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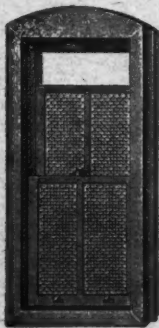
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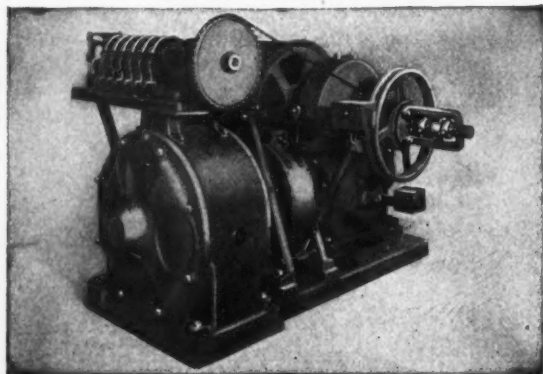


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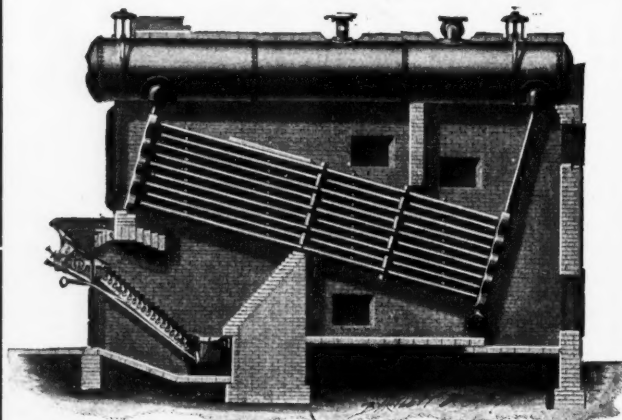
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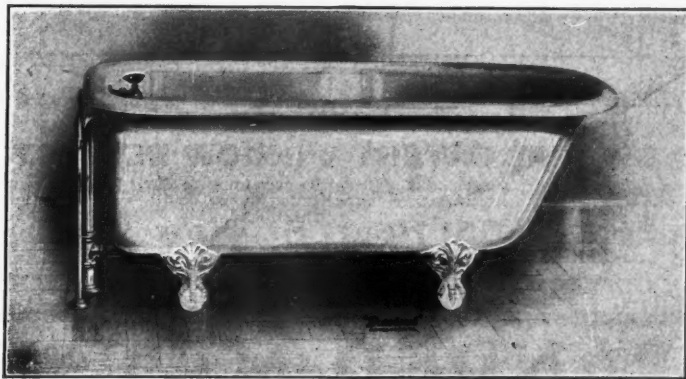


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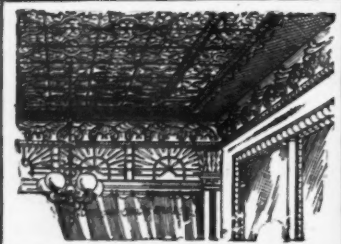
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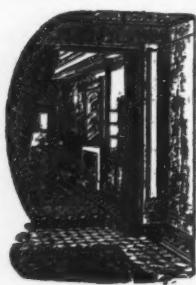
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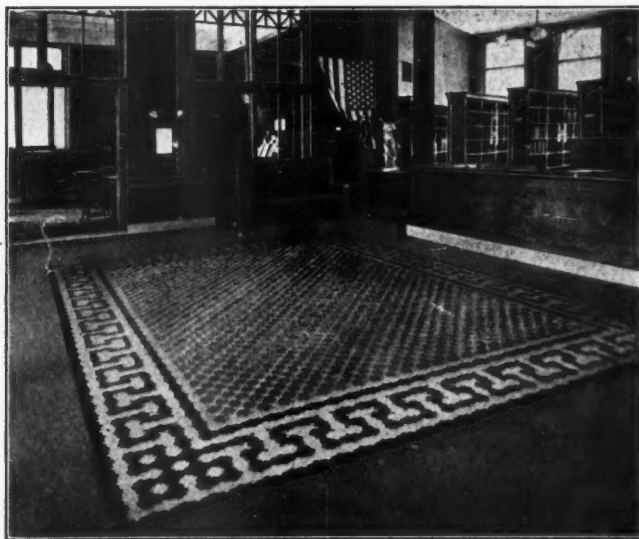
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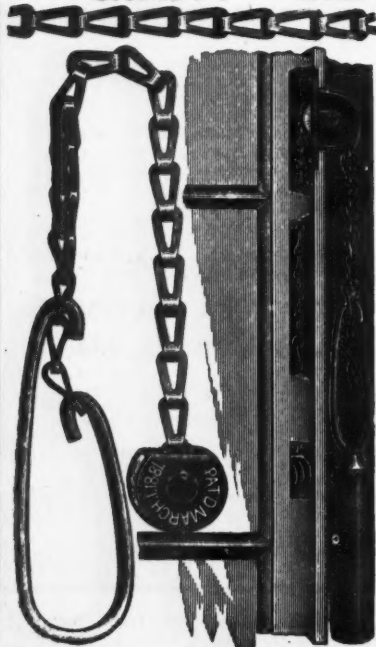
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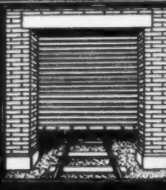
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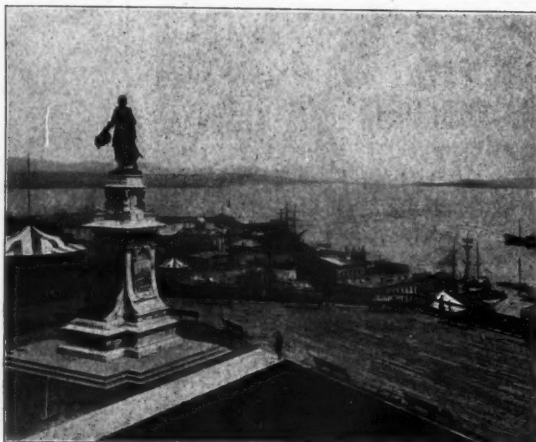
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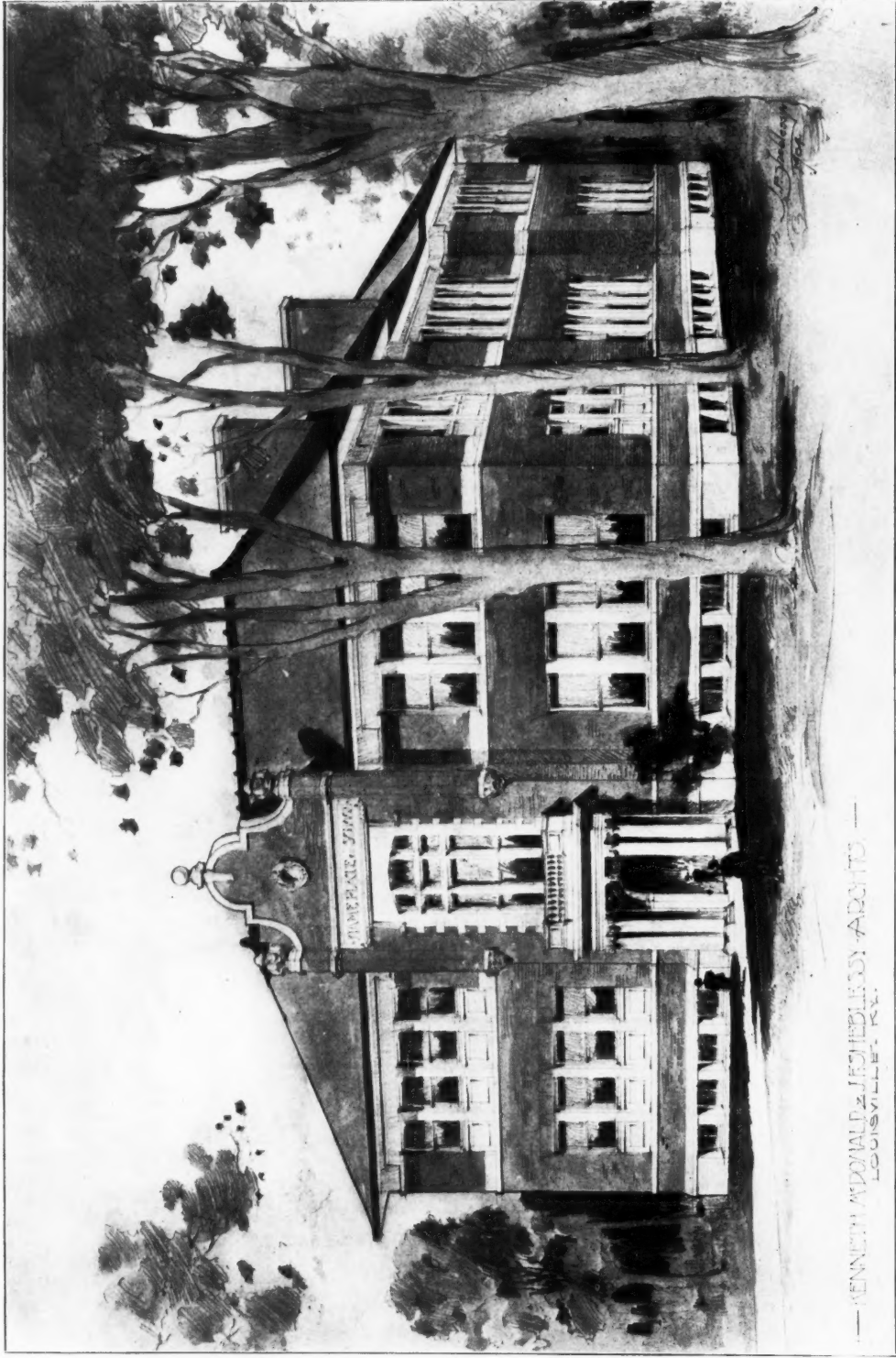
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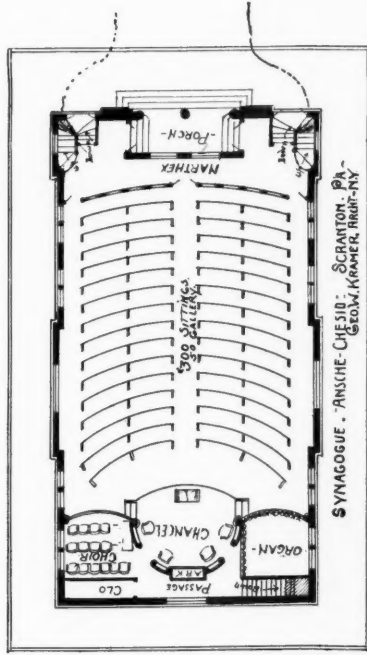
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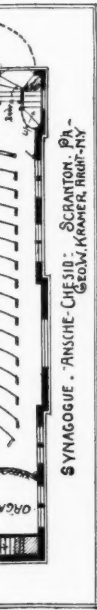
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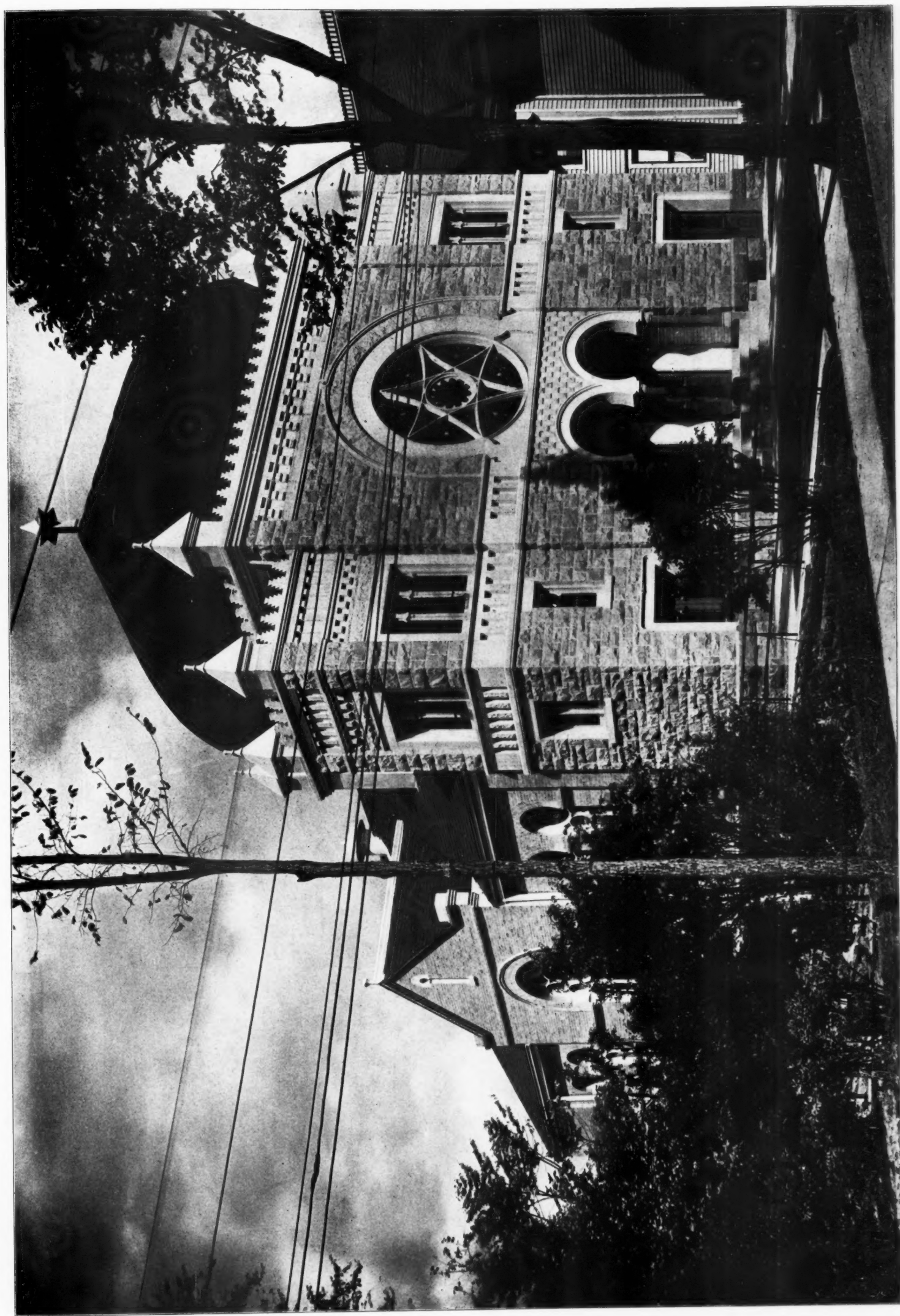
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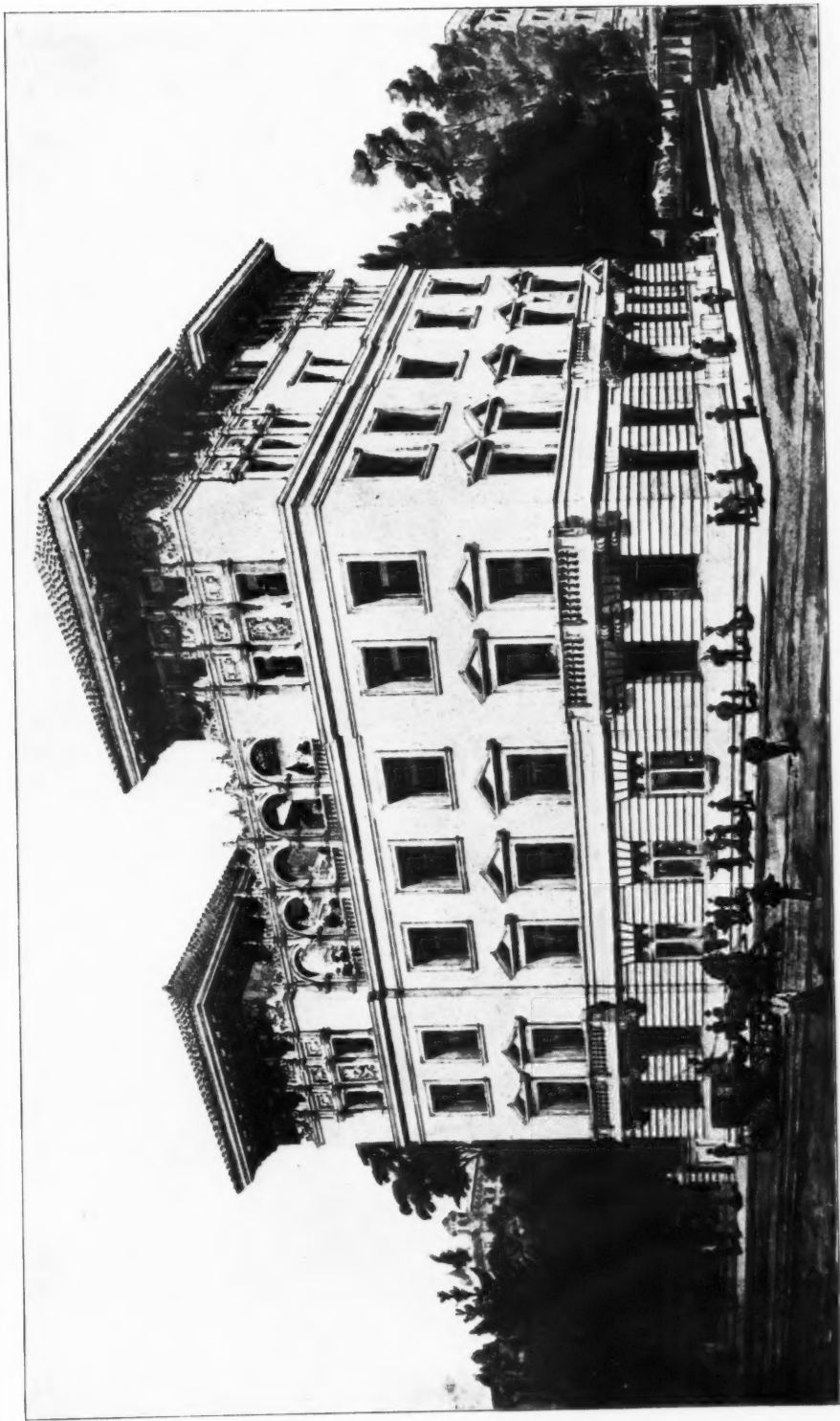
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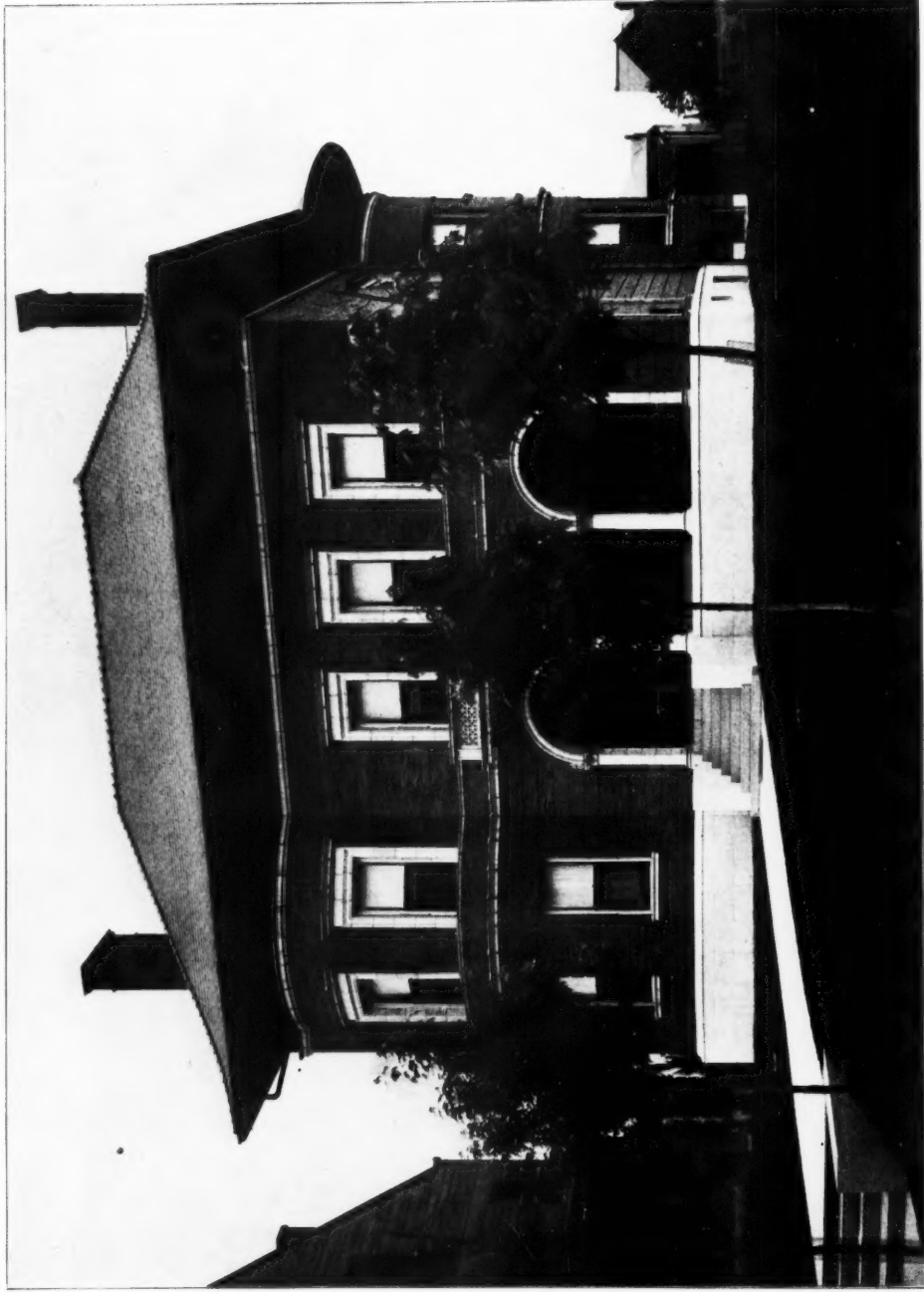
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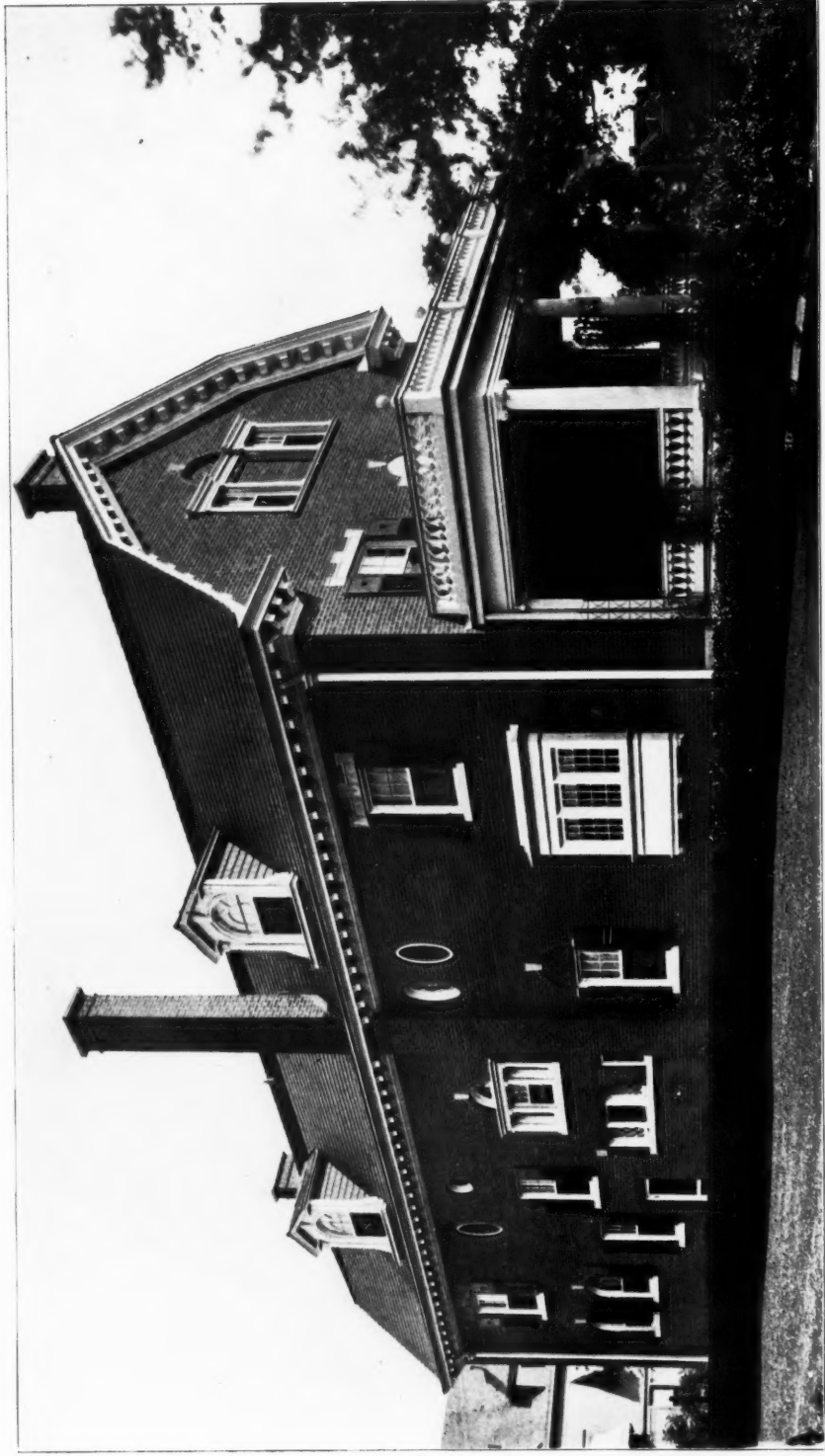
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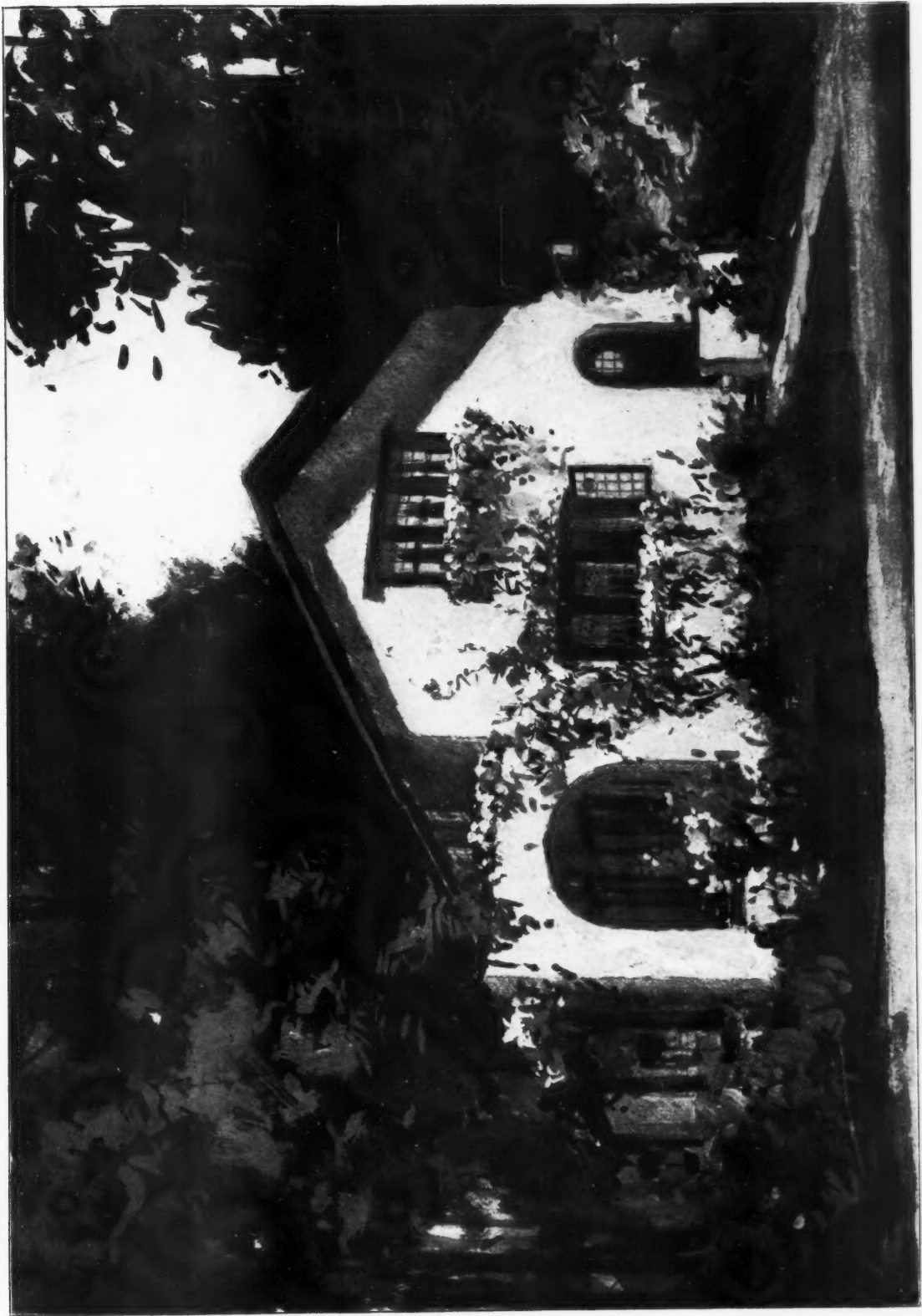
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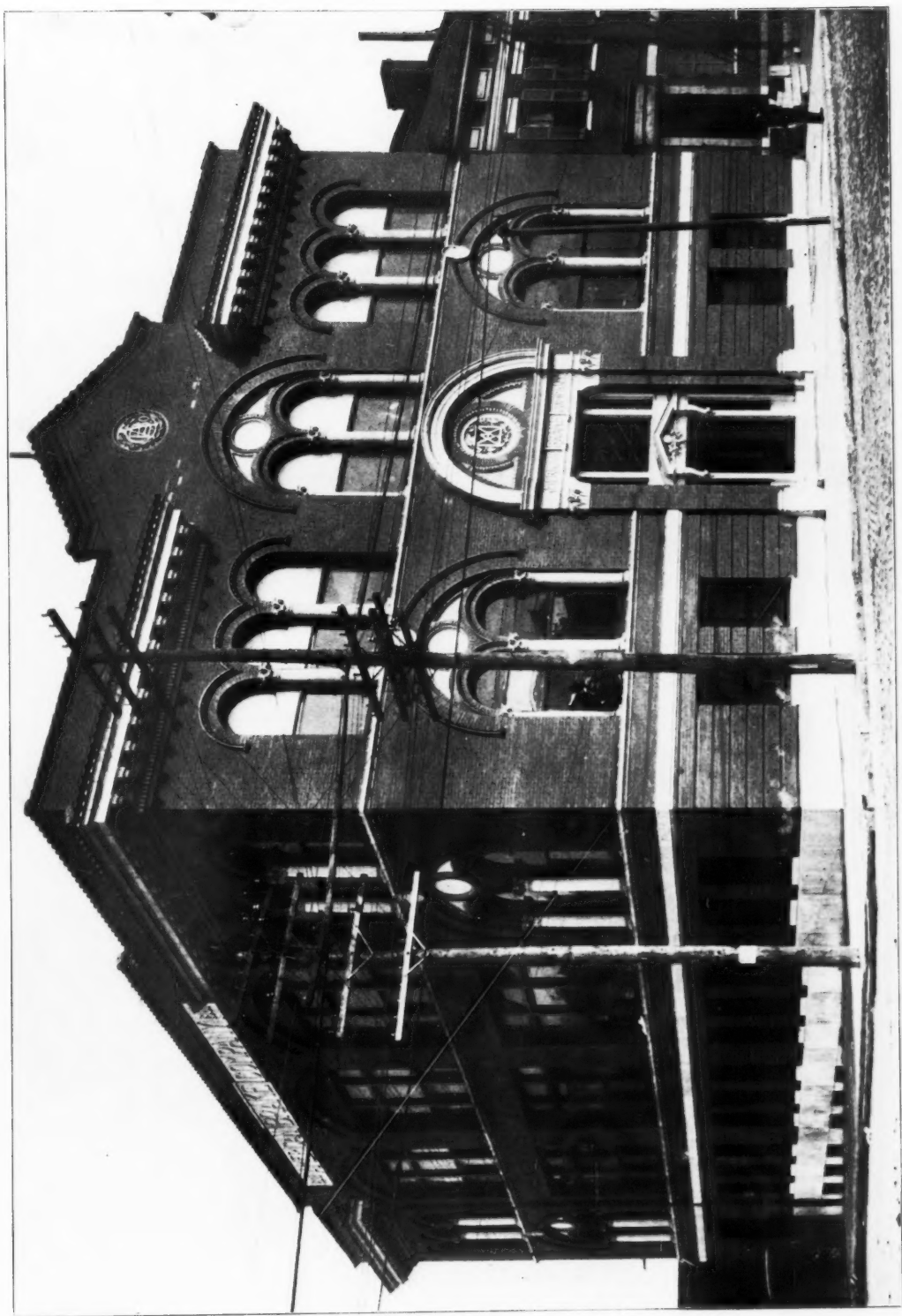


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The Designs for the Manhattan Bridge at New York. When the change of administration in the city of New York and the consequent change of the engineer in charge of the Manhattan bridge took place, considerable comment was indulged in by the daily press in regard to the change in the architect who designed the architectural features of the bridge. This, in turn, was taken up by the art commission of the city and the Fine Arts Federation. When, in 1901, the work was taken up, the bridge was designed as a mere cable bridge. Upon the change in administration, in 1902, these plans were set aside and a new and heavier bridge designed and the commission decided to use cables formed of eye bars instead of mere cables. It was perfectly proper for the art societies to watch with some concern the different changes that were taking place, but it is not clear how they were concerned either in the matter of a wire or eye-bar structure, so long as a proper architect was found to design its architectural features. This was certainly made safe by the appointment of Mr. Carrere and that seems to be all there is to it. The passage of a resolution by the Fine Arts Federation, stating that the Federation disapproved any changes from the designs in public works when they have once been accepted, unless conclusive reasons therefor are shown, is undoubtedly right and proper, but the endorsement of the plans by the Fine Arts Federation and their approval by the Fine Arts commission of the city refer only to the artistic features of the design, and the changes in the design of this bridge are primarily changes in the constructional design, with which the art commission would seem to have no concern. We shall not presume to express any opinion as to the wisdom of the change in the engineering scheme. The facts which we have to consider and which must, we believe, be considered by the art commission, and which should be considered if at all by the Fine Arts Federation are, that the engineering scheme has been changed, requiring a new architectural design, and the question, as we see it, for their determination at this time is whether or not the new designs are architecturally sufficiently meritorious to receive the approval of the art commission. It is very unfortunate that this controversy has arisen, but as it had its origin entirely out of the sphere of artists and designers it would seem proper that it should be considered by architects and the art societies solely in its artistic aspect. In guarding the rights, so recently acquired, of having something to say in regard to the designs for public works, the Federation should be sure of its ground before inciting a controversy. Political influence is strong, and in this case the city of New York, at least its artistic part, is to be congratulated that since Mr. Hornbostel, whose superb designs met the demands of the problem so thoroughly, could not see them carried out, there is still the same certainty that an architectural treatment worthy of the structure will still be presented through Mr. Carrere. We look to see this controversy amicably settled in conformity with the views above stated; and as a result a structure adequate in its engineering construction and faultless from an artistic standpoint.

THE ORTHODOX CATHEDRAL OF FAMAGUSTA, CYPRUS.

FAMAGUSTA came into existence as a great medieval city of the Levant at the close of the thirteenth century. In its beginning, says *The Builder*, the town seems to have been a mere fishing village for long after the disappearance of ancient Salamis, two miles away to the north, or old Famagusta, as it was called in the middle ages. But in the early days of the Frank occupation of Cyprus this village became important on account of its natural harbor, and a fort was built for its protection.

An orthodox bishopric was established at an early date, and in its cathedral (which in all probability is the small Byzantine church at the side of the immense Gothic building, the subject of the present article) the remains of St. Epiphanius, Bishop of Salamis, were enshrined. This relic was venerated here until the close of the sixteenth century—that is to say, until the Turkish invasion. Hamendorf saw it here in 1564. (*Itinerarium*, 1621.)

In 1291 the loss to Christendom of St. Jean d'Acre occasioned an immense impetus in the development of Famagusta as a stronghold and a center for European commercial enterprise in the near East, and to the early fourteenth century belong the extensive fortifications and the citadel which we see at present, as it were, through the earthwork ramparts added by the Venetian engineers of two hundred years later. The magnificent fosse hewn in the sandstone rock, a remarkable work of its kind and dating from the same period, would form the quarry whence the stone for the walls was obtained. As a means for contributing toward the prosperity of the city several pilgrimages were instituted about the beginning of the thirteenth century. Already the monastery of St. Barnabas was a recognized resort, and in addition the name of St. Epiphanius was associated with the new city by the shrine within the Byzantine cathedral already mentioned, and by a mysterious cave where miraculous water dropped from the rock, according to Stephen Lusignan, who mentions having witnessed the miracle.

The southeast quarter of the city appears to have been almost entirely occupied by the orthodox or "Greek" section of the community during the Middle Ages. The northern and western portions appertained equally exclusively to the Latin, Nestorian and Armenian population, whose churches remain in ruins, a melancholy evidence of once flourishing colonization, while all traces of domestic or commercial occupation have entirely disappeared. In the "Greek" quarter several small Byzantine churches still survive. They are buildings of a small, unimportant character, their only claim to notice being in certain fragments of fresco still clinging to their walls. Toward the middle of the medieval city, and probably marking the center of the primitive fishing village, stands the orthodox cathedral. As already remarked, this small, insignificant Byzantine building may be of great antiquity, but, as in all Byzantine churches, evidences of age unsupported by historical or documentary proof are very deceptive. In the present case no details of architecture or sculpture present themselves for identification, and the general forms of the pointed arch construction afford very little clue. The building would appear to have been much repaired and added to at subsequent periods. At the present time this building is very ruinous, its tottering walls threaten to fall at any moment, and, considering its general faulty construction, it seems to stand as it is by a miracle.

The great Gothic cathedral or "Metropolis" of the orthodox church in Famagusta is a very remarkable building from every point of view. Built on to the side of the little primitive Byzantine church above described, it completely overshadows and practically effaces its parent building. In addition to its immense size—unprecedented in Cyprus building of a native kind—several remarkable differences from the usual Byzantine arrangements are noticeable in the plan. In adopting the Gothic style of the fourteenth century the orthodox clergy seem to have waived several well-known prejudices of their church and allowed an unusual resemblance to the Latin plan and detail. The primitive cathedral consisted merely of two aisles, each terminated by a semicircular apse. This would appear to have been a customary plan for an orthodox church in Cyprus at an early medieval period. The two apses are arranged one for the altar proper, the other for the "altar of prothesis." Both altars are necessarily concealed behind the gorgeously decorated iconostasis. At a still earlier time churches were often covered by a large dome, like the early church in the castle of St. Hilarion, or at least a cruciform plan was adopted with a dome at the crossing.

The two-aisled plan is singularly characteristic of Cyprus churches, but during the fourteenth century a change was probably brought about in ecclesiastical taste by the building of so many splendid cathedrals in the Latin or European style by the French and Italian master masons settled in the nearer East during that period. The orthodox community, seized with a spirit of emulation, attempted to rival the superb cathedral of Famagusta, built in 1311 by Archbishop Bandoïn Lambert for the crowning of the putative kings of Jerusalem. The more usual two-aisled plan was abandoned for the imposing triple division of the medieval church as imported from Europe by the Crusaders.

Another great church in Famagusta, known to the Turks as "St. Nicholas," was also built about the same time as the orthodox cathedral. Although much smaller in scale, it resembles the orthodox cathedral in such a remarkable manner as to seem

merely a replica. Thanks to a rather more robust construction, smaller proportions, and a situation farther removed from the Turkish batteries of 1571, this church remains at the present day in a remarkable state of preservation. The well-preserved interior affords to an experienced eye an excellent idea of what the now completely ruined orthodox cathedral must have been like; but in the latter case, however, the fresco decorations still form a remarkable feature, which is completely wanting in the "St. Nicholas" since its conversion into a mosque. In most buildings of this type it is difficult to judge of the original intention of the designer owing to the removal of the fixed furniture, and particularly of the iconostasis. No Latin church was built during the Middle Ages without its high "jubé," or roodscreen, and no orthodox church then or now could be constructed without its iconostasis completely covering up the east wall, which in no case was ever intended to be visible. As a consequence the eastern walls of Byzantine churches always appear singularly mean and uninteresting when laid bare and naked by the removal of the screen. On the other hand, the lantern-like apse of a Latin church, with its choir enclosure forming almost a church within a church, remains architecturally interesting even when denuded of its screens in the taste of modern days.*

The orthodox cathedral was built of regular coursed masonry neatly cut in the best style of Latin building, and in singular contrast with the wretched workmanship of the average village church of Cyprus. Moldings and carved details are the same precisely as those in the Latin cathedral and churches of the fourteenth century, and it is evident the mason-craft of all these monuments is identical. European masons and sculptors were certainly employed on the Latin cathedral of 1311; if European workers were not engaged for the orthodox building, we must suppose the native artisans had assimilated Western ideas of work and craft in a very remarkable manner. Such neatly jointed stonework, carefully executed vaultings and elaborate moldings to arch or window are hardly to be found elsewhere in buildings of the native Cyprus church.

It may be concluded from the plan that in all probability a domical lantern was constructed in the middle of the nave vaulting. This feature, so beloved by Byzantine architects, probably added to the unsubstantial constructive character of the church, and assisted in the general downfall of the vaulting at the time of bombardment in 1571. Only at the northeast corner of the ruin does a fragment of the original vault remain—at the present day in a most precarious condition.

Two very remarkable resemblances in the plans of the two cathedrals of "Latins" and "Greeks" remain to be noticed. In spite of the well-known aversion of the orthodox to interments within their churches, the "Greek" cathedral has been originally planned for building by means of the peculiarly Western mode of "founders' tombs." That is to say, the means for the purpose were provided by persons who claimed the right of sepulture within the church. The walls of the cathedral where not occupied by doorways are constructed to receive "founders' tombs," and this method of construction has unfortunately tended toward the destruction of the building, as in so many other churches in Cyprus. In the Latin cathedral there are also "founders' tombs," but they have a comparatively small influence on the stability of the edifice. In the "Greek" cathedral and in the later Latin churches these tombs are introduced in such a manner as to completely cut away the main strength of the church walls. As a sign of date, these "founders' tombs" may be taken to represent the last years of the fourteenth century. The system was of Italian origin, and rapidly spread over Christendom as an easy way of erecting churches in the days before "bazaars" and other modern means for the purpose. The second peculiar resemblance between the orthodox cathedral and the Latin type of plan is the presence of small sacristies or treasuries leading out of the three eastern apses. In the orthodox ritual there is no necessity for a distinct or external sacristy: the space of the "prothesis" occupies the place. Why should these unusual features have been introduced? Perhaps we may be almost allowed to see in these resemblances and the adoption of the Gothic style some evidence of that *rapprochement* between the two branches of Christianity which was considered within practical politics at the beginning of the fifteenth century.

Identification of date in the medieval building in Cyprus is a very difficult and uncertain study. The methods of work and mason-craft seem to have been full of archaisms at all periods. Naturally this arises from local workers being employed in copying a foreign style for which they had no natural affinity. For instance, the singular chevron or zig-zag decoration to doorways, which in Europe is a distinctive feature of the earliest transitional style from Romanesque to Gothic, is in Cyprus continued in use with moldings of the sixteenth century period. It seems possible for various reasons to suppose the orthodox cathedral a building of the fifteenth century and a much later replica of "St. Nicholas," as the sculpture on the latter seems to be of fourteenth century style.

* Attempts have been made to identify "St. Nicholas" (now used as a grain store) with the church of SS. Peter and Paul, which, according to Stephen Lusignan, was built by one Simon, a merchant of Famagusta, out of the proceeds of one successful trading voyage. This story is somewhat suggestive of the popular medieval romances of "Whittington and his Cat" type, and the assumption that the "St. Nicholas" of the Turks is SS. Peter and Paul of the legend is too hypothetical and rests on practically no evidence. The dedications of the ruined medieval churches of Famagusta can only be identified in a very few instances.

Although in the last stage of ruin, its vaulting gone and a great part of its walls, the orthodox cathedral still possesses a remarkable series of frescoes on such portions of the interior as still stand erect. The three eastern apses are intact, and their semicircular walls are decorated with a series of paintings in rows one above another. These paintings are of very inferior character, and have a great resemblance to the common fifteenth century frescoes executed by itinerant artists for village shrines in Italy. The lowest row of figures represent apostles and doctors of the orthodox church. This series is carried round all three apses. At a higher level a series of New Testament subjects, scenes from the Passion, etc., treated as pictures within a decorative framework in the common Italian manner, are painted. The semi-dome over each of the apses is of course filled with dim traces of the usual colossal figures representing a "Majesty" or "Paradise." More interesting paintings are, however, to be found on the side walls of the church over the "founders' tombs." In one or two cases these are remarkably well preserved. They form panels continued upward from the arched recess in the style of the tombs in the "Frari" church of Venice. These "founders' paintings, being doubtless commissioned by individuals, are of a very much superior type compared with those which cover the eastern wall of the church. The solid, well-built walls of the cathedral have retained their plaster and these frescoes in a most remarkable manner, in spite of the vandalism of the past three centuries and the overwhelming destruction always resulting from the fall of a vaulted ceiling. Perhaps their preservation may be partly due to the way in which the walls were first covered with a very slight coating of plaster, which naturally has a better chance of surviving than a heavy layer of "intonaco," as was often used in the Middle Ages in Italy.

This church must have presented a very remarkable and magnificent appearance when it stood complete with its elaborate carved and gilded furniture of the later medieval style. It apparently possessed a wood iconostasis, the traces of a stone base for which remain at the pavement level of the sanctuary. The Bishop's throne would also be a wooden erection, and would be on the outside of the iconostasis, in a position similar to that of the patriarchal throne in the "Catholicon" of the Holy Sepulcher at Jerusalem. In endeavoring to realize the former appearance of this interior, a problem is presented by the space which in an ordinary orthodox church is occupied by the stalls and seats ranged round the church for the convenience of aged members of the congregation being in this case devoted to wall-tombs. We must suppose these very usual and, indeed, necessary adjuncts to a church were arranged in the form of a choir in an English cathedral.

The church is a most interesting example—perhaps almost unique as a positive design—of the mixture of Eastern and Western ideas in plan and detail. Not the least curious thing to observe in this hybrid character is the fact that in spite of a certain incongruity, perhaps inseparable from such attempts to adapt the details of one style to the plan and proportions of another, in the present case the result, as far as can be judged from the ruins, was imposing and satisfactory. The still perfect church of "St. Nicholas" has a remarkably fine internal effect, even in its present mutilated condition. We can judge by comparison that its larger neighbor was proportionately finer. The central lantern added to the orthodox cathedral would perhaps have had a somewhat mean appearance in the interior view. It appears small in proportion to the general scale of the church, much in the way that the lanterns over the crossing of Milan Cathedral and many other Gothic churches of large size appear small since our eyes have been accustomed to the more liberal proportions of the domical churches of the renaissance. And in addition this Gothic-Byzantine lantern in Famagusta had not apparently the satisfactory position of crowning a crossing of nave and transepts.

Few, if any, records remain of the history of the orthodox cathedral of Famagusta. Stephen Lusignan ("Corografia," p. 31) states that in 1212 the Pope Innocent III. sanctioned the formation of a Greek Archbishopric in Nicosia (translated from Famagusta) and of three Bishoprics of Famagusta, Paffo and Limassol. A few years later, however, Pope Alexander IV. made an ordinance, called the "Alexandrine," by which the three Bishops were not to reside within their titular cities, and the Greek Bishop of Famagusta was directed to reside in Riso Carpasso. By a strange anomaly the Greek Bishop seems to have been enthroned in the "Chiesa Cattédrale de' Greci" by the Latin Bishop of Famagusta, and took on this occasion the oaths of fealty to the Pope of Rome. This curious ceremony is fully described by Stephen Lusignan, who seems to have acted on occasion as Latin Vicar-General for the purpose.

After the destruction of Famagusta by the Turks, the "Greek" cathedral is mentioned as being confirmed together with the Chapel of St. Symeon to the orthodox community, which had permission to remain within the ruined city. This could not, of course, be the church which has now been described, as there is every reason to suppose it must have been reduced to the condition in which we see it at the present day by the Turkish bombardment. The marks of iron cannon balls on the ruin and the close vicinity of the site to the side of the city most exposed to the Turkish batteries suggest this. Perhaps the church of "St. Nicholas" sometimes confused with the cathedral may have been constituted the "Metropolis" of the city at this

period, but this church seems to have been taken away from the orthodox after the year 1600 and converted into a mosque. It is now a granary.

In 1901 M. Enlart, the author of "L'Art Gothique et de la Renaissance en Chypre," attempted some small excavations of the orthodox cathedral, and discovered the two rows of steps in the central apse. This peculiar feature is unusual in buildings of the last few centuries, and of course reminds the student of the primitive Byzantine arrangement. There does not appear to have been any episcopal throne provided for in this form of presbytery such as we are familiar with in examples of churches of the eleventh century in Europe. It was perhaps a mere surviving ritual feature, like the similar arrangement of comparatively modern Coptic churches in Egypt, and indeed the two steps are almost too narrow to allow of their having been used by the priests. M. Enlart also discovered some interesting traces of the method of glazing employed in this church during his excavation. Among the debris were immense quantities of broken window glass of various colors. On investigation these proved to be remains of roundels which had been set in a peculiar framework of plaster of paris, a system which is represented to some extent at the present day by the mosaic-like windows of Turkish mosques, which are also worked in the same way with a coarse setting of plaster. These roundels were about eight inches in diameter, of a very poor quality of glass—imperfect white, deep blue, green and purple in color. A few fragments of marble mosaic from the flooring were also turned up. Most of these remains are now in the little museum at Famagusta.

The Orthodox Metropolis stands in a most interesting condition for study and exploration. With the exception of M. Enlart's researches nothing seems to have been touched within the ruins for centuries. Much of the stone on the outside next the road has probably been removed, but speculators in second-hand building stone have not yet penetrated very far into the mass of fallen vaulting which fills the interior. This mass looks as if it lay as it fell in at the time of the Turkish siege, and under such debris much of interest may still be buried.

Sketches of this building were made by Mr. Vacher in 1883 for a paper on "Medieval Buildings in the Island of Cyprus," published in the *Transactions* of the R.I.B.A. These sketches are somewhat inadequate to give an idea of the scale of the building, but the plan is a carefully measured one; unfortunately the communication between the two churches is not shown. M. Enlart gives some excellent sketches and photos in his great book on the architecture of Cyprus, but his plan also requires correction in one or two particulars. A really complete and exhaustive set of drawings of the cathedral can not of course be made until the whole of the interior is freed from the mounds of fallen masonry, which at present reach a height in places of 6 to 8 feet. This would be an interesting enterprise on the part of any archaeologist with time to spare for superintending the always slow and tedious operations of Levantine laborers.

ARCHITECTURE AT THE PARIS SALON.

As usual, the central and most important exhibit in the architectural galleries of the Salon is a great scheme of restoration of classic buildings. This is M. Patouillard's "*Etat actuel et restauration de l'île Tiberine, à Rome*," the drawings of which, along with various sketches of ancient monuments in Greece and Italy, fill the greater part of one room. Although in this, as in other similar exhibits in former years, there is a great deal that is purely imaginative, M. Patouillard's restoration is of more interest than most that we have seen, both from the ability and effectiveness of the drawings, the peculiar nature of the subject, and from one or two interesting items among what may be called the documents on which the restoration is based.

The author's scheme and argument are briefly explained on a written card placed beneath the principal drawing. The Insula Tiberina, now Isola San Bartolomeo, is a long, narrow island, running to a point at each end, and reached from the opposite banks by two ancient bridges, the Pons Fabricius (Ponte Quattro Capi) on one side, and the Pons Cestius (Ponte San Bartolomeo) on the other side, facing each other near the middle of the island. The tradition is that, 293 B. C., an appeal to an oracle in respect of a pestilence was answered by a counsel to build a temple to Æsculapius on this island; that this was done, and that the temple stood near one end of the island, where now stands the medieval church of San Bartolomeo. Furthermore, that to give importance to so sacred and important a spot, the island was built all round with a revêtement of masonry, and that, in view of its form, somewhat approaching to that of a long ship in plan, it was treated accordingly, and finished at the end near the temple in the likeness of the prow of a galley on a large scale, as if it were a great ship anchored in the stream. Not a trace of this treatment is left now, but the author exhibits a remarkable engraving by Piranesi showing unmistakably a part of the prow and some of the heavy rusticated masonry beyond it, as it existed in his time. Another of M. Patouillard's documents is a copy of a small drawing in the Orsini collection in the Vatican Library, which is labeled with the name of the island, and shows it in a ship form—far too pronounced, with its rising stem and stern, to be accepted as a literal representation; it is such a representation as one expects to find on a coin; but still there it is, the island in a ship form, with the two bridges indi-

cated. On the "deck" of the ship, in this drawing, is shown a circular building near each end, accompanied by columned and pedimented screens in front of them; the circular building on the right is shown as colonnaded, that on the left is without an order. In the center rises an obelisk. If M. Patouillard attaches any importance to this drawing as a piece of evidence, it is odd that he should have entirely neglected the suggestion of the circular temple at the right-hand end, where no such feature is shown in his restoration. He accepts, however, the obelisk; and the suggestion of the circular building at the left-hand end appears in the form of a circular turret, of more lofty proportions, close up to what would be the "stern" of the galley; but it is hardly the kind of feature which the Orsini drawing suggests.

In his brief statements the author does not cite his authorities from ancient literature, though referring to them as existing; and, writing this out of reach of any available sources of reference, we are not in a position at the moment to form a decisive opinion on the assumption on which his restoration is founded, except so far as regards the Orsini and Piranesi drawings just referred to; we may return to the subject of the archeological history of the Tiberine island on another occasion, when we can treat it fully. In the meantime, we can only describe what M. Patouillard shows us. He has an exceedingly fine and learned perspective drawing, taken from a high point of site, showing the island surrounded by the revêtement of rusticated masonry with a terrace all round; the near end of it built up in the form of the prow of a galley, and near this end the temple of Æsculapius, a hexastyle Corinthian peripteral temple parallel with the long axis of the island, the entrance facing toward the island, with an open square before it, in the center of which is an obelisk on the axial line. The temple and the square occupy almost exactly the position of the present church of San Bartolomeo and its forecourt; and how probable it is that a later church should be built nearly on the lines of a Pagan temple formerly occupying the site we of course know from many instances. Facing the large temple, on the further side of the open space, is the small tetrastyle temple of Jupiter Jurarius—Jupiter in his capacity of presider over the fulfilment of oaths; and the remainder of the plan is occupied by a number of buildings symmetrically arranged, but of which the names and purport can not be discerned at the height at which the plan is hung; the round turret before mentioned coming in at the rear. The end or prow of the island, behind and on each side of the Æsculapius temple, is occupied (as in such a case it undoubtedly would have been) by a crowd of votive altars and statues, and the river-god Tiber reclines on a long pedestal at the prow. The buildings along the margin of the island are shown as walled up, with engaged orders of pilasters, the spaces between occupied by mural inscriptions, and openings in the upper portion filled in with the well-known Roman form of cross-barred balustrading. The huge perspective view is of course accompanied by complete sections, plan and elevations finished in the most elaborate manner; and the whole, whatever we may think as to its archeological probability, is a magnificent conception shown in a splendid set of drawings. The author's artistic abilities are further illustrated by a series of vigorous and effective water-color drawings in Athens, Pompeii and elsewhere. It is fortunate for M. Patouillard that he lives in a country where such talent as he displays is certain to be recognized and rewarded by commissions from a Government which never forgets an able and painstaking architect.

Apart from this great set of drawings, restorations are less numerous than usual. M. Girod shows a large drawing of the restored interior of a chamber in the Abbey of St. Germain-des-Prés, of Louis Treize epoch, which is a good piece of work, though we doubt the probability of the decorative painting of ceiling rafters shown, which looks more like modern French than like any possible renaissance work; and M. Bourgeois exhibits two very elaborate historical drawings, intended as a parallel of the forms of civil, religious and domestic architecture in France and Belgium "à travers les différents siècles," though the period embraced is really a very limited one. The two drawings each show one side of a *Place* lined with imaginary buildings of different dates, in elevation, but so colored and treated as to have a pictorial effect. Each drawing is accompanied by a lengthy written analysis at the foot, in very small writing. It suggests one way of illustrating architectural history, by a combination of drawing and written analysis, and evidently represents a good deal of labor and thought, but it is a kind of thing which can hardly be studied to any purpose on the walls of an exhibition.

There are, as usual, a number of those ambitious *projets* for buildings which no one expects to see carried out, and a good many of which are probably the result of Ecole des Beaux-Arts competitions. Many of these serve at once to show how complete is the training received by French architects, and how mechanical may be the architecture resulting from such a scholastic system. M. Bouchet's "*Une Gare Centrale de chemin de fer à Paris*," a vast erection nearly all in glass and iron, is an admirable piece of constructional work, but absolutely devoid of the architectural effect which might be obtained in a great railway station. Another railway scheme which is equally unattractive architecturally, nevertheless deserves attention for its able and thorough working out of a practical problem; this is M. Jouven's "*Un Centre Urbain*," an idea evidently suggested by the work at present going on in Paris for the junction of the various metropolitan lines. M. Jouven shows a central station with three underground stories reached by lifts; the first of

offices; the second a set of railways in arched tunnels with flat floors; the third, railways in tunnels of complete elliptical section. The plan shows the various lines of railway starting diagonally in four directions to serve all parts of the city; the scheme is very completely worked in elaborate sectional drawings; the buildings above ground, it must be admitted, having nothing to recommend them architecturally, but in a practical sense the whole is very cleverly thought out. Two or three large designs for an "*Escalier de Musée*" evidently represent a recent "*Ecole*" competition subject, and one of them, by M. Payret-Dortail (pupil of M. Laloux), in a vigorous treatment of French renaissance, is a really fine design shown in an admirable set of drawings. Some of the details are rather too *rococo* in feeling, but the whole design is dignified and effective, with some originality and what one may call a great style about it. One can not help wondering why it is that drawings produced for Royal Academy architectural prizes are for the most part so timid in style and execution compared with a set of drawings like this. The Academy set very good subjects sometimes, but the atmosphere seems to be different, and the sets of drawings produced would be nowhere beside the best examples of Ecole competition drawings. A design by M. Hebrard (pupil of M. Scellier de Gisors) for "*Un Palais de l'Automobile*" (does any one really require such an establishment?), seems an inspiration from the Palais des Beaux-Arts, equally good in its refined and dignified treatment of the Classic order, and equally spoiled by an enormous and portentous glass roof, even bigger than that of the Palais. M. Fougereousse (pupil of M. Deglane) exhibits a very fine study for "*Une Place Publique*"; a fine colonnaded block at the top, with flanking terraces terminating at the front angle in a quarter circle worked into a picturesquely treated cupola above; the whole would make a really fine piece of city architecture to surround a large square. The design by M. Blondel for "*Eglise Paroissiale pour la ville de X*" one may conclude to be only a *projet*; as a design for a parish church it is a depressing example of the sort of architecture which seems to be regarded in France as suitable for a church—a kind of bastard Romanesque, as cold, hard and deficient in charm as can be well imagined. Our imitation Gothic is better than this; or is it all matter of association, and could one learn to like it?

It is satisfactory to find that architectural exhibits at the Salon now include a far larger proportion of buildings actually carried out, or to be carried out, than was formerly the case. Ten years ago, in fact, one could hardly find any drawings representing the actual practical architecture of the day; nothing was to be seen but *projets* and drawings of ancient works. The latter still form a very large proportion of the show, but this year the illustrations of practical architecture are more numerous than we remember to have seen them before, and include some very interesting work. There are but two models this year, and not large ones. One of these is M. Lafore's monument to soldiers killed "*Dans les Dêlées d'El Moungar*"; a fine design showing a lofty stele or obelisk crowned with a funeral urn, with a spirited draped female figure in front brandishing a sword. The other model is that of a funeral chapel in the Cimetière du Nord, by M. Boiret. This is a very "*Art Nouveau*" affair, all ellipses; an elliptical arch in front, broken at the foot to allow passage to the entrance door; a short stumpy column rises from each foot of the curve, supporting at the top a square die worked out from the intrados of the elliptic arch; between the columns are the metal gates of the chapel. The elliptical archivolt is repeated on each face, and the whole crowned with an odd-shaped cupola in which elliptical lines again predominate. A huge palmleaf, probably intended to be of gilt bronze, is applied in a spiral line to each of the front columns. The whole thing is original, but rather ingenious than beautiful. Among funeral monuments may be mentioned also the large drawing by M. Laroque, "*Tombeau d'un Musicien*," a marble stele with a bronze bust in front, and a lyre and other emblems worked on the face and base of the stele; the inscription on the monument states that it is to the memory of "*Boullard, Fondateur de la Lyre Moulinoise*"; apparently a local genius.

A piece of exceedingly practical architecture is illustrated in the set of large drawings of the "*Usine Génératrice de la Compagnie du Chemin-de-fer Métropolitain*," by M. Friesé. This is a long engine-house of immense size, with six great brick chimneys arranged in pairs on opposite sides of the building, two at each end and two in the center; the end elevation is an imposing piece of brickwork, with a great arched window in the center, and the two chimneys rising from corbelled bases at each side of the gable. The effect would have been still better, however, if their lines had been brought down to the ground. The administrative building, treated in a different and less massive manner, forms a separate block across one end of the engine-house. It is needless to add that complete sections, showing all the details of the machinery, are included in the drawing.

Among designs showing civic architecture is the design for the Chamber of Commerce at Roanne, by M. Blanvillain, in collaboration with M. Liault. This is an important building in the best style of modern French renaissance; it is on an angle site with an elliptical angle vestibule finishing in an angle cupola above; it shows a rusticated ground story, and upper stories with a considerable expanse of plain masonry, the first and second windows grouped in pairs into one design, with a carved panel separating them; the arrangement of the plan is both practical and effective. Another good civic building is M. Toussaint's "*Caisse*

d'Epargne," at Pont-à-Mousson. As an instance of the manner in which national characteristics are reflected in architecture, one may notice how consonant it is with the peculiarly thrifty character of the French middle and lower classes that savings banks are among the most numerous class of public erections in France; the erection of a new "Caisse d'Epargne" in this or that town is one of the most frequent items of news we have to chronicle under the head of "France." M. Toussaint's building also is in the best style of modern French classic, severe and restrained in treatment. Among the examples of modern classic buildings one of the best is a private residence at Neuilly, by M. Bouwens van der Boyen, an architect whose name is well known to many of our readers. For a classic villa in a first-class suburb this is quite a model design. The center block, with a strongly marked cornice, is divided into a center and side compartments by four broad flat pilasters stopping against the architrave of the entablature, in the spaces between which the windows are grouped in two stories, the center space in the upper story occupied by an inscription tablet within a garland; the lesser buildings form symmetrical one-story wings on each side of the center block; the details are very refined and well considered, and, without showing any startling originality, the result is a thoroughly satisfactory design. In the same category of severe classic design is M. Rives' residence in Rue Villaret-Joyeuse; and with these temperate and refined fronts one may contrast M. Périn's "House in flats at low rentals" on Boulevard Brune, a specimen of "Art Nouveau" in all its glory. The ground story is in stone, with yellow brick above, and a huge white-coved cornice (stopped by projections at each end of the front) along which realistic green leafage meanders; similar leafage climbs about other portions of the front (what it is made of is not apparent), and the entrance is flanked by terminal figures, the lines of which seem modeled from a corkscrew. Better the regulation classic than this kind of originality. That French architects can employ classic details, or what pass for such, with very coarse and commonplace results, is however unfortunately proved in M. Piquart's Municipal College at Châlons, with its huge finials over the cornice like the heads of nine-pins, and the segmental arched cloister round the quadrangle. There is no form more unattractive for an arched cloister than a series of segmental arches of very slight rise; a warning to be noted. M. Renou's "Projet de Restauration du Château de Beauregard" may come under the head of practical work, as it includes considerable additions to and remodeling of an old château, of which the plan is at present in this form  but which is to be altered to . A good point in the ground-floor plan is that half the long block, the half next the courtyard, is occupied by a wide "Portrait-gallery" the whole length of the court front, which is not only a fine internal feature in itself, but serves as intercommunication, in place of the less dignified and more commonplace passage or corridor. On the upper floor the two wings are specially planned, the left-hand one as the family wing, with the parents', governess' and children's rooms in the same corridor; the right-hand one as the privileged guests' wing—"Des Amis."

The old-style of French "Maison de Campagne" with its familiar congeries of timber gables and barge-boards at all angles, seems to be fortunately getting out of favor; at least we only noticed one example this year, though that one was of the most rampant description. Among designs of this class which show some special interest is that entitled "Une Villa Dans un Pays Chaud (Pour un Collectionneur)," though the title is only given in this general manner, appears like a real house, or might be one. The special features are that the exterior is finished white and decorated with figured friezes, which look like sgraffito; the principal bedroom is contained in a central erection rising above the rest, commanding air on all sides and with very extended eaves to keep the sun off the walls; and the special needs of a "collectionneur" are provided for by a large one-story wing in three square compartments, two for painting and the center one for sculpture, and each top-lighted by a dome. M. Cochet is the architect; if it is not a house actually carried out, it is at all events of interest as a suggestion. Another interesting building among the minor works illustrated is the new "Groupe Scolaire" at Ivry-Port, by M. Despeyroux. The schools are one-storied buildings with a double roof and large mullioned windows; the interiors of the rooms have green tiled skirting and walls of a very light blue up to the top of the door-casings, with a graceful foliage ornament bounded by curved lines, forming a kind of frieze between the door heads; the walls white above this. Some pen sketches of constructional details are added; the whole is a very good and sensible piece of work. We may notice also M. Antoine's village church in Picardy, a curious and characteristic design in a kind of very severe quasi-Byzantine style; a stone plinth, dark red brick walls over, and circular windows set in a stone encadrement amid the brickwork. M. Bentz's "Eglise St. Joseph" (we are not told where) is in that kind of modern French Byzantine style which was especially worked out by the late M. Vaudremer, and of which the most typical example is his church at Auteuil. The design is good, but we do not love the type, nor understand the French fancy for it. M. Rives, whose hotel in the Rue Villaret-Joyeuse we have mentioned, exhibits with it a very fine water-color drawing of an idea for a grand staircase, or rather, staircase hall—"Départ d'un Escalier," showing an interior of the most sumptuous description, with gilded balustrade, colored marble paneling and sculpture, the whole rendered more effective by a brilliant flood of light cast over part of the picture from an

unseen window, the rest being left in comparative shadow. As a study of architectural effect in water-color it is one of the finest drawings we have seen.

Drawings illustrative of existing monuments are so numerous that they probably form a numerical half of the exhibits, though not occupying a proportionate space, as many of them are small. Among the most noteworthy are M. Fonseca's fifteen colored drawings of the sculpture of the Cnidian friezes at Delphi; M. Tièche's large and fine colored interiors of the Opera House and of some of the older Parisian churches; M. Brunet's three large frames of small sketches, "Croquis et Impressions de Voyage," very good of their kind—the sketches include a good many English subjects; M. Guidetti's water-color sketches on the Acropolis, showing forcibly the effect of the ancient marble under strong sunlight; M. le Tourneau's drawings of the Byzantine crosses at the ancient churches of Kalabaka and Nojarelli, and also very fine views of the buildings themselves; and M. Chauvallon's water-color views of the ancient ramparts of Menetion-sur-Cher.

The new Salon, though it professes to have an Architectural Section, contains, as usual, nothing that is worth comment under that head, the architects at all events appearing to be faithful in a body to the Old Salon; and the specimens of furniture design, grouped in bays round part of the staircase hall, are so far inferior to the best of our work of the same class that they have little interest for an English visitor.

CHEMICAL ANALYSIS AND RAW MATERIAL USED IN CEMENT.

ESSENTIALLY Portland cement consists of silica, alumina and lime. The materials from which the lime is obtained (according to the following from the student's column in *The Builder*) are of very different qualities. They are found as soft chalk or hard crystalline limestone and many degrees between these two, but, as a rule, the harder the substance the more carbonate of lime it will contain. The soft chalks, although nearly pure carbonate of lime when dried, in natural state contain much water; while some of the hard limestones in natural state contain as much as ninety-nine per cent CaCO_3 . Just as the limestones vary, so the other raw material, the clay, is found in different forms. It occurs in all grades, from the plastic clay or river mud to the hard shales. These raw materials are never found quite pure, but containing varying proportions of foreign chemical compounds, such as carbonate of magnesia, water, sulphuric acid, alkalies, coal, etc. Because of this, it is of the greatest importance, if the finished cement has to be a reliable one, for the manufacturer to know their exact composition. This is only determined by chemical analysis. The following methods of analysis are as carried out by Dr. Karl Schosch, of the High School of Charlottenburg:

Limestone Moisture.—One hundred grams of the crushed material is put in a wide glass tube and dry air pumped through it till the weight is constant. The loss in weight is the moisture to air-dryness. The tube is next placed in an air oven and kept at 105°C . for two hours. The loss in weight added to last result gives the total moisture.

Loss on Heating.—Weigh two grams of the dry substance, after grinding, into a platinum crucible and heat over a gas blow-lamp till the weight is constant. The loss is combined water, organic matter and carbonic acid. The carbonic acid is estimated in another portion of the dry substance by any of the well-known methods of carbonates (Mohr's apparatus is recommended). This result deducted from the last gives combined water and organic matter. The combined water may be estimated in another portion of the substance by heating two grams in a hard glass tube, through which a current of dry air is passed, and catching the water expelled in pure dry calcium chloride.

Insoluble Residue.—In most limestones this is present only in small quantities, so it is not necessary to separate the silica, sand and oxides of iron and alumina. After determination of the loss on heating, transfer the residue in the crucible to a porcelain basin, add a little water, then gradually about 10 ccs. of twenty per cent hydrochloric acid, and dilute the whole to about 250 ccs.

Heat to boiling, and add ammonia till alkaline (test with litmus paper). The precipitate consists of clay, sand, silica, oxides of iron and alumina. Take the basin from the burner, when the precipitate will quickly settle to the bottom. Filter into a liter flask, and wash till not a trace of chlorin is in the washing water (test with silver nitrate).

In washing do not stir up the precipitate with the water, because the silica might go through the filter paper. After washing, transfer the precipitate, yet wet, to a platinum crucible, and burn for ten minutes after the paper is ashed.

Lime.—When the filtrate in the liter flask is cool make up to the mark with distilled water. Draw off 500 ccs. into a beaker, add a few drops of hydrochloric acid to prevent precipitation of the carbonate of lime, and boil. Next carefully add crystalline oxalic acid, then slight excess of ammonia. Allow the precipitated oxalate of lime to stand—in a warm place if possible—during the night. By this means it is not necessary to reprecipitate the lime. Filter, wash with boiling water till no chlorin is in the washings (test with silver nitrate), dry, ignite in a platinum crucible over a blast-lamp till constant, and weigh as CaO .

Magnesia.—To the filtrate from the lime add a few drops of hydrochloric acid, evaporate to a bulk of 250 ccs., allow to cool, and add 250 ccs. of ten per cent ammonia, then sodium phosphate. Stir well till the phosphate of magnesia separates, allow to stand twelve hours, and filter. Wash with cold water to which twenty per cent of ammonia has been added till the washings are free from chlorin (test with silver nitrate and nitric acid). Dry the precipitate, and if in small quantity ignite along with the filter paper, if in large proportion separate the phosphate as far as possible from the filter paper, which is burned in a platinum wire loop, adding the ash to the precipitate in a porcelain crucible, and ignite the whole till quite white. If necessary, add a drop of nitric acid. So long as black points are to be seen the ignition is not complete. Weigh the phosphate ($Mg_2P_2O_7$) and calculate to MgO or Mg_2CO_3 .

Sulphuric Acid.—Acidulate the remaining 500 ccs. in the liter flask with hydrochloric acid, heat to boiling, and precipitate the sulphate with barium chlorid. Allow to stand over night, and if only in small quantity wash with cold water, otherwise use hot water. A good paper for filtering barium sulphate is made by Schleicher and Schull (Blue Band No. 589). Ordinary filter paper moistened with a ten per cent solution of ammonium acetate will prevent the barium sulphate passing through. After good washing (test with silver nitrate for chlorin, not for barium with sulphuric acid), burn the precipitate in a porcelain crucible. If pyrites is present the following separation is necessary: Put two grams of the original dried substance into a porcelain basin, cover with bromin water, add 25 to 30 ccs. hydrochloric acid, and boil. By this means the sulphid is oxidized into sulphate. The total sulphate is then estimated as above. The difference between this and the last result gives the sulphur present as sulphid.

Alkalies are usually obtained by difference. If required to be estimated, use Laurence Smith's method, which is as follows: Mix 0.5 grams of the very finely powdered substance with 0.5 grams of sal-ammoniac and enough pure precipitated carbonate of lime to bring the mixture to about eighty per cent $CaCO_3$; put the mixture into a platinum crucible. Heat, with the lid on, first for half an hour over an Iserlohn burner, then for another half hour over a blast-lamp. The alkalies assume the form of chlorid. Soak the crucible and contents in water; heat and filter. From the filtrate precipitate the lime by means of carbonate of ammonia at a boiling heat, filter off the carbonate of lime, evaporate to dryness, ignite the residue gently to remove the sal-ammoniac, and weigh what remains. This residue should consist only of fixed alkali chlorid, but generally it is contaminated with lime and magnesia; hence, it is advisable to redissolve it in the crucible in a little water, add a pinch of pure lime, and treat again as before. The pure alkali chlorids are weighed and the potash determined by chloroplatinic acid.

Analysis of Clays.—The moisture, combined water, carbonic acid and organic matter are estimated as in limestone.

Gross Analysis.—Mix two grams of the very finely powdered dry substance with about ten grams of a mixture of sodium carbonate 50 parts, potassium carbonate 50 parts, and potass nitrate 5 parts. Place in a platinum crucible and fuse over a blow-pipe flame till all effervescence ceases. While the contents of the crucible are still molten, quickly chill the bottom of the crucible by placing in a shallow basin containing cold water. Now place the crucible and lid in a large porcelain basin and cover with water to which a few drops of hydrochloric acid have been added. When the melted mass is free from the crucible remove the latter from the basin, washing it thoroughly. Evaporate to dryness, take up the residue with water acidulated with hydrochloric acid, heat to boiling, and filter the silica, care being taken not to wash any of it through the paper as explained in limestone analysis. Dry and ignite, taking precautions to prevent any of the silica, which is very light, escaping from the crucible. Heat the filtrate from the silica to boiling and add ammonia in slight excess. Filter the precipitated oxids of iron and alumina, wash thoroughly, transfer while yet wet to a platinum crucible, and ignite. If manganese is present, the following method of separation is employed: Neutralize the filtrate from the silica in the cold with sodium carbonate; mix with perfectly neutral sodium acetate and heat to boiling.

The alumina and iron are precipitated as basic acetates, but at boiling heat the manganese salt is quite soluble. After two minutes' boiling take the beaker from the flame, allow to settle, filter hot and as quickly as possible, and wash with very hot water. Next dissolve the precipitate in hydrochloric acid and precipitate the second time with ammonia. All the manganese is in the two filtrates, which are mixed and neutralized with sodium carbonate. Add excess of bromin water, boil and filter the separated manganese. Wash with boiling water, transfer while yet wet to a platinum crucible and ignite sharply. Weigh as Mn_2O_3 , and calculate MnO .

Lime, magnesia, sulphuric acid, pyrites and alkalies are separated as explained in limestone analysis.

In valuing his clay the gross analysis alone does not give much information to the cement-maker. A method founded on that of Lunge and Schocher's for marls is used with advantage by the author. The *modus operandi* is as follows: A gross analysis is done as just explained, only the iron is separated from the alumina by fusing the ignited oxids with acid sulphate of potash, dissolving in sulphuric acid and titrating with standard potassium permanganate. One gram of the dry clay is then

ground to approximately such a fineness as it would be in grinding the raw material for practical working, and mixed with enough pure dry carbonate of lime to bring the total $CaCO_3$ in the mixture to about eighty per cent. The mixture is strongly ignited in a platinum crucible over a blow-pipe flame, the same heat and time of ignition being maintained each analysis. The mass is transferred to a large porcelain basin, water added, and then about 20 ccs. hydrochloric acid. The liquid is evaporated to dryness, the residue taken up with water and a few ccs. hydrochloric acid, filtered, and washed free from chlorin. The precipitate consists of silica acid, sand and undecomposed silicates. This is boiled along with the filter paper in a nickel basin with twenty per cent solution of sodium carbonate, filtered, and washed, first with hot sodium carbonate solution and then hot distilled water, till all the silicic acid is dissolved and the sodium carbonate washed out. The residue on the filter consists of difficultly fusible silicates and coarse sand, which is ignited in a platinum crucible and weighed. This result varies according to the time of heating and the intensity of heat applied; but, if always carried out in the same manner, comparative results can be obtained which will give the manufacturer an expression of the cement-making value of the clay. The other constituents are determined as explained under gross analysis. Fresenius' modification of Seger's method, by decomposing the clay with hot concentrated sulphuric acid, is not convenient and is tedious, which led the author to adopt the carbonate of lime method; moreover, sulphuric acid does not act on the felspar and fine sand, so that the cement-maker can not by this method determine if his clay is or is not easily decomposable in the burning of the raw mixture. The results of analysis given below are obtained from a sample of clay by the three methods described.

	Gross Analysis	Fresenius' Method.		CaCO ₃ Method.
		Soluble in HCl.	Insol.	
	Per cent.	Per cent.	Per cent.	Per cent.
Carbonic acid	11.38	.....	.....	.....
Water and organic matter	6.69	6.69	.....	6.69
Soluble silica	42.33	0.49	23.32	33.61
Insoluble silica .....	.....	.....	18.43	9.23
Alumina	23.27	3.38	18.32	15.96
Oxide of iron .....	.....	.....	.....	5.74
Lime	14.69	.....	0.39	0.39
Carbonate of lime .....	.....	25.09	.....	25.09
Magnesia	1.47	0.31	0.61	0.92
Carbonate of Magnesia .....	.....	0.65	.....	0.65
Sulphuric anhydride	1.30	1.30	.....	1.30
Alkalies, etc .....	.....	.....	1.02	1.02

The operation of the Portland Cement Works at Rochester, which are about a mile in length, are situate on the River Medway, and are said to be the largest Portland cement works in Europe, will give a practical application of these methods of manufacture. They were acquired by the present company in 1891, when the plant only consisted of a few kilns of the chamber type, and a pair of mills for grinding the clinker, power being supplied by a 250 horse-power beam engine. The works were enlarged from time to time, until in 1899 they were equal to an output of 3,000 tons per week. About that date, becoming aware of the remarkable results obtained in the United States with rotary cement kilns, the firm investigated the question and erected a full-size experimental kiln on the American system, with which they made a long series of exhaustive experiments. Numerous modifications, alterations and improvements were introduced, until, after about two years of uninterrupted experiment, Messrs. Martin, Earle & Co. succeeded in evolving a perfect rotary kiln, capable of dealing successfully with the Medway raw materials—chalk and clay—for the manufacture of Portland cement. The rotary continuous kiln was found to offer peculiar facilities for regulating the burning during the process of clinkering, whereas with the intermittent chamber kiln no such correction is possible. The new system also showed itself superior to the old, both as regards the quality of the product and the cost of production. The rotary kiln house is a large brick building in which the sixteen kilns are arranged in line. The kilns are provided with slurry agitators and coal-firing apparatus. Some are also fitted with apparatus for drying sufficient fuel—which is finely powdered coal—for the entire battery. The body of each kiln is ninety feet in length, constructed of mild steel, and lined with basic fire-brick. The kilns are set on the incline, and rotate at such a speed as ensures a well-burned clinker. The remarkably large output of 200 tons of clinker per week can be obtained from each kiln, maintaining an average of twenty-five cwt. per actual running hour of the kiln. The clinker discharged from the kilns is transferred to horizontal revolving coolers, from whence it is transmitted by conveyors to the crushers, and is afterward elevated to cooling towers. The dry-mill house is situate behind the cooling towers, and the milling is there done by "Griffin" mills arranged in separate batteries of six mills each, which receive the clinker from overhead hoppers through chutes. The finished cement is conveyed from the dry-mill house by ordinary screw conveyors to the warehouses, where a number of customers have stores specially reserved for their own use. The men employed in connection with the rotary kilns are approximately two-thirds fewer than required to obtain the same output from the old-

fashioned kilns. Three sets of engines are employed to drive the wet plant, the dry-mill and the coal-mill plants respectively, all of which are identical in size and type. Each engine is of the triple expansion marine type, designed for mill work, with rope drives, and working with surface condensers and centrifugal circulating pumps. High-pressure steam is supplied to the wet plant from a battery of three Lancashire boilers, and to the other plants from a battery of five similar boilers, all fitted with Galloway tubes. The rotary kilns are driven by two horizontal engines with rope-drives, and take steam from three marine boilers. The principal buildings on the works, as well as the chalk quarries, are lighted by electricity. Powerful arc lamps are employed, and the current is supplied from a generating station on the works.

AN OLD CITY IN ITALY.

ANCONA, in southern Italy, is the capital of a province and has a fine harbor. Its population is considerable, containing a large proportion of Jews; according to Baedeker, six thousand out of twenty-eight thousand, but Amati gives the figures as two thousand and thirty-two thousand respectively. It lies on the lowest slopes of Monte Conero, the Cumerus or Cumerus of Pliny, between the promontories of Monte Astagno and Monte Guasco. From the summit of the latter the Cathedral St. Ciriaco overlooks the town and the harbor, standing on the site of a temple of Venus, which is mentioned by Catullus and Juvenal, while the other horn of the semicircle is occupied by the citadel. Below this is the lazaretto, built in 1732, a pentagonal fort with a drawbridge, now utilized as a bonded warehouse. The northern pier is fortified with two batteries, and is of Roman construction. At the beginning of it rises the triumphal arch erected in honor of Trajan in 115 A. D. by the Roman senate, said to have been designed by Apollodorus. It is Corinthian, narrow and lofty, built of Parian marble without mortar. It was once adorned with trophies, inscriptions, an equestrian statue of Trajan and statues of Plotina and Marciana, his wife and sister; all these were removed by invaders in the fifth and tenth centuries. It is approached by steps and railed round. Beyond is another arch by Vanvitelli, which faces toward the sea. It stands on the continuation of the Roman pier, which was made by Clement XII.

The streets of the city are narrow and winding (except in the new part, which is more interesting to the inhabitants than to the traveler), and every now and then steps are made use of to conquer the steep more rapidly. The Palazzo Comunale was built about 1270. Margheritone of Arezzo made the design, and from the street below a good deal of the back part may be seen much as he left it. The façade and interior were altered in the fifteenth century by Francesco di Giorgio, and modernized in 1647. On the façade is a quaint relief of Adam and Eve of the original period and others remain at the back. Within is a fourteenth century statue of Marco de Rossi, the legist. A little lower down a piazza has at one side an interesting façade of the same period. The Prefettura has a fine court with Gothic arcades, through which the street passes. The pointed arched gateways (which still have the chains used to block the street hanging by them) have been recast in renaissance times with fluted attached columns, and other pointed arched openings have been disguised by additions in the same manner. The windows on the first and second floors have graceful arabesques on their friezes, and the machicolations beneath the cornice have been adapted as a decoration. The church of St. Francesco (now a barrack) has a very fine Gothic portal attributed to Giorgio da Sebenico, and so much resembling the Gothic work of Istria as to make the attribution probable. The church of St. Agostino (now also a barrack) has a striking doorway of similar style with a curious mixture of renaissance detail. Another building of the same character is the Borsa, called the Loggia de Mercanti, built in 1459. The fifteenth-century Palazzo Benincasa adjoins it. There are several late renaissance churches, among which is one with a rococo spire, which is oval in plan, and has a spirally ascending arcading as decoration, giving it the strangest and most unstable appearance. An early renaissance door of the church of Ste. Marie della Misericordia is rather overrich, but pretty.

The most interesting buildings in Ancona, however, are the Cathedral and the church of Ste. Maria della Piazza. The façade of the former is ascribed to Margheritone, but there are many fragments of an earlier period worked up into the structure, without counting in the ten antique columns of the interior (the dedication was to St. Lorenzo until the tenth century). The dodecagonal cupola is believed to be the earliest and one of the finest in Italy. It was filled with scaffolding and undergoing restoration, so the writer has no opinion on the point. The plan is a Greek cross, each of the arms being flanked with aisles. The nave arcade is round arched, with buttress slips above each column. A dentilled cornice crowns the whole wall, and a string separates a blank clearstory space from the arcaded portion. The wooden roof is like that of St. Zeno, Verona, in shape, and is painted blue and white with yellow rosettes in each square. In the right transept there are three queer flat and shallow Ionic caps, with a heavy ornamented block above, and a cushion abacus above that which is molded at the top and bottom, but otherwise plain. These appear to be of the ninth century, and much resemble some figured by Cattaneo. There is a crypt below each transept, and on the right is a fine parapet wall with panels bearing incised designs, relief being given by

the ground being tooled back for a space. There are four slabs on one side, with storks, an eagle, peacocks and griffins respectively, the first facing each other on each side of a pomegranate tree, the second clutching a rabbit in its claws, the third with a poplar-leaved tree between them, and the fourth with branching conventional lilies and a central stem. The design is striking, though the execution is rough, and is probably copied by local carvers from Byzantine originals. On the other side figures stand in couples beneath arches—three couples and one single figure, the background being inlaid with reddish marble. Apparently this parapet wall was remade in the fourteenth century, to which period the framing and the figures appear to belong. In the crypt below are many interesting sculptured fragments of various dates—a thirteenth-century relief of Christ between symbols of the Evangelists, signed Philippus; three twelfth-century statuettes, probably from the left transept, the sarcophagus of Titus F. Gorgonius, prætor Ancona; a fourth-century work with reliefs of Old and New Testament subjects; the sarcophagus of St. Marcellinus, a statue of St. Primitivus and other fragments, both of architectural and figure sculpture. The crypt of the left transept has been modernized in baroque style. Here are the tombs of Sts. Cyriacus, Marcellinus and Liborius. The façade has a beautiful porch with griffins, one holding a ram and the other a serpent. The south door is largely made of earlier fragments, and probably a good deal of work was done in the fourteenth century, using up material of an earlier period. Many flat reliefs are incrusting in the façade, and pieces of gray cipollino applied for decoration without constructional value. Close by is the campanile, and at the other side the archbishop's palace, where Pius II. closed his weary life in the consciousness of failure in 1464. He provided his blessing and indulgences in plenty for the crusade against the Turks which he had preached, but neither money nor arms.

The church of Ste. Maria della Piazza has a façade of 1210 with much carving by Philippus; a central round arched doorway with elaborate archivolt and rows of arches across the whole façade. At the side is a pointed arched doorway and a round arched corbelled cornice, which also occurs at the summit of the nave wall. The proportions have been altered by renaissance additions. In the wall of the façade, behind the arcading, are some pieces of interlacing inlaid work with gilded tesserae still adhering, which seem to show an earlier use of them in this connection than is generally allowed. The springings of arches in the main piers show that there was once a porch. The *scodelle* under the first row of arches are coarsely painted majolica of late date. This façade now so much blackened by age was built of white and pink marble.

The origin of the town is lost in the mists of antiquity. Pliny says it was founded by the Siculi fifteen centuries before Christ, Strabo that it was founded by Syracusans flying from the tyranny of Dionysius about 400 B. C. The name is derived from the Greek *αγκυρα*, an angle, referring to the shape of the coast. It became the capital of Picenum, and fell under the power of Rome in 268 B. C., when it was made a colony and an important maritime station. Besieged by the Goths under Totila, it was succored by Belisarius (551), and became the principal city of the Pentapolis under the Greek Exarchs, but was afterward conquered by the Lombards. It was given to the Pope by Charlemagne on the destruction of their kingdom. In 839 the Saracens burnt it. In 1058 remembering that damage, it joined the Normans. Nicholas II., therefore, anathematized it, but removed the curse at the intercession of St. Peter Damian. It was attacked in turn by the troops of the Church and of the Emperor, and in despair put itself under Emanuel Comnenus for forty years, from 1143. It was twice besieged by Frederick II., during this period (1167 and 1174). In the latter siege a widow named Stamura showed great bravery, setting light to the war engines under a shower of darts and stones, and apparently escaping unhurt. Ancona ceased to have relations with Constantinople after the signing of the peace of Constance between Pope and Emperor.

THE PRESERVATION OF PLACES OF NATURAL BEAUTY.

IN the United States there are few relics of the past which can be preserved in any degree of perfection, because our past was that of the Ishmaelite and the structure or habitation was at its best a log or frame shelter. When that is gone there may still remain the trees that were preserved from the original forest or planted by the passing pioneer. The *Builder* gives an interesting sketch of the work of "The National Trust," an organization in England which could be imitated in this country on much the same plan. At a recent meeting of this society a general outline of the work and its possibilities was given by members. The general trend of these remarks showed that The National Trust is developing into an important power, and seems likely, if it receives adequate support in the way of funds, to realize a very great work for the nation, and more especially for future generations, in securing in perpetuity places of beauty which otherwise would almost infallibly be spoiled or destroyed for all purposes of public enjoyment. The Bishop of Southwark, who described his interest in the movement as being that of a "slum bishop," made a point in this respect in recurring to the condition of the surroundings of St. Saviour's sixty years ago, when there was a quiet oasis shaded with trees all about the neighborhood of the church, under which his present parishioners might now be sitting had there been a National Trust existing at

the time to secure the trees and the open space for them. Another question which comes into the purview of the National Trust is that of the destruction of the beauty of natural sites by the very means which are taken to bring people within easy reach of them. As Mr. Sidney Colvin said, in a speech which was admirable both in matter and manner (the speeches generally, we may observe, were quite above the usual level of oratory at public meetings), the consecration of certain scenes in the poetry of Wordsworth resulted eventually in a kind of rush to see them, which had the effect of entirely destroying the very quality for which the poet loved them; and the chairman, Sir Robert Hunter, in his opening remarks, while pointing out that the Trust took up no general position of hostility to railways, touring and tourists, put the very crucial question in reference to the Snowdon light railway—what was the use of providing what were called easy and cheap means of transit for the public to places of natural beauty, in a manner which robbed those places of that very atmosphere of quiet and seclusion which gave them the greater part of their charm?

The National Trust, though its program includes places "of historic interest" as well as of "natural beauty," has so far directed the greater part of its efforts toward the purchase and preservation of natural beauty, and this partly for a practical reason. Though the Trust has been successful in getting a good deal of money subscribed for special purposes, it is not at present a wealthy body; and it appears that the places of natural beauty which they have acquired bring in a sufficient amount of return, by rents for uses not interfering with their attractions, to make the Trust in this respect self-supporting; while ancient remains, on the contrary, require a certain expenditure in keeping them from further decay. A larger revenue may make a difference in this respect, but in our opinion the Trust is doing better for the country in securing sites of unspoiled country and preserving them than in any other possible expenditure of its energies.

This question came up in a concrete form in the third and the only really important resolution submitted to the meeting. On Wednesday, as usual, three out of the four resolutions were little more than formal, giving speakers the opportunity of saying anything they wished to say in regard to the policy and objects of the Trust; but the third one proposed a larger scheme than the Trust has yet taken in hand. The resolution ran—

That this meeting warmly approves of the proposal for the acquisition of Aira Force and Gowbarrow Fell on Ullswater by the National Trust, and pledges itself to use every endeavor to secure the required purchase money.

This is a larger purchase than any which the Trust has hitherto attempted, and consists of some seven hundred and fifty acres of park and wild fell rising to a height of 1,578 feet above sea level, together with a ravine through which the Aira Beck flows, and with a frontage of a mile to Ullswater shore. The owner wishes to sell, but has given the Trust for the present the first claim. Were the land to be sold publicly, there can hardly be a doubt that it would be utilized for building "attractive residences," and thus lose its wild character and be the occasion of intruding houses on to the banks of Ullswater. It is not so much from the desire to possess this estate, as the desire to prevent others possessing it who would put it to a utilitarian use, that the Trust urges the raising of funds to acquire it. The price is £12,000, of which only a small proportion is as yet promised, but the Trust has been so successful in other cases in procuring money for the objects it has at heart, that we have every expectation of its success in this effort also, and that we shall hear of the completed purchase at the next annual meeting.

The preservation of the beautiful waterfall, Aira Force, is another important object. Seeing that we have arrived at a time when every engineer regards a waterfall not as an object of beauty, but as an instance of power running to waste, it is necessary to look jealously after our waterfalls, or none of them will be left to us. The fate of Foyers is a warning not to be lightly forgotten; let us do what we can to preserve those that still remain from destruction.

OUR ILLUSTRATIONS.

Church at Philadelphia.
Residence of Lawrence Buck, architect.
Houses, Dayton, Ohio. F. B. Heathman, architect.
Hotel Maryland, Pasadena, California. John Parkinson, architect.
High School Building, Troy, New York. Cummings & Son, architects.
Rear View, Residence of W. T. Fenton, Chicago. H. R. Wilson, architect.
Oakley M. E. Church, Kansas City, Missouri. Sheppard & Farrar, architects.
Residence of L. M. Hellman, St. Louis, Missouri. Weber & Groves, architects.
Building for American Brake Company, St. Louis, Missouri. Weber & Groves, architects.
Hebrew Synagogue, Scranton, Pennsylvania. George W. Kramer, architect, New York.
Accepted Design, School Building, Greenville, Mississippi. Kenneth McDonald and J. F. Sheblessy, architects, Louisville, Kentucky.
Special Plate: Residence of W. T. Fenton, Chicago. H. R. Wilson, architect.

SPECIAL PLATES.

Issued only with the Photogravure Edition.

The Ryerson Building, Chicago. Holabird & Roche, architects.

View in Hall, Residence of W. T. Fenton, Chicago. H. R. Wilson, architect.

Residence of F. R. Brown, Rockford, Illinois. Patton & Miller, architects, Chicago.

View in Dining-room, Residence of W. T. Fenton, Chicago. H. R. Wilson, architect.

Residence for S. H. Velie, Kansas City, Missouri. George W. Mayer, architect, Chicago.

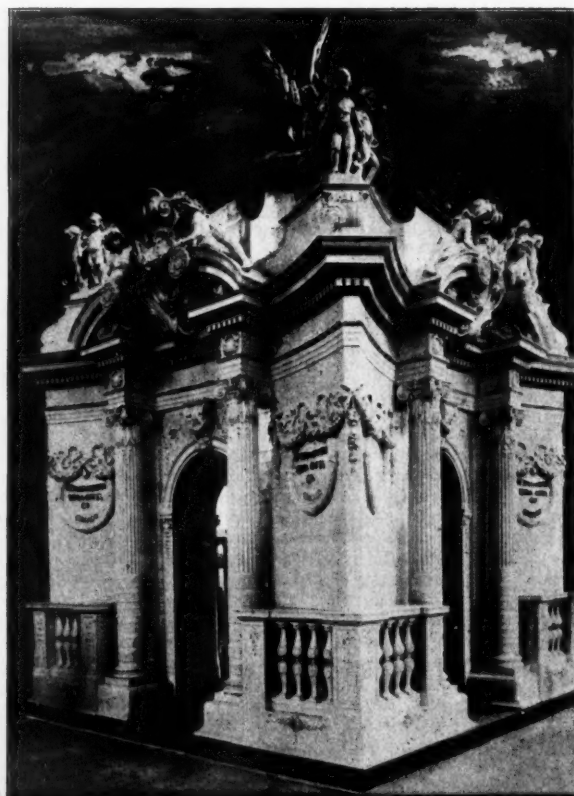
View in Dining-room, Residence of F. R. Brown, Rockford, Illinois. Patton & Miller, architects.

Country House at Glencoe, Illinois, for Mr. Harry Rubens. George W. Maher, architect. The design of this house is independent of any architectural precedent. Its reason for being follows the law of organic growth. The needs, tastes and temperament of the patron and owner form the basis for arrangement and design. Democracy in design is the keynote of effort. Where the designer attempts in a philosophical manner to interpret the ideals of the respective patron and following close to the law of principle, endeavors to be honest and consistent in all his efforts. The motifs in this house are repeated throughout interior and exterior, also inclusive in all surrounding buildings—barn, lodge, conservatory, and landscape effects, thus forming a harmony of feeling throughout the conception. The decorative flower motif is the hollyhock, a local flower.

MOSAICS.

THE supervision of the arrangement of the roof garden of the new Oriel theater in New York by N. F. Barrett, president of the American Society of Landscape Architects, is probably the first instance where a landscape architect has been employed for this purpose.

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