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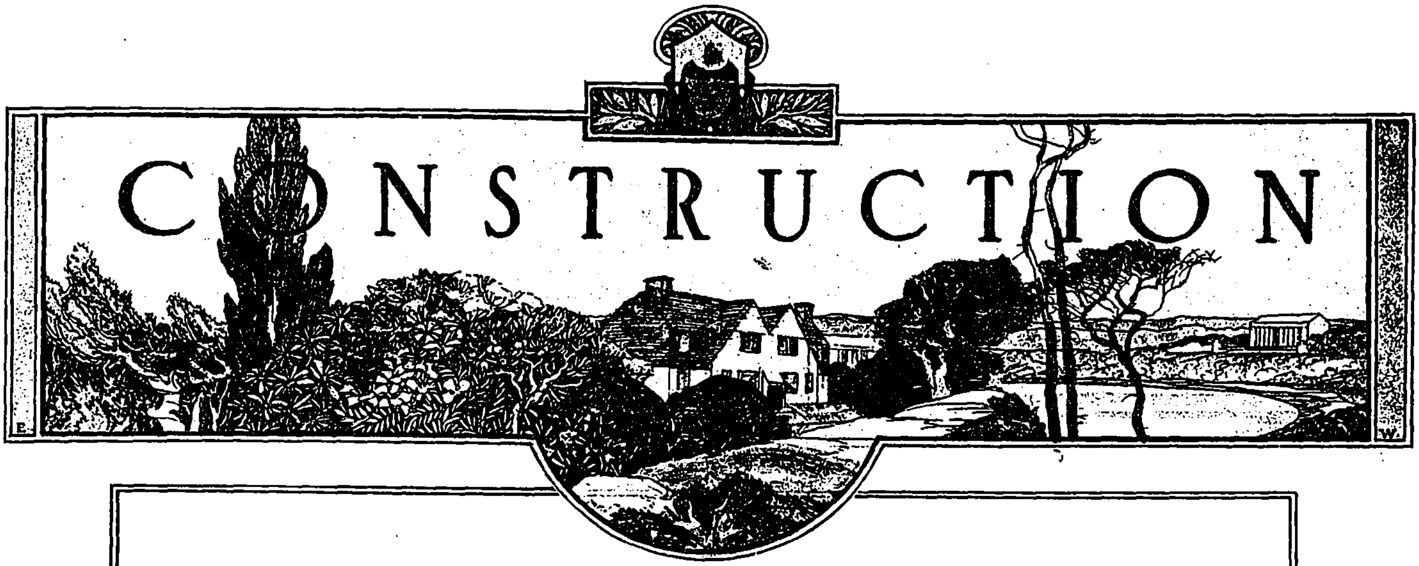

CONSTRUCTION

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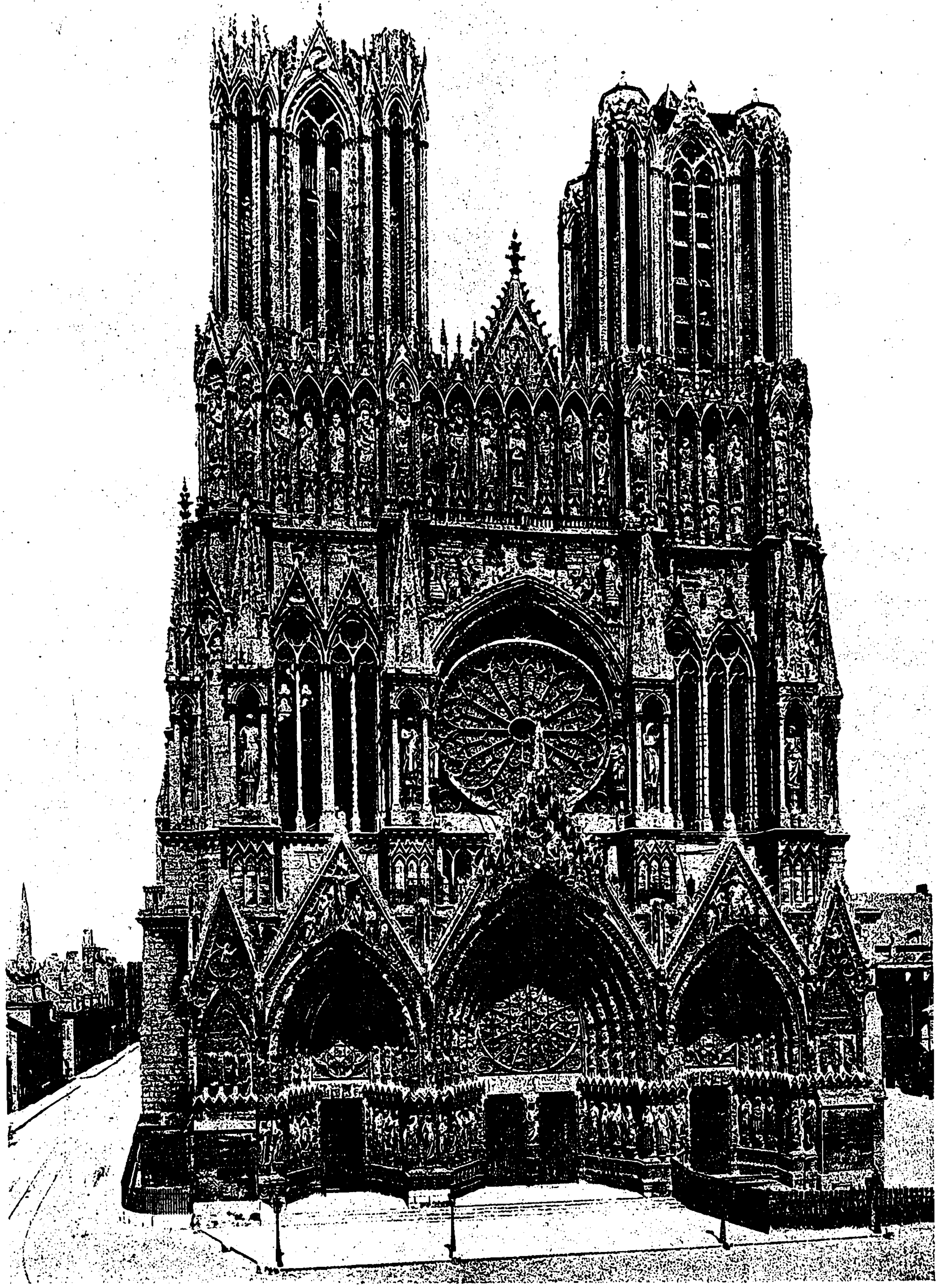


THE CATHEDRAL AT RHEIMS, FRANCE.

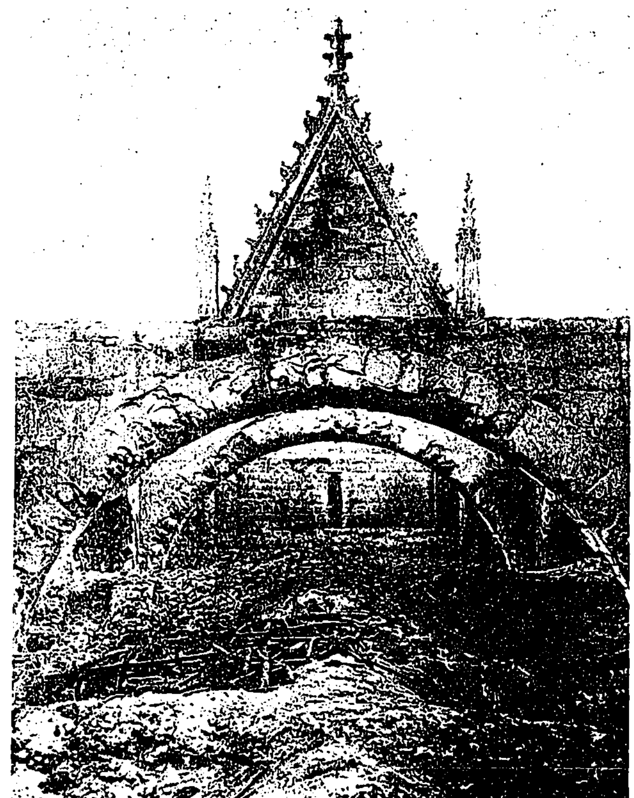
EDITORIAL

The terrible disaster which has befallen peace-loving Belgium, also Northern France—Our duty in the face of this irreparable loss to architecture.

THAT peace-loving Belgium should be the battle field of the European nations is regrettable. During her early struggle for existence she always maintained a right of self-government and escaped the feudal system so prevalent in neighboring countries. The middle ages found her people industriously extending their commercial trade; amassing wealth while others consumed themselves by crusades or feudalistic strife. It was at this period when individualism rose to its highest plane and developed in Belgium the greatest civic architecture of Europe, an art which might have evolved itself into the noblest of all ages had they escaped the Spaniard who destroyed their liberties in the sixteenth century. And hardly a week goes by without the announcement of a city being bombarded and destroyed—all of which tells a tale of ruin to the esthetic creations of a peaceful people.

It is also unfortunate that the route of the German army in France encompasses the territory wherein are found so many beautiful cathedrals. Erected about the thirteenth century, it can hardly be expected that these vast edifices will escape the terrific bombardment of fighting millions. Picture for a moment the wide sweep of battle array and consider the alignment of cities famed for their ecclesiastical structures. Abbeville, Amiens, Rouen, St. Quentin, Noyon, Laon, Soissons, Rheims, Chalons, and Toul, reaching from the western shore line of France to the eastern boundary touching Germany directly north of Paris. Whether these monuments of an illustrious age are destroyed by Germans or the French themselves, it matters little—our only thought is the irreparable loss to posterity of such ennobling works of God and man.

Sorrowful though we may be over the needless destruction of an architecture which can never be replaced and which has proven a source of great inspiration to us all—still we are forced to come back to the one question: if we cannot help it—and we are powerless—what is our duty now? And the conclusion seems to be: "Smile, and while you smile another smiles, and soon there's miles and miles of smiles, and life's worth while because you smile." Be optimistic even though it hurts. Take the spirit of the largest brick industry in the Dominion. At a large sacrifice to themselves and purely from a motive of humanitarianism they are keeping their men at work. This means the storing of vast supplies at an increased expense, but rather than see the men who have stood by them suffer, they are assuming this added burden. Such an action is worthy of the highest commendation and establishes a precedent worthy of all business concerns. In the end their just consideration of all employees will prove to be a wise step. With the war over and the light of prosperity flooding our country from one end to the other, they will be able to meet the heavy demand for building materials. Do not forget that the bravest are not always on the firing line. Sometimes they are planning to keep others alive instead of aiming to kill.



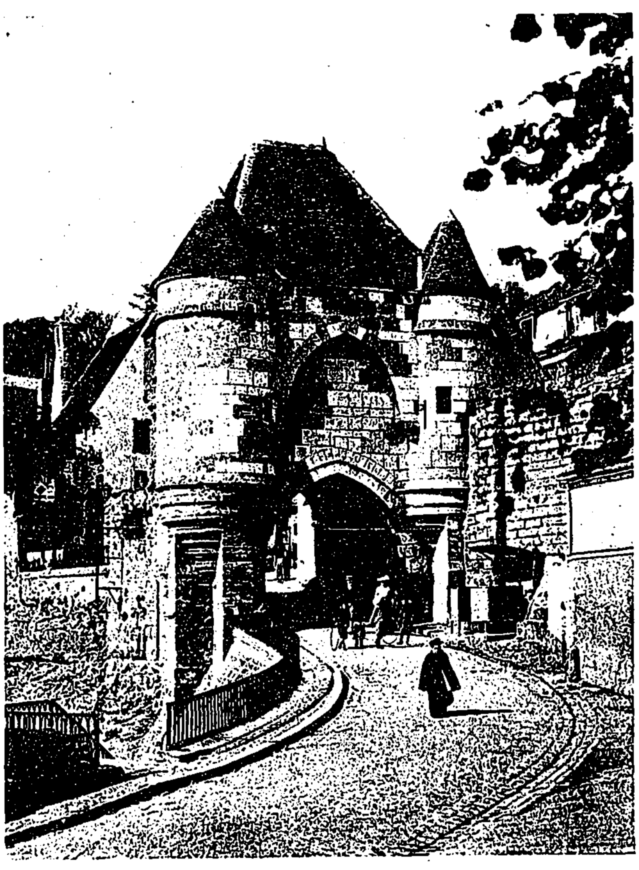
RHEIMS CATHEDRAL. DAMAGE TO ROOF BY WAR SHELL.

NAVE OF CATHEDRAL,
RHEIMS, FRANCE.

Architectural Monuments in the War Zone of France

HARDLY had the peaceful peasants of northern France realized that a vast horde of Germans were passing through their country on their victorious march to Paris, when they were brought to feel that this same host were being driven back again. But at what an irreparable loss to art and to civilization! Settled by the Gauls in the sixteenth century B.C., this territory has had one continuous struggle for existence. After the Roman Empire held sway the Franks established themselves and ruled down to Charlemagne's time, 800 B.C., at which period the Frankish Empire went to pieces and prepared the way for Feudalism. Then came wars with England, Germany and Spain, all of which wrought havoc to every phase of art. From the loss in former struggles it is heartrending to contemplate the final results of the present war upon the well-known monuments of architecture reared in all parts of northern France.

No country is more charming or full of interest than that portion which is forming the battle-ground between the Germans and French. From Abbeville to Nancy are scattered ancient castles, magnificent cathedrals, artistic gardens, and picturesque homes. It is impossible to handle in this short article more than one phase, and in doing that it can only be done in a general way. Up to this time little damage has been done to the ecclesiastical work except at Rheims but events may yet bring about a complete destruction to many of these famous buildings, the marks of genius in an age absolutely foreign to the commercialistic trend of modern life.



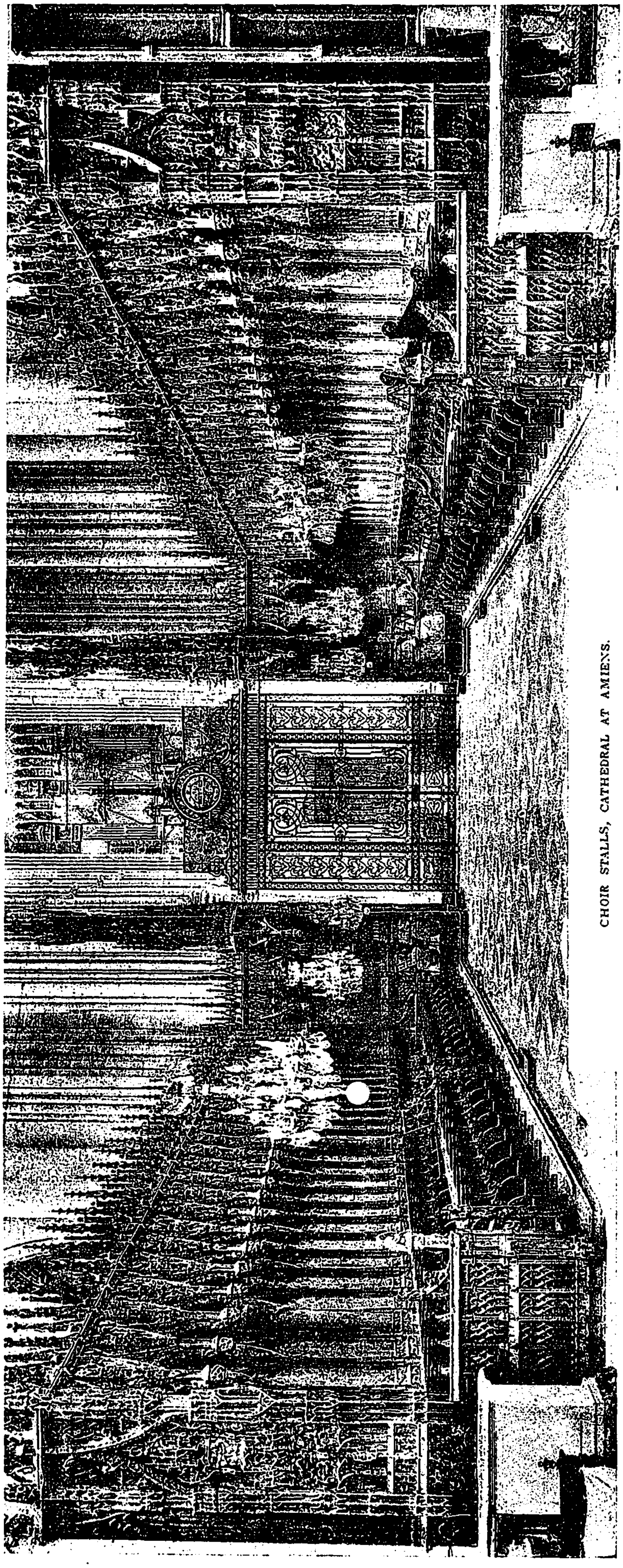
THE GATE OF ARDON, LAON.

While the picturesque town of Abbeville is scarcely included in the war zone, nevertheless it is the first in the line of cathedral cities, stretching across northern France and may yet feel the effects of the present struggle. Fortified during the reign of the Frank kings, it retains the old landmarks of yesterday. The quaint market place is enclosed with high pitched gables of varying colors. The cathedral, St. Wolfran, is late Flamboyant and commented upon by Ruskin as a wonderful proof of the fearlessness of living architecture. The nave consists of bays having a high clerestory and a triforium screened by rich sixteenth century carving; the ribs of the vaulting falling without imposts or break of any kind.

This region contains many half-timber houses which have proved an inspiration to architects in this country. The work of the fourteenth and fifteenth centuries possess an individual charm and are especially well built as evidenced by their present condition. It is regrettable that the people of today are erecting modern homes in this section, as the towns are fast losing their quaint picturesque character. Many of the old houses are so twisted out of shape that it is remarkable how they hold together. The example shown at Abbeville is known as the house of Francis I and shows one of the many which still exist in all cities and towns of Normandy.

As some one has said: "The great difficulty in attempting to describe the architecture of France during the glorious period of the 13th century is really the *embarras de richesse.*" Of the thirty some first class cathedrals erected during this period the war zone covers a large number. The edifices at Paris and Chartres which might have been seriously effected are not considered, but rather those north which raise their majestic spires from the eastern boundary to the western shore.

Notre Dame at Amiens, started in 1218 after the plans of Robert de Lugarches, is likened to one of the chief gems in the incomparable religious jewel box of France. It is one of the largest churches in the world, measuring four hundred and sixty-nine feet long, two hundred



CHOIR STALLS, CATHEDRAL AT AMIENS.

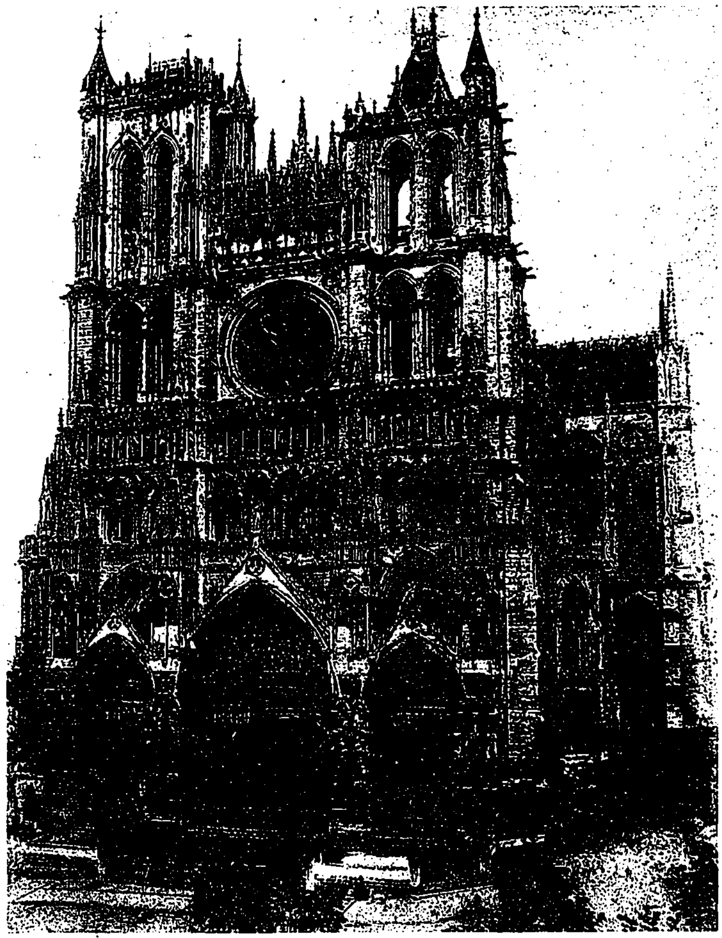
and thirteen feet across the transepts, one hundred and forty-four feet across the doorway and one hundred and forty-two feet high to the crown of the vaulting. Upon the interior there are one hundred and twenty-six slender pillars which narrow as they ascend, making the vaulting appear wider than the floor. A feature of unusual interest are the choir stalls comprising four hundred subjects and presenting more than three thousand six hundred and fifty figures. Surrounding the choir is an ambulatory with an admirably carved stone screen and seven apsidal chapels. Upon the exterior the building exhibits the same grandeur and finished workmanship. The main facade is flanked by two unfinished towers of the thirteenth and fifteenth centuries and dominated by the slender sixteenth century spire over the crossing rising to the height of three hundred and sixty-seven feet. In addition the front has three deep and sumptuously decorated porches as well as a superb rose window one hundred and fifteen feet in circumference. The cathedral is celebrated for its beautiful details and sculpture work; the west facade containing so many scriptural events that Ruskin has titled it the "Bible in Stone." A striking feature upon the interior is the vastness of the fenestration which gives one strong blaze of light typifying the splendor of the heavens through the deep blue glass.

As for the material and spiritual phases of Gothic sculpture work in the thirteenth century the greatest advancement was made in France. Nowhere is this more exemplified than at Amiens. As stated above, the western walls and porches are so covered with sculpture as to be the veritable Biblical teacher of that age. The three porches and adjoining buttresses contain forty life size statues with small figures beneath which identify each one. Directly above is another row extending from side to side of twenty-two full-size beings from regal history. The key to the exterior is found in the figure of Christ placed on the central pillar of the main entrance while the other work evidence His life and death as well as His teachings. Surrounding Him are the Apostles and the Prophets, while the crowned figures above are the kings of Judah. The epitome of the Christian doctrine is depicted in the tympanum representing the Resurrection and Final Judgment.

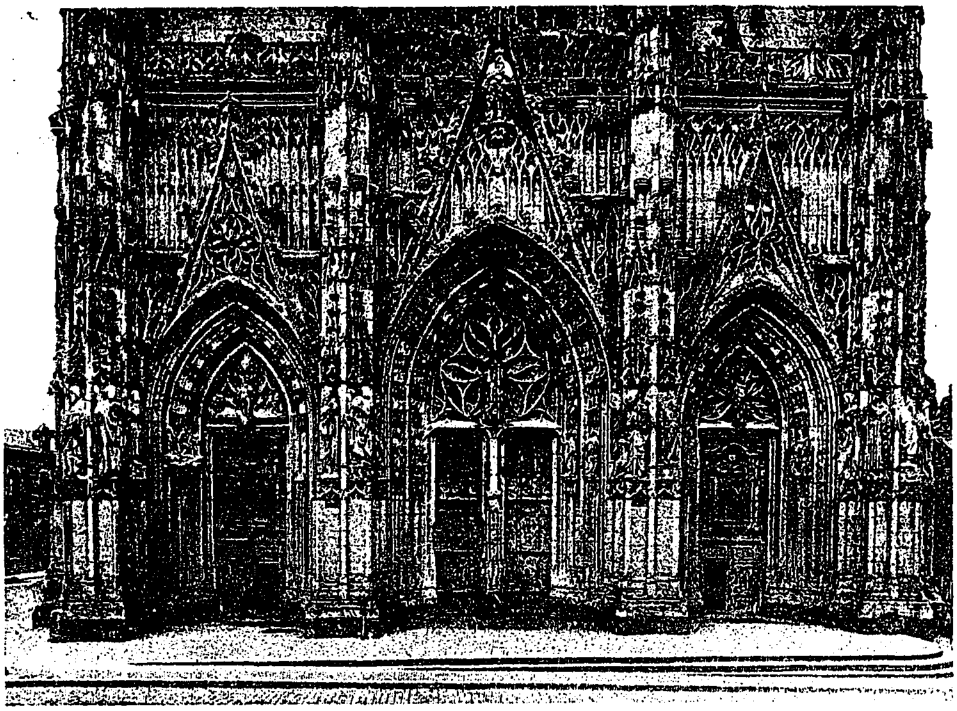
Rouen, the unrivalled city of gothic art, was founded long before the Roman Era in Gaul. To-day it has its ancient, historic quarters with narrow lanes over which the eaves of the houses practically meet; also its attractive and modern section. Up to 1204 Rouen was under the influence of the Normans, but from that date on it has been under the influence of the French. The city lies on a sloping plain beside the river Seine with steep cliffs near by presenting a grand view of the many spires from which it derives the title of the "City of Churches." The Cathedral of Notre Dame while not so large as those at Amiens and Rheims, rivals them in respect to detail. Arcambeau in his description states that the west facade, erected by LeRoux, 1507, is truly imposing with its pinnacles, open arches, balustrades, three doors of which the two side ones date back to the thirteenth century, great rose window and three hundred statues. The edifice was started in 1202 while the main work was finished in 1223. Ruskin also claims it to be the most exquisite piece of pure Flamboyant work in existence and that there is not a cusp or finial that is useless, not a stroke of the chisel that is in vain; the grace and luxuriance of it all are visible, sensible even to the uninquiring eye; and that all its minuteness does not diminish the majesty, while it increases the mystery of the noble and unbroken vault.

The interior of the Rouen cathedral is full of interest; one feature being the fifteenth century stairway leading to the library, also the five tombs of Duc de Breze and the well known piece by Le Roux of the Cardinal d'Amboise, a Renaissance masterpiece; and ninety-six choir stalls. Considerable glass of the fourteenth century is found with careful workmanship in the details, the broad colored borders enclosing grisville fields enlivened with birds, squirrels and angels playing instruments. The sixteenth century rose window consists of concentric circles of white angels, red seraphim and green foliage contrasting with the reds and yellows of the centre as well as the dark greens and blue on the outer surface.

For beauty and perfection of architecture, St. Ouen, at Rouen, is placed at the head of all collegiate churches in France; while in the proportion of its nave, transepts and choir it even surpasses the excellent example at Cologne. Freeman states that St. Ouen goes farther to unite the two forms of excellence—external outline and internal height—than any other church in France or England. It is the loftiest church



CATHEDRAL AT AMIENS.



DETAIL OF CATHEDRAL AT ABBEVILLE.

rosaces above all with wide borders containing fleur de lis. The great beauty does not depend on the design, but rather on the deep rich color schemes. Philip II robbed the cathedral of all its wonderful tapestries, a reason no doubt for building the Escorial.

Soissons, at one time the capital of Neustria und Clovis, has developed into a quiet provincial city of approximately fifteen thousand inhabitants. The west front of Saint-Jean-des Vignes, dating from the eleventh century, with its beautiful cloister, give us a slight idea of its former splendor. This facade alone was saved from ruthless destruction by the Prussian army in 1814 upon the entreaty of the citizens, although considerably damaged in the war of 1870. The cathedral with its beautiful proportions, carved capitals, splendid glass, is considered one of the most beautiful in France. Rodin, in speaking of the cathedral, likens it to a ship at anchor during the stillness of the night. He sees beauty only in its outlines when the darkness hides the restorations of recent years, and portrays the august character of the original design, just as the sky impresses one of its grandeur in the nightly revel of stars. This gothic edifice, three hundred and twenty-eight feet long and one hundred feet to the top of the vaulting, is quite plain with a tower two hundred and seventeen feet high. The nave is

in the world that has a real centre tower, a feature of noble outlines and appropriate setting. Upon entering one is struck with the brilliant lighting, to accomplish which a large amount of white glass has been used with the lighter tones of the other colors. Here is found the most complete series of patriarchs, saints, apostles, bishops and abbots all depicted in light shades to bring about the one endeavor to furnish ample light. Other churches containing notable examples of glass work are St. Maclou, St. Vincent, St. Patrice, St. Godard and St. Romain, the last having three rose windows with glass dating from the thirteenth to the sixteenth centuries.

The history of St. Quentin is of great interest and here a strong defence met all invading foes. While unable to defeat the Spanish army in 1557, it enabled the French armies to assemble and save Paris. This defeat, however, was so important that King Philip II erected in commemoration the far-famed palace of the Escorial in Spain. But little of this age is left and the town is modern in every respect. The church on the exterior lacks the graceful gothic feeling of French edifices, but our great pleasure is found within. The two sets of transepts are unusual but charming and extremely so with the stained glass. There are seven double windows in the clerestory with double rows of dignitaries, and

HOUSE OF FRANCIS I., ABBEVILLE.

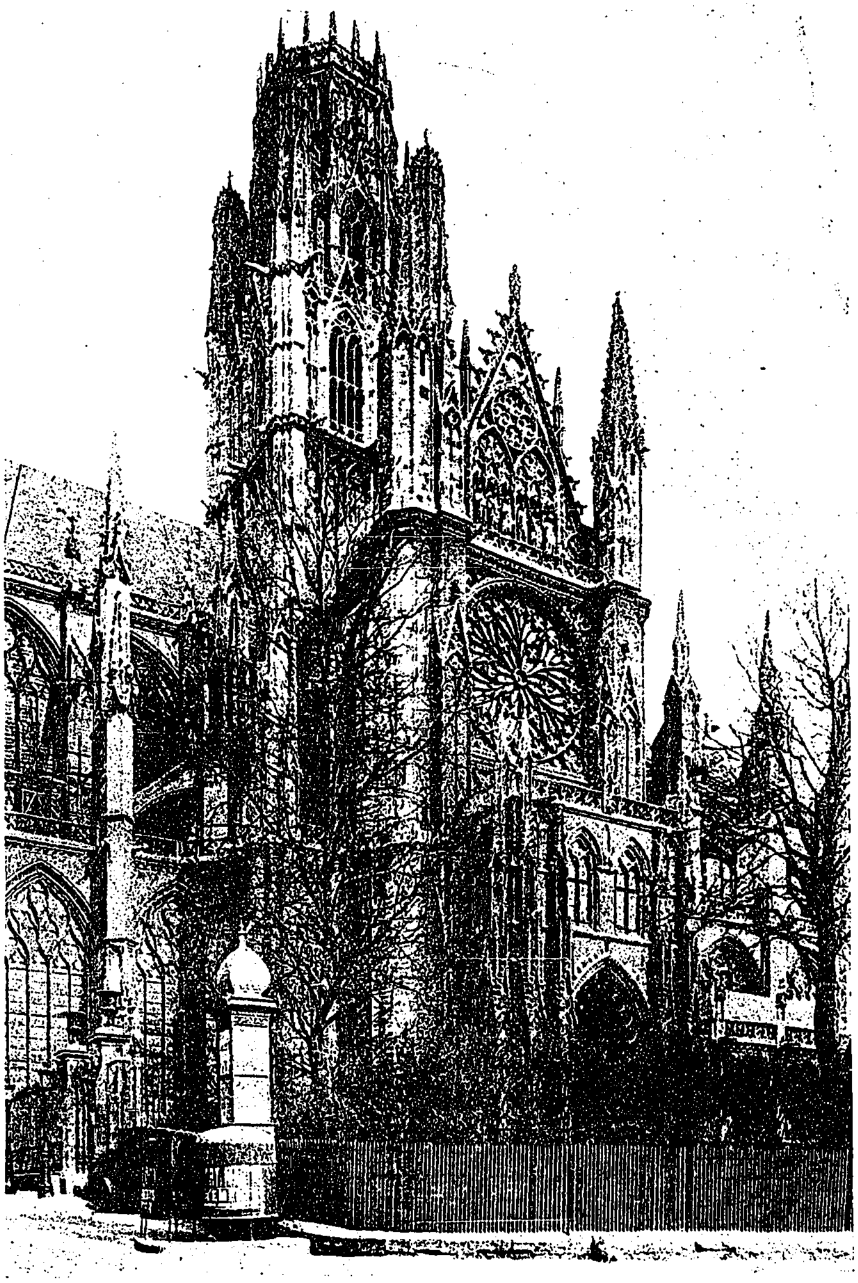
pierced by a splendid rose window over two rows of modern glass, in which part of the cathedral is seen the "Adoration of the Shepherds" by Rubens.

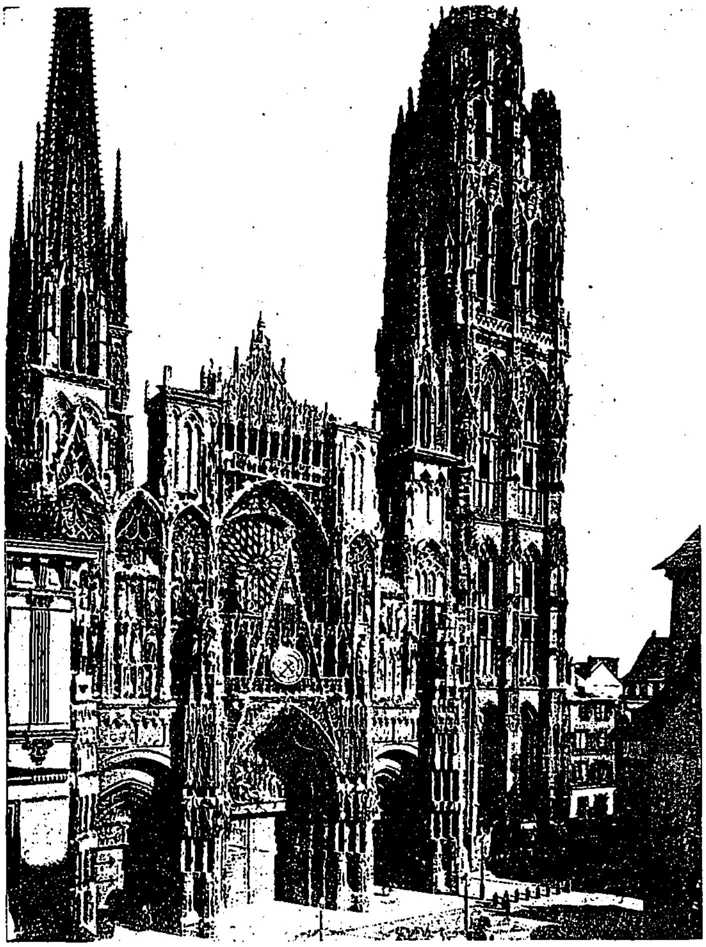
Soissons was enriched through the great love for stained glass shown by former patrons. The rose window at the north contains a circle of medallion panels surrounding the central figure of the Virgin Mary, on the outside of which is a double border of panels containing a red field bearing the castles of Castile in gold.

Laon is extremely fascinating, located as it is upon a hill some three hundred and fifty feet out of the plain below. It is the outgrowth of a Gaulish hill fort and mediæval stronghold and has little of its ancient character changed. The cathedral follows the English type of a square termination, but uses the great circular window, above which are three large porches. In addition to the large number of statues and bas reliefs are oxen which guard the upper parts of the towers illustrating a popular tradition which tells that, in order to facilitate the building of the church, an inclined wooden plane was erected from the Place du Bourg to this doorway, and up which the oxen drew the stones and other materials. Each tower encloses a winding staircase visible from the exterior, with small columns of singular lightness and elegance supporting the steps.

It is hard to picture the beauty and wealth of these cathedrals in former days. The following account of what happened to Notre Dame of Laon during the Revolution will furnish in a measure some idea of the sacrifices already made. In 1790, the cathedral was closed for Catholic worship and despoiled of its riches and precious furniture. In 1792 it was used for several weeks as a corn market, and it became successively the temple of the Goddess of Reason in 1793 and of the Supreme Being in 1794. In the great portico all the statues were knocked down and broken, and all the statuettes which adorned the arches were decapitated and mutilated. The cathedral was provisionally given back for religious services in 1795, closed again in 1798, reopened 25th December, 1799; but it was not till April 25th, 1802, that it was definitely and officially restored for Catholic worship. The Episcopal chair, which had been overthrown, was never re-established, and the numerous and powerful chapter were dispersed for ever. The choir was ornamented with rich wood carving and sculptured screens, upon which were represented the principal events of the exorcising of Nicole de Vervins; but all this wood carving was burnt on the Place du Bourg, during the revolution of 1793.

Rheims, as viewed from the hill which separates the narrow vale of Epernay from the great plain of Rheims, presents a magnificent view. The city was razed by Attila in 508 and made an archbishop's see in 744, from which date it became the ecclesiastical capital of France. The cathedral, which has been somewhat damaged by the various recent bombardments of the German and French armies, is referred to by Viollet-le-Duc as the queen of Gothic cathedrals. Here the kings of France were consecrated in


CHURCH OF SAINT OUEN AT ROUEN.



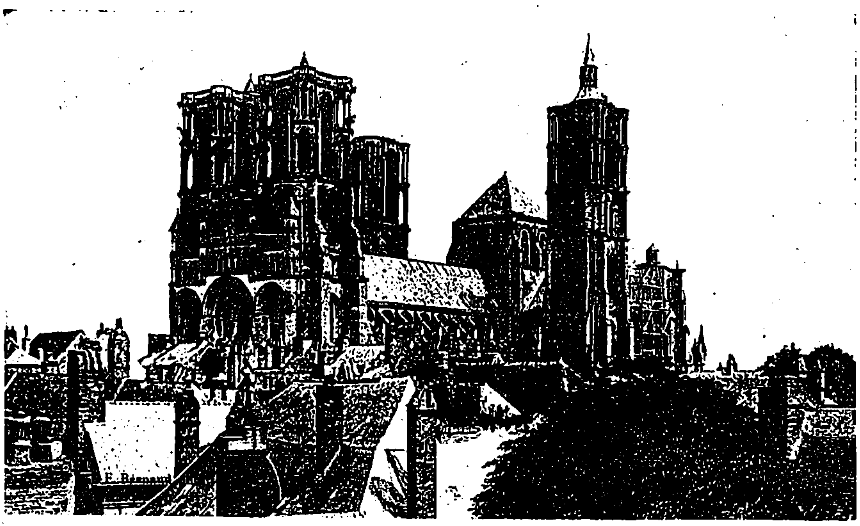
CATHEDRAL AT ROUEN.

memory of the baptism of Frank Clovis by Saint Remy. Started in 1211, its tower was completed about 1430, shortly after which a conflagration destroyed the upper portions and the only part to be restored was the sanctus-belfry on the summit of the apse. As suggested, the edifice is a superb expression of the earlier inventions of the builders of Aquitaine and Anjou combined with those of the architects of the Ile de France. The part which impresses us most is the magnificent grouping of the west front and the perfect appropriateness of its studied ornamentation applied with no less sobriety than judiciousness. The facade with its twin towers two hundred and sixty-three feet high presents a creation of life and interest, having a triple doorway five hundred and thirty statues, a rose window forty feet in diameter, a gallery of kings and other decorative features.

The general arrangement of the plan; harmony of the parts; absence of side chapels; proportion of side aisles to central nave—all go to place the cathedral at Rheims as one of the best if not the most perfect in France. Its measurements within are four hundred and fifty-three feet long, ninety-nine feet broad, and one hundred and twenty-five feet high.

As nearly all the kings of France were crowned in the cathedral, and in honor of such royal consecration, the great clerestory possesses a series of windows containing the first thirty-six kings of France, together with the archbishops who consecrated them. Brown glass has been used for flesh tints, since a lighter shade would have clashed with the other rich and strong colors and spoilt the existing harmony of tones. Of the three rose windows the western one with the kings below is the best, exemplifying the deep richness of early glass. An interesting feature occurs in the transept. A series of bishops, one to a window, are shown with a fanciful representation of his cathedral. Care has been taken to make each building different, revealing an artist with a fertile imagination. St. Remi is also rich in glass depicting the French kings, and while the work is of an earlier date the colors do not have the same depth and richness as those found in the cathedral.

While probably not triumphal, the great arch at Rheims partakes of the nature of the triumphal arches by its beauty of proportion and dignified splendor. This arch was doubtless, when perfect, more magnificent than any of the arches in Rome. Its great size no doubt lends much to its impressiveness. It is composed of three archways, the central one of which is slightly wider than those on the sides. While, unfortunately, this arch has been so much injured by being built into the walls of the city that it is difficult to say what its original form may have been, there still remains in excellent condition enough to make its beauty beyond question. The column, for instance, on the extreme right, and the bit of architrave above it, are remarkably well preserved and full of fine expression. The columns are Corinthian, and are more delicate than



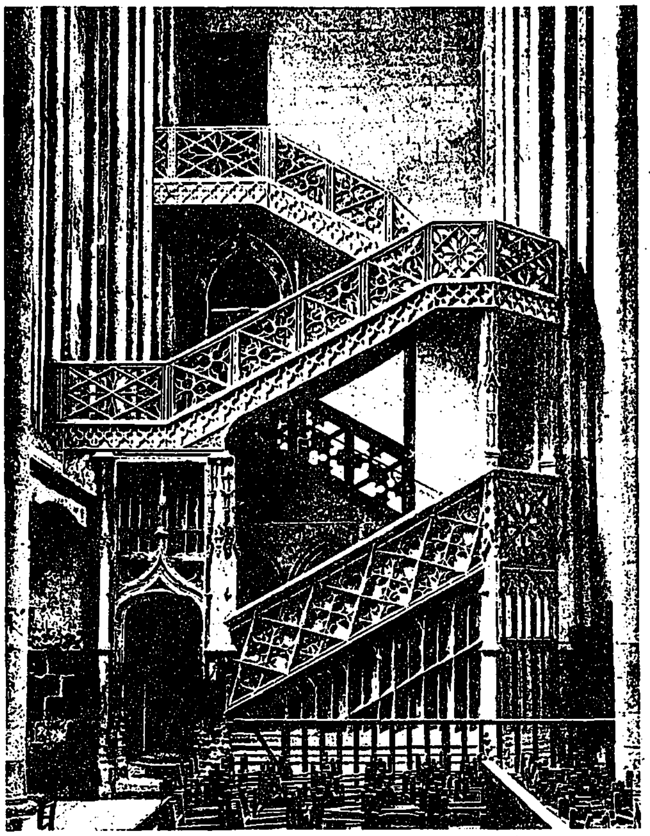
CATHEDRAL AT LAON.

most work of their time; for that time, if we may judge from the decadent style of the sculpture, was in the last age of the Roman empire.

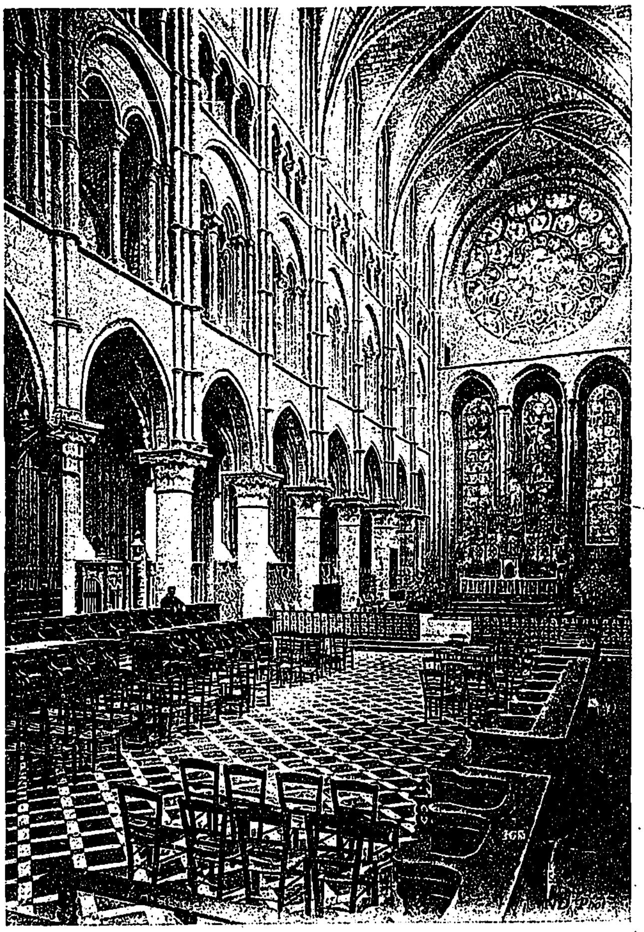
The following discussion of Flamboyant Gothic churches appeared in *The Brochure* and furnishes an idea of the rapid and sane growth of this style in architecture: The history of the Gothic style of architecture in France follows the course of almost all the styles that the world has seen,—a course so common that it has almost come to be formulated into a law of art. Beginning rudely, but with abundant energy, the style gradually progressed in refinement until it touched its period of highest development. Thereafter, the skill of hand remaining but the original impetus and inspiration sapped, it declined. It is the Gothic of this third period, the period of decline, which, in France, has been called "Flamboyant" from the flame-like curves most characteristic of its tracery, that we have here to consider.

"The art of any epoch is determined by an aggregation, which is the general state of mind induced by surrounding circumstances;" and to fairly understand any style it is necessary to glance, even though cursorily, at the history of its period.

Gothic architecture in France reached its greatest general perfection in the thirteenth century; but the beginning of the fourteenth inaugurated a long period of artistic stagnation, for, with the accession of Phillipe de Valois in 1328, commenced that sanguinary and protracted struggle between the rival thrones of France and England which continued, with little interruption, to the year 1450. During this period history presents but an unvarying recital of provinces laid waste, towns ruined and their monuments given up to the flames. The soil of France, traversed in turn by the hostile armies of the stranger and by the equally ferocious mercenaries charged with her defence, ravaged by pest and desolated by famine, offered a field little favorable to the development of architecture,—an art which, above all others, needs the fostering of peace. As was natural during such a period, the over-charged emotional nature of the nation found its vent in an unparalleled and feverish outburst of religious ardor. "When," says Taine, "men are very miserable they become excitable, like invalids and prisoners. Their sensibility increases and acquires a feminine delicacy; their heart is filled with caprices, agitations and despondency,—excesses from which they are free in a healthy state. They depart from such moderate sentiments as alone can maintain continuous masculine action. One can easily appreciate the hold the Christian faith derived from such sentiments. Morbid or trembling sensibility found its support in infinitudes of terror and of hope, in imaginings of flaming pits and of eternal perdition, and in



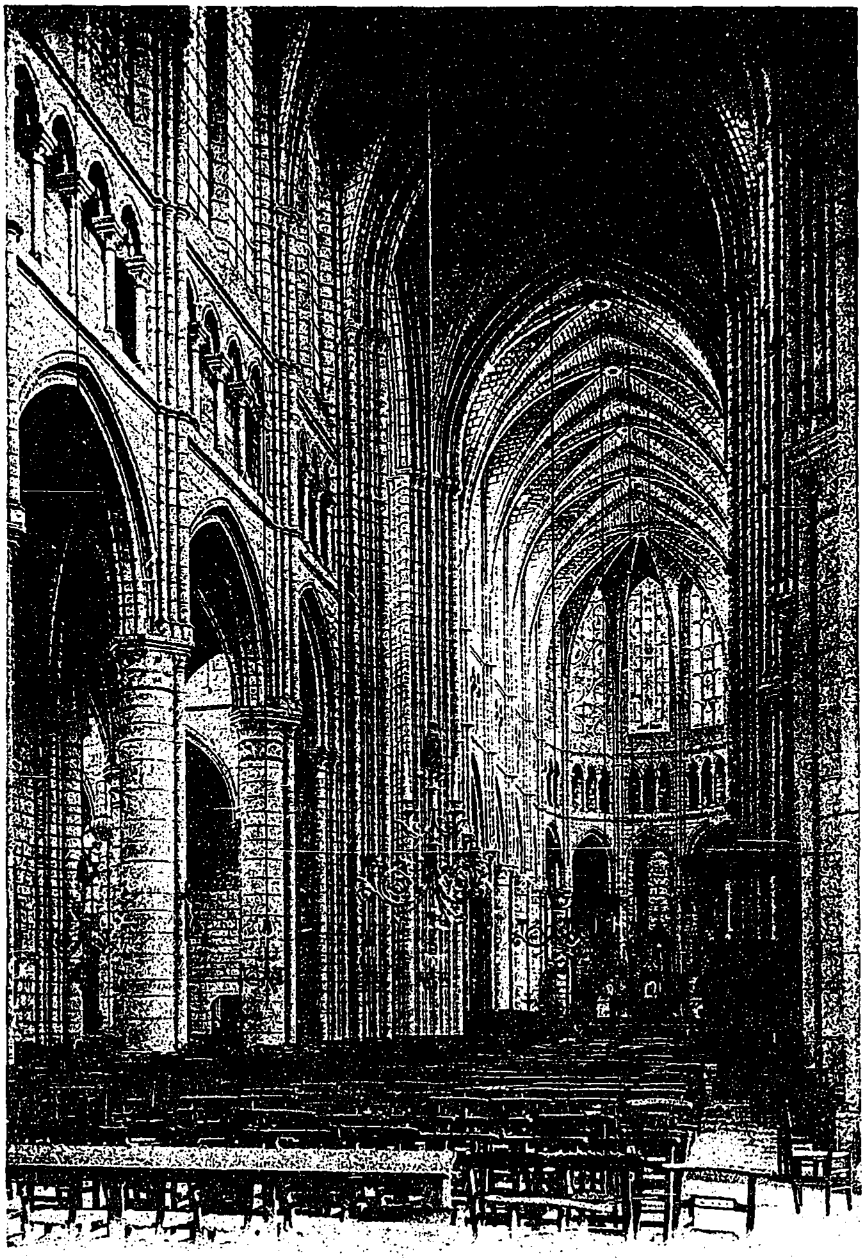
STAIRWAY TO LIBRARY, ROUEN CATHEDRAL.



NAVE OF CATHEDRAL AT LAON.

conceptions of a radiant paradise and of ineffable bliss.''

It was not until about the middle of the fifteenth century, after more than one hundred years of desolation, that, inspired by the appearance of that idyllic figure, Joan of Arc,



INTERIOR OF CATHEDRAL AT SAISSONS.

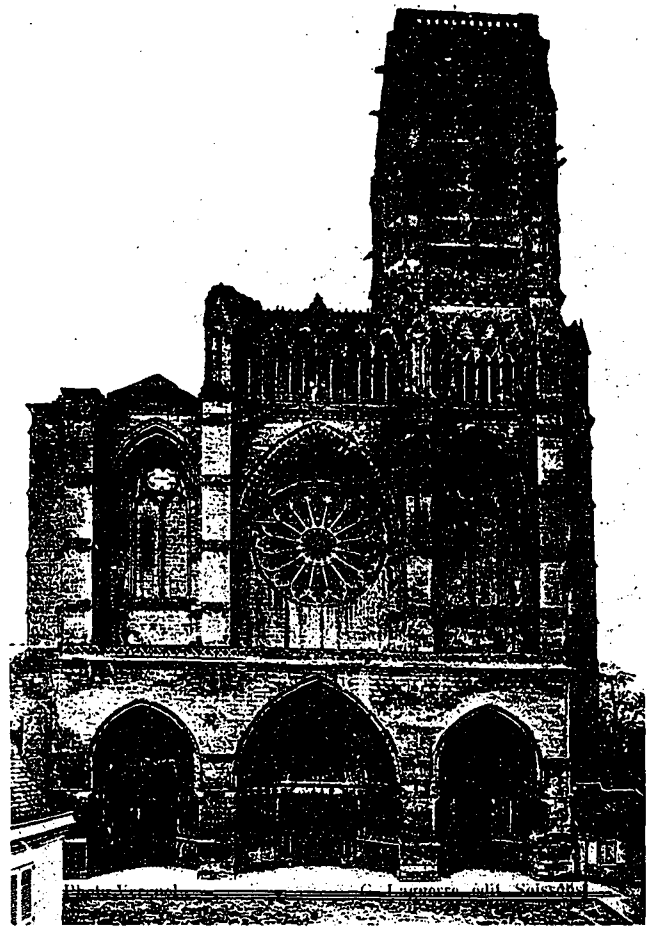
France roused herself from the desperate and weakening lethargy. Foot by foot the English were driven back, until Calais alone remained in their possession, and she resumed her place among the nations. Once again the arts flourished, and churches began to be built on all sides; but now in a new style, a style which showed no uncertain traces of the feverish moral excitement of the intervening century. The earliest authentical examples of Flamboyant Gothic correspond pretty nearly in date with the expulsion of the English.

But with this new upspringing, and relief from misery, came a natural reaction from the delirious religious ardor of the foregoing period. Never, truly, had the Church demanded more stringent outward observances or more exacting service; but the inward faith, overstrained, had relaxed and weakened. The clergy found it necessary to forward the work on their churches by selling indulgences. At Rouen the abbot of St. Ouen was obliged, in spite of his vast domains, to twice have recourse to this means, and published two decrees, the first granting forty, and the second one hundred days of absolution—for cash payment. The south tower of the facade of Rouen Cathedral was constructed from the funds raised by the sale of permissions to eat butter during Lent, and has been known as the ''Tour du Beurre'' ever since. The zeal of the workmen, which in the preceding centuries had sprung solely from religious ardor, now became coupled with another sentiment,—the desire for personal recognition as artists; and if they still worked for God's glory they had now no small thought for their own glory and reputations; and from the Flamboyant period on, they have taken care to leave us in no such ignorance of authorship as in the preceding centuries.

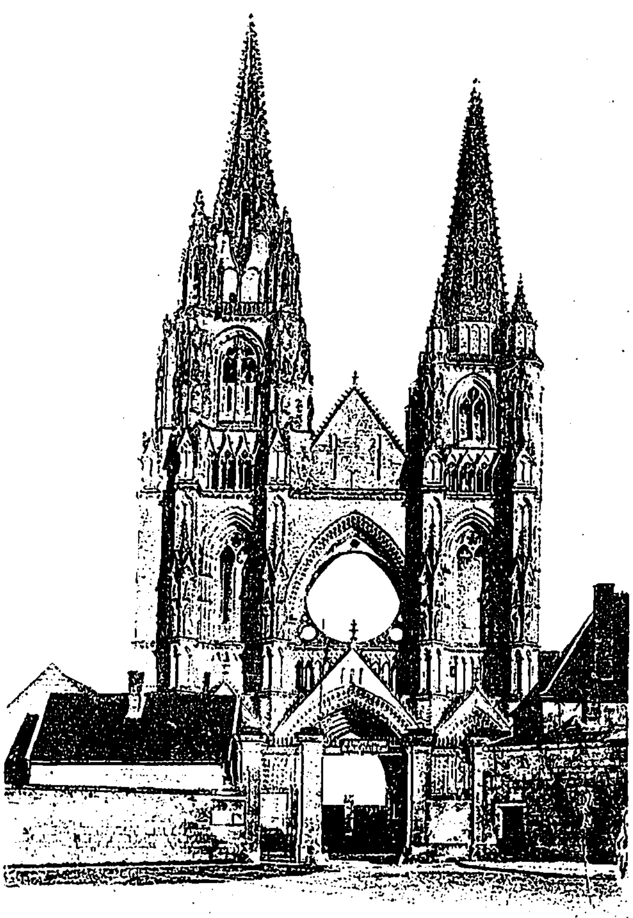
''You have,'' writes Ruskin, ''in the earlier Gothic, less wonderful construction, less careful masonry, far less expression of harmony of parts in the balance of the building. Earlier work always has more or less of the character of a good, solid wall with irregular holes in it, well carved wherever there is room. The last phase of good Gothic has no room to spare; it rises as high as it can on the narrowest foundation; stands in perfect strength with the least possible substance in its bars; connects niche with niche, and line with line, in an exquisite harmony, from which no stone can be removed, and to which you can add not a pinnacle; and yet introduces in rich, though now more calculated profusion, the living element of its sculpture: sculpture in the quatrefoils—sculpture in the brackets—sculpture in the gargoyles—sculpture in the niches—sculpture in the ridges and hollows of its mouldings,—not a shadow without meaning, not a light without life.

''But with this very perfection of his work came the unhappy pride of the builder in what he had done. As long as he had been merely raising clumsy walls and carving them like a child, in waywardness of fancy, his delight was in the things he thought of as he carved; but when he had once reached this pitch of constructive science, he began to think only how cleverly he could put the stones together. The question was not now with him, What can I represent? but, How high can I build—how wonderfully can I hang this arch in air, or weave this tracery across the clouds? And the catastrophe was instant and irrecoverable. Architecture became in France a mere web of waving lines,—in England a mere grating of perpendicular ones. Redundance was substituted for invention, and geometry for passion; the Gothic art became a mere expression of wanton expenditure and vulgar mathematics."

It must not be supposed, however, that this degradation of French Gothic from its highest perfection was instant and universal; and although the change, because of the long preceding period of almost complete stagnation, is more marked than is usual in such transitions, where the dying style dissolves and fades by barely perceptible gradations into that which is to succeed it, the early Flamboyant work fell but little short of the best of that of the thirteenth century. "Flamboyant tracery," says Freeman, "certainly does produce forms of the



CATHEDRAL AT SOISSONS.

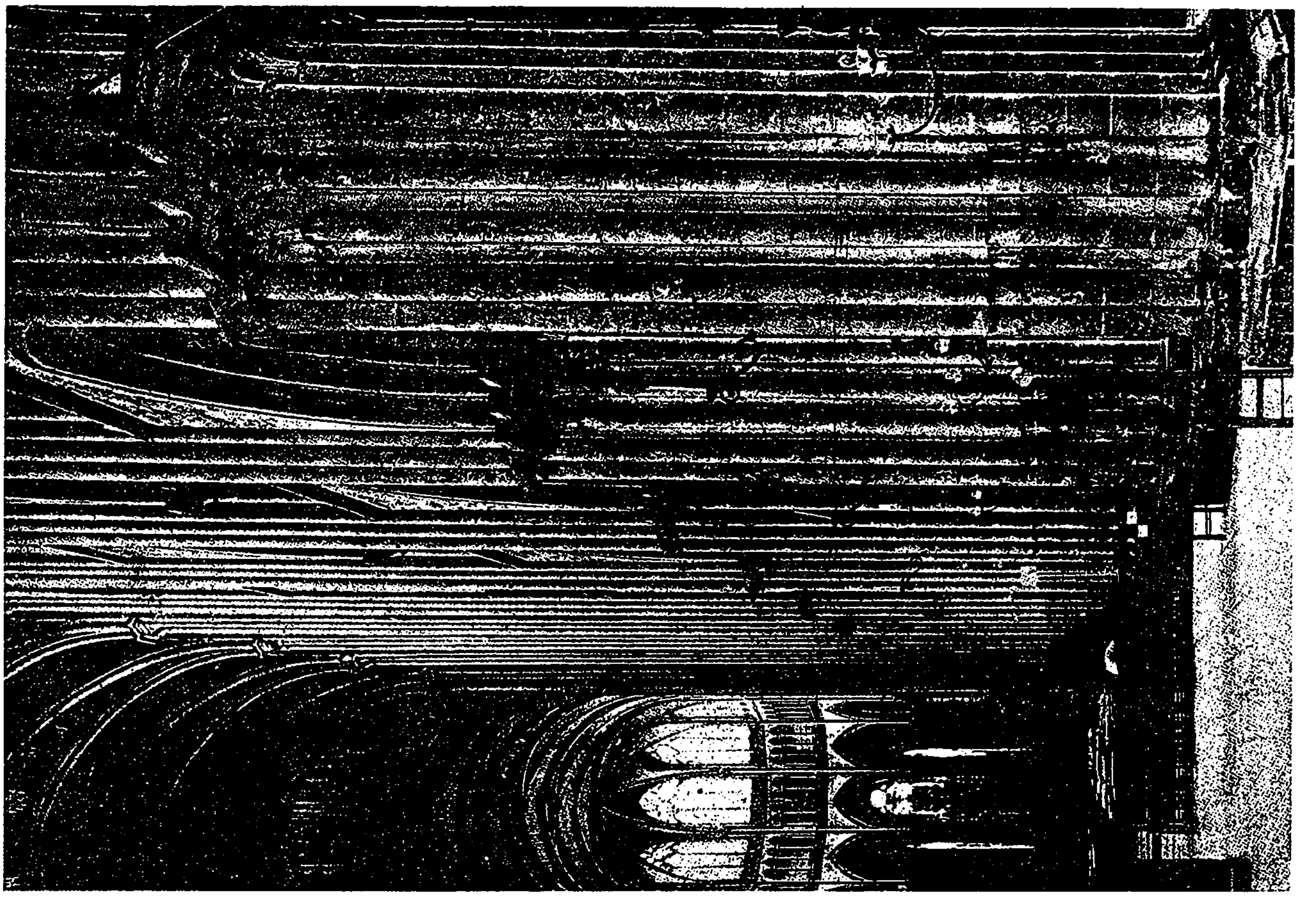


SAINT JEAN DES VIGNES AT SOISSON.

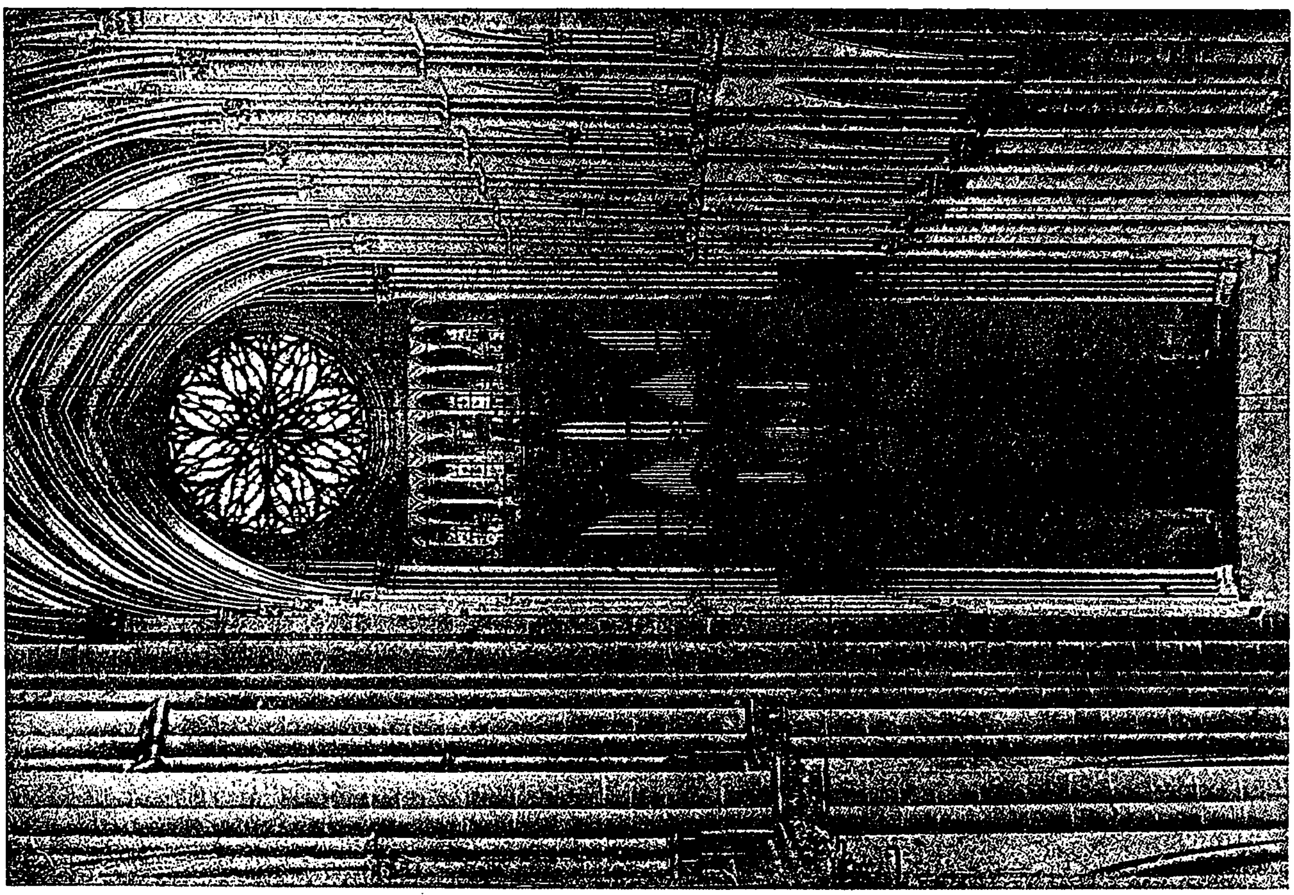
most extreme ugliness; but, on the other hand, when really well wrought, perhaps no other is so thoroughly satisfactory. '*Corruptio optimi est pessima.*' No other style has the capabilities of Flamboyant; no other has so grievously abused them. It has, on the one hand, reared the very noblest temple of our faith; on the other, it has run into all the perverse extravagances of an exuberant and undisciplined fancy. Truly the Abbey of St. Ouen may claim the first place among all the edifices that human skill has ever reared. Without, it combines the vast height so conspicuous in French churches with the more majestic outline of the English; the cross form nobly developed, no dimensions stunted, and all circling round, what Amiens, and Cologne, and Freyburg cannot boast, the true predominant central tower, and that one mass of superb tracery, and crowned with the lovely lantern."

Perhaps the most lucid exposition of the essential characteristics of the Flamboyant style, and certainly a most readable one, has been given us by Ruskin in his "Seven Lamps of Architecture." Taking as a text the window, as a typical feature of the Gothic style, he traces it through the earlier stages of its development, and then continues:—

"We have seen the mode in which the openings or penetrations of the window expanded,



ROUEN CATHEDRAL. THE NAVE.



AMIENS CATHEDRAL. NORTH AISLE.

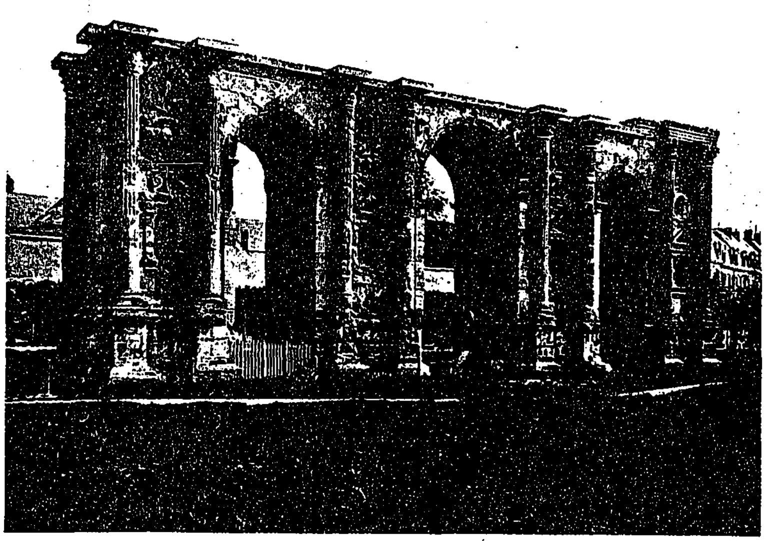
until what were, at first, awkward forms of intermediate stone, became delicate lines of tracery; and I have been careful in pointing out the peculiar attention bestowed on the proportion and decorations of the window at Rouen as

CHOIR OF ST. LOUP AT CHALONS.

compared with earlier mouldings, because that beauty and care are singularly significant. They mark that the traceries had *caught the eye* of the architect. Up to that time, up to the very last instant in which the reduction and thinning of the intervening stone was consummated, his eye had been on the openings only, on the stars of light. He did not care about the stone; a rude border of moulding was all he needed; it was the penetrating shape which he was watching. But when that shape had received its last possible expansion, and when the stone-work became an arrangement of graceful and parallel lines, that arrangement, like some form in a picture, unseen and accidentally developed, struck suddenly, inevitably, on the sight. It had literally not been seen before. It flashed out in an instant as an independent form. It became a feature of the work. The architect took it under his care, thought it over, and distributed its members as we see. I have confined myself, in following this change, to the window, as the feature in which it is clearest. But the transition is the same in every member of the architecture.

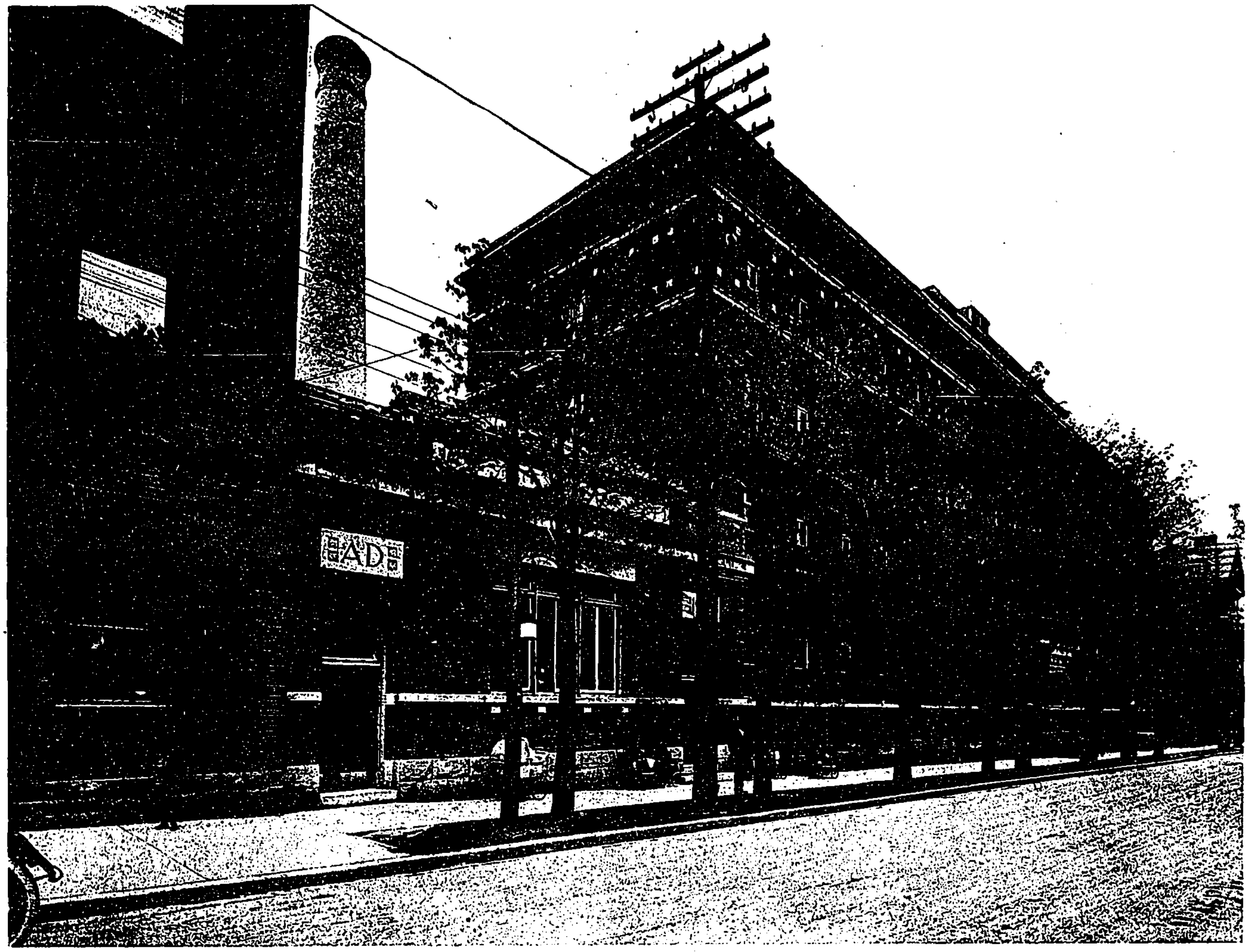
"Now, the great pause was at the moment when the space and the dividing stone-work were both equally considered. It did not last fifty years. The forms of tracery were seized with childish delight in the novel source of beauty, and the intervening space was cast aside, as an element of decoration, forever. . . . That tracery marks a pause between the laying aside of one great ruling principle and the taking up of another; a pause as marked, as clear, as conspicuous to the distant view of after times, as to the distant glance of the traveller is the culminating ridge of the mountain chain over which he has passed. It was the great watershed of Gothic art. Before it, all had been ascent; after it, all was decline; both, indeed, by winding paths and varied slopes; both interrupted, like the gradual rise and fall of the passes of the Alps, by great mountain outliers, isolated or branching from the central chain, and by retrograde or parallel directions of the valleys of access. But the track of the human mind is traceable up to that glorious ridge, in a continuous line, and thence downwards. And at that point and that instant, reaching the place that was nearest heaven, the builders looked back, for the last time, to the way by which they had come and the scenes through which their early course had passed. They turned away from them and their morning light, and descended towards a new horizon, for a time in the warmth of western sun, but plunging with every forward step into more cold and melancholy shade.

"At the close of the period of pause, the first sign of serious change was like a low breeze passing through the emaciated tracery, and making it tremble. It began to undulate like the

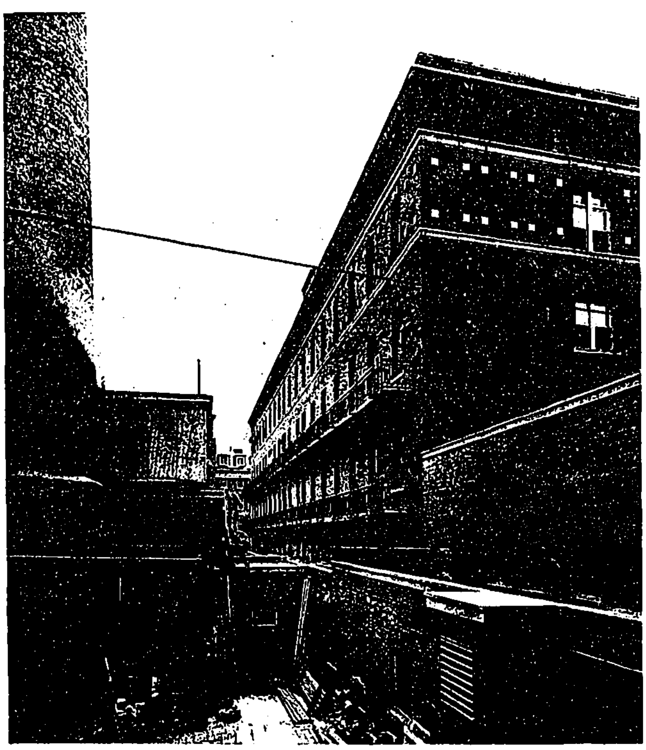


ROMAN ARCH AT RHEIMS, FRANCE.

threads of a cobweb lifted by the wind. It lost its essence as a structure of stone. Reduced to the slenderness of threads, it began to be considered as possessing also their flexibility. The architect was pleased with this his new fancy."



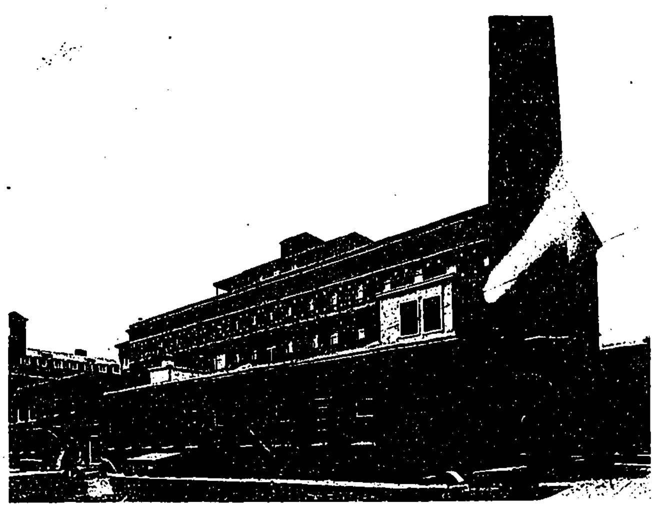
NEW WEST WING OF OUT-PATIENTS' DEPARTMENT
ON ELIZABETH STREET.



VIEW BETWEEN LAUNDRY AND WEST WING.

HOSPITAL FOR SICK CHILDREN, TORONTO.

STEPHENS & LEE, ARCHITECTS.



LAUNDRY AND POWER HOUSE.

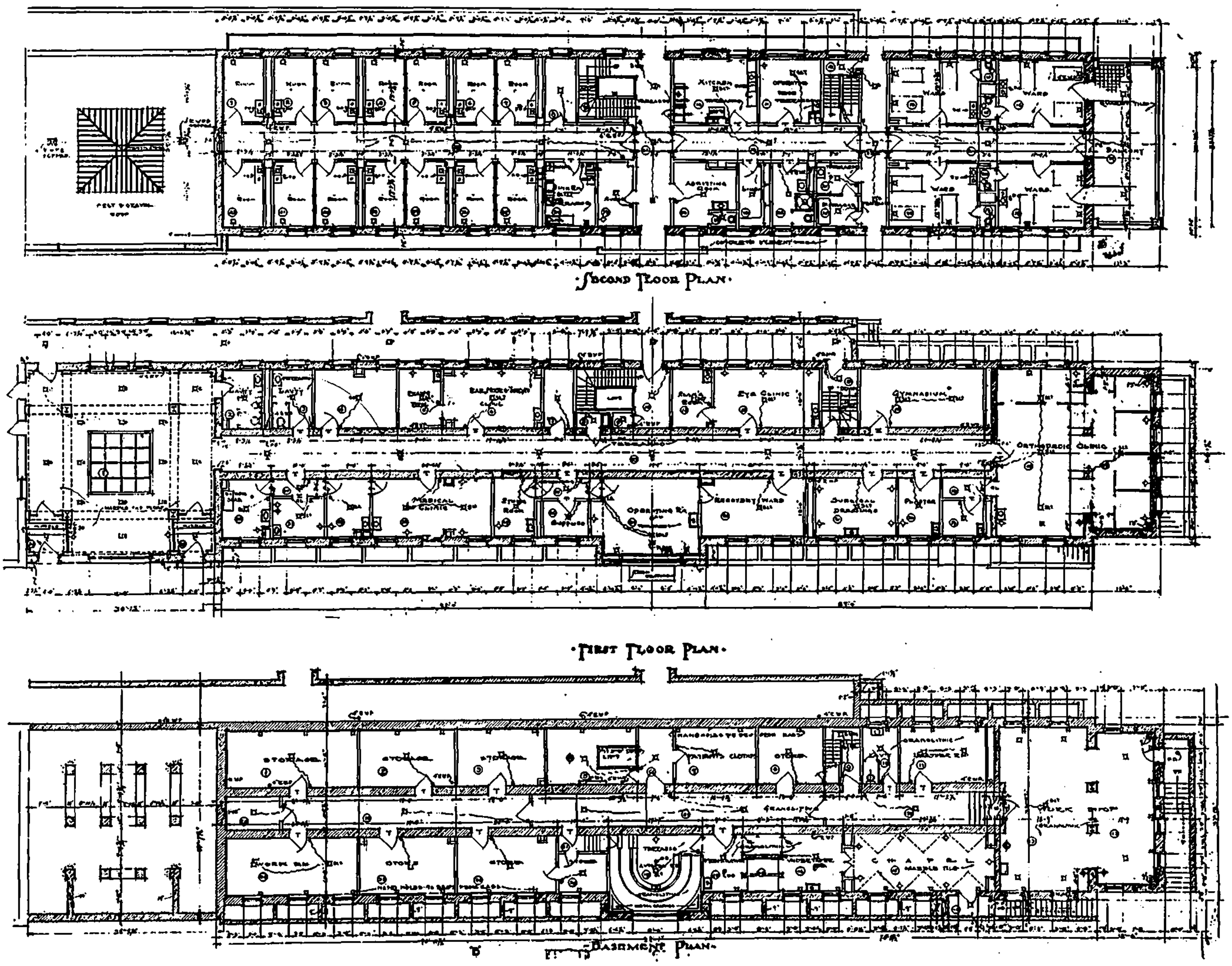
Hospital for Sick Children, Toronto

THE alterations and the additions to the Hospital for Sick Children, College and Elizabeth streets, Toronto, are now complete. These consist of a new wing, including new out patients' department, a power plant and laundry, and a new pasteurizing building and plant. In addition to this there have been various alterations and changes to the main building, described shortly as follows: The whole of the top floor has been given up for an operating suite, with two large operating rooms well lighted from the north. Immediately adjoining these is the sterilizing room, anaesthetic rooms, work rooms for preparation of dressings and accommodation for surgeons and dental operating room.

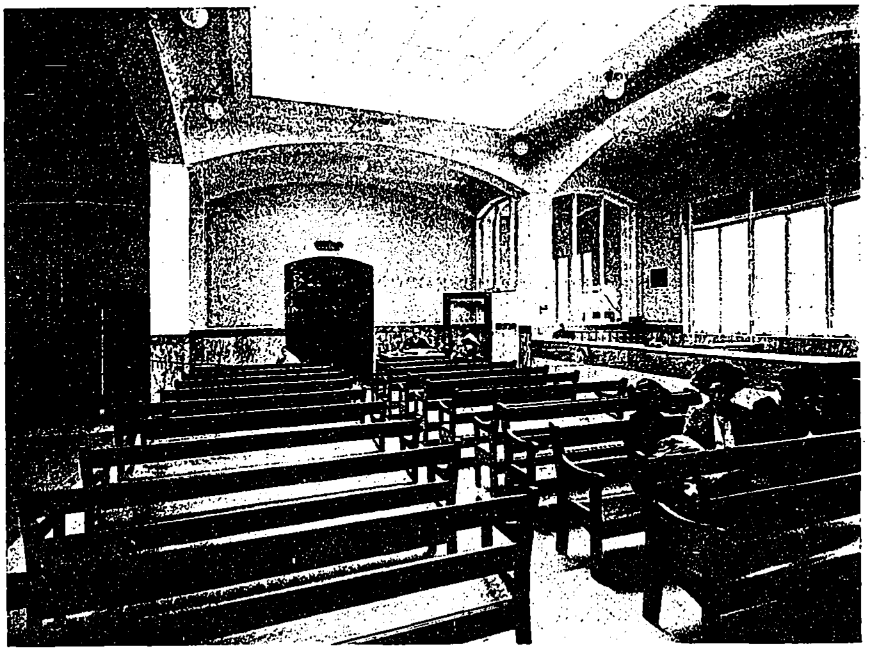
A new electric elevator has been installed. Each of the five large wards flanking the building on the east and west have been altered and extended in such a manner as to permit the addition of an airing balcony at the southeast of each and a sink room, bathroom and toilet at the north end of each. The kitchen has been extended and much improved by the addition of cold storage, new diet kitchen and complete modern equipment throughout.

It has been found necessary to enlarge the X ray department for the treatment of special cases. The space that was formerly occupied by operating rooms has been assigned for this purpose, and an apparatus has been installed with dark room, etc. These changes, with the adjustment to heating arrangements and the installation of modern ventilating system and electric lighting, have brought the main building completely up to date and the last word in modern hospital construction.

On the west side of the property has been built a new wing, the ground floor of which is divided up into the various clinics for out patients' treatment, with a waiting room capable of seating 200 patients, and dispensary. This department includes operating suite, orthopedic and surgical clinic; ear, nose and throat clinic; eye clinic, medical clinic, dressings, examination, preparation and plaster rooms. In connection



PLANS OF HOSPITAL FOR SICK CHILDREN, TORONTO.

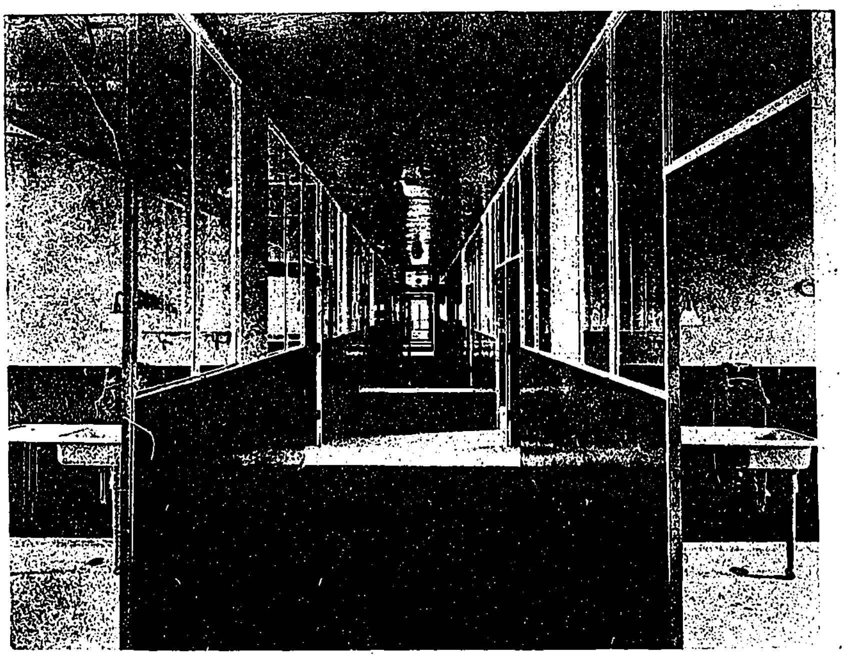


OUT-PATIENTS' WAITING ROOM.

with the orthopedic clinic is a large workshop with modern machinery driven by electric motors for manufacturing the various artificial appliances prescribed for patients in this department. The second and third floors of this wing are divided into 14 single and four 3-bed wards on each floor, making extra accommodation for 52 patients. These will be used for detention purposes to prevent the admission or spread of communicable diseases in the hospital. Each of these floors has its own diet kitchen, sink room, receiving and discharge rooms. The division between the wards themselves and corridors are made by means of metal and glass screens running from floor to ceiling for the purpose of keeping the patients under complete observation. These various floors are accessible by elevator or staircase, the elevator cage being constructed to take a bed if necessary. This elevator runs to roof, which is to be used as an open-air ward, having been covered with flat red tile, and protected by high parapet wall, with that end in view. There is provision also on this floor for kitchen, toilets and sink rooms, so that patients may be treated on the roof as long as is thought desirable. On both sides of ward floors and outside of building running from end to end are observation balconies, and at the south end of each floor are airing balconies. The top floor is at present given up to accommodate the servants, and is so arranged as to be converted into wards when necessary. The basement is taken up by orthopedic workshop, autopsy room, morgue, chapel and various storerooms. The construction throughout is fireproof, the floor construction being concrete and expanded metal, all beams and columns being fireproofed with concrete, and wood trim being reduced to a minimum, only being used for doors and windows.

The hospital has followed the lead of many other institutions who find economy in providing their own light, heat and power, and for this purpose a building has been erected in a central position on the property. The basement of this building is occupied by the boiler room, containing three 200 h.p. water tube boilers, and a generating room, containing electric generators and ice manufacturing machinery. From this plant is derived the steam to heat the various buildings, being conveyed in mains run through tunnels constructed for them. From the generators is derived the electrical power necessary for lights and to drive the motors in use for fans, laundry, workshops and ice machine. The refrigeration is run in cork-covered piping to the Pasteurizing plant, ice-making room and cold storage boxes in the main building, and other parts of the hospital.

To provide the requisite draught for boilers, a stack has been erected to the north of the power-house at a height of 125 feet from the ground level, and high enough to



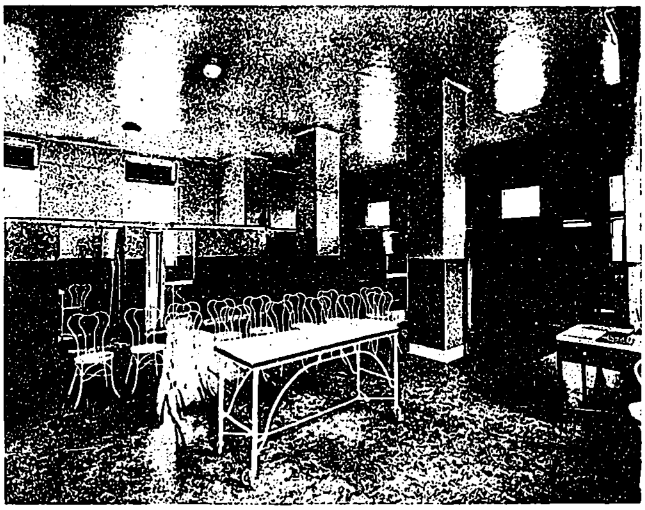
CORRIDOR, FIRST FLOOR, NEW WING.

remove fumes of coal consumption clear of adjoining buildings. Coal bunkers, with a storage capacity of 200 tons, have been built adjoining the power-house to the north. The fire boxes to boiler are fed automatically, each grate having its own smoke-consuming apparatus.

On the upper or ground floor of the power-house is situated the laundry. This is a room 80 ft. long by 30 ft. wide, and is fully equipped with all the most modern laundry machinery, including washing machines, body ironers, rotary extractors, mangle and drying cabinet. In connection with this are the sorting rooms. The machinery throughout is run on panel board control, the power for which is derived from the power plant as described. Like the other new buildings, the power plant and laundry have been constructed of materials thoroughly fireproof and of strong and lasting qualities.

For the dairy and Pasteurizing plant, which formerly occupied temporary quarters in a cottage on Laplante avenue, a new building has been erected at the rear of the power plant and facing the nurses' home. In accordance with the growing demand for certified and Pasteurized milk, a modern equipment has been installed, including bottle-washing machine, bottle fillers, separator, Pasteurizers, steam kettles, ice boxes, etc. Serviceable quarters have been assigned for distribution to the public, who have access through Laplante avenue. All buildings are intercommunicating by means of covered corridors, which give access to each department.

The architects of this work were Stephens & Lee; engineers, Williams & Cole; building superintendent, R. H. Collinge.



ORTHOPEDIC CLINIC, OUT-PATIENTS' DEPARTMENT.

NEW OPERATING ROOM IN MAIN BUILDING.

FOR several reasons a children's hospital should not be directly connected with a hospital for adults. The isolation of the patients in a children's hospital must be more complete, and is a necessity on account of the communicable nature of children's diseases from one to another and on account of their peculiar liability to secondary infections. Their resistance to such infections is lowered by wasting disease. Perfect isolation is easily obtainable in a large institution built on the cottage plan, and can also be maintained in a pavilion plan, but it is more difficult to accomplish this in a small hospital in which all of the patients must be housed in one building. This is likewise the case in the usual city hospital built on the block plan. Small hospitals and city hospitals should be designed and equipped so that they can be divided into separate units by closing doors which are normally concealed in recesses across corridors and by sealing the joints. Many of the rooms should have French windows opening to exterior porches, so that the isolated portions of the building can be served by way of stairs open to the air. The institution must be divided up into as many well-separated units as possible, to provide for partial isolation of different classes of diseases. Surgical (clean and pus), medical, skin, gastro-intestinal diseases, and the specialties, eye, ear, nose, and throat, etc. There must be ample provision for the isolation of patients in small wards and single rooms. The unit measurements of the architectural features should also differ in a hospital for children from those for adults, and it is a mistake to attempt to maintain the same unit measurements of floor, window and air space. Inasmuch as the childrens' beds are the smaller, the window spacing should be in proportion, the window-sills ought to be lower, and the stories need not be as high, for their breathing capacity does not require as much initial air space. The stairs should have a lower rise, and other details require special treatment.—*Hornsby and Schmidt.*

Copper Alloy as a Retardant in Metal Lath of Corrosion

CLARENCE W. NOBLE

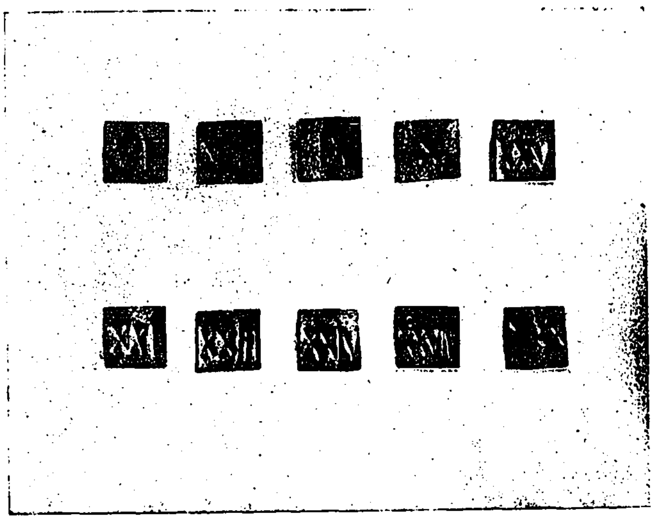
THE problem of corrosion in metal lath is one which is receiving far greater attention today than it did ten years ago. At that time the metal lath industry was in its infancy and corrosion had not yet had time to manifest itself. Its dangers were not therefore appreciated. Architects specified metal lath indiscriminately without stating whether or not the material was to be protected. Contractors, being but human, put no more value into their work than was demanded. As a result, many a job has been erected with metal lath which is in no way protected from the rusting effect of the plaster. The recent discovery that the lath in some of these buildings has practically disappeared, has brought about a greater care in such specifications.

It is a well known fact that metal lath bedded in hard wall plaster is corroded far more rapidly than were it exposed to the atmosphere. The reason for this is not generally understood.

The basis of all hardwall plasters is plaster of paris or calcium sulphate. This is a salt which may be described as having sulphuric acid as one of its ancestors. The bad family name has clung to the child, and the corrosion of metal lath in hard wall plaster is regarded by many as the result of an acid attack. This, however, is not the case. Calcium sulphate is not acid in its nature. The test with litmus paper gives a blue color which indicates alkali. This is further shown by the fact that many hard wall plasters contain hydrated lime. Every school boy knows that if lime and sulphuric acid are placed in contact, the result is a rapid evolution of hydrogen gas, together with the destruction of both the acid and the lime. The presence of an acid in a plaster containing lime is therefore impossible.

In order to explain the reason for the corrosion of metal lath in hard wall plaster it is first necessary to consider the nature of rust. Electric action and chemical action are very closely related. It is now generally admitted that corrosion in steel is the result of electrical action. The elements necessary to form an electric battery exist when two metals differing in electric potential are in contact in the pres-

TO THE LEFT, WEIGHING THE SPECIMENS.
ABOVE, TEST SPECIMENS BEDDED IN PLASTER.
BELOW, SPECIMENS READY FOR TESTING.



ence of an acid or salt. The ordinary lack of uniformity in the distribution of the chemical impurities in steel is sufficient to vary the electric potential of the metal and consequently to make one of the necessary conditions for a weak electric current. The other condition is afforded by the small amounts of impurities that are found in nearly all water or moist air. This weak electric current in time results in the corrosion of the steel.

Hardwall plaster in setting up is electro-active. When it hardens in contact with unprotected steel, it forces an electric current through the steel and consequently greatly accelerates rusting which, without the assistance of the forced current, would be weak or absent. This explains the real reason for the corrosive properties of hard wall plaster.

The writer is the general sales agent for a recognized brand of metal lath. More than any other Canadian therefore, the problem of corrosion in metal lath is his problem. The investigation of the properties of copper alloy in hard wall plaster described in this paper by him was made in the course of a general study of the properties of several advertised brands of rust resisting steel. It was necessary first to decide what would be a fair test. Technical information on this point is woefully lacking. There is an abundance of opinion recorded, but very few tests. The only extensive tests of the effect of hardwall plaster on metal known to the writer, outside of his own, are those being conducted by the Bureau of Standards of the United States Government. Dr. Pearson, who is conducting these tests, believes that the proof of the pudding is in the eating. He, therefore, has erected a large number of panels each about 18 x 24 inches square, using samples of practically all the metal lath on the American market together with all the different types of protecting coating, and covering them variously with all kinds of plaster he could find. These test panels were erected some two years ago. It was proposed to await their destruction by time, after which an adequate report could be written. The main objection to this system is that time may not destroy the panels. The writer recently made a careful examination of them. Nearly all, particularly those on coated lath are apparently in excellent condition. In some cases the portion of the lath which was not covered by the plaster shows rust. There is no means short of the destruction of the panel of finding out whether or not the portion of the lath which is bedded in the plaster is rusting.

As has been stated, it is the opinion of Dr. Pearson that corrosion tests must be carried to destruction. His reason for this lies in the lack of uniformity of individual results. With this opinion the writer must differ. Time may be of no value to the United States Government, but the architect in private practice wants information about the quality of his materials not for his grandson, but for himself. Lack of uniformity must be overcome by averaging the results of a large number of tests. Dr. Pearson's tests are, when analyzed, a combination of a weather exposure test, and hard wall plaster exposure test. That portion of the lath which is not bedded in the plaster receives a weather test, and the balance of it is tested by the plaster. Full information now exists as to the destruction of steel by weather. Only information on destruction by plaster is needed. It is this information which the writer has secured.

As plaster of paris is the cause of the mischief, it appeared reasonable to make a series of tests with this material. The Canadian Laboratories Ltd., of Toronto, were employed to do the work. They were supplied with a number of samples each one inch square of twenty-seven gauge steel both of commercial metal and copper alloy. These were carefully cleaned in sulphuric acid of all mill scale after which they were washed in a bath of lime water followed by pure water. They were then dried and accurately weighed. After weighing they were bedded in plaster of paris, where they were left for a time varying from seven to ninety days. When this time had expired they were removed, cleaned of plaster and washed in ammonium citrate. This removes the rust without attacking the steel. After the removal of the rust the specimen was again weighed, and by subtraction from the original weight, the loss of weight by corrosion was found. This, when divided by the original weight gives the per cent loss of weight, which is the figure desired for comparison. No extreme accuracy was attempted in securing specimens of identical area as the reduction of all losses to percentage of original weight gives results which are comparable regardless of the area used in their determination.

The net gain from this first series of experiments was only experience. Pure plaster of paris sets very rapidly. Enough plaster was mixed to bed the entire series of twenty-four specimens at one time. When bedding was first started, the plaster was very wet, but before it was finished it had set up sufficiently to make it necessary to exert considerable pressure in order to cause it to adhere well around the specimen. It was found that the specimens bedded in fresh mortar had corroded rapidly while others had not. The result was that the ninety day tests showed less corrosion than those of fourteen days, a result which was necessarily somewhat disconcerting. Owing, however, to the fact that specimens which were to be removed at the same time were bedded in consecutive order, and consequently were subject to attack from plaster in a similar condition, it was found that comparison could reasonably be made between the different specimens in the same set. Such comparison indicated a resistance of corrosion on the part of copper alloy greater than that of the other materials tested. It is the hope of securing more accurate information along this line that led to the second series of tests.

The general procedure of the first series of tests was followed in making a second series except that several modifications were made in order to secure more accurate results. The idea of accelerating the tests by using pure plaster of paris was abandoned. Instead, five different series of tests were made, using five brands of commercial plaster. In order to avoid the error arising from difference in the amount of absorbed water, only sufficient plaster was mixed to imbed one specimen at a time. The water used was always forty per cent. by weight of the plaster and the specimens were placed in the plaster immediately after the admixture of the water. It was suggested by others who contemplated a similar series of tests that the rate of corrision might vary with the humidity of the atmosphere. Consequently an atmosphere of standard humidity would be necessary in order to permit comparison with tests made by different observers. In order to secure this, the specimens were stored over a water bath in a closed box, thus insuring complete saturation of the atmosphere. The possibility of electrolytic action between the specimens was avoided by keeping them separately stored on glass plates.

Each of the five different series of tests consisted of fifteen specimens of plain steel and fifteen of copper alloy intended for removal three of a kind at a time, at one day, seven days, fourteen days, thirty days and ninety days. Thus a total of one hundred and fifty specimens were tested.

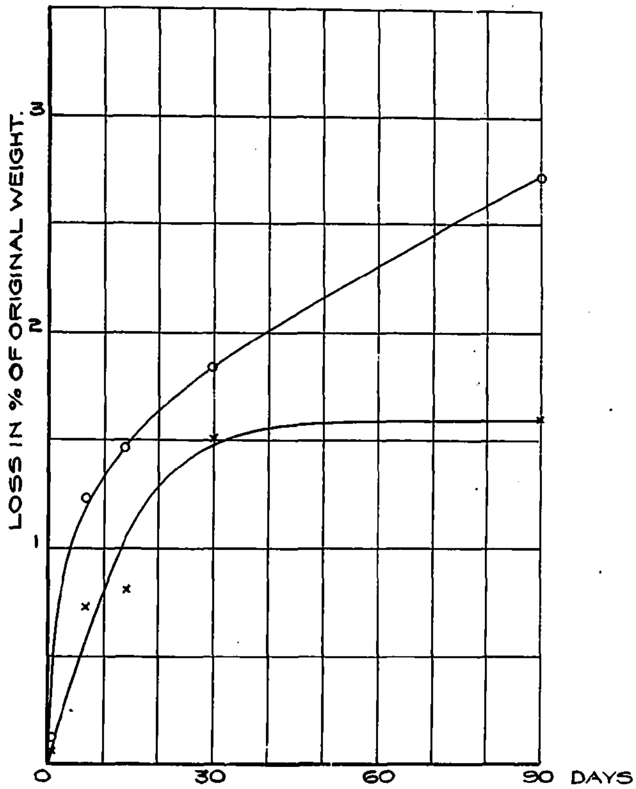
The plasters selected for tests are among the most widely known brands on the Canadian market. With the exception of the plaster indicated in the table as Number 1, they are typical hard wall plasters. Number one is a slow setting patented plaster having but a small percentage of calcium sulphate in its composition, and is more porous in its nature than the others. The plasters used were furnished by their manufacturers who knew the purpose for which they were to be used. With them they gave a statement of their composition. Plasters No. 2, 4 and 5 contain about 70 per cent. sand; No. 3 contains no sand. It is furnished to the plasterer in this condition with the understanding that he will add his own sand. All plasters were tested just as furnished. The other constituents of the hard wall plaster are plaster of paris, a small amount of hair, a little retardant and a varying amount of hydrated lime.

Both the ordinary steel and the copper alloy were manufactured by the U. S. Steel Corporation. The plain steel was obtained from commercial stock while the copper alloy was from sheets furnished for the test. Through a misunderstanding the gauges of the specimens were not uniform. The plain steel tested with plasters except No. 2 was 25 gauge, while the copper alloy was 26 gauge throughout. Twenty-seven gauge plain steel was used with No. 2 plaster. On this account the comparison of results by percentages of original weight lost would give misleading results. This difficulty was overcome by correcting the reported results by a factor which in effect reduced the percent of loss to that on an equivalent area of 27 gauge metal.

The mass of information obtained with each kind of plaster at each time of exposure is considerable, but can be summarized in two figures stating the average percentage of loss of the three specimens of each kind of steel tested. These figures from all tests corrected to bring them to standard basis of 27 gauge steel are given at the end of this article.

The rate of corrosion of steel under apparently like conditions varies so widely that uniform results cannot be expected from specimens one inch square even in the average of three tests. The value of the individual figures in the above table lies therefore chiefly in the fact that they are constituent figures in larger averages based on all the plasters tested for a given time, or all of the times tested for a given plaster. The figures showing the average effect of time regardless of plaster are shown in the columns at the right hand of the table, and the figures showing the effect of a given plaster regardless of time are shown in the averages at the bottom of the table. The figures both at the right hand and bottom of the table are themselves averaged and by checking each other prove the correctness of the computation. They show that as the average of seventy-five tests with all plasters and all times of exposure plain steel loses 1-51—100 per cent. of its original weight by corrosion, and copper alloy loses 94—100 per cent. In other words the average ratio of loss by corrosion for plain steel and for copper alloy is as 1.61 to 1.00.

Another way of expressing the relative powers of resistance of the two metals is by average of the ratios of loss by corrosion of these materials in the different plasters. These ratios are shown directly under the average loss for each plaster. This method indicates that average loss by corrosion of plain steel and copper alloy in the various plasters is as 1.77 to 1.00. This figure, it will be noticed, does not agree with that showing the average of all tests. The reason for this is that the plasters which show a less rate of corrosion than others show also a greater advantage for copper alloy. For example, No. 2 plaster, which is the least corrosive of those tested, shows a ratio between plain steel and copper alloy of 3.62 to 1.00. This high value while it affects considerably the average of ratios by plasters affects but slightly the general average of all tests as it is based on



VARIATION OF CORROSION WITH TIME
PLAIN STEEL-o. COPPER ALLOY-x

very low rates of corrosion. It is for the reader to decide which figure expresses more truly the relative value of the two metals.

The effect of time on corrosion is shown graphically in the accompanying diagram, which is based on the average of all tests at any given time for both plain steel and alloy. In this diagram the vertical spaces indicate per cent. loss by corrosion, while horizontal distances indicate time.

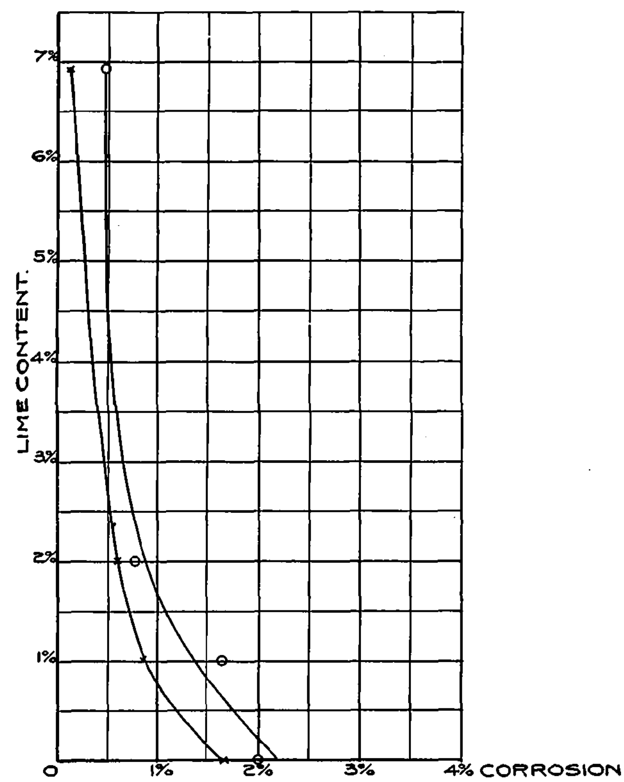
In both the plain steel and copper alloy the corrosion at seven days was more than seven times as great as that at one day. This is probably due to the well known fact that a steel surface has a very considerable resistance to rust until corrosion is once started but after the polish has been cut corrosion proceeds more easily and rapidly.

After seven days the rate of corrosion in both the plain steel and alloy falls off rapidly until the thirtieth day. This latter period in the case of copper alloy seems to mark very nearly the final point at which corrosion takes place. The rusting in the sixty days between the thirty and the ninety day tests is practically the same as the rusting which took place in the first day alone. This probably occurred in the first few days of the period. In the case of plain steel corrosion seems to be quite active after the thirtieth day. Thirty three per cent. of the loss shown in the average of the ninety day tests had taken place since the thirty day test.

It must be borne in mind that the figures discussed as the result at ninety days are the average of only fifteen tests for each of the metals. It is quite possible that a larger number of tests might slightly modify the figures given in these conclusions. It will be remembered that with the exception of No. 1, all the plasters tested are similar in composition. The only important variation is in the percentage of hydrated lime. This lime was found to have an important influence on the rate of corrosion.

TABLE SHOWING RELATION BETWEEN LIME AND CORROSION.

Plaster No.	Per cent. Lime	Loss by Corrosion. Plain Steel	Copper Alloy
4	0.00	1.99	1.66
5	1.00	1.66	0.87
3	2.00	0.79	0.61
2	6.92	0.47	0.13



VARIATION OF CORROSION WITH PERCENTAGE OF HYDRATED LIME
PLAIN STEEL-o. COPPER ALLOY-x

The foregoing table shows in parallel columns for the various plasters the average amount of corrosion and the percentage of hydrated lime.

Plaster No. 1 has been omitted as it differs in type from the others. It will be noted that when the plasters are arranged according to their lime contents they are also arranged according to their corrosive rate. In fact, the correspondence is so close that the rate of corrosion of an untested plaster could be predicted by interpolation within reasonable limits if its lime content were known. The relation between lime and corrosion is also shown graphically in the accompanying diagram.

This relation between lime and hard wall plaster corrosion is a hitherto unrecognized fact of great importance. A comparison between plaster No. 4 and No. 2 shows that the addition of 7 per cent. hydrated lime reduces the corrosion rate on plain steel to 24 per cent. of the rate shown by a plaster without lime. If copper alloy is used the rate is only 8 per cent. of the rate with unlimed plaster. The specification of a plaster containing 7 per cent. lime applied to copper alloy lath will reduce the corrosion to 6½ per cent. of what it would be were neither of these precautions observed. All of this is, of course, entirely independent of the protective coating of the lath. It would appear therefore that for metal lath the specification of copper alloy with a hard wall plaster containing seven per cent. hydrated lime should become a standard. As it may otherwise escape the attention of the casual reader, it is here stated that the importance of this discovery is out of all proportion to the space taken in describing it.

Unless the wall is actually wet it would appear that the presence or absence of sand in the plaster has no effect on corrosion. This is shown by consideration in the above diagram of the position of Plaster No. 3, which will be located by the fact that it contains two per cent. lime. It was tested neat, while the other plasters carried about two thirds sand, yet it fell into the place in the diagram that was appointed for it by its lime content.

The information gained from these tests may be summarized as follows: 1. With a saturated atmosphere, but without the presence of water as such, the richness of the mix of hard wall plaster has no effect on its rate of corrosion of metal lath. 2. The addition of hydrated lime up to seven per cent. (and probably more) reduces the rate of corrosion. 3. The use of copper alloy instead of plain steel reduces the rate of corrosion and also increases the efficiency of hydrated lime in this respect. 4. With a metal lath formed from copper alloy corrosion from hard wall plaster ceases in about thirty days. 5. The combination of seven per cent. of hydrated lime and copper alloy reduces the rate of corrosion to about one sixteenth of the rate shown when these precautions are not observed. 6. As compared with these simple precautions the use of a heavy gauge as a means of resisting corrosion is exceedingly inefficient and expensive.

Percentage of Loss by Corrosion of Plain Steel and Copper Alloy Bedded in Patent Plaster.

NOTE:—All percentages when specimens tested were other than twenty-seven gauge are reduced to equivalent loss of twenty-seven gauge material. Each figure is the average of three tests.

Plaster		1	2	3	4	5	Average	Ratio
Days.	Plain or Alloy.							
1	Plain	0.43	0.00	0.04	0.12	0.08	0.13	1.86
1	Alloy	0.16	0.00	0.02	0.09	0.07	0.07	1.00
7	Plain	1.37	0.12	0.57	1.94	2.22	1.24	1.77
7	Alloy	0.83	0.00	0.35	1.40	1.01	0.72	1.00
14	Plain	2.22	1.25	0.88	1.68	1.33	1.47	1.81
14	Alloy	0.99	0.10	0.93	1.34	0.71	0.81	1.00
30	Plain	3.06	0.16	0.80	2.82	2.41	1.85	1.22
30	Alloy	2.10	0.15	1.08	2.70	1.59	1.52	1.00
90	Plain	5.59	0.82	1.64	3.40	2.24	2.74	1.71
90	Alloy	3.08	0.40	0.75	2.78	0.98	1.60	1.00
Average	Plain	2.63	0.47	0.79	1.99	1.66	1.51	1.61
Average	Alloy	1.43	0.13	0.61	1.66	0.87	0.94	1.00
Ratio	Plain	1.84	3.62	1.30	1.20	1.91	...	...
Ratio	Alloy	1.00	1.00	1.00	1.00	1.00	...	...

Average of ratios by days ....—Alloy 1.00 Plain 1.67

Average of ratios by plasters..—Alloy 1.00 Plain 1.77

Ratio of average of all specimens tested—Alloy 1.00 Plain 1.61

THE following programme is given for the Federal Parliament House, one of the architectural units of Canberra, the projected capital city of Australia. The competition is open to architects of all countries.

Purpose.—The Government of the Commonwealth of Australia, having under construction the Federal Capital City at Canberra, desires to secure the services of an architect or architects to design, in harmony with the objects and policies of the general design for the city, the first of its important public buildings. The foremost of these buildings in importance and in order of construction is Parliament House, for which tentative designs are invited in international competition open to all qualified architects. If any premiated design additional to the first shall have been specially commended by the Adjudicators on account of exceptional merit, it is possible that the Commonwealth may subsequently commission the author thereof in connection with other buildings at the Capital; but it must be understood that such commendation does not entitle the said architect to any right for such future employment.

Conditions.—These conditions are mandatory, and failure on part of a competitor to conform to the same will exclude his design.

Qualification of Applicants.—Intending competitors are required to acknowledge receipt of Programme of Competition on accompanying Registration Form indicating responsible architectural practice in design and supervision of building construction. Satisfactory compliance with this condition will be a first essential to candidacy for employment in connection with the execution of this work. No adjudicator, nor advisor, nor employee of the Commonwealth of Australia shall compete or assist a competitor. No competitor shall submit more than one design.

General Information.—Registration Forms and Programmes can be obtained by addressing any of the following places:—Department of Home Affairs, Melbourne; Commonwealth Works Director, Sydney; and Public Works Departments in Adelaide, Brisbane, Perth and Hobart. London, Office of High Commissioner of Australia; Public Works Department at: Wellington, N.Z., Cape Town, Ottawa; The British Embassies at: Berlin, Madrid, Paris, Rome, St. Petersburg, Stockholm, Vienna, Washington.

Special Information.—Additional information, if necessitated by circumstances, will be forwarded by the Federal Capital Director of Design and Construction to all registered competitors.

Preparation. — All the drawings required shall be drawn with pencil or pen, without wash or colors, except plain washes if desired, to indicate sections or to block in openings, or to show different planes of distances. All lettering shall be of plain legible type. All rooms shall have figured dimensions. All drawings shall be cloth-mounted on stretchers. The only drawings to be submitted are:—

(1) *Plan of each floor of Parliament House

(2) *Longitudinal section of Parliament House.

(3) *Transverse section of Parliament House.

(4) *3 Elevations of Parliament House
*Drawn to a scale of 1-16-inch per 1 foot.

(5) Perspective from direction of "Terrace Court of the Reservoir," indicating relationship with proposed future Departmental and Capitol Buildings. Scale 1-16-inch per 1 foot at nearest angle on picture plane.

(6) Detail of one architectural feature of the building, selection optional.

A brief description, in print or typewritten, unsigned, must accompany the drawings, including a statement of the total volume of the ultimate building in terms of cubic feet. Cubage shall be computed to indicate as exactly as possible the actual volume of the building, calculated from the surface level or levels of the lowest floor to the highest points of the roof, and contained within the various outside surfaces of the walls. The actual volume of projecting features of all sorts, including parapets, towers, lanterns, bays, dormers, vaults, and exterior steps above grades shall be included, but covered open-sided porticos or loggias shall be taken at half their volume. Light wells of less than 400 square feet area shall not be deducted.

A figured diagram, showing method adopted in computing volume, shall accompany each design. Any language may be used at the option of the Competitor.

Submission.—Designs shall be submitted without revealing the registered address of the competitor or bearing any distinguishing mark, motto, or name which could serve as a means of identification, but with a sealed opaque packet firmly attached containing name and address of the author or authors, with a declaration that the design is his or their own personal work, and that the drawings have been prepared throughout under his or their own personal supervision. Such packet and the design to which it is attached will be given a common number on receipt, and the former will be held and opened after adjudication only by His Excellency the Governor-General or his deputy. Any attempt by an author to disclose his identity in any other manner will disqualify his design, and such design will not be included in the competition. The designs shall be delivered to the Federal Capital Director of Design and

Construction, Melbourne, Australia, or to the High Commissioner of Australia, London, England, free of cost to the Commonwealth, on or before 31st March, 1915. Omission to so deliver will involve disqualification, unless the Commonwealth Minister of State for Home Affairs is satisfied that the delay could not have been foreseen and is only for a period that will not interfere with the work of investigation.

Custody.—The Government does not accept responsibility as regards safe transit, custody, or retransit of the designs or any documents forwarded or delivered by a competitor, but it undertakes that all reasonable care shall be exercised to prevent damage during the period in which they are in its possession and that insurance will be effected based on its own estimate of value.

Publicity.—All designs and documents not excluded from the competition may be exhibited for reasonable period after adjudication, such exhibition to be open free to the public. Publication of designs, whether premiated or unpremiated, will in no way entitle competitors to any claim for compensation against the Government or its agents in regard to proprietary or other rights.

Return.—The winning design shall become the property of the Government. All other designs will be repacked and shipped, or posted for return to the several competitors. Each competitor will be advised of their despatch. Freight and other charges in transit will be paid by the Government to the address so named by the competitor.

Adjudication.—The drawings will be adjudicated by a jury of architects as follows:—George T. Poole, of Australia; John James Burnet, of London and Glasgow; Victor Laloux, of Paris; Otto Wagner, of Vienna; Louis H. Sullivan, of Chicago.

In case of disability of any adjudicator, his successor will be appointed by the Federal Capital Director of Design and Construction.

The jury will examine all designs submitted, determine as to their conformity with the mandatory conditions, and select eight (8) designs in order of merit and accord mention to such others as may be deemed especially worthy. The decision of the jury will be final, and its announcement will be made in Melbourne within three months of date of receipt of designs, or as soon thereafter as is possible. The report of the jury will state its reasons for the selection and classification of the designs, in order of merit, and a copy, accompanied by the names of the prize winners, will be sent by the Federal Capital Director of Design and Construction to each competitor.

Immediately upon the opening of the identification envelopes by the Governor-General the prize-winners will be notified by telegraph.

Premiation.—In accordance with the jury's award the Government of the Commonwealth of Australia agrees to pay within two months of adjudication premiums as follows:—To first in order of merit the sum of £2,000; To second, £1,500; to third, £1,000; to fourth, £500; to fifth, £250; to sixth, £250; to seventh, £250; to eighth, £250.

Employment of Architect.—The Government will employ the competitor placed first by the jury as architect for the initial portion of the building (note reference in 3.22); and so far as the subsequent stages of the ultimate building are concerned, it is the intention of the Government similarly to employ him. Insomuch, however, as the construction of the ultimate building may spread over a number of years, this statement cannot be taken to bind the Government to employ the architect in the later stages.

Extent of the Service Required.—The employment of the competitor as architect for the construction of the building, or any part thereof, is to include the preparation of all such working drawings and specifications in connection with the work to be constructed and the furnishing of all such information in connection therewith as the Minister for Home Affairs may require, and the furnishing to the Minister of necessary copies thereof and the supply of one permanent copy on tracing linen of the plans, elevations, and sections of the work as executed, and also a permanent copy of all corrected details of the work and figured plans and diagrams of all ducts, wires, pipes, and appliances for service systems inside and outside the building. If the Government decides to require personal supervision by the competitor employed as architect, he shall, in addition to the above, faithfully and diligently personally supervise the execution of the work, and perform all such architectural services in connection therewith as are necessary to insure the complete carrying out of his design. No departure from the working drawings and specifications is to be permitted without written approval of the Minister for Home Affairs.

Remuneration.—The architect will be remunerated for his services as follows:—

(a) If the employment includes personal supervision of the execution of the work, he will be remunerated in accordance with the schedule of percentage charges sanctioned and published by the Royal Institute of British Architects as at the date of the first publication of this programme in the *Commonwealth Gazette*; or

(*b*) If his employment does not include personal supervision of the work he will be remunerated at the rate of 3 per cent. on the calculated cost of the actual work undertaken.

CONSTRUCTION

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CONTRIBUTIONS—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and duly returned.

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THE MONTREAL office of Messrs. Palmer, Hornbostel & Jones was discontinued on October 1st. Harry Edward Prindle, formerly Canadian representative of this firm, has opened an office at No. 915 New Birks Building, Montreal, for the general practice of architecture. Mr. Prindle is preparing plans for the new Union Station at Quebec, P.Q., for the Canadian Pacific Railway.

* * *

THE Conservation Commission is to be highly commended in its selection of Thomas Adams, noted expert of the British Local Government Board, to help the various Canadian municipalities in handling the large problem of city planning. Mr. Adams has been entrusted with the bringing about the planning of Greater London. In this connection the questions of determining the arterial roads is already under way with the 117 local authorities in Greater London and some 20 local authorities, just outside the metropolitan area. The total area represented comprises about 1,083 square miles, or 693,120 acres, and the population within the area is now nearing 8,000,000. Mr. Adams attended the International Town Planning Conference in Toronto in May and on his return to England wrote a very sympathetic appreciation of the efforts being made in Canada to accomplish town planning. He considers provision for shelter, for food supply, for work and for transit to be the fundamental things in communal life; next come facilities for education and last, though not necessarily least, the public playground and the civic centre. Mr. Adams will assume at once his duties as town planning adviser to the Conservation Commission.

* * *

"ABOUT the supposed crudities of American life and the lack of artistic perception, I had certainly been misinformed. I must say that I found New York interesting to a fascinating degree and in certain respects beautiful. The so-called sky-scrapers are in many instances not at all bad. The architectural tendency begotten by the exigencies of lofty construction has in it a good deal of originality. If I were to forecast a complete renovation of modern architecture I should say that the influence that would be most likely to bring it about would come from New York. And there is something in this thought that should minister to the just pride of Frenchmen, for the most eminent architects of New York are pupils of our own Ecole des Beaux Arts. I say to you now, much as it may surprise some of you, that skyscrapers may be agreeable to look at, and that many of them are beautiful. Of course I do not advise the immediate adoption of this system of construction in France, where the architectural physiognomy of the cities has been a matter of long development." —*Prof. Bergson.*

* * *

THE DOLL HOUSE, conceived by Bird & Son, is an exceptionally clever example of the use of Neponset products. This playhouse of colonial design is well built, with solid wood frame, the sides being made of Neponset wall board; the roof of grayed slate color to represent shingles; the floors of Neponset flooring, part of which are covered with wall board strips; the windows of translucent fabric. The house is constructed so that all furniture can be easily moved in all the rooms on both floors. Measuring two feet six inches by one foot three inches by one foot seven inches, it demonstrates minutely the Neponset building products of fire-resisting values.

A CONCRETE ROAD has been laid providing a permanent highway to the plant of the Canada Cement Company of Montreal. The construction consists of several types and the specifications similar to those adopted by the Association of American Portland Cement Manufacturers. The actual work was done under the supervision of the Canada Cement Co. and consisted of fifteen sections, in some of which eight pounds of high calcium hydrated lime were added to each bag of cement and the two thoroughly mixed before placing in the concrete mixer. In the one-course sections containing lime, the lime was used throughout the entire thickness, but in two-course sections the lime was used in the top course only. All sections of the road are twenty feet wide—concrete fourteen feet and shoulders three feet. A four-inch tile drain was placed under the north shoulder. The proportions used for one-course concrete were 1:1½:3. For two-course concrete the proportions for the base were only 1:2½:5, and for the wearing course 1:1:1½. The subgrade was rolled the entire width of twenty feet. The concrete is six inches thick at the sides and eight inches thick at the centre for all sections.

* * *

THE MARKED increase in disastrous fires is directing more attention every day to the need of fireproof building materials that can be relied upon. The failure of many so-called fireproof materials when subjected to the intense heat of large conflagrations suggests the need of more careful judgment in the choice of these materials as well as a more stringent interpretation of fireproof building regulations. The demand for building materials that would not be affected by fire has encouraged manufacturers to experiment with all kinds of materials, and one that has thus far successfully withstood all tests is a peculiar rock known as asbestos. Deposits of asbestos, in one or more of its allied species, are found to a limited extent in Russia, Italy, Egypt, India, South Africa, and, in fact, in all parts of the world. But that which is mined in Canada is about all that is of much commercial value, as other varieties are either too brittle to utilize or too hard to mine. By far the largest of these Canadian mines is owned by the H. W. Johns-Manville Co., of New York.

* * *

A NEW DREDGE is being built by M. Beatty & Sons for the Randolph Macdonald Co., Limited, of Toronto, of the boom and A frame type, with a three and a-half cubic yard dipper to work in thirty feet of water. The steel hull is one hundred and seven feet long, with thirty-six feet beam; nine feet three inches deep at the bow and eight feet three inches at the stern. The boiler, of the Scotch marine type, is ample in size to furnish steam for the entire plant when working under heavy load. The bow anchors, instead of wood, are made of steel plating, twenty-eight by thirty inches by fifty-five feet long, with a circular reinforcement on the inside, forced into place and firmly riveted. All the sheaves and bearings, as well as the anchor points, are of open hearth steel castings.

* * *

THE NEW galvanizing plant recently completed by the A. M. Byers Company at their mills in Pittsburgh contains the most modern and efficient equipment for manipulating the galvanizing process known to-day. Specifications call for hot metal process, a coating of highest grade prime western spelter, and a deposit one hundred per cent. heavier than that required in Government galvanizing specifications. A careful weighing and inspection before galvanizing; the device for turning the pipe in the baths; the extra long cleansing period; the pyrometer regulated kettles; the superior quality and absolute purity of the spelter, and the final weighing that assures the proper coating—each of these steps are specialized and handled by experts. Into its porous, uniform texture the spelter bites down deeply, coating thickly and evenly, minimizing possibility of flaking and assuring greatest life.

* * *

"WAR found us ready. In our stock-room in Toronto we have at the present time 965 chain-blocks in stock. Your orders by 'phone, telegram or letter will be shipped at once. The Herbert Morris Crane & Hoist Company, Limited." In musing over the above circular this thought presented itself; how many of the large business concerns will be able to say at the end of the war, "Peace found us ready"? It might be well for each company to consider the desirability of having an over-head stock when peace comes and in the meantime by so doing keep our country from becoming panic-stricken and our people from experiencing the embarassment of extreme poverty.

* * *