one, and in the Primitive Church stood alone in the centre of the sanctuary, between the throne of the bishop and the outer or west edge of the chancel platform. In the early days of the Faith it was without either *re-table* or *reredos*; moreover nothing was allowed upon the *mensa* besides the altar cloths, the sacred vessels, the service book and the diptychs containing the names of all those persons, both the living and the dead, who were to be remembered at the celebration. The *mensa* was a slab of natural stone, slightly hollowed out on top, sometimes with an orifice for the escape of the water when the slab was washed.

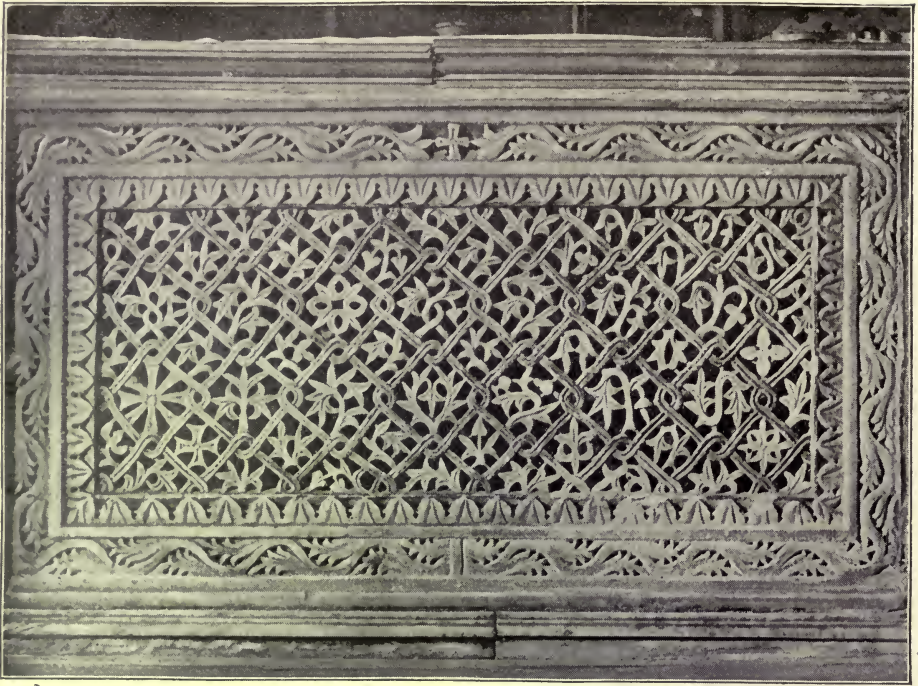
filled in the open spaces between the bottom of the *mensa* and the floor with perforated slabs of marble, stone and wood, metal grills or simply with curtains of silk. The use of curtains was by no means confined to the altar itself; they were also hung from rods running from spring to spring in the arches of the *ciborium*, at least on one or three sides. The arrangement of a primitive chancel and altar can be seen to-day in many churches in Italy, more particularly in the Roman churches of St. John in Laterano, St. Clement, St. Lawrence, and in the Ambrosian basilica at Milan. In the last-named church true orientation has been kept; the building stands due east and west, with an isolated altar



A HIGH-ALTAR (SIXTEENTH CENTURY) IN ST. AGNES, ROME.



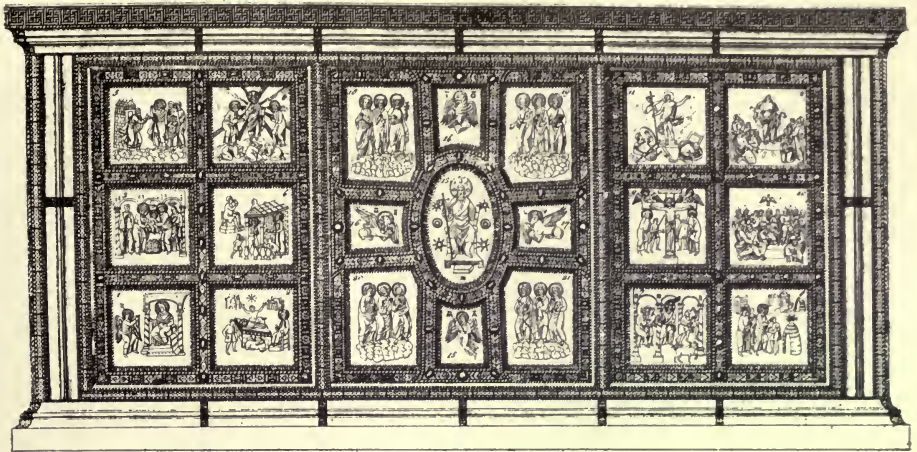
A HIGH-ALTAR OF THE SEVENTEENTH CENTURY—S. PRASSEDE, ROME,



PERFORATED MARBLE SLAB FROM AN ALTAR AT RAVENNA.

in the east end, beneath a dome-shaped *ciborium* upheld by four columns of porphyry, and behind it, against the east wall of the sanctuary, stands the Episcopal chair. This is the church in which Saint Ambrose in the year 386 deposited under the high-altar the remains of the martyrs Gervasius and Protasius and concerning which he wrote a long letter to his sister. The following passage is taken from this letter, as it illustrates the usage of the Christians in always associating with their altars the relics of martyrs and saints. He writes: "Bring these victorious victims to the spot where Christ is the sacrifice. But He, who suffered for all, upon the altar, they who have been redeemed by His passion, under the altar—wherefore let us bury the hallowed relics, placing them in a worthy home." This custom was not always followed, that is, after the ninth century; subsequently to this date the relics were sometimes placed above the altar, but never above the high-altar.

The altar of the days of St. Ambrose was replaced in the year 835 by a magnificent work of art which is still the principal altar of the basilica. It was erected by Archbishop Angilbert and is an oblong cube, made of silver parcel-gilt and pure gold, enriched by repoussé work, colored enamels and inlays of precious stones (*encabochon*); the sides and back are of silver, the frontal of gold, which is divided into three compartments, the middle one contains a cross having in its centre a seated figure of the Redeemer, while in the arms of the Cross there are representations of the four Evangelists under their symbolic forms, and between the arms the Apostles are arranged in groups of three; the remaining compartments are filled with eventful incidents in the life of Christ. The back of the altar is similar to the front, as far as its divisions are concerned, the central one is occupied by two doors leading to the relics; upon these doors are four circular medallions filled with figures of the arch-



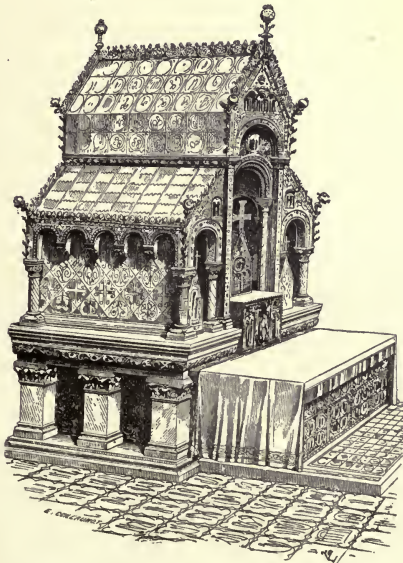
Front of the high-altar of the ninth century in the Basilica of St. Ambrose at Milan.

angels Michael and Gabriel, St. Ambrose receiving the altar from Archbishop Angilbert, and St. Ambrose blessing the silversmith Wolvinus, the designer and maker of this wonderful altar; in the other compartments are portrayed the principal events in the life of St. Ambrose; on the sides of the altar there is the same kind of work; in the left one there are eight angels bearing vials, and four medallion portraits: Ambrose, Simplicianus, Ger-

vasius and Protasius; on the other side there are the archangels Michael, Gabriel, Raphael and Uriel, together with four saints: Martin, Maternus, Nabor and Nazarius.

This most beautiful and remarkable altar is one of the best examples of the basilican type in existence: a simple table without re-table or reredos, accessories that would be in the way and hide the priest from the people, as he celebrates with his back to the apsidal or east end of the presbytery and his face toward the people, with the altar between him and them.

Just the date of the introduction of side-altars into churches cannot be



The relic-altar of S. Denis. A restoration by Viollet-le-Duc.



The side-altar of S. Felice (16th century), Church of S. Anthony at Padua.



Mediæval altar, with hanging. After Viollet-le-Duc.

fixed with any great accuracy, however it is known that they came in use at a very early period and that after the sixth century a plurality of altars was the rule in the churches of Western Christendom.

St. Gregory of Tours (A. D. 573), tells us that he said mass at three different altars in the church at Braisne, near Loissons, in France; Palladius, bishop of Saintonge, wrote Gregory the Great, Pope from 590–604, for relics to place in the altars of his church, thirteen in number; and Alcum (735–804) in a Latin poem, says that there were thirty altars in the cathedral church of

York; from this time on, the evidence as to multiplication of altars in all churches is overwhelming, both from documents and monuments. Side-altars were built in honor of some particular saint or the titular of the church or for the reception of the relics of many saints. Very often a figure of the saint was placed above his altar or his relics in a reliquary of one form or another.

An altar containing a number of relics was generally more beautiful than other side-altars, often rich in gems and precious metals; such a one was erected by the great Abbott Suger in the twelfth century in the church of Saint Denis: it was built of porphyry enriched with agates and in places overlaid with gold and incrustations of precious stones, here and there inscriptions made with letters in enamel; the bodies and relics were placed back of and under the altar in a chest cut from a block of black marble, and resting on this were eight square pillars of the same material, which upheld another block of black marble embellished with mouldings; between the pillars there were eight wrought iron grills covered with gold, gilt foliage and round bits of enamel on copper. Inside the pillars and grill-work, over the sepulchre, there was a cover of stone and copper, and above the upper block of marble, of the same length and width, there was a tabernacle in the form of a church with a nave and two aisles, richly embellished with carvings and enamels, in the nave and aisles were beautiful



A silk embroidered antependium of the 18th century. Italian.



A THIRTEENTH CENTURY ALTAR IN THE LOWER CHURCH OF S. FRANCIS AT ASSISI.
Designed by Jacopo d'Alemania.



SIDE-ALTAR OF THE HOLY CROSS IN S. MARK'S, VENICE.



A part of an ivory and wood antependium in the Cathedral at Salerno.

reliquaries of wood in the form of a sarcophagus, these were made precious with metals and embellished with agates, Oriental pearls, aqua marina, topazes, garnets, sapphires and many other gems. On the peak of the larger reliquary there was a cross of gold and on the others crosses of silver, all three set with amethysts, garnets and emeralds. Upon this master work of art was written in golden letters the following legend: *Facit utrumque latus, frontem, lectrumque Sugerus.*

During the first ages of the Faith, down through mediæval times, it was customary to partially surround the altar with veils, a practice already alluded to; these curtains were changed with the vestments of the feast, so as to agree in color with them. In addition to these, hangings: superpendiums and antependiums, were sometimes employed as veils or half veils for the front of the altar below the *mensa*; these frontals, however, were not always made of cloth, often they were constructed of metal, wood or ivory.

It will be seen from the above that the distinguishing marks between high-altars and side-altars of the past were in the position they respectively occupied in the church building, in the elevation of the high-altar over all others, in its simplicity both in form and decoration, and in the richness of ornamentation in side-altars of all kinds, more especially relic-altars. Then again nothing could be placed above a high-altar except the Eucharistic reservation, which was at times suspended in a pyx hanging by a chair from the underside of the *ciborium* or from a bracket attached to the back of the altar.

The next form of altar to be considered is that known in the early church as *altaria portatilia* or a portable altar. This kind of altar consisted of a small portable slab of wood or stone, consecrated and generally containing relics; they were used by missionaries, bishops and priests when on a journey, or by armies when in a camp distant from a church or while on

the march. The Venerable Bebe tells us that when the two Hewalds preached the Faith of Christ to the Saxons in 690 they daily offered up the "*sacrifice of the saving oblation—for they had with them sacred vessels and a consecrated slab for an altar.*" So common had they become in the days of St. Anselm, 1106, and so often abused, that he thought it his duty to protest against consecrating them: "I do not condemn the usage," he writes, "but I prefer that unattached altars should not be consecrated." Nevertheless down to a very late date grants of portable altars were frequent, Julius II., in the sixteenth century, granted to the Guild of St. Botolph at Boston, in England, the right to use one; to-day, however, their use is almost entirely confined to Roman Catholic missionaries in heathen lands or in a sparsely-settled country. Many of the portable altars of the middle ages were objects of great beauty and artistic value; they were made of jet, jasper and marble encased in rich frames of gold or silver carving, mosaics and gems. As this kind of altar is foreign to our subject it will not be referred to again in this or subsequent articles.

Next to the altar in importance, its earliest accessory, is the *ciborium*, otherwise a canopy. It is sometimes incorrectly called a baldachin, an English corruption of the Italian word *baldacchino*: a canopy made of a textile fabric, and held over a priest when carrying the Sacrament in procession or taking it to the sick, or placed above the chair of an illustrious person on state occasions and also over the throne of royal personages.

The word *ciborium* is derived from the Greek *Κιβώριον*, the primary meaning of which is a cup in the form of the seed-vessel of the Egyptian lotus, hence its application to an altar-canopy which in form resembles an inverted cup. The *ciborium* came into use just as soon as the Christians began to build churches having any architectural value, and was not only placed above high-altars but also often over side-altars, when they came into vogue. These canopies were supported

by columns and were constructed of wood or wood covered with metal, of metal alone, marble, alabaster and many other substances.

The *ciborium* of the church of Santa Sophia at Constantinople, erected by Justinian from the design of the architect Anthemius in the year 534, was an octagonal pyramidal dome crowned with a cross and resting upon four columns of silver, the whole enriched with mosaics and ornaments, hangings and veils of silk in which were woven figures of Christ, St. Peter, St. Paul and other saints.

Often lamps were suspended either from brackets at the corners of the *ciborium* or from the soffit of its arches, while from the centre of the under side of the dome or ceiling hung a chain to which a pyx was attached.

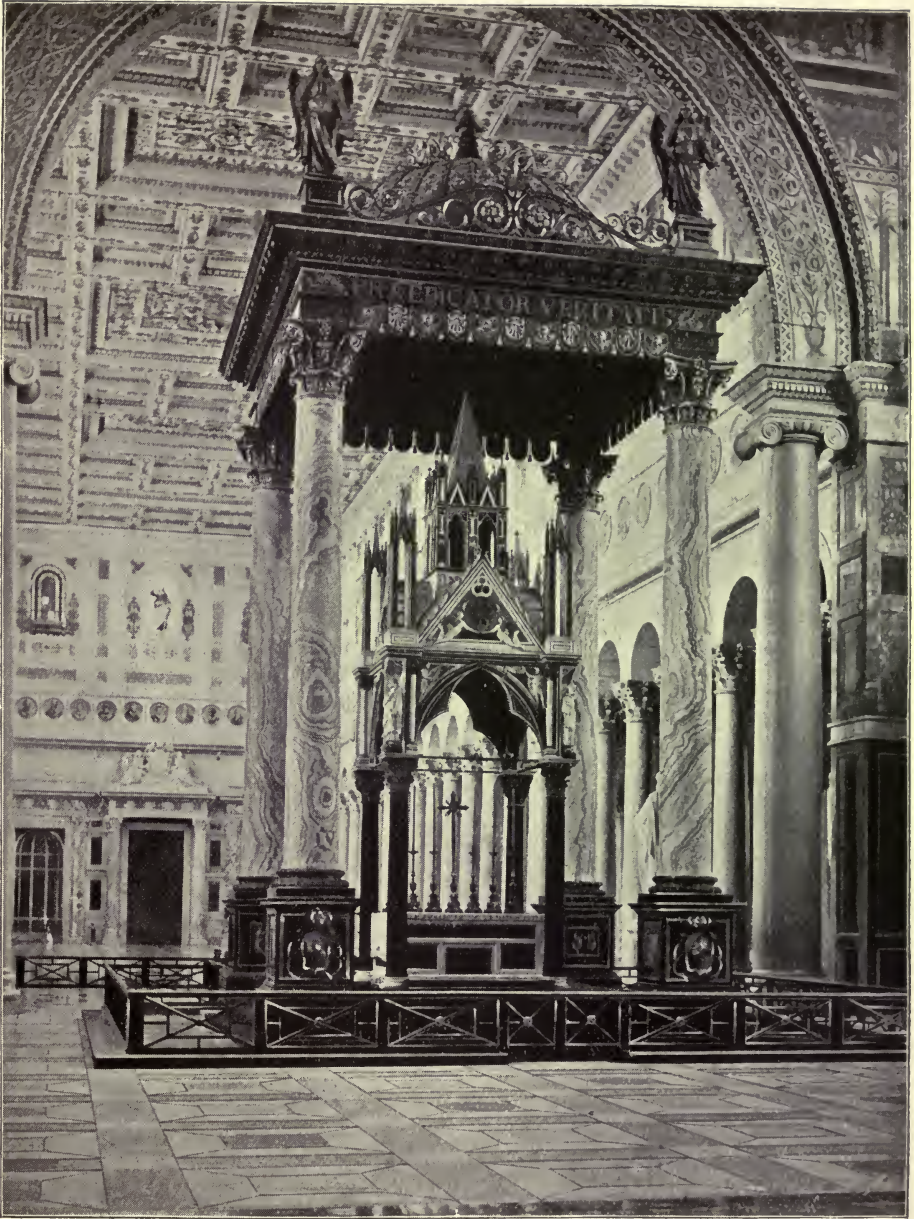
The most celebrated *ciborium* of modern days is that over the high-altar of St. Peters at Rome, which is 95 feet high, and was built by Urban VIII. from the design of Bernini in 1633. It is of bronze supported upon four spiral columns with composite capitals and gilt ornaments, and is said to have cost \$225,000.

In the basilica of St. Paul *Fuori le Mura* at Rome there is a double *ciborium*; one over the other, the under one is Gothic in style resting upon four columns of red porphyry, while the upper canopy is in harmony with the lines of the church and is supported by four columns of Oriental alabaster, presented to Gregory XVI. by Mahomet Ali.

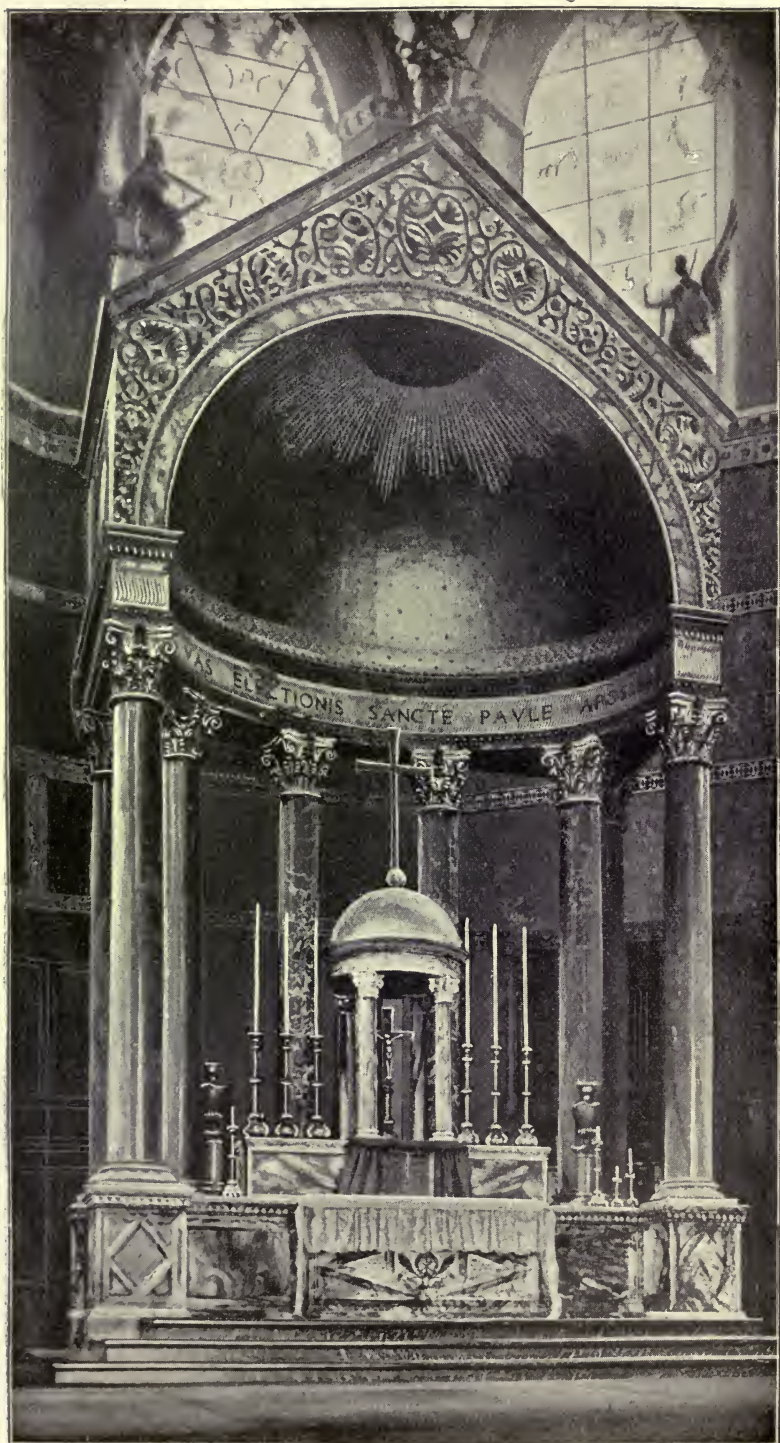
Ciboria in the form of a semi-dome are not uncommon, although not of an early date; one of the best examples of this kind is in the church of St. Paul the Apostle, in New York; it is composed of alabaster with gold-mosaic and stands upon monoliths of most beautiful African marble of various colors.

In Italy, wherever the high-altar of a church is without a *ciborium*, it is the custom on great festivals to suspend over the same a square or elliptical canopy of silk damask, which the Italians rightly call a *baldacchino*.

The next accessory of an altar to be considered is the *re-table*, which is a



HIGH-ALTAR OF ST. PAUL'S, ROME.



H. W. BELKNAP.

HIGH-ALTAR IN THE CHURCH OF ST. PAUL THE APOSTLE.

New York City.

Designed by Stanford White.

sort of shelf, step or steps at the back of the *mensa* and raised above it. The crucifix or altar-cross, candlesticks, reliquaries and flower vases are placed upon this member. Its origin is unknown, as well as just the time it was first employed, yet there is one thing we can say with the full assurance, and the statement cannot be refuted, viz.: that it is not found in conjunction with the early altars, although a most useful accessory and almost invariably forming a part of all altars built since the fifteenth century. The word *retable* is taken from the French, but in France it is equivalent to our word *revedos*.

Modern altars in a general way resemble those of past ages, nevertheless there is enough difference to mark them as belonging to our time. To draw out in full these differences would serve no practical end, yet, in view of what has already been said, and from the following rules governing the construction, form, size and decoration of the altar of to-day the whole matter will be very plain to all attentive readers.

In order to have a fixed standard, as a guide in every thing concerning altars, it is well to take the rulings of the Congregation of Rites as the criterion, if for no other reason that its laws and judgments are based on known precedents, canons, constant and well-founded traditions, and are generally conservative. Besides, its decisions are accepted as absolute by the largest body of Christians employing altars in their divine service.

I. A modern high-altar may be placed in one of two positions: either well out toward the front of the sanctuary, as practiced in the early church, or close to the east wall of the chancel, but never attached to it, at least two feet and a half away, as this space or passage is needed, not only at the time of consecration, but at all times for the convenience of the sacristan and those carrying on the services.

II. A high-altar must stand upon a platform with a *predella* or foot-pace approached by not less than two steps, thus with the *predella* raising it three

steps above the floor of the sanctuary. If there is a desire to raise it higher, there is no reason against it, only the steps, including the *predella* in any case, should be kept unequal in number and never more than nine. There is a symbolism in odd numbers, a teaching thought, that it behooves the architect to adhere to, as it appeals to devout minds and is traditionally sound. Three stands for the foundation of all truth: the Father, the Son, and the Holy Ghost; five for the holy wounds of the crucified; seven for the virtues of humility, liberality, chastity, meekness, temperance, brotherly love and diligence—the steps that all Christians must tread if they hope to place the seven deadly sins beneath their feet on the road to the Heavenly Altar of everlasting life; and nine represents the three angelic hierarchies of three choirs each, or the nine orders of angels who are always singing there divine canticles before the throne of God.

III. The *predella* should not project less than four feet and a-half in front of the altar and at least fourteen inches at the sides. Its length should correspond with that of the *mensa* plus fourteen inches at either side. A good width for the treads of the steps is from twelve inches to two feet, and the height for the risers four and a-half inches; it has been found by experience that low and wide steps offer less chance of accident by a misstep to those engaged in the ceremonies pertaining to the altar, than any other form. If the *predella* and its approaches are of stone some provision must be made for holding the carpet in place, with which the ceremonial prescribes they should be covered on all solemn occasions or grand functions. In this country it is better to make the *predella* and steps of wood on account of the extreme cold of winter. The steps on the sides of the *predella* ought to be as wide as those in front, and the lowest one of these six feet back of the communion rail or more if there is room.

IV. The *mensa* of a high-altar should be rectangular in form, a single, natural stone, not less than nine feet long

and two feet wide, square at the edge, without sculpture which is liable to catch the vestments of the celebrant. Where the altar is very long the top may be made of three slabs, but the centre is alone the *mensa*. A good general height is three feet five inches above the *predella*; when it is over this, or more than two feet six inches wide, it will be found inconvenient for the average-sized man, especially if there is a tabernacle above it. It can be supported upon stone piers, columns, a solid or hollow foundation, but not upon brackets, bricks or artificial stone; the support can be covered or filled in with wood, stone, marble, mosaic and metal, and ornamented in any way that is dignified and consistent with its use and the style of architecture of the church in which it is built.

The *mensa* should invariably extend beyond its base or support, both at the front and sides, in order to give the priest, while celebrating, room to genuflect without striking his knees against the altar-frontal. On its upper surface five crosses must be cut, one at each horn or corner and one in the centre of the slab; and among some nations the date of consecration, together with the name of the consecrator, are inscribed on the under side.

V. If small relics are used, there must never be less than two. They, with three grains of incense, are put in a leaden box, either square or round, closed with a cover, tied down with a red ribbon crossed and sealed with the signet of the consecrating bishop, and placed in a square cavity called a *sepulchre*, three inches by three inches, hollowed out of the centre of the *mensa* of sufficient depth to receive the box and allow room for a cover of stone, which, when in place, must be flush with the upper face of the slab and fastened with cement. If the relic is the body of a saint it is placed under the *mensa* within the altar.

VI. If the *mensa* is made of any other material than stone or marble, as in the case of wooden altars, there must be a *super-altar* or altar stone, of marble, jasper, alabaster, etc. This stone must be inlaid in the body of the

mensa, midway between the Gospel and Epistle end, and at an equal distance from the back and front edge—that part of the altar on which the chalice and paten rest. Moreover, it must bear five incised crosses and have a receptacle for relics. In truth, the *super-altar* is the *mensa*, hence it is made of stone, as stone alone can be consecrated, and as it “signifies Christ the Stone growing into a mountain; as it is said, the mountain itself is fat, *being anointed with the oil of gladness, above his fellows. Jacob set up the stone for a memorial, and poured oil upon it.*”

VII. High-altars of the great basilicas, as described above, were without *re-tables*, because they would have prevented the people from seeing the officiating priest, who stood, as was said before, with the altar between him and them; but where the altar is turned about, so that the priest has his back toward the nave, it is customarily furnished with a *re-table* of two, three or more steps or shelves, running the full length of the *mensa* or beyond it, all of one length, or breaking away at the sides or cut in two in the middle by a tabernacle, where there is one, which is the case in the high-altar of most all parish churches.

VIII. The *re-table* is either as long or longer than the *mensa*, and is built up at its back or east edge, but in no case must it encroach upon the same. It is sometimes made of wood or of the same material as the altar; the gradines vary in height and depth; the first from the altar should not be as deep as the next ones, six inches is a fair height by eight inches deep for the first, twelve for the next and fifteen for the third. This is a matter very largely determined by proportion and good taste.

IX. High-altars in some monastic churches (merdicant friars) are joined to the side walls of the chancel by paneled and ornamented partitions, with a door on the right and left leading to the choir, which is east of the altar. There is sometimes a square opening in the *re-table* so that the celebrant can be seen by the religious.



SIDE-ALTAR IN ST. MARK'S, VENICE (SIXTEENTH CENTURY).



A SIDE-ALTAR OF THE SEVENTEENTH CENTURY—S. TRINITE, FIRENZE.

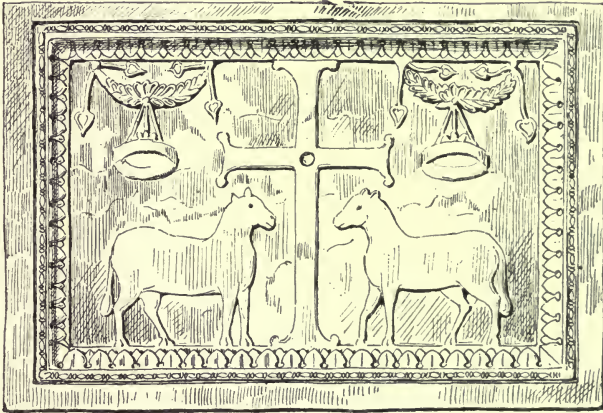
X. Side-altars are ruled by the same general canons as high-altars. They are smaller, stand upon a *predella* without steps, and with one gradine on the *re-table*; they should never have a *tabernacle*, unless the altar is used as an altar-of-the-Blessed Sacrament. If they are altars of sacrifice the *mensa* is the same as that of a high-altar. Side-altars may have a figure of its titular on the *re-table* or picture in a *reredos*. When there are a number of *side-altars*, the first in dignity is the one nearest the Gospel side

of the high-altar and the next is on the Epistle side.

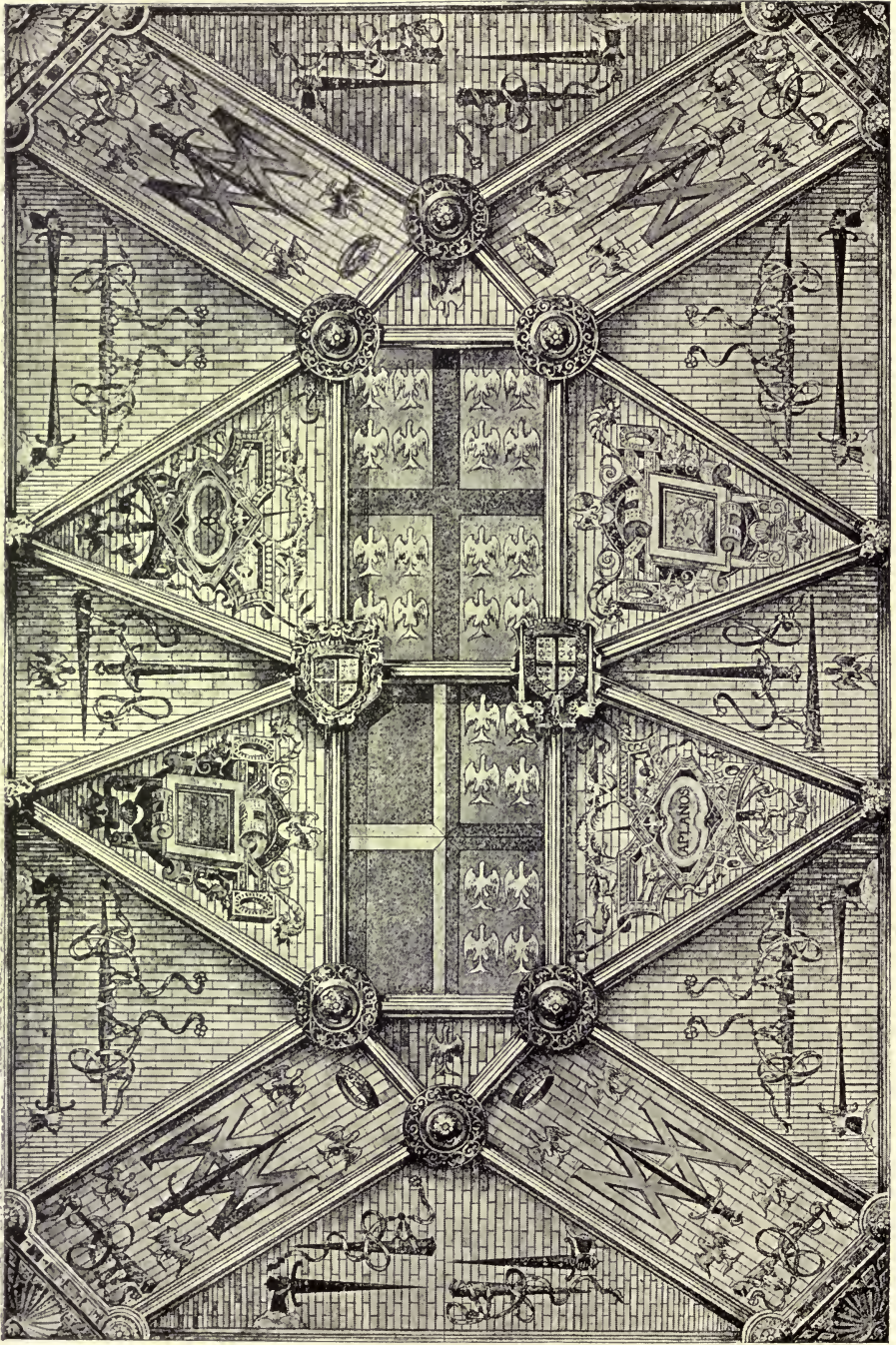
XI. An altar cannot be built over a mortuary vault; this prohibition extends even to the *predella* and steps; nor can there be a cupboard for cruets, etc., of any kind in the altar, *re-table* or *reredos*.

The next division of the subject of this paper, viz.: the *reredos* and *tabernacle*, will be treated at length in the second part of this article—in a future issue of the ARCHITECTURAL RECORD.

Caryl Coleman.



Front of a fifth century altar in the tomb of Galla-Placidia at Ravenna.



VAULT IN CHAPEL OF CHATEAU D'ECOUEN.



MODERN MOSAICS.

THE MOSAICS OF NICCOLO BARABINO IN THE FAÇADE OF THE CATHEDRAL AT FLORENCE.



NICCOLO BARABINO, whose sudden death in 1891 was such a loss to Italian art, was pre-eminent both as a dramatic and decorative painter.

Born at Sampierdarena, near Genova, in 1832, he entered the Accademia of the Belle Arti in that city at the age of twelve, and closed a brilliant career there by carrying off the Durazzo scholarship. Finding that his friend Semino had been classed second in the list of competitors, he insisted that the scholarship should be divided between them, and the two set off to study together in Florence. The generous disposition here displayed accompanied him through life and won him the warmest regard from his fellow artists.

Barabino's first pictures were commissions for religious subjects, especially for Madonnas; and in these his tendency to decorative effects makes itself at once felt. He loves to paint the Virgin Mother with her Babe in panel form, with straight lines behind, either of the niche in which she sits or of the rug hung on the wall. The folds of the robe are more or less decorative, as are the lines of the marble bench with raised steps, on which she sits. Take for instance the two Madonnas

seated among olive branches; the *Madonna dell' Olivo* and that called *Quasi oliva speciosa in campis*. The latter was purchased by the Queen of Italy, who carries it about with her in all her journeyings, and always places it near the head of her bed. In these the decorative intention is plainly visible, both in the attitude of the Madonna, in the way in which she holds the Child, in the upright lines behind, in the raised steps on which her feet rest, and in the slightly conventional treatment of the olive branches that surround her. All the details in fact go to emphasize the constructional decorative line of composition, and thus to give character and force to the composition itself.

This same treatment of steps, pilasters, constructive marble work and niche opening in the central part of the composition, form the main lines on which Barabino designed the three mosaics over the doors in the façade of the Cathedral of Florence. He has thus obtained a most effective variant on the ordinary mosaic backgrounds of blue or gold. He has secured a concentration of effect rare if not unknown in mosaics, and he has brought the three tympani into such harmony with the rest of the façade (in which, it will be remembered, statues seated or standing in niches are largely used) that their design seems

to have sprung complete from the mind of the master who gave birth to the plan of the whole.

When Emilio de Fabris found that his design for the façade had been chosen from among all those presented to the Committee of Judgment, he ap-

pealed to Professor Augusto Conti, well known as a writer on art and philosophy, to furnish him with the details of ornamentations which should harmonize with his architectural scheme. Prof. Conti decided that the whole decorative scheme should be in honor first of the Virgin (to whom the Cathedral, Santa

Maria del Fiore, is dedicated) and then of the Son, in whom the Universal Church rests. The embodiment of this idea is clearly visible in the sculptures with which the façade is loaded; and Barabino has conceived his mosaics in the same spirit.



By Prof. Barabino

JESUS ENTHRONED.

Mosaics in the central door of the facade of S. Maria del Fiore.

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At the time when this work was confided to him, Barabino was President of the Artists' Club in Florence, and all men hailed in him one of the greatest, perhaps the greatest living Italian painter. Moreover he was especially fitted for work of a decorative character, as he has executed, especially in



By Prof. Barabino.

FAITH.

Mosaic over left-hand door of S. Maria del Fiore.

Liguria, a great number of very fine frescoes; thus acquiring that boldness of design and line which are essential to an art dependent on architecture.

The composition of the three lunettes focuses, so to speak, Prof. Conti's intention in the decoration of the whole façade. That over the central door, below the shrine of the Madonna and Child, and Passaglia's bas-relief of the Madonna surrounded by Seraphim, represents Christ, enthroned in the act of blessing the Virgin bent before him and imploring grace. Above run the words, *Mater divine gratia*. On each side are grouped the Saints invoked as protectors of the city. In this, as in the other mosaics, the composition and treatment are clearly given by the accompanying engravings which the kind courtesy of Prof. del Moro, De-Fabris' successor as architect, enables us to

publish. Of the richness and depth of the coloring, however, which gives exactly the note of warmth needed by the coldness of the marbles above and around, engravings can of course give no idea. The two side lunettes are to the honor of the Madonna, protectress of the city and inspirer of charitable institutions. That over the left-hand door, the one nearest Giotto's bell-tower, is the image of Faith, with representatives of the various arts that made the city famous grouped around the throne, and above her head the legend, *Auxilium Christianorum*. Over the right-hand door is Charity throned, above the founders of the various charitable institutions of Florence, and above her runs the motto, *Consolatrix Afflictorum*. Both Faith and Charity are, however, not the purely ideal figures generally used, but the type which



By Prof. Barabino.

CHARITY.

Mosaic over right-hand door of S. Maria del Fiore.

Barabino always adopts for his Madonnas. He has given us the Madonna as Faith, the Madonna as Charity.

Passing now to the composition and coloring of the central mosaic, we are at once struck by the admirable effect of light and shade obtained by the curvatures of the niche in which the central figure sits, and the highly decorative effects of the lines of simulated marble-work forming the pilasters on each side of the niche. The figure of Christ, slightly sculptural, is redeemed from conventionality by the extreme freedom of motion of the arm thrown up in the act not only of blessing, but also of calling attention to the kneeling Virgin *mater divina gratie* and by the pose of the head which is more erect than is at all usual in figures of the Christ, being even slightly thrown back and giving the expression not so

much of meekness (that is left to the Virgin) as of active regal life. It will in fact be remembered that Christ was saluted as King of the Florentines, and that an inscription to this effect still exists on the door of the Palazzo Vecchio. Noticeable, too, is the peculiar cross draping of the cloak, to be observed also in the figure of Faith over the left door, and in the *Madonna of the Olive*. The saints around are those especially dear to the Florentine mind; St. John the Baptist, whose Church opposite the Cathedral is every year the scene of the most solemn rejoicings; Sant' Anna, protectress of the liberty of the city, on whose feast day the Tyrant Duke of Athens was driven out; San Lorenzo, whose vast dome-crowned Church rises but a short distance from the Cathedral; S. Giuliana Falconieri and Santa Maria Maddalena dei Pazzi,

peacemakers between the factions of warring Florence; and San Vittorio honored for the victory of the Florentines over the Pisans.

The coloring of this central mosaic is gorgeous and harmonious. The reds predominate—crimson in the cloak of San Lorenzo on the right, violet-purple in that of San Vittorio, light porphyry-purple in the vest of the Christ, and the note is given again at the foot of the throne by red-edged books. These various tints are dominated and harmonized by the intense deep red of the niche, still further toned by its black arabesques and the deep shadow in which the left-hand portion of it lies. The note of blue is given by the world which the Christ holds in his left hand and by the Madonna's cloak. The former is light blue, as of the sky, the latter an intense dark blue. The requisite lighter tints are given by the Christ's white outer robe and the head-dresses of the nuns, while the black cloaks of these latter and St. John's sunburnt figure introduce the sombre tone necessary to set off the brighter colors. Add now the glittering haloes, the golden vase with its white lilies and their yellow stamens, the golden arabesques of the Christ's robe and the golden points in the lines of marble-work that frame the niche, and you have a whole of marvellous richness and harmony of coloring.

In the two side lunettes the gold falls into the background. They form, as it were, a rich but sober setting to the bright gem in the centre. The figure of Faith in the left-hand lunette is wrapped in a cloak of the blue usually assigned to the Madonna, arranged in Barabino's favorite cross draperies, and she holds a red book. She thus stands out from and relieves the group around the steps of the throne, in which dull yellows and browns predominate, deepening into yellowish green in the tunic of the workman who displays the fleece

at the left of the picture. The silken tissue displayed on the right is dull yellow. Very noticeable here as elsewhere in Barabino's mosaics are the intensely Florentine and characteristic faces. They are sharp and shrewd, each with its own individuality impressed on it. Look, for instance, at the notary craning forward at the Madonna's right hand, or at the upright figure at her left in the corresponding mosaic over the right-hand door.

The two points of light in the right-hand mosaic are given by the scarlet robe of the left-hand figure just mentioned and the rose-hued gown of the Madonna. The drapery of the other figures is black, or practically so, the requisite light being obtained by the marble and small points of gold which form the background. The personages in this mosaic are founders of the hospitals, founding hospitals and other beneficent institutions, whose heraldic devices ornament the steps of the throne on which the figure of Charity is placed.

Regarding these three mosaics as an organic whole, we must give them high praise as fulfilling, under considerable difficulties, the true scope of the mosaic art. They are thoroughly in harmony with the rest of the façade; they are eminently decorative in their conception and execution; the heads are individual and interesting; and they are of a coloring rich enough to give warmth to the whole weight of marbles above and around them. The execution is perhaps in places flat, notably in the black robe of the principal personage on the left of the figure of Faith; and some of the details—the space being so extremely limited—cannot be appreciated from below. But we may nevertheless feel sure that the mosaics of Barabino in the façade of the Cathedral of Florence will remain an example of that revival of the art which marks the end of the nineteenth century.

Isabella De Barbieri.



STUDY IN CHATEAU DE CHANTILLY.



THE MUSICAL IDEALS OF ARCHITECTURE.

Part I.

THE UNITY OF THE HARMONIC LAWS IN THE ARTS OF MUSIC AND DESIGN.



MUCH as the several branches of the Fine Arts have been discussed, and their origins, influences and laws of right and wrong individually analyzed, there are yet certain aspects of the unity in origin and purpose of the various members that have never received the attention they would seem to deserve.

Among these relations is that between Music and Architecture, including under the latter the minor arts allied to her and dependent to any degree upon abstract design.

To be sure, ever since Pythagoras, who probably derived much of his knowledge from the ancient lore of the Egyptians, propounded his theory of the harmony of numbers as being the foundation of all natural phenomena, and Plato raised the minds of men to the contemplation of an ideal beauty in which the accidental and the imitation of externals had no part, many

writers on Art have discoursed in a general way upon "the harmonic law of nature" as the source of the beauties of design. The notion of the perfection and symbolic character of certain numbers took strong hold upon the philosophers and artists of Egypt, Greece and India; and there can be no doubt that they sought to find an application of such not only to arithmetic, geometry, astrology and music, but also to the element of proportion in architecture. But little positive knowledge of this matter, however, has come down to us. Vitruvius hints of some such natural basis of proportion being known to the Greeks, but does not reveal what he supposed their secrets to be, except that he advances the opinion that the proportions of the human figure were taken as guides for the Orders and the distribution of the various parts of temples, which theory cannot be taken seriously in a literal sense, though the analogy between the ratios of the perfect human form

and the most charming examples of design constitutes a part of the analogy of which we purpose to treat. That numbers and measure furnish a tie between architecture and arithmetic, geometry and music, was observed, though obscurely, by Leon Baptista Alberti, and more accurately, though not altogether soundly, by the astronomer Keppler and by the Scotch author D. R. Hay, of whom we will speak more fully presently. Others, searching the origins of music, have proved that her harmony is founded upon laws of nature. And scattered here and there in various works may be found fragmentary or chance comparisons of color to musical tone, or of the rhythmical motive of some particular design or the architectural effect of a musical composition.

But, while music and architecture have thus been acknowledged to possess a few fundamental analogies, and the various arts have been separately shown to express many of the same principles of natural harmony, yet no one, as far as I am aware, has noted the completeness of their resemblance—has made, in short, any study of the matter as a whole; examining their common mathematical basis and, at the same time taking into account the difference in nature of imagination and charm which must necessarily separate an art existing in *space* from one in *time*. For unless we do this we can only prove an *analogy* in certain methods, which may, however, be the outcome of completely opposite artistic motives.

Whereas it is the purpose of this paper to examine the two arts in a comparative way, as far as necessary limits will allow, with the aim of proving that there exists between them a consistent and organic union. A relation, starting in the physical laws of light and optics on the one hand, and sound and hearing on the other, and in their rudimentary media of expression, such as notes, metres, tones and lines, colars and geometrical forms, and carried on through their respective systems of artistic and imaginative composition, design and execution.

Of course each has, necessarily, laws entirely its own and emphasizes certain

characteristics, which in the other are subordinate. Their difference is such as to separate them, vastly in outward semblance and give them principles of structure peculiar to each, and an individual cast to all of their ideals. These essential points of difference we will note as they naturally arise.

Nor is it the intention to infer that either art is in any respect an imitation of the other. The Greeks, and probably the Egyptians, must have appreciated that certain of the values of their proportions were similar to corresponding values in music. But, beyond this, each of the two may be considered to have worked out its own way, irrespective of the other.

However, I think that the recognition of the fact that the arts of design are based upon universal harmonic laws and are closely related in method and ideal to the art of music would not be without permanent value, especially in such a time as the present when the practice of architecture and ornamental design have become but little more than the study and adoption of past modes and styles, often with no thought of their original meanings. And the more any common aim among the different phases of art becomes apparent, the less do they seem arbitrary and accidental; the firmer grows the belief, so necessary to the spirit of the finest work in art, that beauty arises out of truth.

As both music and architecture show many fixed principles of form and composition running through their most divers styles and the productions of races altogether unknown to each other, it is evident that neither can be a chance invention. If, then, it can furthermore be shown that these principles are to a great extent counterparts of each other and derived from nearly identical physical, physiological and mathematical laws, and that still further their ideals are in intimate sympathy, we may hope to establish this union to the extent claimed.

As the foundation of this relationship lies in the fundamental identity of light and sound, it will be necessary in the first place to determine the main features of resemblance of these phe-

nomena and of their respective perceptions by eye and ear, and to seek the meeting place, so to speak, of space and time. And as the second point to be observed is the universality of the laws of harmonic form, we may proceed to examine what correspondence as to relative proportion or ratio there may be between that limited number and range of sounds which the ear has selected as harmonious to that also limited range of colors and geometric lines in which the eye recognizes the beautiful, when, turning from the simple admiration of the loveliness revealed in nature's actual, living shapes, it essays to create ideals in form after its own imaginings. After comparing the physiological-mathematical bases of the two harmonies we will seek for similarity in the artistic principles of composition and design; in the manner of using and constructing an art out of the elementary scale of sounds and primary forms just mentioned.

Having thus examined the relations of their harmonic systems, the second part of this paper will be devoted to the expressive nature of these two art languages, inquiring in what they are at one and what at variance in imaginative and emotional ideal.

And lastly, by glancing over the historic developments of the two, we will seek to trace how in the most notable eras of artistic power these similar laws and motives have impressed similar characteristics of style upon each, and have guided them successively into the same paths of thought.

Light and Sound.

The experiments and discoveries of modern science have been gradually establishing a strong resemblance between the phenomena of light and sound. Each is a form of vibratory motion and is propagated in undulatory waves through various elastic media. The waves of light move at a much higher rate than those of sound; their speed being 192,500 miles a second, while sound has a rate of only about 1,090 feet a second. All sounds of whatever quality or pitch travel in the same medium at an even velocity

as do all rays of light. But the vibrations either in light waves or sound waves are not always the same in number for any given time. From this it follows that certain rays of light or of sound make different impressions than others upon the eye and ear respectively. Of this the practical effect is that there are various colors and sounds of different pitch.

The range of light vibrations, that is, from violet to deepest red, covers from 727,000,000,000,000 to 458,000,000,000,000 undulations that enter the eye in a second or a little less than an octave. The ear perceives a more extended range of about nine octaves vibrations, but of a much lower rate in the same interval of time. The organs of different people vary considerably in the limits of this range of perception.

Both light and sound obey the same geometric laws of reflection and refraction.

What is known as the phenomenon of "interference" is also common. If lines of light be passed through certain crystals, which have the property of separating their rays, and are then caught upon a screen we will have an alternation of light and dark bars, and if two tuning forks be vibrated, one a little more slowly than the other, a rising and falling of the sound will be produced. In both cases these alternating effects are caused by the rays crossing or interfering with the result of diminution of force in certain directions or spaces and reinforcement in others.

There are some features of difference, however, in their respective wave movements, as is shown in the property of light, known as polarization, which prove that the molecules in any particular ray move in a transverse direction to the line of the ray; whereas in sound the motion is back and forth in the line. Now, while this is probably responsible for some of the difference in phenomena, it has no practical significance unless it be held accountable for the fact that light travels in straight lines and therefore possesses the property of shadows, while sound, as everyone knows, is able to turn around cor-

ners, though with partially diminished intensity; somewhat in the manner that waves upon the surface of a lake curl around jutting points of land and diverge into bays and streams.

This is, of course, a fundamental difference; but when we consider an important distinction in the nature of the production and occurrence of the two phenomena, we see that it is this very difference in physical properties which makes possible any mental or artistic relations. But as this concerns more properly the relations of musical, as distinguished from ordinary sounds, we will discuss it later.

The theory of wave motion links space and time together and demonstrates light and sound to be products of essentially the same energy, perceived by different organs according to the intensity of that energy. Each phenomenon consists in the propagation of energy upon mechanical laws, identical in all leading respects.

A simple experiment, first made by Chaldin, the scientist, vividly illustrates how sounds may actually be made visible. A square plate of glass, supported at the middle by an upright rod, was covered uniformly with sand and a violin bow drawn across the middle of one edge, when the particles of sand, agitated by the vibrations, or by the little whirls of air set in motion by the vibrations of the glass, flew from the centre of the plate and collected in heaps along the diagonal lines. As the stroke was varied the sand shaped itself into many geometric figures.

Space and time themselves are less opposites than complements of each other. Motion and force are of course the particular attributes of the one, matter and rest of the other. Yet only by virtue of their mutual dependence may either be apprehended as sounds or forms. For sound and light consist, as we have noticed, in the transmission of force, yet by means of minute motions of matter. Mentally considered, too, the properties of space and time are inseparable. Matter alone is a dead thing; time supplies it with life and measure. Absolute force is an in-

conceivable abstraction; space adds form and proportion.*

Nature continually manifests motion in space or motion and space bound together as one; it is Life. This throbbing life of nature—not her visible forms or movements, but her harmonious ideal, so to speak—filtered through the intellectual and emotional or imaginative sense, as light through a leaded window of splendid hues, and made audible becomes Music, and made visible becomes Design in form, most notably Architecture.

The eye and ear present strong resemblances in construction and in the number and function of their parts, showing that nature has fitted them for the perception of analoguous properties of matter.

Before proceeding to speak of musical sounds and artistic forms, as distinguished from sound and light or form in general, let us take a rapid glance at these two art systems and at those motives that set them apart from the other arts; as a traveler might peer from a height over a plain stretching away beneath him, to note the position of the hills and the winding courses of the streams and roads, by which he is to shape his way.

The beauty and emotional charm contained in works either of music or architecture, depend but little upon direct imitation of things in nature. In painting and sculpture, on the contrary, actual forms and color are represented. However, no artist is purely an imitator. He has to interpret, to choose, to dwell upon certain notes and harmonies; partaking to a limited degree of the musical motive of ideal arrangement and harmony. Imitative motives, as displayed in painting and sculpture, play an important part in architecture. But it is rather as a lovely crowning of the work than as its inner character or the sinews of its

* The analoguous yet opposite natures of space and time are lucidly analyzed by Mr. Isaac L. Rice in a treatise entitled, *What is Music?* In this same work the identity of tones and colors, as being each forms of vibration, is noticed; also lines, as the unit of measure in space, are compared to metres, by which are expressed measure in time. The essential distinction in the beauty which characterizes time and motion from that of space and rest, is dwelt upon, but their unity of purpose the author confines to their common quality of being perceived as states of mind.

strength. All her distinctive power lies in the quality of design. A certain proportion between adjoining forms, as between succeeding sounds, is instinctively felt to be pleasing. Change one of the parts or one of the sounds sufficiently and the result will be discordant and disagreeable.

But more than this, the melodies and the structures evolved upon this feeling for harmony and fitness become raised to a higher level than the mere making of a pleasurable impression upon ear or eye. Mysteriously they gain the power to move the hearts and minds of men. How is this so? What are the secrets of the process that transform the mathematical and the useful into the beautiful?

Architecture represents the pure art of design in space; music, that in time. The properties of such art are abstract, nor do they contain any definite beauty or human feeling in themselves. Yet they may become mirrors of the imagination. They may be moulded by the emotions, as clay under the deft fingers of the sculptor. The designer in lines and colors seeks to produce objects of beauty as well as the literal interpreter of nature. So does also the designer in metres and tones. It is by creating harmonies upon inherent and constant laws (whose likeness in the two cases we will notice presently) that either succeeds in this, and this is done through means of *notes* or units of form, in whatever materials have been chosen or are at hand.

The musician arranges his metres and tones in melody and harmony, according to principles of measure and time. In the simple beginning of his art, he is content with a succession of single notes, as in simple songs and ballads. As the art advances notes of various pitch are combined to produce a single sound; or harmony, in its technical sense, is invented. Finally counterpoint combines and balances, as it were, different melodies upon harmonic principles.

The designer shapes his objects and builds his structures upon his ideas of proportion and order. They may be simple in line or composed of many lines. Consisting, as do Egyptian and

Greek colonnades, in the repetition of a few simple forms, or may be compounded of many lines and forms of varying structural motive, intricately interwoven and balanced, as in a Gothic cathedral: and the expression of these forms varies from simplicity to complexity, as much as do the systems themselves.

But to consider them more in detail.

The Theory of Harmony: Music.

All forms are not beautiful, nor all sounds musical. The musical are distinguished from the unmusical sounds in being caused by repeated impulses, and therefore vibrations, at regular intervals. For the production of a sustained sound or note it is necessary that there be a succession of impulses, that is, repetitions of the original noise, at regular intervals of time and exactly similar in duration, intensity and character. Such a note proceeding from a musical instrument or from the voice is produced by a succession of distinct strokes or impulses, but so extremely rapid that the ear grasps but the single sound. The frequency of this repetition determines the *pitch* or relative accutences or gravity of the note. Its *intensity* and *quality*, which are the two other distinguishing features of sounds, depend; the first, upon the relative abruptness of the stroke or impulse, and the second, upon the character of the instrument or source of the sound.

But, "it is the pitch only of musical sounds," as Sir John Herschel says, "whose theory is susceptible of exact reasoning, and on this the whole theory of harmonics is founded." The exact nature of it comes from the fact that the *intervals* of the scale (as the separation of notes by virtue of the relative frequency of repetition of vibration is called) are permanently established in numerical ratios. If a string be vibrated so as to produce any musical note, as C, and then a string of half the length, but otherwise the same, be struck, the latter will make twice the number of vibrations as the former in the same time. The interval of pitch will be as 1:2, and the note of the shorter string is known as the octave

of the fundamental note, or, in other words, the C, next above in the scale. On the same principle, the numerical ratio, next in order of simplicity, namely, 2:3, gives the interval of the *fifth*, or C to G, if C remain the key-note; 3:4 produces the *fourth*, and so on for the other notes of the scale.

The general principle, and, until the appearance of the famous work, *The Sensations of Tone*, by Professor Helmholtz, the only one that could be offered upon which rests the consonance of tones, is that they all are governed by simple ratios whose terms differ but slightly. The primary intervals of the scale above given are the simplest ratios possible.

The ratios of all the consonant intervals are contained in the simple numbers, 1, 2, 3, 4, 5, 6, or multiples of them.

The three intervals above mentioned, *i. e.*, the octave, the fifth and the fourth, were the only consonances admitted as perfect in the Greek scales. The Pythagorean theory of consonances was that the simpler the ratio between the vibration numbers of two notes the more perfect the concord. This is nearly the truth, but is not literally borne out by the modern systems of harmony. For the *thirds* and *sixths*, whose ratios are next in simplicity to the above, but which had always been classed as imperfect consonances, are now considered as more agreeable and more productive of music than the fourths and fifths. The key-note, its octave and major third, sounded together, form what is known as the common, because most perfect chord.

Prof. Helmholtz, after abundant and conclusive experiments, gave the first thorough and scientific explanation of the causes of harmony and dissonance by investigating the physiological as well as the physical basis by which the musical properties of sound are distinguished.

He concludes that the distinction of consonance and dissonance is, primarily, the result not of the nature of the interval but of the quality of tone and the construction of the whole tonal system. The magnitude of the intervals is independent of this quality, but

“the harmoniousness of the consonances and the distinctness of their separation from dissonances depend on the quality of tone.”

The facts by which he establishes the importance of these tonal relations are briefly these: Most tones are complex, consisting of a prime sound and several other simple sounds, called its partials or overtones, which the ear, however, does not ordinarily separately distinguish. Now, when two sounds are heard together their united sound is usually disturbed by the beats of the partials, with the result of breaking up the sound into pulses and causing a rough effect. This relation is dissonance. But, when “two of the lower partial tones of the notes combined are of exactly the same pitch,” there will be no disturbing beats, or only of such small intensity as to be unnoticed.

Consonance is then “a continuous dissonance, an intermittent sensation of musical sounds.”

The explanation of the long known fact that consonance is determined by the ratios of small whole numbers is found in the manner in which the ear resolves all complex sounds. Into the laws and mathematical expression of this we cannot enter, except to state the conclusion; which is, that just such ratios as these must appear between the partials and the prime tones; or, to put it differently, that the former must be either once, twice, three times, and so on, as great as the latter.

The elementary features, then, of harmony in sound are, that it possesses a continuous, smoothly flowing character, which results from an identity of certain of the simple sounds of which it is compounded; and, secondly, that the intervals, or difference in pitch between the notes that compose the consonance, may be expressed in the ratios of simple whole numbers.

The Theory of Harmony: Form.

Are any principles of harmony, such as the above, to be observed in form?

It is a truth, to which all nature as well as every work of design attest, that when two or several forms are seen together their relation is harmonious

when the forms in question have enough in common; that is to say, display sufficient uniformity in their elementary parts either by direct repetition, in whole or in part, or through evidence of organic relation and continuity between them. I do not mean simply as affecting impressions of congruity or incongruity through association of ideas, but as producing from physiological causes, pleasurable or painful sensations, just as combinations of sound cause the sensation either of consonance or dissonance.

The eye, if at all open to the beautiful, receives impressions of harmony or discord in combinations of line just as the ear does when sounds of different pitch are united. Of course no one would be so foolish as to propose that, for either of these senses, all things could be divided into two absolute classes of harmonious and inharmonious. But the lines which bind together the parts and give contour to a Greek vase, or still more, a perfect human body, are beautiful without regard to any school of taste. And many other objects which could be named, no one with even half an eye could think harmoniously put together.

It is much easier to observe some reasons for such instinctive choice in matters of design than in nature. For in the latter's own lines it is more the degree of consonance which may be noticed than a comparison of consonant and discordant. She is seldom positively discordant except when men take the trouble to make her so. But, that the harmony of her color, or the quality of tone, depends upon just such principles of unity painters show us every day.

We have in the sphere of architecture examples of the necessity of repetition of elements in such features as a row of columns, which must naturally be equally spaced (unless there is some other regular system of grouping), and the line of arches in a nave, which, though they differ to some extent in detail of ornament, would scarcely be made of various heights and spans.

A pattern for a wall surface repeats itself in regular spacings, not simply because it is cheaper to do it so, but

because the effect is more pleasing than restless impression which would be made were it laid out with no system.

Its skeleton lines are a system of squares, rectangles, or other simple figures; as is also the skeleton of a good architectural plan.

As to the combination of objects more distinct, we may cite a building having wings nearly detached. These must be treated with some similarity of line or feature to the main mass or they cannot be brought together for a unity of effect. This principle is so evident in all designs that there will be no necessity to multiply instances of it. The law of symmetry is a sort of epitome of it. Of course when such things are too baldly done, a tiresome monotony is the only result. Variety there must be or there is nothing to harmonize. The feeling of the Greek, the Burgundian, the Italian, as to what is the proper proportions of variety and uniformity have differed somewhat. But, in any style, without such repetition of elements, so that, through forms, however diverse, the same characters of line, color tone, or texture may be carried smoothly, unity of effect and therefore harmony would be impossible.

The eye looks for more or less continuousness of such feeling, and is offended when the treatment or color scheme is too much interrupted, too roughly contrasted.

This, then, is the same distinction which Helmholtz makes on physiological grounds between the sensations of consonance and dissonance in music.

Let us see for the next step if this basis of harmony in design is connected with any demand for the sort of numerical relations which determine the consonant intervals in music.

As the chief distinction between sounds is their difference in pitch, so the chief distinction between forms is their difference in shape.

Any one who has made any study of architectural design has probably realized that buildings of fine and harmonious effect follow, as to general dimension, the proportions of simple rather than irregular figures. That is to say, the relations of length to breadth and

other such proportions are as a rule expressed by nearly related numbers rather than by those widely separated. And were we to analyze the plans and elevations of the masterworks of the best days, we would find that such geometrical figures as the square, the equilateral triangle, and such rectangles, isosceles triangles and right-angled triangles as possess ratios of simple numbers, either as between the length of sides or degree of angles; we would find that such figures may frequently be circumscribed about their outlines and the parts into which the design is divided or inscribed upon diagonals.

If the properties of such geometric proportions have any influence upon the designs of the present day, it is purely an unpremeditated one. But with the ancients it was otherwise. To the Pythagorians and the Platonists geometric figure was an idea. The symbolism with which they endowed the harmony of number has lost all meaning or value to us, but the dependence of the element of beauty upon it, if such there be, should surely still be of interest to us.

The great architectural essayists since the period of the Renaissance, such as Alberti, Palladio, Vignola, De Quincey, Durand, Stuart, and the numerous more modern authors who have followed implicitly upon the same lines, have, after the manner of Vitruvius, thoroughly, and one may say exhaustively, displayed the works of antiquity in their exact form and proportion and lay down abundant rules for the perfect proportions of each Order and variety of building, in accordance with classic tradition. But they offer little or no explanation, save the necessary and non-committal one, one of a faultless eye, of how these inimitable proportions were originally evolved. A few other investigators, however, notably Ramsey Hay, a Scottish designer of the last century, and Violet le Duc, the famous French architect of recent times, have, by geometric analysis of the structures of classic and mediæval times, proved that the people of those days, and especially the Greeks, were aware of certain mathematical relations upon which they determined the proportions of

their most beautiful designs. Not that mathematics could have created design had the visual sense of consonance and congruity been absent, nor that beautiful architecture may be practiced by mere mathematical prescription (though certain writers seem to have thought so), after taste has fled. But simply, in my opinion, that those people, possessed with the finest sense of perfect and ideal form, discovered, in developing their systems of design, that the most harmonious proportions would result from leading dimension being made coincident with the lines of certain simple geometric forms, and such being discovered they used their knowledge with intelligence. Thus, according to the observations of Mr. Hay,* if a rectangle be circumscribed about the front elevation of the Parthenon, its lower line resting upon the upper step of the stylobate, on which stand the columns, being the base line of the columns, its two vertical sides springing from the extreme bases of the outer columns and the apex of the pediment touching its upper line, this rectangle will be such that its diagonals will divide it into two triangles, the angles of which are 90° , 60° and 30° . These angles are in simple ratios, such as 2 : 3 and 3 : 4, to the angles of the two triangles which compose a square. Other rectangles applied to subdivisions of this façade are also of a thoroughly homogeneous character, with the above inscribing rectangle and all the chief numerical ratios of the intervals of the musical scale are found repeated in the relations of their several diagonals.

Again, according to le Duc,† who believed that the modulus of the order was not taken at the base of the column, as generally supposed, but near the middle, we have the following: If perpendiculars be let fall from the middle of the exterior line of the angle columns, the triangle, whose base will be given by the intersection of these perpendiculars with the platform upon which the columns stand, and whose

* See *The Natural Principles and Analogy of the Harmony of Form*, 1842; *First Principles of Symmetrical Beauty*, 1846, etc.

† See *Entrétiens sur L'Architecture*, vol. I., and *Dictionnaire Raisonné de l'Architecture Française de XVe au XVIIe Siècle*. Art.: *Proportion*.

apex is the apex of the pediment, will be the triangle given by a diagonal section of a pyramid with a square base and whose vertical section from the vertex, parallel to one of the sides of the base, is an equilateral triangle. And if this triangle, on the diagonal of such a pyramid, is applied to the Parthenon, it will be found that where its sides cut the lower line of the architrave the axes of the third columns from the end are determined, and that the intersections with the second columns gives the line from which the modulus was determined.*

The Roman Triumphal Arches and Basilicas reveal a conformity of principal dimensions to circles and equilateral triangles.

The finest of the French cathedrals were found by the last-mentioned author to be based upon systematic use of a right-angled triangle of peculiar simplicity and an isosceles triangle derived from it. The former, which appears to have been considered of particular value by the Pythagorians and other early Greek mathematicians, was such that its sides were as 3, 4 and 5, a perpendicular to the hypotenuse from the angle opposite divides it into two similar triangles. All the sides are divisible both decimally and duo-decimally.

And the other, which was the one chiefly used in the Gothic buildings and which also certain French archæologists have proved to coincide with the Pyramid of Cheops, is formed upon the same base as the preceding, and given a height equal to half the hypotenuse of the same. In other words, its base is to its altitude as 4 to $2\frac{1}{2}$.

The principle of the mean proportional is also one that many authorities have found to fit the lines of notable works. Many other writers have more or less thoroughly analyzed the geometric ground work of proportion,

* If this triangle was taken upon the same base as the rectangle of Mr. Hay, its height would be a few feet in excess of the other. But, as will be seen from the text above, its base is slightly shorter, and its height, therefore, is practically, if not absolutely the same. The measurements of the Parthenon made by Stuart and Penrose show the above geometric figures apply within fractions of a foot to its lines, and it is impossible to suppose that this result could have been arrived at unintentionally; especially in view of the well-known importance attributed by the Greeks to the harmony of number.

though without establishing any other natural basis of harmony than that outlined above.*

A thorough investigation of this subject would be a lengthy work in itself, so we must be content with this bare mention of the most prominent instances of the influence of geometric figure upon the harmony of form.

The importance of this connection, as regards relations to things in music, is that the figures which have been adopted by the ancient masters of this art are those of most homogeneous character, the ratios of whose important parts are proportioned to each other with a simplicity equal to that of tones, which is as much as to say that the intervals of space or extent, by which the form of objects are distinguished, are determined as regards harmony and discord by ratios of small whole numbers, which ratios take a corresponding office in time. In short, that the simpler geometric forms constitute a foundation for the harmonies of design similar in purpose to the fixed ratios of the intervals of pitch.

The only author, to my knowledge, among those who have studied the geometry of design, who has made any direct comparison of it to the scientific basis of music, is the above-mentioned D. R. Hay. This writer reaffirms with more definiteness and example than any before him, the old Pythagorean idea of the universality of the harmonic ratios in geometry, music and the human figure. He makes some interesting studies of the geometry of the Parthenon, of which we have mentioned, and of the generating forms of Greek vases. He then draws some theoretically perfect figures, chiefly combinations of the circle, square and equilateral triangle. But in view of the greater importance of the physiologi-

* Such discussions may be found in the following works: *The Geometry and Optics of Ancient Architecture*, by John Pennethorne, London, 1878; *Principles of Athenian Architecture*, by Penrose, 1851; *Gwilt's Encyclopedia of Architecture*; the works on *Gothic Architecture*, by R. W. Billing; the works on *Proportion*, by A. L. Fock, Amsterdam, 1875; *Traité Théorique et Pratique de L'Art de Batir*, by Rondelet, Paris, 1855; *Nouvelle Théorie du Module*, by Aures, Nimes, 1862; *Les Projets Primitifs*, by Hensylmann; and papers in the *Transactions of the R. I. B. A.*, by the last-mentioned author and by W. W. Lloyd, D. R. Hay, John Pennethorne and Baron de Geymuller, in vols. 1852-3, 1858-9, 1878-9 and 1891.

cal basis over the mathematical as the origin of harmony, which Helmholtz establishes, he decidedly overrates number harmony. It is one of the features of musical analogy, but not the only one. There is more in the beauty of form than this tame mathematical perfection. Like other formalists and echoers of Vitruvius, to whom this famous name was synonymous with architecture itself, he fell into the error of the day of regarding architecture as merely a sanctified geometry. Symmetry was too all important, and so such theorists lose sight of the fact that something else besides the mathematical exactness of proportion may enter into the creation of beauty. And furthermore, the dictates of construction and necessity give caste to what otherwise might be an entirely theoretic art. The objects created by design become in a measure a part of nature which surrounds them. What may be good in a palace would be quite unlovely in a rural cottage. The connection of simple ratios with the harmony of sounds and forms is still a fact a most vital one—but it must be considered as a more or less variable result of æsthetic principles. The historic developments of scales and of standards of beautiful form show that they have been subject to change with the progress of taste.

On the other hand we may observe that the recognition of the extensive use of precise geometric relations by the ancients in their designs, does not place the idea of proportion in a more mathematical light than we at present regard it. For, while we follow blindly the classic proportions, the ancients themselves who originated these forms, united in one beautiful result their reason and imagination. Violet le Duc perceived that this was the true value of the geometric element of proportion, when he says that design arrives "by application of reason to the satisfaction of the instincts."

For though proportion was undoubtedly carried almost to the point of a science by the ancient and mediæval builders, it is evident that such a science could have had its source nowhere but in the faculty of artistic

perception, and be of possible service only when practiced under this same indefinable sense or knowledge of the beautiful. The instinct of the true and cultured eye led the first designers to the mathematics of its expression. That the ocular sense agrees with a far reaching natural law is a matter of later discovery. The geometric figure never had any value in itself, nor may their relations be fixed by exact law. Knowledge of the perfect ratios is sound, or geometry by no means assures the production of art in either. An equilateral triangle is certainly more harmonious than a very irregular one, but the eye is not offended by the latter as is the ear by the mere sounding of a discord. It is only when some design is laid out upon such an unshapely figure that the eye realizes the dissonance. Beauty appears only when the lines of the generating form have become lost to general discernment amid gracefully varied lines and modeled surfaces. Music, which cannot be said to lack expressive possibilities, is more rigidly exact in the basis of harmonic proportion. However, as musicians will tell you, the ear does not require absolute perfect concords; were it so, there could be no music but of the tamest character. A separate row of keys would be required for every tonic. But the matter is practically arranged by a compromise in which all the intervals are tempered, as it is called. So in architecture. A series of forms perfect in their mathematical relations can seldom be combined, nor would it be profitable to attempt only such. Art typifies life, movement and personality. This spirit must be infused into the inactive, impersonal perfection of mathematics ere it may give birth to beauty.

The Artistic Systems of Harmony.

The feeling for consonance, which underlies all music and of which the ratios above mentioned are but the numerical expression, has its correspondence in the arts of form as much as the ratios themselves have in geometry.

In the voice and every musical instrument we have a scale of several

octaves and several keys, and in designing objects or buildings we have a more or less wide range of shapes, planes and relative sizes of geometric forms which it would be possible to use. And as no melody can be built out of the accords of a single octave, but must combine consonant notes or chords of several in a well-proportioned succession or arrangement, so no pleasing design can be made out of merely a circle, a triangle or a parallelogram, but must be shaped from a selection and combination of such simple generating forms in just such variety that there is a consonance in the series of parts and in the whole. A random succession of chords on beautiful lines can result in no composition however simple, either in music or design. The idea of *measure* must be introduced. From the plainest of songs to the most elaborate effects of instrumental harmony, there is necessity for measure; *i. e.*, for arrangement in accent, metre, phrases, melodies, and regular distribution of these. There is a like demand in architecture. A building, or any feature of a building, such as an entrance or a colonnade, must be given certain marked divisions of parts. A façade must have more or less grouping of its arcades, colonnades, windows and other elements of its treatment, which must also be distributed at carefully studied intervals.

But this requirement is not fully complied with by simply dividing a wall, an entablature, or other such feature into three, five, or any number of equal parts. There should be an inequality in the divisions. For instance, a long part between two shorter ones, as in the horizontal divisions of a façade of three stories, as in the vertical divisions of a "pavilion" treatment, or as in the base, shaft, and cap of a column. Or simply a long and a short division may have proper effect as in a building having a pronounced basement, and the wall above unbroken by horizontal lines up to the cornice, or in the Grecian Doric column, which has no base. Or, again, three parts, successively increasing or decreasing from top to bottom, are used as in the Italian palaces.

Or, yet again, the proportion of two equal, or nearly equal parts and one shorter may be observed as in the relative heights of architrave, frieze and cornice in the Greek orders, or with the third part greater than the others, as in the Roman orders. Now this, considered as an artistic process, is nothing more nor less than the principle of *metre* and *rhythm*, as to music and poetry; and *proportion*, as to design. And the same ideas of variety and consonance which govern the general divisions and distribution of quantities in either, hold also for the modeling and defining of parts and of the whole—the treatment of profiles and roof lines and the grouping of masses—in other words, *melody* and *outline*.

A succession of rhythms, regular, without being too uniform, under systems of modulation (the passing from one key to another) produces melody. Proportion develops through the repetition and binding together of well-proportioned units, and in graceful mediation between horizontal and perpendicular planes.

As the various parts and features of a design will naturally be carried out upon different metrical systems, if we may be permitted the term, their relations to each other and to the whole have to be thought of. A façade is always given a few main dividing lines—often only horizontally, especially if Italian influence is felt, but in many other cases vertically as well. It is, we will say, to be three stories high and composed of as many superimposed orders. The primary triple division is clearly defined and each order has its own variously proportioned subdivisions. A grand entrance or a loggia will be handled on a somewhat independent scheme. If the doors or rows of windows, the portico, the loggia be any of them, made too large or too small, too emphatic, or insufficiently so, a discordant effect will be given to the whole design.

The Greeks and the masters of the Renaissance were especially successful in obtaining just that variety, yet unity of size and form as yields an effect of harmony and life. In the façades of Bramante may be especially noticed

the systematic use of broad and narrow spaces between openings, pilasters or other members, and the adherence to two or three ratios for the proportioning of all the prominent divisions of an entire building.*

This is surely similar to the artistic laws that govern the construction of melody; and these laws of form—viz., rhythm and melody in music and proportion and outline in architecture (which in either case are in a degree interchangeable, or at least not distinctly separable terms), are the primary and invariable principles through which their organic form is acquired.

As we have said, in the finest works the general proportions, as the length to breadth of a building and of many of its minor features are determined upon regular geometric forms; but in all that relates to the grouping and distribution of these parts—the gradation from greater to less, the bringing together of elements not in themselves consonant, the balancing of like with like, the emphasizing of the principal theme and all such motives, in one art as in the other—we must go beyond the sphere of mathematical regulation. For instance, all the windows of a front may, perhaps, be twice as high as broad, yet those of each row will be of a different scale of size. And the determining of such relative scales is a matter that cannot be brought down to rule or to definite mathematical formula, except in a traditional sense, that a thing once well done may be repeated under similar conditions. The column and entablature and the gable roof are the notes of the structural theme of the whole of Greek architecture. The curves of the Greek mouldings, with slight variations, repeat themselves through history as often as the leaves through the forest, much as modes and forms of composition in music recur unnumbered times.

But, with all the reiteration of such ideas, two distinct elements in proportion may be observed. In the first place, it is the seeking of geometric

harmony; and secondly, it is a rhythmic, melodic and harmonic sequence and combination of forms or notes, such as appeal to the æsthetic sense and eye and may be judged by them alone.

It is much the same with music. For composition and execution with her depend, partly, upon the knowledge of and ability to use the scientific harmonies of sound, but, for the rest, upon her sublime and lovely power of speaking the pure, unfathomed language of the soul.

"The mystic powers that in bless'd numbers dwell."

Such a union we know exists and is of decidedly similar nature in time and in space.

The leading artistic ideas or laws which in different cases go to make up rhythm and proportion are the same. Some of these we have mentioned, as the aim of attaining variety in unity, subordination of minor to major motives, grouping, massing, contrast, complement, gradation, and all such. These being principles of all nature's forms of organic life, their necessity is observable, though to a less extent, in painting and every other art. The separate existence and influence of these latter qualities in the several arts have been so frequently established that it is needless for us to follow this general comparison into further detail.

Some of the laws of consonant form, however, belong more exclusively to the structural arts. Thus repetition of forms and themes, and accent, or stress laid at intervals upon certain such: the constant dependence upon which the most superficial glance at musical and architectural work would demonstrate. Symmetry is more vigorously enforced in design, but balance, which is next door to it, is as necessary in music.

But there is one more important element of musical structure, namely, that of key. Musical writers have frequently noticed that the tonic system of key imparts to music structural system. Mr. I. L. Rice, in *What is Music?* goes to the extent of calling the tonic "the centre of gravity of the musical scale;" and the dominant, whose action

* This *travée rythmique* of the palaces of the Cancelleria, the Giraud, and of many studies by Bramante is discussed by the Baron de Geymuller in *The Transactions of the Royal Institute of British Architects* for 1891.

is opposite to the tonic, as "the audible manifestation of the centrifugal force."

The various parts of a melody may modulate into many keys, but the fundamental note or tonic with which the piece began holds the modulation in check, and the melody ends in it. The interlacing figures of a piece of ecclesiastical music, which seem anxious to fly off in all directions, centre finally into the tonic chord and are unified thereby, much as the multiplicity of forces in a Gothic vault equilibrate each other and gather together their thrusts into perpendicular shafts. The function of key reflects the general law of attraction and gravity and its opposites. But I think we may legitimately carry the comparison a step farther and see that it is more specifically paralleled in form and design through the principle of stability and the effect of a predominating system of lines according to the plane in which they are carried.

We have already touched upon the resemblance between modulation of key in music and that element of proportion which endeavors to mediate between different planes of treatment. Lack of modulation, as in the chants of barbarous people, has the same monotonous and dreary effect, though often with its own impressiveness, as an unbroken expanse of wall or cornice line, a chimney-like tower, or any such case where a single plane of treatment is almost literally adhered to. But if the stretch of wall be broken by porticoes or by emphasis of angle, and the tower be crowned, as the Italian campanile, with lightsome forms, life and gracefulness are at once introduced, as will be done in music by variety of key.

As there are only two distinct varieties of key, the major and the minor, so there are only two manners in which object may be in absolute stability—the perpendicular and the horizontal. The latter is the entire absence of motion, the inertness of matter; the former bespeaks life, but life in repose. All forms that lie in arched or oblique lines suggest active forces and motion, as the gable, the flying buttress. Musical pitch is governed by the quality of

key. The fundamental key of a piece is its bond of unity. Likewise, in architecture, the degree in which work obeys gravity, unreservedly as does the classic, or seeks to defy it as the Gothic, is directly referable to the relative ascendancy or depression of its key; in other words, the preponderance of perpendicular or horizontal line.

The prominent keys of a piece of elaborate harmony become resolved into what is called its tonality, or the recurrence and clinging to certain tones and chords. It is the coloring of music. Tone, as we have seen, bears a relation to music through similarity of its rudiments and principles of harmony to the harmonic laws of sound as established in the systems of intervals which determine them; and, also in that the laws that govern the proportions of form are largely the same as those that lead to rhythm and melodious and harmonic distributions of notes and chords. But the quality of tone itself of course has its more literal visual correspondent in color. The term *chromatic*, used in music, and *tone*, so frequent in studio parlance, prove a tacit acknowledgment of the identity; and as color is of great importance in all design, though sometimes neglected, we may be permitted a few words about this relation.

Neither tones nor colors may be satisfactorily confined to precise limits of forms, unless they be of extremely conventional or inorganic character. Some of the loveliest orchestral effects, as in a symphony, depend upon tones being spread over rhythms and carried through the melodies, swelling and fading in a system considerably independent of the measured forms. This tonality and value of key is continually displayed in nature's ærial coloring.

We look out of our window at an extended stretch of field and wood, gathering in the distance into a ragged line of hills. It is morning. The warm, yellow sunlight bathes the whole landscape. If we fix the eye upon one object at a time, we see them each in their own vivid colors—the thousand different dewy greens of leaf and turf, the gray weathered shingles of the barns, the spotless white of the farmhouses, the staring red of the corn

cribs. But if we look out at no one form in particular, and with eyes perhaps a trifle closed, we perceive one pulsating, glowing, golden tone, streaked with bluish shadows, which fills the whole air and seems to penetrate every patch and fleck of other color, blending them all toward itself, so that each individual color appears but a variation of the yellow sunlight. Even the blue of the distance and of the sky has a light and watery tone.

It is a little later in the day. A mist has been floating in from the sea, obscuring the sun. The warm tone has vanished. The various objects that we saw before are still in a general way red or green or yellow; but they are entirely different reds and greens and yellows, now that the sun no longer sheds its gladdening rays over them. The whole scene is keyed to a cool, gray tone that brings out deep greens and purples where we had never noticed them before.

Again on another day, at sunset, on the shore of a lake. Day is fading and, with it, strong light and corresponding shadow are blending into one. Forms have become vague, tones accentuated. A fathomless rosy and golden light is in the west and seems to flow down from the sky over the distant hills and float toward us, gradually diminishing through intervening colors into which it instills its purple and its madder glow, until, with a last burst of fire, it plunges into the glistening sapphire of the lake.

Not only in atmospheric effects, but in individual objects, may be noticed the independence of color and form. Look at an autumn leaf or gay plumage of a bird and see how the colors run over the surface in spots and streaks, often with seaming wilful disregard of the organic lines.

These principles are evident in the noblest works of architecture. Organic forms, either of sculptured relief or group of mouldings (a capital, a cornice, or an arch are, in their own way, decidedly organic), are left, not necessarily colorless, but at least in monochrome, or with sparing touches of other tones. Brilliant color, where introduced, is confined to geometric and conventional

forms, chiefly in flat inlay or intaglio motives and mosaic.

A successful interior will not be obtained by simply rendering in strong colors (even though contrasting well in the abstract) all the various architectural members of the treatment. Such a proceeding would be crude and unlovely. The scheme of color tones should spread through the whole room, paying heed to only a few of the most important divisions of the form. We may very likely need to mark frieze and cornice from the wall panels by some difference in tone, but do not treat caps and mouldings like an illuminated manuscript. Put the illumination upon the flat surfaces.

Perhaps the highest application of true color feeling in design is in the Ravenna and Palermo mosaics and the thirteenth century colored windows. In these glorious works, figures, animals and other forms are found united with the most intense and splendid color; but the tonal loveliness would be inevitably ruined were it not that there is a severe avoidance of accurate drawing and delicate outline.

Modern architecture seldom commits the sin of adding brilliant color to highly organic forms, but we usually go to the other extreme and ignore color altogether. Yet rich, full color, finely used and in the right place, is necessary for the complete carrying out of the architectural idea. Modern music could never have come into existence had not the ideas of tone developed as well as those of measure and time.

Any building, unless done in brilliant colors, is a pictorial study in monochrome, whether the designer has concerned himself about it or no. Stone, terra cotta, iron, wood, all vary in texture, and therefore in the quality of light they reflect. That whole part of a building which is executed in one material, say stone, will bear a distinguishing tone from another part done in plaster and terra cotta, however like is the design. Therefore, if for no other reason, designers know that to obtain artistic results they must treat outlines and ornaments with modifications of character accord-

ing to each particular material in order to bring out the most valuable qualities of that material, and must, as far as possible, group or distribute the various materials used upon consistent schemes of balance and proportion, just as a composer must keep in mind the *timbre* of the instruments he is writing for, and distribute the work accordingly. These qualities it must be admitted play a more vital, because more constant, part in modern music than they have ever done in architecture, but not more than they may in some future style.

Texture and color qualities are bound to exert a strong influence for or against the harmonious effect of the structure. It is only in modern times that there has been any failure to realize the importance of these tonal values; and that any one has thought of executing identical forms indiscriminately in many materials, regardless of their proper aptitudes. And only in these days has it been so largely attempted (how often with conspicuous lack of success) to give one material a superficial resemblance to some other, in order to carry out in it a scheme of ornament which belongs by nature only to the nobler—proving, though vicious itself, the value of tonal harmony. Sunlight always adds color to form. In the mere presence of light and shade, color, in a simple state, is continually before the designer.

But the quality of shadow has certain interesting relations of its own. Of the pitch and quality of sound we have spoken. Intensity, its other distinguishing feature, is present in form in the principle of shadow. It is to the one artist what silence is to the other.

Some pages back, it may be remembered, this phenomenon of form was mentioned as one of the essential points of variation between light and sound; but that this was offset by the difference in the manner of their occurrence. By which we mean this: Sounds are produced from innumerable sources and of infinitely varied duration. We live in a continually changing sensation of sounds, extend-

ing from occasional silence to the roar of the tempest and the crash of thunder.

But light comes to us from a steady source, that clouds or fog but slightly dim; and when we need artificial light we wish it to be just as uniform. Were it not for the law of shadows night would be but a slightly diminished day, and we could have no art of form save in lines upon flat surface.

It would be as though our ears were to be besieged by an unceasing volume of sound from some great instrument which varied in pitch but never in intensity. For as rays of every color come from the steady light of the sun (the distinguishing colors of objects being due to the fact that only certain rays are reflected to the eye, and the rest absorbed, refracted or reflected in other directions), so a series of sounds may vary in pitch while being all of the same intensity.

The musician creates the very sounds he desires—now soft, now loud, sudden and sharp, or gradually swelling as his effect requires. The architect and sculptor cannot create their light, but they *do* create their *shadows*, through modeling and shaping forms. Some parts may be given faint shadows, others strong, passing gradually from high light to deep dark, or contrasting boldly, according to the wish—spacing light and shadow and grading them as the musician does with sound and silence.

Shadow is also concerned with the degree of relief of the work from the dominant or average plane, thus becoming interwoven with the ideas of pitch and key. Just as sculptured ornament may be in high or low relief, may also be the architectural forms themselves. Thus the façades of the early Renaissance are in much lower relief than those of a later period, and the Greek work on the whole is less bold than Roman and Mediæval. The forms of Gothic invention are evidently more intense than the classic, whether from a structural or a mental point of view. Classic outlines show simplicity, delicacy and calmness. But mediæval crockets and gargoyles, deep recessed portals, steep gables and soaring pinna-

cles reveal a mind wrought to an intense point of spiritual enthusiasm.

There remains unmentioned one important and elementary characteristic of music. This is the distinction of simple melody or single note succession from *harmony*, as technically limited, to music executed in chords, or by several notes of different pitch sounded simultaneously.

From a literal point of view, namely, that two things cannot occupy the same space at once, harmony, in this sense, and counterpoint do not exist in form. But two objects, differing in form or color, may be *seen* at the same time and act mutually upon one another, producing an impression either of harmony or discord. Every design, it may be objected, would be brought under this category. That may be, but not equally. A design of great simplicity and singleness of motive more clearly illustrates melody than harmony. Of this sort is purely columnar architecture and also the façades of the early Renaissance, which mainly consist in rhythmic studies upon broad, flat surfaces, and delicate outlining of the forms. There is seldom, in such style, attempt at much massing of features opposite in character. But all such design as does not rest content with repetition of a proportioned unit and succession of simple rhythmic forms, but seeks to work together into a consonant whole several forms, clearly distinct in structure and in the kind of proportion they suggest; such motives of design, I say, spring from the same idea of composition that gives rise to counterpoint, even though it cannot be said that one may distinguish in an absolute manner between such work that is fashioned to this harmony from that which may more properly be termed melodic.

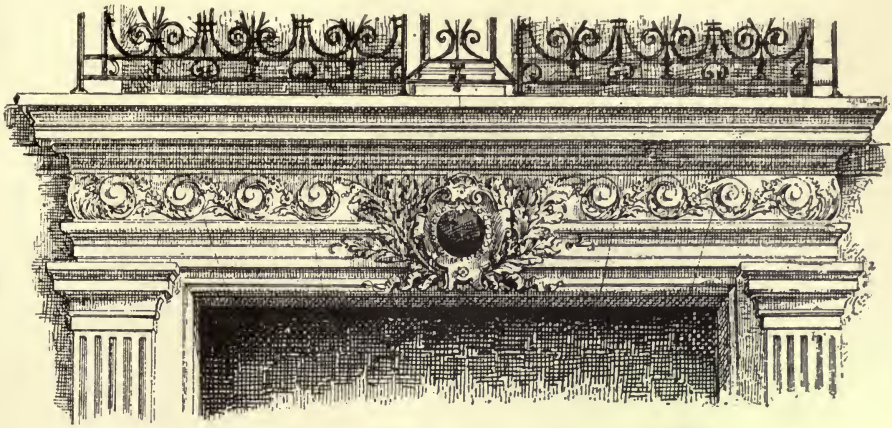
In music there is a clear distinction between the succession of single notes

and the simultaneous sounding of many. Whereas in architecture the change is so gradual from the repetition of a simple motive as a column and entablature to the complicated effects of arch motives, and plans, broken into wings and compound systems of grouping, that a separating line has naturally never been drawn. In the typical extremes of either motive, however, the difference is very strong. On the one hand, such work as the Greek, which uses but one or two general structural motives and the simplest schemes of proportion in consequence; and on the other design that calls in play a number of distinct motives as the Gothic, and develops a system of proportion, depending on balance and gradation between many structural parts. The former class, named or unnamed, which is the classic, and a large element of the revived classic, typifies melodic composition, and the latter, which is in part the Roman, the Byzantine and the late Renaissance styles, but especially the Gothic, carries into effect the artistic principles of harmony and counterpoint.

Brief in detail as such a general analysis as this has necessarily been, it will, I think, suffice to establish the fact that the harmonic structures of music and architecture are the outcome of the same primary laws of form, taking effect in different conditions and surroundings. The similarity is particularly remarkable in the recognized principles of measure and distribution, or rhythm and proportion. But also the vital characters of key, tonality, quality and intensity have their correspondence in similar properties in the arts of abstract design. And as, besides, their physical bases are to a large extent identical, it seems reasonable to suppose they may be found to manifest, though in different environment, many of the same conceptions of the beautiful.

H. Toler Booraem.

(TO BE CONTINUED.)



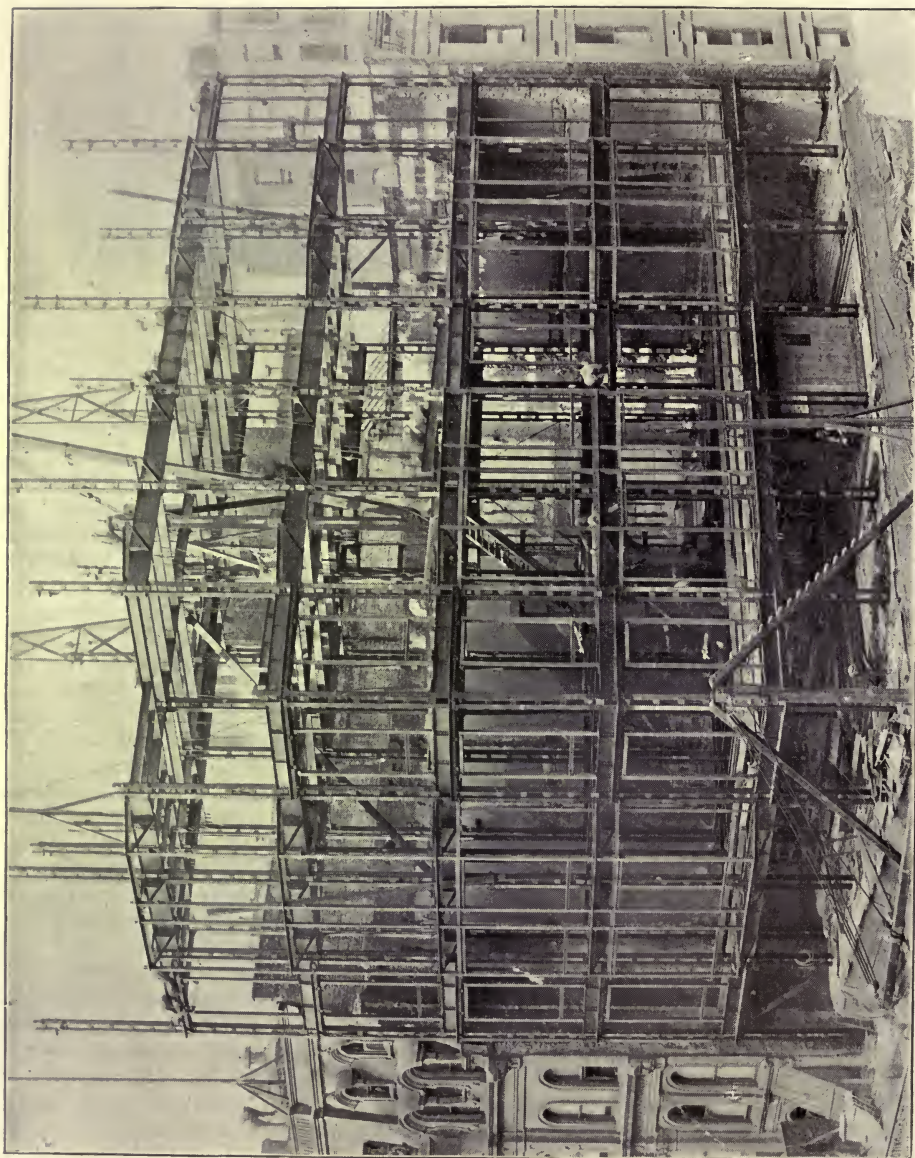
A WHITE ENAMELED BUILDING.



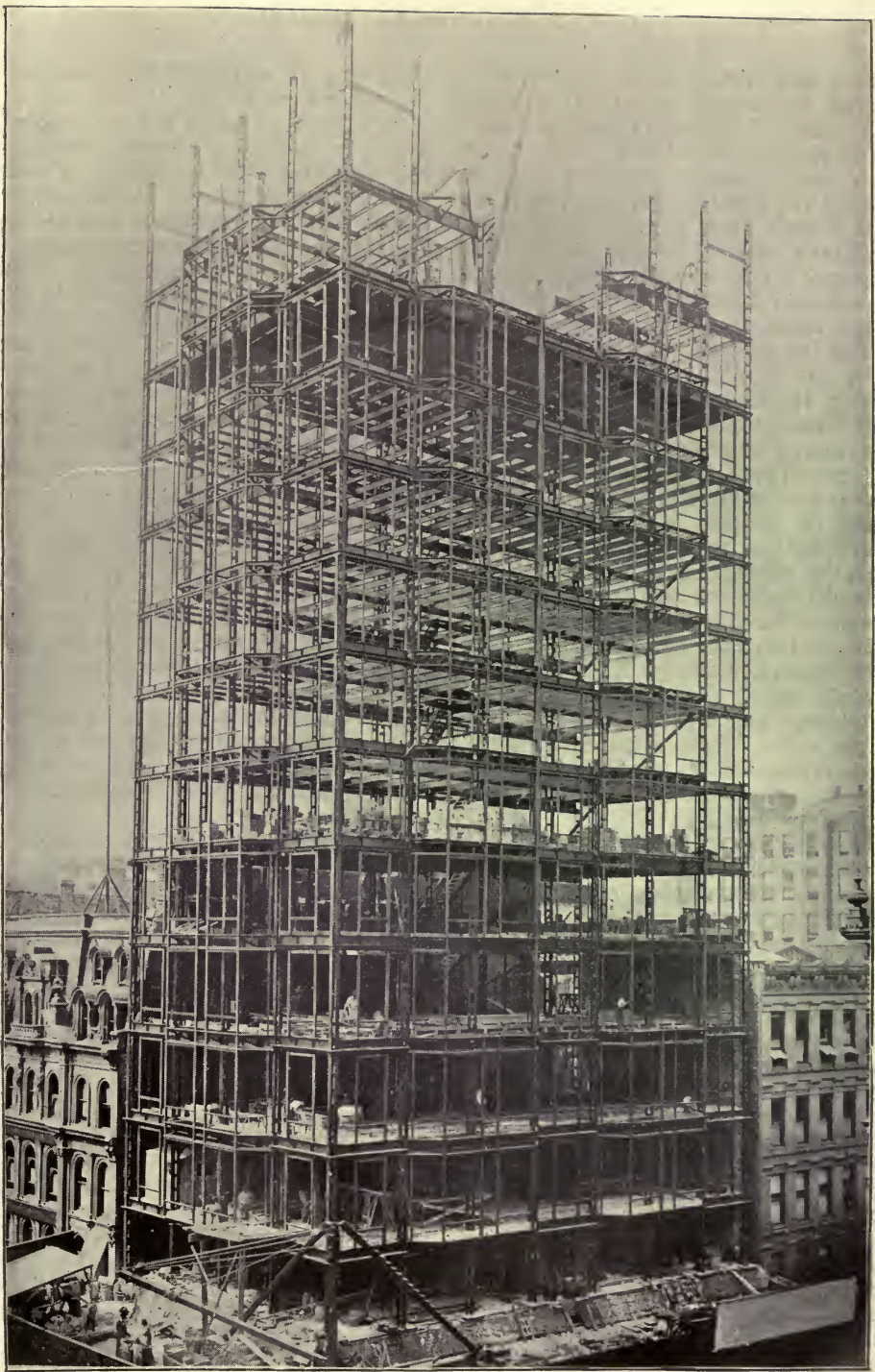
CHICAGO has been treated to a most novel sight. On one of its crowded thoroughfares a sixteen-story building has been in course of erection, the two lower floors of which are occupied by one of the largest dry-goods establishments in the city, and the daily routine of business goes on without interruption while the fourteen upper stories of steel fire-proofing and cream-white enameled terra cotta climb up into the sky to a height of 200 feet. It is the Reliance Building at the southwest corner of Washington and State streets, 55 feet on State street by 85 feet on Washington, and the plans come from the office of D. H. Burnham & Co. Mr. Charles B. Atwood, architect; Mr. Edward C. Shankland, M. A. S. C. E. and M. I. C. E., of London, engineer.

Some five years ago there had been a five-story building on this site of very heavy masonry construction, the lower floor of which was occupied by a National Bank. The leases of the upper floors did not expire until May 1, 1894, but as on the removal of the bank to its own building it was deemed desirable to arrange the first floor for store purposes, plans were made in 1890 for a sixteen-story building by Mr. John Root, and the foundations and first story of this new build-

ing were put in, the upper four stories of the old building being held up on screws, while the first story of the new building was slipped in under them. This spring, when the leases ran out and it became possible to proceed with the work, the original plans underwent radical changes, and Mr. Atwood conceived the idea of using cream-white enameled terra cotta for the exterior, with the exception of the first story already completed, which is of polished Scotch granite. The somewhat limited ground space and the great height of the building present difficult problems to the architect who attempts to produce an attractive structure, and with its plate-glass foundations, which the shopkeeper demands, it is hardly to be supposed that even the designer will consider it a masterpiece. Still there is one most important feature which, regardless of the architectural beauties of the structure, must be considered, and which will make this building stand out as a conspicuous mark in the history of architecture in America, namely, the use of enameled terra cotta for the exterior. The question of being able to obtain this material was a serious one. However, the Northwestern Terra Cotta Co. was able to guarantee the required conditions, and they have produced a fine and novel material from the first story up. Should



RELIANCE BUILDING—JULY 16, 1894.



RELIANCE BUILDING—JULY 28, 1894.

enameled terra cotta prove to be what is claimed for it, if it stands the test of Chicago's severe winters and changeable climate, there can be no possible doubt but what as a material for exterior construction it will be largely used in such cities as are afflicted with a smoky, sooty atmosphere. The idea of being able to wash your building and have it as fresh and clean as the day it was put up, must undoubtedly attract people to the use of this material. No doubt more ambitious conditions will follow with the introduction of extensive color schemes and more elaborate ornamentation. There is certainly no limit to what can be done in this direction, and with a perfect assurance that the material can be produced and that its quality of endurance is assured, why should architects and the public complain of the monotony of the dull greys, browns and reds of the present material used in building. It is to be sincerely hoped that the next enameled building may more extensively introduce color. However, the first step is the important one, and the boldness of the architect who took the first step is to be commended.

In the Reliance Building the design of ornamentation adapted by Mr. Atwood is quite simple, being of a somewhat French gothic feeling, but as the building is purely a commercial one, there is little elaboration. The accompanying illustration gives a fair idea of the terra cotta work, except that one loses the exquisite color and enameled effect, which is certainly most beautiful. The building being very narrow, compared with its height, especial attention has been given to designing the frame-work, which is of steel and it carries the outer walls as well as the floors of the building. The Z bar column, with its horizontal cap plates breaking the column in two at every story, was discarded and a new column used composed of eight angles. The ends of this column were planed off and connected by means of vertical splice plates. A clause in the specification will show the requirements in this particular, which is as follows:

"The columns will be made in two-

story lengths, alternate columns being jointed at each story.

"The column splice will come above the floor, as shown on the drawings. No cap plates will be used. The ends of the columns will be faced at right angles to the longitudinal axis of the column, and the greatest care must be used in making this work exact. The columns will be connected, one to the other, by vertical splice plates, sizes of which, with number of rivets, are shown on the drawings. The holes for these splice plates in the bottom of the column shall be punched $\frac{1}{8}$ small. After the splice plates are riveted to the top of the column, the top column shall be put in place and the holes reamed, using the splice plates as templates. The connection of joists or girders to columns will be standard wherever such joists or girders are at right angles to connecting face of column. Where connection is oblique, special or typical detail will be shown on the drawings."

This column also being open to bottom admits of putting the pipes in the corners of the columns and inclosing them with the fire-proofing surrounding the column.

For wind bracing, instead of tension rods, which had been used heretofore, it was determined to put plate girders 24 inches deep at each floor between the outside columns, thus binding the columns together and transferring the wind strain from story to story on the table-leg principle. These plate girders are bolted to the face of the column, and form a perfectly rigid connection with the column. The columns are in two-story lengths, and adjoining columns break joints at each floor.

Every piece of iron in the construction, including all the roof beams, is thoroughly fire-proofed with porous fire-proofing. Each piece of fire-proofing around the column is wired to the column with copper. It was specified that:

The steel may be made either by the Bessemer or Open Hearth Process. It must be uniform in quality and must not contain over .10 of 1 per cent of phosphorous. The steel shall have an ultimate strength of 60,000 pounds

per square inch, and shall not vary from this more than 4,000 pounds per square inch either way. It shall have an elastic limit of not less than one-half the ultimate strength; an elongation of not less than 25 per cent in 8 inches and a reduction of area of not less than 45 per cent at point of fracture.

All blooms, billets or slabs shall be examined for surface defects, flaws or blow holes, before rolling into finished sections, and such chippings and alterations made as will insure perfect solidity in the rolled sections.

A test from the finished metal will be required, representing each blow cast; in case the blows or casts, from which the blooms, slabs or billets in any reheating furnace charge are taken, have been tested, a test representing the furnace heat will be required, and must conform to the requirements as heretofore enumerated.

A duplicate test from each blow or cast and furnace heat will be required, and it must stand bending 180 degrees over a mandrel the diameter of which is equal to one and one-half times the original thickness of the specimens, without showing signs of rupture either on convex or concave side of curve.

After being heated to a dark cherry and quenched in water 180 degrees Fahrenheit it must stand bending as before.

The original blow or cast number must be stamped on each ingot from said blow or cast, and this same number, together with the furnace heat number, must be stamped on each piece of the finished material from said blow, cast or furnace heat.

No steel beam or angle shall be heated in a forge or other fire after being rolled but shall be worked cold unless subsequently annealed.

Steel for rivets throughout this structure shall have an ultimate tensile strength of not less than 56,000 nor more than 62,000 pounds per square inch, an elastic limit of not less than 30,000 pounds per square inch, an elongation of not less than 25 per cent in 8 inches and a reduction of area at point of fracture of at least 50 per cent.

Specimens from the original bar must stand bending 180 degrees and close down on itself without sign of fracture on convex side of curve. Specimens must stand cold hammering to one-third its original thickness without flaying or cracking, and stand quenching as heretofore specified for rolled specimens.

Where wrought iron is required by plans and specifications, it shall be tough, fibrous and uniform in quality.

It shall have an elastic limit of not less than 26,000 pounds per square inch. It shall be thoroughly welded during the rolling and free from injurious seams, blisters, buckles, cinders or imperfect edges.

When tested in small specimens the iron in no case shall show an ultimate tensile strength of less than 50,000 pounds per square inch, and shall have an elongation of 18 per cent in 8 inches.

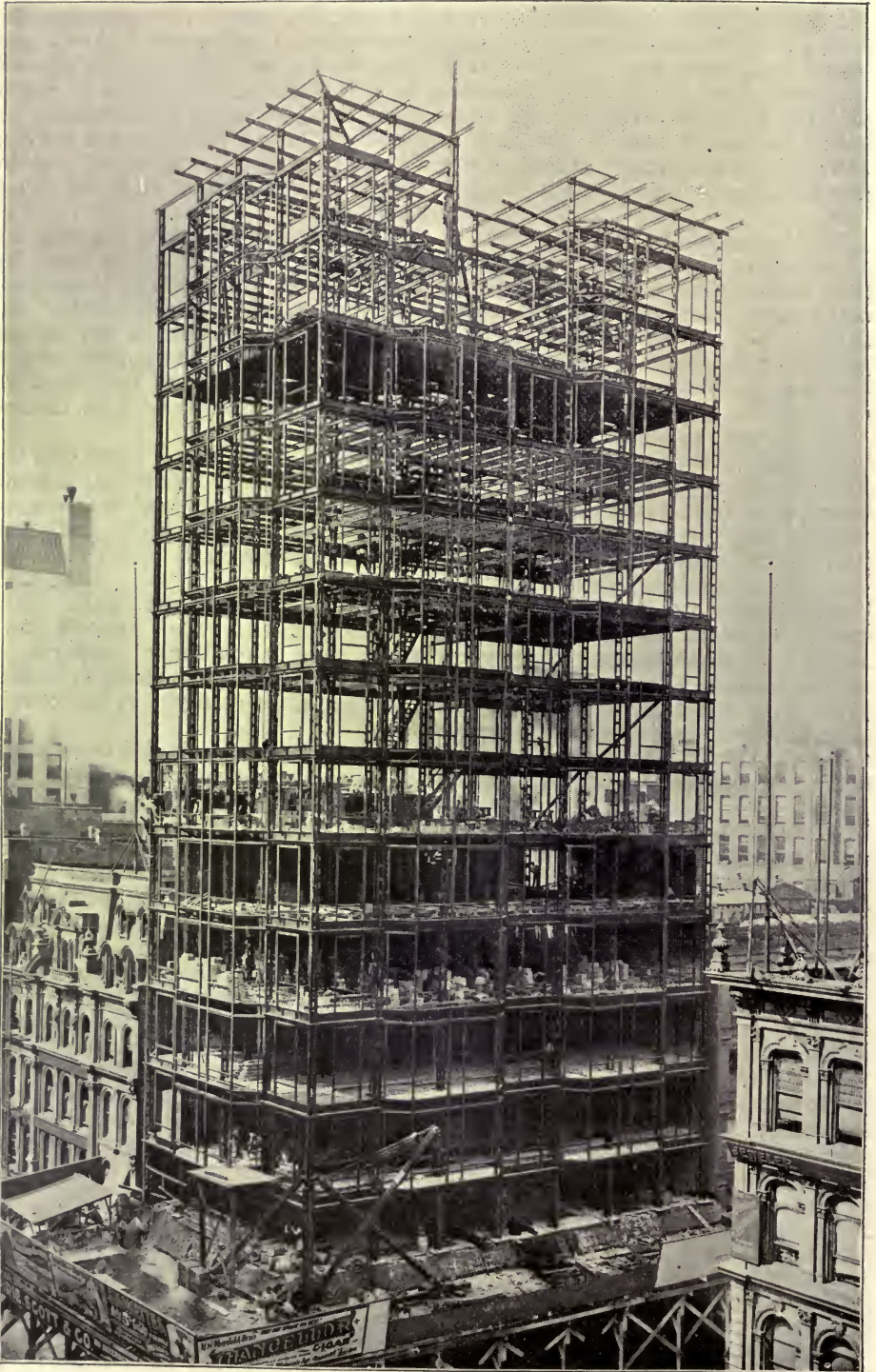
The same sized specimens taken from angle and other shaped irons shall have an ultimate strength of not less than 50,000 pounds per square inch, and shall elongate 15 per cent in 8 inches.

All iron and specimens from plate, angle and shape iron must bend cold for about 90 degrees, to a curve whose diameter is not over twice the thickness of the piece, without showing fracture. When nicked on one side and bent by a blow from a sledge, the fracture must be nearly all fibrous, showing but few crystalline specks.

Cast-iron shall be the best quality of metal for the purpose. Castings shall be clean and free from defects of every kind, boldly filleted at the angles, and the arrises sharp and perfect.

Cast-iron must stand the following test: A bar 1 inch square, 5 feet long, 4 feet 6 inches between bearings, shall support a centre load of 550 pounds without sign of fracture.

As stated in the beginning of the article, the sight of seeing a tremendous building pushing up into the air while one can safely stand at its base and look into shop windows, crowded with the usual display, is, to say the least, rather out of the usual. However, the architect and contractors



RELIANCE BUILDING—AUGUST 1, 1894.



RELIANCE BUILDING—CLOSED IN NOVEMBER 8.

had the material all ready to go up, and on May 1st, when the building was free—that is, the four upper stories—a protecting platform had been built just above the store front, covering completely the sidewalk. It took only a short time to demolish these upper stories, and the accompanying illustrations show how rapidly the steel frame-work and enameled terra cotta went up. The four illus-

trations represent conditions July 16th, July 28th, August 1st and Nov 8th, 1894. That the fire-proofing work and finish of the interior will progress with equal speed is suggested by the fact that the building is to be ready for occupancy January 1, 1895, and leases are already signed from that date. That this, the first enameled building erected, should be watched with unusual interest is only natural.

Chas. E. Fenkins.





RECEPTION ROOM IN OFFICES OF HENRY IVES COBB, ARCHITECT.



THE HISTORICAL MONUMENTS OF FRANCE.



FRANCE is the first country in Europe and, therefore, for us of European race the first country in the world in the importance of its architectural monuments. There is no Grecian architecture there, not even at Marseilles; but then Grecian architecture is an affair not of monuments but of ruins and documentary evidence; to study it is to study an abstraction made up from comparison and inference. But as for those styles which we know from structures which remain, complete or reasonably complete, France is easily the first of lands. In Roman buildings her shows vies with that of Italy and excels that of all other countries in view of the fact that the only large and nearly perfect Roman temple stands in Nîmes, and the only remaining Imperial bridge, with its two memorial arches, one at each end, stands at St. Chamas; that the only great theatre which has preserved its stage wall nearly perfect is at Orange; that one of the two or three great aqueduct bridges, and probably the most elaborate and attractive one, still spans the Gard; that nine out of the twenty existing triumphal arches or gateways which are in part triumphal arches, two of the four best preserved of those amphitheatres which can be said to exist in a state other than ruinous, two of the four monu-

ments of obelisk-like uprightness, and furthermore a great share of the less perfect or less important Roman buildings of the whole Mediterranean world, from the Euphrates to the Atlas and the Grampians, are preserved on her soil. In the post-Roman round-arched style, or styles, France has her great display; for if the Turkish Empire has, with North Eastern Italy, the greatest share of that of the early centuries, and if Germany has great cathedrals like Spier, Worms, Trier, Mainz and Bamberg, which were not destroyed to make room for their Gothic successors, France retains a host of Romanesque churches, in the south, in the north-west and in the centre, rich in decorative sculpture, admirable in design and construction, almost perfect in preservation except where the accursed restorer has made them fresh and sleek. Neither English "Norman," nor German "Byzantine" (two appellatives which rival "Gothic" in absurdity) can rival the French Romanesque in the beauty of their sculpture, nor can the smaller round-arched churches of either vie with those of France in their general completeness and elaboration, noble exceptions, like the great Saint Martin at Koln, always being admitted. And there is such an astounding mass of this Romanesque art. One supposes, too hastily, that the better and richer Romanesque churches were all swept away by the workings of the great

Gothic spell, but it is not so. For the Gothic period itself, of course, there is no other art worthy a moment's serious comparison with that of France. After familiar living with the French churches, those of Spain seem fantastic; those of Italy unreal, and as if built in a dream, however exquisite in detail; those of England small and petty; those of Germany stiff, labored, the work of academically-taught graduates of schools of art, if we can imagine such to have existed in the fourteenth century. But indeed the supremacy of French Gothic no longer needs to be urged. As for the art of the Renaissance, nothing indeed exists in France like the Italian churches, that must at once be granted; and the palace-front and the *cortile* of the Italian cities are also southern products which the northern towns know not; but the Château of the sixteenth century, anywhere north of a line drawn from Nantes to Lyons, what a noble creation is that! And how rich is France in those splendid monuments, nearly as perfect as the day they were built! And to pause a moment over a curious and exceptional development, and to go back in our chronology while we pick it up: What is there more fascinating than the much-abused latest Gothic; that which the French writers call a part of the Renaissance movement, as indeed it is, the strange and lovely work of the reigns of Charles VIII. and Louis XII. Admitting the charm of the English Fan Vaulting, in its three or four great examples, the late Gothic of Beauvais, of St. Riquier, of Rouen, of "The Church of Brou," of Abbeville, of Usson, and of the stalls of Amiens is of vastly greater importance. In the post-Renaissance days French art takes the lead again as it had done during the Gothic period. The architecture of Louis XII., Louis XIV., Louis XV. and Louis XVI. was nearly always the type and model for all Europe. And the remains of this latest epoch are abundant in proportion to their recent creation. It was not a time of very great vigor and of huge undertakings in building; royal palaces are about the only structures of exceptional size and cost, but of what was

built in those times France still preserves the greater part. On the whole, then, France is the land of the most numerous and valuable buildings. The great Revolution to the contrary notwithstanding, that territory where it is the pleasantest and easiest to travel of all Europe is also the most thickly set with monuments of architectural fine art, upstanding, intact, roofed and windowed, doing the work they were made for; too often marred by the restorer, but unexpectedly often treated mercifully by him, and accessible to every student. Let no one think, because he knows the great cities that he knows architectural France; that is only to be known by the patient wanderer and the one who is willing to try the nooks and corners. The pleasure he will have by doing it makes him the less to be pitied, and makes of his "patience" an agreeable receptivity; but that fact does not diminish the good it will do him.

Now, of all this wealth of ancient architecture a certain body of men, appointed at headquarters and armed with large powers, are the custodians. They form the Historical Monuments Commission, and their position is advisory to the Minister of Fine Arts. In these matters the minister of fine arts has great power, and the law of 1887 arms him with special and accurately-defined duties in the matter of the classification and preservation of ancient buildings. Then, too, it is almost wholly in the power of the Commission to decide whether a dolmen, a fragment of a Roman bath, a round-arched doorway built into a later wall, or a Gothic Church or Renaissance timber house, in full utility and beauty, is or is not a structure to which the State has a predominant right of control. Sometimes this control, when it is to be asserted, is obtained by expropriation and subsequent State ownership, sometimes by less stringent measures, in the cases where private property has been designated as worthy of being classed as "a historical monument." In the case of the churches, and many of the more important civic structures, the State was already owner, at least in every sense of custodianship.

The long list of these buildings, parts of buildings, ruins and "megalithic" monuments does not include all the structures in France which it is well for the student to visit, but it does include the more important ones. The list of them, even before the war of 1870, was long; a few were lost with Alsace and Lorraine, but others have been added. The whole list, as it was in 1887, can be got, appended to the act of that year confirming and modifying the law. It is very improbable that many names have been added to it during the past six years. And, as it stands, in spite of some anomalies and odd omissions for which perhaps there are reasons sufficient, it is the most remarkable roll of architectural efforts, experiments and triumphs anywhere to be found.

This Commission, having existed in one form or another for over half a century now, may be thought to have done comparatively little in the way of publishing some record of the treasure put into its charge. There is its one publication in book form, four volumes in folio, of the *Archives de la Commission de Monuments Historiques*, a work which was published after the Franco-Prussian war, but on lines determined by the Imperial authorities. This fine collection contains plates and some slight accompanying text descriptive of forty-three monuments ranging from the amphitheatre of Arles to the Chateau of Blois, in chronological order, and from these to the 30-foot chapel of Saint Gabriel, near Avignon, in order of importance. One of the special features of the work is Viollet-le-Duc's monograph on the fortifications of Carcassonne, plans, elevations and details, a worthy specimen of the elaborate fortification of the thirteenth century, grafted on and carrying out a much earlier system, begun in Gallo-Roman or in "Visigothic" times. The plates devoted to Blois are also of singular value; for here a record is preserved of what the Chateau was before M. Duban began his extensive restorations; restorations not unintelligent, not unwarranted if it be admitted that every old building is to be put into and kept in as a spick-and-span condition of complete repair; but still involving

a destruction of some old work which is to be regretted, and of which a record needed to be kept. The general preface to this work speaks of the "great number of remarkable drawings" which even in those early days were available and from which a selection was made for the plates of these four volumes. These drawings had been made by order of the Commission, and in each instance, for the purpose of laying before the minister the condition of the monument, assumed to need some outlay for repairs, care or restoration. The purpose of these drawings of the structure in its actual state being, then, accurate rendering and nothing more; and the drawings showing the restored or repaired structure being those of the architect in charge of the work, we have a considerable assurance of accuracy, and trustworthy guidance. A good book! But during the twenty years that have elapsed since these volumes were completed, no more of it has appeared, although the drawings in the hands of or available to the Commission have increased in number enormously. Those who have seen a selection of them in Paris will know how greatly it is to be desired that a farther publication should be made of these important documents.

Instead of that, however, the attention of the Commission has been turned to photography, and a huge collection of negatives has been made, fine prints of which are for sale to whomsoever will buy. Each print bears the prettily designed seal of the Commission, and also the words *Robert-Mieusement, Éditeur, Paris*. Many of them bear the date of the making of the negative; an excellent precaution.

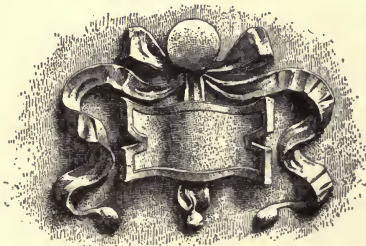
The most out-of-the-way corners of Brittany, the most forgotten villages off the lines of railway contain their share of the important monuments of France. These are not costly churches or big castles, but they are what is rarer still; as an old spelling-book is more scarce, when you want it, than a first-folio Shakespeare, because not set such store by in its time. It is they which have the mediæval church-yard "cross;" often a structure like a tower, and sometimes taking the form

of a *lanterne-des-Morts*, for which see Viollet-le-Duc's dictionary, *sub voce*. They have the "Calvary," if their luck is to be seated in Brittany. They have the ruined ante-Gothic Church, ruined but preserving its doorway and part of its nave in almost perfect repair and its sculpture in almost its original condition, like that at Aiguesvives, a place in the "Garden of France," and not so far from Tours itself, but not likely to be thought of by the traveler who flashes by on the railroad five miles off. They have the strange fortified church of the South, Les Saintes Maries, for instance, with battlements for warlike use, and not the pierced and foliated gimcracks of a late Gothic school at its wits' ends for ornament. These little villages and country-side nooks are sometimes, too, the homes of the real marvels of art, they having indeed grown up to such small development as they have reached around the votive church or the monastery, which some vision or some more earthly reasons of convenience had placed there. Such are the splendid late Gothic Church of Avioth, with 350 people living around it, afar on the Belgian frontier, near no place of greater importance than little Montmédy, and not very near to that; and the still more strangely contrasting village called *Notre Dame de l'Épine*, where the huge church, bigger and more elaborate than many a

cathedral, lifts itself out of a lonely plain, where indeed a few cottagers struggle along the roadside, but no ancient, compact, self-contained village has ever grown up.

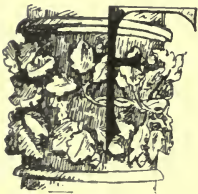
Such is the game which he who loves ancient buildings will be put on the track of by the photographs of the Historical Monuments Commission. That it is not complete yet, that many a monument has been photographed in two aspects which needs a dozen views more, that many another has furnished only some general views which should afford a hundred details, is as true as that what has been done is good. Why, Mr. Organia's work on St. Mark's, of Venice, includes 450 photogravures of its details, and is it to be presumed that the Cathedrals of Chartres, Bourges, Reims, Amiens, offer less material? Either one of those great churches calls for photographs by the score, but these the local operator or the traveling student himself must take. Mr. Trompette, before his death, had taken 250 views of the cathedral of his own town. The collection before us is the most perfect guide possible to imagine to the architectural riches of France; little by little it will be increased, no doubt, but in the meantime its splendid record of great art of many periods is as accessible to foreigners as to Frenchmen for a study which will surely not exhaust its resources any too soon.

Russell Sturgis.





A HISTORY OF OLD COLONIAL ARCHITECTURE.



FOR most practical purposes the colonial architecture of the United States may be described as a reproduction, with such means and skill as the builders could command, of the English architecture of the eighteenth century. It outlasted the condition of political dependence by quite half a century. Indeed, such building in the United States as was architectural at all remained in effect colonial during the first quarter of the nineteenth century, and until it was displaced by the Greek revival. "The colonies," as they were up to the time when they ceased to be colonies, comprised only the Atlantic slope of the Appalachian chain, a strip of sea-coast varying from forty to two hundred miles in width, and extending from the boundary of Canada, then merely a geographical expression, to the boundary of the Spanish settlements, or rather of the Spanish claims, in Florida, which was hardly even a

geographical expression. Only where the mountains declined, as in the neighborhood of New York, were the settlements extended westward. Between Portsmouth on the north and Charleston on the south, and east of the mountains, was included all that there was of what is properly colonial building.

In spite of the diversity of the sources from which the coast was settled, the building became uniformly English as soon as it became so durable or ambitious as to take on the character of architecture. There are relics of Swedish building in Pennsylvania, and relics of Dutch building in New York and New Jersey. But neither what we can see of the relics of New Sweden and New Netherland, nor what we can learn of the state of things of which they are relics, suffices to invalidate the statement that so soon as the building of the colonies began to be architectural it began to be English. When the final transfer of New York to the British was made, in 1664, it is probable that three hundred buildings were as

many as were surrendered, and there is no evidence that the most pretentious of these fairly represented the state of architecture in Holland, where the Flemish Renaissance, to which a resort has been had within the past twenty years by architects, especially by British architects, in search of a style, was then in its most flourishing condition. The old market of Haarlem, the design of which has lately been adapted with much ingenuity and cleverness to the uses of a New York church of Dutch origin, and which is perhaps the most characteristic product of the Dutch Renaissance dates from about 1580. The small farmers and small traders who formed the Dutch community had built only to fulfill their immediate necessities, and timber as most available for the quick provision of shelter was the main material. The relics of Dutch architecture now extant in New York and New Jersey owe their preservation, of course, to the more durable character of the structure, which is mainly of rough masonry, with a sparing use of brick, as the more precious material. The Holland bricks seem to have been preferred to the English, so long as bricks continued to be imported, that is to say, nearly or quite to the end of the colonial period, though bricks were made along the North River very much earlier. They were made, however, of Dutch shapes and sizes, and it is questionable whether in many cases it was not the shape and size of "Holland bricks," that gave rise to the tradition that bricks had been imported from Holland which were in fact of American manufacture.

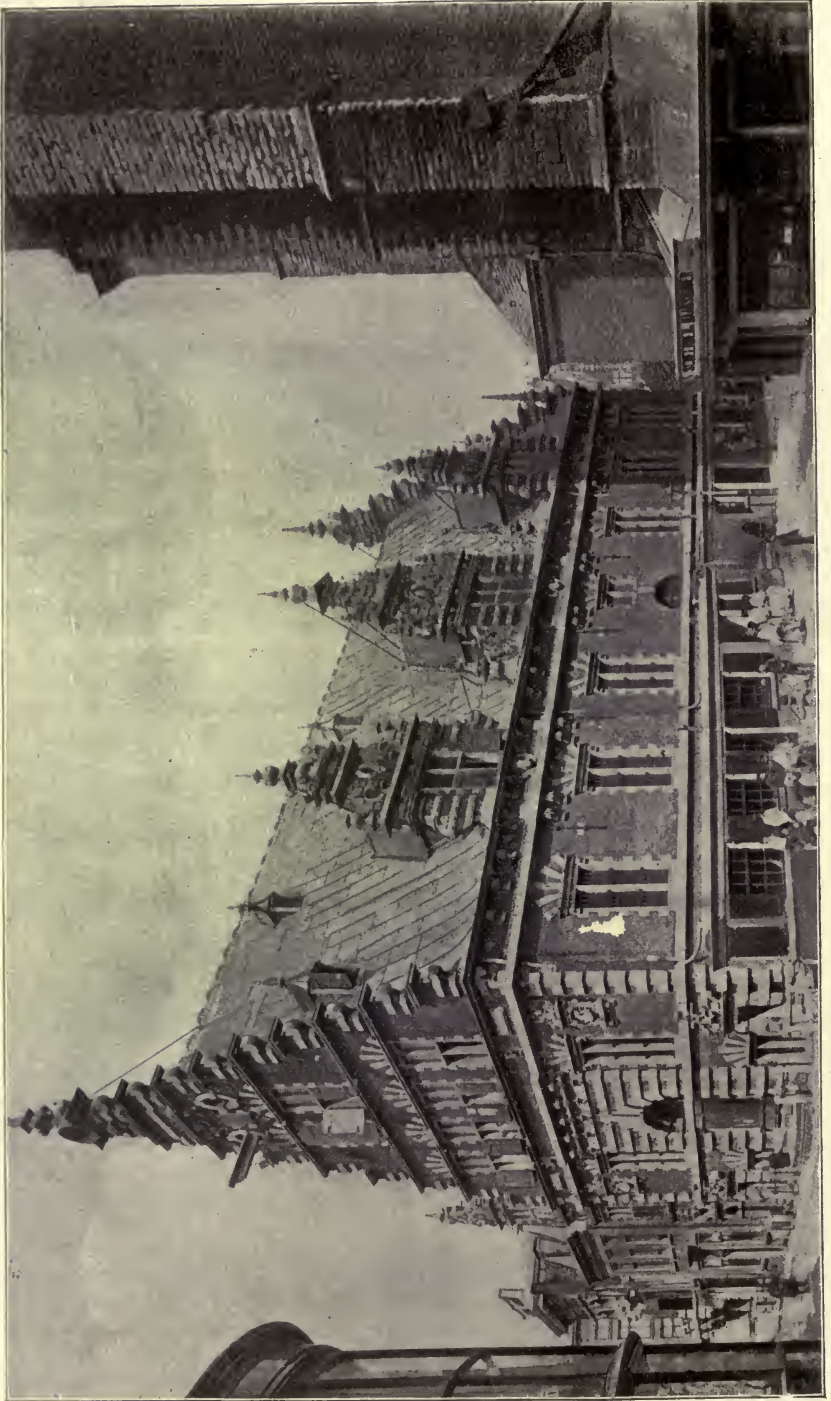
Albany, it is true, continued to be a Dutch settlement for some time after it had been renamed from Fort Orange, and after New York had ceased to be so. But as soon as permanent buildings, such as churches, began to be erected, even in Fort Orange the English taste had come to prevail there also. A meeting-house was indeed one of the first requisites in the Middle Colonies as well as in New England, but there is little evidence that before the beginning of the eighteenth century it had any pretensions superior to

the dwellings, except what it derived from its greater size. The meeting-house of the pioneers, often a place of refuge from Indian attacks, had the twofold character of the ancient building of the British border, which was

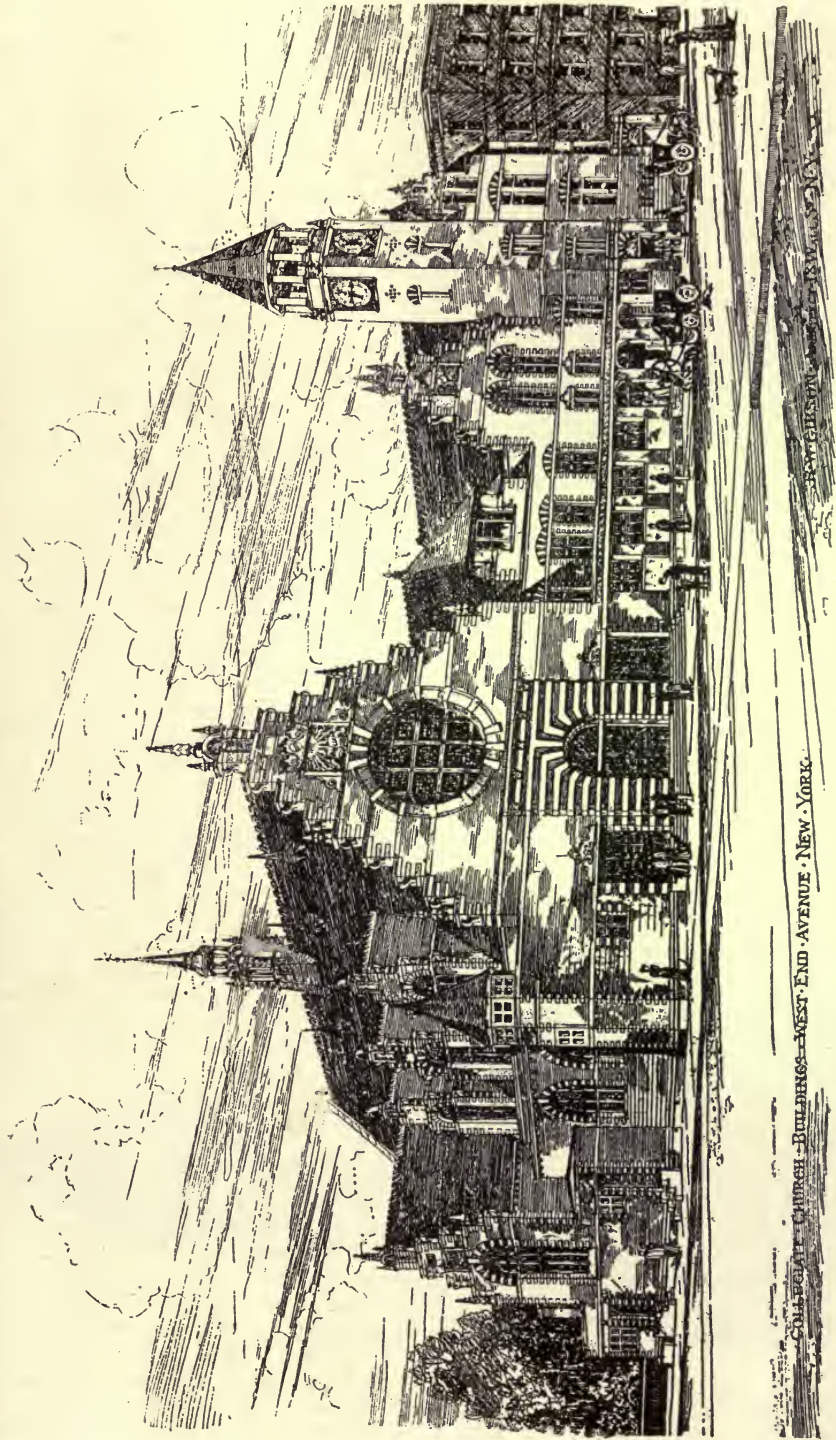
Half church of God, half tower against the Scot.

This was the case with the meeting-house of logs that was built by the Swedish colonists as the Delaware, in 1677, and that was succeeded by the "Old Swedes Church," built in 1700, and still standing. The plan of this edifice is evidently conformed to its requirements, without much thought of appearance. In execution it is a very workmanlike example of brick-work, but the detail proves, as clearly as the uncouth general form, that nothing but utility was in the mind of its builders. The little belfry that bestrides the roof is obviously an addition of a much later date than the body of the building, and this may be said with almost equal confidence of the decorated doorways of cut stone, which are insertions of a date that must be very considerable later than the beginning of the eighteenth century.

There is one church still remaining which is indisputedly much older than the Old Swedes', and to which tradition assigns a date so very much older as to stagger credulity. This is St. Luke's, in Newport parish, the old brick church, near Smithfield, Virginia, still standing and lately restored to habitableness, though its congregation has long since migrated and left its site more solitary than it was two centuries ago. The date assigned to it is 1632, and has little else than tradition to support it, the most palpable form of the tradition being that a Virginian, who was born in 1777 and died in 1841, was employed in 1795 in the office of the clerk of Isle of Wight county, and remembered seeing in the parochial records of 1632 frequent references to the building of this church, then in progress. The records, themselves, were long ago made illegible by decay and have disappeared. Whoever compares this date and this church with



OLD MEAT MARKET, HAARLEM.



COLLEGIATE CHURCH - WEST END AVENUE - NEW YORK

what is otherwise known of the condition of the plantations in 1632 will find it extremely difficult to accept the date. The two natural questions, "where did the money come from," and "where did the workmen come from," are hard to answer. It is true that Raleigh had, in 1588, begun the work of evangelizing the New World by giving £100 "for propagating Christianity in Virginia," and in 1619 and the following years, under the instigation of King James and the Archbishop of Canterbury, who was himself one of the "Adventurers" of the Virginia company, the subscriptions for a "university" in the colony amounted to £1,500. A minister had attended the first ship load of colonists in 1606, and the Church of England was as much concerned about the religious welfare of the colony as the Independents and Presbyterians afterwards became about the spiritual state of New England. That there was a church building upon or near the site of the existing edifice in 1632, or even earlier, is probable. What is extremely difficult to believe without more convincing evidence than that which has satisfied the two historians of the Episcopal Church at Virginia, is that a church so monumental as to have lasted in its essential parts for two centuries and a half should have been within the pecuniary and mechanical means of the colonists in 1632, only a quarter of a century after the first settlement at Jamestown, twenty years after the baptism of Pocahontas, eight years after the patent of the Virginia Company had been revoked and the colony made a royal province, twelve years after the massacre which had destroyed Jamestown and for the time checked all missionary enterprise. It was not until 1633 that George Herbert's couplet was published, paraphrased in smoother verse a century later by Bishop Berkeley :

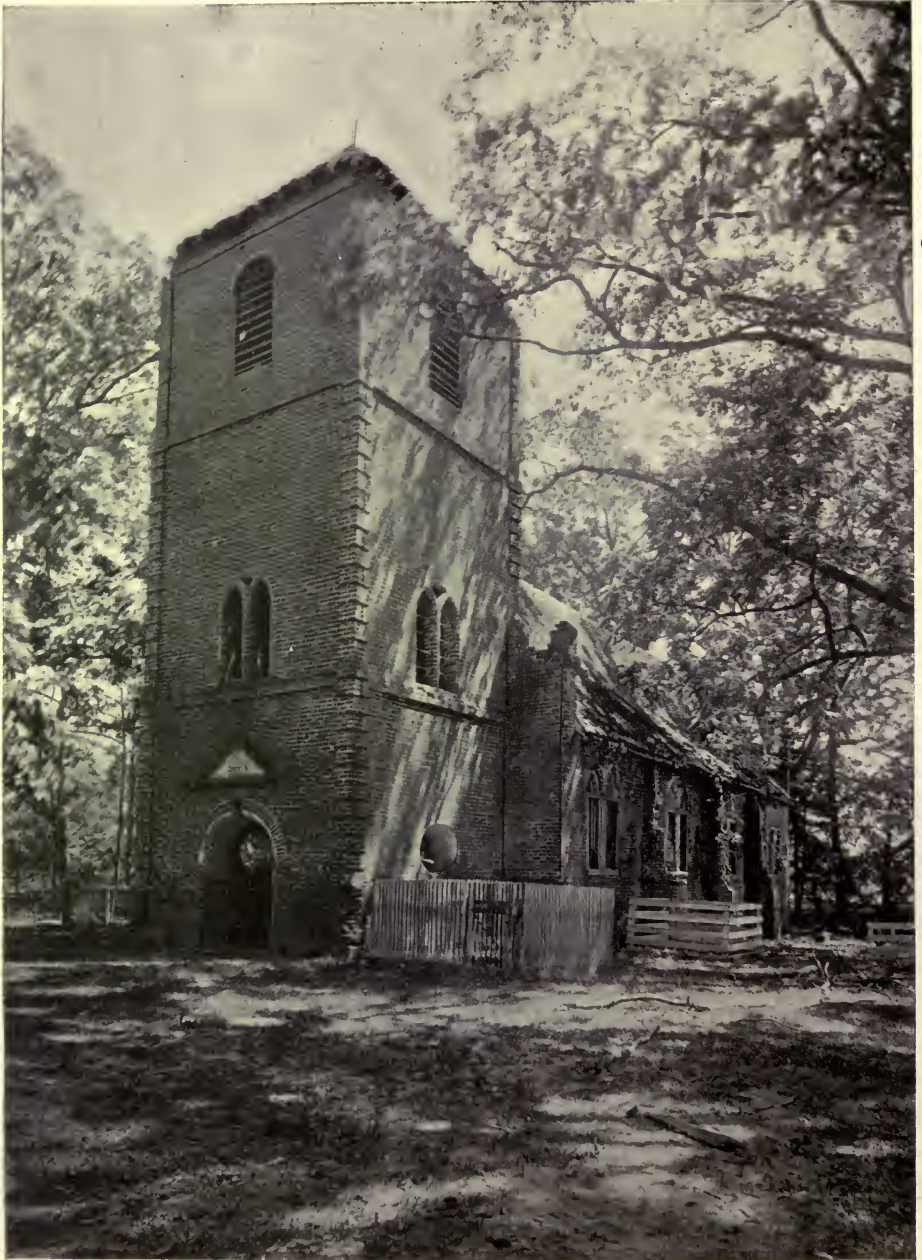
Religion stands on tiptoe in our land
Ready to pass to the American strand.

It was not until 1701 that was founded the Society for the Propagation of the Gospel in Foreign Parts, which,

indeed, never extended its labors to Virginia, but had a marked influence in the church building of the Middle Colonies. Even in 1655 there were but ten ministers in all Virginia. It seems, therefore, that a date nearly half a century later than that assigned by tradition is necessary to prevent this interesting building from being an entirely anomalous exception to all that we know of the state of society in Virginia or in America in 1632. A duration of two centuries still leaves it a venerable object, as American antiquity goes, and justifies the claim that local pride makes on its behalf of "the oldest Protestant church in the Western Hemisphere," and it may easily be the oldest building within the limits of the English colonies in America. The more credible supposition as to its age detracts no more from the architectural than from the historical interest of the building. Architecturally, indeed, the building might easily enough be referable to the date which tradition assigns to it. The body of the church is a parallelogram of fifty feet by thirty, and the adjoining tower eighteen feet square by about fifty feet high. A drawing made about forty years ago represents the tower as covered by a plain low pyramidal roof, but this was very likely more recent than the building. Whether the church was built in 1632 or much later it is probable that workmen as well as materials were imported expressly for its building, for there was scarcely permanent employment for such a body of bricklayers in Virginia at any time during the seventeenth century. Nearly a hundred years later (1781) Jefferson deploras "the unhappy prejudice" of the Virginians "that houses of brick or stone are less wholesome than those of wood," adding that as the duration of wooden buildings "is highly estimated at fifty years, every half century our country becomes a *tabula rasa*." This earliest of Virginian monuments is an excellent piece of brick-work that owes its duration to good workmanship and to the quality as well as the quantity of material in its thick walls. It is quite clear that it was not designed by



CATHEDRAL AT SALTILLO, MEXICO.



ST. LUKE'S, NEWPORT PARISH, NEAR SMITHFIELD, VA.

A. D. 1632.



Philadelphia.

OLD SWEDES CHURCH.

A. D. 1700.

an architect, for it has no badge of the Jacobean or Caroline architecture except the appearance of the protruding keystone over the entrance, and the quoining at the angles of the tower, though, indeed, this latter is as old in English building as the so-called Anglo-Saxon period. The work is what might be expected from an English bricklayer of the seventeenth century reproducing from memory, and in the material available to him the form of a parish church of the old country. The Gothic tradition had died out and the reproduction was a reproduction of the forms alone. The arch, for example, in the second stage of the tower is not structurally an arch, for the joints are horizontal, and it owes its stability merely to the cohesion of the brick and mortar, though the arch of the belfry stage is a true arch, a ring of half a brick in thickness. The buttresses, it is probable from their form, were useless appendages, such as the nineteenth-century architect frequently applies to denote that his building is Gothic. It is possible, however, that they may have had reference to the original roof construction, and possessed a mechanical function with relation to it, though this cannot be determined, as the church was re-roofed "some twenty or thirty years" before 1857, when Bishop Meade described it.

Whatever its precise date may be, St. Luke's, at Newport, is probably, with two exceptions, and these barely exceptions, the only colonial church of the seventeenth century still standing, and is eminently worthy of the pious pains that have lately been taken to restore it. The oldest churches in the Middle Colonies, antedating by a year the oldest in Philadelphia are the Dutch church at Sleepy Hollow and the Swedish church at Wilmington, Del. The former is a parallelogram of rude masonry, the windows framed in yellow bricks that were undoubtedly imported. It has an apsidal end, as in Philadelphia, but with the gable of wood, bearing a wooden belfry, very artlessly designed and attached to the roof, which is quite rude enough to be the

reproduction of that set upon the original building of Philipse. The church at Wilmington, equally rude in construction, is distinctly better in design, and the lateral porch is a positively picturesque feature. The Old Swedes', as we have seen, was built just at the close of that century. Early in the following century Philadelphia took, in population and wealth, the lead among American cities, which it held throughout the colonial and revolutionary periods and did not lose until the end of the first quarter of the present century. In churches and in public buildings the relics of the colonial period are much more extensive and interesting than those of any other American town, and perhaps than those of all other American towns. The plainness of the domestic and the commercial building during this period, so violently in contrast with the now current Philadelphia mode in these departments, is in part referable to Quakerish simplicity and in part to the preference for brick which came from the natural facilities of the place for brickmaking, and the early advantage that was taken of them, in so much that "Philadelphia bricks" acquired, during the eighteenth century, a pre-eminence that they retained until within the last twenty years. It is not without significance that the most elaborate and pretentious of the early buildings of Philadelphia should have been that of the Church of England. The present edifice succeeded a previous church, also in brick, which was older than the existing Swedes' Church, having been built in 1695, and no doubt resembled it in design. It rejoiced, however, like so many colonial churches in the Middle Colonies, in a communion service given to it by Queen Anne. At the time of its erection (1727-1731) Christ Church was not only by far the finest building in the colonies, but in relation to the wealth of the community was a more impressive testimonial of public interest in its purpose than any religious edifice erected since. There was at that time and for long afterwards no such person as a professional architect in the colonies. The me-

chanics were intrusted with the design as well as the execution of utilitarian buildings, while for civic or religious monuments the designs were either imported or intrusted to amateurs, who dabbled in Vitruvius and had some knowledge of the current modes of the old country. A physician of Philadelphia, Dr. John Kearsley, was the amateur who was invoked to design Christ Church. It is not clear whether the steeple, as it now stands, was part of his original composition, for it was not finished until 1754, twenty years after the completion of the church. It is less successful in design than the body of the church to which it is attached. Though the modeling of the octagon is very well considered as a design for a substructure of a spire in masonry, it loses most of its effect when rendered in evident woodwork, and the spire itself, which is carried to the height of 196 feet 9 inches, is not happy in outline or proportion. Upon the body of the church one is inclined to congratulate the shade of the amateur designer, considering the difficulties under which he labored. He had at command excellent brick and excellent bricklayers, but the task of making an architectural building out of bricks alone was one which he not only forebore to attempt, but which doubtless never occurred to him as feasible. To him, as to his professional contemporaries in the old country, architecture was a matter of "the orders," and to make a work of architecture out of a building was to apply the orders to it with accuracy and discretion. Unfortunately the exterior application of the orders involved the employment of large masses of stone and of skilled stonecutters, and skilled stonecutters in sufficient numbers were not to be had in the colonies at that time. Hence it was necessary to imitate the orders in brick, or in wood, the latter process being objectionable from its lack of durability, and the former from its mean and petty appearance, even to those who did not at all connect the forms of the orders with the construction that gave rise to them. The lack of stonecutters in colonial Philadelphia during the colo-

nial period is made evident by the use, in the dwellings of the humble class that remain from that period, of sills and lintels of wood in brick walls, thus limiting the duration of the building to that of the more perishable material. In Christ Church it is made evident by the construction in brick of members which could not have been devised for the material, as the pilasters of the walls and of the chancel-window and the entablature of this window. The exterior is, however, a reasonably frank and straightforward exposition of the interior arrangement—a galleried room, 75 feet long by 61 wide and 47 high, with a chancel 15 feet by 24. The interior was designed with accurate knowledge of what was done in England, and shows the system, adopted by Wren and his successors, of an order completed by the insertion between the column and the impost of the arch of an ugly and irrelevant fragment of entablature. That the detail here is more correct than that of the exterior is doubtless due to the fact that the amateur architect was here assisted in his design by the mechanics who were to execute it. Indeed, it is noticeable throughout the whole colonial period, at least the politically colonial period, that the carpenters were much better trained than the stonecutters, and that the woodwork habitually betrays the result of this superior training, being at once more correct in design and very much more accurate in detail than the stonework in the comparatively few instances in which classic detail was attempted in stone. Neither at the time of its erection nor long afterwards, did Christ Church, Philadelphia, have any rivals to the northward. There is not a church left standing in New York within thirty years as old, nor were there any of which there is any reason, on architectural grounds, to lament the disappearance. The Old South Church in Boston, was contemporaneous with Christ Church, having been begun in 1729, but the interest of this is exclusively historical. Indeed, considering that the plan of the two edifices is virtually the same, and their dimensions not very far apart, the Philadelphian



Philadelphia

CHRIST CHURCH

A. D. 1727-31.



Philadelphia.

INTERIOR CHRIST CHURCH.

Restored 1882.

relic attests the clear superiority in the polite arts of Philadelphia over Boston. It has in the comparison a distinct air of "gentility," to revive the eighteenth century word, while the Bostonian church, otherwise merely uncouth and ugly, derives a taint of vulgarity from its unsuccessfully pretentious spire. It is true that, while there is no reason to doubt that the Old South was fairly representative of the Boston of 1729, Christ Church may make an unduly favorable showing for the Philadelphia of that time. The next Philadelphian church to it in antiquity, St. Peter's, is thirty years younger (1758) and distinctly inferior, lacking, indeed, all the features that give distinction to the older building, except a chancel window correctly designed and detailed in wood, but deprived of its effect by the juxtaposition of other windows in a relation that seems entirely fortuitous. The steeple is positively ugly, the tower being a shaft of brick work pierced with openings without architectural relation to itself or to each other; and the spindling cone of the spire is abruptly and awkwardly set upon this, without any such attempt to soften the transition as the polygonal base that is the most successful feature in the design of Christ Church, and that needs only execution in monumental material to be a really monumental feature.

Within a few years, however, Christ Church had an architectural rival in the English colonies, and the rival was then esteemed to have the better of the competition. This was St. Philip's, in Charleston, said to have been completed in 1733. It is to this undoubtedly that Burke refers in the description of Charleston, contained in his "Account of the European Settlement in America (1757)." "The church is spacious and executed in a very handsome taste, exceeding everything of that kind which we have in America." Though Charleston was at a much earlier date divided into the parishes of St. Philip's and St. Michael's, and though the existing church of St. Michael's was begun in 1752, it was not opened for service until February, 1761. St. Philip's was burned in 1835, but in the rebuild-

ing the old church was reproduced, except that the spire was made taller, and now, but for the damage done to it by the earthquake of 1885, it still corresponds to the quaint account of its predecessor in "A Short Description of the Province of South Carolina" (London, 1763).

St. Philip's Church is one of the handsomest buildings in America. It is of brick, plastered and well enlightened on the inside. The roof is arched, except over the galleries (nave tunnel-vaulted), two rows of Tuscan pillars support the galleries and arch (vault) that extends over the body of the church, the pillars ornamented on the inside with fluted Corinthian pilasters, whose capitals are as high as the cherubins over the centre of each arch, supporting their proper cornice. The west end of the church is adorned with four Tuscan columns, supporting a double pediment, which has an agreeable effect; the two side-doors, which enter into the belfry, are ornamented with round columns of the same order, which support angular pediments that project a considerable way and give the church some resemblance of a cross. Pilasters of the same order with the columns are continued round the body of the church; over the double pediment is a gallery with bannisters; from this the steeple rises octagonal (*sic*) with windows to each face of the second course, ornamented with Doric pilasters, whose intabature supports a balustrade: from this the tower still rises octagonal with sashed windows in every other face, till it is terminated by a dome, upon which stands a lanthorn for the bells, and from which rises a vane in the form of a cock.

The nave of St. Philip's is 74 feet long, the vestibule 37 and the portico 12, making the total exterior length 123 feet. The greatest width is 62. It would seem to have been inevitable that when the parishioners of St. Michael's came to build, they should strive to outdo their neighbors in dimensions as well as in "elegance." The extreme length of their church is 130 feet, the body 80 feet, and the steeple is 192 feet high, but the extreme width, 58 feet, is 4 feet less than that of the older church. The description of it from the same authority just cited, may serve to supplement, if not to elucidate the illustration.

St. Michael's Church is built of brick; it is not yet quite finished. It consists of a body of regular shape, and a lofty and well-proportioned steeple, formed of a tower and



Charleston, S. C.

ST. MICHAEL'S CHURCH.

A. D. 1752-61.



Near Charleston, S. C.

GOOSE CREEK CHURCH,

Circa A. D. 1715.

spire; the tower is square from the ground, and in this form rises to a considerable height. The principal decoration of the lower part is a handsome portico with Doric (Roman-Doric) columns, supporting a large angular pediment, with modillion cornice; over this rise two square rustic courses; in the lower are small round windows on the north and south; in the other, small square ones on the east and west (on all four). From this the steeple rises octangular, having windows on each face, with Doric pilasters between each (*sic*), whose cornice supports a balustrade; the next course is likewise octagonal, has sashed windows and festoons alternately (festoons no longer, perhaps removed when the clock-faces were inserted) on each face, with pilasters and a cornice, upon which rises a circular range of Corinthian pillars, with a balustrade connecting them, from whence is a beautiful and extensive prospect. The body of the steeple is carried up octangular within the pillars, on whose entablature the spire rises, and is terminated by a gilt globe from which rises a vane in the form of a dragon.

One is not surprised to learn from another source that the steeple of St. Michael's was, during the whole colonial period, the chief landmark of the low Carolinian coast to incoming mariners, and it served the same purpose a century later for Confederate blockade runners. Of the architect of St. Philip's no tradition remains, though it is probable that the plans for it were procured in England. It does not betray, as even Christ Church in Philadelphia betrays, the hand of the amateur. It is certainly known that the design of St. Michael's was imported, and the *South Carolina Gazette*, of February 22, 1752, in describing the projected church, informs its readers that it was to be erected "from Mr. Gibson's designs." There is no architect of the period known by this name to fame, or even to tradition. But the most fashionable church architect in London in 1752, to whom the agent of the colonial church would naturally apply, was James Gibbs, who died in 1754, the designer of the Radcliffe Library at Oxford, and of the church of St. Martin's-in-the-Fields in London—then the most admired church since Wren's time. It is not at all unlikely that it was he who designed St. Michael's which certainly is worthy of him, or of any designer of the time. There are several examples in colonial

architecture of the conjunction, introduced by Hawksmoor a generation before and employed by Gibbs of a classic portico with a steeple modelled upon the steeples of Sir Christopher Wren. The conjunction is unfortunate in that it involves the standing of the spire on the roof, to keep it out of competition with the portico, and prevents its lines from being brought down to the visible support of the ground. This has been avoided in St. Paul's church in New York, by putting the steeple at one end of the church and the portico at the other, which is upon the whole a more eligible arrangement than that oftenest adopted in England and employed in St. Michael's, and in subsequent American churches; but the conjunction has seldom been better managed than in the present instance. St. Michael's is one of the most valuable remains of colonial times, a massive and dignified structure. If there were no other relic of those times in Charleston, we might still agree with the local historian who wrote in 1854, that in his youth "all our best buildings, public and private, were of provincial date," and apprehend that the saying might be repeated in 1894.

There is near Charleston a curious and interesting church which, in a chronological order, should have preceded the churches last described. This is St. James', at Goosecreek, on the Cooper River, which must have been finished before 1731, for in the "Descriptions of South Carolina, for Protestant Immigrants," published in that year, it is recorded that soon after 1706 "the church they first built became too small for the growing number of parishioners, and they erected a beautiful brick edifice." The brick is plastered, and the angles are quoined in stone. The general aspect of the building, exceptionally well preserved as it is, is not only antique but foreign. Except that its architecture is distinctly of the Renaissance, it has no architectural affinity with the churches of Charleston, or with any of the churches of the English settlements further to the north. On the other hand it has distinct affinities with the Spanish Renaissance, as that

was practiced in Mexico at an earlier date, and in Louisiana and Florida at a later. Its existence is explained by reference to the Spanish Settlements in the South, and to the indeterminate boundary between Florida and South Carolina, which was so often the cause of bloody affrays, but which in this instance seems to have resulted in an exchange of the arts of peace. A comparison of it with what is called the "Cathedral" of St. Augustine, though,

church at St. Augustine. The difference in date goes to prove an identity of origin by excluding the notion of a direct imitation; for, whereas the Carolinian church, as we have seen was finished before 1731, the Floridian church was built in 1793, under the supervision of two Spanish engineers, although Florida had been ceded to Great Britain in 1763.

There are few other interesting churches of the colonial period in the



CATHEDRAL OF ST. AUGUSTINE (1793).

in fact, it was built for a parish church, indicates that the design was furnished by a Spaniard, even if the work was not executed by Spanish craftsmen. It is quite plain that the unsightly hipped roof was not meant to be seen, and that the front was not completed. What exists indicates not less clearly that it would have been most naturally completed, and the design carried out by the superstructure of a false gable, such as that which covers the front of the

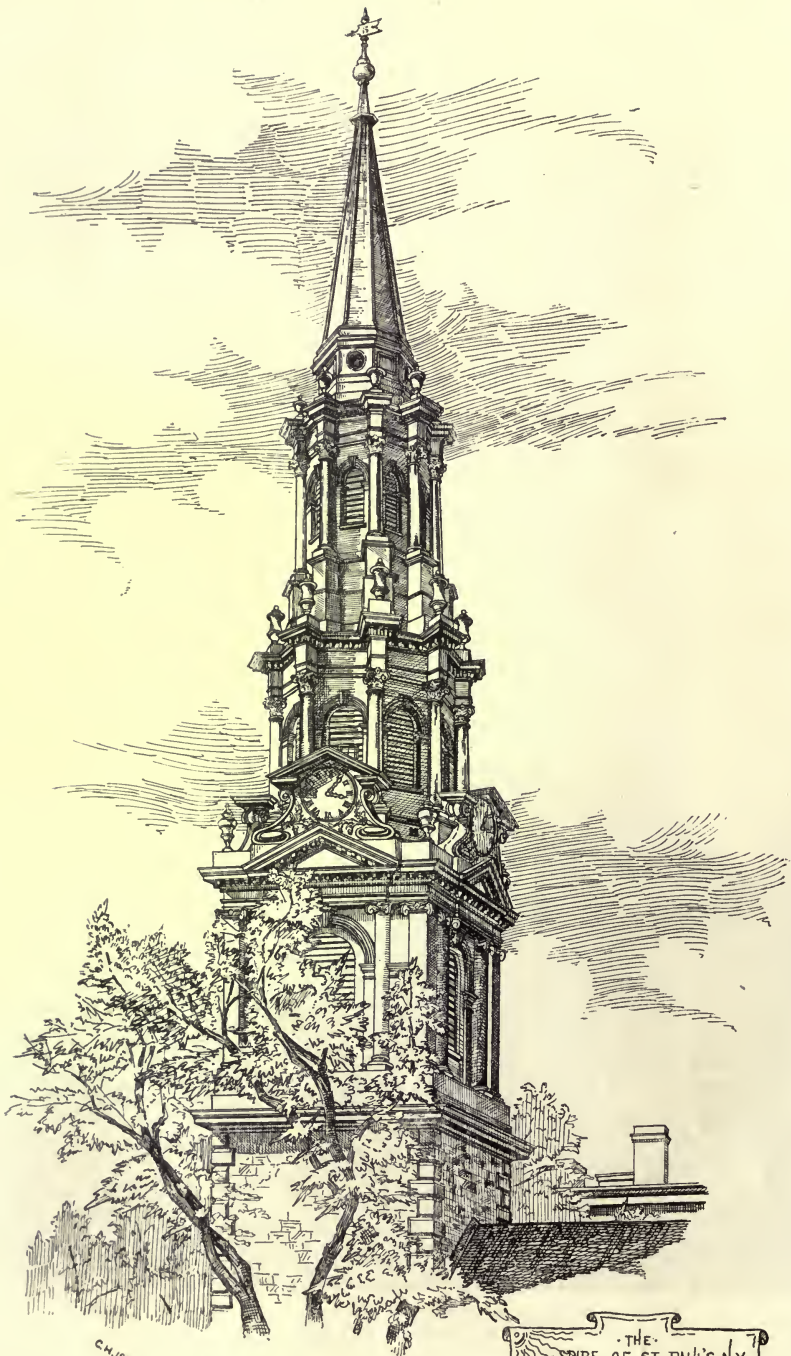
Southern States. In Virginia the earliest church of all is very nearly the best, having a simplicity and repose with its homeliness that are lacking to the more pretentious and not more skilful builders of a later day, and that come near to constituting an artistic quality. The New England meeting house of the eighteenth century, of which we have considered one of the most conspicuous examples, is entirely devoid of architectural interest or architect-



Philadelphia.

ST. PETER'S CHURCH.

A. D. 1758.



C. H. ISRAELS
JUNE - 1868.

THE
SPIRE OF ST. PAUL'S N.Y.



ZION CHURCH, PHILADELPHIA.



A. D. 1802.

OLD ST. PETER'S CHURCH, ALBANY, N. Y.

Philip Hooker, Architect.

ural purpose. The most bigoted praiser of time past has not ventured to suggest the vernacular New England meeting house as a promising point of departure in ecclesiastical architecture. In the middle colonies, however, there are many churches in which the type ultimately derived from the work of Sir Christopher Wren, has undergone local modifications that tend to render it national. This is the church of rough stone with quoins of hewn stones at the angles and the openings, with a tower slightly projected from the front, carrying a spire with several stages of classic detail, comprising one or more orders, of

which St. Peter's, Albany, 1802, is a favorable but not too favorable example; a seemly and not uncomely edifice. Of St. Paul's, in New York, Major Charles Pierre L'Enfant, afterwards the planner of Washington, was, at the time he was employed in altering the City Hall, described as the architect. But this is clearly out of the question, for the body of the church was built in 1764-66, and L'Enfant came out with D'Estaing only in 1777. What he did was very likely to add the east front, including the portico—not the spire which was erected within this century. The portico consists of four Ionic columns, the capitals of which those in the

City Hall resemble closely enough to have been imitated from them. At the centre they are so widely spaced, apparently to afford a full view of the chancel window, as not only to exceed classical precedent, but to threaten the integrity of the entablature if that had been actually of masonry. As a matter of fact it is of wood, the columns being of brick covered with stucco, painted to imitate brown sandstone. A very

In the order of development of the colonies civic buildings came after churches, and down to the middle of the eighteenth century were upon the whole inferior to them in size, costliness and architectural pretensions. In point of time, New York took the lead in the erection of a durable municipal monument. It was in 1700 that the City Hall was erected at the head of Broad street, which was to serve it,



A. D. 1731-1735

INDEPENDENCE HALL, PHILADELPHIA.

James Hamilton, Architect.

good example of the type exemplified by St. Michael's at Charleston, in which the portico and the steeple are combined, is St. John's Church in New York, 1803-07, of which the architect was John McComb, the superintending architect and putative designer of the New York City Hall. In construction this is more substantial and genuine than St. Paul's, the columns, with their bases and Corinthian capitals being of cut stone, though ere also the entablature is of wood.

purpose for more than a century, or until the completion of the existing City Hall in 1811, excepting the brief interval during which, in an embellished state, and under the name of Federal Hall, it served as the capitol of the United States, an interval commemorated by the statue of Washington at the scene of his first inauguration as President. It was at the instigation of Lord Bellomont, Governor of the Province, that the project

was undertaken in 1698, in which year the plans of "James Evetts, architect," but doubtless in fact a mason, were adopted. The foundation was laid in 1699, and in the following year, as has been said, the building was occupied. The general scheme, of two wings and a recessed centre, about equal in extent to both, was much the same as that adopted for the building which superseded it, although the earlier building was on a much smaller scale, and of course far less elaborated. Indeed, the only attempt at decoration was in the brackets of the cornice, in the wooden lantern of the roof, in the balcony at the centre of the second story, and the coats-of-arms of the Governor (Bellomont) and the Lieutenant-Governor (Nanfan), emblazoned on stone tablets affixed to the front. In spite of its moderate dimensions, its humble material, which was apparently brick, with stone only in the sills and lintels, the binders which served as capitals to the square piers of the loggia and possibly the string course between the stories, the building was dignified and impressive by reason of the justness and, indeed, felicity of its proportions, and by its very absence of pretense. The cost was £3,000. When in 1789 it was decided to enlarge and improve the building for the occupancy of Congress \$32,000 was appropriated for the purpose, and the spending of it was intrusted to Major L'Enfant. His enlargement consisted in raising the roof so as to admit a low attic in place of the roof story lighted by dormers, of the original, and in an increase of height by the addition of an upper roof of somewhat lower pitch. The recessed centre was filled up with a wall in the plane of the wings, and from it a portico in two stories, and in Roman Doric was projected twelve feet. The frieze was divided so as to embrace thirteen metopes, in each of which was a star, and the centre of the pediment was dignified by a spread eagle. The alterations were much admired. John Page, who came to New York for the first session of Congress, as a representative from Virginia, writing home, after saying that "this town is not half so large as Philadelphia, nor in

any manner to be compared with it for beauty and elegance," and that he is "well assured Philadelphia has more inhabitants than New York and Boston together," goes on to say that "the college, St. Paul's Church, and the Hospital are elegant buildings. The Federal Hall also in which Congress is to sit is elegant." Thomas Twining, an English traveller who visited New York in 1793, found it the only building worth looking at, or at least worth mentioning.

The oldest of the secular public buildings of Philadelphia, more famous and memorable than that of New York whether as City or as Federal Hall, is fortunately still standing and in perfect preservation. It is the building which for more than a century has been known as Independence Hall, but which, for the first half-century of its existence, was the State House of Pennsylvania. It is almost exactly coeval with Christ Church (1731-1735), shows an equal skill in workmanship and the same method, the use of black glazed headers with red brick. In one point, at least, the free use of cut stone, the workmanship shows an advance, for tooled ashlar are employed in the quoining at the corners, in the panels and the string courses, while the keystones of the flat brick arches required an even higher degree of skill in stone-cutting. Of this also the architect was an amateur, a lawyer, James Hamilton by name, and his design was as successful for its purpose as that of the church. The dimensions of the building are 100 feet by 44, and they are made the most of by the emphasis added to the horizontal lines and the limitation of the whole front to a single plane, while the relation of the stories to each other and the interpolation of a third term in the paneled band inclosed between the string-courses, make up a well-proportioned composition and relieve the long front of monotony. The effect of length is enhanced and variety at the same time added by the judicious addition of the lower flanking buildings, the one the old City Hall of Philadelphia, the other Congress Hall, which furnished quarters for the executive officers during

the Revolution. The tower, though it has refinement of detail, is scarcely so fortunate as that of Christ Church either in its design or in its adjustment to the building which it crowns. Carpenters' Hall, the next most important secular relic of colonial times, is fifty years younger than the State House (1770), inferior to it in dimensions, and in spite of its pediments and its arches, so similar in design and workmanship as to show an extreme conservatism, which is the more remarkable by its contrast with the recently prevalent rage for innovation in Philadelphian building.

"The great commodiousness of navigation and the scarcity of handicraftsmen" were assigned by Burke, and no doubt rightly, as the causes which "have rendered all the attempts of the government to establish towns in Virginia ineffectual." When the planter had his own wharf on his own estate, from which he sent his produce directly to his agent in London or Bristol, and at which he received his supplies directly in return, he had no need of a market-town. The Virginian village was a "court-house;" the town was a capital. The peculiar situation of Virginia in this respect is worth consideration by the student of colonial society in general, as well as by the student of colonial architecture in particular, for it is intimately connected with the social and political history of the colony. Burke goes on to say that "Jamestown, which was anciently the capital, is dwindled into an insignificant village; and Williamsburg, though the capital at present (1757), is yet but a small town." "However," he adds, "in this town are the best public buildings in British America." In view of what we have just seen of Philadelphia at this time we must challenge the accuracy of Burke's information. It appears that he was misled by an extremely rosy view taken by Hugh Jones, A. M., in the "Present State of Virginia," 1723, which Burke paraphrases and almost repeats. The college of William and Mary is held by many Virginians, as an article of faith, to have been designed by Sir Christopher Wren, but this belief is overthrown by the very testimony on

which it is founded. It would be a grievous thing to ascribe the design of the actual building to Sir Christopher. Jones says: "The college of William and Mary is double and 136 feet long, having been first modeled by Sir Christopher Wren, adapted to the nature of the country by the gentlemen there, and, since it was burnt down, it has been rebuilt, nicely contrived, altered and adorned, by the ingenious direction of Governor Spotswood, and is not altogether unlike Chelsea Hospital." But it is not even the restoration of Spotswood that is now to be seen, for his work was also destroyed by fire, in 1746, to be replaced by the present building, of which the architectural origin is neither known nor important. The colonial capital has also disappeared, having been burned down in April, 1832. It confronted the college at the other end of what Burke calls "a noble street," and conformed to it in architecture; and the colonial church (1715) is still standing, although the interior has been altered. The capitol was built "at the cost of the late queen" before 1723, and Jones says "it is the best and most commodious pile of its kind I have seen or heard of." He adds: "The buildings here described are justly reputed the best in English America, and exceeded by few of their kind in England." One may reasonably suspect Jones of an ignorance of Philadelphia, as well as of an inordinate desire to please Governor Spotswood. A less rosy but more accurate view is given in Jefferson's "Notes on Virginia:"

"The only public buildings worthy of mention are the Capitol, the College, the Palace, and the Hospital for Lunatics, all of them in Williamsburg, heretofore the seat of our government. The Capitol is a light and airy structure, with a portico in front of two orders, the lower of which, being Doric, is tolerably just in its proportions and ornaments, save only that the intercolonnations are too large. The upper is Ionic, much too small for that on which it is mounted, its ornaments not proper to the order, nor proportioned within themselves. It is crowned with a pediment, which is too high for its span. Yet, on the whole, it is the most pleasing piece of architecture we have. The College and the Hospital are rude, misshapen piles, which but that they have roofs would be taken for brick kilns."

The tradition that Sir Christopher had something to do with the existing architecture of Williamsburg refuses to be altogether dislodged, and has alighted upon the Court House, which is the only remaining relic in Williamsburg, excepting the College, of colonial secular architecture. In a very recent publication it is ascribed to him, though it is quite evident that it had no architect except the colonial mechanic who

Burke says: "I shall be very concise in my account of Maryland which, agreeing with Virginia in its climate, soil, products, trade and genius of its inhabitants * * * will save much trouble in that article." But the capital, chartered in 1708, and named in honor of Princess Anne, not yet Queen, was, relatively to the population of the colony, if not absolutely, a more important place than the capital of Virginia, dur-



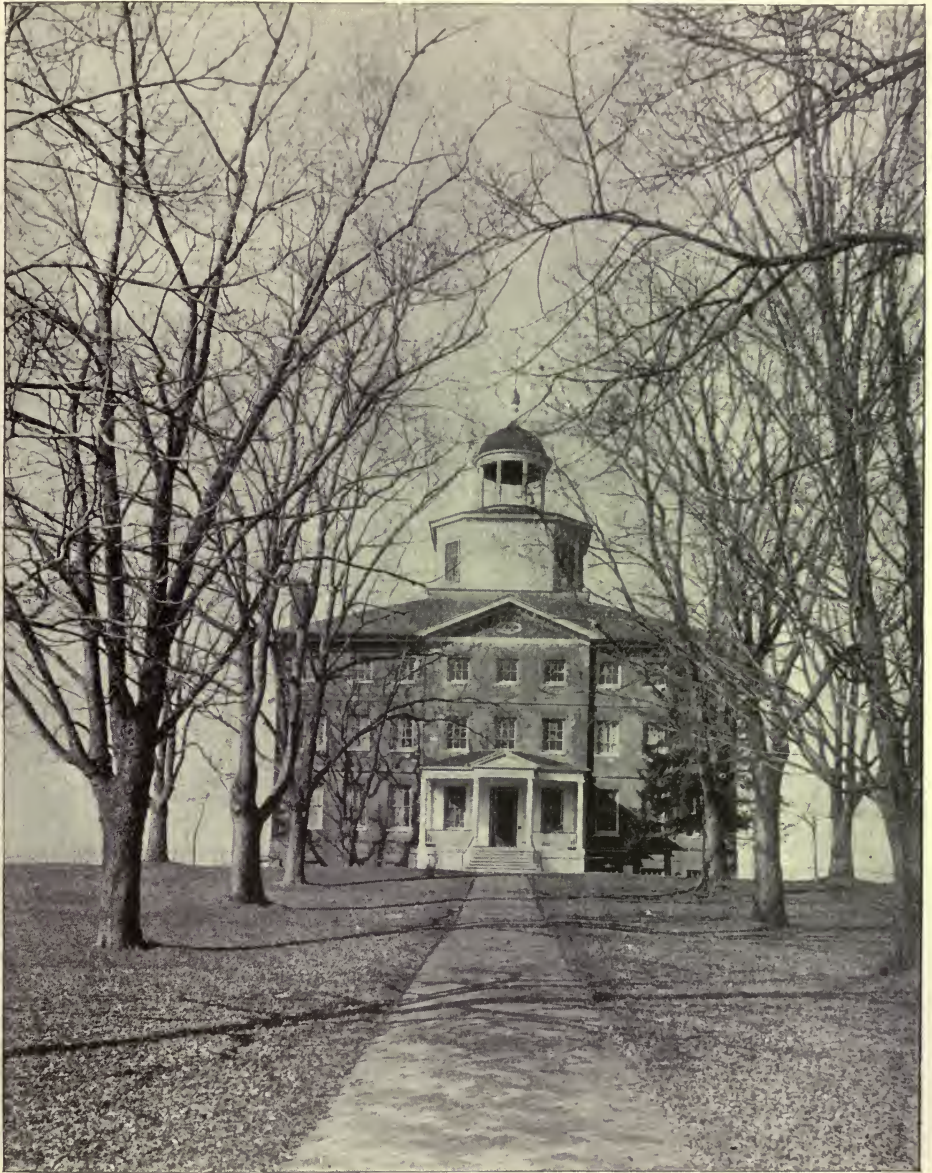
THE COURT HOUSE, WILLIAMSBURG, VA.

From Chandler's "The Old Colonial Architecture of Maryland, Pennsylvania and Virginia.

built it. A similar tradition retains its hold about the steeple of the oldest church in Providence, R. I., which is in another recent publication declared to be by Wren, although when the steeple was built, in 1775, the architect had been half a century in his grave.

After it was given over, like Virginia, to the culture of tobacco, Maryland became in most respects an extension of the Old Dominion, insomuch that

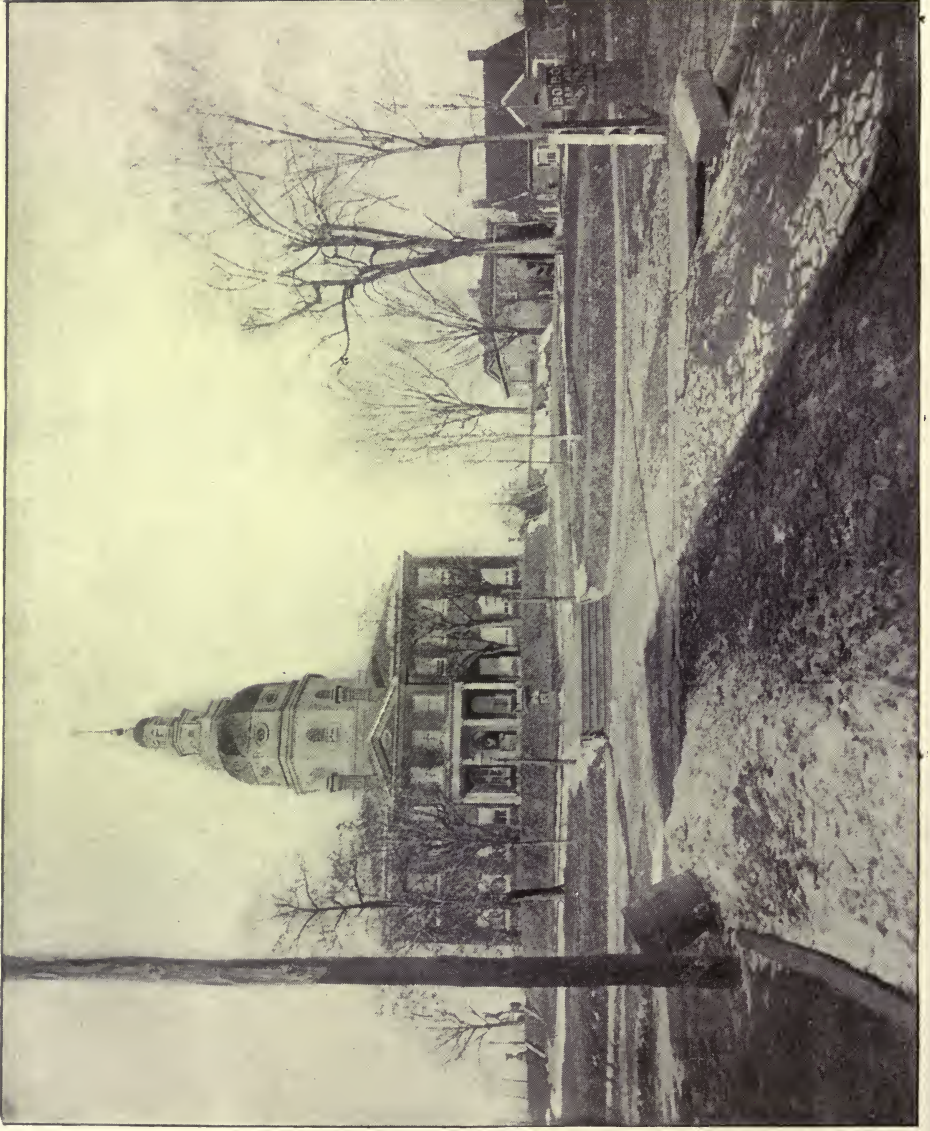
ing the colonial period. The commercial sceptre passed to Baltimore before the colonial period was completed, and commercial stagnation left Annapolis a relic of those times, insomuch that it is now, upon the whole, to a student of colonial architecture, the most interesting town in the United States, as retaining its ancient aspect least impaired. Its claims upon his attention were urged in Mr. Randall's interesting



Annapolis

ST. JOHN'S COLLEGE.

1744-85.



Annapolis, 1772-3.

STATE HOUSE.

Joseph Clarke, Architect.



HOUSE OF DELEGATES, MARYLAND.

paper upon "Colonial Annapolis" in No. 3 of *THE ARCHITECTURAL RECORD*.

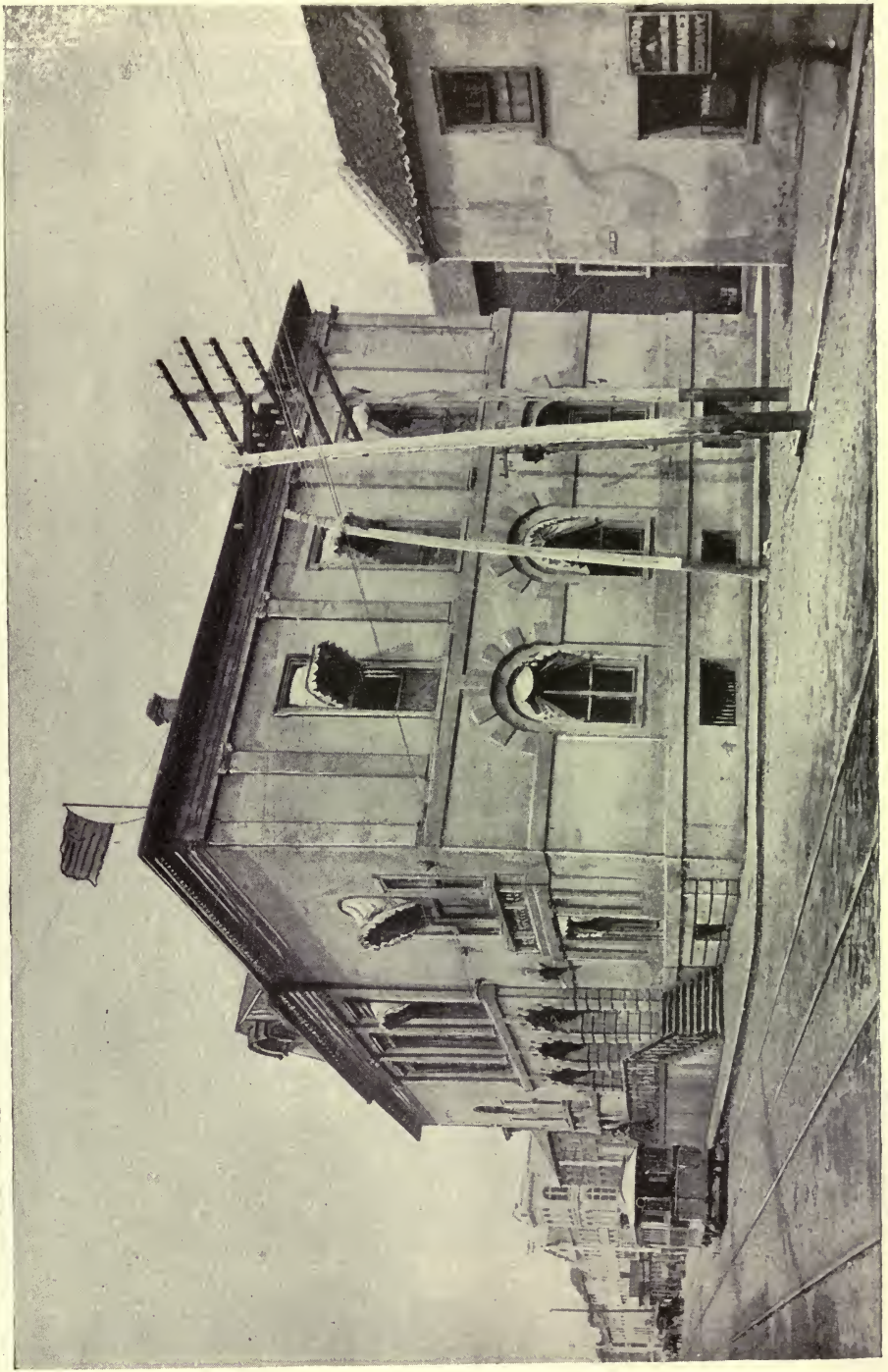
The earliest of the remaining public buildings of Annapolis is St. John's College, a seat of learning which was very probably established in emulation of the like institution at the capital of Virginia, and by a chief magistrate whom the laurels of Spottswood would not suffer to sleep. At any rate it was begun as early as 1744 through the importation by Governor Bladen of "a Mr. Duff, the architect, from Scotland." It was not completed, however, until 1785, after having become a bone of political contention, and long after it had come to be commonly known to the simple Marylander who had no yearnings for the higher education, as "the Governor's folly." There does not seem to be a complete justification in its interior aspect for the importation of its architect, since there is nothing beyond the reach of the home-bred bricklayer excepting the dome, which is certainly in execution and probably also in design a later addition to the work of Duff, and is an unfortunate erection in which the ambition of crowning the edifice with a wooden monument seems to have been accompanied by the utilitarian device of securing an additional apartment above the roof. The lack of stone-cutters is attested in this building by the extremely sparing use of cut stone, the single band of it across the foot of the gable, where it is most conspicuous, being almost the only instance of its employment.

The same economy is noticeable in the State House, which albeit of a considerably later date than the college, shows a close similarity in the workmanship of the exterior, while the rich and successful interior brings out anew the striking inferiority that is shown in all the pretentious buildings of the colonial period of the workers in stone to the workers in wood. The joiner-work in the State House is marked by a precision and delicacy which cannot be excelled, and leaves in its way nothing to be desired, while the design of the rotunda is worthy of so elaborate an execution, and worthy, indeed, of execution in a more durable material.

In 1769 the Legislature appropriated £7,500 for the building, of which Joseph Clarke was appointed the architect, and the corner-stone was laid in 1772, and the next year the building was roofed. The dome, however, is not to be ascribed to the original architect, at least it was not added until after the Revolution. Our admiration for his treatment of the interior must make us willing to relieve him of the responsibility for the cupola, in which, as in many more recent erections of the same kind, the ambition to attain a towering height—in this case the even height of 200 feet—led the architect to design a feature disproportionate to his substructure, and not only unduly to elongate the dome itself, but to add offensively superfluous stages to it. The diameter of the dome is 40 feet; the area of the building 120 by 82.

In Charleston the only secular public building remaining from the colonial period is the old Post-office, built as a merchant's exchange. It is manifest that its present aspect cannot represent its original state, which indeed is difficult to reconstruct from what is now to be seen. Like the neighboring church at Goosecreek, it is an anomaly in colonial architecture, since it can scarcely have been undertaken to reproduce in it the current forms of English building. It is not improbable that artisans from the Spanish settlements to the Southward were again employed in its building. The date of its erection increases the plausibility of a conjuncture suggested by its architecture, for the building of it was authorized by an act of Assembly in 1761, and it was in 1763 that Florida was ceded by Spain to Great Britain, in exchange for Havana.

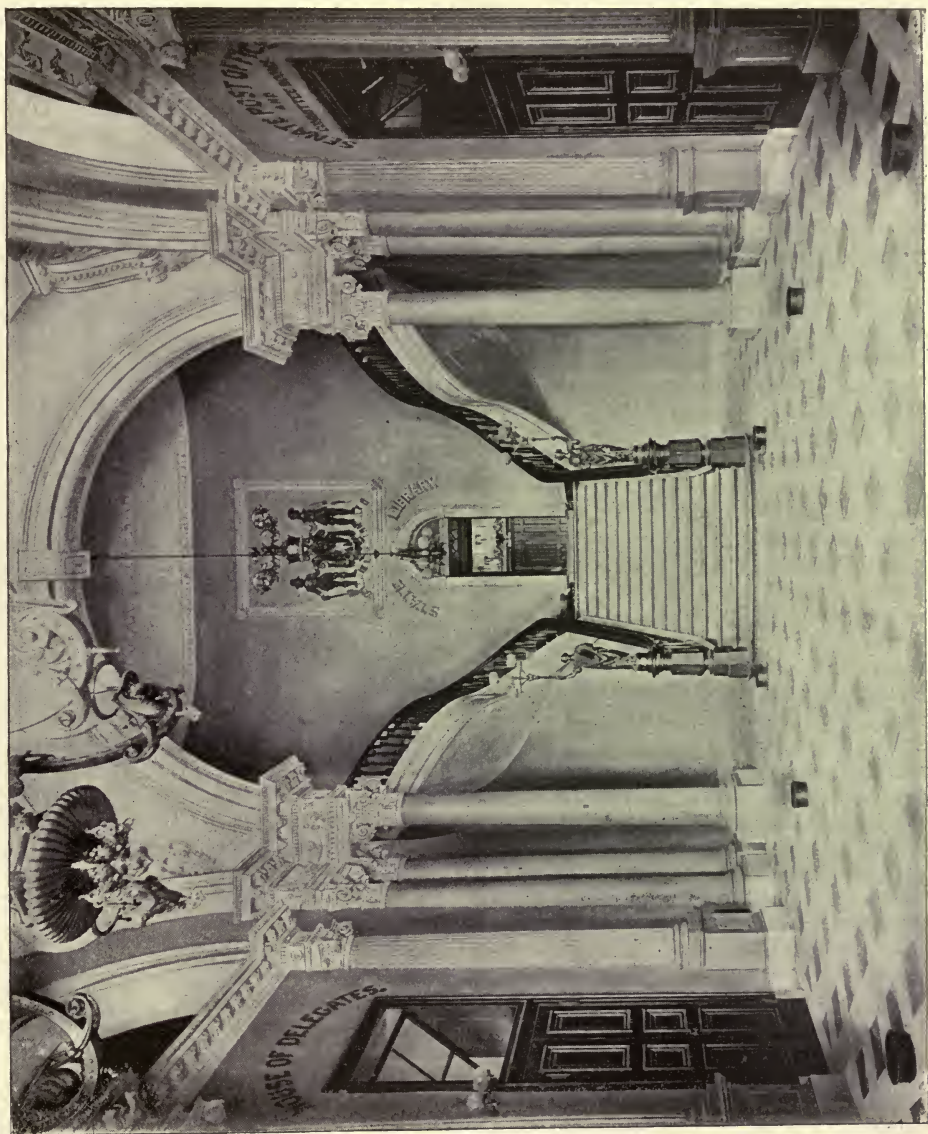
The one colonial public building of Newport that has been preserved and that is worth preserving is the Redwood Library. It was in 1747 that Abraham Redwood gave £500 for the establishment of the library that bears his name. Peter Harrison, the pupil of Vanbrugh, who was employed at the time in building King's Chapel in Boston, was chosen the architect of the library which was finished in 1750.



OLD POST OFFICE, CHARLESTON, S. C.



STATE HOUSE, BOSTON, MASS.



Annapolis,

ROTUNDA, STATE HOUSE,

The architecture is confined mainly to the Doric portico, of which the columns are 17 feet high and which is projected 9 feet from the face of the building. These two works of Harrison are noteworthy, as probably the only remaining buildings in New England erected before the Revolution from the designs of a professional architect. Neither the old State House nor Faneuil Hall in Boston now remains in its primitive condition. The former, erected in 1748, had originally its broken gable and tower, but the design of the roof has since been materially modified, and the latter was enlarged towards the close of the century under the direction of Bulfinch. But what remains of provincial Boston suffices to show its architectural inferiority to the seaports to the south of it.

A Bostonian, however, is memorable as the first educated American who devoted himself to the profession of architecture. Charles Bulfinch, born in Boston in 1763, was graduated at Harvard in 1781, and three years later spent a year in Europe. In 1793 he superintended the erection of the first theatre in Boston, the erection being in itself a relaxation of Puritanical severity that was of good augury for the progress of the polite arts. The design of the theatre, a scholarly front in two stories, with a tetrastyle portico and a pediment in the upper, survives only in the complimentary medal struck for Bulfinch by his employers. In 1795 he was appointed architect of the new State House of Massachusetts and for three years superintended its construction. At the time of its completion, excepting the Capitol at Washington, then in course of construction, it was the most monumental public building that had been projected in the United States, and its architecture deserved the celebrity which it obtained. In general composition it is very successful. The superstructure of two stories is sharply distinguished from the basement, while its subdivision suffices to relieve it of monotony without compromising its unity. The flatness of the wings, the want of visible depth in the walls, and the want of emphasis in the

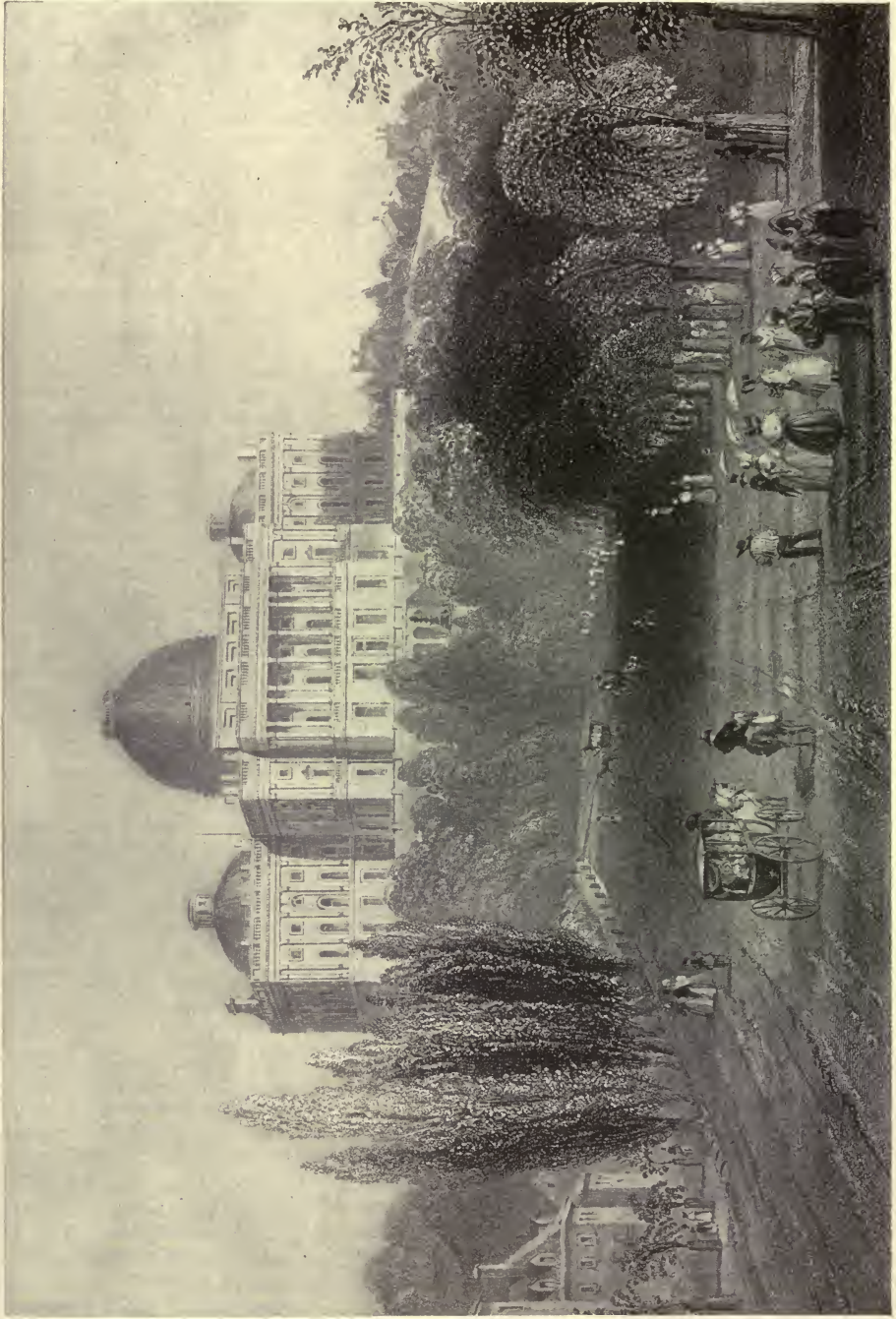
subdivision and the detail are distinctly defects of colonial work. The treatment of the centre, however, is as distinctly an innovation, and shows that the architect had studied continental as well as English Renaissance. For the first time in America, the order is superposed upon an arcade, after the manner introduced by Mansard at Versailles, and afterwards employed by Latrobe in the Capitol of the United States and repeated in the extension by Walter, the columns of the order are properly doubled at the ends, and the pediment is withdrawn from the order, to appear above it on the substructure of the cupola. The adjustment of the cupola to its base, always a difficult point of design, is here managed with reasonable skill if not with entire felicity. From an inspection of the building one can understand the admiring wonder with which it was received, and how it should have become the fruitful parent of so many less respectable domed buildings in State Houses throughout the land, and even, as we shall see, in the national Capitol. It is not only remarkable, considering the period at which it was erected, but it remains a dignified and creditable public building, worthy of perpetuation in more monumental material than that in which it was originally executed.

The great architectural work of those years and of many years thereafter was the Capitol of the United States. It was in 1795, after Major L'Enfant had planned the "Federal City," that President Washington appointed a board of three commissioners to provide for the erection of suitable public buildings. They decided that the Capitol should exhibit "that true elegance of propriety which corresponds to a tempered freedom," and advertised for designs for such a building to be submitted July 15, 1792. They set forth that it was to be of brick, and issued a very general programme of requirements, embracing fifteen rooms in all. The advertisement brought no designs that seemed to the commissioners worthy of adoption, although Washington wrote that

he was more agreeably struck with Judge Turner's plan than with any other, mainly because it had a dome, which, in the President's judgment, "would give a beauty and grandeur to the pile," but it did not have the "porticos and imposing colonnade," upon which he equally insisted. Other designs were submitted, and on April 5, 1793, the President gave his formal approval to the plan submitted by Dr. William Thornton, because in it "grandeur, simplicity and convenience were combined," and the first prize of \$500 and a building lot in the new city was awarded accordingly. But the same award was also made to Stephen Hallet. Like the architect of Christ Church, Philadelphia, Dr. Thornton was a physician of that town, entirely an amateur in architecture, and Hallet, a Frenchman, who was a professional architect, and had practiced in Philadelphia, had no difficulty in showing that Thornton's design was impracticable, and that if it could be built the building would not be habitable. Accordingly he was chosen to revise Thornton's plan, but the resulting design resembled the original more than the reviser's own competitive design. It is noteworthy that it retained what Jefferson called "that very capital beauty," the portico of the east front. That Thornton was really the original designer is sufficiently shown in a letter of Jefferson's, written in 1811, in which he says that having been convinced, during his Presidency, that the interior arrangements could be improved, he "deemed it due to Dr. Thornton, author of the plan of the Capitol, to consult him on the change." Hallet became the architect of the Capitol, but kept the place for only two years, and was succeeded in 1794 by James Hoban, an Irishman, who had done architectural work in South Carolina and had been employed as Superintendent under Hallet. Indeed his functions in connection with the Capitol seem to have been chiefly of superintendence during his entire connection with it, which lasted for ten years, the work being done after the drawings first of Hallet and then of George Hadfield, an

English architect, who came to Washington highly recommended. Hallet had been dismissed by the Commissioners in consequence of a quarrel with Hoban and refused to surrender his drawings. Hadfield, who became architect in 1795, insisted that the plan under which Hoban was working was "capitally defective," but was overruled by Washington and by the Commissioners, and afterwards declined to hand over to Hoban for execution his accepted plans for the Executive Department buildings. His connection with the Capitol as architect came to an end in 1798, and the working drawings from that year until 1803 seem to have been furnished by Hoban. It does not seem, however, that Hoban can be called the designer of any part of the building, although he furnished the designs for the original Executive Mansion, and for its rebuilding after its destruction by the British. This was and is a dignified and even stately mansion, and does credit to the taste of its architect, if not to his power of design, since it was reproduced in all architectural essentials from a nobleman's mansion in Ireland. Hadfield was again employed as chief draughtsman under Latrobe, who became architect of the Capitol in 1803, and remained until 1817, carrying the building to the state of completion which it had reached at the time of the burning by the British in 1814, and restoring it after that interruption. Architecturally the burning, outrageous act of vandalism though it was, was by no means calamitous, since it enabled Latrobe to restore both interior and exterior with more monumental material and doubtless with more successful details. The changes necessarily cost money, and the additional cost embarrassed the architect and his employers. In the same letter of Jefferson to Latrobe, already quoted, he says "You discharged your duties with ability, diligence and zeal, but in the article of expense you were not sufficiently guarded." The labors of Latrobe undoubtedly determined the general arrangement of the Capitol, as we now see it, excepting the wings and the dome, and left his immediate successor little latitude except in de-





Washington.

WEST FRONT OF THE CAPITOL.

1793-1830.

tail. When in 1817, Latrobe found himself unable to agree with the single commissioner who, during his service had been substituted for the Board of Commissioners previously established, and resigned, he was succeeded by Bulfinch, who had met the new president, Monroe, in Boston, and had favorably impressed him. He modified the designs for such parts of the building as were not committed by construction, but in the main proceeded upon the lines laid down by Latrobe. The chief alteration he made was very questionable, being the change of the form of the dome into a cupola more nearly resembling in outline that of the Massachusetts State House, and the construction of a subordinate dome over each wing. In spite of its defects, however, the Capitol, as Bulfinch left it completed in 1830, was creditable to the country and to its own architects, the finest as well as the last development of colonial architecture. Its extreme dimensions were then 355 feet by 121, and 120 feet to the top of the dome.*

The influence of Thomas Jefferson upon American architecture was very considerable. His interest in it began at least as early as his rebuilding of Monticello, in 1770, and increased until the close of his life. He adopted, without question, the current dogma that the five orders were founded in the nature of things, and that architecture was an affair of orders exclusively, but he held that innovations might be made upon them to express other than antique conditions. The "American order" was for a long time attributed to him, and it may have been at his instigation that Latrobe undertook to supplant the acanthus with the maize and tobacco plant, in the decoration of capitals, and made the interesting essays to that end that still remain in the Capitol; though it has been clearly shown that Latrobe was the designer of the "order." The progress of the

Capitol, during his presidency, revived in Jefferson the interest of his early manhood. In rebuilding his own house, he had been forced to become his own architect and almost his own builder. So low was the state of the mechanic arts in Virginia in 1770, that the window-sashes were imported from London. In his "Notes on Virginia" (1781), he complains that "a workman could scarcely be found here capable of drawing an order." "The genius of architecture," he continues, "seems to have shed its maledictions over this land. * * * The first principles of the art are unknown, and there exists scarcely a model among us sufficiently chaste to give an idea of them."

The first fruit in a public building of his architectural zeal was the Capitol of Virginia, at Richmond, commonly, but inaccurately, said to have been designed by him. After the change of the capital from Williamsburg to Richmond, and in 1785, Jefferson, being then in Paris, was consulted with reference to the design of the new State House, and he consulted "M. Clarissault, one of the most correct architects of France." The capitol, according to Jefferson himself, is "the model of the temple of Erechtheus at Athens, of Baalbec, and of the Maison Carrée at Nismes, the most perfect examples of cubic architecture, as the Pantheon is of the spherical." (The reasoning and the collocation have alike a seriously old-fashioned air to modern students.) Jefferson goes on to say that the Maison Carrée was selected more specifically, retaining the proportions while enlarging the building, but with the change of the capitals from Corinthian to Ionic, "on account of the expense." Throughout the colonial period, indeed, the Corinthian order was very little employed, doubtless because of the extreme difficulty and costliness of reproducing the capital in wood. Not only were Ionic capitals substituted for Corinthians, but "I yielded with reluctance to the taste of Clarissault in his preference of the modern capital of Scamozzi to the more noble capital of antiquity." The Capitol is 134 feet by 70 in area and 45 high, excluding the basement.

* I do not pretend to reconcile the discrepancy between the two views of the Capitol. Both were drawn by W. H. Bartlett, though they were rendered by different engravers, and both were published after 1830. It is possible that the artist never saw the building, and probable that the view of the east front shows Latrobe's design for the dome, the taller dome and the subordinate domes in the view of the west front being Bulfinch's.

Undoubtedly, the most considerable outcome of Jefferson's interest in architecture was the last. The University of Virginia, of which he desired to be commemorated in his epitaph as the father, was the child of his old age, and it was the formation of this institution that was his chief care from his retirement from the presidency in 1809 until his death in 1826. He was unquestionably and alone the architect of it, and after the aid of the State had been pro-

vided the dormitories of the students, accentuated at intervals by the "pavilions" which consisted of professors' houses. The long vista between these colonnades was to be closed by a reproduction, one third the original size, and considerably modified, of the Pantheon, "the most perfect example of the spherical." The most important of the modifications is the omission of the second attic and pediment. Against the rear of this abuts the posticum



STREET FRONT OF THE UNIVERSITY OF VIRGINIA.

Charlottesville, Va.

A. D. 1819-26.

Thomas Jefferson, Architect.

cured by the Act of 1819, he pushed on the execution of his architectural project until it was in great part realized, and the institution in actual operation before his death. His project was grandiose and impressive. The buildings were to line three sides of a quadrangle, 600 feet by 200, the fourth side being left open. The curtain wall of the long side was to be a continuous colonnade of one-story high, being the front of

of an amphiprostyle Corinthian temple, for which the *Maison Carrée* seems to have furnished the model, and to have retained in Jefferson's mind for thirty years its place as "the most perfect example of cubic architecture." The portico, hexastyle and three columns deep, as at Nismes, forms the main entrance to the University, and was evidently intended to be finished by an imposing terraced approach with double flights of steps. The scheme

was completed by two additional ranges of dormitories, facing outward, parallel with the ranges facing the campus and 200 feet distant from them.

Considering the resources available for carrying it into execution, Jefferson's scheme was incomparably the most ambitious and monumental architectural project that had or has yet been conceived in this century. If the execution was not at all points ade-

quate, it must be admitted to have been very surprising for a remote Virginian village. The campus of the University of Virginia as it now appears, has far more unity, dignity and impressiveness than the heterogeneous "college-yard" of any other American institution of learning. It is not strictly colonial in style, but in great part a prefiguration of the Greek revival which was shortly to supplant colonial architecture. The professors' houses, the "pavil-

ions" of the architectural scheme, mark the first appearance of the classic temple in domestic architecture. The portico ignores the house, and an undivided order embraces the front, leaving the balcony to be inserted as a gallery, an arrangement fatal to the architectural effect. The pavilions in which this device is resorted to are as much less attractive as they are less practically eligible than those in which the colon-



Charlottesville, Va.

CAMPUS FRONT OF THE UNIVERSITY OF VIRGINIA.

nade is continued across the front in the form of an arcade, and supports the order of the second story, in which its material is confessed in a departure from classical proportions and the "too wide intercolonations" with which the youthful Jefferson had found fault in the old Capitol of Virginia. The material of the monumental buildings of the University, though not always genuine, is solid and durable, and enough of it is genuine to increase the wonder that

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such a project could have been carried out during the first quarter of the century. The capitals and bases of the large columns are of marble, cut in Italy; the shafts of brickwork covered with stucco, of which also the colonnades of the dormitories are built. It is evident that Jefferson in his architectural zeal subjected himself to his own admonition to Latrobe and "in the article of expense" was "not

which was under construction for the ensuing eight years, and indeed longer, though it was occupied in 1811. It remains the most admirable specimen of architecture belonging to the city, being effective in its composition, and of careful and scholarly design in its detail. In mechanical execution it was very far in advance of any building that had then been erected in New York or in the country, and showed that a



HOUSE AND DORMITORIES ON THE CAMPUS, UNIVERSITY OF VIRGINIA, CHARLOTTESVILLE, VA.

sufficiently guarded," for before the University was opened what was then the enormous sum of \$300,000 had been spent upon it, and this extravagance combined with Jefferson's selection of a President tainted with Unitarianism to bring the University into popular disfavor and to make its early history one of continual struggle.

It was in 1803 that the corner stone was laid of the City Hall of New York,

body of stone-cutters had become available who could carry out with great precision and even with spirit an extensive design which involved a profuse use of carved decoration. It is noteworthy that in the discussion concerning the material to be employed, which resulted in the choice of marble for three of the fronts, it was an architectural emulation of Philadelphia that was invoked, although the Massachusetts



OLD ACADEMY, ALBANY, N. Y.

State House, a much more monumental edifice than existed elsewhere in the United States, had been completed for five years. The report of the building committee in favor of the use of marble, made in September, 1803, sets forth that seeing "that as a commercial city we claim a superior standing, our imports and exports exceeding any other in the United States, we certainly ought, in this pleasing state of things, to possess at least one public building which shall vie with the many now erected in Philadelphia and elsewhere." The appeal was successful. The building was constructed with three fronts of marble from Massachusetts, and with one, then the least conspicuous, of brown sandstone from New Jersey. The frontage of the building is 215 feet 9 inches. Its cost was not far from \$500,000.

John McComb was the architect of record of the City Hall, but an obstinate tradition affirms that the actual designer was a Frenchman named Mangin. The denial of the authorship to McComb certainly receives some support from the most interesting and successful of the buildings of the same period at Albany, the Academy. This was begun in 1815, four years after the completion of the City Hall, and finished in 1818. The design bears marks of colonial building, from which the earlier building is free, such as the emphasis given to the construction of the walls in two planes, very frequent in brickwork of the colonial period. But the resemblance of the two buildings in design is nevertheless very striking, and as evidently is not the result of direct imitation on the part of the designer of the more recent; while the detail in each case shows a like knowledge and propriety. McComb was certainly not the architect of the Albany Academy, whose name is given as Seth Geer. If we accept this and the corresponding record in respect to the New York building as final, we are required to believe that two untraveled Americans had acquired architectural training enough to design buildings of considerable elaboration and novelty as well as the power, then common among well-trained carpenters, of applying the

forms of the classic orders without committing solecisms. It seems simpler to believe that the two employed the same educated foreigner as draughtsman and designer. Though the Albany Academy is much smaller and less costly than the City Hall, having but 90 feet of frontage, and costing but \$90,000, it justifies the praise of the author of a "Description of Albany" in 1823, as "a large and elegant pile of masonry, in design and execution the most chaste in the city;" for the only other secular public building then extant was the old Capitol begun in 1810, and lately demolished to make room for the new. This was much less considerable than the Academy, being in a coarse version of classic with a Corinthian portico of columns of brickwork veneered with marble, reeded instead of fluted. There is nothing in its design which we cannot readily accept as within the power of the common American builder of 1810.

Dwelling houses necessarily precede "meeting houses," for either sacred or secular purposes, but the very first provision for shelter in a new country cannot be durable. There is no part of the Atlantic coast in which timber was not readily available at the time of the first European settlements, and the very first buildings must in all cases have been log cabins. They continued the first dwellings of the pioneers as settlement went inland, and indeed they still continue to be. But as soon as the settlement became permanent and provision for shelter other than temporary, the log cabin ceased to be built. It would be interesting to know the date of the introduction into America of the saw-mill, which for a century and more has determined and dominated the vernacular building of the country. It existed in Norway before the middle of the sixteenth century, and a futile effort was made, by a Dutchman, it is worth noting, to introduce it into England shortly after the middle of the seventeenth. But it did not accompany or closely follow the advance of civilization until the present century, and indeed it is not uncommon to find houses in New England built

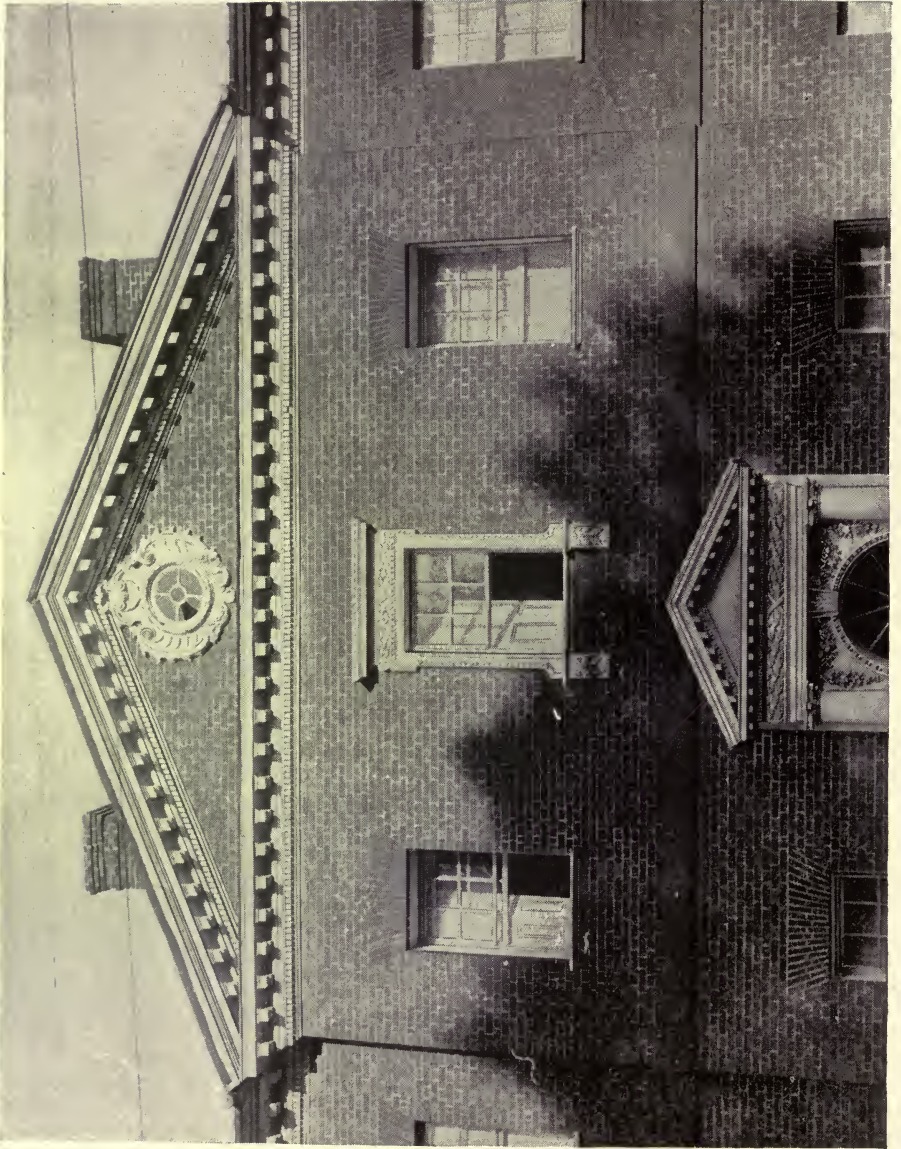


WASHINGTON HOUSE, GERMANTOWN, PA.

within this century of which the clapboards bear the marks of the axe. It may at any rate be laid down as a rule that the new dwellings of the second or third generation in any part of the country were no longer log cabins. To this rule there were exceptions and one of them was noted by Jefferson, who says that in Virginia, in 1781, "the poorest people build huts of logs, laid horizontally in pens, stopping the interstices with mud," and this, of course, is a description of the log cabin. But it is at least evident that the log-cabin was merely a shelter, and generally a provisional shelter. No attempt, that is to say, was made, when more costly and more leisurely building became possible, to develop the log-cabin either practically into a commodious or architecturally into a decorative dwelling. Nothing was developed here at all corresponding in skill or elaboration to the log-architecture of Switzerland or Scandinavia, and such examples of this architecture as are to be seen in this country are either importations, like the admirable Swedish school-house shown at the Centennial Exposition of 1876 and now in Central Park, or reproductions or imitations of European models, like the equally admirable building erected for the State of Idaho in the Columbian Exposition of 1893. It is perhaps unfortunate that the log-cabin should have been so soon and so completely supplanted, but it is certain that it never attained to such a development, or exercised such an influence upon succeeding buildings as entitles it to be mentioned in an account of architecture in America.

The date of the establishment of the first brick-kiln in America would be as interesting to know as the date of the establishment of the first saw-mill. It is certain that bricks were made upon both the Delaware and the Hudson early in the eighteenth century, but not likely that they were made extensively during the seventeenth. The earliest authentic instance I have been able to find of the use of native brick is in the first public buildings of Annapolis (1696-7). When Jefferson built Monticello, in 177c, the

bricks for the mansion were burnt on his own estate and under his own direction, a fact which goes to prove, as well as his own explicit statement eleven years later, that bricks were not a staple commodity in Colonial Virginia. If the date of the old church near Smithfield be accepted, it seems clear that the excellent bricks of that structure, as well as the excellent bricklayers, must have been specially imported. The earliest houses that remain to us are for the most part of rough masonry, sometimes with no brickwork, sometimes, as has already been said, with so sparing a use of brick as to indicate that it was an exotic and costly material. Of the former class is the Sip house on Bergen Heights, opposite New York, still or very lately standing and inhabited by the seventh in descent from the Sip who built it in 1666. Of the latter was the house at Gowanus which was demolished about twenty years ago, and which bore its date, 1676, in figures of iron upon its gable. The last Dutch house left in Albany, on the other hand, demolished in 1893, after an existence of two centuries, was entirely of brick, but of brick unquestionably imported. Like the Sip house on Bergen Heights, the old houses at Hackensack of the end of the seventeenth century and the beginning of the eighteenth, commemorated by Mr. Black in his interesting paper in the ARCHITECTURAL RECORD (Vol. III, No. 3), were rectangles of rough masonry, one story high, with a superstructure of timber, including the gables. They derive their one touch of picturesqueness, probably an unconscious touch, from the projection of the roof and of the floor-beams, with the simplest possible form of verandah, needing no supports from beneath. It is scarcely available for shade, but it forms an outside shelter and a protection against eavesdropping. The same device is a mark of the origin of such Dutch farmhouses as still remain in Flatbush and other suburbs of Brooklyn. The suburbs of New York, indeed, both in Long Island and in New Jersey, continued to be Dutch settlements throughout the eighteenth cen-



FRONT GABLE, HARWOOD HOUSE.



WARNER HOUSE, PORTSMOUTH, N. H.

ture, and constitute the most important exception to the rule that colonial building was English building. They scarcely constitute an exception to the rule that colonial architecture was English architecture.

Albany, indeed, remained Dutch long after New York had become English. Morse, describing it in 1789 for his "American Geography," says that the houses were "built in the old Dutch Gothic style, with the gable end to the street, which custom the first settlers brought with them from Holland." Albany, so largely brick-built as it was long before this, must have made the impression of a durable as well as of a quaint and picturesque town upon the travelers from the South as well as from New England. I have already referred to Jefferson's deprecation of the universal use of wood in Virginia. The rosy Jones had written sixty years earlier of Virginia: "Here, as in other parts, they build with brick,

but most commonly with timber lined with ceiling and cased with feather-edged plank." Forty years earlier still Dankers and Sluyter wrote of Massachusetts: "All the houses are made of small, thin cedar shingles, nailed against frames and then filled in with brick and other stuff, and so are their churches." It is obviously unlikely, by the way, that bricks should have been imported for filling. What remains of the earliest building of New England, as well as inherent probability indicates that the "shingles" of this description are the same as the "feather-edged plank" of Jones and the "construction of scantling and plank" of Jefferson, and would now be called clap-boards. This was the vernacular building of the colonies as it is of the states. There were but four brick dwelling houses in Portsmouth, according to its annalist, before the beginning of the present century. But while Albany doubtless derived from its ma-

terial a look of more permanence than other settlements, the only badge of the "old Dutch Gothic" was in the crow-stepped gables, though not all of them were crow-stepped, and the houses were humble in dimensions and simple in construction. The Dutch house near Tarrytown, built in 1650, which Washington Irving, with the assistance of George Harvey, architect, rebuilt in 1835, and called Sunnyside, was a more commodious residence after the re-

Troy under excavation. A part, not more than half, of the Philipse manor-house, now the City Hall of Yonkers, was built during the seventeenth century by Frederick Philipse the first Lord of Philipsburg, and builder of the church at Sleepy Hollow, the remainder being added by his grandson in 1745 in unquestionable English colonial. The workmanship of the old part is substantial but rude, and the interior fittings with their clumsy mould-



PADDOCK HOUSE, PORTSMOUTH, N. H.

building than at first, and yet Thackeray described it justly as "but a pretty little cabin of a place." Nay, the "great Vanderheyden palace," built in 1725, and entirely Dutch in architecture, which was the boast and wonder of Fort Orange, and the weathercock of which now adorns Sunnyside, measured but fifty feet by twenty and had two rooms on the ground floor. The early Colonial glories shrink under investigation as proud

ings suggest the handiwork of a shipwright turned joiner. But this edifice, built as it was by the richest man in New York, shows the extreme of elegance that was attainable under the Dutch dynasty.

The town-houses of the prosperous merchants of New York and Boston and Philadelphia took on during the eighteenth century a very similar aspect. Such examples as the Frankland and Hancock houses in Boston, the



GOVERNOR LANGDON'S HOUSE, PORTSMOUTH, N. H.

Walton house in New York, and the Arnold house in Philadelphia, show the type, a solid symmetrical, rectangular mansion of brick, sometimes quioned, often covered with plaster, a substantial and decorous, but scarcely artistic dwelling. Towards the close of the politically colonial period there came in, in New England and the Middle colonies, the notion referred to by Cooper in "The Pioneers," and apparently shared by him that there was a certain indelicacy in the exposure of the roof. Possibly this was an Anglomaniacal revolt against the steep roofs of the Dutch. At any rate the roof in the most pretentious houses came to be kept as low as was prac-

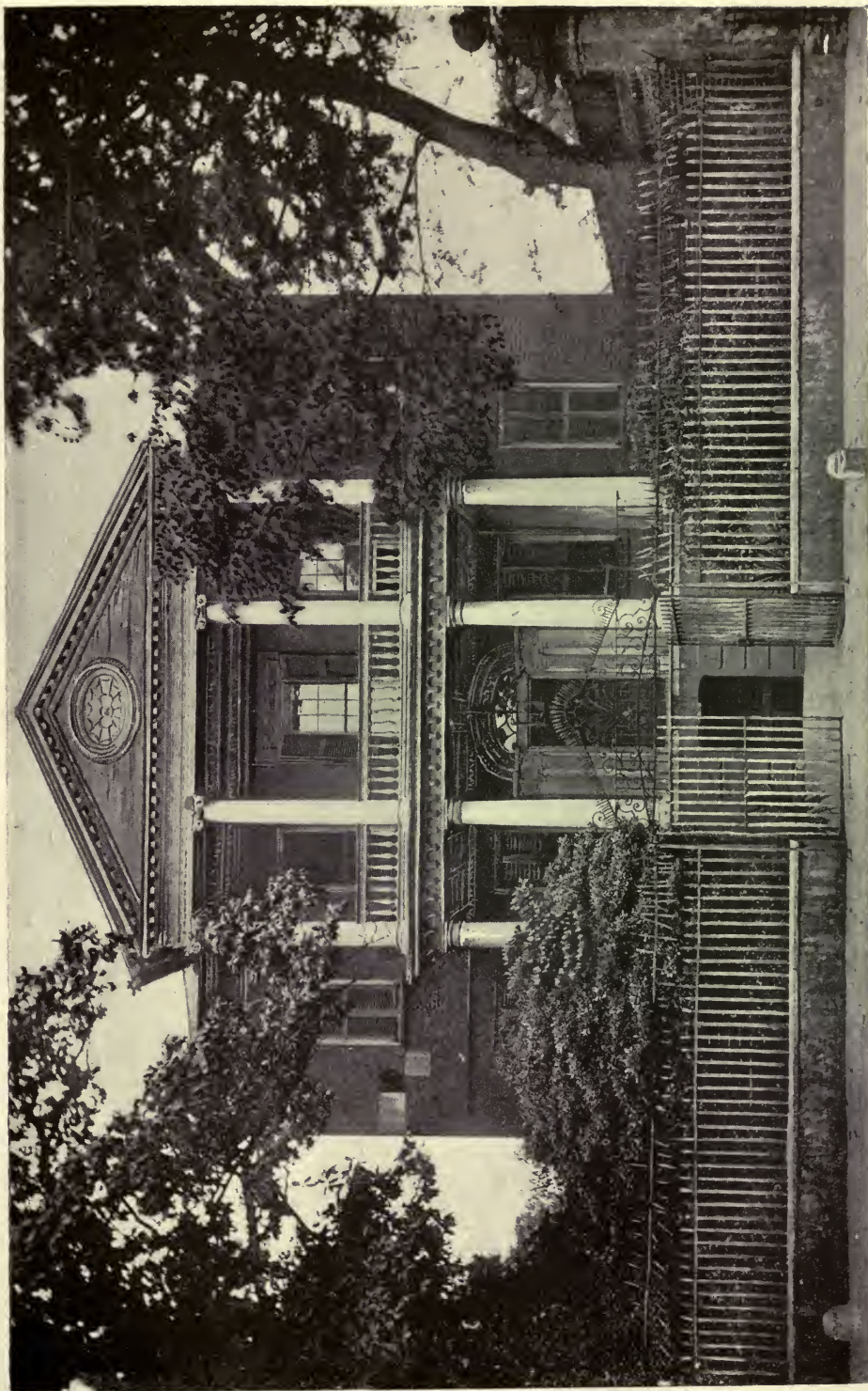
tically possible, and still further concealed by a balustrade. The Arnold mansion shows the limits of the mason's craftsmanship, as it was allowed to be exhibited in the town-houses. The carpenters and the plasterers possessed a much higher degree of skill, and to the former the exterior as well as the interior decoration of the houses was confided. In composition the only architectural quality these mansions had was the often effective proportioning of the stories to each other. The exterior decoration was confined to the entrance, which was designed by the carpenter, from the manuals of his trade which he or his predecessors had brought from the old country. He

followed his models with literal fidelity and with a high degree of mechanical skill, and it is his detail and that of the plasterer that we commonly mean when we speak in praise of colonial architecture. It was indeed very good detail of its kind, the more taking by contrast with what succeeded, when the carpenter had passed an architectural declaration of independence and trusted to his own invention. The order that embraced the entrance formed an effective central feature, whether or not it was accompanied by the decorated window that often appeared above it, as in the Scott House at Annapolis, or expanded into a portico of two orders, as in the Pringle House at Charleston. The schooled and respectful carpenter of colonial times survived in New York for at least the first third of the nineteenth century, and the stonemasons arrived at a skill sufficient to translate the prim refinement of his work into more permanent material. Thus St. John's Park and Bond street and Washington square were successively built up with mansions that owed to this detail a real attractiveness, and the well designed and executed entrances lent a grace to a much humbler dwelling, the brick high-stoop house, of two stories a basement and an attic that was the typical New York dwelling until it was supplanted by the brownstone front. This type established itself in Albany and in the older towns of central and western New York, as a much simpler type, indeed a type characterized by a simplicity that amounted to baldness, spread itself westward from Philadelphia. At the end of the first quarter of this century New Yorkers were architecturally better housed than either Philadelphians or Bostonians. If the Virginian whose opinion of New York in 1789 we have quoted, had postponed his visit for forty or even thirty years he would have been compelled to award it the prize of "elegance."

With respect to country houses, it is to be noted that New England at no time possessed a landed gentry. The rural parts of it were inhabited during the colonial period by small farmers, and the rich men were townsmen whose

fortunes had been gained in commerce. The chief of them, indeed, had been made in the fisheries, an historical fact, which survives in a phrase of Bostonian origin, the "codfish aristocracy." It was the town houses that were the costly and pretentious dwellings, and they were confined to the seaports, which were, indeed, the only towns. What is now known as the Warner house in Portsmouth, built by Captain McPhaedris, "an opulent merchant," in 1718, of bricks imported from Holland, was the wonder not only of Portsmouth, but of all New England, for its solidity and its cost, which reached what was then the prodigious sum of £6,000. It is unlikely that Boston itself contained so pretentious a dwelling. Of its most famous colonial mansions the Frankland house was built in 1735, the Hancock house in 1737, and the house of Governor Shirley in 1748. The Portsmouth house is almost exactly contemporary with the Vanderheyden palace, and the comparison is instructive. It is especially noteworthy as illustrating how the colonial dwellings of New England that are important enough to be considered an example of colonial architecture were town houses and never country seats.

What is true of New England in this respect is true of Pennsylvania. It is not quite true of New York, for New York possessed a landed gentry in the holders of the manorial grants, and these possessed "seats." The seats were not of much architectural importance. Most of those along the Hudson River, were built of wood and have perished, and of those which were built of brick few had architectural pretensions or importance, beyond what was given to them by mere size. The manor-house of the Van Rensselaers, of Rensselaers Wyck, was one of the most pretentious as well as one of the most successful of these, having form and comeliness as well as size, though the wings and the portico, that add so much to its attractiveness, were added from the designs of Richard Upjohn in 1847—the body of the house dating from 1765. It must have been almost as great a wonder in its time at Albany as the McPhaedris house in Portsmouth



THE PRINGLE MANSION, CHARLESTON, S. C. (PRE-REVOLUTIONARY.)

half a century before. The mechanical advance in the interval is in one respect noteworthy, for whereas hewn stone was unknown in New Hampshire in 1720, the quoins, sills and lintels of the Van Rensselaer house are of this material. The same prodigality is shown in a profusion of carved work in mahogany and pine, somewhat ruder in execution and feebler in design than such decoration could then have been found at the seaboard, but carved with spirit and with tolerable precision. The other brick country-houses that remain

Carolina" (1761) assures his readers that "the men and women who have a right to the class of gentry are more numerous here than in any other colony in North America." However that may be it is certain that there was much visiting and entertaining between the plantations, and that the plantation houses were designed and built accordingly. Unfortunately they built of wood, and their buildings have passed away. The author of the "Description for Protestant Immigrants" (1731) assures us, it is true, that "if you travel



in New York and New Jersey are much plainer and simpler, following the type of the Philipsburg manor-house at Yonkers, though the interiors are apt to be decorated with some rather elaborate wood carving, often including a room panelled in oak or pine, and some very elaborate plastering.

It was in the South, however, that family seats most abounded. The planters of rice and indigo in South Carolina, for as yet cotton was not a Southern crop, made money and spent it easily. The author of "A Short Description of the Province of South

into the country you will see stately buildings, noble castles and an infinite number of all sorts of cattle." But his style discredits him as the unscrupulous author of a prospectus with designs upon the Protestant immigrants, and he lacks specification.

It was in Virginia and Maryland that the great tobacco planters became the most considerable landed gentry in the colonies, and built houses to contain themselves and their acquaintances which are the most extensive and the most interesting of colonial country houses. "The inhabitants of Virginia,"

Burke wrote, "are a cheerful, hospitable and many of them a genteel, but somewhat vain and ostentatious people." The life of the "barons," of the Potomac and Rappahannock, the York and the James and of the Chesapeake was patriarchal, and when tobacco became a lucrative crop, they projected and built their mansions on patriarchal lines. Except for a short season at Williamsburg or Annapolis, they lived at home or at each other's homes, and

was only "founded," and the nucleus of the present mansion constructed, in 1700, Brandon about 1740, The Grove 1746, Westover 1749. They were for the most part as originally designed symmetrical and rectangular masses of brickwork, the projecting porches and verandahs of such as have them being subsequent additions, required by a sunnier climate. Of exterior ornament there was little, and that little confined to the entrance. This



LONGFELLOW HOUSE, CAMBRIDGE, MASS.

they made their homes capacious accordingly. How patriarchal the life was may be inferred from the advice of one Virginian to another, delivered within this century: "Never buy an hereditary place, for many people think they have as much right there as the owner." The great houses of the lower James are ancient as we Americans count antiquity. Shirley, the seat of the Shirley Carters, is said to have been built, though more probably it

is the more remarkable because the interiors are so elaborately wrought. The explanation, doubtless, is that in "the scarcity of handicraftsmen," the mere bricklaying was all that could be done on the spot, while elaborate woodwork could be imported from England, and only put in place by the native workmen. One may pronounce with confidence that the rare specimens of hewn stone, such as the urns of Westover, were carved in England and shipped from



DINING-ROOM, CHASE HOUSE.



VAN RENSSELAER MANOR HOUSE, ALBANY, N. Y.



EMERTON HOUSE, SALEM, MASS. (REMODELED).

the stone-yard at London or Bristol to the purchaser's wharf. Evidently the ornamental iron work is from a foreign smithy. The embellishments of the mansions of Virginia and Maryland are, indeed, examples of English work of the period, and do not exhibit the slight modifications of it which are traceable at the North and differentiated the later colonial from English. In Maryland, as the aspect of Annapolis assures us, the scarcity of handicraftsmen was less than in Virginia. The mansions were really designed, outside as well as inside, and apparently by colonial mechanics. Homewood, in Baltimore, was built about 1780, but its design is evidently a reminiscence of that of Whitehall, erected in 1740-50 as the seat of Governor Sharpe. Each of these, unlike the great Virginia houses, exhibits a real and effective architectural composition, having unity, variety and subordination, with a discreet use of ornament good in itself and appropriate in scale and in form to its place. Not many examples of domestic architecture since have been more artistic, and none have expressed more distinctly the notion of a decorous and refined social life.

Doubtless this expression is the highest achievement of colonial architecture, which it reaches oftener in the minute detail of an interior than in the design of a building, or even in the composition of a front. In the expres-

sion of American life, Colonial architecture left very much to be desired, but what such a mode of building saved us from, when as yet there were no educated architects, may be seen from what followed when the trained and deferential colonial carpenter was succeeded by the emancipated and disrespectful provincial carpenter. Even the freaks of the colonial carpenters, and they sometimes indulged themselves in freaks, were gentle and subdued extravagance. The very timidity and feebleness that often accompanied the refinement of their work becomes in the retrospect an engaging and amiable weakness;

No black-souled villain ever yet
Performed upon the flageolet.

It has been very well said of colonial building that "in the hands of a man of genius it would have been a poor tool, but to the men who had to use it, it was salvation." The examples of it which have been noticed in this survey surely suffice to convict of singular recklessness a popular historian of the United States, who ventures to say that "there did not exist in the country," in 1784, "a single piece of architecture which, when tried even by the standard of that day, can be called respectable. Not a church, not a public building, not a house has been preserved to us that is not a deformity."

Annals of Annapolis; Adams' Annals of Portsmouth; Brewster's Rambles About Portsmouth; Burke's Account of the European Settlements in America; Conway's Barons of the Potomac and Rappahannock; Frazer's Reminiscences of Charleston; Meade's Old Families and Churches of Virginia; Historical Collections; South Carolina, N. Y., 1836; Connecticut, New Haven and Hartford, 1836; New York, N. Y., 1842; Pennsylvania, Philadelphia, 1843; Virginia, Charleston, S. C., 1845; Historic Churches of America, Philadelphia, 1893; Jefferson's Notes on Virginia; Jefferson's Writings (9 vols., N. Y., 1853-4); Schouler's Life of Jefferson; Jones' Present State of Virginia, London, 1723; A Short Description of the Province of South Carolina, London, 1761; Descriptions of South Carolina for Protestant Immigrants, 1731; Mason's Newport Old and New; Mason's Reminiscences of Newport; Munsell's Annals of Albany; McMaster's History of the

United States; Morse's American Geography, 1789; Weise's History of Albany; Scharf's History of Maryland; Winsor's Memorial History of Boston; Philadelphia and Its Environs; Annual Address Before the American Institute of Architects, 1876 (A. J. Bloor); Annual Address Before the American Institute of Architects, 1881 (J. H. B. Latrobe); *Harper's Weekly*, April 25, 1885, February 13, 1892; *International Review*, November-December, 1874; *Century Magazine*, January, 1891, June, 1891; *Lippincott's Magazine*, July, August, 1884; *Magazine of American History*, October, 1881; *Architectural Record*, Vol. I., No. 3, Vol. III., No. 3; Year Book of Trinity Parish, N. Y., 1894; Chandler's Colonial Architecture of Maryland, Pennsylvania and Virginia, Boston, 1892 (Bates, Kimball & Guild). To the publishers of the last-named work we are indebted for permission to reproduce five illustrations in the foregoing article.

Montgomery Schuyler.



MEMORIAL WINDOW TO JAY GOULD,
(Centre window of group of three.)

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Designed by Frederick Wilson.



MEMORIAL WINDOW TO JAY GOULD,
(Left-hand window of the group of three.)

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MEMORIAL WINDOW TO JAY GOULD,
(Right-hand window of a group of three.)

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WINDOWS IN OLIVET COL. CHAPEL,

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CERAMIC MOSAIC FLOOR,

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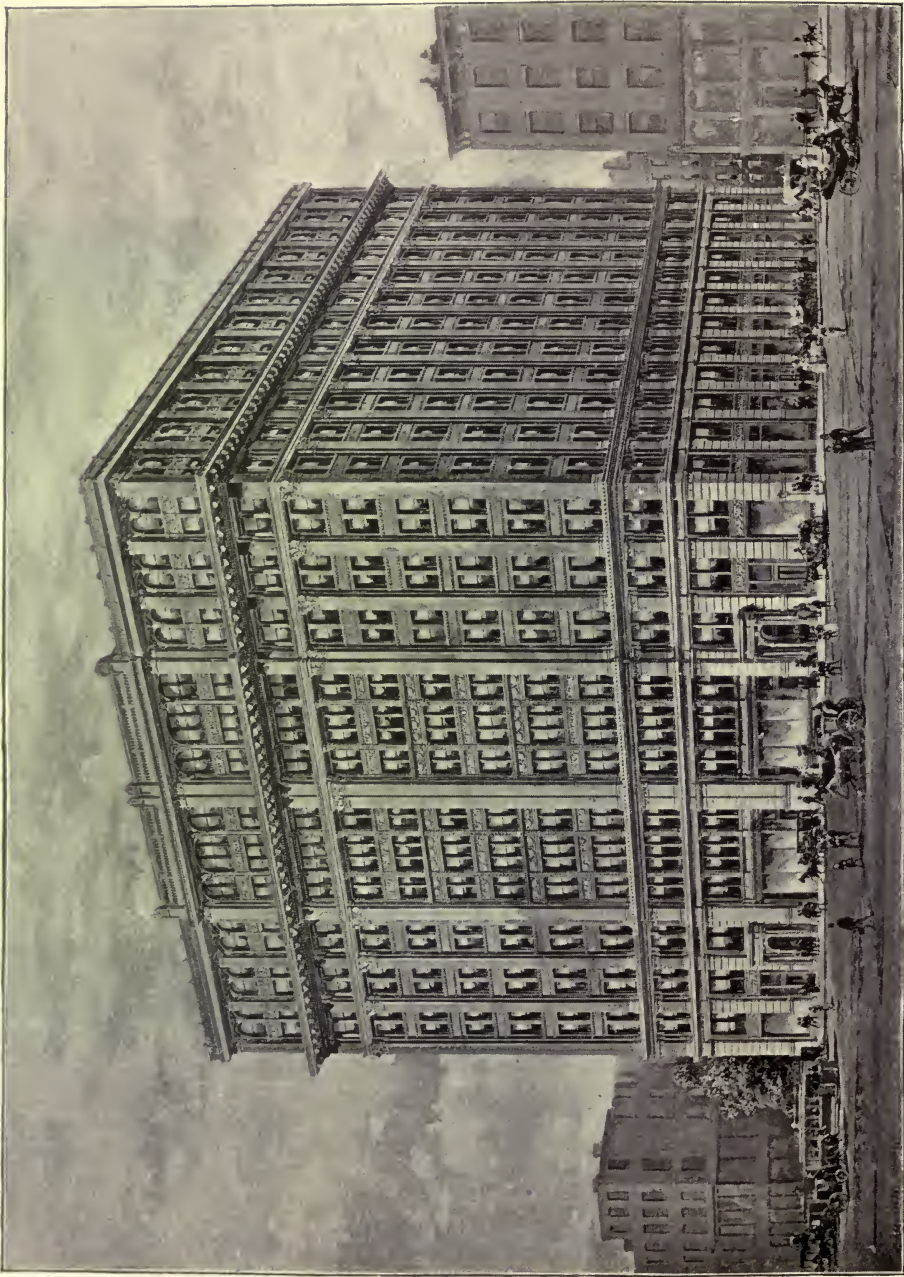
BRONZE DOOR FOR THE MERCHANTS NATIONAL BANK BUILDING,
Baltimore, Md. Executed by Hecla Iron Works. Baldwin & Pennington, Architects.



WROUGHT IRON GATEWAY,

Designed by the late John W. Root.

Executed by Winslow Bros. Co.



Broadway and Waveley Place,

THE NEW YORK BUILDING.

R. Maynicke, Architect,



NEW BOOKS.

The Reign of Queen Anne. By Mrs. M. O. W. Oliphant. New York: The Century Co.

The reign of Queen Anne was not only one of the most eventful in English history, but it is distinguished as marking for the Anglo-Saxon race, the culmination of a mood between which and the genius of the people there is, one may say, a fundamental hostility. It is common to speak of Queen Anne's times as the Augustan Age. The title is inexact, but it serves sufficiently well to characterize the only "age of letters," in the restricted meaning of the term, in English history. For the American architect the period will always possess a special interest. It was the Age of Wren, when those architectural forms were naturalized on British soil which subsequently inspired the earliest attempts at architecture in this country. If some familiarity with the social history of the times in which it arises is necessary to a full understanding of any particular phase of architecture, students of the "old colonial" style cannot do better than make a starting point with the history of Anne's reign. Mrs. Oliphant's work will serve excellently for introductory reading. In a series of biographies the chief events of the reign and the distinguishing tone of the period are clearly and sympathetically set forth. In this case the biographical method imposes few limitations upon the historian, for it is remarkable how naturally the history of the times groups itself around a few persons—Anne, herself, Marlborough and his ambitious wife; "dear adored Mrs. Freeman," Swift and Addison, and the political and literary company that gathered about them. Mrs. Oliphant's work is remarkably pleasant reading. The story moves fluently in an easy, clear, felicitous style which unfortunately is too frequently lacking in "history." The book is superbly illustrated and the binding and typography re-

fect much credit upon the publishers, the Century Company.

Schools and Masters of Sculpture. By A. G. Radcliffe. New York: D. Appleton & Co.

This work will serve excellently for the general reader or for the student requiring a clear untechnical text-book on the history of Sculpture. The author plainly has kept in view the deficiencies and requirements of the uneducated. The work, consequently, is popular in style and presents to the reader rather the interesting facts of the plastic art than the essential ones. The philosophic note, the point of view, is entirely absent. Instead, we have an easy conversational treatment which avoids difficulties and keeps the reader free from the embarrassment of technicalities and the trouble of striving for *insight* into the masterpieces described or the schools to which they belong. In this manner the entire history of the art is covered from the early realistic Egyptian statues to the last productions of St. Gaudens. Two chapters are given to the study of sculpture in the museums of Europe and America—an excellent idea—which will be found of real utility by travelers and students visiting the great national collections. The volume is well and abundantly illustrated.

Engineering Construction in Iron, Steel and Timber. By William Henry Warren. London: Longmans, Green & Co.

It is impossible within the limits of a short notice to consider in detail a work of the character of this one. The primary object in view in writing the book, the author says, was to prepare a text-book for students attending the first portion of his lectures (University of Sidney, New South Wales,) on materials and structures, but he considers that the work may be found useful



PRINCESS ANNE,

From Mrs. Oliphant's "Reign of Queen Anne."

not only to engineering students in technical colleges and universities, but also to those engaged in the design of constructional iron and steel. It is to the latter, we apprehend, that the work will be of most value, and by them it will be found to contain a clearer and upon the whole more satisfactory statement of the modern theory and practice of construction than is to be found elsewhere. The excellent plan of giving examples selected from existing structures has been adopted. The author evidently is well acquainted with American practice. His eye one may say is constantly upon it and his familiarity with European methods enables him to give a far more comprehensive scope to his remarks than is to be found in any other work of similar compass. In common with English technical books of the higher grade the typography of this volume is excellent—an example to American publishers and authors.

The Meeting Place of Geology and History. By Sir J. William Dawson, F.R.S. New York, Chicago and Toronto: Fleming H. Revell Company.

The object of this work is better indicated in the following passage than in its title: "If we take the Canstadt people to represent the under tribes of the antediluvian Cainites, the feebler folk of Truchere, to represent the Sethites and the giant race of Cromagnon and Mentone as the equivalent of the 'mighty men' or Nephelim of Genesis who arose from the mixture of the two original stocks, we shall have a somewhat exact parallel between the men of the caves and gravels and those we have so long been familiar with in the Book of Genesis." This is asserted with no positiveness, but by adopting the theory of the comparative recency of man and denying that the development of the savage into the civilized man, was the matter of the slow process that some scientists claim it to have been, and by a series of interesting reasoning, argument and illustration, the author endeavors to leave upon the reader's mind the impression that there is a strong relation between the primitive history of man in Genesis and scientific discovery.

Renaissance and Modern Art. By Wm. H. Goodyear. Chautauqua: Century Press.

A work in which history and architecture interpenetrate is that recently issued by the Chautauqua Society from the pen of Wm. H. Goodyear. With Mr. Goodyear architecture and history are inseparable. Architecture with him is not the isolated fact that it appears to be in the

ordinary text-book. To treat of the entire art of the Renaissance period, especially when the Renaissance is regarded as still continuing, in a book of only 300 pages requires an effort of condensation which almost precludes a successful narrative. Mr. Goodyear, however, has told his story interestingly. It has nothing of the disjointed character common to the text-book. Each step that the reader takes forward is a step through the entire breadth of the subject. Proportion, too, is well observed, and the student is greatly assisted by the interpolation in the text of 203 engravings of the chief works of architecture, sculpture and painting of the period considered. We very heartily recommend this work to our readers. It supplements the volume, "Roman and Mediæval Art," issued recently by the same author in the same series, of which we shall speak later.

Childhood in Literature and Art. A Study. By Horace E. Scudder. Houghton, Mifflin & Co. \$1.25.

Mr. Scudder is an essayist whose work invariably possesses literary charm and music. His last volume is one of his most delightful essays. "We are justified," says Mr. Scudder, "in believing childhood to have been discovered at the close of the last century." Men, women, lovers, maidens and youths have figured in literature from the earliest times, but it is in modern days that the child has been added to the *dramatis personæ* of literature. We do, of course, in the older writers catch occasional glimpses of childish figures, but they are occasional and fugitive glimpses only. Mr. Scudder goes curiously into the subject and shows us in a series of delightful chapters the part which childhood played in Greek and Roman literature, in early Christian and Mediæval art, and in English, French and German literature and art. A chapter is devoted, indeed, how could it be omitted? to Hans Christian Andersen—the child's Shakespeare. A final chapter is given to "Childhood in American Literary Art."

Costume of Colonial Times. By Alice Morse Earle. New York: Charles Scribners Sons.

It is a good sign, the interest which we are beginning to take in the early social history of our country. The revival of Old Colonial Architecture is a mark of this interest. In spite of the work that historians have done it is remarkable how many questions concerning the first period of American history may be asked with-

out finding answers. We have not yet a complete history of Colonial Architecture. The dates of even the most important buildings have to be dug out of local histories. The author of this book has found the material for her work in letters, wills, inventories of estates, court records, and eighteenth century newspapers. The result is a valuable glossary containing a great amount of curious and interesting information. The work should certainly find a place on the historical shelf of every library, and unlike many books of reference it is distinctly good reading.

Architect, Owner and Builder Before the Law.
By T. M. Clark. New York: Macmillan & Co. \$3.00.

Some legal knowledge is absolutely necessary to the safe practice of architecture. Hitherto there has been no work at once adequate and comprehensible to the lay mind to which the architect could turn for information. This deficiency has now been very adequately supplied by Mr. T. M. Clark's work. We recommend this work to our readers without any qualifications whatsoever. It is absolutely indispensable to the architect. It is not only a thorough piece of work on the legal side, but it is very good reading as well, and will give every architect who studies it a clear knowledge of his relationship to owner and builder as defined by the courts.

The Norman Monuments of Palermo. By Arne Dehli and G. Howard Chamberlin. Boston: American Architect and Building News Co.

It gives us very great pleasure to announce that the American Architect is now offering Dehli and Chamberlin's "Norman Monuments

of Palermo" at a reduced price. This useful work, it will be remembered, was originally published by Messrs. Ticknor & Co., at \$5 for each part. The four parts of the work can now be obtained for \$12, and at this low price it should certainly find a place in every architect's library. The chief feature of the book, naturally, is the prints, of which there are three, 13x18, in each part, besides a dozen plates of measured detail work. The latter will be found of much practical usefulness, as we know of no other work to which one can turn so readily for exact details of the unique architectural development which followed the Norman conquest of Sicily. The engravings are supplemented by adequate descriptions and some interesting historical notes.

The Renaissance Under the Valois. By Charles T. Mathews, M.A. New York: Wm. T. Comstock.

The attention which has recently been bestowed by American architects on the earliest phases of the Renaissance, gives especial value to C. T. Mathew's sumptuous work, "The Renaissance under the Valois." This period of the classical revival offers abundant precedents and examples well worth the attention of the modern architect in search of a style. It is certainly the most picturesque phase of the Renaissance. Mr. Mathews has gathered from the great French collection of photographs the best examples of the style. He has added to these a careful and sympathetic essay, which describes the buildings illustrated and surrounds them with the social and artistic conditions amid which they were produced. The illustrations are excellently done and the volume is handsomely bound.





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