

THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XXXVIII.

Copyright, 1892, by TICKNOR & COMPANY, Boston, Mass.

No. 884.

Entered at the Post-Office at Boston as second-class matter.

DECEMBER 3, 1892.



SUMMARY:—

Death of Professor Eugène Létang. — An International Congress considers the Matter of the Transmission of Real Property. — Scheme to erect a Building for the Boston Architectural Club. — Plating the Iron Tower of the Philadelphia City-hall with Aluminium. — Aerial Navigation.	141
THE CHAMPAGNE SCHOOL OF ARCHITECTURE. — I.	143
THE CASTLE OF VIANDEN.	145
LETTER FROM BALTIMORE.	148
CONSTRUCTION. — XVI.	149
LETTER FROM PARIS.	152
SEA-WATER FOR STREET-WATERING AND SEWER-FLUSHING.	153

ILLUSTRATIONS:—

House of Col. J. Mason Loomis, Chicago, Ill. — Three Designs for a Tomb submitted at a Competition of the Denver Architectural Sketch Club. — The W. Baker & Co.'s Chocolate Pavilion for the World's Fair, Chicago, Ill. — Houses at Allston and Cambridge, Mass., and Buffalo, N. Y. — Details of the Van Rensselaer Manor Houses, Albany, N. Y.	
Additional: Loggia of the Hôtel D'Ecoville, Caen, France. — I. Façade; II. Plan of the Hotel and Detail of the Ceiling; III. Door. — The Eton Mission Church, Hackney, Wick, Eng. — Bethnal Green Workhouse. — Staffordshire County Council Buildings.	154
NOTES AND CLIPPINGS.	155
TRADE SURVEYS.	156

TO OUR SUBSCRIBERS.

DURING the coming year we shall pay especial attention to the architectural features of the World's Fair at Chicago.

The gelatine plates of the INTERNATIONAL EDITION in particular will be largely selected from World's-Fair subjects, and subscribers to that edition, will receive also *twelve extra helio-chromes* mainly from the same sources, to be issued at intervals during the year.

All new subscribers for the year 1893, who remit to us their subscriptions *direct, in full*, before January 1, will receive the December numbers of this year gratis.

TWENTY years ago we had the pleasure of welcoming, and for months playing the part of interpreter between him and his pupils in the architectural department of the Massachusetts Institute of Technology, M. Eugène Létang, who had consented to undergo what he then considered a temporary expatriation for the sake of a larger income than a man without family or influence could hope to acquire before old age came on him in France. The expected short residence extended itself year by year, till at length M. Létang realized that he was practically out of the race, and became partly reconciled to making a more useful but less conspicuous career for himself in this country. But for his great personal modesty, he might have achieved success in active practice here, in spite of lack of friends and influence, for he was really a more capable artist than he was usually credited with being, and it was somewhat a matter of surprise when we discovered, years after, how sound a reputation he had left behind him in Paris as an *homme fort et sérieux*. How great an influence he has had on the architecture of this country at the present day we imagine he was far from suspecting; but the common, the national failing of almost all the pupils who came under his care was a tendency to exuberance and fantasticality both in plan and design, which they fondly defended under the name of "picturesqueness," and which his firm belief in the teaching of his former *patron*, M. Vaudremer — that nothing should be done that could not be logically defended, and that simplicity and a regard for proportion were the prime elements in good designing — admirably served to chasten and refine as could have been done by no other of the many Frenchmen of his time whom we have known. It was a most fortunate chance that brought such a man to fill such a position in an institution, the first of its kind, which has had so great an influence on the extraordinary development of architecture in this country during the precise period of his short life-work, and with that life-work Eugène Létang had better reason to be satisfied than if he had made a large income in active practice during his lifetime of fifty years.

ALL the former pupils and friends of the Architectural Department of the Massachusetts Institute of Technology will learn with pain of the death of Professor Eugène Létang, who had been connected with the department almost from its foundation, and had contributed in a very great degree to its success. Professor Létang was born in the department of Nièvre, France, and pursued the ordinary course of study for young Frenchmen intended for the profession of architecture. At the School of Fine Arts he was particularly successful, carrying off four medals, and winning a high reputation for solid attainment, interrupting his work only to lend his aid in the defence of his country during the war of 1870-1. Soon after finishing his course at the Beaux-Arts, he was induced by Professor Ware, who was then engaged in creating, one may say, the first great American school for the education of architects, to take charge of the instruction in architectural design in the Institute of Technology in Boston, and from that time, until a few weeks before his death, he was untiring in his efforts for the school. No one who has ever been in the Institute School will forget Professor Létang's earnest and sympathetic teaching. Not only was his consummate knowledge of the art which he professed so evident in his criticism of the work of his pupils, and in the suggestions which he made for their guidance, as to command their respect, but there was a certain stimulating quality about his instruction that added much to its effectiveness, while his cheerful kindness endeared him to all who were brought in contact with him. Outside of his school, Professor Létang was known to comparatively few persons. He was far too much of an artist in temperament, and too thorough a gentleman, to fancy pushing himself even into a society which would have been glad to welcome him, and his circle of intimate friends was small. What, however, he lacked in the extent of his acquaintance, he more than made up in his devotion to those of his friends and compatriots to whom he found himself able to be of service. In the small French colony in Boston he was deservedly beloved and honored, and he will have no more sincere mourners than those who, arriving in Boston strangers and poor, have found in him a man to whom the appeal of a countryman was never made in vain. Professor Létang leaves a widow, to whom, we are sure, the sympathy of all our readers who knew her distinguished husband will be extended.

AN important International Congress was held in Paris last month to consider the subject of the transmission of real property, which, it must be confessed, needs study about as much as any subject with which laymen are concerned. This was the second Congress of the kind, the first having been held in the Exposition year, 1889. The Congress of 1889 appointed a permanent committee to observe the course of events and provide for the holding of the next meeting, and the committee appears to have done its work well, for the list of the "adherents" to the second Congress comprised more than four hundred names. The President of the Congress was M. Yves Guyot, the chairman of the permanent committee, now a member of the House of Deputies, and formerly a minister; and among the Honorary Presidents were several other past or present ministers, such as MM. Tirard and Rouvier, with one of the most distinguished economists in Europe, M. Léon Say. M. Yves Guyot, in his opening address, cleverly summed up the troubles from which purchasers of real estate now suffer, and which it was the object of the Congress to try to mitigate. "Let us suppose," said he, "a purchaser, convinced that caution is the mother of safety. He wishes, not to acquire a piece of ground of uncertain limits, but a city house of perfectly definite description. He goes to the office of registry of mortgages; he verifies all the references through the entire list of transfers; he satisfies himself that the property is not encumbered with mortgages given either by the seller or by any of the preceding owners. He employs a notary to subject to the most minute examination all the documents; he proceeds even to the provision of security against concealed conveyances. He buys; he has the transfer properly made, and, after all, he is not sure of being the owner. No, for the books of registry of mortgages are arranged by the names of persons. Nothing is necessary but an inversion of a name, an irregularity of orthography, a confusion of Christian names, to vitiate all the evidence presented

by the registry. The purchaser has learned the condition of one proprietor, real or false, but he has learned nothing about the condition of the property. Moreover, by inheritance or legacy, the property may have passed under new names, without the register having been informed of the fact, and the certificates which he gives have simply the value of a copy. The registry gives public evidence of the transfer of a piece of property, but neither confers nor proves ownership. A donation may be revoked on the birth of a child, or a conveyance vitiated by violence or fraud, or by having been assented to by an irresponsible person, and all the records concerning the property in question will become misleading. In one word," said the speaker, "the purchaser can find nowhere any guaranty of the validity of the transactions which he may enter into concerning real property. He is obliged to have recourse to researches more or less long, more or less troublesome, and attended with more or less risk. From this arises a timidity which may easily be comprehended, but how does it show itself? The price of everything rises when buyers are eager, and falls when they are undecided and uncertain; and to-day the actual course of real-estate values is lower than that which will prevail in the day when a simple, rapid and safe procedure shall give full security to the transmission of such property." Architects have many opportunities of observing the uncertainties of real-estate ownership, and they are probably as serious here as in Europe; but it will occur to most of them that in France, at least, to judge from M. Yves Guyot's description, there ought to be a favorable field for the operations of a title-guaranty company, like those which flourish in this country.

THE meeting of the Boston Architectural Club on Wednesday evening was one of unusual significance, not only in that which relates to the immediate interests of the club, but to the ultimate interests of all that goes to advance the growth and welfare of architecture in all parts of the country. At this meeting was developed the outline of a scheme which illustrates incidentally how, through force of personal character and persistence, a chimera may be groomed, dressed and trained into a creature serviceable in the modern world. The scheme, which for some year or more it has been known that Messrs. Blackall and Norris, the President and Treasurer of the club, had entertained, is more properly called chimerical than Quixotic, for it contemplates the erection upon one of the most desirable, and therefore most expensive, sites in the city, by and through the agency of these two individuals, who are not themselves capitalists, of a building which must cost over a million of dollars, the operation being financed in such a way that the Boston Architectural Club may acquire quarters large enough for its classes, meetings and exhibitions free of charge, and may eventually become seized with a large and increasing fund, to be used by it for educational and benevolent purposes. Even an active imagination is not able to at once foresee what may be the influence on the city and country of the educational possibilities which this audacious but possibly practicable venture is likely to exert, if a wise administration of the trusts can be accomplished by those who direct and control the efforts of the club.

THE *Scientific American* gives an account of the process of plating with aluminium the ironwork of the Philadelphia City Building, which is now being carried on at the shops of the Tacony Iron and Metal Company, at Tacony, Pa. The late Mr. McArthur, the architect of the building, wished from the first to cover the ironwork with a skin of aluminium, to protect it from the weather, and save the cost of painting, which, it was estimated, would amount to ten thousand dollars a year, if the iron were to be kept secure against rust. The great expense of an aluminium skin prevented, however, the adoption of this plan, and Mr. John Ord, who succeeded Mr. McArthur, suggested that a substitute for it might be provided by electro-plating the ironwork with aluminium. It has been supposed that aluminium could not be electrically deposited, but Mr. Darling, of New York, has devised a process for doing so successfully, and he has been engaged to apply it at Tacony. The first step was to construct tanks, to hold the plating solution, and, as some of the pieces were columns, three feet in diameter, and twenty-six feet long, the tanks were necessarily of great size, that for the aluminium solution holding seven thousand gallons. After pickling the pieces of iron, they are

first electro-plated with copper. The copper film is very thick, sixteen ounces being deposited on each square foot of surface. This coating alone would protect the iron, but the copper would soon turn black and green by exposure to the air, so that the final coating of aluminium is added for appearance. From two to three ounces of aluminium per square foot is deposited over the copper, forming a very substantial film. Like most metallic films deposited from solution by electrical decomposition, however, the aluminium coating is porous, and, while it is firm enough to adhere well, it is not sufficiently compact to resist the action of the atmosphere, which covers it with a gray coat of oxide. This effect of the air was foreseen, but the color of the coat of oxide harmonizes well with that of the marble which forms the main mass of the building, so that it is, if anything, preferable to the glitter of an untarnished surface, and it is found to be very superficial, and to protect the metal under it from further action. The work will certainly be interesting to architects, but it remains to be seen how it will bear the long-continued action of the weather. Although the aluminium itself may not be attacked, every one who has used nickel-plated iron tools knows that water, or damp air, will reach the iron from the outside through the pores of the nickel, and that tiny spots of rust then appear on the surface, which spread until the nickel coating is destroyed; and it seems by no means impossible that the oxides, or other compounds of copper, produced by the acid vapors of the city, may in time make their appearance through the aluminium film. We are not sure that we should not like this. The appearance of weathered copper, though far from resembling that of marble, is very dignified, so that the possible deficiencies in the aluminium coating need not cause anxiety.

WE have mentioned, in connection with an account of experiments in aërostation, as an indication of what might be expected, in the way of rapidity of movement, from the well-designed and well-managed air-ships of the future, that a common swallow had flown, carrying a letter, from Bordeaux to Paris, a distance of about three hundred and five miles, in two hours. This feat was accomplished in the course of some experiments, undertaken by a French society, to see whether swallows could not be substituted for carrier-pigeons. Since then, the speed of flight of these birds has been more carefully observed, and a German engineer estimates that the common chimney-swallow is capable of flying ninety metres a second, or more than two hundred miles an hour. Whether our air-ships will go as fast through the air as swallows, remains to be seen, but there seems to be no reason why they should not. Of artificial locomotive machines driven by equal power, in proportion to their weight, the largest generally move fastest. It is true that sharks are said to keep up for days with the swiftest steamers, but the muscular power of a shark is probably greater in proportion to his weight, and to the resistance which the water opposes to his movement, than the force of expanding vapor available for the steamer. With machines for navigating the air, the case would be quite different. The swallow is not particularly muscular, nor does he, apparently, use his muscles much for propelling himself forward, depending mainly, so far as can be seen, on gravitation to cause him to slide swiftly down the air, and exerting his wings only to keep his balance, and, at intervals, by a quick stroke, to send him upward to a point from which he can make another oblique descent. There is something rather alarming about the idea, which has been before suggested in these columns, of making our future balloons navigate the air by gravitation, starting, let us say, from a point a couple of miles above the earth, and coasting down the air, at an angle of three or four minutes with the horizontal, reaching the ground two or three thousand miles away, without the expenditure of any artificial power whatever after the preliminary start, but we are not sure that it may not prove to be the most practicable one. It would be very easy, by using cylinders of compressed gas, to raise our air-ship to the height required to launch it, and it ought not to be difficult to regulate the speed of the descent, by varying the position of the wings, or by a sort of horizontal rudder. Fresh cylinders of compressed gas could be carried on board, for lifting the balloon again in case of emergency, but, apart from these, no machinery, fuel nor engines of any sort need be carried, and a great weight would thus be saved.

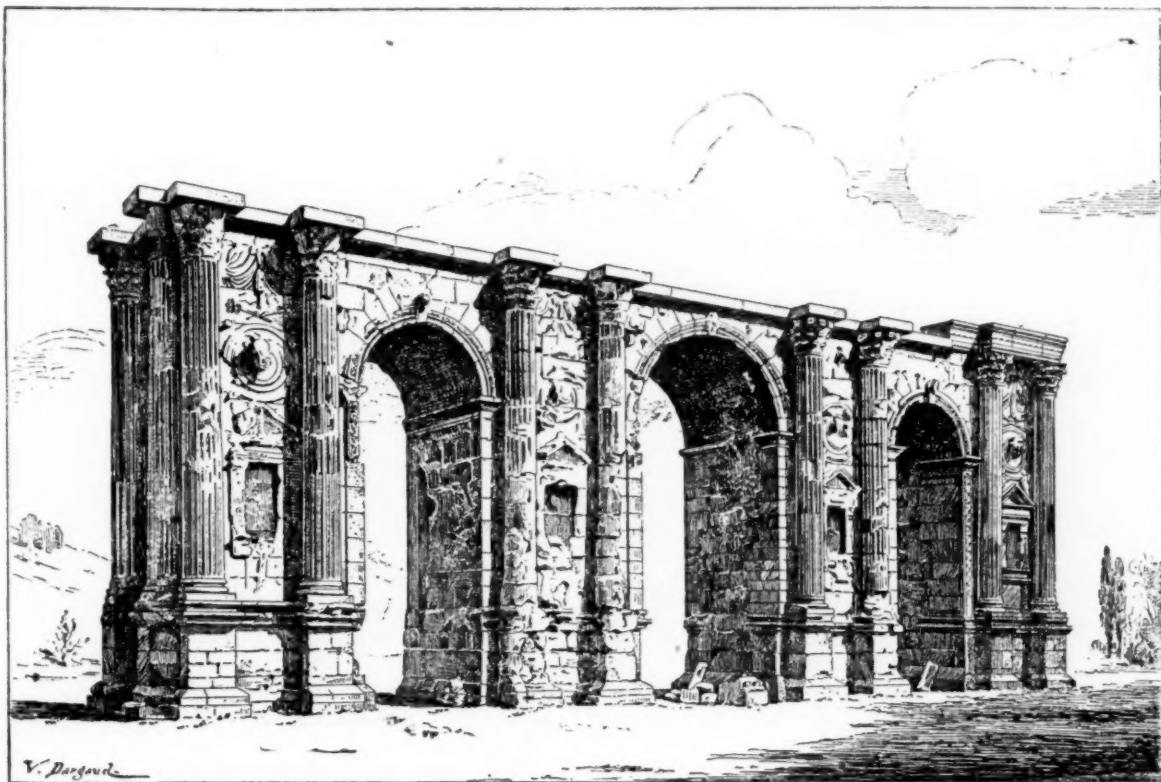
THE CHAMPAGNE SCHOOL OF ARCHITECTURE.¹ — I.

PROTECTED by the lines of defense which the Romans had established in the hilly valley of the Rhine, and which served as a rampart against the invasions of the barbarous Germanic tribes, the plains of Champagne early became initiated into the Gallo-Roman civilization. True to the Roman idea, and in conformity with the wholly municipal character of Rome's political and social organization, the province was sprinkled over with great cities, adorned from the start with those official edifices which the Romans made the seal of the civilization that they carried with them in their conquests. The triumphal arch at Rheims known as the *Porte de Mars*, on account of its proximity to the temple of Mars, and which was erected in honor of Cæsar and Augustus, still bears witness to the prosperity of those days.

After the Germano-Frankish invasions of the Merovingians, Champagne, like the other provinces north of the Loire, passed through a period of disintegration and barbarism, during which all that remained of the ancient civilization took refuge in the

to become the proper expression of that people, of its peculiar mental constitution, of its beliefs, of its wants and of all the conditions of its life, if left to its own inherent forces to develop, can reach full maturity and perfection only after an exceedingly long lapse of time.

In what circumstances then have the races that have risen successively out of barbarism into civilization reached the goal? In every case the nation has, through protracted struggles and long wars of defense or conquest, found itself in contact with a more advanced people. Some destitute of native genius—certain of the peoples of Asia Minor, for instance, notably the Phœnicians and Hebrews—were content to borrow ready-made, as it were, the arts of their Egyptian or Assyrian neighbors, and brought thereto no transforming original element. Others, on the other hand—as appears in the parallel artistic development among the Arabs and the nations of the West—after a hurried but necessary apprenticeship in technical processes and knowledge, after a rudimentary training, the main result of which was to arouse latent intellectual needs and dormant ideas, took advantage of what they acquired and became creators after their own fashion, creators



Porte de Mars, at Rheims.

large cities and in the institutions of the Christian Church. Later, in the ninth century, the Germanic invasion of the Carolingians definitively ushered in an entirely new civilization, none of whose characteristics were borrowed from the old Gallo-Roman organization. When Charlemagne's attempt to reconstitute the Roman Empire had at length proved a failure and when, the tide of northern invasions having been turned back, the elementary forms of a new social organism had begun to appear, the living germ hidden in the still barbarous race—but young and full of vital force—took root and gradually developed toward maturity.

New institutions, destined to lead to the feudal régime, sprang up, and at the same time the foundations of a new art, derived from the same source, were laid. It may be asked what soil bid fair at that moment to be best prepared for the growth of this art. The answer seems easy. Beneath the barbarous exterior of the Germano-Frankish races must certainly have lain its germs, since they ultimately produced it. But just as it requires the accumulated experiences of centuries for a people to pass of itself, without foreign intervention, from barbarism to a high state of civilization, so the art that is

full of originality. It is then along the line of contact of two peoples—one older and of a more advanced and more refined civilization, often even in its decadence, the other younger and teeming with life—that the seeds of a new art germinate.

It is not to the south of the Loire, in regions destined to remain Gallo-Roman for centuries and to follow their own course of development, it is not to the east of the Rhine, in sections where Germanic traditions were long maintained, that we must look for the conditions which we are seeking; but rather in the country between these two, chiefly along the boundaries of Frankish Neustria and Germanic Austrasia, where the invading hordes of the ninth century encountered the Gallo-Roman civilization already prepared for them by the Franks. It is in the broad plains of Champagne and Ile-de-France, bordering upon both territories and passing continually from one rule to the other, that the earliest and boldest and most original attempts were to be made.

Any further discussion of these points belongs naturally to a treatise on French architecture as a whole, and we content ourselves with showing that Champagne was destined to be one of the provinces in which the new architecture took its start, and that the study of its edifices, therefore especially deserves the attention of archæologists.

¹ From the French of P. Planat, in Planat's *Encyclopédie de l'Architecture et de la Construction*.

This school has never been wanting in aggressiveness or in the ingeniousness necessary to its success. It is proper to add that if the characteristics of the people of Champagne were early revealed in a distinctive kind of delicate and *spirituelle* artlessness, which is found exemplified in the most striking men from Joinville to La Fontaine, their art, self-created, exhibits qualities of refinement, grace and elegance, sometimes carried to extremes and imparting to it a peculiar and well-defined physiognomy. All this may be readily determined by a brief study of the representative religious or civil edifices of the province. Down to the sixteenth century, and even later, we shall find it easy to detect the original and individual elements of a Champagne construction.

After the Cathedral of Rheims, which we have already had occasion to describe under the heading "*Cathedrals*," the most characteristic religious structures and the most interesting to the student are unquestionably Notre-Dame at Châlons, St. Remi at Rheims and St. Urbain at Troyes. In these three churches we can, as it were, trace the rise and development, with their most original lines, of the distinctive features of Champagne architecture. It is chiefly to them that we shall

St. Stephen. "The side-aisles¹ were then lighted by small semicircular windows, narrow and elongated; three of these still remain one near the sacristy, another on the same side at the base of the choir tower, and the third by the organ stairway and closed by a tomb. The others were enlarged in the sixteenth century to receive the beautiful stained glass that may yet be seen here."

St. Remi at Rheims, occupies the site of an older church erected by Hincmar; its foundations were begun in the eleventh century. The *chevet*, the portal and the two bays at the entrance were begun in 1162 and belong, therefore, to the twelfth century; but the walls of the nave and of the arms of the cross, the pillars and arches of both nave and transept, together with the south bell-tower and the southern chapel are of the eleventh. The roof and small bell-tower were not constructed until the fourteenth century.

St. Urbain, at Troyes, was begun in 1262, and left unfinished; nearly all the construction must be accredited to the fourteenth century. It is often cited as one of the finest examples of Gothic religious architecture at its zenith.

We will note briefly the changes that were wrought from



Side View of the Church of St. Remi, at Rheims.

look for the indications needed in carefully determining its specific character.

Notre-Dame of Châlons is the production of several architects; the four towers were begun in the Romanesque era; it is probable that these, with the sanctuary, the chapels and the two transepts, constitute the part consecrated in 1183. The broad aisles were built later; various arcades, masonry-work and sculptures of the thirteenth century, in the lower part of the interior of the towers and different positions of the nave as well as around the apse, cover constructions of the twelfth century. The chapels and altars with all their accessories and carvings were not wholly completed until the second half of the thirteenth century, says M. Barbat. "The consecration took place, it is true, in the fourteenth century (1322). But the terms of the official report show that the church had been finished for a long time (about fifty or sixty years); it is doubtless due to this fact that persons who are familiar with the dissensions that divided the two chapters for centuries have inferred that the object of the consecration was to effect a reconciliation in the church." Reference is here made to the contentions long kept up between the chapters of Notre-Dame and

century to century in the important parts of the churches, that is, in the nave, the side-aisles, the choir, the buttresses, bays and clerestories.

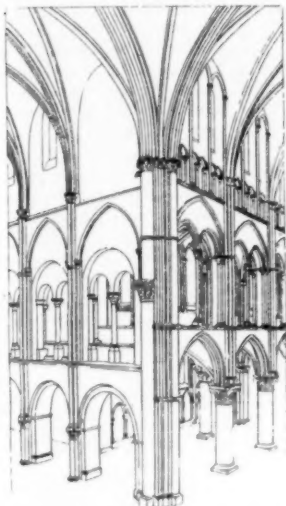
In the northern French provinces — Normandy, Ile-de-France, Champagne, Burgundy and Picardy — when the architects began to vault the Latin basilicas, they continued to cover them with a timber roof, but an intervening space was arranged for, in order to protect the masonry from any infiltration of water through the outer roofing and to permit of passage for examining and repairing the extrados of the vaulting.

Although churches of the tenth and eleventh centuries had their aisles covered with timber, the sanctuaries were vaulted in St. Remi and the apses were covered with a half domical vault; the nave, which belonged to the tenth century, was not vaulted until the twelfth and about that time a choir, with side-aisles and a chapel, was introduced. In the same way the nave of the Church of Notre-Dame at Châlons-sur-Marne was not vaulted until the twelfth century, at the time of the reconstruction of the choir.

In Champagne, toward the end of the eleventh century and

¹ Barbat: *Histoire de Notre-Dame de Châlons*.

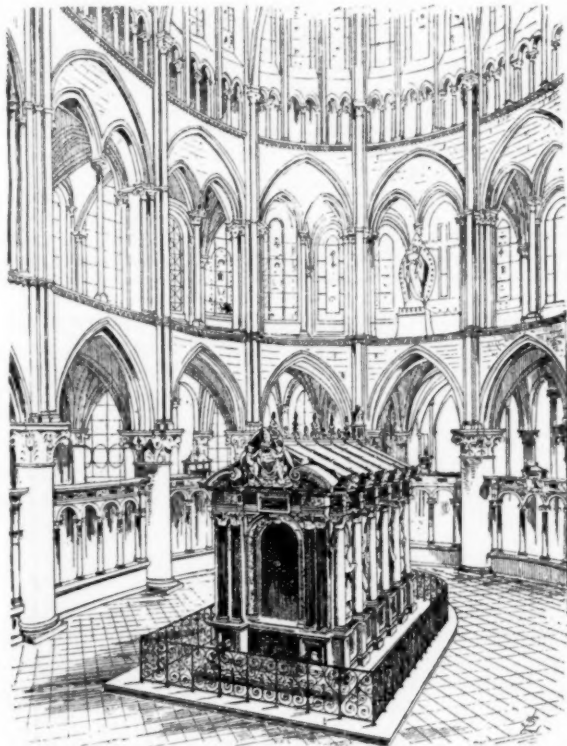
in the twelfth, the side-aisles were quite frequently vaulted while the naves were still covered with timber. The vaults were placed transversely; at each pillar of the nave a transverse *doubleau* was established over the aisle. This series of semicircular vaults was replaced afterwards by groined vaults. St. John's at Châlons-sur-Marne was covered in this way at first, as was also St. Remi at Rheims; the gallery above the side-aisle must also have been vaulted on the same principle; as to the choir, no doubt exists in regard to this disposition.



Nave and Transept of St. Remi, at Rheims.

the side-aisles were covered with double-sloped roofs, the water from which was carried into a gutter above the *doubleau*. In this way a free space for a high broad bay was left in the wall of the nave. In these secondary churches, the latter was still covered with timber.

The triforium was originally open, showing the timbers and coverings of the side-aisles. It was, moreover, simply a rather narrow passage. The openings were embellished on the outside with stained glass, and, in order not to shut off the light to be admitted through this and which would necessarily be somewhat dimmed, the plan was soon adopted of reversing the



Apse of St. Remi, at Rheims.

direction of the roofs by placing the ridge-tiles parallel to the axis of the edifice longitudinally instead of transversely. The roofing consequently formed merely a pent house over the apertures of the openwork triforium.

[To be continued.]

THE CASTLE OF VIANDEN.



Mural Tablet of Henri de Nassau, in the Church.

SITUATED a few miles from Diekirch in the Grand Duchy of Luxemburg, and close to the borderland of Rhenish Prussia, is one of the most picturesque of ruins, the ruined castle of the counts of Vianden. In olden times it was a strong place, an almost impregnable fortress, standing upon an all but isolated hill which forms a sort of promontory. Around it are lower hills; in the valley beneath is the old town; and flowing over rocks and stones, the little river Our, spanned by a bridge of two arches, on the parapet of which stands a statue of St. John Nepomuck, the patron of bridges and of running water, and the advocate of silence.



Window in the Salle Byzantine.

The country round Vianden is the most picturesque in the Ardennes, by reason of the absence of vine-culture, factories and ironworks, and the natural beauty of the red earth. The town twists and twirls round the foot of the castle hill, and many are the steps and steep inclines leading to the old château, by way of the Hockelstour, an outpost upon the remains of the castle wall which originally possessed twenty-six turrets and six gates.

Although tradition ascribes a Roman origin to the domain,¹ and coins have been found upon the castle hill bearing the effigies of several of the Roman emperors, the first authentic notice of the place appears in the will of Sainte Irmine, daughter of Dagobert II,

¹ For some of the details made use of in this paper, and the plans, I am indebted to the "Monographie de Vianden" by M. C. Arendt.

King of the Franks, who, in 698, bequeathed a vine-yard, situated upon *Monte Viennensi*, together with its vine-dresser, to the Abbey of Echternach. In the Act of 870 dividing the empire of Lothaire, the district was placed under administrating counts (*comtes bénéficiaires*); and even in the lifetime of St. Willibrord (*d.* 726), there were

Princes of Orange. In this wise King William III of Great Britain was Count of Vianden, and besides Queen Mary two other English princesses have been countesses — Marie, daughter of Charles I, who married William, Prince of Orange, and Anne, daughter of George II, wife of William Charles Henry, Stadtholder of Friesland.

The Dutch Republic administrated the property after the emigration of the House of Nassau to England in 1795; and then came Louis Bonaparte, who exchanged the property for some in Friesland, Napoléon giving it to the Baron de Marbeuf. By the treaties of Vienna and Aix-la-Chapelle, the domain, much diminished in size and value, was returned to the House of Nassau. And then came its most evil days; for, after having withstood bombardment by the armies of Louis XIV, and the Revolution, it was sold in 1820, by the *syndicat d'armortissement* to a builder for 3,200 florins, who, after taking away all that was convertible into money, left the rest for still further destruction by time and weather.

The old township had its own courts of justice as well as a system of weights and measures; and the different guilds took part in the municipal government. The legendary matter connected with the castle and its belongings is profuse: there are ghosts still to be seen, and if you look down into the whirlpool in the river just above the bridge, you will not only hear bells ringing, but you will see *la dame blanche*, who was precipitated into the water by the devil, for accidentally slaying her father in the darkness. Poor Lady Euphrosine! sometimes she haunts the woods in a carriage drawn by four milk-white steeds; but was it her fault entirely that she eloped with a valiant knight to avoid a wretched marriage? What a life these women led, forced into partnerships irrevocable, to please fathers and brothers and natural guardians!

The houses in the one street are of little interest, and the faubourg now contains but few houses. The parish church was originally part of the convent of the Trinitarians, founded in 1248, by Count Henri of Vianden. It has an interesting doorway, and a curious carved wood organ-gallery. The two short naves terminate with square-ended chapels, in one of which is the high-altar, a mass of carving, colored and gilded in the worst possible taste. But the mural tablets of Marie de Spanheim, who died in 1400, and Henri de Nassau (*d.* 1589) are worthy of inspection. There is a pretty legend woven up in connection with the greyhound upon which the feet of the Countess rests — a very common device and signifying fidelity, just as a knight's feet, or a warrior's, generally rest upon a lion, the emblem of courage and valor. The legend runs in this wise: Marie's father, Godefroid III, departing for the Holy Land, had left his daughters under the care of a treacherous knight, who,



Vianden.

counts at Viennois, and Viandenois, which were part of the larger district. In the twelfth century, under Frédéric I (of Vianden) the title became hereditary; and in the fourteenth century, so much had the domain been enriched by wars, gifts, and robberies, that it contained 150 villages, besides a large number of abbeys and convents.

In 1270 the counts, hitherto independent, became the vassals of the House of Luxembourg. Philippe I in 1308 freed his subjects, and gave them a charter, by which they were justified in rebelling against any attempts of their rulers to curtail their liberties. The same clause is found in the famous *Joyeuse-entrée des Brabançons* charter or *handvest*, a fact which is attributed by historians to the influence of the counts at the court of Brabant. It is to this period that Vianden owes the foundation of its guilds, the construction of



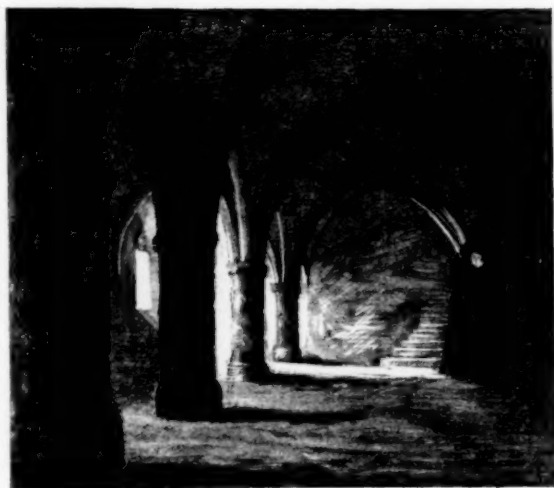
The Chapel.

its fortifications, its various institutions, and its *croix de Justice*, now but a fragment upon which sits the post-office letter-box!

Two centuries later, the Countess Marie of Spanheim dying without children, the domain passed to her sister Adelaide, wife of Othon of Nassau, and through their heirs, became the inheritance of the



St. Yolande of Vianden [Mural Tablet.]



The Cellar.

upon the death of the father, determined to make himself master of Vianden. To this end, he proposed marriage to Marie, and upon her refusal, caused her to be imprisoned in one of the underground dungeons of the castle, where she would infallibly have died of hunger had it not been for her faithful hound who brought her food, and

then by various barkings, intimated to the Count of Spanhiem (her betrothed) the place of her confinement. If the dungeon were the Hexenloch (G) or *trou des sorcières*, it is quite possible that the faithful dog may have dropped down food to his mistress, although it seems improbable that a human being should have been able to exist in such a place for any length of time. It is literally a hole dug down into the earth, some thirteen feet in diameter, and twenty-two feet in depth, and lined with solid masonry, the only opening being a small trap-door at the level of the ground above, from which the victims must have been dropped. It is but fair, however, and to the credit of humanity to state that some persons think the excavation may have served as a silo for the preservation of cereals; but the name has an unpleasantly suggestive ring about it, and the hole is but a repetition of the lower part of the *donjon* or *weissen-thurm* (M) which is known to have served as a prison.

The altar of St. Antoine is a curious erection formed of a mass of relics under glass, and representing a sort of picture, but only interesting in so far as it was originally in the chapel of the château.

It is sad to contemplate the destruction of so much that was old and picturesque at Vianden, not by wars, which were always raging, nor by fires and inundations, which were many, but simply by stupid, wanton vandalism. The bridge was rebuilt in 1865 replacing the old one of a single arch; and its turreted gate disappeared a few years earlier, in 1850. The figure of St. Népotucène which stands upon the parapet of the bridge, is also modern, but that does not prevent it turning upon its pedestal three times, when the bells in the Hockelstour ring out midnight. This saint is invoked against inundations and another effigy of him may be seen at Bruges. Three or four of the town-gates were also demolished as late as 1850.

Archæologically, the castle is one of the most interesting ruins, as the whole plan can easily be followed. (See general plan.) On entering, the visitor passing through three gates A, B, C, the last still retaining its watch-tower, enters a court-yard in which, formerly, were the domestic offices and garden (I L K). From this, a gate with portcullis (D) leads to the principal entrance of the castle (E), a Romanesque doorway, five feet nine inches in breadth. The *Salle d'armes* and the *Salle des chevaliers* still retain the springings of the ribs of the vaulting with their corbels ornamented with the armorial bearings of the counts. The so-called *Salle Byzantine* over the *Salle d'armes* was lighted by seven windows upon one side and four upon the others, richly decorated with single shaft columns and foliated capitals. These halls were from ninety feet to ninety-five feet long and twenty-five feet to thirty feet broad. (See plans II, III.)

From the *Salle Byzantine* a covered way leads to the chapel (H) which is of two stories, and passes round it. This part was restored about thirty-five years ago by Prince Henri of the Netherlands; the work being carried out by M. Koenig, engineer, and M. Arendt, architect.

The plan of the chapel is a decagon of thirty-two feet eight inches in diameter, the opening to the lower story or crypt, being a hexagon. At the east end is a semicircular choir; at the west a Romanesque porch. The nave (if it can be so called) is lighted by five two-light windows, the choir by five simple lancets, filled with *grisaille* glass, the centre one bearing the arms of Orange-Nassau. Underneath the windows is a double arcade, the supporting columns bearing simple cushion capitals.

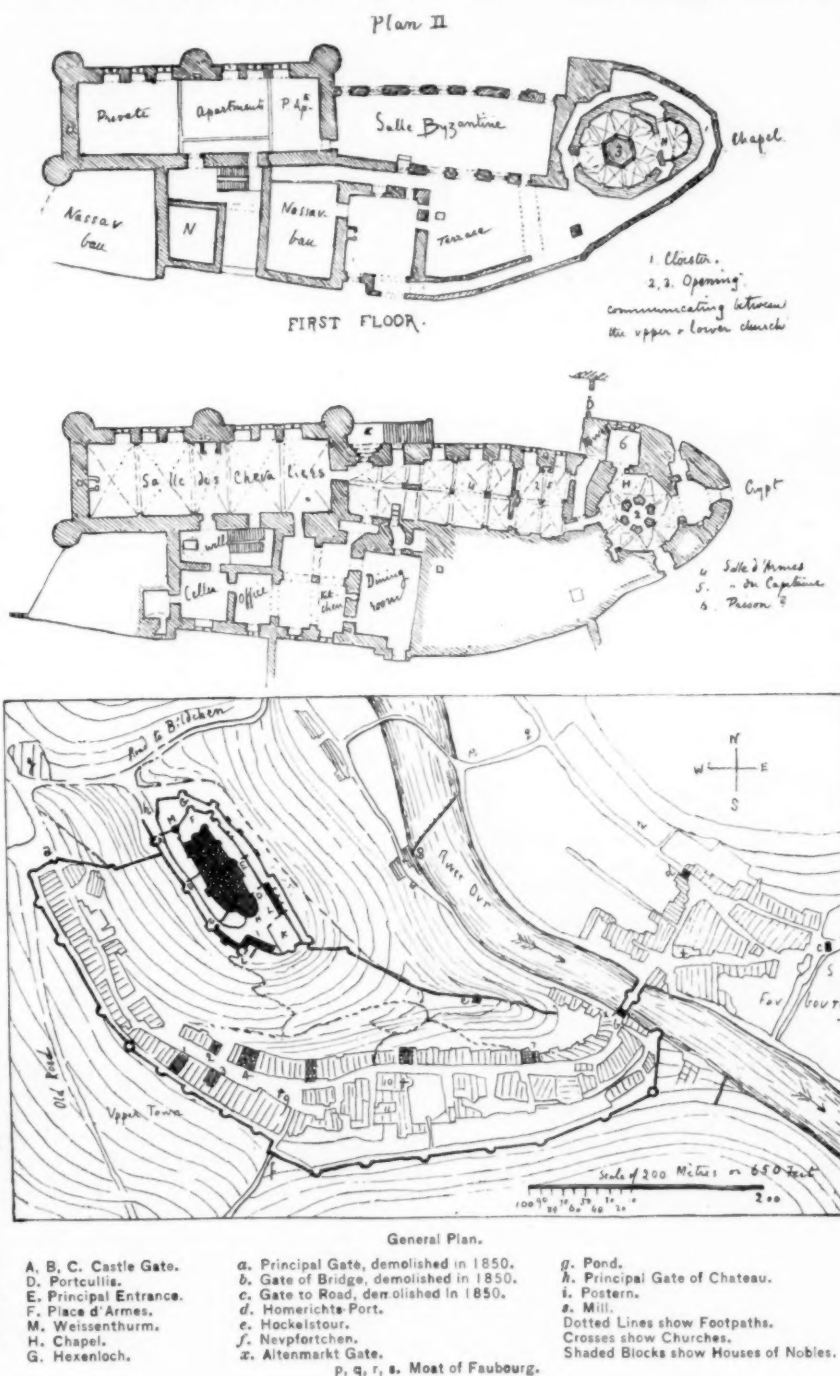
The opening (Plans II, III; 2, 3) connecting the two stories, is surrounded by a stone seat. The wagon-head vault is supported by clustered columns with foliated capitals. In the choir, the ribs of the vault meet in a central boss. There are various theories as to the origin of these double chapels; that the retainers (or prisoners) filled the lower story during the divine offices. The latter hypothesis is not improbable, as upon the same floor are what might have been dungeons; and tradition assigns to this part of the castle the prison of St. Yolande, who was confined by her mother for refusing a rich marriage, and who afterwards became prioress of the Dominicans of Marienthal. On the other hand the crypt may have been intended as the burial-place of Frédéric II, who built the chapel upon his return from the Holy Land. Frederic was the father of St. Yolande and a son who died in Palestine, and was founder also of the convent and church of the Trinitarians.

The bell of the chapel, now in the parish church, bears the following inscription: *Der Weil ist gegosen na Christus geburt do man schreic MCCCLXXXI im Jar.*²

As one walks through the pine woods upon the sloping hill, traces of the two platforms which surrounded the castle may still be seen. The walls, like those encircling the town, were turreted and supported by bastions; but only one tower remains, the Hockelstour (Plan I e). Here, in olden times, by day and night, a sentinel paced to and fro in the wooden gallery which then surrounded the tower; and so perfect a view of the valley does this outpost command,

¹ Mr. Ferguson says of this class of double chapel: "In castle chapels, where this method is most common, the upper story seems to have been occupied by the noblesse, the lower by their retainers, which makes the arrangement intelligible enough." Of other double chapels with an opening after the manner of Vianden, one may be seen at Eger in Bohemia, another at Landsberg, near Halle in Saxony; and a third at Freiburg, on the Unstrutt.

² During this time (the bell) was cast, in the year written 1481 after the birth of Christ.



General Plan.
A, B, C. Castle Gate.
D. Portcullis.
E. Principal Entrance.
F. Place d'Armes.
M. Weissen-thurm.
H. Chapel.
G. Hexenloch.
a. Principal Gate, demolished in 1850.
b. Gate of Bridge, demolished in 1850.
c. Gate to Road, demolished in 1850.
d. Homerichte-Port.
e. Hockelstour.
f. Neufortchen.
z. Altenmarkt Gate.
p, q, r, s. Most of Faubourg.
g. Pond.
h. Principal Gate of Chateau.
i. Postern.
s. Mill.
Dotted Lines show Footpaths.
Crosses show Churches.
Shaded Blocks show Houses of Nobles.

that it must have been well-nigh impossible for an enemy to approach Vianden by stealth. The tower now stands bereft of its gallery and its walls, but forms a picturesque object between the town and the castle. Nor is it a purely ornamental relic of the past, for it contains the bells formerly belonging to the parish church. Naturally Vianden would not be worthy of its reputation, if the devil were not known to haunt its precincts. There he sits, still watching poor Count Sigefroid and one of his friends from Falkenstein, who dare not leave their game of dice, lest the father of lies seize them. For did they not both swear by all the holy relics in the church, that he who first gave up the game should be taken by his Satanic Majesty? And so they go on, age after age, and the servant of the arch fiend waits patiently watching for his prey.

The roll of the counts who distinguished themselves in Church and State is a goodly one. Godefroid, in 986, was dean of the Abbey of Stavelot. Gérard, abbot of Prüm, founded the abbey of Nieder-Prüm, and governed the Abbey of St. Hubert, dying in 1212. The celebrated founder of Cologne Cathedral, Conrad de Hochstaden, was a son of the Countess Mathilde, and nephew of the reigning Count, Frédéric I. The archbishop laid the foundation stone of the great church in 1248, which is about the date of the chapel at Vianden; and all through the thirteenth century, there was free intercourse between the counts and the prelates of Cologne, which may account for the beauty of the architecture of the castle, which belongs to this period. In 1255, Philippe I founded a commandery of Knights Templars at Roth, a few miles off, which gave rise to squabbles innumerable until the suppression of the order in 1311, when all its land was turned over to the Knights of Malta. The church is of much older date, and is said to have a subterranean passage leading from the crypt to the château of Vianden, or the castle of Poschet. In the burial-ground is an old lime tree measuring nineteen feet in circumference, which is said to have been planted by St. Willibrord.

One of the archbishops of Rheims, Jean, formerly bishop of Théouanne, was a son of Count Godefroid II; and a brother of a canon of St. Lambert of Liège. But a more celebrated Vianden count was Englebert II, the favorite of the Emperor Maximilian. He was governor of Brabant, lieutenant-general of the Low Countries, and knight of the Golden Fleece. He accompanied Maximilian on his campaign against Luxembourg, and in 1483, was appointed governor of the province. He died in 1504, having bestowed many privileges upon the burgomaster and citizens of Vianden. The Renaissance monument erected to his memory in the church at Breda is said to be the work of Vincens of Bologna, and resembles the tomb of Sir Francis Vere at Westminster so much, that it was probably the model for the latter. The alabaster effigies of the count and his wife, Maria of Baden, repose upon elaborately carved mats; and over them is a slab bearing the count's armour, supported at the corners by four half-kneeling figures of Regulus, Caesar, Hannibal and Philip of Macedon. The counts of Vianden had become possessed of the barony of Breda through marriage, and of the principality of Orange by succession, their title being, in 1533, Counts of Nassau, Dillenbourg, Katzenellenbogen and Vianden, Prince of Orange, Seigneur and Baron of Grimberg, Breda, Diest, Sichene, Cuyck, Rumpst, Hoboken, Ingen, Leeck, Arlay, Noserooy, St. Vitti, Butgenbach, Dasbourg, Herstal, Viscount of Antwerp, Besançon, etc. Such were the titles of William the Silent, and of William III of England. It was the former who gave the citizens a charter to levy a tax upon wine, native and foreign, for the repair of the town-walls, the gates, the towers and bridge; but this must have been ineffectual, for his son Maurice was compelled to abolish all taxes as a bribe to the towns-people to pave the streets and keep the ramparts in a state of preservation. The modern parts of the castle called the Quartier de Juliers or Nassaubau, were built between 1617-20, during the occupation of Maurice or his elder brother.

The Vianden of to-day is not only shorn of its mediæval grandeur, but its population has diminished by half since the fifteenth century, when it numbered 3,000 citizens, inhabiting 400 dwellings.

SOPHIA BEALE.



THE BELT-LINE TUNNEL.—THE BALTIMORE AND WASHINGTON BOULEVARD SCHEME.—STAINED-GLASS AT ST. PAUL'S AND AT ST. THOMAS'S.

THE dream and the realization, or the promise and the fulfilment—the flattering prospectus and the finished result, or various other suggestive similar themes might be taken just now as very appropriate texts for “a well digested discourse” on several recent and important undertakings in Baltimore, either already far advanced toward completion or else only yet in process of discussion and in the stage of most illuſively brilliant coloring before the eyes of the most willingly blinded public, in

whom the natural faculty of gaining knowledge by experience seems to be totally absent.

For the last two years the whole city has been more or less disturbed—literally shaken up and down—physically, mentally and morally, by the notorious Belt-Line tunnel project, which the promoters claimed and the people accepted as a great scheme in the line of progress and improvement, a vast benefit to the city, and there are actually millions buried in it to bear fruit for somebody, but not, that we could ever discern for the city of Baltimore. In the starting of the project, it was placed before the public as preëminently a system of rapid transit for local traffic between different sections of the city, and only incidentally as a means of through traffic for a big trunk-line railroad. The impossibility and absurdity of the local-transit scheme always seemed to us too evident to admit of serious consideration, but all legal authority was quickly obtained and the work promptly begun and carried on. The actual result up to the present time has been that a large portion of one of the most important sections of the city has been kept in a continual state of disorder, discomfort and actual danger; streets have been torn up, or blocked off or rendered almost impassable; buildings have been either totally destroyed or rendered unfit for use, trade and traffic have been so interfered with that numerous suits at law have arisen in consequence, and a general widespread appearance of dirt and disorder pervades the neighborhood, while we hear no more of the benefits of the city's rapid transit, and the whole undertaking is tacitly accepted as a big railroad scheme, through and under Baltimore, between New York and the West by a corporation that has acquired possession of a large amount of Baltimore's property, which it intends to use as much to its own advantage as possible with no consideration whatever for either good or evil to the city, while the citizens either grumble feebly or, to save trouble, pretend to trust indefinitely that “some good thing” may come out of it in the end. Meanwhile they calmly march on to the next pitfall that lies conspicuously in wait for them.

Passing serenely through the ordeal of surface rapid-transit which, with cable and electric roads, is rapidly converting a large number of the pleasantest streets into thoroughfares uninhabitable for dwellings of the better class, or any quiet occupation in comfort—simply, in many cases, that rival lines may cut each others' throats—they are met by the brilliant chimera of the great “Baltimore and Washington Boulevard,” a proposed enterprise of vast dimensions, to which the local press, with vivid imagination, are just now devoting columns of description and recommendation. As long as three years ago the scheme was started in the newspapers with elaborate description in detail of this grand avenue-to-be, *forty miles long*, connecting the two cities; to be one hundred and fifty feet wide, laid out in the most attractive manner to accommodate the various kinds of light and heavy travel, and bordered by fountains and shrubbery on either side, amid which would stand charming villas—eighty miles of them—and the whole to be known as the “Columbian Avenue,” uniting Washington, the delightful residence suburb, to Baltimore, the great business centre, as one grand metropolis of several million inhabitants. The total cost was to be—completely finished, with all the suggested embellishments—\$2,000,000, or at the rate of about \$50,000 a mile, and it was to be completed in the present year of 1892. Such was the picture presented at the first inception of the scheme when one could almost see in the mind's eye the great forty-mile Boulevard, extending level over hill and valley in all its attractive features and thronged with its thousands of people, in all variety of vehicle, bent on both business and pleasure. But mark one point, it was only incidentally suggested that about thirty feet of the whole width might be devoted to some system of rapid transit. It all looked like a very fine thing, that everybody would be glad to have, and that everybody serenely assumed that *somebody* would develop in the very desirable manner indicated. Months pass quietly on and from time to time something is said or done that tells that the scheme is living and moving, but little by little we hear less of the “Boulevard” and the title of “Turnpike and Tramway Company” begins to creep in, and a “new competing line” is spoken of “to divide freight earnings with the Baltimore & Ohio and the Pennsylvania,” the “Boulevard” is now reduced to a width of sixty feet—not one hundred and fifty—with forty feet additional for a railway; but, “the tramway is to be built first,” to obtain it is claimed, facilities for construction. In short, our lovely “Boulevard” has vanished, and all that remains is a new railroad line of some, as yet, undecided motor, in the hands of the West Virginia Central Railroad—or the Baltimore Traction Company, already controlling about sixty miles of single track in the city and with millions of outside capital to back them—as a rival to the Baltimore & Ohio and the Pennsylvania for the traffic between Baltimore and Washington. And the wonder is why one should ever have anticipated anything very different from this, or could have ever admitted the possibility of such a Utopian scheme as that proposed, a forty-mile-long æsthetic avenue, extending through such a proverbially flat, sandy, unproductive, uninteresting and sparsely-settled tract of country as is the greater portion of that lying near the shores of the Chesapeake between the Patapsco and the Potomac. The absurdity of the idea seems to be its most conspicuous feature.

It is pleasanter to turn from such disagreeable facts—too important, however, to be neglected, as elements for good or evil in architectural development—and to note some incidents, specially relating to this great anniversary year, of a more harmonious and artistic

nature. This year is the two hundredth anniversary of the establishment of St. Paul's parish of Baltimore City and County, whose church stands, as a sort of modest cathedral, at Charles and Saratoga Streets, a fine brick Italian basilica, built by Upjohn nearly forty years ago, over the foundation of the previous structure, of much greater age, destroyed by fire. This old parish has always held a somewhat unique and important position in the community, asserting a sort of motherly jurisdiction over the other parishes of the city and county, and the formality is still to be followed of asking the permission of St. Paul's to establish any new parish within her precincts, as may be seen from time to time in the notices nailed upon the west door. In her register, lately systematically copied and revised, are found among the records of births, marriages and deaths nearly thirty thousand names, including a large proportion of those who have at some time been prominent in the State, many of families not specially connected with the Episcopal Church but belonging to other religious denominations. Her rectors have been few, not over a dozen in all, we believe, and not one, having been once established, has ever left the parish till removed by the hand of death. One, the Rt. Rev. James Kemp, became one of the early bishops of the diocese; his successor, the Rev. Dr. Wyatt, as associate and full rector, held the office for more than half a century, as mural monuments on the interior tell to us of this generation. It was proposed to commemorate this two hundredth anniversary by the completion of the tower—an unfinished campanile on the northwest corner—from Upjohn's original design, and also to deepen the chancel at the east end. The two projects, however, did not prove feasible at this time and several less formidable improvements about the building were substituted, among them two new memorial windows, designed by the Tiffany Company of New York; one of these is of special interest, both as to subject and treatment. It was given by the children of the parish in memory of Maryland's late very distinguished prelate, Bishop Whittingham, and the subject chosen was a reproduction of Ary Schaeffer's well-known picture of "St. Augustine and his Mother," the idea being a particularly happy one from the fact that the Bishop owed greatly the eminence he obtained in later life to the early teaching of his mother, a woman of much culture and strong character. The treatment of the window, with the light apparently falling upon the two figures from a point above the altar, to which they are gazing in wrapt adoration, is very successful, and the absence of all memorial inscription upon the glass itself, this being placed on a small brass plate beneath, is much to be commended.

Another ancient parish, that of "St. Thomas in the Garrison Forest," celebrates its one hundred and fiftieth anniversary this year in its old colonial church, lately enlarged and "restored" with the added good fortune of having Mr. Lafarge design a new triple window for the chancel, the subject being "The Ascension," the general treatment being chiefly inspired from a portion of his large fresco of the same subject over the altar in the Church of the Ascension in New York. As a piece of coloring and of religious conception this window is something for the artistic sense simply to gaze at and feel satisfied and thankful. It is, however, a beautiful thing in the wrong place; the details and simplicity of the old colonial building, with the sunshine, the bright sky and the foliage through the clear diamond panes of the other windows, make discordant notes.

Indeed it is rare when one begins to deal with the difficult medium of memorial windows that the result is all harmony, and in the church of "St. Michael and All Angels" an artistic crime has just been committed in colored glass, so absurdly atrocious that it would not be worthy of comment if it were not for the bigness of the abomination. One of the chief factors in the whole interior effect of the building are the three exceptionally large windows, or groups of windows, one each in the north, south and west ends. The treatment of the glass for these windows was of course a most important question. Mr. Lafarge had already given suggestions that would have been very beautiful, could have been gradually carried out as the means were obtained, and which did not have cheapness as one element in their favor, the spaces being fitted meanwhile with temporary glass of indifferent merit. Meanwhile, also, two influential men of the congregation, desiring to erect memorials to the members of their family, in one case without consulting the architect, in the other in the face of his most open and urgent opposition and remonstrance, have two of these great spaces filled with the most flagrant "chromos" of stained-glass design, elaborate and pretentious, false in form and color and method, and grossly violating nearly all the well-known rules for glass treatment now accepted by artists. Such action is an insult to either the knowledge or ignorance of the art-sense in a community. We withhold the name of the "artist" for whom in other respects we have a high regard.

Memorial glass is sometimes not without its humorous side also. Messrs. Tiffany & Co. have also lately put up a window in a prominent Baltimore church of more than average merit. It was given by two pious ladies in memory of a deceased relative, the subject chosen being "St. Luke, the Good Physician," and the sketch submitted showed the usually accepted representation of a man in the prime of life, standing, with his accustomed evangelical attribute of the Bull. The good ladies, however, had other ideas, and, having obtained somewhere an engraving of "St. Mark," they insisted that they greatly preferred an old gentleman sitting down, that they never liked bulls and always had rather a leaning toward lions. The argument waxed long and warm, and it required the united efforts

of the rector, a vestryman, an architect, Tiffany's representative and Mrs. Jamison's "Sacred and Legendary Art" to convince the ladies, against their will, and allow St. Luke to appear in a manner that he might be recognized.

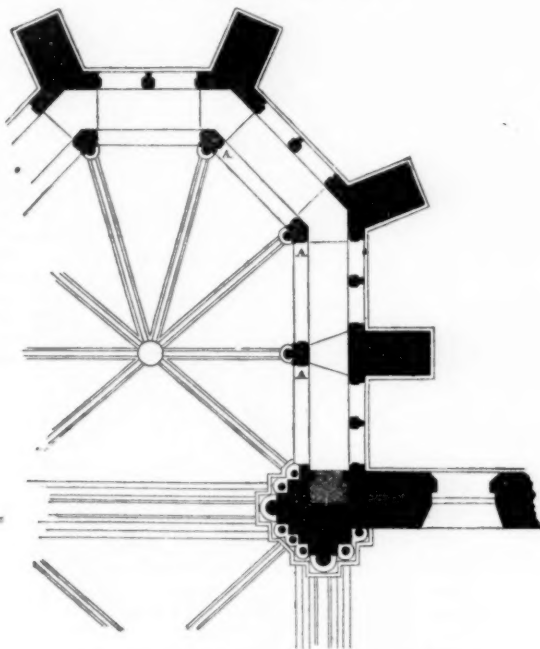
CONSTRUCTION.¹—XVI.

Fig. 86. Apse of the Church at Rieux on the Marne.

LET us examine then, in what the system of Champagne consists. We see it reaching its zenith in a little edifice on the Marne, the Church of Rieux, near Montmirail.

We first give (Fig. 86) half of the plan of the apse of this pretty church. It is seen that this plan strongly resembles that of the apse of Notre Dame at Dijon. But we are in Champagne, in a territory where materials of resistance and great size are rare; accordingly the small piers *A* are no longer composed of columns set against the stratum; they are groups of attached columns presenting a large enough section to be built in courses. Furthermore, these piers, instead of being tall, are short.

Let us now examine the apse at Rieux in the interior (Fig. 87); we see at *B* the cradle-vaults concentric to the wall-arches, extending towards them, circumscribing the windows and supporting the beams of the roof and outer cornice.²

Accordingly, here are two adjoining provinces, Burgundy and Champagne, both of which start from the same principle of construction. But in the first of these provinces, the materials adapted to masonry are abundant, hard and easy to extract in large pieces and the constructions partake of the qualities peculiar to Burgundian limestone; in the second, on the contrary, are found only beds of chalk or marl, of very little solidity and impossible to extract from the quarries except in small pieces; hence the architects regulate their mode of construction by the nature of the stone of their province.

The church of Rieux dates from the first years of the thirteenth century; its sculpture belongs almost to the twelfth.

Champagne is in advance of Burgundy and even of Ile-de-France, when it is a question of developing the principles of Gothic construction.

Already, the windows of the apse at Rieux are provided with mullions set against the stratum, while in Ile-de-France they are not seen until twenty years later and in Burgundy only about 1260.

The method indicated in Figure 87 for the construction of the vaults and the piers that support them, is applied in the apsidal chapel of the Church of Sainte Remy of Rheims, earlier by twenty years, at least, than the apsis of the church of Rieux; it is developed in the Cathedral of Rheims, in all the vaults of the chapels and of the great nave. (See "Cathedrale," Fig. 14, "Chapelle," Fig. 36).

Let us now return to the Cathedral of Auxerre and let us examine the advantage that its architect has been able to derive from the two methods, of Burgundy and of Champagne.

We give (Fig. 88) a view in the interior of the upper part of the choir; we have supposed one of the great windows removed, to show how the flying-buttresses sustain the vault and how the interior buttress is cut through at the height of the triforium and of the gallery above.

¹From the "Dictionnaire raisonné de l'Architecture Française," by M. Viollet-le-Duc, Government Architect, Inspector-General of Diocesan Edifices, translated by George Martin Husk, Architect. Continued from No. 877, page 44.

²M. Millet has had the goodness to sketch for us this charming little edifice, so very little known, the best type perhaps, of the architecture of Champagne at the beginning of the thirteenth century.

At *A* we perceive the cradle-arch fixed between the wall-arches and the archivolts of the windows; but, by a concession to the Burgundian system, this cradle-vault does not start as, in Champagne,

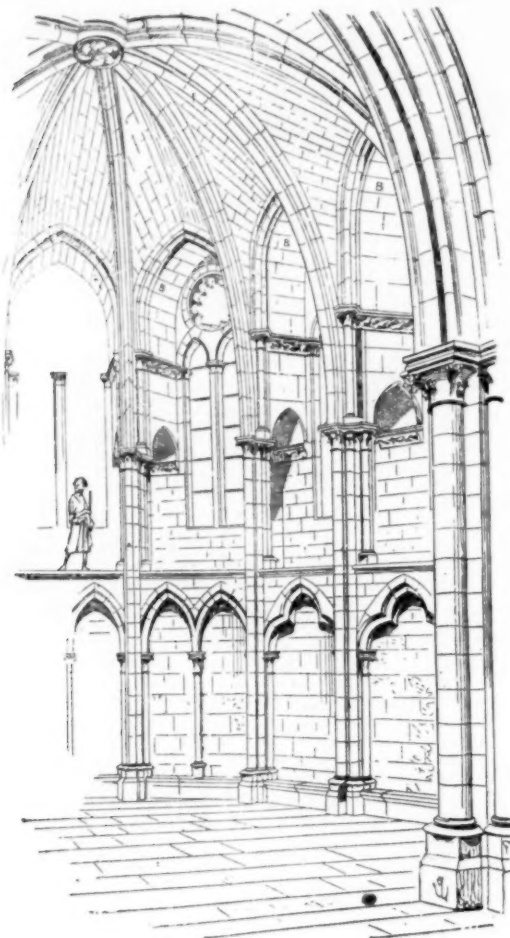


Fig. 87. Apse of the Church at Rieux on the Marne.

from the capitals *B*, but a little higher up from a lintel *C*, placed upon the sides of the interior buttress.

This cradle-vault is here fixed upon the extrados of the wall-arch, but it is independent; while, in the system of Champagne, the cradle-vault and the wall-arch are one, or, rather, the cradle-vault is simply a very broad wall-arch. The mullions of the windows are built in courses and not composed of columns and of sashes set against the stratum. We give at *D*, the horizontal section of the high pier at the level *E*; and at *F*, the section of the pier at the level *G*, of the triforium.

Following the Burgundian plan, these piers are set against the stratum for their entire height.

The cornice and water-channel above do not rest then upon a flagging, as in the aisles and in the chapel of the Virgin, of the same edifice, but upon the arches *A*.

The beams of the roof are laid upon the wall-arches.

The gutter above throws its waters upon the copings of the open-work that surmounts, weights and consolidates the flying-buttresses. These copings have enough resistance and thickness, and are firmly enough sustained by the open-work, whose upright positions are close together, so as to form an actual prop of stone opposing its rigidity to the thrust of the vault.

Figure 89 gives the exterior view of one of these flying-buttresses, very well built and well protected by the projections of the copings.

Let us leave, for a moment, the provinces of Champagne and Burgundy to examine how, during the same time (that is, from 1200 to 1250), the Gothic methods of construction had progressed in the French provinces Ile-de-France, Picardy and Beauvoisis.

One of the qualities peculiar to Gothic architecture (and, perhaps, its most striking one) is that one cannot study its form, appearance or decoration independently of its structure.¹

¹ We have often been called upon to defend the projects for restoring Gothic monuments, to give a reason for the expenditures, necessary and considerable, in order to save them from ruin. In the very natural hope of securing economy, people have often repeated: "Do only what is strictly necessary and leave to better times the work of finishing, carving and polishing, etc." The reply was difficult, for it would have been necessary to enforce a whole course of Gothic architecture upon the people who were giving us these suggestions to make them understand that in Gothic edifices everything has to be put together, that the stone is laid when carved and polished, and that, to speak accurately, one cannot build a Gothic monument while leaving anything to be done by those who are to come after us. From the point-of-view of art, is this a defect? Is it not, on the contrary, the highest praise that could be given to architecture to say,

One can deceive with the Roman architecture, because its decoration is only a garment, not always perfectly adapted to the object that it covers; but we cannot deceive with the Gothic architecture, for that architecture is, before all things, a construction.

It is chiefly in the edifices of Ile-de-France that we can show the application of this principle.

We have seen that in Burgundy, thanks to the excellent quality of the materials and to the possibility of extracting them in large pieces, the builders have been able to permit themselves a certain hardihood, which may pass for a feat of strength.

This fault could not be charged against the builders of Ile-de-France or their school. They are wise: they know how to keep within the limits imposed by matter and, even when Gothic architecture plunges into exaggeration of its own principles, they still preserve, relatively, that moderation which is the stamp of men of taste.

The valleys of the Seine and the Oise have excellent beds of limestone, but of a slight thickness when the materials are hard and of great thickness when they are soft; that is, at least, the general law.

All the front part of the cathedral at Paris was erected during the first year of the thirteenth century; as a construction, it is an irreproachable work. All the members of the immense western façade, on a scale superior to everything else that was built at that period, are exactly regulated by the dimensions of the materials employed. It is the height of the ledges of stone that has determined the height of all the parts of the structure.

Up to the present, in treating of the early constructions of the Gothic period, we have cited only edifices of moderate dimensions; now, the processes which may be sufficient when it is necessary to build a small edifice are not applicable when it is necessary to raise enormous masses of materials to a great height.

The lay architects of the thirteenth century, consummate workers, thoroughly understood this law, fallen to-day into oblivion, despite our scientific progress and our theoretical knowledge of the strength and the resistance of materials suitable for building.

The Greeks raised only small monuments, in comparison with those of the Roman period, or if, by exception, they wished to surpass the usual scale, it must be admitted that they have not subordinated the forms to this change of dimension. Thus, for instance, the large basilica at Agrigentum, known under the name of the Temple of the Giants, reproduces in colossal size the forms adopted in much smaller temples; the engaged capitals of that edifice are composed of two blocks of stone put together. To make an engaged capital by joining two stones set side by side, so that there is a joint in the axis of this capital, is an atrocity in principle. In the same monument, the colossi, who were probably set with their backs to

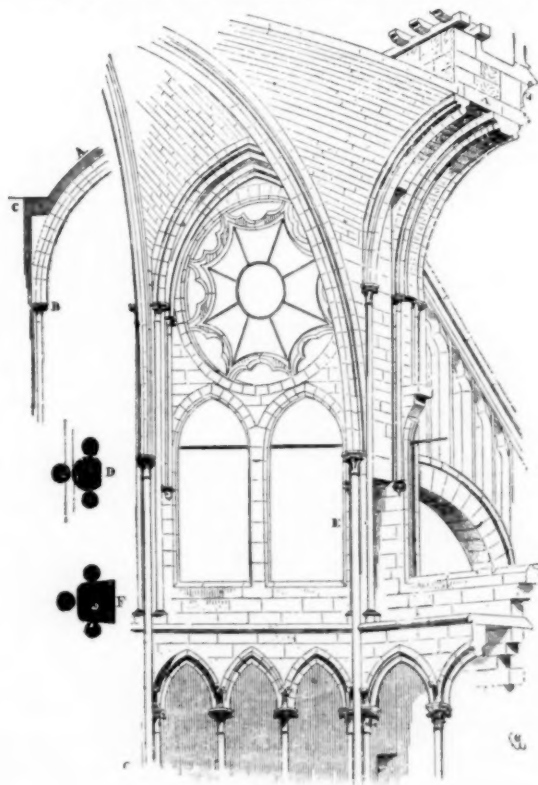


Fig. 88. Choir of the Cathedral, Auxerre.

the piers and formed the second inner row, are carved out of courses of stone so thin that their heads contain three pieces.

To make a statue, a caryatid, even if it be colossal, out of courses set one upon another, is likewise an atrocity for a true constructor.

after having proved it, that all which constitutes it is so intimately connected that its ornamentation is so truly part of its structure that one cannot be separated from the other?

The joints were hidden under a painted stucco which disguised the poverty of the work, very true; from our point of view, putting ourselves in the place of the Gothic builders, the ignorance of the principle is none the less evident.

But one must judge the arts by applying to them their own principles not the principles belonging to different arts. We are not bringing an accusation here against Grecian architecture; only we state a fact and ask that people will judge Gothic architecture by taking its own elements, its code, and not by applying to it laws never made for it.

The Romans have only one way of building, applicable to all their edifices, whatever be their dimensions: our readers already know that the Romans mould their edifices upon a form, or in a form and cover them with an envelope purely ornamental, which neither adds to, nor detracts from the solidity. That is excellent, that is reasonable; but it has nothing to do with Gothic construction, whose appearance is only the result of the structure.¹

Let us return to our point of departure. We were saying that the Gothic architects of the thirteenth century governed their mode of construction by the dimensions of the edifices that they wished to erect.

There is a law so simple that the whole world may understand it, without having the least idea of statics: namely, that given building stones having a surface 40 centimetres high, for instance, if we raise a pier 3.20 metres high with these stones, we shall have nine horizontal beds in the height of the pier; but if with the same materials we raise a pier 6.40 metres high, we shall have seventeen beds.

If each bed undergoes a depression of 1 millimetre, for the smaller pier the settling will be 9 millimetres, and for the larger pier 17 millimetres.

We must still add, to the depression resulting from the number of beds, the greater weight which adds a new cause of settling in case of the larger pier.

Accordingly, the more stones the builder piles one upon another, the more he increases the chances of settling, because of fractures or instability in the various members of his edifice, since, if his edifice increases in size, the materials are the same. These differences are not perceptible between edifices that differ little in their dimensions, or when one consents to put an enormous excess of resistance into the constructions; but if one is unwilling to put into the work more than the exact quantity of materials needed, and if, with the same materials, he desires to build a façade like that of a village church and one like that of Notre Dame at Paris, he will see the need of adopting special arrangements in the large edifice in order to ward off the singularly increased chances of settling, ruptures and consequent general dislocation.

We have already seen how the early Gothic builders had found a resource against settling and deformations, resulting in the use of stones set upright, against the stratum, to strengthen the higher piers built in courses.

We have also shown how, during the Romanesque period, the builders had enclosed a mass of rough stones between walls that kept on the outside the appearance of a structure in large facing-stones. The Gothic architects, having been able to show the inefficiency of that process and its lack of cohesion, substituted masonry of small facing-stones, and tried to give it resistance and especially rigidity by placing beside it large pieces of stone, detached and only connected from point to point, with the body of the structure, by courses set upon their bed and penetrating deep into that structure. With stones set against the stratum they made columns and with the connecting courses, bases, rings, capitals, friezes and bands. That is the origin of those arcades of the basement, those arrangements of pillars, set against the facings, and often even of the open-work which decorates the tops of the exterior buttresses or of the walls.

The façade of the cathedral at Paris furnishes us with fine examples of that mixed construction, composed of courses and of stone inlaid against the stratum, whose function is so plainly evident and which present such brilliant inducement for decoration. One must, it

is true, have been called upon to analyze these constructions, in order to recognize their practical meaning; nothing is simpler in appearance, as a structure, than the enormous façade of Notre Dame at Paris and this is one of its excellences. In seeing such a mass, one does not suppose that it is necessary to employ certain artifices, studied contrivances for giving it perfect stability. It seems enough to have piled up courses of stone from the base to the summit and as if that enormous mass ought to maintain itself with its own weight. But, we repeat, to build a façade 20 metres high and to build one 69 metres high, are two different operations; and the façade of 20 metres, perfectly solid and well combined, might not, if its dimensions were tripled in every way, be able to stand upright. These are laws which practice alone can teach. There is no need of making intricate calculations to understand, for example, that a pier whose square horizontal section gives 1 metre of surface and whose height is 10 metres, gives 10 cubic metres resting on a surface 1 metre square; that if we doubled the height of the pier, and likewise its width and thickness, although the ratios between its height and its base are similar to those of the first pier, we obtain a surface 2 metres square, (or containing 4 square metres) and a solid of 80 cubic metres.

In the first case, the ratio of the surface to the solid is as 1 to 10; in the second, as 1 to 20. The ratios of the weights to the surfaces are hence augmented in a proportion increasing as the scale of the edifice is augmented.²

This first elementary rule being established, there is presented in the construction of very large edifices, a difficulty which will again augment the effect of the weights produced by the increase in volume.

If the materials do not go beyond a certain height, their dimensions in length and width are equally limited; and it results that, if we can raise, for instance, a pier having a metre of surface in its horizontal section, by means of courses made each of one block of stone, it will not be the same when the pier has 4 square metres in its horizontal section, for we cannot procure courses of that size. Hence, in enlarging the scale of an edifice, on one hand, we change the ratios between the solids or weights and the surfaces, and, on the other hand, we cannot obtain such complete homogeneity in the constituent parts. This is a new cause for rupture — for dislocation. To avoid the danger arising from too great a weight resting upon too small a surface, we are naturally led to enlarge that surface at the base, being at liberty to diminish it in proportion as the structure rises, and as the weights consequently become less.

The type most nearly approaching this principle is a pyramid; but a pyramid is a heap of stones, not a construction.

Let us suppose a tower built on four walls, and shown in cross-section in Figure 90. We have given to the walls at the base a

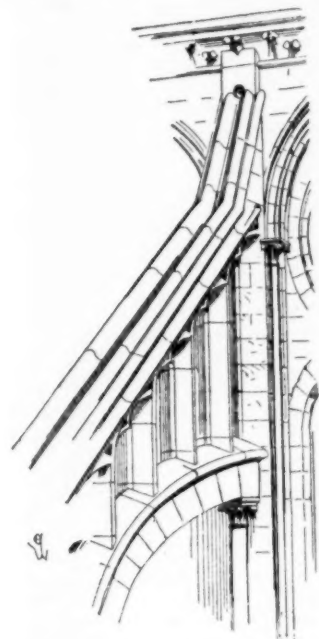


Fig. 89. Flying-buttress, from the Cathedral, Auxerre.

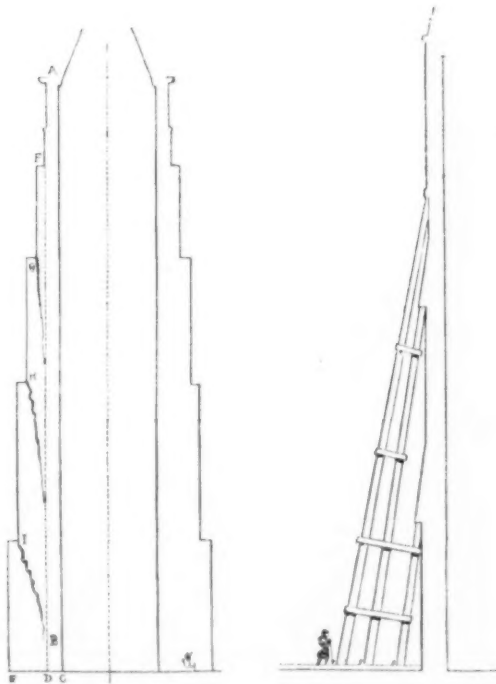


Fig. 90.

Fig. 90b.

thickness sufficient to resist the pressure of the upper portions, and, as much to reduce that pressure as to keep from piling up useless

² Now, we have sometimes met architects who were greatly surprised to see the piers of their churches breaking down under the weight and who said: "But we followed exactly the relative proportions of such an edifice and used materials analogous as to resistance. Gothic construction really presents no security." One might reply, "No security it is true, if we wish to enlarge or reduce the scale while preserving the relative proportions. Gothic construction demands that people shall take time to study it and learn its principles and the Gothic architects were wicked enough to invent a system of construction which, in order to be applied, must be studied and reasoned out."

¹ We shall perhaps be accused of repeating ourselves in the course of this work; but the prejudices against which we must contend are only the result of error, or of false valuations repeated with rare persistence. In such a case, truth, in order to show its claims, has no choice but to use the same tactics.

materials, we have gradually reduced the thickness of these walls, accordingly as our structure has risen. But, plainly, all the weight *A B* rests upon the surface *C D*, and if the additional weight *D E F* is not perfectly united with it, and does not form a whole with the load *A B*, from top to bottom, since the most important settling must take place from *A* to *B*, fractures will occur, first at *I*, then at *H*, then at *G*; this increment of weight *D E F* that we have added, will do more harm than good and since all the pressure will then bear effectively upon the surface *C D*, the inner facing of the wall will give way. If our tower is not very high, it will be easy for us to fasten together perfectly, by means of long stones, the outer facings of those within, to make a homogeneous structure, and hence it will be really the base *C E*, which will carry all the weight; but if our tower is very high, if its size is colossal, whatever precautions we may take, since the structure must consist of a considerable quantity of stones, we shall never be able to fasten the two facings together firmly enough to resist that difference of pressure exerted on the interior and exterior; our masonry will come apart and the effects just noted will be produced. We must hence use some artifice. We must bring it to pass that the outer facing, less heavily weighted, shall present a rigidity greater than that of the inner facing, and that

stronger pressure is exerted upon the inner facing (whose intersection with the projecting jambs of the bays at different heights is shown by the dotted line *A B*) than upon the exterior facings of the piers, and although, because of this pressure, a perceptible settling can be seen in the interior, nevertheless, since all the weights are transmitted, by the arrangement of the blocks of stone sunk in the thickness of the filling, and fastened by cramp-irons at different heights, onto the outer facing and since they form, as indicated in Figure 91*b*, a series of angles like the teeth of a saw, the weight *C D* rests upon the base *E F*, the weight *E G* rests upon the base *I K*, the weight *I L*, upon the whole base *M N* and thus down to the base of the pier.

But since, in fact, the depression must take place between the points *E G*, *I L*, *M O*, and *P R*, it results that the projections *G F*, *L K*, *O N*, *R S*, rest their angles *F*, *K*, *N*, *S*, very heavily upon the outer facing *V*, and since this undergoes less depression than the inner facing, being less heavily weighted, it fills the office of the prop that we indicated in Figure 90*b*.

(To be continued.)

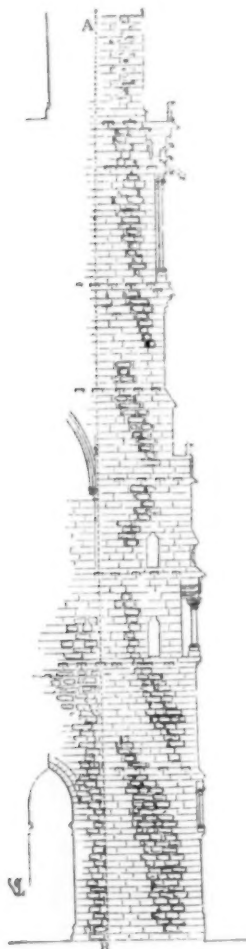


Fig. 91.

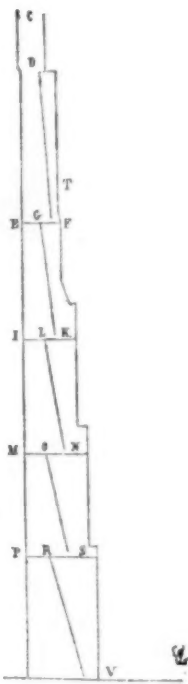


Fig. 91*b*.

at the height of each point of retreat there shall be a very strong connection with the body of the structure.

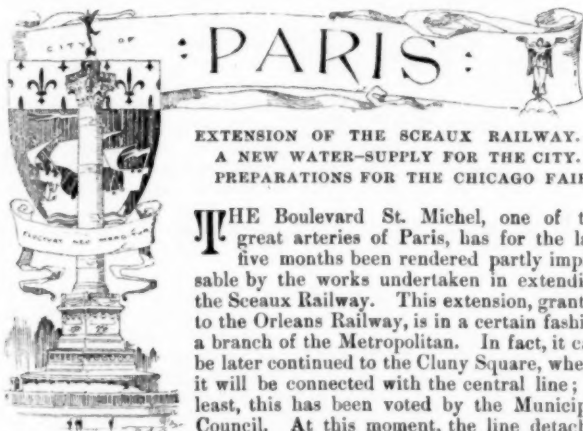
In other terms, the outer facing must prop the body of the masonry and produce the effect seen in Figure 90*b*.

Now, this is not easy when we have only stones nearly all of the same size. Still, the architect of the façade of the cathedral at Paris has reached this result by a very scientific and well planned arrangement of his structure. He has begun by establishing each tower, not upon filled walls, but upon piers (see plan of the cathedral of Paris under the word "Cathedral") for it is easier to give homogeneity to the structure of a pier than to that of a wall.

These exterior and interior piers are built in courses of hard stone, regular, carefully levelled, enclosing an excellent mass and consisting of large stones sunk in thick mortar.

The interior pier is buttressed in every direction, since it is interior and it carries a vertical weight; but the exterior piers, whether at the front or the sides, have had to be supported by a strong base. Now, the whole structure is well faced in long stones, within and without, and from the basement to the shaft of the towers, the supports are built as indicated in Figure 91.

The result of the method employed is that, although a much



EXTENSION OF THE SCEAUX RAILWAY. —
A NEW WATER-SUPPLY FOR THE CITY. —
PREPARATIONS FOR THE CHICAGO FAIR.

THE Boulevard St. Michel, one of the great arteries of Paris, has for the last five months been rendered partly impassable by the works undertaken in extending the Sceaux Railway. This extension, granted to the Orleans Railway, is in a certain fashion a branch of the Metropolitan. In fact, it can be later continued to the Cluny Square, where it will be connected with the central line; at least, this has been voted by the Municipal Council. At this moment, the line detaches itself from the Sceaux line a little before it enters the present railway station, to bury itself almost immediately under the Place Denfert-Rochereau, and follow a route underground below the Rue Denfert-Rochereau, the Avenue de l'Observatoire and the Boulevard St. Michel as far as the Carrefour Medicis, where will be found later the new terminal station. The length of the line is about 1,700 metres, the minimum radius of curvature is 250 metres, and the grades do not exceed .016 metres. The normal type of the tunnel has a width of nine metres between the walls, and a height of six metres between the rails and the keystone. It is wholly built of rubble laid in cement. The arch, which has a radius of 4.80 metres, has a rise of 3.13 metres, and a thickness at the key of 0.65 metres. As to the side walls, they have a thickness of 1.40 metres, and are connected with one another by a concave, inverted arch, which supports the *dalot*, or small drain, the ballast of river sand and the two tracks. Niches are arranged in the wall every twenty-five metres, to serve as refuges and to assure the security of examination. In places where height is absolutely insufficient, stone vaulting is replaced by a metallic shield with a lining of brick and cement.

Works so considerable as these necessitated, as can be seen, the displacing of sewers, water-conduits, gas-pipes, etc., which run in every direction beneath the streets. These modifications, which are to-day well advanced, have been effected without very seriously interfering with traffic. Yet the tramways, which used to occupy the centre of the boulevard, have been forced over onto the side-walks, and pass along in front of the shops and stores, causing great wrath in the bosoms of the lessees, whose trade has been materially interfered with. The different works, although interesting, nevertheless present nearly the same difficulties as the construction of the line itself, which has been carried out in accordance with the following programme:

The walls of the tunnel were, in the first place, built in trenches guarded by sheet piling — trenches not different from those in which drains are ordinarily laid, except in the particular of their excessive depth — they reach a depth of eleven metres at certain points. Once these walls finished, an intermediate cutting was made, while retaining a mass of soil trimmed to the interior profile of the arch, so that it could be made use of as a centre. This surface was carefully prepared and covered with a layer of plaster, on which the arch stones were laid. These, in turn, were covered with another coating of cement and a second layer of bitumen. The cutting away of the interior mass of soil will be done later, as soon as the exterior work is finished.

In certain portions the vault is built at two times. The first portion consisted in finishing a certain length in two parts, the first slightly greater than half the span. Earth is then filled-in again over this half-vault, and the roadway is restored, so as to allow of the renewal of circulation. Then the cutting is made for the second portion, and the vault finished.

The greatest difficulty encountered in all this has been due to the fact that the new road must be built over the ancient quarries, which are to be found under a great portion of the left bank. The ceiling of these quarries is to be found at a depth of from two to twenty-two metres beneath the projected track. In the portions where there is sufficient resistance, they have contented themselves with prolonging the walling of the tunnel down to solid ground; but, in those portions where the old fillings-in are defective, and have caused settlements, they have been compelled to sink, from distance to distance, blind wells, which have been continued down to the bottom of the quarry pits. These have been filled up with masonry, and connected with one another by small vaults. These indispensable works of consolidation have cost over 200,000 francs.

The road-bed of the Sceaux Railway, which was originally intended to have a tread of 1.75 metres, has been reduced to the normal tread of 1.44 metres. The new line will, therefore, have the ordinary construction. The rails, eleven metres long, are double-headed, weighing 42.5 kilogrammes per running metre. Each pair of rails rest on fourteen ties. The engines are to condense their exhaust steam. There will be no particular precautions taken, except at the Luxembourg terminal station, where a powerful ventilator will exhaust the vitiated air and discharge it into a huge chimney extending above the neighboring habitations.

The cost is estimated as follows:

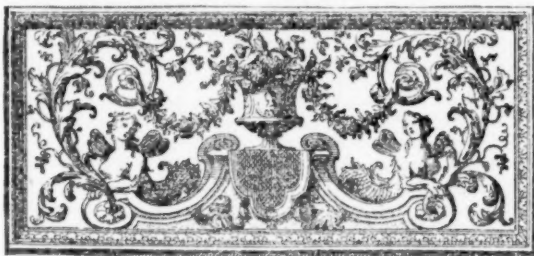
Acquisition of site for the Luxembourg Station.....	1,450,000 francs.
Streets, sidewalks, sewers, water and gas pipes, and tree setting.....	763,000 "
Earthwork and construction.....	4,643,000 "
Way and fixed material.....	250,000 "
Stations.....	523,000 "
Ventilation.....	147,000 "
Telegraph line.....	5,000 "
Total.....	7,781,000 "
Interest and general expenses.....	934,000 "
Grand total.....	8,715,000 "

or, 5,127 franc per running metre. These works, although carried out with great speed, will take about two years for their completion.

I have spoken in a former article of the law proposed by M. Raspail, Deputy, relative to the construction of a canal through which the present contents of the sewers should be carried to the sea. This proposed law has been the object of a very interesting discussion in the Chamber of Deputies, to which I may have occasion to return, and in the course of which M. Proust, Inspector General of the Sanitary Services and Commissioner of the Government, undertook to defend the City of Paris, which had been keenly attacked on the score of hygiene. Now, according to M. Proust, we should have at this time in Paris, without speaking of the water used for public service, that is, merely the water used for private purposes, 150,000 cubic metres of spring water, and in another year we shall have 100,000 more. This very respectable increase will be furnished by the waters of the Avre, whose head-waters have been secured. The chief canalization of the waters of the Avre where it leaves the reservoir is composed of tubes of sheet steel riveted together with a diameter of a metre and a half and a thickness of 0.012 metres. Each joint has a length of six metres and weighs about 3,000 kilogrammes. The laying of these pipes, because of their weight and dimensions, presented peculiar difficulties, which have been ably overcome by the contractor for the work by the aid of three pieces of apparatus: the trolley for transporting the pipes, an especial apparatus which enabled them to make the joints with ease and a small electric locomotive. The pipes are lowered to their bearings through an excavation seven metres in depth by means of a windlass. They are placed on girders attached to the trolley, and the little locomotive at once hauls the wagon and pipe to the point where the last length was laid. In the interval between the return of the empty car and its loading, workmen make the joint, which is formed by a first ring cylindrical on the outside and conical within and clasped between two other rings which are grooved so as to receive a ring of india-rubber. The exterior rings are kept in place by bolts. In this way about sixty metres of pipe can be laid each day, and this rapid performance gives rise to the hope that next summer Paris will be abundantly provided with spring water, and that our municipal councillors will no longer be obliged to distribute the water of the Seine to each Arrondissement in its turn.

People are busy in Paris preparing for the Chicago Exhibition. All the French committees are working earnestly at their installations, which must be finished by the month of January and forwarded, ready to be set up, to Chicago. Several classes are making great sacrifices to be worthily represented in America, and the clothing interest particularly promises to display a luxury and elegance which are altogether Parisian. At the Trocadéro they have begun to take castings which shall represent in their smallest details façades and other portions of the finest monuments in France, all to be sent to Chicago. Five of these works, among others the Porte de Toulon, with the caryatides by Goujon, and the rood-gallery of the Cathedral of Digne are finished. At the present moment a casting is being taken from the north transept of the Cathedral of Bordeaux, which is a perfect marvel. The forwarding of these works of art will take place about the middle of the month of November.

SEA-WATER FOR STREET-WATERING AND SEWER-FLUSHING.



Designed by Daniel Marot. From *Der Formenschatz*.

MR. JOHN WILLIAM COCKRILL, A. M. I. C. E., has been borough engineer and surveyor for the town of Yarmouth, England, since 1869, and, in a paper lately presented to the Institution of Civil Engineers, he details his experience in the use of sea-water for various purposes as above indicated. This paper is here abstracted as follows:

The whole borough has a population of about 50,000, is situated on the river Yare, two-and-one-half miles from the sea, and sea-water has been used continuously since 1869 for street-watering. The town site is flat and narrow; the sewage is delivered directly into the river by short lengths of sewers with gradients ranging from 1 in 200 to 1 in 400; 1 in 500 being the flattest, and the water-supply is private, and the management and supply good. In 1882 the sewers were found to be in a bad state, and about thirteen miles of them were relaid, especial care being taken to have them tight and well ventilated. Automatic siphons or flushing-tanks to the number of fourteen were also put in, ranging in capacity from 1,600 to 3,000 gallons. The first six of these tanks were served from the water-mains through a low-pressure meter delivering 200 to 300 gallons per hour to each tank. A movable iron flush-tank of 3,000 gallons capacity was placed over the head of the sewer, and could be emptied in one minute.

This system of flushing worked well, and kept all the sewers, old and new, in good condition. Previous to 1877 the water had been pumped from wells close to the river, and was as salt as the river itself. But this system of water-supply became expensive when the flushing system was introduced, and in 1884 the author prevailed upon the authorities to lay a complete set of mains for street-watering and sewer-flushing, at a cost of about \$22,500.

There was some opposition to this scheme, and delay followed. In 1885, the Local Board obtained from two eminent chemists their opinions on the desirability of using sea-water for watering streets and flushing sewers, with the following results: First, as to its use on the streets. There is no doubt that the street remains damp for a longer time than if fresh water were used. But its use is not to be recommended, says the committee: "1. Because the road, in drying, we are given to understand, becomes very slippery and dangerous. 2. Because the salts present in sea-water are very hygroscopic. Hence, in the case of delicate goods (such as silks, jewelry, etc.), injury is certain to arise from the dry dust blown about on a dry day and settling on these goods, becoming damp when the air contains a more than usual quantity of moisture. 3. Because the occurrence of nuisance from the action of the brine on the organic matter on the road and in the subsoil is certain to be complained of."

As to its use for flushing sewers. "Its use is inadvisable: 1. Because the solvent action of salt water on organic matter is very inferior to that of fresh water. 2. Because, where organic matter is in a state of solution in fresh water, the addition of brine (sea-water) will effect the precipitation of the organic impurities. 3. Because (it follows as a consequence of 1 and 2), if salt water be used for flushing, the quantity of suspended matter will be increased, and the deposit in the sewers likewise increased. 4. Because sea-water has an energetic action on metals and cements. 5. Because the sulphates, which are present in large quantity in sea-water, are certain to be reduced by fermentative action, while from the resulting sulphides any acid will generate sulphuretted hydrogen. Thus the nuisance arising from flushing sewers with sea-water may be considerable."

The experts, in conclusion, said: "We are strongly of opinion, therefore, that it is most undesirable to use salt water, either for road water or sewer-flushing, on the two-fold ground of injury to property and injury to health."

After this opinion was given, an inquiry was held before Mr. Codrington, M. I. C. E., by order of the Local Board, and Mr. H. P. Boulnois, City Engineer of Liverpool, gave evidence in favor of the scheme, with the final result that the work was carried out on the author's plans. The plant included an 8-horse-power Otto gas-engine operating a pump of 25,000 gallons daily capacity; a brick tower, 44 feet high, carrying a 23,000-gallon tank; an 18-inch pumping-main 700 feet long to the tank, and a distribution system of nine miles of three to seven inch iron pipe, coated with Dr. Angus Smith's composition. The hydrants, 42 in number, are not over 800 feet apart, and 40 valves, of three to six inches diameter, were put in for sewer-flushing. After three years' trial, this system was

extended to the portion of the borough on the other side of the river, at a total cost for the salt-water supply to the town of \$35,000.

It should be stated that, before the first scheme was submitted, the author wrote to the engineers and surveyors of a number of sea-side towns, and the following gives, in a condensed form, the information which he was then able to lay before the Council with the original scheme:

Birkenhead.—“One spread of salt water on the surface of a street or road is equal to about three spreads of fresh water, as the latter, under the heat of the sun, evaporates; whereas the salt water leaves a crust on the surface, and keeps down the dust for a considerable time. We have not yet flushed our sewers with salt water.”

Hastings.—“Sea-water has been used in this town for some years for street-watering and sewer-flushing, and no inconvenience has been found to arise. There is, perhaps, rather more mud on the roads during the autumn, but, on the whole, I believe that sea-water has a sanitary effect on both roads and sewers.”

Worthing.—“Many of our streets are watered with sea-water, and have been for years. The effect upon roads is to bind them together almost like cement; dust is never seen on these roads when dry, and sea-water keeps damp at least as long again as fresh water. Such an argument as sea-water acting upon sewage so as to make it offensive is simply absurd.”

Eastbourne.—“We thought of using sea-water some years ago, but, as there was a general objection to it, we gave it up. From what I have seen of its use, my opinion is that it materially assists the solidifying of a road.”

Brighton.—“We do not use sea-water for street-watering, but we use it for flushing our main intercepting sewer, and, if used in sufficient volume, it is not offensive.”

Blackpool.—“This corporation has used sea-water for street-watering and sewer-flushing for some time, and I find no complaints arise whatever; but sea-water makes sett-paving slippery.”

Ryde.—“I can state confidently, after thirty years' experience in the use of salt water for watering roads, that, so far from deteriorating macadamized roads, it hardens the surface—so much so, that during the recently dry summer, we found that in streets with a gradient of 1 to 12, when it was necessary to water a second time in the day, we were compelled to use fresh water, otherwise the streets would have become too slippery. Doubtless, after a long course of salt water on a level road, when rain first comes, the surface will be a little dirtier than if fresh water had been used. We find it pays to use salt water where a load of water costs twice as much as fresh. With reference to flushing sewers, I am disposed to think that the contention of your water company is right, but in this matter I have had very little experience.”

Rhyl.—“Sea-water will not injuriously affect macadamized roads, but have a good effect.”

Torquay.—“I have used sea-water for street-watering upon macadamized roads for several years, and do not find any inconvenience; but, if there is any difference between salt and fresh water, I think the salt water is preferable. I do not use salt water for flushing, except very rarely in the low level, and then I do not find any smell more offensive than at other times.”

Margate.—“Had no special means of raising salt water, and so gave it up; when used, one load went as far as three loads of fresh water.”

Plymouth.—“All the low levels are watered with it; consider that two loads of fresh water are not equal to one of salt.”

South Shields.—“One load of salt water equals four loads of fresh.”

Tynemouth.—“Has a very good effect upon street surface, as it hardens the surface of macadamized roads; we use it for watering, flushing and baths.”

Barrow-in-Furness.—“Use salt water for street-watering; when fresh water used, it took twice the quantity.”

Ilfracombe.—“Used sea-water formerly, and contemplate doing so again. It retains its effect twice as long as fresh water, and it is very binding.”

In addition to the foregoing, the following opinion of Mr. H. P. Boulnois may be quoted: “Watering the streets with sea-water should be adopted wherever it is feasible, as it not only gives a delightful freshness to the air and dispels iodine, but it also causes the surface of the street to maintain its humidity for a longer period than when fresh water is used, as it impregnates the soil with hygro-metric matter. This has been often attempted artificially by adding common salt to the water used for watering.”

The general results may be stated as follows: Since the construction of the works, the consumption of water for street-watering has been, annually, less than 5,000,000 gallons, at five cents per 1,000 gallons, instead of 7,000,000 gallons at twenty-four cents per 1,000 gallons, as before. There is also a considerable saving on the gravel and flint for macadamized roads, and the author believes that these roads can be maintained for about fifteen per cent less than when fresh water was used. The salt water does not seem to hurt them in any way. During the summer months the dust is kept under by the qualities of salt water, and in the early autumn, if the surface coating is removed by the broom upon the appearance of the first frost, no evil effect is traceable to the use of salt water. No complaints are made by shop-keepers, jewellers, etc., and the three reasons urged by the committee of chemical experts have given no cause for anxiety.

Used in sewer-flushing, salt water has cleaned them thoroughly, and, after five years' experience, no nuisance of any kind has followed. Its effect in the Yarmouth sewers has been to reduce and almost prevent the generation and accumulation of sewer-gas. Sewers can now be entered at once on the removal of the man-hole cover, which was not the case before. An 18-inch pipe sewer on a gradient of 1 in 300 was formerly constantly clogged by deposits; it is now kept thoroughly clean by two flushes per day from a 3,000-gallon tank, which fills the sewer two-thirds full. There are no deposits of any sort in the sewers, except in several of the larger ones, and there it has been reduced one-half since salt water has been used. As to the effect of salt water on iron, the author says that the siphons are of galvanized sheet-iron only, but they have required no repairs since they were put in. As to the sulphates in sea-water, no evil effects are traceable; the town possesses no manufacturing, and no acids are discharged into the sewers.

The salt water has never been used for extinguishing fires, though it is available if needed. The author does not recommend it for this purpose, as he considers that a dwelling would not be habitable after its walls had been saturated with sea-water. It is used for private baths with satisfaction to the users. Mr. Cockrill concludes by commending the use of salt water for the purposes stated, and thinks that a supply of 40,000,000 gallons a year could be raised and distributed for from four cents to eight cents per 1,000 gallons, resulting in a great saving, as compared with the use of fresh water. — *Engineering News*.



[Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

HOUSE OF COL. J. MASON LOOMIS, CHICAGO, ILL. MR. FRANCIS M. WHITEHOUSE, ARCHITECT, CHICAGO, ILL.

[Heliochrome, issued with the International and Imperial Editions only.]

THIS building on the Lake Shore Drive has the advantage of facing not upon the drive itself, but upon the open lot which the owner prudently secured for his own enjoyment. One peculiarity of this disposition is that as the stable fronts the drive, but with the open space between them, the grooms and stablemen have a more enjoyable outlook than the owner has.

THREE DESIGNS FOR A TOMB SUBMITTED AT A COMPETITION OF THE DENVER ARCHITECTURAL SKETCH-CLUB.

THE W. BAKER & CO.'S CHOCOLATE PAVILION FOR THE WORLD'S FAIR, CHICAGO, ILL. MESSRS. CARRÈRE & HASTINGS, ARCHITECTS, NEW YORK, N. Y.

HOUSES FOR M. H. BIRGE, BUFFALO, N. Y.; FOR L. HAMMOND, ALLSTON, MASS. AND FOR MRS. J. D. PARKER, CAMBRIDGE, MASS. MESSRS. CRAM & WENTWORTH, ARCHITECTS, BOSTON, MASS.

DETAILS OF THE VAN RENSSLAER MANOR-HOUSES, ALBANY, N. Y. MEASURED AND DRAWN BY MR. G. F. CRUMP, ALBANY, N. Y.

[Additional Illustrations in the International Edition.]

LOGGIA OF THE HÔTEL D'ECVILLE, CAEN, FRANCE.—I. FACADE; II. PLAN OF THE HOTEL AND DETAIL OF THE CEILING; III. DOOR. DRAWN BY ARTHUR ALEXANDER STOUGHTON, PARIS, FRANCE.

[Three Copper-plate Photogravures.]

CAEN is one of the French towns where an architect can spend an indefinite period in sketching, measuring and studying.

Few towns can rival it in the number and excellence of monuments of all the styles. All its monuments are *chefs d'œuvres*; the Abbaye aux Hommes and Abbaye aux Dames, are notable examples of northern Romanesque; the half-dozen Gothic churches are models of their style, possessing a type of spire noted for its originality and beauty; of the Renaissance the apse of St. Pierre is as splendid a piece of religious architecture as any in France, while Caen possesses a series of Renaissance houses of the greatest beauty.

These town abodes of the rich commoners vie in splendor and fineness of design with the château of the same period, and it is interesting to study the correspondences and differences between the two sorts, due to the requirements of town and country houses built for proprietors having a like appreciation for the arts and a common desire to imitate the magnificence of their sovereign. Instead of the avenues of approach, the moats and draw-bridges, the former present a dignified but not too ornamental façade to the street and the town, keeping the richness and display at home to be lavished on the *cour*

d'honneur. Here are seen the arcades; the staircase towers, surmounted by open lanterns; the rich cornices and crestings; the lacework dormers, and all the wealth and originality of carved detail, that exist in the château. Of those that remain in Caen the Hôtel d'Ecoville is the most complete, the most congruous in style, and the most charming in mass and detail.

This house was built in 1538 by Nicholas Le Valois, seigneur d'Ecoville. The architect's name seems to have been Blaisé Leprestre. Remaining for many years in the founder's family, it finally changed hands, was used at one time as the hôtel de ville, and is now in a neglected state, being divided up into lodgings; part being kept for a bourse. It is composed of a body of buildings disposed about a square court; the façade, on the Place St. Pierre, opposite the beautiful church of that name, though simple, was originally an agreeable composition of two stories of windows, surmounted by a row of dormers. In the middle the entrance to the court formed a feature, emphasized above by a dormer motive containing a figure on horseback. The façades of the court opposite the entrance and on the right are the best, the other two being less elaborate and having been altered from their original form. On the right between the windows are three remarkable features, consisting of slender columns with pedestals and niches between containing archaic figures of Judith and David with, in the second story, panels of figures and heraldic forms, while the lines terminate in the roof in elaborate dormers. The other façade which contains the entrance, continues the motive of two stories of windows with entablatures and slender columns and all the complement of beautifully varied capitals, fine mouldings and charming detail, the composition completed by a fine dormer.

The entrance forms the feature of the right-hand part of this façade, and is shown in our plates. It consists of a loggia of two arches raised a number of steps above the court level, giving access at right and left to the principal rooms on the ground-floor, and leading to the upper stories by a large circular stone staircase, built around a newel. Above the roof the staircase is covered by an elegant open lantern of columns and arches supporting a dome. In the second story the loggia is repeated, being covered by a terrace and parapet. In each loggia the flat stone ceiling is divided into two squares by a transverse arch, pierced to give it lightness. These compartments are again divided into square and triangular caissons, filled with rosettes, heads and other ornaments. On the mouldings that surround the ceiling are fine heads from which depend square cartouches and ribbons, and in the corners are more playful winged heads, with puffed-up cheeks, which represent winds. The most elaborate feature of this loggia, however, is the doorway at the left end. The rectangular opening is surmounted by a semi-circular carved panel, the whole framed by pilasters and an entablature which is crowned by a niche and miniature orders, and fanciful ornament, in which dragons and monkeys form part. The panel over the door is filled with a relief formed of a curious assemblage of figures and symbols from the Apocalypse of St. John, arranged in a naive perspective.

All the ornament both in design and execution is treated with an originality and freedom which make every inch of space interesting, since no two details are alike. The relatively limited extent of these houses and their position in the middle of a town, allowed and forced the artist to study every part with the utmost pains, and the effect is easily seen in the admirable proportion of the composition, in the extreme refinement of the mouldings and the exquisite sentiment and finish of every curve of the ornament.

These drawings were exhibited at this year's Salon.

THE ETON MISSION CHURCH, HACKNEY, WICK, ENG. MESSRS. BODLEY & GARNER, ARCHITECTS.

BETHNAL GREEN WORKHOUSE. MESSRS. NEWMAN & NEWMAN, ARCHITECTS.

THE design which we illustrate was submitted in a limited competition for the proposed new workhouse to be built at Tottenham by the Guardians of the Bethnal Green Union, and, being placed second in order of merit by the assessor, was awarded by the Guardians the second premium.

The establishment was intended to provide accommodation for one thousand inmates, and the design may be briefly described as follows: Upon each side of the entrance-gates are placed the receiving wards, divided for bad and good characters, together with the porters' rooms, clothes and furniture stores, post-mortem room and dead-house. In the rear, and occupying the centre of the site, is the administration block, comprising, in the front, the committee-room and offices, medical officer's rooms, waiting-rooms, medical officer's and master's house, together with the necessary offices; in the centre, the dining-hall, kitchen, scullery, sewing-room, matron's office, stores and officers' quarters, and at the back the engine and boiler house, bakery and flour store and laundry.

Upon each side of the administration block, and connected by covered corridors, are the blocks for male and female inmates. Each block consists of day-rooms on the ground floor, with two floors of dormitories and attendants' rooms, accommodating 184. The necessary lavatories, bath-rooms and offices are placed in small angle blocks, separated by disconnecting corridors, from which are arranged the exits to the fire-escape stairs. At the extreme end of

the site is the infirmary for forty; married couples' quarters for twenty-four couples, and infants' home for thirty-two, and in the centre a water-tower, supplying fire-hydrants in all parts of the establishment. The necessary workshops are placed upon the right-hand of the site next to the male blocks.

It was the intention of the architects to heat the whole of the buildings by hot-water, heated by steam-heaters, and the whole of the drainage and sanitary arrangements would have been upon the most approved principle. The cost of the buildings, complete, was estimated at 66,000*l*.

STAFFORDSHIRE COUNTY COUNCIL BUILDINGS. MR. CHARLES LYMAN, ARCHITECT.

THE main buildings are placed in one block, with Martin Street on one side and a considerable open space on the other, and the east end is also to the open. The chief superintendent's house is a separate building, and is put next to Eastgate House, fronting to Eastgate Street. The care-taker's house is also a separate building, fronting to Martin Street. From Eastgate Street, and also from Martin Street, approaches are given leading to one another, and also to the space in the rear, where the back premises of the judge's house are freely reached. Eastgate House premises are not in any way interfered with. The general arrangement affords complete means of drainage in the open, without the slightest interference with any buildings. On the open space at the rear, an electric-lighting station may hereafter be placed on a sub-ground floor, still leaving light and air to the main building uninterrupted.

The main entrance to the buildings is from St. Martin's Place, and this leads directly to the whole of the premises, both on the ground and first floors. In addition, there is a commodious entrance from about the centre of the Martin Street frontage, also leading directly to every part of the building, both on the ground and first floors. The public gallery in the Council-hall is separately approached from Martin Street, and has no other connection with the buildings. The present chief constable's offices and the house of the superintendent of police are entirely occupied by the main entrance, vestibule, cloak-rooms and lavatories, etc. Next the vestibule a grand staircase is placed, leading to the Council-hall on the first floor. Adjoining to the Council-hall, the three committee-rooms, chairman's parlor and waiting-room are arranged, and contiguous to these rooms are lavatories, cloak-room, etc. There is a separate staircase to the committee and adjoining rooms, leading also to the east side of the Council-hall. On the ground floor, the whole of the main building is occupied by the offices and strong-rooms of the clerk to the County Council and the county surveyor and surveyor of main roads, to which offices there are also separate lavatories, etc. The basement floor contains only the necessary coal-cellars and heating-apparatus chamber, but it is proposed to put a basement to the central corridor of communication, which will afford accommodation for storage and for pipes and other appliances.

The Council-hall has been designed that its form should be as compact as possible, that it should be lighted entirely from the sides, that the chairman should command every seat, and that every seat should look direct to the chairman, and be directly visible from every other seat; also, that the movements of members or officials should be capable of being as easy and unobtrusive as possible. The consideration of the acoustic properties of this room have led to the selection of the general form here given — its proportions, arrangement of seats, the voids and solids and linings of its walls, and the finishing of its ceiling and floor. The details of the arrangement of the committee-rooms have also been duly considered in respect of the position of the rooms, their forms, lighting, heating and entrance. The form of the tables is planned that the chairman and members may easily face one another. The offices of the clerk to the County Council occupy the whole frontage to Martin Street, and those of the county surveyor and main-road surveyor front the open space to the north.

The houses of the chief superintendent and care-taker are separated from the main block, but at the same time they are easily accessible in every way, and have command of the premises.

NOTES AND CLIPPINGS

ELECTRIC LIGHT AND GAS. — The erection of numerous large electric central stations has naturally brought the respective merits of gas and electricity for lighting purposes to the fore, as well as the question of what effect the increased adoption of the latter is likely to have upon the consumption of the former. As a rule, however, the consumption of gas is steadily increasing, notwithstanding the more general adoption of electric light. In Stockholm, for instance, the increase in the consumption of gas in the year 1888, when 14,000 incandescent, and about 250 arc lamps were in use, amounted to more than 61.2 per cent, a state of affairs which still exists, although electric light has in the mean time become much more general. In Berlin, where the central stations alone feed some 100,000 lamps, in addition to numerous private installations, the increase in the consumption of gas has of late years been steady. During the financial year 1888-89, for instance, the private consumption of gas rose 71.2 per cent, although the number of electric lamps was doubled during the same period, a fact which becomes still more remarkable when it is pointed out that the increase

in the gas consumption was largest (about 10 per cent) in the central part of the town, which were nearest to the electric installations. Under these circumstances the corporation of Berlin decided to build a fifth gas works, calculated for a maximum production of not less than 12,400,000 cubic feet per day. At about the same time Hamburg expended 150,000*l.* in the extension of one of its gas works, although at the same time an electric central station for 20,000 lamps was being built. In Leipzig the old gas works have been extended and the new ones doubled, simultaneously with the erection of several important electric installations. At Elberfeld, a manufacturing town of a little more than 100,000 inhabitants, the consumption of gas is increasing, although there is a central electric station of 7,000 lamps capacity. The same is the case at Mühlhausen. At Darmstadt, with only 50,000 inhabitants, the gas works were taxed to the utmost of their capacity; an electric central station for 4,000 lamps was, therefore, built, but the gas works have since had to be extended. At Lubeck there was, to begin with, a decline in the consumption of gas after the central electric station of 2,600 lamps had begun operations, but this did not continue for more than a year, and since then the consumption of gas has been steadily increasing. In Gothenburg electric light has been adopted to an unusual extent, and is constantly increasing, but still the consumption of gas becomes larger every year, and a new gas works has been built. Of course it is improbable that a continued increase of electric lighting will also for the future be attended by a larger consumption of gas, yet there is no reason to anticipate any marked decadence as far as gas is concerned; for along with its original use for lighting purposes gas is every day applied more and more to heating and industrial purposes. — *Engineering.*

THE "GHOSTS" OF BRITISH ARCHITECTS. — According to the *Daily News* of London a volume has appeared which deals with the question whether architects are artists or not. All is well, it remarks, till we come to read Mr. Prior's entertaining essay on "The Ghosts of the Profession." The profession, it seems, abounds in Mr. Pecksniffs, whose very town pumps are not their own, but the work of Tom Pinch or of Martin Chuzzlewit. We do not feel quite certain that examinations might not prove obstacles to the modern Mr. Pecksniff. "There is a certain architect of some repute who prides himself on the scrupulous care with which he keeps the designing of his work in his own hands. He brings a quite unintelligible muddle of blots one morning to the office, and sets a clerk to work to draw out his idea. In a week or so he returns to praise the fidelity and exactness with which his design has been reproduced. But the clerk has known better than to attempt such an impossibility. The scrawl was put straight into the waste paper basket, and the whole worked out de novo, in confidence that the principal would gladly accept anything that was shown him as his own." It does seem as if even an examination might have terrors for this professional Pecksniff. We read that "drawings lately came before a society accompanied by a note from the architect, apologizing for their meagreness on the score that his Gothic clerk had the influenza." A Gothic "ghost" with the influenza presents a pathetic picture. Another anecdote relates that at a national competition, where each selected candidate received £400, an architect paid £200 to a ghost, who handed on the work at another £100 to the ghost who really did it. "Alas! poor ghost," but the Psychical Society usually gives names and dates in attestation of its spiritual anecdotes. None is given here, and "the statements are tough."

RECIPROCITY IN LABOR. — A labor story of an uncommon kind comes from England, from the Rother Iron Works, owned by Messrs. Owen and Dyson, at Rotherham, near Sheffield. In July, 1889, when trade was at its best, the masters, without solicitation or agitation on the part of the men, granted an advance of wages amounting to 10 per cent. Naturally the latter felt very grateful, and they passed a resolution of thanks to the firm. At the same time they promised "that should our employers at any future period deem it necessary to reduce our wages to enable them to compete, we shall be happy to reciprocate the spirit of good feeling which has actuated them towards us." This pledge the men have loyally kept. At a meeting recently held they adopted a resolution conceding to their employers the 10 per cent. On meeting the men, the firm expressed their pleasure at this honorable fulfillment of a promise voluntarily given, and pledged themselves to restore the 10 per cent as soon as trade should warrant it. If this example could be followed generally by employers and employed, the day of the walking-delegate would be over. — *New York Evening Post.*

THE SPITZER COLLECTION. — The Spitzer collection is to come under the hammer, after all. Next April is to witness its dispersal, by public sale, at Paris. After Mr. Spitzer's death it was hoped that it would pass intact into the possession of some museum. These anticipations, however, have not been realized, and next April will see the whole world scrambling for the possession of the innumerable treasures which the collection contains. Then will be the time for the many art museums throughout this country to lay the foundations of collections worthy of the wealth and importance of their communities, and it behooves energetic citizens to lose no time in obtaining subscriptions, both from private and public sources, with this object in view. The sale will take place in the mansion which Mr. Spitzer inhabited, near the Bois de Boulogne, and a public exhibition of the collection will probably take place in the early months of next year. — *The Collector.*

UNAVOIDABLE ELECTRIC ACCIDENTS. — An electric shock was experienced by a workman, in Berlin, the other day in a peculiar manner. He was engaged in boring a hole in a wooden wall in order to put in a screw, when he received a strong shock, and, ignorant of the cause, he left the gimlet in the hole and fled. At the same time the electric clock of the "Urania" opposite the house suddenly stopped, and the electricians for a long time could not imagine what was the matter. It was found, however, that the workman had pierced the thin wooden

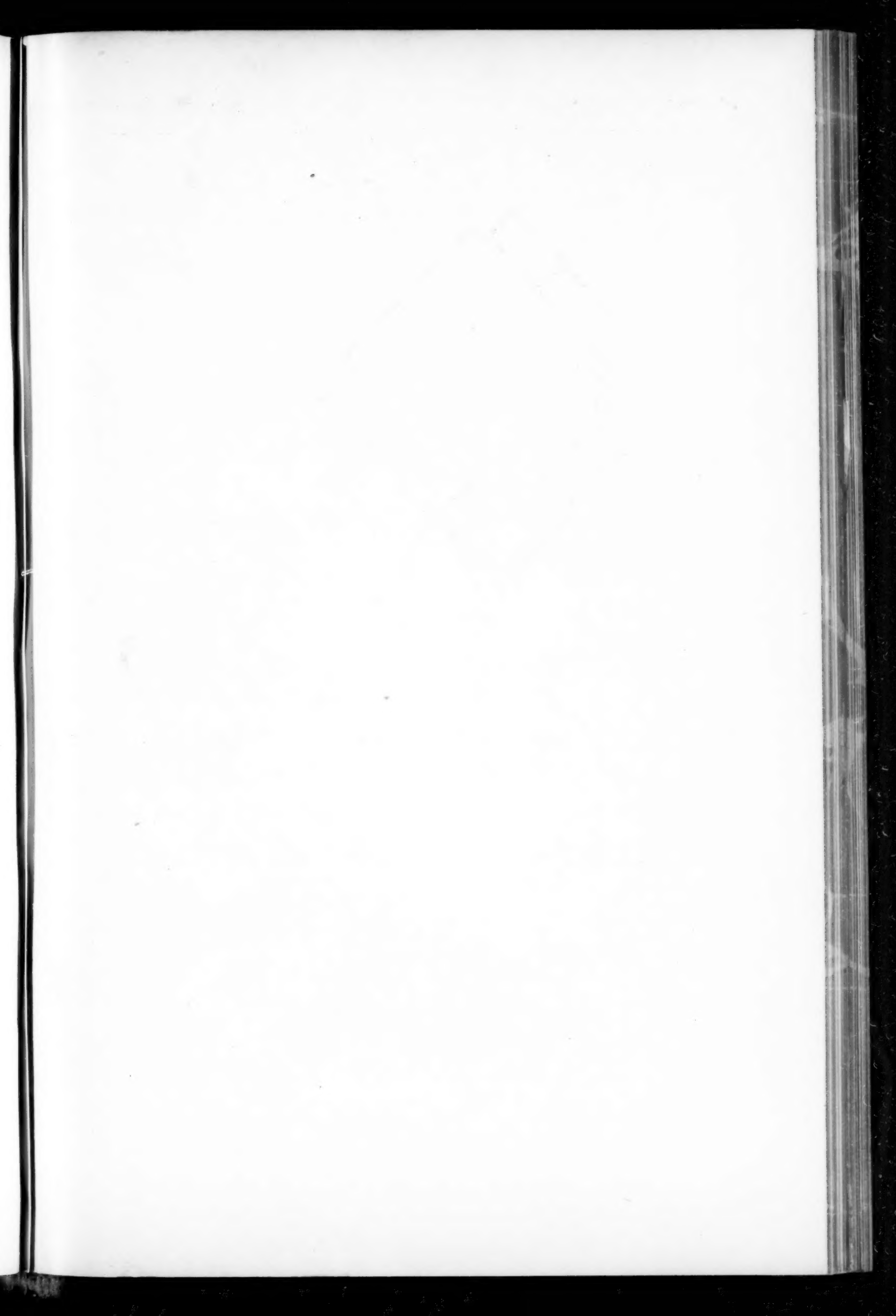
wall and the lead covering of an electric cable which regulates the Urania clock, and at the same time slightly touched a "light-cable" with his gimlet. In this way a communication was established between the two cables, and the strong current from the "light-cable" jumped across to the clock cable, when proving far too strong for the clock it stopped the works. The clock company had provided for the protection of the cables, but had never thought of such an unusual accident. — *Invention.*

THE GOVERNMENT TO PROTECT THE BIG TREES. — Register Sheehan and Receiver Shannon of the United States Land Office in this city have received instructions from Washington to suspend from entry all lands in California on which the Sequoia gigantea, or "big trees," are found. The Secretary of the Interior writes that he learns that the trees are being destroyed in certain places where they have been found by persons who take up claims for the mere purpose of using these particular trees. The redwood found in the coast counties is a sequoia, but not of the Sequoia gigantea species, being the sempervirens, and therefore is not included in the order. There are no Sequoia gigantea trees growing within the limits of the San Francisco land limits. — *San Francisco Chronicle, November 6.*

THE LIFE OF INCANDESCENT LAMPS. — The average life of a 20-candlepower incandescent lamp at the Massachusetts cotton-mills in Lowell is 1,208 hours, according to the statement of Mr. W. S. Southworth, at the recent meeting of the New England Cotton Manufacturers' Association. The plant consists of an Edison dynamo with 600 lamps connected to its circuit. The average number of lamp renewals yearly is 276. Estimating the cost of the power used at \$25 per horse-power, per annum, the total annual cost for lighting, including interest and depreciation on the plant, is \$1,160. The cost of gas to furnish the same light at \$1.10 per thousand would be \$1,600. This makes the electric light cost the same as gas at 85 cents per thousand. — *Engineering News.*

TRADE SURVEYS

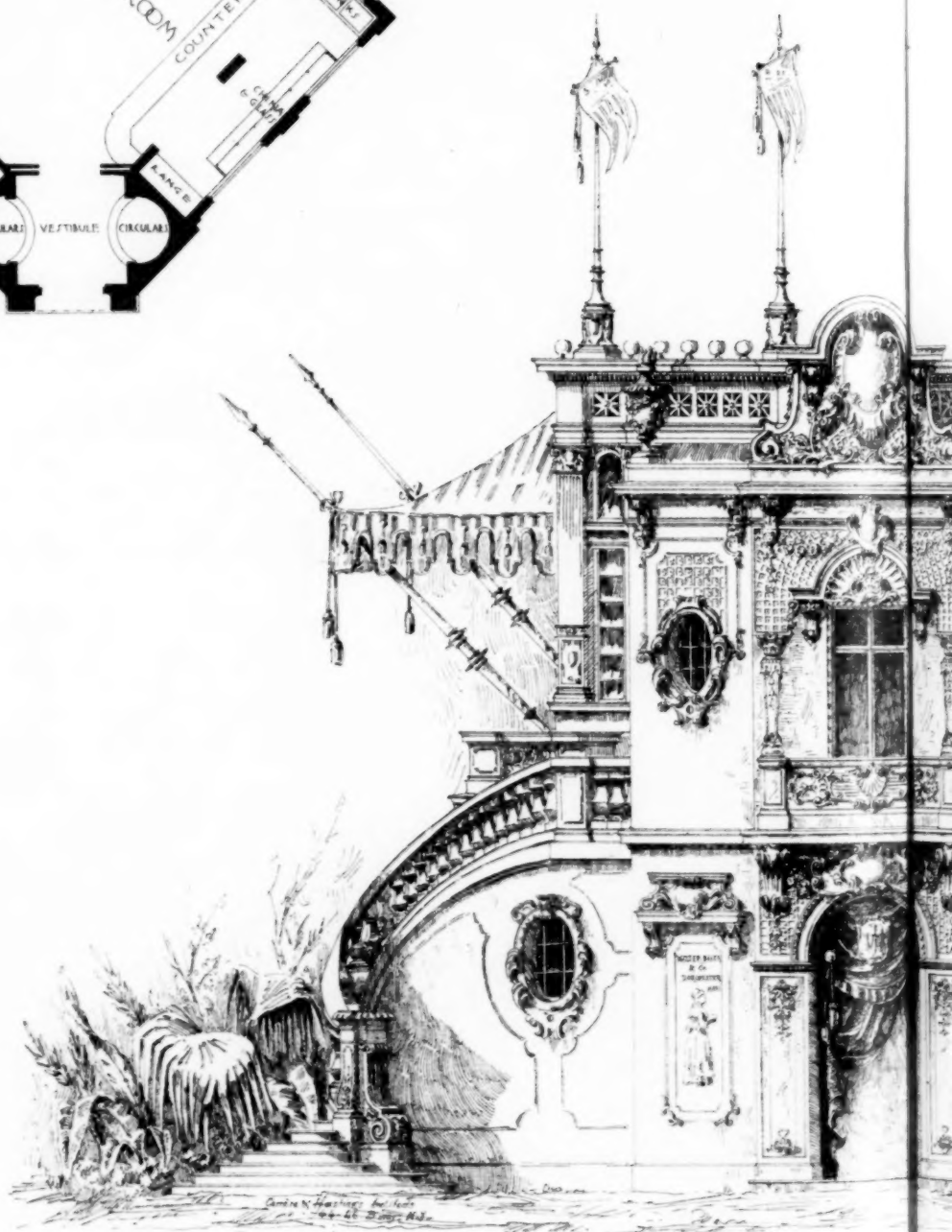
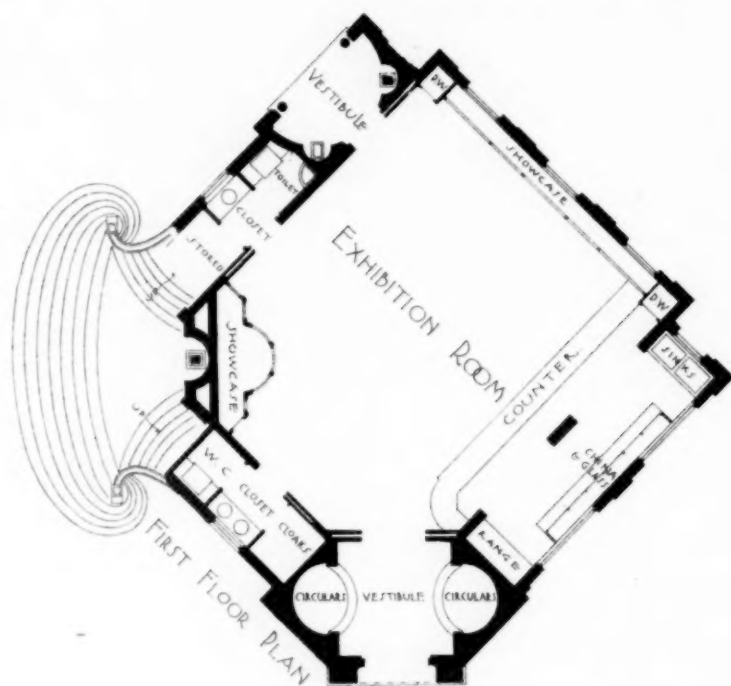
THE markets show greater strength than was anticipated. Quotations fluctuate even within narrower limits than in the early autumn. Production is kept within what is regarded as conservative limits. An advancing tendency is predicted in several channels of trade, but stronger evidences of it will be required before the prediction can be accepted. The volume of business shows a slight falling off. Railway traffic has also suffered. The distribution of merchandise has not declined perceptibly. Mills, shops and factories are running full time generally. The strong point of the situation is that sales in all channels are made only for present requirements. Jobbers in Eastern cities are pleased at this condition, and say it augurs well for a large winter and spring business. In retail circles, a good business is being done in nearly all kinds of merchandise. Clothing, notions, boots and shoes and shop products generally are going out in larger quantities than usual at this season, and yet distributors are not loaded up. Consumption is in a most satisfactory condition throughout the Western and Southern States. Cotton is advancing; wheat is low, but may improve. Provisions, though low in price, afford satisfactory margins. Farmers complain less than ever. The liquidating process is not impeded. Chicago business concerns give good reports of the great Northwest as to distribution of goods and merchandise. Implements of all kinds go easily. Advices from a few leading houses in St. Louis show a growing improvement in the Southwest, and railway managers there speak of increasing traffic in the great number of small towns along the lines of road that cobweb that region. From Atlanta come encouraging reports concerning enlarging country-store business. Railway promoters and builders are giving more attention to the Atlantic coast, believing that a great expansion of traffic is possible with more railroads. The hosiery and knit-goods industries are quite prosperous, though held down to some extent by heavy German importations. With free wool, coal, iron and iron ore, and perhaps a larger increase of raw material, new conditions will be introduced which cannot fail to exercise a favorable influence on the industries immediately effected. The advancing tendency in cotton will doubtless stimulate an increase in acreage, but an impulse has been given to diversified agriculture in the South which will produce lasting results. There is a steady, though slower, industrial expansion in these States, and a slower improvement of farm values near the larger industrial centres. No weakening of confidence is observable, but more prudence in investments is necessary. In monetary circles there is an abundance of money, from the usual standpoint of viewing the situation, but this opinion is not shared by a very large agrarian class. The best that possibly can be expected in the reconsideration of ratios between gold and silver values is to devise some measures to check the advancing value of gold as compared to silver. Even this is uncertain, because of the lack of organization on the part of those to be benefited. The question of a new or a different currency system is forcing itself on the attention of economists and bankers, but no plan has commanded assent. The volume of money seems equal to necessities. The only disturbing event is the exportation of gold, which may continue until the danger line is passed. The business world, however, is giving no attention whatever to the matter. The iron trade is strong, and increasing quantities of material are being turned out. An encouraging sign is the increased amount of projected work in various directions, especially in manufacturing establishments and in railroad building. During the past three months, over three thousand miles of road have been projected, and preliminary organizations for the prosecution of work effected. A great deal of manufacturing capacity has been lately projected, especially in electrical construction and supply channels. Another point is the establishment of little industries, the purpose of which is to get nearer to market and nearer to cheaper fuel. An adjustment of this sort is going on all around. The lumber manufacturers agree that sales this year exceed last year's. The coal-producers are making preparations for a still greater output in the great coal States, especially Pennsylvania and West Virginia. No weak spots are visible in the world of business, and much of this is due to the determination of producers to keep pretty close to actual market demands.



THE WALTER BAKER & CO'S COCOA

WORLD'S COLUMBIAN EXHIBITION

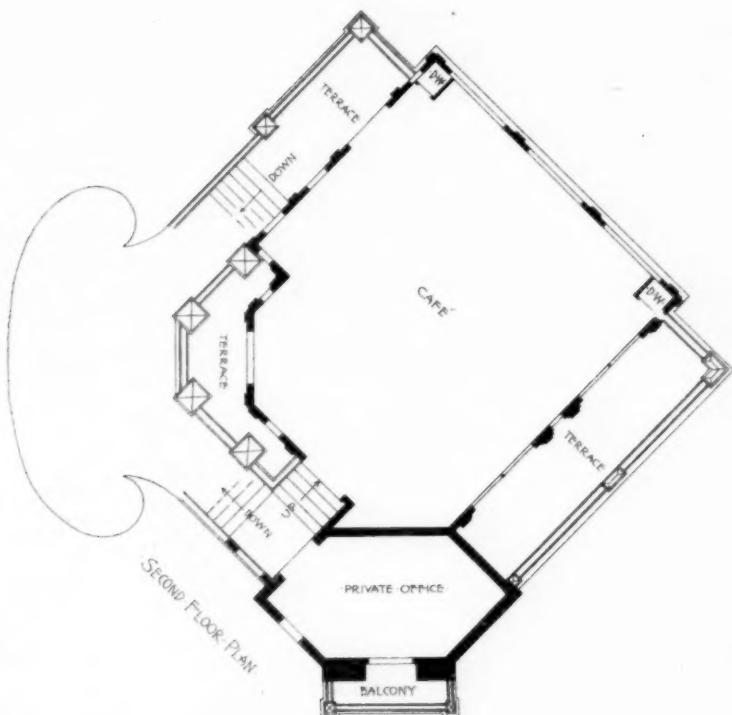
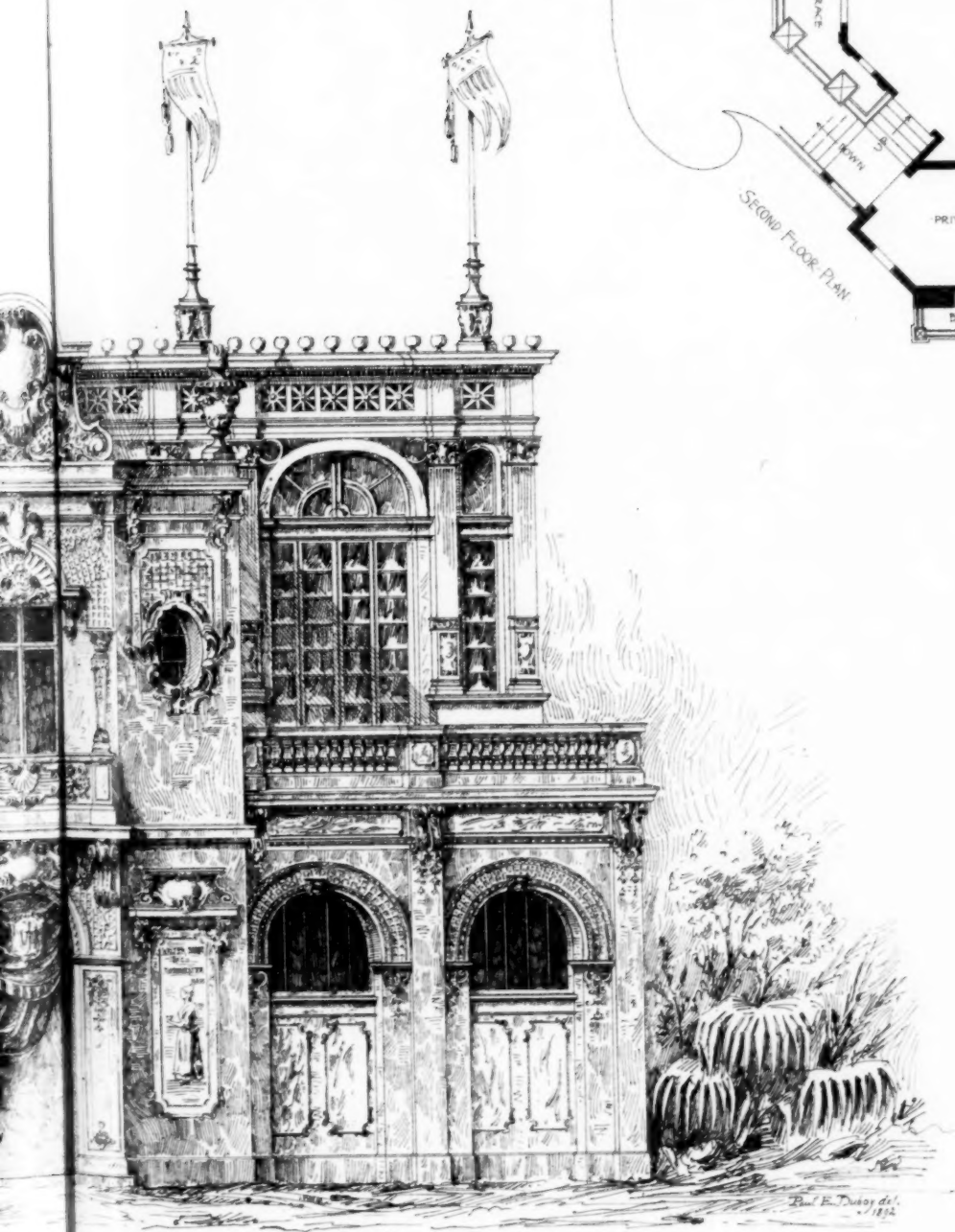
ARCHTS.

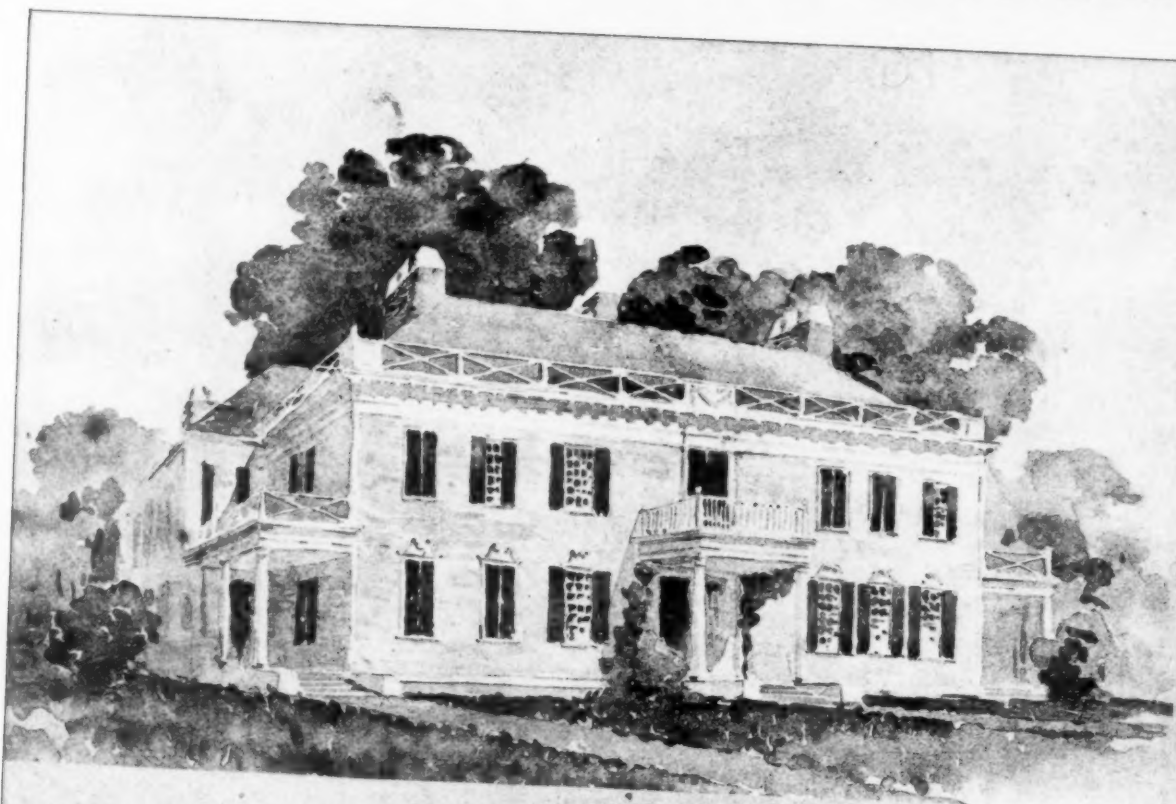


U.S. COCOA AND CHOCOLATE PAVILION

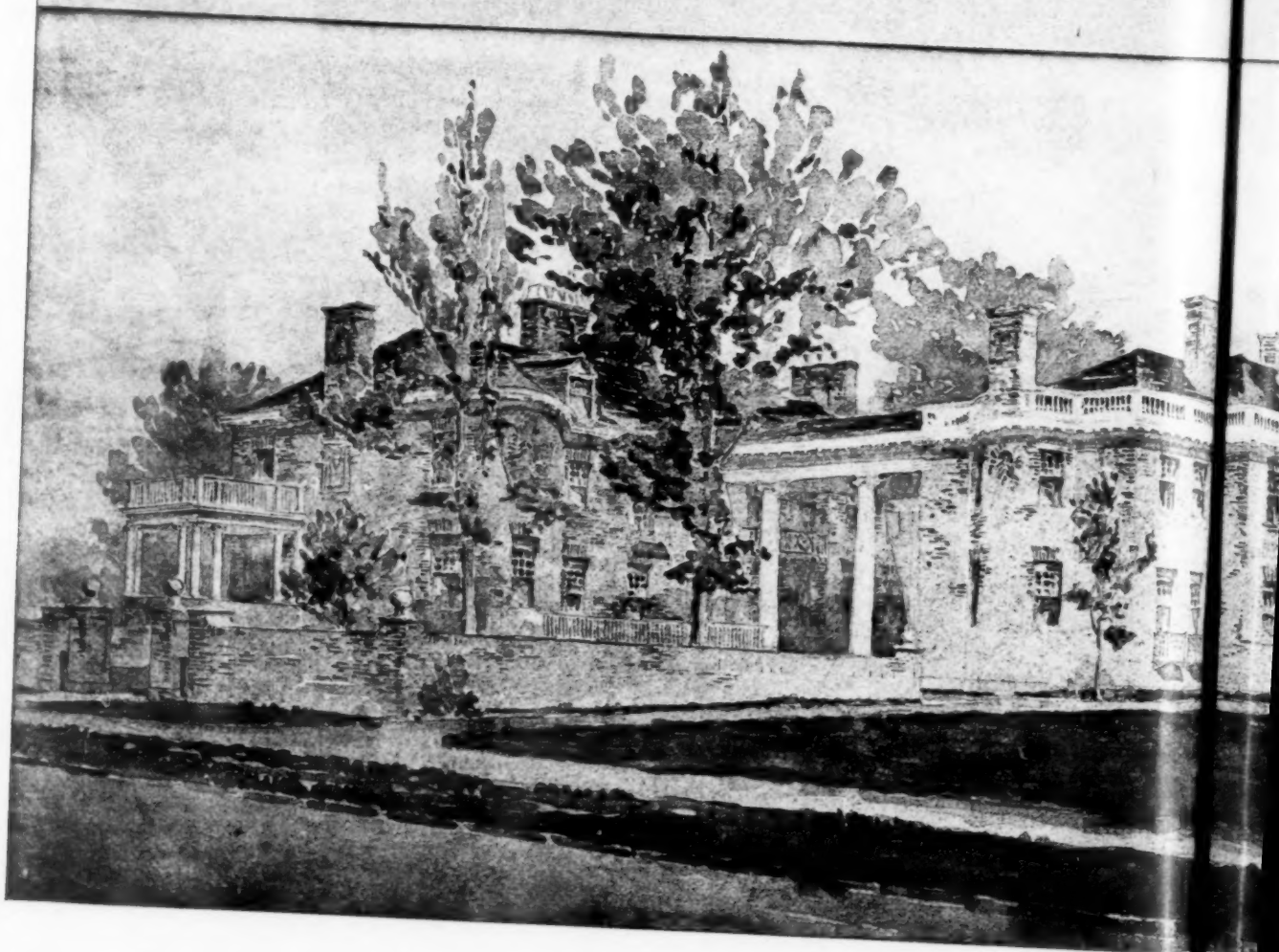
EXHIBITION: CARRÈRE & HASTINGS

ARCHTS





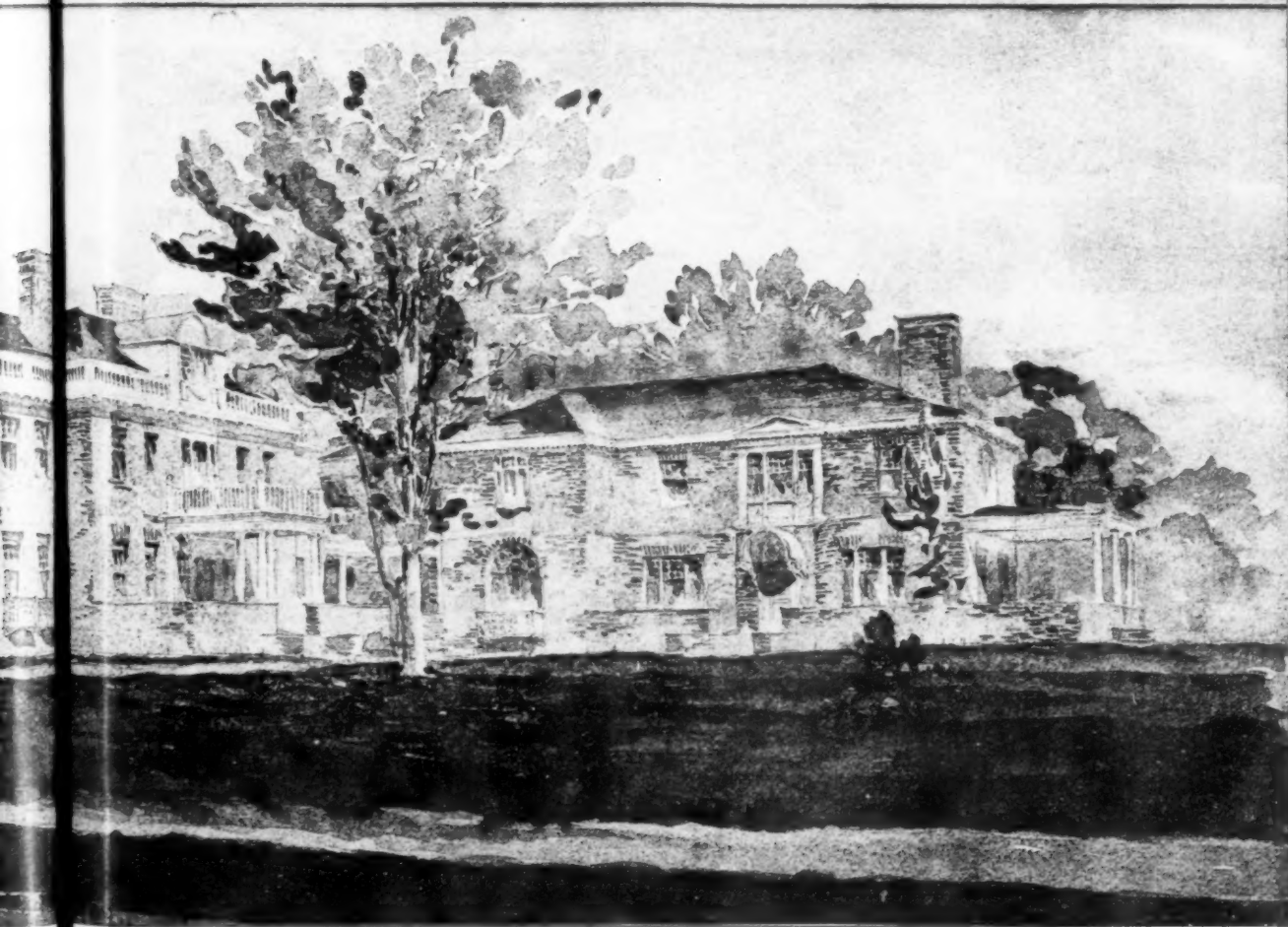
DOUBLE-HOUSE FOR LEE E. HARRISON ESQ. ALLSTON.



HOUSE OF M. H. B. GEORGE
CRAM ESQ. ARCHT.



HOUSE OF MRS. J. D. PARKER, CAMBRIDGE.



HELIOTYPE PRINTING CO. BOSTON

H. B. GEORGE, BUFFALO, N. Y.
ARCHITECTS.



- FRONT ELEVATION -

- VAN RENSSELAER MANOR HOUSE -

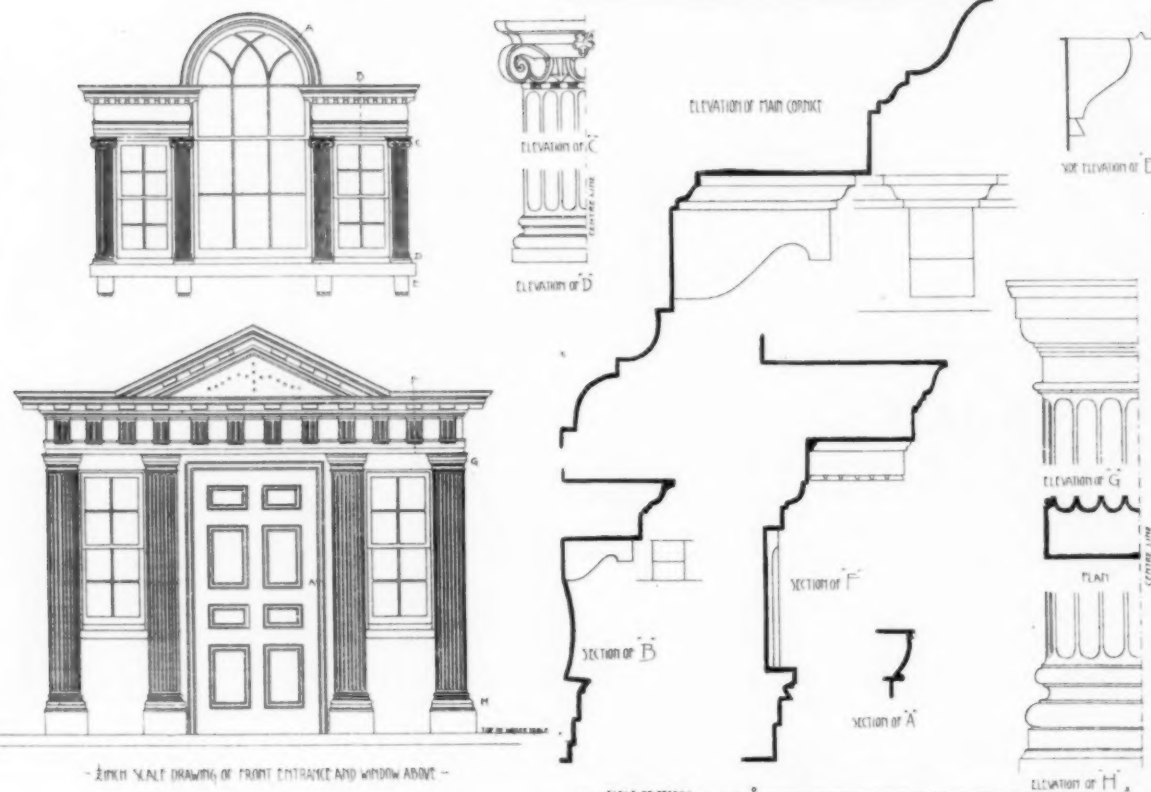
ALBANY, NEW YORK.

SCALE, 4 FT. TO AN INCH

BUILT ABOUT AD. 1790

MEASURED AND DRAWN BY GILBERT F. CRUMP

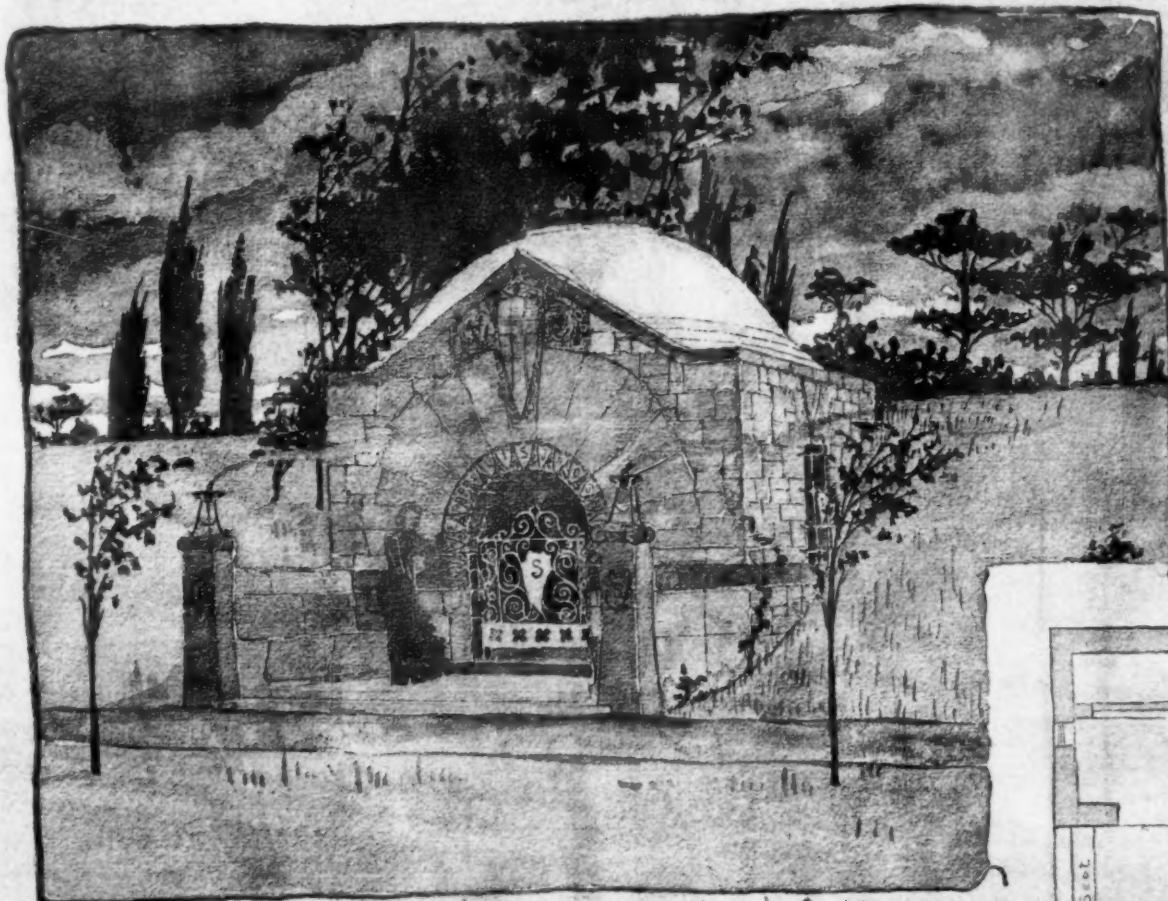
SCALE DETAILS OF THE VAN RENSSELAER MANOR HOUSE AT ALBANY, NEW YORK.



- 2 INCH SCALE DRAWING OF FRONT ENTRANCE AND WINDOW ABOVE -

MEASURED AND DRAWN BY G. F. CRUMP

HELIOTYPE PRINTING CO. BOST.



"Denver Architectural Sketch Club"
Competition for a family Vault
Submitted by Young Widow.

