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CONSTRUCTION

VOL. V NO. 2

CONTENTS FOR JANUARY, 1912

ILLUSTRATIONS

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SATURDAY NIGHT BUILDING, TORONTO, CANADA
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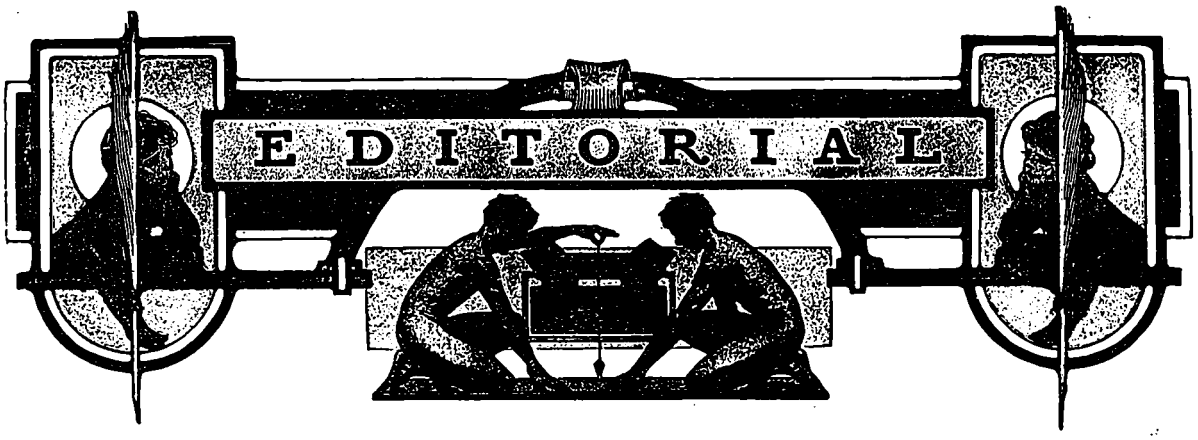
Kent Office Building, Toronto, Ontario. A. R. Denison & Stephenson, Architects.



¶ *A system of hollow tile wall construction that simplifies the use of that material and gives impetus to its use in residences.*

THE PASSING of the balloon frame pine house is one of the marked changes in American civilization. It changed a hundred years ago from the log house to the framed, and when a Chicago genius involved the "balloon frame" some sixty years back, the two by four studding and two by ten joist changed house construction from the heavy frame to the lighter structure. Now, the farmer, on the prairie or hill, from Nova Scotia to Prince Rupert, builds of concrete with gravel from his own premises, and those nearer the source of supply and skilled labor construct of brick or hollow fireproofing tile. The evolution of the latter material from a steel beam protection to the enclosing fabric of the houses of the people with rich and poor, has been comparatively slow, but steadily increasing. It has not yet reached the stage where manufacturers produce material specially for that purpose, but this is one of the probabilities in the near future. It is not altogether necessary as the material in its present steel protection and flat floor arch form is quite as adaptable as one could wish, except in a few particulars. The main obstacle to the more rapid increase in house construction use is difficulty in obtaining workmen who can readily lay the blocks in the walls, as it is enough different from brick and stone laying to make the ordinary worker in those trades to a degree incompetent. The energy of the National Fireproofing Company and some architects in the Eastern States is overcoming this, and the number of fine residences constructed of hollow tile is spreading rapidly. We are able to present the details of a simple system that has been worked out by an architect of ability in Minneapolis, which, for the first time, as far as we know, gives to the workman a direct plan to work by and shows the architect how readily the ordinary fireproofing material of commerce can meet every requirement of his design as completely as brick or wood. Mr. Corser has given the subject some years of thought and experiment, and his scheme has been successfully followed by other architects in the carrying out of attractive and architecturally harmonious residence designs. The adaptability of Mr. Corser's wall plan is such that CONSTRUCTION is gratified in being able to place it before the architects of Canada, not only for use in the modest cottage, but in the most pretentious residence, as it has the simplicity and practical utility, but not the ephemeral character, of the "balloon frame."

¶ *The "mention" of* CONSTRUCTION *as an advertising medium by architects a valuable assistance in increasing its influence.*

SPLENDID as has been the support CONSTRUCTION has received from subscribers and advertisers alike, there is still something to be done by both to aid in carrying it to that high point of excellence that will make it the most valuable medium of record and dissemination of technical thought and work in the two hemispheres. The operation involved in its publication is three sided. There is the publisher's side, which endeavors to ascertain the needs of the subscribers it serves and supply them. This can be augmented by a sympathetic interest among those who by their patronage support its publication. The advertiser, by his belief in its value as an advertising medium, and his continuous use of its pages in describing intelligently and persistently his product, can aid in making it permanent, and by constantly augmenting its force and influence the subscriber can probably do more than either the publisher or the advertiser for the upbuilding of CONSTRUCTION, especially the architect subscriber. It is his journal in that it is the only architectural medium published in Canada that the profession in the Dominion can look to to make record of his works. His money contribution is the smallest of the three involved, but his interest in its continuous and successful publication is greatest. A service he can render, and it only needs his remembrance when the opportunity serves, is to call the material contractors' attention to the journal as a medium for placing his wares before the profession so that the standard materials will be listed in its pages and used by the profession to the exclusion of those that are without specific merit. If without this help from the subscriber, CONSTRUCTION can attain the position that it holds in architectural journalism, how much greater will be its growth and

success if each architect takes his interest in its success seriously and keeps it in mind when using its advertising pages as a directory of building materials and appliances and informs vendors of its virtues.

¶ *A systematized professional practice one of the results of the issuing of standard contract forms by the American Institute of Architects.*

AS AN organization that has succeeded in accomplishing more reforms in architectural practice, both within and without its ranks, than any other, the American Institute of Architects stands first. While contending with newer conditions and a less ethically developed people than that of Germany, France, Italy or England, it has successfully regulated many of what might be termed the business features of the profession and established rules thereto that have the support of the profession and interested public alike. While the establishment of a better government architecture through the passage of the Tarsney Act; the appointment of a civic commission for the city of Washington; or the regulation of public competitions, belong broadly to this general improvement of architectural practice and the betterment of design, it is in the establishment of standard documents for the use of the architect in his dealings with the contractor and owner, and the contractor in his dealings with architect and owner, that the work of the Institute takes its most practical and beneficial form. For almost twenty years the uniform contract, a standard form evolved and issued jointly by the National Association of Builders and the Institute, has been in general use to the practical abolition of disputes over obscure terms or lack of equity in contracts. Ever since this document was established committees of the Institute have been at work upon other standard forms, especially during the past four years, and after repeated reports and revisions, these documents have been issued. They comprise those forms currently used by architects, and the effort has been to improve them with a view to making them clear in thought and statement, equitable as between owner and contractor, applicable to work of almost all classes, binding in law and standard of good practice. The forms are six in number: "Invitation to bid," "Instructions to bidders," "Form of proposal," "Form of agreement," "Form of bond," "General conditions of the contract." These forms while intended for use in general practice, can be regarded as a form of reference representing the judgment of the Institute as to what constituted the best practice of the profession. It is in this latter phase that the Institute preserves its ethical integrity and at the same time gives to the users a readily understood form and a simply worded document that will bear legal inspection. The direct work was in the hands of the Institute Committee on Contracts and Specifications, of which A. B. Pond, of Chicago, was chairman. To get its results the committee studied with great care the forms in use by thirty well-known architects, and also the uniform contract. Tentative forms were first embodied in a first and second edition which were submitted to all the chapters of the Institute for criticism. As a result of all the criticisms thus obtained, careful revisions were made and embodied in a third edition. This in turn was submitted for criticism to engineers, contractors, and architects throughout the country. The results, with their suggestions and further study, were finally incorporated in three editions. It was in 1907 that the Institute authorized sanction to the publication of standard forms, and in 1911 final approval of the Institute was made on the completed documents. It is doubtful if ever in architectural history so complete a summary of the professional attitude toward the physical features of the art architectural has been made. The forms are copyrighted by the Institute and printed under permission by one concern, a royalty on all sales accruing to the Institute as in the case of the uniform contract, where the two parties to its ownership are the royalty beneficiaries.

¶ *The smoke nuisance a matter of police regulation and not an inability to prevent its continuance or secure its abolition.*

THERE IS probably no more hackneyed subject among all those pertaining to city life than what is known as the "smoke nuisance." Thirty years ago it was not only a live issue, but innumerable patented "smoke consumers" were put upon the market and ordinances passed for the suppression of smoke. England was promised a "smokeless London," and the cities of the United States vowed that smoke should be abolished. And that we have the same smoky cities and the same agitation kept up by health boards year after year seems to argue that the abolition of smoke in cities is impossible as the producers often claim. During the entire thirty years it has been known that careful firing of itself does away with more than one-half the trouble, but it is cheaper to hire an "engineer" who will fill up his furnace with slag and leave it for half an hour than to get one who will intelligently throw on coal in small quantities and frequently. Then there are mechanical stokers that will do this work automatically, but their installation costs money, and firms like Boggs & Buhl, of Allegheny, or Eaton's, of Toronto find little encouragement after going to the expense they have in the direction of smoke prevention, to know that their neighbors continue in the same old way. It is probable that the chief fault, like the automobile nuisance that drives the larger mass of people from the streets, is in the courts that will not carry out the ordinances to a greater extent than they are obliged to. A fine in the first instance and an imprisonment for a repetition in either case for both owner and servant, would soon abolish both these impositions on the public. It must not be inferred that all the efforts toward securing "smokeless cities" have been entirely useless. Most cities have grown, and some have doubled and trebled populations and industries in thirty years,

and even with this handicap there is less smoke in some than formerly. This rapid additional growth is probably the reason that Toronto is losing her former reputation for cleanliness, for her laws are drastic enough if they were rigidly enforced. And they would be if the courts understood that the non-production of smoke is directly in the hands of the people making it, and there is no excuse except an added expense in the operation of the plant. It is absolutely unjust to those who are wise enough, or law abiding enough, to go to this expense, when others are allowed to plead inability. There is not now, and there never has been, any valid excuse for the fabric destroying, health endangering and cleanliness preventing smoke nuisance.

¶ *A one hundred and eighty thousand dollar hotel at Kingston to be built, the only architectural services supervisory.*

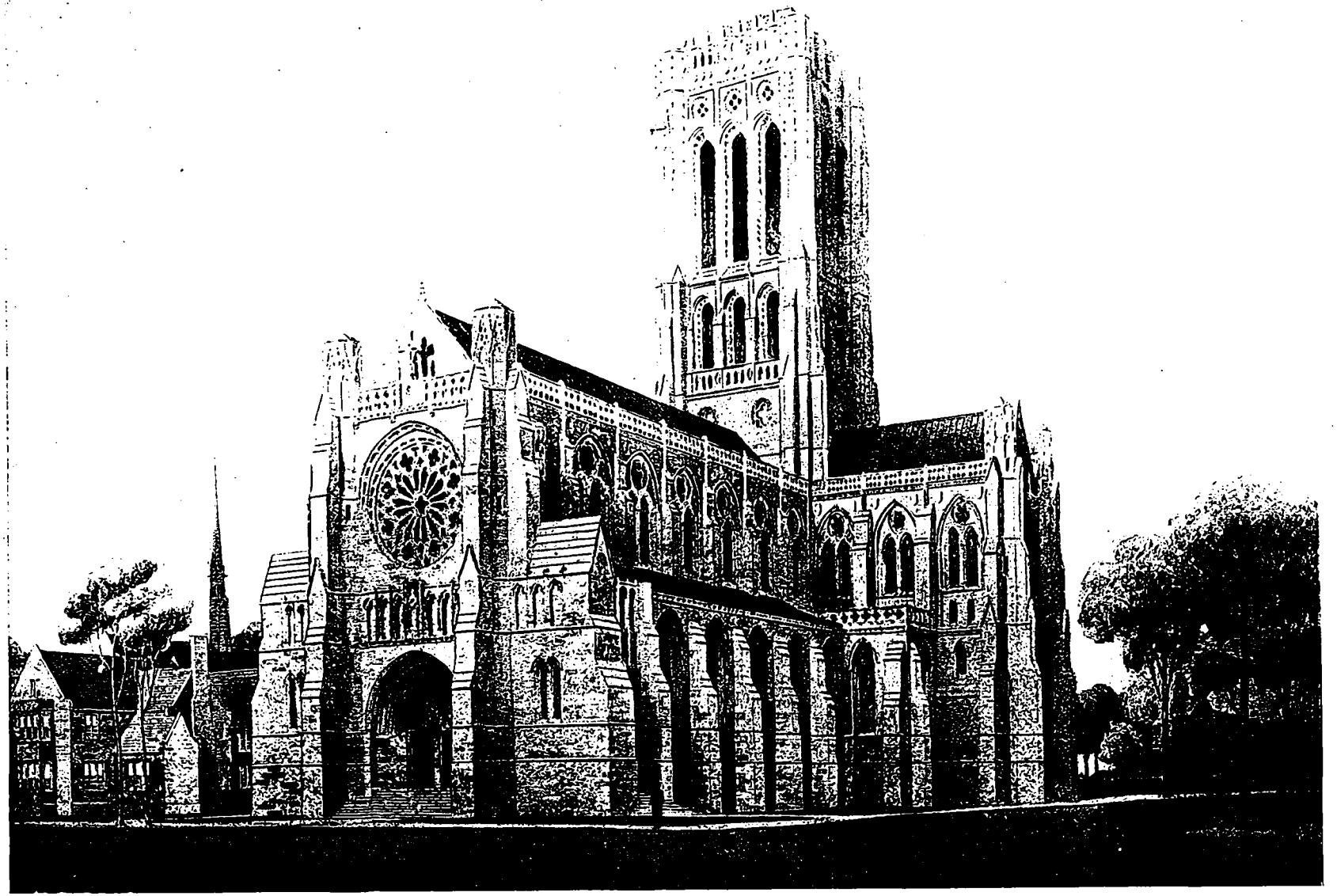
CONSTRUCTION would like more light upon the hotel project which seems to be a live subject of debate at Kingston. It seems, from press reports, that a municipal hotel is projected and that it is going to be "constructed of reinforced concrete and thoroughly fireproof as well as up to date." All this is very good and enterprising, and the carefulness of the city fathers is further evidenced by the proposal that: "Furthermore, to assure that there shall be no doubt of the cost, the city is to have a supervising architect." Of course, this is very necessary, and it is hoped that the "supervising architect" will also look into the matter of the price of beef and the chef's salary and other details pertaining to a new hotel of the first class. If the money is forthcoming and properly supervised any of the reinforced concrete contractors or the real estate men who sold the ground can furnish the plans and working drawings. But perhaps in Kingston the buildings grow like mushrooms, and the employment of a "supervising architect" who handles the cash is an extraordinary expense, a precaution only indulged in when the people need to be assured that the money will be well spent. In such advanced communities, when the engagement of an architect is such a luxury, it is fortunate that they still feel that one must be employed so the people will know the cost of the proposed structure though they know of no other use to which his particular talents can be put.

¶ *The immediate necessity in Montreal an increased force of inspectors, especially for tenement house supervision.*

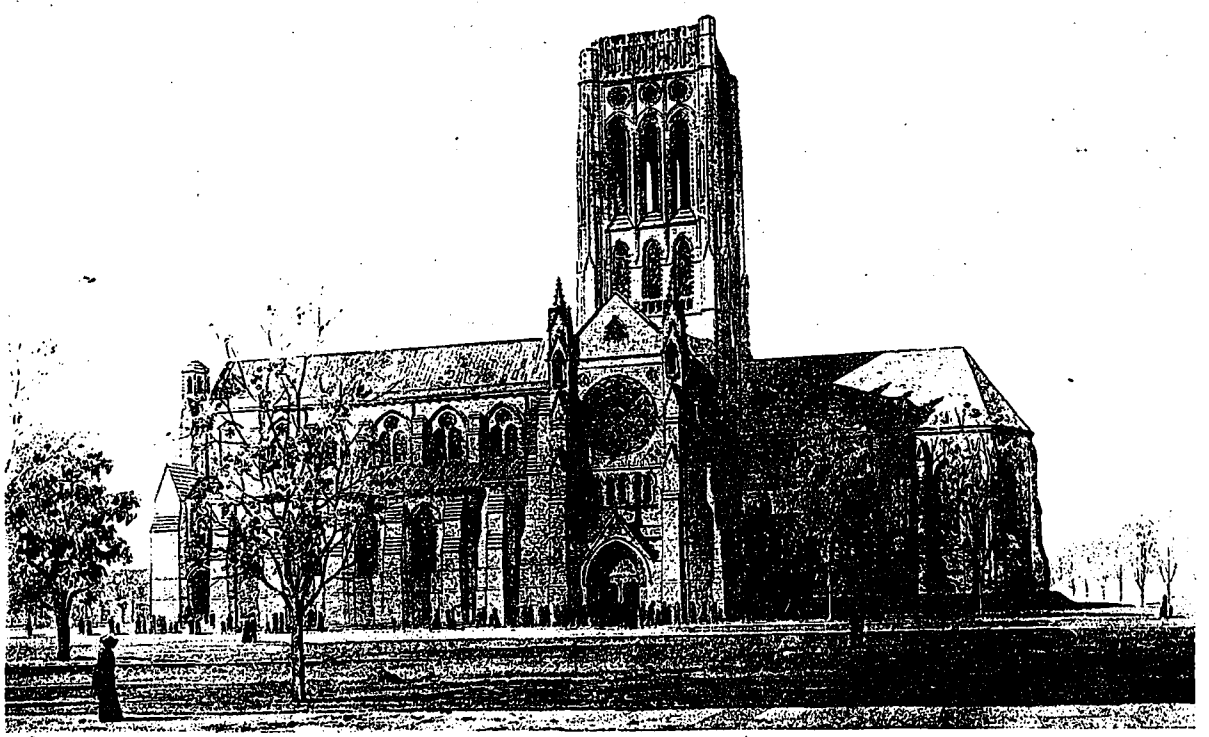
WHILE the movement to break up the slums in Montreal, which is so generally endorsed by the architectural profession and was aided by Earl Grey, by building workingmen's houses on the Island and elsewhere, has not in any way been abandoned, the immediate necessity of abolishing firetrap apartment houses is now occupying the attention of architects and public alike. The reason for the existence of dangerous buildings is not in the lack of sufficiently stringent building by-laws, or a competent head to the building department. The laws are generally adequate and Mr. Chausse is highly competent. But the city rests there and the result is that the entire inspection of plans and buildings as well seems to be left to that one official. Since Mr. Chausse was first appointed, the building of the city has increased enormously and no adequate provision has been made to meet the increased work of the building department, so that plans have been hastily scanned, few structures receiving more than a cursory inspection and an overworked and highly conscientious official becomes responsible for a condition that is in no degree his fault. The architects of the city should not only continue their agitation for adequate fire escapes upon all apartment houses, but bring proper representations before the civic authorities so that the building department will be increased to a point of efficiency to meet the greater requirements of an enormously increased field. It should be understood by those in authority that this increase in responsibility in the building department is not alone in the aggregate amount, but in the size and purpose of the structures. The building of apartment houses is becoming so general and the importance of close inspection of both plans and structure so great that a special force of skilful inspectors should have that department specially in charge under Mr. Chausse's direction. Meanwhile, a police inspection of tenements in regard to the adequacy of fire escape protection may save some lives before an efficient and sufficient corps of building inspectors can be organized.

¶ *Regretted death of Samuel Hooper, Provincial Architect of Manitoba and member of the Council of the R.A.I. of Canada.*

ONE of the most serious losses sustained by the architectural profession of Canada in recent years is in the death of Samuel Hooper, R.A.I.C., of Winnipeg, provincial architect of Manitoba. Mr. Hooper was born at Hatherleigh, Devon, England, in 1851. He worked as a draftsman for his uncle, a practising architect and surveyor of the Duchy of Cornwall, as a young man, but when he settled in Winnipeg, in 1880, he established the Hooper Marble Works. While engaged in the marble business, he designed and executed the monument to Hon. John Norquay and also the monument in the City Hall square commemorating the soldiers who fell in the Riel rebellion. Eighteen years ago Mr. Hooper took up the practice of architecture, and after enjoying a large private practice, four years ago, when the Government established the office of provincial architect for the erection of a number of Government buildings, Mr. Hooper was appointed to the position, and practically all the Government buildings of the province, up to the present, were designed by him. Mr. Hooper was a man of sterling qualities, with a high sense of honor, and highly regarded both by his professional confreres and the public.



Perspective View of St. Alban's Cathedral, Toronto, Ontario. Cram, Goodhue & Ferguson, Architects, Boston and New York. Symons & Rae, Supervising Architects.



Perspective View of St. Alban's Cathedral, Toronto, Ontario. Cram, Goodhue & Ferguson, Architects, Boston and New York. Symons & Rae, Supervising Architects.

CATHEDRAL OF ST. ALBAN THE MARTYR

The Cathedral of the Church of England in the Diocese of Toronto an example of the simple and massive type of transitional Early English, closely following Church traditions in form and plan.

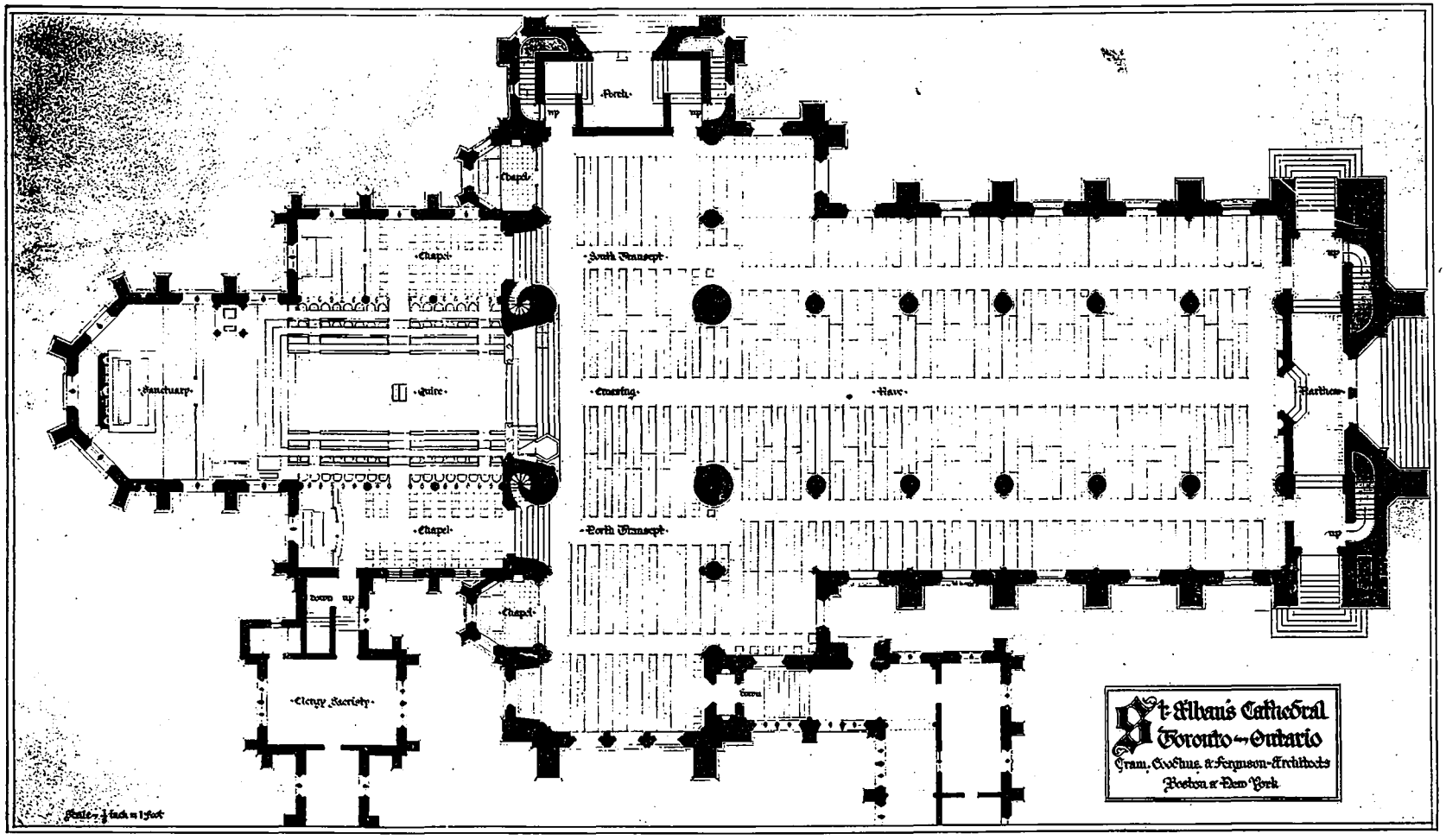
THE CHURCH OF ENGLAND in the Diocese of Toronto is about to erect in the See city a cathedral which, when completed, will be one of the finest church edifices in Canada. The cathedral at its inception in 1883 was dedicated to St. Alban the Martyr, and was proceeded with up to 1886, when the choir was completed, since which time it has been at a standstill.

Under the recently appointed Bishop, the Right Rev. Dr. Sweeny, the fourth Bishop of the Diocese, the work has begun anew, and with some prospect of completion by 1914, when the Diocese will commemorate the seventy-fifth anniversary of its founding. The Bishop is being warmly supported by his chapter, the church public and the press of the city and has every reason to be gratified with the progress of the enterprise. The architects who have designed the cathedral are Cram, Goodhue & Ferguson, of Boston, and the erection is under the supervision of Symons & Rae, architects, of Toronto.

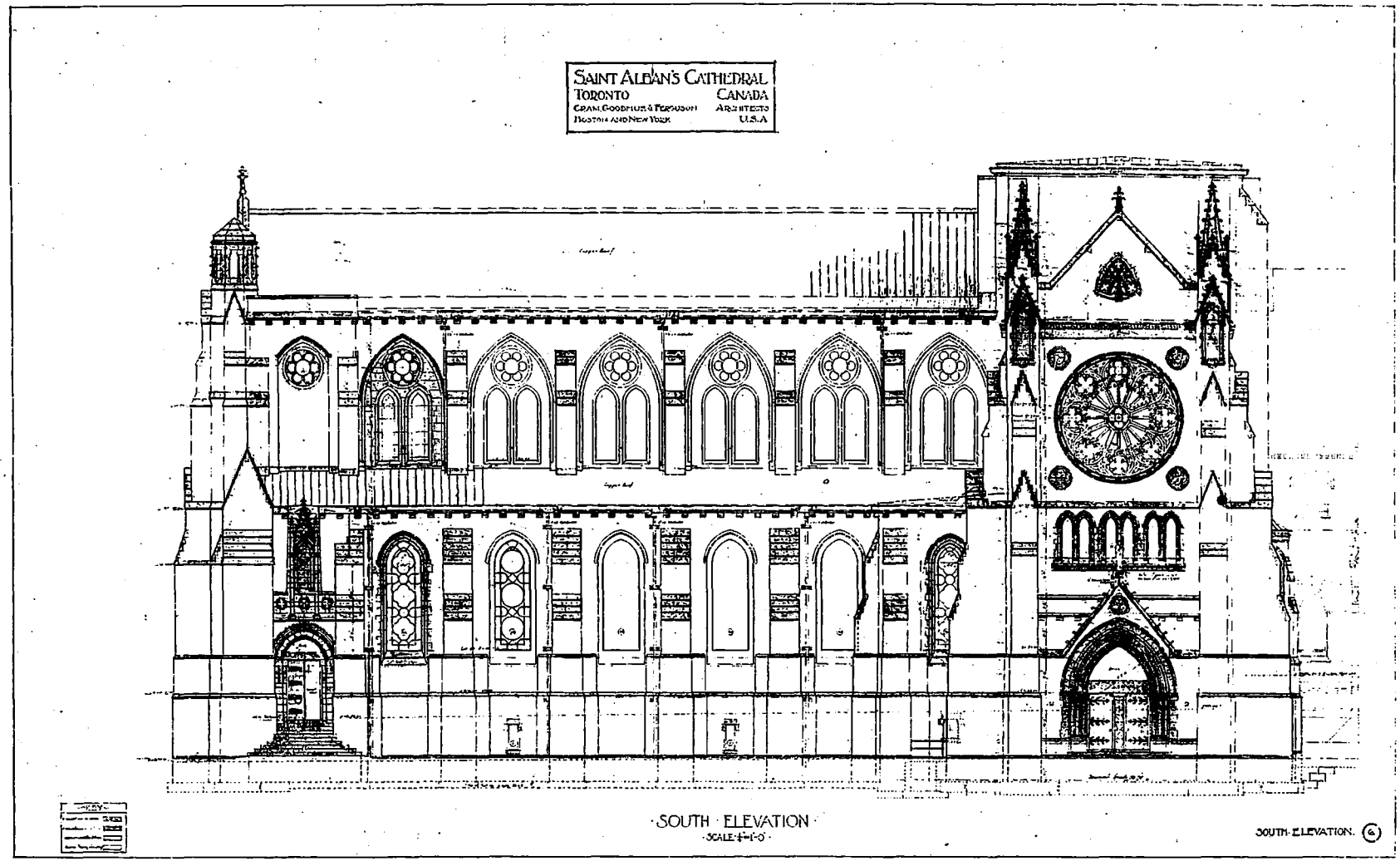
When the cathedral is completed in accordance with the plans published herewith, it will, in dimensions at least, take its place with the cathedral churches of Great Britain. A realization of this fact has controlled the architects in all that they have done. At the very outset it became evident that the dimensions necessary to provide the requisite accommodations meant, not a large parish church, nor what is called a "pro-cathedral," but in actual fact a great fabric that, if the architects properly play their part, would stand with many of the great monuments of Anglican Christianity as a fitting exponent of the religion of the race.

Elsewhere will be found a comparative statement of the dimensions of St. Alban's, and those of certain of the older cathedrals. These notes deal, not with materials or considerations of size, but with the principles that controlled the architects in their work. Out of the nineteenth century came a false idea that the essence of Gothic architecture was elaboration of parts and richness of detail, all expressed in cer-

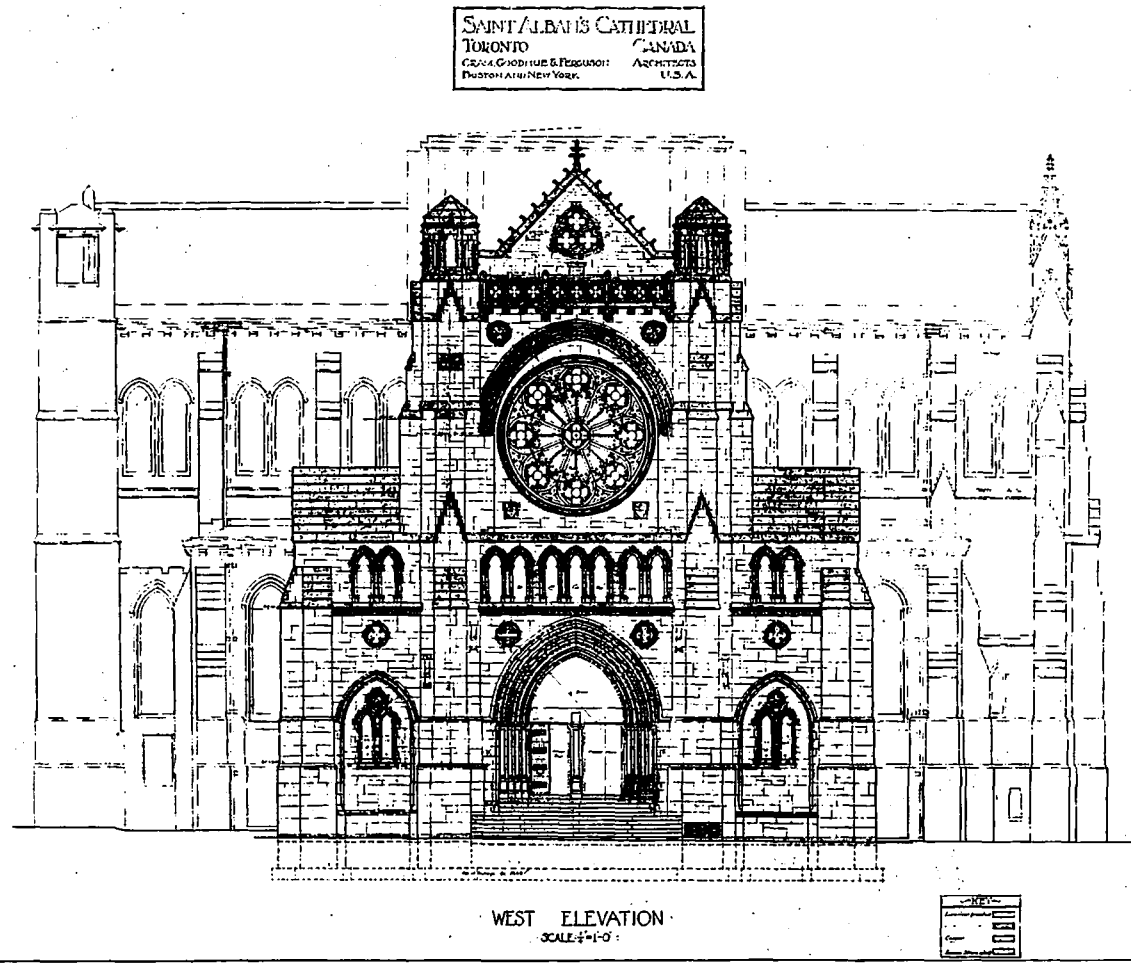
Interior View of St. Alban's Cathedral, Toronto, Ontario. Cram, Goodhue & Ferguson, Architects, Boston and New York Symons & Rae, Supervising Architects.



General Plan of St. Alban's Cathedral, Toronto, Ontario. Cram, Goodhue & Ferguson, Architects, Boston and New York. Symons & Rae, Supervising Architects.



St. Alban's Cathedral, Toronto, Ontario. Cram, Goodhue & Ferguson, Architects, Boston and New York. Symons & Rae, Supervising Architects.



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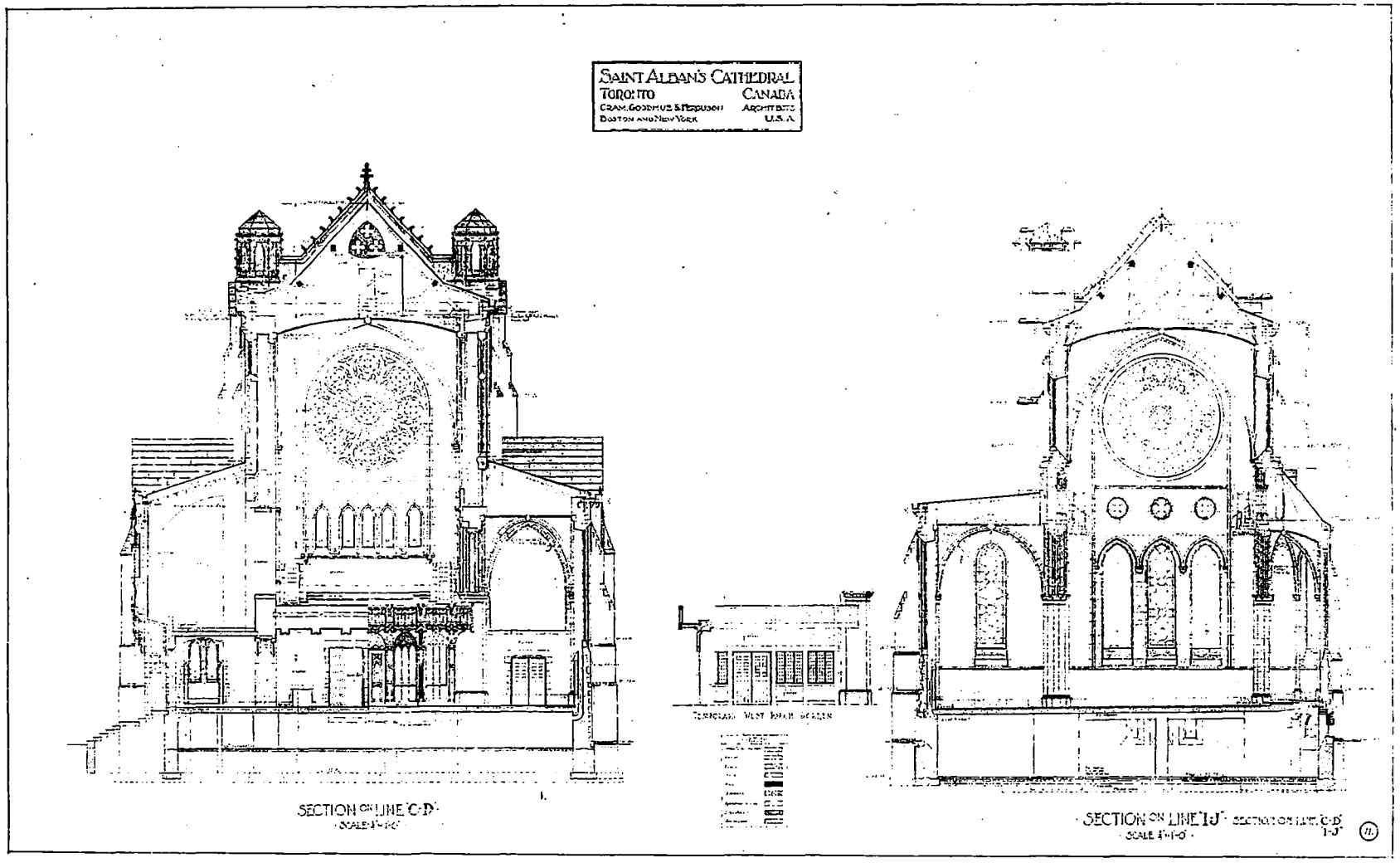


St. Alban's Cathedral, Toronto, Ontario. Cram, Goodhue & Ferguson, Architects, Boston and New York. Symons & Rae, Supervising Architects.

tain more or less stereotyped forms. To this doctrine the architects take definite exceptions. To them the essence of Gothic architecture is structural integrity; simple, but powerful, composition; brilliant and effective building up of light and shade, and a scrupulous adherence to forms beautiful always in themselves; through all and over all a certain sequence of forms determined by the genius of the great Middle Ages, but serving rather as a suggestion and guidance than as a series of classically established types from which no variation was possible. The present designs for the cathedral are couched, therefore, not in the terms of the late and splendid perpendicular Gothic, where, though the fundamental principles of structure and composition were preserved, the effect derives rather from an almost unimaginable and certainly incomparable richness and elaboration of parts, but rather in those of that earlier type of Gothic characteristic of the new vitality of the thirteenth century, where detail is minimized and the results are obtained by a scrupulous adherence to the great principles of architectural integrity.

Nor have the architects confined themselves to one definite model, either in the shape of one particular building, or group of buildings, nor even to the work of Great Britain alone. All the architecture of Christianity in the north of Europe has been put under requisition, and elements are to be found which owe their inception to the north of France, as well as to England itself. An effort has been made to epitomize the architectural impulse of the early Middle Ages to reduce this to its simplest and most fundamental terms, and then to vitalize the whole by the spirit of the twentieth century.

That the work should be definitely Gothic was, of course, a foregone conclusion. The present choir is expressed in a certain version of the late nineteenth century view of what constituted Gothic art, not an entirely adequate conception of the situation, it may be frankly admitted, but sufficient to control all the other work that was to follow on. Apart from this fact, however, there could be no question as to the necessary style, since Gothic is the one perfect form of architectural expression developed by Christianity for the purpose of voicing its own essential nature. It is the architecture pre-eminently of Christianity and of the northern races, and there is no other style in history which may justly be used now or ever toward these same ends; moreover, in itself it is one of the only three great and perfect forms of artistic expression ever developed by man, the other two being Greek and Byzantine, neither of which adapts itself in any way to our racial or religious expression.

A reference to the plans will show that the new work has been conceived on the simplest and most monumental lines. There is for the central feature a great tower supported on four huge piers. From this tower developed to the east the old choir, north and south deep transepts of three bays each, and to the west a nave of seven wide bays. Broad aisles flank the nave on either side and westerly aisles are applied to two bays of each transept. To the east of these two same transepts open out, first, on either side of the tower the old aisles of the choir now turned into side chapels, and two other small polygonal chapels, one of which will be used for the baptistery. In the south transept is a large vestibule, with a gallery above, and at the west end there is a still larger porch, also with its gallery over. The ordinance of the interior is of the simplest and most classical type, great main arcades of simple cylindrical columns bearing powerful and heavily moulded arches, and above a lofty and deeply embrasured clerestory, with a triforium gallery piercing the vaulting piers and giving a line of circulation all around the church at this high level. The four tower piers also are cylindrical in form, the whole suggesting, in a distant sort of way, the great shafts of Gloucester Cathedral, and the minor shafts of St. Saviour's, Southwark. The whole church, nave, transepts, crossing, aisles and chapels, is vaulted throughout in masonry. Masonry also is used for all the interior walls, while the floor is paved with tiles and stone; indeed, the fabric contemplated is one of the most solid construction and of everlasting durability.

The windowing has been studied with particular care. Each bay of the aisles is lighted by an enormous arched window, without mullions or tracery, in the simple and classical form characteristic of the most noble thirteenth century work of France and England. Each clerestory bay contains two smaller lancet windows surmounted by a great rose after the fashion of Chartres or Bourges. Three rose windows of great size occupy the ends of the nave and transepts, forming, as in Notre Dame, Paris, the great window features of the interior. It is intended that all the windows in St. Alban's Cathedral should in the end be filled with glass of the most classical type, viz., that of the twelfth and thirteenth centuries as it is now seen in Chartres, Bourges, and Canterbury, glass that is in no respect pictorial, florid, or sentimental, but decorative and jewel-like in color to the highest possible degree. All the openings will be divided by armatures of iron or gun metal, in which will be set the scintillating glass that if conscientiously carried out and strictly adhered to, should in time make this one of the most notable interiors of modern times.

The exterior, as will be seen, is of a formal, massive and simple design, the great central tower dominating everything and serving as a landmark for the entire region. In its proportions, composition and detail, this exterior harks back partly to such work as Bourges in France, and partly to the noble and peculiarly English type seen in the ruins of Whitby, Byland and Gisburgh Abbeys. Ornament everywhere is reduced to a minimum, and reliance is placed on a just and delicate composition of line, mass and light and shade.

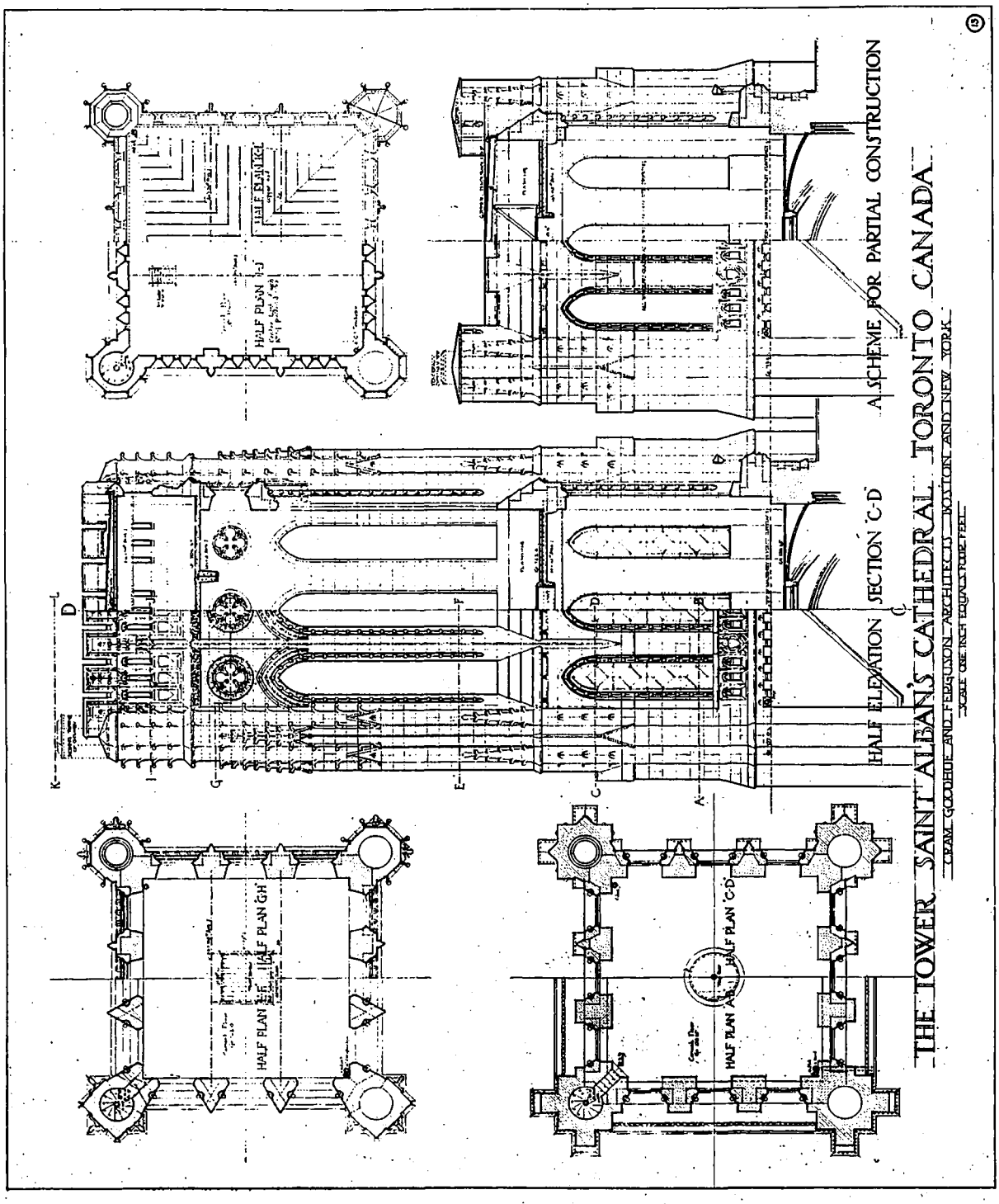
Though the great central tower cannot probably be built at the present time, it is, nevertheless, an essential part of the design, and it is greatly to be hoped that some devout and public spirited benefactor may come forward to rear this tower as a memorial. In its design it can hardly be said to find a prototype in any existing work. It has been studied with the

most scrupulous care in the hope that it may perhaps be given place in time with the great sequence of central towers which in their variety and beauty form one of the most notable contributions of British genius to Christian art.

The seating of the congregation is divided as follows: In the nave, crossing and transepts, in pews, 1,750; in chairs, 65; in the south gallery, 96; in the west gallery, 78; in the south chapel, 68; in the north chapel, 57.

TABLE OF DIMENSIONS OF CERTAIN ENGLISH CATHEDRALS.

	Length of nave	Height of nave	Width of nave	Width of transepts	Height of tower
Winchester	240	75	75	150	140
Hereford	165	63	70	140	140
Canterbury	220	78	75	130	203
York	205	93	104	141	195
Wells	200	66	70	135	155
Exeter	178	63	72	140	145
Worcester	210	78	78	130	170
Gloucester	180	67	84	106	188
St. Albans Toronto	165	63	69	131	195



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A JOURNAL FOR THE ARCHITECTURAL ENGINEERING AND CONTRACTING INTERESTS OF CANADA

ROBERT CRAIK McLEAN, Editor.

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CONTRIBUTIONS—The Editor will be glad to consider contributions dealing with matetrs 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.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. 5 Toronto, January, 1912 No. 2

CURRENT TOPICS

THE UNION BANK of Canada at Toronto (Darling & Pearson, Architects) was built under the general contract of H. C. Fitch & Co., of Montreal. The sub-contractors were: For marble and marble counters, Lantz Company of Bridgeburg, Ont.; ornamental iron, Canada Foundry Co.; heating and plumbing, John Ritchie Heating and Plumbing Co.; painting and decorating J. McCausland & Son; elevators, Otis-Fensom; metal sash, Hope Manufacturing Co.; terra cotta hollow tile block, National Fireproofing Co.; exterior (Burmatoft) terra cotta, Eadie, Douglas, Ltd., England.

* * *

THE CONTRACTORS engaged upon the construction of the Kent Building, Toronto (A. R. Denison & Stephenson, architects), a photograph of which forms the frontispiece of this issue, are as follows: Steel work, Canada Foundry Co.; masonry, H. Needham; carpenter, R. G. Kirby; reinforced concrete, A. Gardner; terrazzo flooring, Bowes & Francis; tile and hardware, J. L. Vokes Hardware Co.; plumbing and heating, Purdy Mansell Co.; painting, H. W. Johnston; plastering, Hoidge Marble Co.; metal work and roofing, Douglas Bros.; marble, Gibson Marble Works; iron stairs, Canadian Ornamental Iron Co.; prismatic lights, Luxfer Prism Co.; vault doors, J. & J. Taylor; wiring, Bennett & Wright; elevators, Otis-Fensom Elevator Co.

* * *

CANADIAN CITIES East as well as West, can certainly take a lesson in civic betterment and civic progress along right lines from the city of Winnipeg. For the past five years, the different divisions of city business have been federated in an industrial association for the general growth of the city. Now the same form of combination has been organized as a town planning commission. With a general chairman and secretary the work of the commission is divided under a number of sub-committees, each with a separate chairman, who has power to select his aids from the members of the commission or from other citizens interested in the work. The duties of these chairmen, each of whom is carefully chosen for his special qualifications, are divided into social survey, traffic, legislation, aesthetic development, river front and dockage, housing, and physical planning. The latter committee is in a way most important as to it comes the results of the investigations of other committees for incorporation into a report with accompanying maps and plans. Active work has already commenced and it will not only result in a well planned city upon modern lines and looking to the needs of future growth, but will take up the details of civic arrangement. It will look to the abolition, for instance, of the twenty-five foot lot, which is the greatest of slum breeders and the sale of which, if not a criminal practice, is a practice that makes criminals in most cities. The housing committee will take care of that feature, while the traffic committee will report on methods for providing for all kinds of transportation now existing or likely to develop. Docks and improvement of the general appearance of the river front will be worked out by that committee, and the erection of buildings and their relation to the aesthetic appearance of the city will be part of the general scheme which is in the hands of a committee largely composed of the leading architects and artists of the city. Of course behind these labors of special citizens is the co-operation and encouragement of all the people, and the whole project is entered upon with so general enthusiasm that Winnipeg will in twenty-five years be one of the most attractive and livable cities in Canada.

* * *

THE FUTURE greatness of Winnipeg is in no particular better assured than through the attitude of the public officials toward civic and provincial development. The latest, but by no means the first, indication of this high plane of public official thought and action is the project for the planning and construction of the new Government buildings for the Province of Manitoba. With an estimated cost of two million dollars, it is planned to erect the necessary buildings on a spacious site. For the selection of an architect an elaborate and thorough

competition scheme is being evolved. This will take the form of two competitions. The first will be open to all architects within the British Empire. These architects will only be required to present sketch plans. The second competition will be decisive. Five or six plans will be selected from the first competition, and the authors will be requested to present final competitive designs. A prominent British architect will be engaged as judge, and the competition will be carried out upon the generally accepted rules governing competitions.

* * *

A CHANGE OF NAMES for oak flooring grades was found necessary by the mills in the United States, and on November 1st, the manufacturers of oak flooring substituted the following: Heretofore the grades were generally known as "Clear," "Sappy Clear," "Select," "No. 1, Common" and "Factory." The names are now, for quarter-sawed flooring "A" Grade in place of Clear and Sap Clear in place of Sappy Clear. For plain-sawed flooring "A" Grade in place of Clear, "B" Grade in place of Select and Common in place of No. 1 Common. The Factory grade remains same as heretofore. The specifications for these several grades are as follows: Quarter-Sawed. "A" Grade (Clear).—Shall have one face practically free of defects, except 3/8 of an inch of bright sap; the question of color shall not be considered; lengths in this grade to be 2 to 16 feet, not to exceed 10 per cent. under 4 feet. Sap Clear (Sappy Clear).—Shall have one face practically free of defects, but will admit unlimited bright sap. The question of color shall not be considered. Lengths in this grade to be 1 to 16 feet. Plain Sawed. "A" Grade (Clear).—Shall have one face practically free of defects, except 3/8 of an inch of bright sap; the question of color shall not be considered; lengths in this grade to be 2 to 16 feet, not to exceed 10 per cent. under 4 feet. "B" Grade (Select).—May contain bright sap, and will admit pin-worm holes, slight imperfections in dressing; or a small tight knot, not to exceed 1 to every 3 feet in length; lengths to be 1 to 16 feet. Common (No. 1 Common).—Shall be of such nature as will make and lay a sound floor without cutting. Lengths 1 to 16 feet. Factory.—May contain every character of defects, but will lay a serviceable floor with some cutting. Lengths 1 to 16 feet. The reason for these changes was brought about on account of the confusion caused by the old names. For instance, the Select grade often was misunderstood for the Clear. For the present, or until the architects, dealers, contractors and all concerned, are thoroughly familiar with the new names, the old names will be carried along in parentheses for comparison. It is hoped that within a year the use of the old names can be eliminated. When these new names will have been established, the results will be far reaching towards the right utilization of oak flooring grades. Each bundle of oak flooring is stamped by the manufacturer to show the name of its grade, to avoid any misunderstanding by the dealer or the ultimate buyer.

IN REGARD TO CEMENT and concrete construction, one point we wish to make, and which must be met by all contractors, is, not what can be done with cement in theory, but in its practical application. Theoretically, the tests of a Government expert for tensile strength, for instance, on certain sizes and lengths are reliable. In practice the manufacturer of the column or beam is almost entirely at the mercy of circumstance. No two shipments of cement are sure to be alike, and following this the inspection of each mixture is liable to error through incompetent or lax superintendence. The theory of concrete makes it the most stable and durable material. One error in composition or ingredient from the geological formation incident to the location of the cement plant to the shovelful of dirt that may be carelessly thrown into a given mix upsets all theory, and the practical result is disaster. The sooner this is recognized and manufacturers and contractors get together on one system by which cement construction from start to finish has the same expert care and inspection that the steel mill gives its product, the sooner will it be adopted for what it is capable of being, the premier building material of the future.

* * *

ANOTHER FIREPLACE that doesn't smoke is the title of an interesting article in Country Life for December. Country Life is a most illustrious collector of detailed information that tends to make domestic life more comfortable and healthful. The making of chimney flues is about as old as the habitations of man, though subsequent to Lamb's roast pig episode, yet it seems difficult for the average mason to build a fireplace that does not smoke, or for some architects to design them. The Christmas number of Country Life is exceptionally interesting even for that magazine that holds a premier position among the beautiful, useful and entertaining publications of the world.

* * *

IN OUR DEVELOPMENT of industrial education it would be well for us to study the course pursued in Germany, where mechanical training is the basis of the manufacturing supremacy that country is so rapidly assuming. Cologne is probably a fair sample of all the cities of the empire in its educational facilities. For instance, there the Royal United Machine Building School prepares pupils for superintending the building and installation of all kinds of machinery, with special courses dealing with the installation of gas, water, electric and other works, and their superintendence. Adjoining the school is a permanent exhibit of German machinery which contains all kinds of machinery in operation, where the mechanics can learn their practical operation. Intending purchasers of machinery also frequent this exhibition, so that its practical value is dual. The fees are low, in some cases free, admission open to anyone, and each pupil is insured against accident or death. The State also provides schools of architecture and building where the pupil is taught the use of tools as well as the theory of

design. Other schools of industrial and decorative design is one of the features of the State's educational system, and here the pupil is supposed to make a life work of what he or she is taught. The training in drawing and painting covers the entire field from painting in water color and oil to the design of wallpapers and carpets and clay modeling and wood carving. The boy in Germany who is to follow a business career is not given a haphazard course, but attends a special commercial school where the curriculum includes subjects from political economy and geography to a dozen languages. The State also attends to the examination of all candidates for master or foreman in all the trades, and no man can claim the position without being able to show a certificate. It is in this thorough training of the individual, in which England is more lax and we in this country regard not at all, that makes for an industrious and therefore contented nation.

* * *

THE FRENCH CHATEAU, which has been adopted by the Grand Trunk Pacific for the eight hotels it proposes to erect between the Atlantic coast and Prince Rupert on the Pacific, is singularly adapted to the purposes of hotel design. The fact that a railroad adopts any architectural form in its construction is noticeable in the breach rather than the observance. The Grand Trunk has long been an exception, even in the designing of its way stations, like those at Battle Creek and Guelph, but this move of the great transcontinental Grand Trunk Pacific to erect hotels at the principal points along its line and to see that these will be architecturally pleasing and a credit to both the road and the city, is an advancement most encouraging in the carrying out of railway enterprises. Unless a change is made by the Government in having its buildings for these new territories designed by architects of ability, it will be the railway depots and hotels and not the government buildings that will give architectural expression and dignity to the cities along the transcontinental lines.

* * *

ON THE NIGHT of November 11, the city of Bedford, which is the centre of the Indiana limestone industry, was swept by a tornado which is estimated to have done damage amounting to half a million dollars. The storm came with little warning, save that there had been a heavy wind all the day. At about 11 o'clock it increased to cyclonic proportions, and when the wind finally subsided it was found that five of the big stone mills had been torn to pieces and seven others had suffered serious damage. The plants that were most seriously injured were the Salem mill of the Indiana Quarries Company, and the mills of the Henry Struble Cut Stone Co., the Reed Stone Co., the Dugan Cut Stone Co., the Furst Kerber Cut Stone Company, and Messrs. Shea & Donnelly. Nearly all of the plants in Bedford suffered more or less, but the greatest amount of damage was done at those mentioned. The sheds were wrecked and the machinery and stone in process of manufacture were more or less injured. A large force of men was at once put to work clearing up the debris and it is expected that all of the plants will be in a position to resume their usual work in a short time. The disaster came at a time when the pressure of work was not as urgent as it frequently is.

* * *

FIFTY YEARS ago on December 21 last, His Royal Highness the Prince Consort died, a loss felt not only by Queen and people, but especially by those connected with art, science and literature. "The Builder" of that date said: "The debt which the industrial arts of this country owe to the Prince is enormous. No one comparing their present state with that which prevailed within the remembrance of not old people, and recollecting the part he has played, can doubt as to the powerful influence that has been exerted for good in these matters, and which may be said to have culminated in the suggestion and perfecting of the scheme of the first great International Exhibition. The extent of his information and his knowledge of the principles of art were remarkable. It was with him no simple 'I prefer that,' or 'I desire this;' but 'it should be so in such a way because of such a thing.' It happened to us to be in the tea-room of the Royal Society on the evening that the Prince paid his first visit there. The visit being unexpected, the meeting was a small one; and we can perfectly well remember the general observation when the Prince, then quite young, passed round the table on which some miscellaneous objects of curiosity had been placed and spoke with knowledge of every one of them—from a piece of amber, of which he named the original locality, to the model of a machine for cutting ship-timbers. A distinguished man, now dead, gave expression to his surprise; and the Prince replied with a smile—the words are as clear in our ears as if they had been uttered yesterday —'Such matters were a good deal looked to at Bonn.'"

* * *

EVERYONE KNOWS that the Parthenon at Athens is one of the most beautiful buildings in the world, but not everyone, perhaps, knows, says "The Illustrated Carpenter and Builder," what a chequered existence it has had. Mr. Banister Fletcher, F.R.I.B.A., towards the close of a lecture on the Parthenon, delivered in the British Museum, told how in the sixth century the building was converted by Justinian into a Greek church, and an apse was added; then, in 1206, under the Frankish Dukes of Athens, it became a Latin church, to be reconverted in 1458 to an Orthodox Greek church, and in 1460 it was a Turkish mosque. Later on, in 1687, it was a powder magazine, and during the siege of Athens the fabric was greatly damaged by a Venetian shell. In 1688 it was restored to the Turks, and much injured by serving as a residence. Then, in 1101, Lord Elgin obtained permission to make more removals of sculptured figures and frieze, which now enrich the British Museum. In 1822 it was surrendered to the Greek insurgents, and in 1830, when Greece secured her independence, the Parthenon became a national monument.

Union Bank of Canada, Toronto, Ontario. Darling & Pearson, Architects.

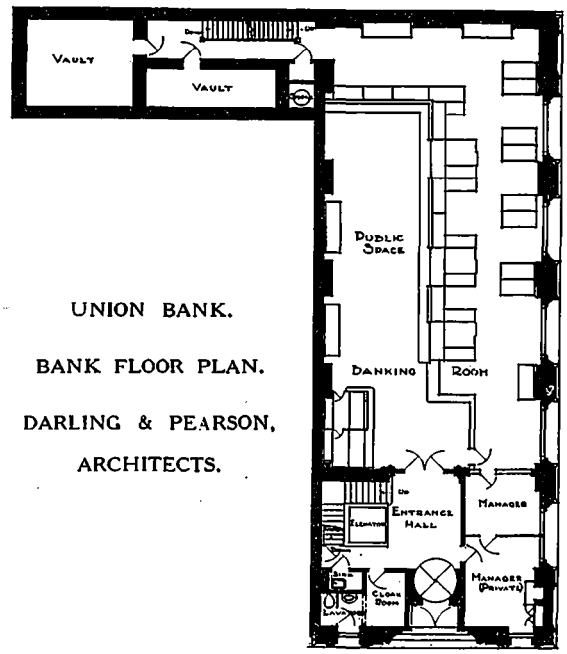
A BANK DESIGNED IN GLAZED TERRA COTTA

The Union Bank, Toronto, Ontario, an example of terra cotta design that suggests that material and not an imitation of stone.

ONE OF THE MOST pronounced indications of our advancement in architectural practice is found in the increasing degree with which designs are made for the material in which they will be expressed. It has been taken as logical by most practitioners that the design should be such expression, but the ability to follow the rule came to the practitioners but slowly, and because it was easier or an innovation the imitation of the standard forms of material was most common. The galvanized iron cornice vainly tried to look like a stone coping, bricks were made so smooth and laid with such thin joints that the wall looked monolithic and terracotta ornament or face and cement structural blocks each sought to tell a lie and say "we are of the stone age." The change has been gradual but pronounced. Galvanized iron confesses itself to be what it is, and by so doing attains a value and a personality that in its proper place and purpose is respectable. The smooth and even colored brick, which Anderson spent a fortune of half a million in attaining, have been thrown aside for the roughness of the paving or hand made brick with wide joints. Cement plastered or concrete block walls no longer seek to imitate the different stone faces given that material by the hammer of the stone mason, but have the dignity and strength that belong to them by right boldly expressed in its use.

It is now becoming true of glazed terracotta. At first an ornamental material, then a veneer for brick, then semi-structural in the size and strength of its forms, but always with a stone suggestiveness that never deceived but always detracted because of the too apparent dishonesty in its use. Glazed terracotta, particularly in white and cream shades, is becoming a popular facing material because of its clean appearance that does not easily smudge in city smoke, and when it does is readily washed. The last move that will bring it into perfect architectural countenance is its design expressive of itself and not suggestive of stone. This has been accomplished to a marked degree in the design for the Union Bank on King and Bay streets, Toronto, by Darling and Pearson, architects.

The building fronts 38 feet on King street, with a depth of 100 feet on Bay street. It is five stories and basement in height, with a mezzanine floor, a total of 90 feet five inches. The design is modern renaissance treated in a decorative manner suitable to the material, which is semi-glazed terracotta made by the Leeds Fireclay Company. The base, which is six feet high, is polished Crotch Island (Maine) granite. The window frames and sash are of steel, manufactured by Henry Hope and Sons, of Birmingham. The interior finish is largely marble and mahogany. The entrance hall walls are lined with polished Botticino marble, and Tennessee marble floor. The manager's room, which adjoins entrance hall, coat room and lavatory are finished in mahogany. The banking room, which is 33 by 70 feet, twenty-five feet high, with four foot dado around room of Escalette and Botticino marble. The general design is in French renaissance. The walls are plaster jointed up to imitate French Caen stone. The ceiling in plaster is highly decorative. Escallette and Botticino marble is



UNION BANK.

BANK FLOOR PLAN.

DARLING & PEARSON, ARCHITECTS.

used for counters, and as in the entrance the floor is of Tennessee marble with a varigated marble border. The grill work of the cages is cast iron bronzed. The vaults are in the rear wing and over them is a ladies' rest room and lavatory. The clerks' lavatory and locker rooms are in the basement.

Above the banking floor the second, third and fourth floors are devoted to offices divided to suit tenants, and the fifth floor is occupied by the head offices of the Union Bank. The finish of these floors is fumed oak. A battery of five vaults is located on each office floor and which are reached by an Otis-Fensom elevator. The offices of the Union Bank on the fifth floor are divided into a directors' room, president's room, a general office, and a number of private offices for officers of the bank. Attic space is utilized for the ventilating system and distribution by the low pressure gravity circulating two-pipe system. One large fan extracts the foul air from the banking room and a small fan is used for the separate ventilating of the lavatories.

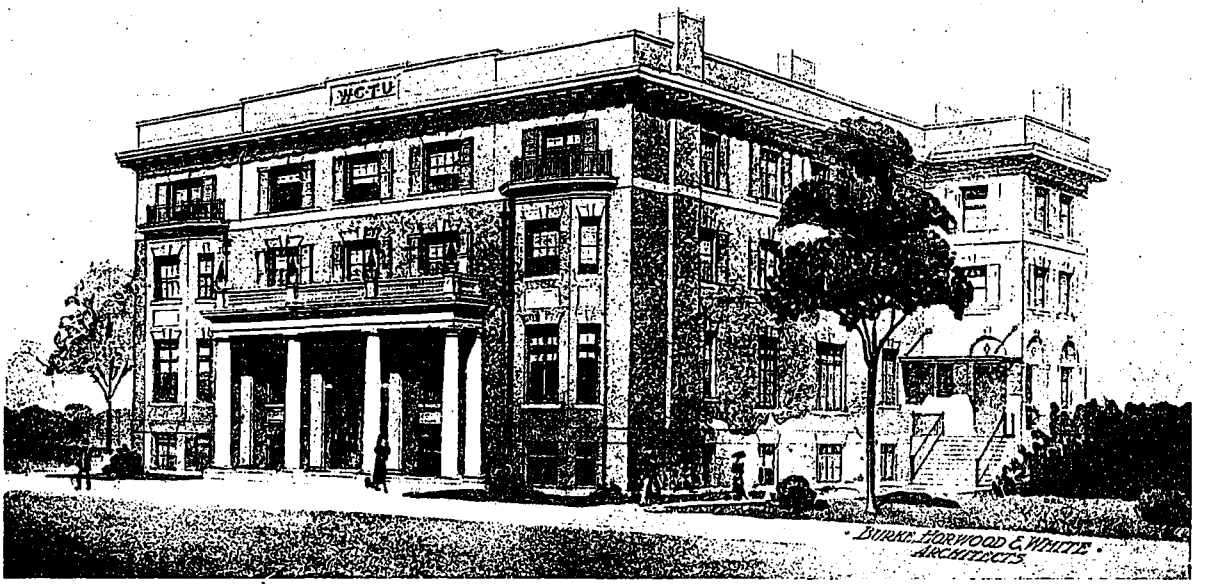
In plan this is a most complete layout for an up-to-date bank building, and with the careful attention that has evidently been given the structure from design to utility installation and interior finish it presents a complete example of modern bank design.

Entrance Detail, Union Bank of Canada, Toronto, Ontario. Darling & Pearson, Architects.

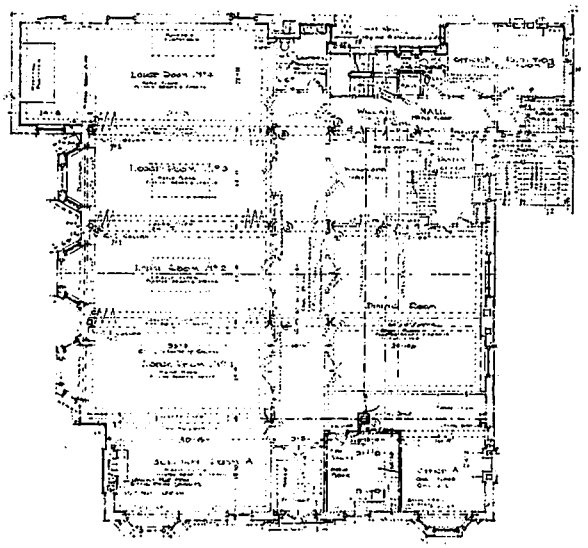
View Toward Entrance.

View From Entrance.

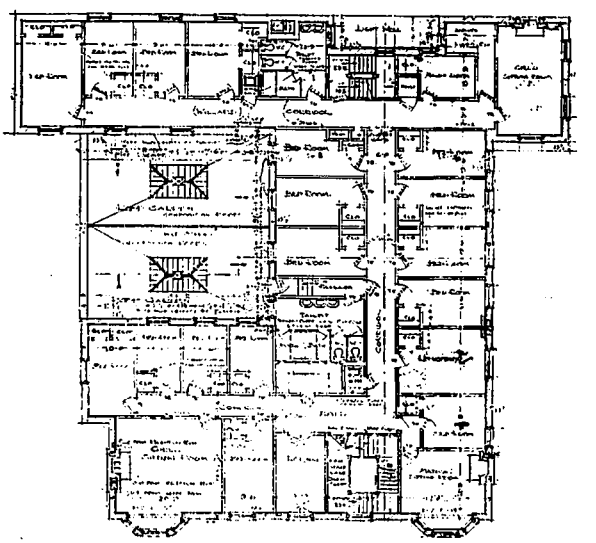
Union Bank of Canada, Toronto, Ontario. Darling & Pearson, Architects.



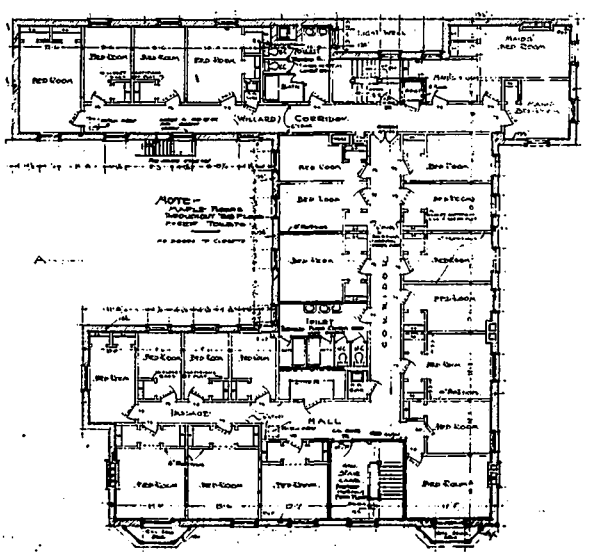
Willard Hall and Home for Girls, W.C.T.U., Toronto, Ontario. Burke, Horwood & White, Architects.



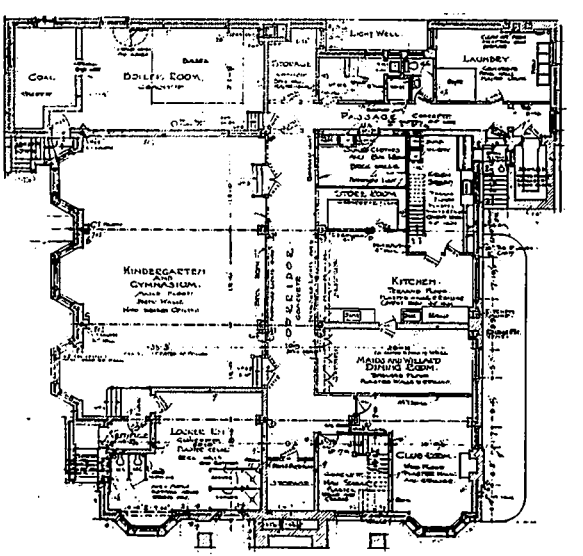
First Floor Plan.



Second Floor Plan.

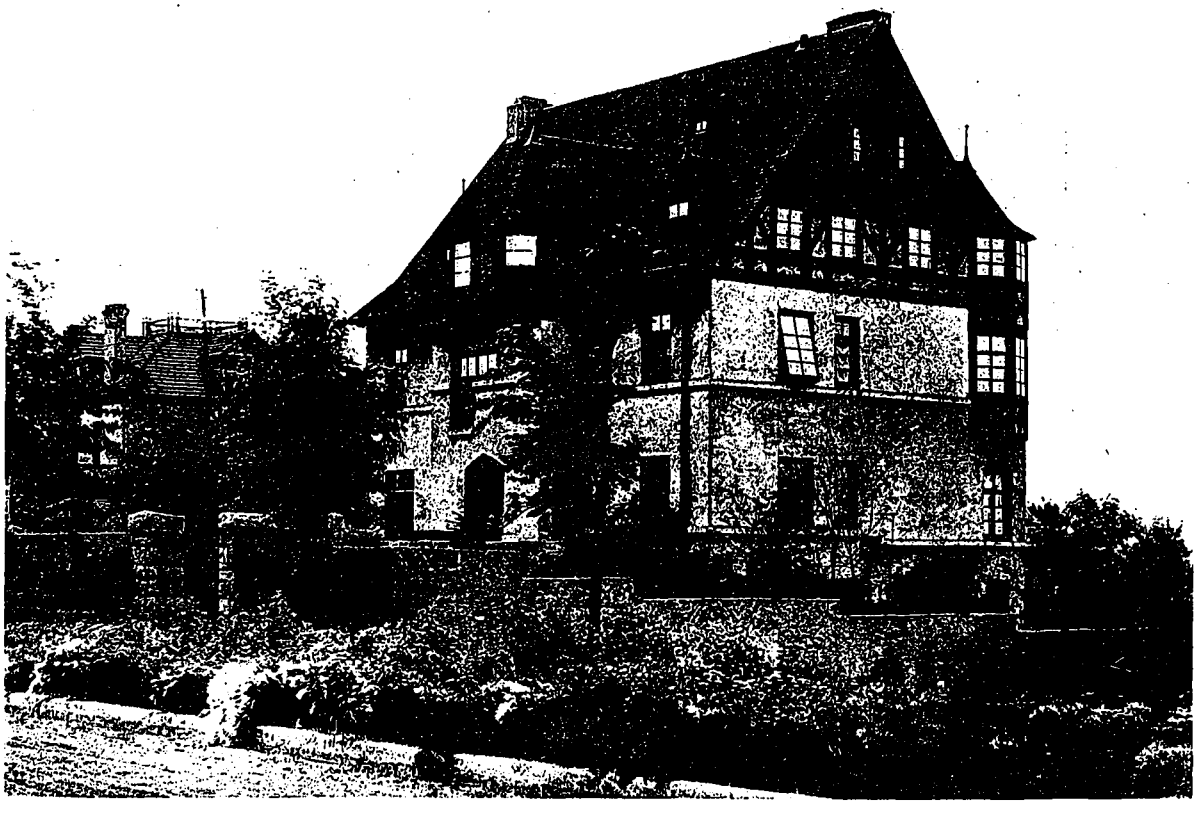


Third Floor Plan.



Basement Plan.

Plans of Woman's Christian Temperance Union Building, Toronto, Ontario. Burke, Horwood & White, Architects.



Hollow Tile House on St. Anthony Parkway, Minneapolis, Minnesota. F. G. Corser, Architect.

CONSTRUCTION OF HOLLOW TILE WALLS

By F. G. CORSER

An architecturally planned and thoroughly worked out scheme for laying porous terra cotta hollow tile walls that make for the greatest strength, warmth, dryness and cheapness in their construction.

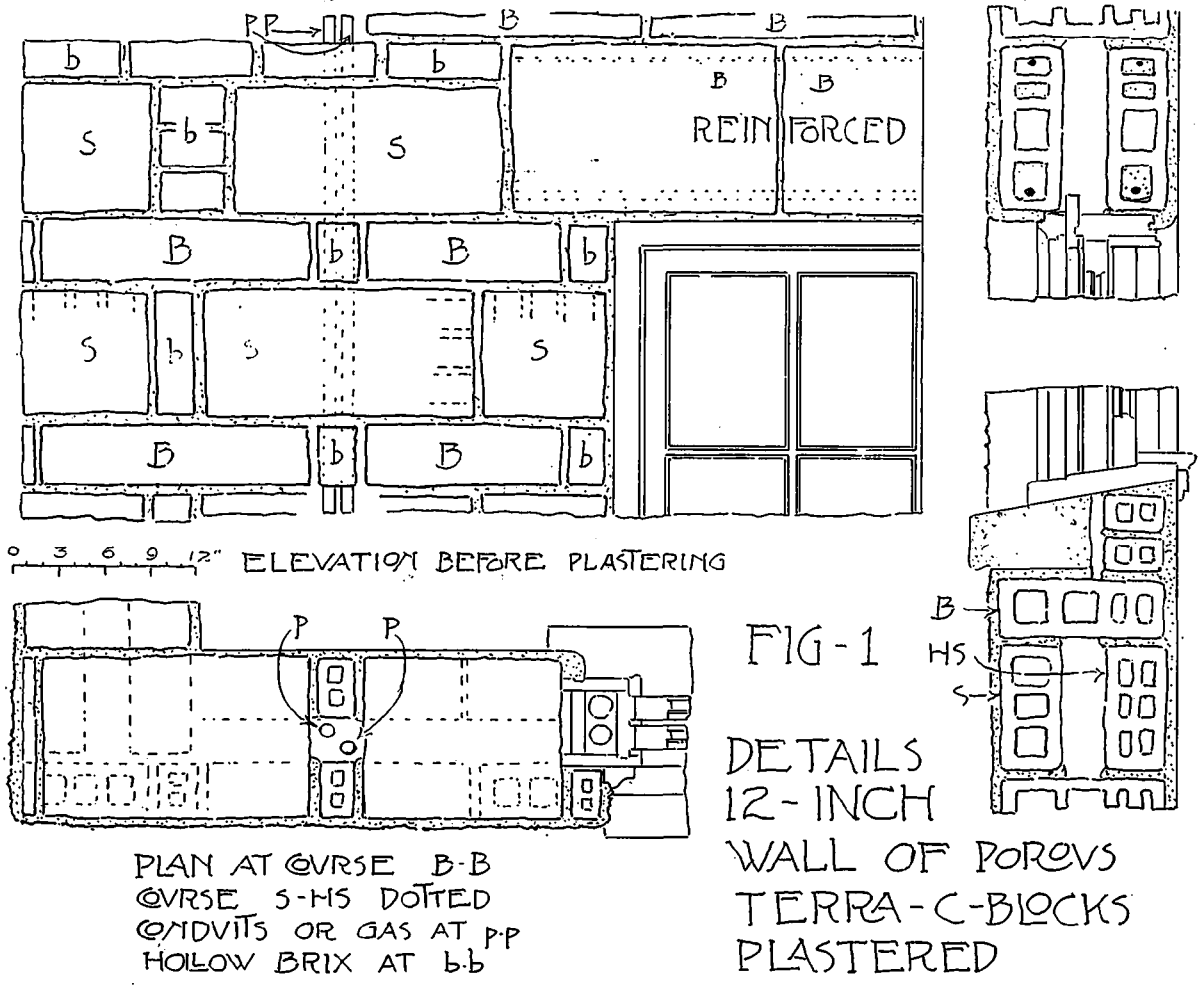
COUNTLESS latter day schemes for walls of masonry that shall be cellular in character, thereby saving materials, while promoting warmth and dryness have been tried and very few of them have stood the test of practice. The favorite field for experiments of this sort has been in Portland cement mortar or concrete, and in this material the percentage of success has probably been lowest.

Builders in burnt clay have produced plenty of impractical schemes, but the problem is less difficult in this material and much has been done that is well worth careful consideration by people striving to build cheaply but with permanence and low cost of maintenance.

The two schemes shown by accompanying cuts are the latest forms of a method of building that has had some vogue in and about Minneapolis for a few years. The first temptation to do this may be laid to the manufacture in that place of excellent "porous" fireproofing floor and partition hollow blocks of about the usual sections. The writer had kept in mind the favorable showing made by "porous" goods at the famous Denver tests of the early '90s, and was also much impressed with the slow conductivity of heat by the material, in which about 30 per cent. of sawdust is mixed before it is moulded, resulting in goods that are noticeably more bulky than the dense blocks, weight for weight.

When, therefore, in 1903, fortune fetched a properly pliable client, he selected from stock forms such blocks as, with hollow bricks, made 12 inch walls not very unlike those shown in Fig. 1. Later the manufacturer made for him the special bond tile, B,

which with the heavy stretcher, HS, gave the wall more bearing strength inside, and also added an air space to the section. A wall of practically this section has been used for three-story "flats" in Minneapolis, where such buildings are allowed with 12 inch walls. The tile HS having about 64 square inch bed, has been tested by the building department of Minneapolis, and showed first failure when under a load of 29,500 lbs. If loaded with one-half the roof and ceiling and one-half the third and second floors of 18 foot spans, to which one-half the weight of the three stories of wall is added, all computed as per building codes, these tiles show a factor of safety of about seven. It may be noted here



that many of the projects for hollow tile walls place the tiles on end, with a view of making all the material of the tiles available for vertical support. Such arrangement makes it impossible to bond so strongly as in the horizontal method shown in the cut, in which also the supporting area of mortar is greater than that of the tile webs, as it should be, the mortar being the weaker element.

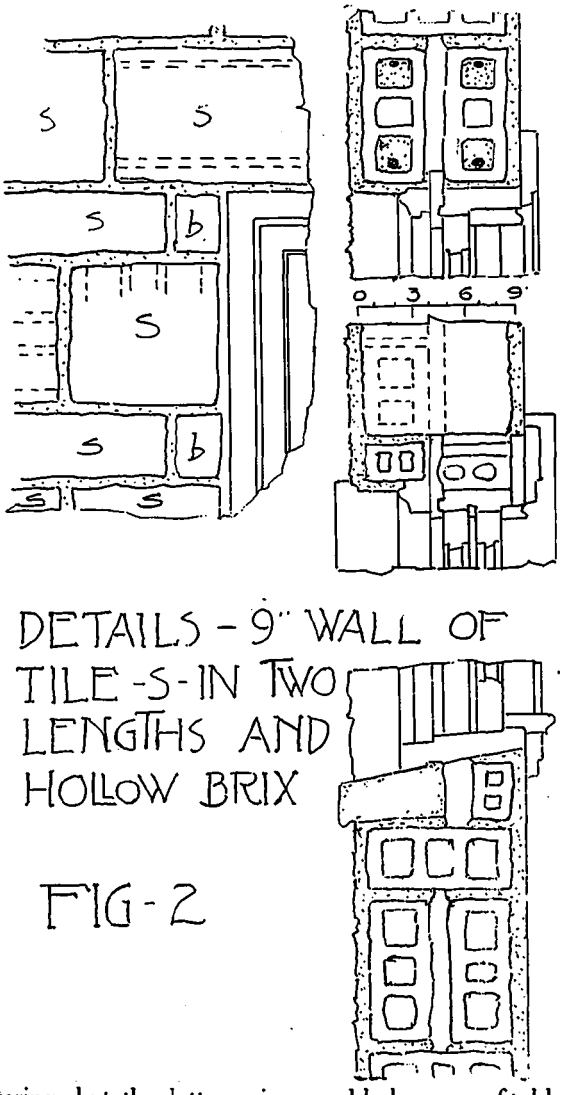
In discussions of cellular constructions as devices for conserving heat, we hear much about "dead air" spaces. These do not exist when air is confined between warm and cold walls, because air in such situations, like liquids, at once becomes subject to currents that convey the heat across, and this "convection" is doubtless greater with the vertical system of cells than in that shown by the figures. While it is true that confined air has the advantage in heat retention over liquids and most solid materials, it is also true that it is effective in proportion as the air spaces are subdivided.

This construction weighs a little more than half as much as a 12 inch brick wall, and takes about one-quarter as much mortar. The blocks B, S and HS run about two to the square foot of wall, which would require eighteen or twenty bricks. These comparisons will give the builder a hint of the saving in hauling, mortars and labor, while the fewer joints will point to one of the reasons for the great warmth of the walls.

Care should be taken to fill the vertical joints when laying, for which reason workmen used to setting the fireproofing tiles of floors will be found well trained for building these walls.

By using tiles of two lengths, with now and then a hollow brick, the troubles of the architect in adjusting the widths of his mullions and piers to the material are greatly lessened, the elasticity of the system making it often possible to retain those finer proportions which many materials in large units almost compel him to sacrifice. The manufacturer provides

tile S, Fig. 1, partly in short lengths as shown at angles and jambs, whereby workmen are almost or quite saved the time and waste of cutting tiles. It has been hte practice of the writer to send a blueprint of a drawing like this figure on the job, and this often answers all questions of a good foreman. This material has been sold f.o.b. in Minneapolis at fourteen cents per square foot of the 12 inch wall, and has been put in the wall complete where a three or four mile haul was involved, at less than twenty-five cents per square foot, ready for plastering, but the latter price would be unprofitable now.



DETAILS - 9" WALL OF TILE - S - IN TWO LENGTHS AND HOLLOW BRIX

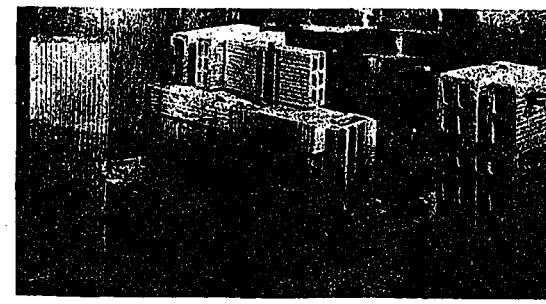
FIG - 2

If the builder has his materials at hand a week or so before setting in the walls, he may easily provide himself with excellent lintels by reinforcing with steel bars, and pouring, as indicated, with cement mortar. The upper bar is more for security in handling after the cement has set, and need not be calculated for strength.

The writer has had no experience with any other material that has proven so good a support for exterior cement plastering as this, and doubtless it is far safer than metal for gypsum goods with their tendency to corrode iron when moist.

The arrangement shown in Fig. 2 is somewhat simpler and cheaper and less strong and warm, having one less web and air-space in cross section, yet for light two-story buildings it will not suffer in comparison with many more elaborate and costly schemes.

In either of the above wall sections the solid material running through is hardly more than ten per cent. of the wall area, which is less than the studding of the "balloon frame," the ordinary wood construction, while heat must travel twice as far to escape through the tile as through the wood. Either section provides for much more effective arrangement of air spaces than we find in frame buildings.



Sample. F, Showing Section used in three "Flats" mentioned. On the left, showing how tiles are reinforced for lintels.

Easy working mortars are advisable. A barrel of good cement to a barrel of (unslaked) lime does nicely in most cases. Several experiences with such walls laid up during very wet weather and plastered outside while yet quite damp developed the fact that the drying out of this wall material may permanently but agreeably discolor the plaster. In one case a "marl" Portland cement having a knack of drying out to a permanent dull olive when applied to dry supports, became on these tiles a warm, pearly gray, very pleasing to one not insistent on too much uniformity.

RELATION OF ARCHITECT AND MANUFACTURER

By F. W. FITZPATRICK

A new thought in the direction of a National Association of Builders and Manufacturers in the interest of closer relations between designers and contractors.

THE REAL BUILDER of to-day is the manufacturer of building materials. The contractors and so-called "builders" perform the function of putting these materials into place, true, but their function is little more than that of supplying the essential labor of installation. Basically, the character of a building depends almost altogether upon the architect and the manufacturer. And even there the architect is limited and influenced by what the manufacturer can or does supply.

These two, then, with functions so intimately interlaced, should work hand-in-hand. Yet they are the two who, according to the so-called professional ethics and the customs of the day, are kept farthest apart.

A moment's digression here may be permitted us to glance at architectural practice as it is. The architect holds a most anomalous place in our commercial and social structure. To be ideally correct, he would have to be a paragon of all earthly virtues and possess qualities super-human. Employed by the owner, and naturally expected by the latter to look after his interests to the exclusion of all else, interests that, nine cases out of ten, are diametrically opposed and sometimes antagonistic to those of the builder, the architect must, nevertheless, be an impartial judge on all questions between these two men and must mete out equal justice to the builder, whose desires and claims are inimical to those of the man who is his employer. And that must be done, too, even in cases where such justice rendered the builder will get the architect into all kinds of a scrape with his employer, because the builder's claims have had rise on account of some neglect or oversight on the part of the architect! That calls for rather strenuous virtue.

Remember, too, that in very many instances, the owner and architect have absolutely nothing in common, they do not belong to the same social strata or set, the relationship has just "happened," much the same as the relationship between a merchant and a customer who merely steps into the store to make a casual purchase. Perhaps, also that particular owner is grasping and endeavoring to get the better of the builder by every means in his power and is really anxious to use the architect for the illegitimate grinding of the builder. The architect knows the builder well, realizes the difficulties under which the latter is working, is justifiably desirous of assisting him, even to the extent of giving him the benefit of any doubt. Their activities are along the same line, there must be a host of ideas and interests in common. Yet, the moment an architect shows the slightest friendliness to, or hobnobs with a builder, he is looked at askance. He has fallen from grace, as it were, and it is vaguely hinted, if not loudly proclaimed, that he is crooked, "stands in" with the contractors and what-not, and as a most natural result, his employment ceases, people are afraid of him.

The whole construction of architectural practice to-day is on an unsubstantial foundation, a relic of former and obsolete conditions and that it is unsatisfactory is clearly proven by the fact that present conditions have given rise to a novel mode of carrying on building construction, where the transaction is direct between the owner and a construction company, without the intermediary of the architect. The latter becoming more or less of a supernumerary, whose function is solely to supply a design that is carried out by the construction company, without further interference on the part of the architect. This is becoming more and more the fashion and in the very largest enterprises, and we may be justified in our apprehension that Architecture as an independent profession, the controlling factor in building, the all-powerful and dominant one, is doomed, and that the "construction company," with its corps of skilled designers, former architects in independent practice, is the coming power.

But as long as the profession holds even the waning power it has to-day, the existing conditions must be dealt with, and not some future possibility.

It is reasonable to suppose that at least the second major consideration with both architect and manufacturer is the betterment, the perfecting, of building. Now, how can any two sets of men accomplish a common purpose and do it best, if they keep as far apart as it is possible to get them? The architect wants something artistic, something new. He spends much of his time yearning for it and some of the balance in a general scolding aimed at all manufacturers because they haven't guessed at what he wanted and proceeded to manufacture it; the manufacturer, on the other hand, also gropes more or less in the dark and tentatively makes this, that, and the other thing as a sort of bait he holds out, hoping that the architect may like it and order. How much better it would be to put shoulder to shoulder and work together!

There seems to be a species of unwritten law that prevents the architect and the manufacturer and the builder from socially gathering in clubs or circles—perhaps a wise law, though I can't see it, but it certainly has obtained for ages. But surely there could be devised some more direct and satisfactory mode of intercommunicating ideas, working together, than now exists.

An architect who is at all original or bright is sure to develop some new scheme of decoration or of combinations of materials or of forms. He is enthusiastic about it, but generally impractical. So off he goes and introduces it in some plans he's making for a building. When the work gets out for figures he's up against a stone wall. He's met with the solemn assurance that this or that is not in the market, isn't done that way and has never been heard of. It gets to the owner's ears, and he immediately jumps at the conclusion that his architect isn't posted, doesn't know what can or can't be done, and loses confidence in him. Thereafter he deals direct with the builder and joins the great army of "knockers" against the beloved profession. Now then, there are Builders' Exchanges in nearly every city, why can't they federate or join or otherwise organize a central, national exchange? Let that office be an important one, maintained by all the trades and manufacturers. Incidentally it could do splendid work in adjusting strike troubles and all such affairs. But its real purpose would be to act as a great clearing house for building information, data, reports and what not. Anything new that the architect might think of, or design, or desire, could be submitted to that exchange and its business would be to lay the matter before the manufacturer best equipped to do that special thing, or to send out an inquiry to all in that particular branch. If one cannot make the thing another can. Or perhaps it is already on the market, but has escaped the attention of that particular architect.

Such a national exchange (or international, for it

should be Canadian and American, the two are inseparable) managed along the broadest lines, would be of incalculable benefit to the Building World generally. The architects would soon learn to use it and depend upon it. Its potentiality for good work would be great. The existing Exchanges can't help but be local in influence and in endeavor. They are necessary, but their scope for good work is bound to be restricted to their immediate locality. The larger organization would be represented at meetings of the architects, at conventions, municipal and others, it would soon make itself felt, and the cost of the maintenance would be but a drop in the bucket compared to the benefits it would yield to architect, owner, manufacturer and builder.

Are we sensible enough to start it now, or shall we have to wait and talk it over and consider it for another ten years or so?

TOWN PLANNING A LIVE ISSUE IN WINNIPEG

Secretary J. Pender West, of the Manitoba Association of Architects outlines the attitude of the Association to the local paper.

WHILE WISHING TO REFRAIN from participation in any question of politics —municipal or otherwise—the members of the Manitoba Association of Architects feel that they would be failing in their duty to the public and to their profession if they allowed the present proposal to build an annex to the city hall to come before the ratepayers without a protest on their part against the proposed method of handling the most important architectural project that is likely to be dealt with by this city for many years.

At the present time there is probably no subject arousing such general and world-wide interest as that of town planning. Conferences—national and international—are being held upon the matter in all parts of the world, and in all civilized countries, cities are grappling with their varied problems, by methods dictated by individual circumstances and requirements, and in many cases are spending immense sums of money to remedy the mistakes of the past.

But, however widely these requirements and circumstances differ from each other, there are certain fundamental and generally accepted axioms upon which all such projects must be based. Probably the two most important and obvious of these are: (1) That any town planning scheme must deal with the town as a whole, subordinating any local or personal interests to a general scheme for the present and future development of the area dealt with. (2) That the scheme must be comprehensive and far-seeing, providing not only for immediate and visible requirements but laying down certain definite lines upon which future development must proceed.

One of the most vital points in any well considered scheme of town planning must naturally be the location of what is now generally called the "civic centre," the principal feature of which is the city hall. The location of this "centre" must be determined with a view to its ultimate relation to the remainder of the features embodied in a carefully considered plan of the entire city. No responsible citizen would counsel or sanction the erection (now, or at any future date) of a city hall sufficient for present requirements only. Surely the same consideration of future necessities should be given in regard to its location.

As a result of the efforts of some of Winnipeg's more public spirited and far-seeing citizens this city has now a fully constituted town planning commission, composed of representatives from almost every public authority or association in the city. Such a body, representing, as it does, the most varied interests and with the assistance of a secretary appointed primarily on account of his wide knowledge of similar work in other places, would appear to be the proper authority for dealing with the location of the new city hall.

Apart altogether from the question of site, the proposed scheme appears ill-considered and inadvisable. It is proposed to erect on the site of the present market building, at a cost of $300,000, a building to meet present requirements, this building ultimately to form a portion of a future city hall. There is little doubt that when the erection of a permanent city hall is undertaken the citizens will insist that it shall be an architectural monument worthy both from artistic and utilitarian standpoints of that great city to which Winnipeg must ultimately develop. Such an edifice will probably cost some millions of dollars, and the absurdity of constructing a small section of it before the whole is designed is too apparent to need demonstration.

This association expresses no opinion as to whether the location of the present city hall is or is not suitable for the new building, but it urges careful consideration of the following recommendations:

1. That the new city hall should have a site of adequate size in the best possible position, having regard to the future development of the city.

2. That the location of this site can best be determined by the town planning commission, assisted, if necessary, by the best obtainable expert advice.

3. That no portion of the new building should be undertaken until the best possible design has been obtained for the complete structure.

4. That no question of present convenience can justify the city in taking such ill-considered steps as will prevent, for all time, the subject being dealt with in a manner worthy of its importance.

Alfred B. Searle, of Sheffield, England, a consulting expert on clay and clay-products and lecturer on brick-making under the Cantor bequest, has written an excellent work on "Modern Brickmaking." (London: Scott, Greenwood & Son: New York: D. Van Nostrand Co. Price, $5.) This is a volume of more than 400 pages, with 200 illustrations.

A MODEL ISOLATION HOSPITAL

Illustration showing the design for the new Isolation Hospital being erected by the City of Winnipeg, with the architect's description.

THE DESIGN for the new isolation hospital to be erected at Winnipeg was submitted in competition with thirteen others and won by Herbert B. Rugh, who has since consolidated his business with Ross & MacFarlane in respect to their Western work.

The arrangement of the different rooms was pronounced by the hospital expert and jury of award as the best layout they had ever seen for an institution for the treatment of contagious diseases. Emphasizing the perfect control obtained by the arrangement of inside lobby and the double protection and isolation of each wing from the other by having the doctor and nurses enter the various wings by going into the doctor's room from the inside lobby, removing their outer garments and then stepping into the chart and gown room, where they put on their gowns and prepare themselves for their work, entering the ward from this room ready for work. In this way the double doors to the ward corridor are kept closed, except for the removal or admittance of a patient.

There were but two changes made in the plans. First, in connection with the receiving department in the basement, detention wards were added to provide space for taking care of patients with uncertain diseases. The other change was made in the emergency operating rooms on each floor, by having a small room partitioned off containing a bath tub, this bath room to be used as the discharging bath, and the operating room as the discharging ward, as the number of operations in a children's hospital are very few and the room would be idle most of the time, unless used for other purposes.

The exterior finish of the building from the grade line to first floor window sills is to be cut stone, balance of building finished in dails brown vitrified brick with cut stone trim. Foundation of the building will be concrete properly waterproofed.

The construction is to be fireproof, structural steel frame, and the floor construction to be reinforced concrete or tile. Corridor partitions to be double four-inch hollow tile so constructed that the space inside the partition will be used for ventilation flues. The main stairway to be ornamental iron with marble steps.

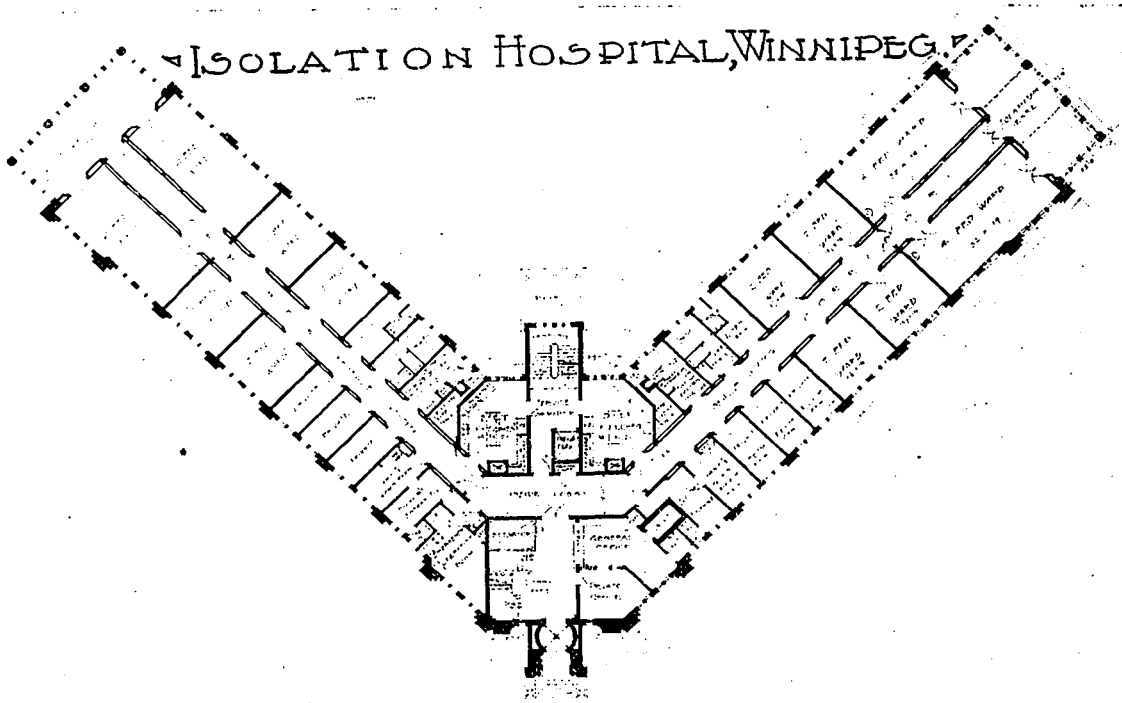
The floors of all bath rooms, sink and service rooms, lavatories and toilets to be tiled with 6 inch square flint tile and the walls to be tiled 6 feet 6 inches high with sanitary wall tiling, having sanitary cove at floor and sanitary corners, etc. The floors of corridors, wards and other rooms to be covered with battleship linoleum, cemented down to concrete, with plastic cove and border at floor. All ceilings to have plaster cove.

All windows to be steel casements, lower casement section to open in with adjusters, etc. Upper transom section to be hinged at bottom to open in and down with adjusters, etc. Storm sash to cover entire opening outside with ventilator at bottom. Screens also to cover entire opening.

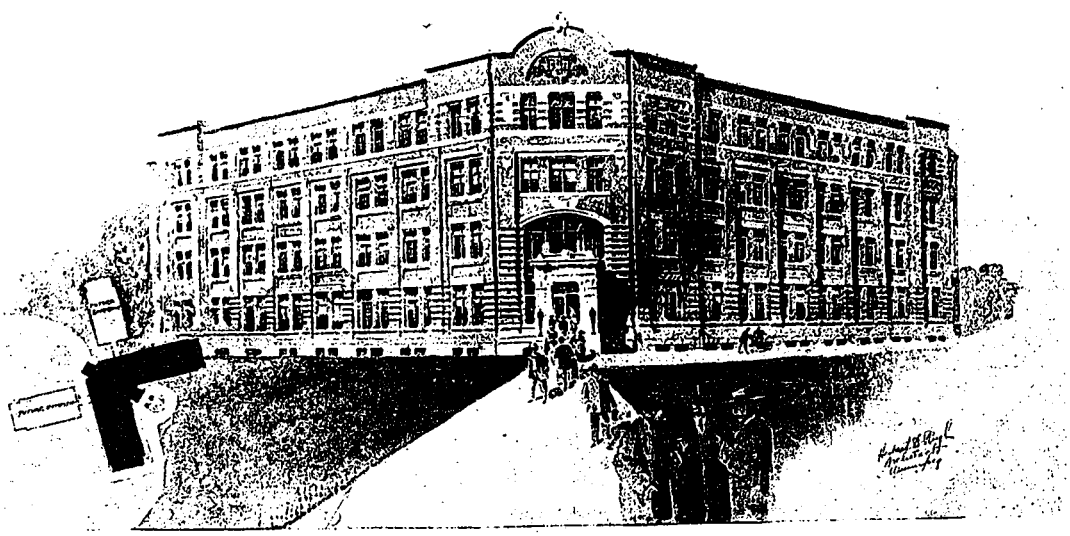
Heating and Ventilation to be of most modern type, all wards, corridors, etc., to be supplied with direct radiation, using the modulated system. All service rooms, kitchens, toilets and wards to have "vacuum" ventilation. Fresh air to be taken from point above the roof of building to fans located in basement, there to be heated, washed, etc., and blown into wards through galvanized iron ducts located in false ceiling of corridors, the foul air to be taken up in vents in corridor partitions to space under roof, then all drawn together and discharged by exhaustion fans through roof at the opposite end of the building from fresh air intakes. Vent openings to be placed at floor and ceiling, so that in hot weather air can be drawn from upper part of room as well as lower part. Plumbing and laundry fixtures to be modern in every respect. Building to be equipped with vacuum cleaning system throughout.

The plans need very few words of explanation. Sexes are separated and each floor is arranged to be used as an elastic ward, or for a single disease. The main stair and elevator lobby is entirely shut off at each floor and from this lobby another entirely enclosed vestibule, "the inside lobby," has to be passed before the ward is reached, so that perfect isolation is attained for each wing of each floor. The doctor has a room with private lavatory in each wing, entered from the inside lobby, in which he removes his outer garments, then steps into the chart and gown room, and from there into the ward. The ward doors in corridors need not be used except for bringing in or removing patients. In the sink room on each floor of each wing there is a specimen closet with vent connection for ventilation. The soiled linen chute, also in this room, is made of 15-inch vitrified pipe imbedded in cement and so arranged that it can be flushed or sterilized at any time. The sink room also contains a work-table, bed-pan sterilizer and rack, slop sink and slop hopper with flush tank operated by foot pedals, a blanket warmer, and shelves. The chart and robe room will be used for dressings and will also be the nurses' workroom.

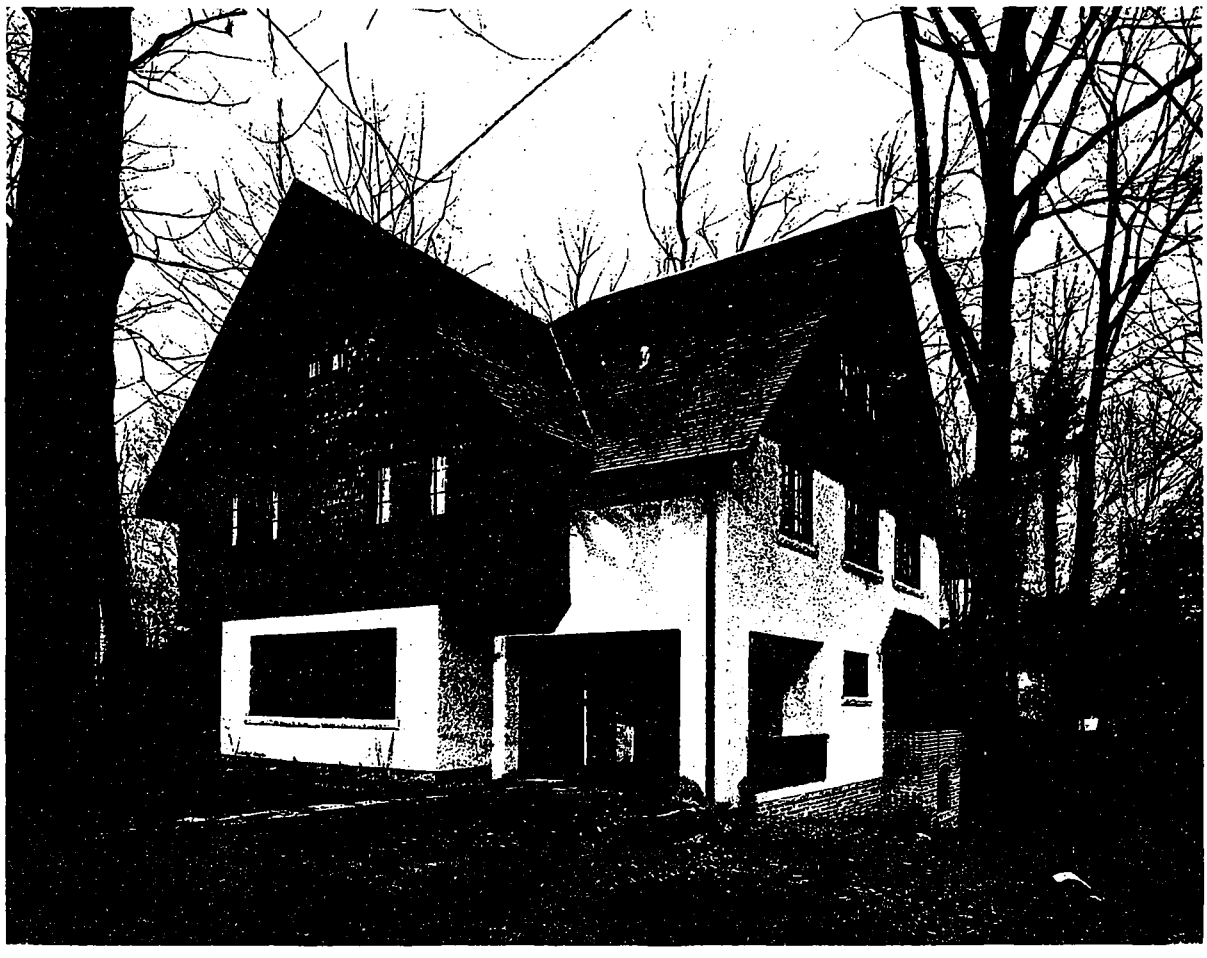
All signals installed are to be electric light signals. Building will be wired for electric light service and piped for gas to kitchens, etc. A duplex ward is located on the top floor with separate service, bath and toilet room. The building is designed to accommodate 150 patients and contains 686,174 cubic feet, including porches, entrances, etc; 1,232 cubic feet is given each patient. On each floor on each wing there is a spacious and well arranged diet kitchen with steam table, ice box, cupboards, sink, dumb waiter and work-table. All service rooms are concentrated and convenient, there is a nurses' lavatory off the linen room in each ward. Ample freight elevator and dumb waiter service is provided to handle everything.



FIRST FLOOR PLAN.



General Plan and Perspective View of Proposed Isolation Hospital at Winnipeg, Manitoba.
Ross and McFarlane, Architects, Montreal, Que.



Residence of Geo. Howell, Toronto, Ontario—Eden Smith & Son, Architects.

This house is built of brick and rough cast on the outside. The shingles on the walls and roof are stained brown, the windows are casement windows equipped with metal weather strip. The ground floor is quarter cut oak and the upper floors narrow quarter cut Georgia Pine. The staircases are oak and trim is Georgia Pine with pine doors. All the woodwork inside is stained brown and waxed. The beam ceiling in living-room shows the real beams and the ceiling between is sheeted.

THE USE OF BRICK IN AMERICAN ARCHITECTURE

Abstract from a Paper read by Donn Barber, Architect, before the Twenty-fourth Annual Convention of the National Brick Manufacturers' Association, held in Pittsburg, Pennsylvania, in February, 1910.

ARCHITECTURE is a comprehensive art, in the sense that nature is comprehensive. It is the material expression of the character of man and it impresses us as a great whole after the manner of a landscape. Architecture is practical and scientific, but at the same time architecture is art. The anatomy of a building and its geological structure is determined by science, the use and plan of a building is determined by practice. Art it is that clothes a building and makes it impressive through its outward appearance. Architecture manifests an infinite variety of organic forms and color, but it invariably refers all to a common cause. The architect has always had every opportunity for the development of his creative faculties, for through the medium of his mind's work he has the power of transmitting crude materials into beautiful forms. The functions of a true architect would, therefore, seem to be the highest that can be bestowed on any human being. His experiences are far greater than those of an ordinary artist; his field is more extended; his work is more durable, and its uses more widely diffused. It might be well if architects realized more fully these great responsibilities, for what they build must of necessity remain as an achievement or a failure, and once their work is consummated it can not easily be changed.

Let us now turn to the subject of brickwork.

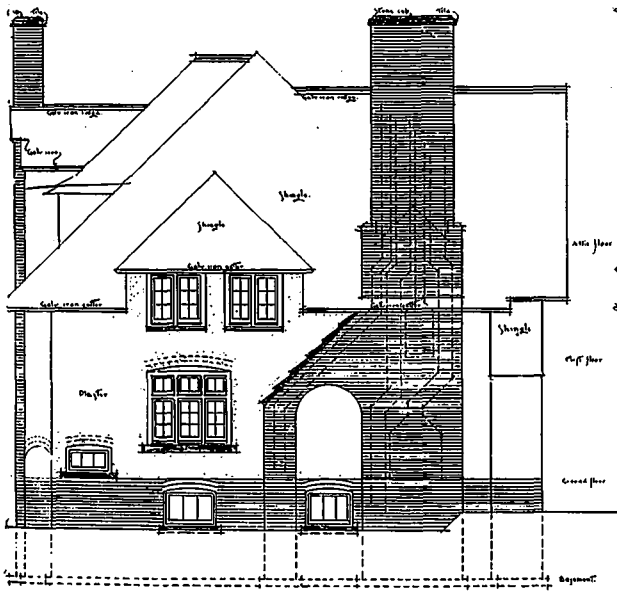
Until very recently the layman unfamiliar with the affairs of the building world, has had little or no opinion regarding brickwork, except, perhaps, to believe it to be an aggregation of clay cubes burned to permanent hardness and possessing as such about as much human interest as the ordinary shovelful of building sand or a handful of wire nails.

It must be admitted that the monotonous and uninteresting methods of brick laying in vogue in this country, even in the immediate past, justifies more or less such public indifference.

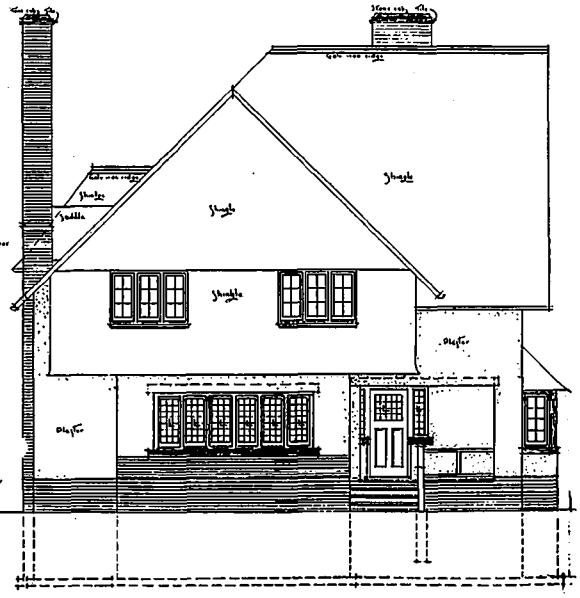
Brickwork now, however, seems to be really emerging from what might be termed its "dark ages," and it is interesting to observe that it is rapidly and surely entering upon a real "Renaissance" of its own.

Architecture has already been defined as an art which seeks to harmonize in a building the requirements of utility and beauty. The brickmaker of to-day should accept this definition of his "platform" in order that he may be able to challenge with his product every other building material to a comparison of merits as measured by such a standard.

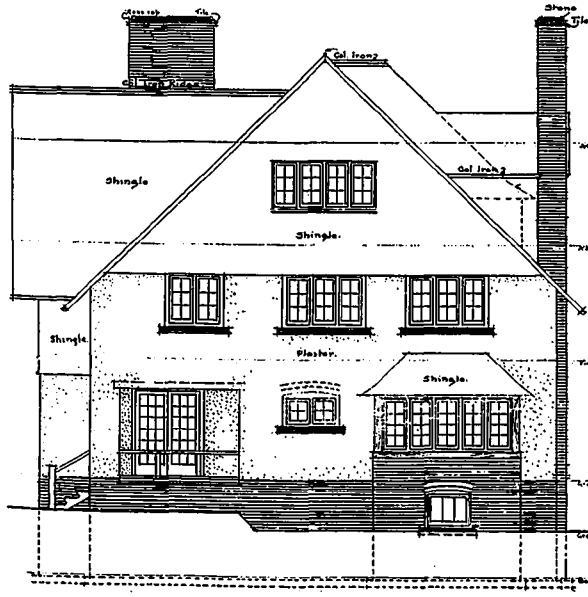
First: From the point of view of utility, because of its size and the ease with which it can be handled, brick is readily adaptable to every form of construction, both large and small. A good brick can further be made imperishable. We have to admit that the ultimate test of everything in this world is "Time." After centuries of competition from every other kind of building material that man has been able to discover or invent, brick stands to-day where other materials have fallen. The earliest records of man have been found inscribed on tablets of burned clay, where everything around them has crumbled to dust. Brick has far greater crushing strength than it can ever be called upon to develop, and, furthermore, it is fireproof. Well burned brick never needs to be painted and seldom requires repairing. Possessing,



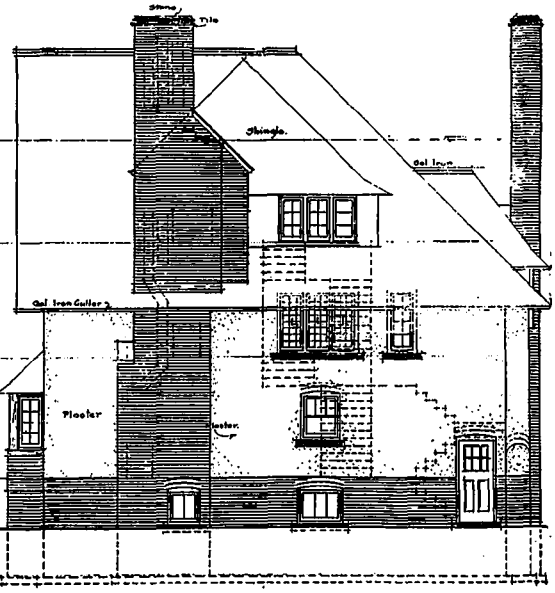
West Elevation.



South Elevation.



East Elevation.



North Elevation.

Elevation of Residence of George Howell, Toronto, Ontario—Eden Smith & Sons, Architects

as it does in the highest degree, these essential requirements of utility, brick is at the same time one of the cheapest building materials in existence.

Considered from the point of view of beauty, brick would seem to occupy a unique position among the structural materials available for the creation of beautiful buildings. Further analysis discloses, among others, the following interesting points:

Brick is made in reasonably small units, so that in the case of many modern buildings, at least one hundred thousand of them show on the exterior. This, together with the varying shapes and sizes now obtainable, make possible an almost infinite variety of form and pattern, thus giving full scope to the imagination, ingenuity and skill both of the designer and of the workman.

Brick, moreover, is now made in almost every conceivable color and shade, the permanency of which is unequaled by hardly any other building material; with such a "palette," therefore, at one's command, and by a skillful use of color, the brickbuilder of to-day can readily add to his design that living touch which the painter gives to his painting.

Brick may be also counted unique in the fact that it requires for its structural efficiency the use of a very considerable amount of material of quite another kind and color, namely, mortar, and further that this material must of necessity show in the form of a joint to a more or less degree in the face of the finished wall. A mistaken idea has prevailed that the mortar joint is a blemish that should be suppressed as far as possible, or be colored to match the brick. We find, however, that the designer of to-day seizes the very opportunity afforded by a mortar joint to introduce into his wall another element of color and pattern.

The word "texture" has lately come into use in connection with brickwork, and, strange as it may seem, this word has a very plausible application; for the builder of interesting brick work has much in common with the weaver at the loom as far as resulting color effect goes. Just as the weaver, with his threads of varying sizes and colors, produces a never-ending variety of useful and beautiful fabrics, just so it is possible for the brickbuilder, with his bricks and joints of many colors and sizes, to weave new ideas and combinations into his work, all in beautiful and imperishable patterns; and this applies to all brick.

Just as the fabric charms and delights the eye and at the same time protects man from heat and cold, and performs a thousand other useful functions, so the beautiful wall of brick, exemplifying man's ingenuity and his artistic skill, forms also the protective structure of the buildings erected for his use. Brick, therefore, would seem to fulfill to a very high degree the requirements of an ideal architectural material.

The modern brickmaker should strive to make his material the most economical so that the architect can do his part to make it the most beautiful, the most useful and the most permanent. It is interesting to note that the architect of to-day continues to avail himself of the same material that served his forefather craftsmen so well in the temples and palaces of Assyria and Persia, and the hanging gardens of Babylon.

In view of its general use throughout the ages it seems strange that we moderns do not look upon brick as one of our most usable resources. To be sure, we have used brick with more or less fluency in this country for walls, for pavements and in some modest degree for decorations, but it is only within the last ten years that we see brick creating a real place of its own in our American architecture. What has already been accomplished indicates plainly what can be done when brick is used in a proper way, and from the point of view of its own peculiar charm and character. The development and perfection of the characteristic traits of a brick style would seem to be now only a matter of time and opportunity.

Looking for a moment to our history of ancient brick-

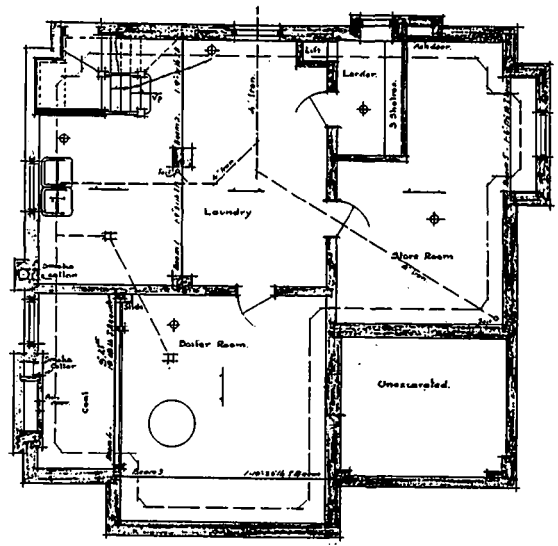
Hall in Residence of Geo. Howell, Toronto. Eden Smith & Son, Architects.

work, we find in Northern Italy, where clay abounds and where stone is scarce, that the Italian builders have developed a remarkable love for their work, particularly in the use of brick and terra cotta. The French availed themselves quite freely of the use of brick for the pattern work of their Normandy manor houses and for the charming wall surfaces of their chateaux. We also find that the Dutch have built up for themselves a charming architecture both for the city and country, in brick and terra cotta; and then finally we find that the English have brought all the good, sensible, homely character of the true use of brick in their very delightful country houses. Each of these people mentioned has impressed its personal and characteristic stamp and form on the brick architecture which it has perfected. Each has, moreover, received a due reward for its labors in producing notable variations of its own, in type of architecture, differing widely perhaps, in spirit, from

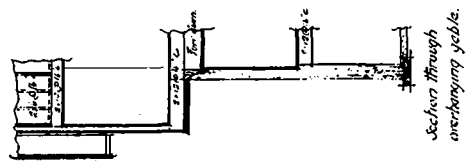
those of the eastern nations, but based usually on the better traditions of older work. We, as moderns, are now free to appreciate the best of all this past to an architecture which will suit our own present day needs and purposes.

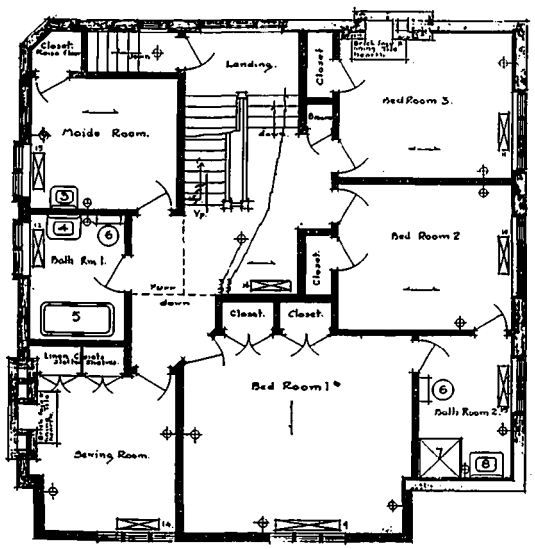
In the history of art we find that each successive family of artisans takes from the common stock of antiquity that which it can devise and use, bringing to the working over of the old forms, a new and ever human interest and seemingly a real expression of a new life and style.

It is, therefore, of inestimable value to have continually before us for study, the cultivated field of European and Oriental brickwork available to-day in book and picture form, and to seek the inspiration that comes from a thoughtful appreciation of what true artists in clay have already produced. The first important step to be taken is to be absolutely sure that we are using bricks in ways appropriate to their peculiar and individual qualities. We can then proceed with a confidence in our ultimate ability to build up interesting and beautiful worth-while walls.

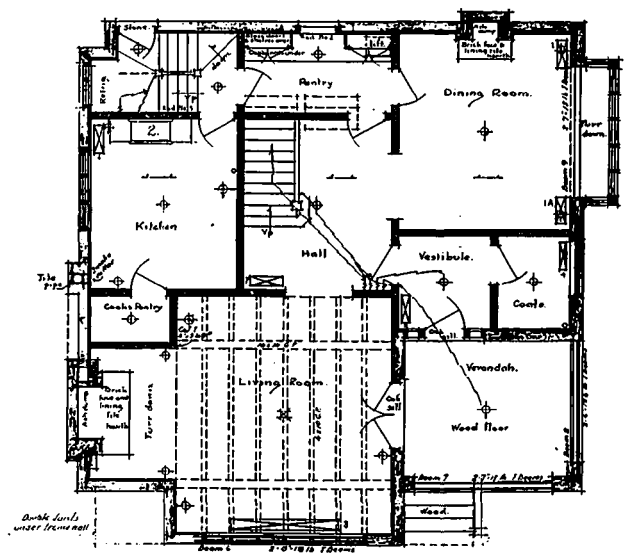


Basement Plan.





First Floor Plan.



Ground Floor Plan.

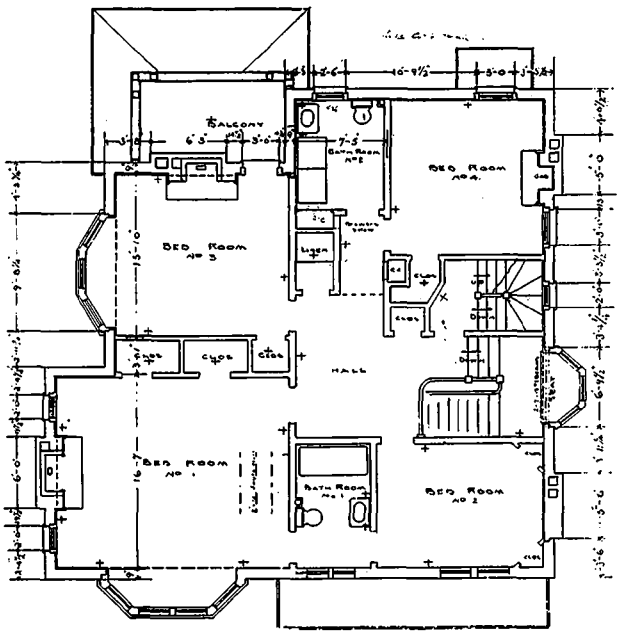
Plans of Residence of George Howell, Toronto, Ontario. Eden Smith & Son, Architects.

In our American cities no brick that we can find can be said to be very old or very impressive; the weather has invariably worked into the poor mortar of the earlier work, causing ruins which seem to lack that something of dignity we find so common in the antiquity of Europe. We have, strictly speaking, no real brick past in America to draw on for precedent. As for new ideas and combinations, it would certainly seem to be inevitable that every possible motive has been exhausted by the ancients who were not only limited strictly to the use of burnt clay, but were instinctive artists in the production of extraordinary patterns and color. Old forms, however, can be readily adapted to our own use, and with study and intelligent handling can be made to take on a new, interesting, and quite natural look.

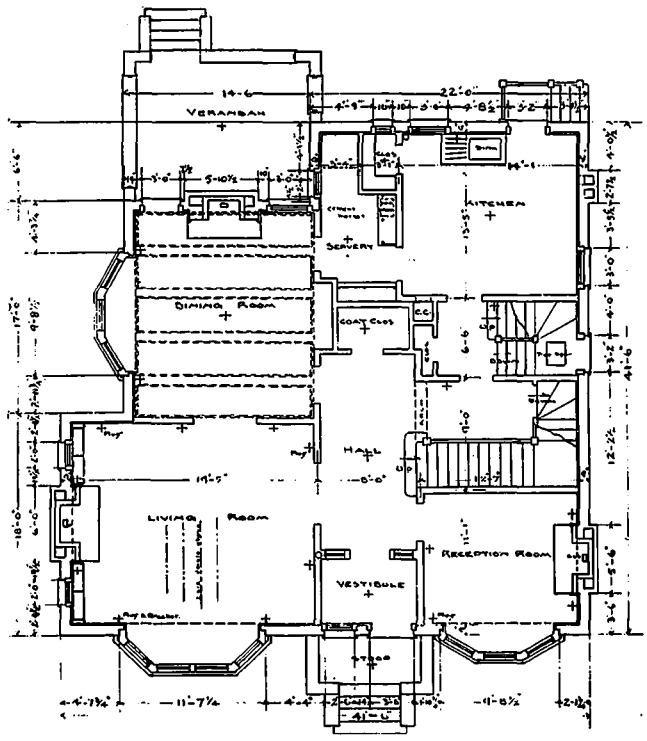
Brick architecture would seem to-day to open up to us vistas of new and hitherto unthought-of problems of possible wall surfaces that can be made appropriate and beautiful both for our city streets or country lawns. Houses, terraces, pavilions and pavements in brick can logically and acceptably be made to become part of their natural setting. The gradual expansion of our artistic life must of necessity bring to the competent designer an opportunity to lavish on brickwork his greatest skill. Brick forms, as we use them, more and more seem for some reason or other, to become very companionable and comfortable. Whether the bricks themselves be the long Roman shapes of the Baths and the Pantheon, the

smooth gray brick of China, or the great flat slabs of the city wall of Mandalay, whether the jointing employed is a hair crack or the deep mortar beds that exceed the thickness of the clay, wherever the inspiration comes from, they are still brick walls, mellowed it may be by centuries of exposure or built from a burning of a few months ago. The weather of a thousand years may have eaten out the joints, or the tucking tool may have raked them out; it is the resulting effect that must surely interest us primarily, for individual brick patterns can be made today to show a bond that will compare favorably with those of the ancient examples in Europe.

In the hands of those who really love its use, the resources of brick as an artistic possibility are limitless. Given a single color and size and the freedom to lay the brick in patterns, with vertical and header courses, cut corners to make diagonal figures, raised



First Floor Plan.



Second Floor Plan.

Plans of Residence of Geo. Brigden, Toronto, Ontario. Bond & Smith, Architects.

or sunken bands or panels—the wall so built becomes an inspiring study; the surface calm in the direct light seizes our attention with unexpected interest as the sun's rays change, every elevation and depression is gradually brought into delicate relief. Another shade of the same color of brick may be added to make the wall less dependent on the direction of the light and capable of almost infinite variations and play of surface. We may even add bricks of another color altogether, and set tiles into the walls, thus accentuating our bands of perceptible contrasts, bringing out all imaginable play in panels over the wall surface and creating all at once that indispensable wall texture which counts for so much in the general aspect of the building.

Brick in varying colors with the added liberty of surface manipulation and bond, really becomes for the designer in brick the painters' palette of pigments, for just as the painter mixes his colors or uses them in juxtaposition either for harmony of agreement, or for brilliant contrast, just so can we use in an infinite variety of effects multi-colored brick and mortar joints for the painting of our building picture.

To appreciate the elemental qualities of brick we must, as has already been said, use them where they appear at their best. Whatever the similarity or difference of the neighboring material, brick must be used in ways appropriate to its scale and its intractable nature. Its limitations are both evident and inevitable. Brick should be used on broad wall surfaces and panels, slight offsets and flat bands.

Within the last few years, architects have come gradually into the use of many new shapes and colors of brick and what is of greater consequence, they have arrived at better ways of laying them, suggested partly by the careful study of the older and sturdier work, and partly by their own inventive genius.

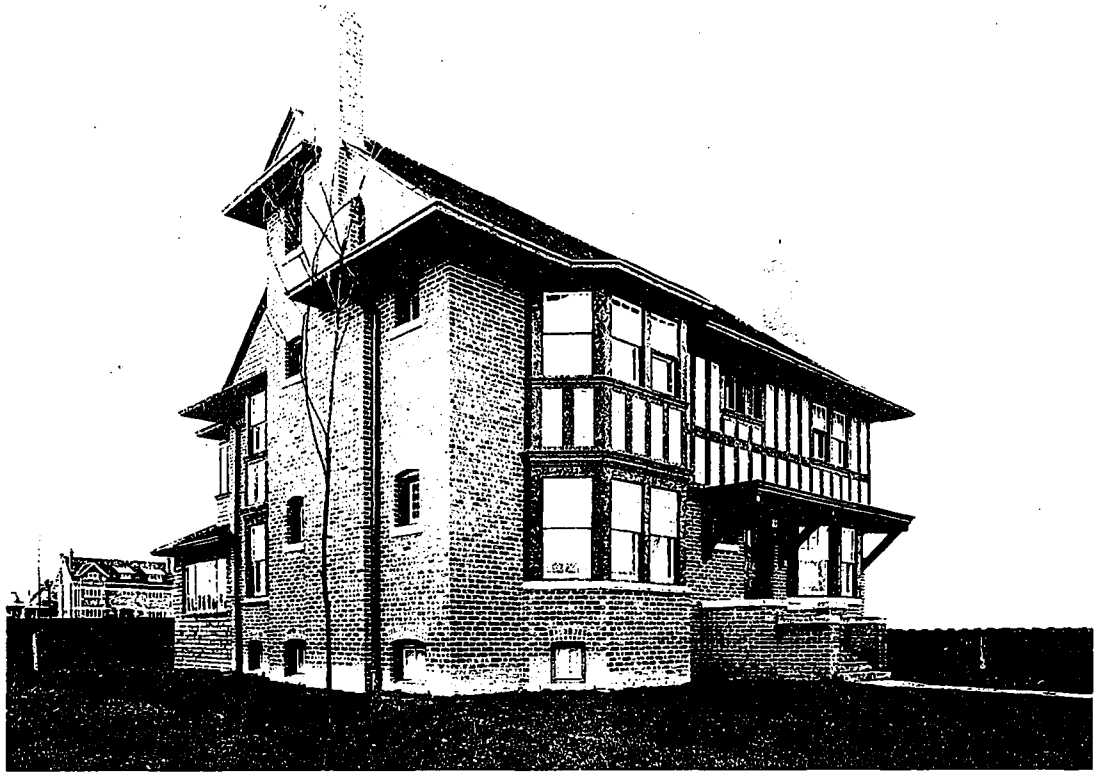
Embarrassed by the sudden wealth of materials at their disposal, they only fear that they may not have opportunities enough to fully exploit the resources now offered. Good bricks in many colors have been manufactured for some time, and satisfactory results have been obtained with their use in association with stone and terra cotta. In general, however, brickwork has played only a secondary part and the building has been made to depend almost entirely on the character of the so-called stone framework—the laying has been regular, the joints small, the wall surfaces smooth and unvarying, forming only the real background for the real architectural display.

In America, brick and terra cotta have always been much used together, the latter imperfectly filling a place midway between brick and stone, often out of scale with both, the pieces too large for the brick and

Dining Room.

Living Room.

Residence of Geo. Howell, Toronto, Ontario. Eden Smith & Son, Architects.



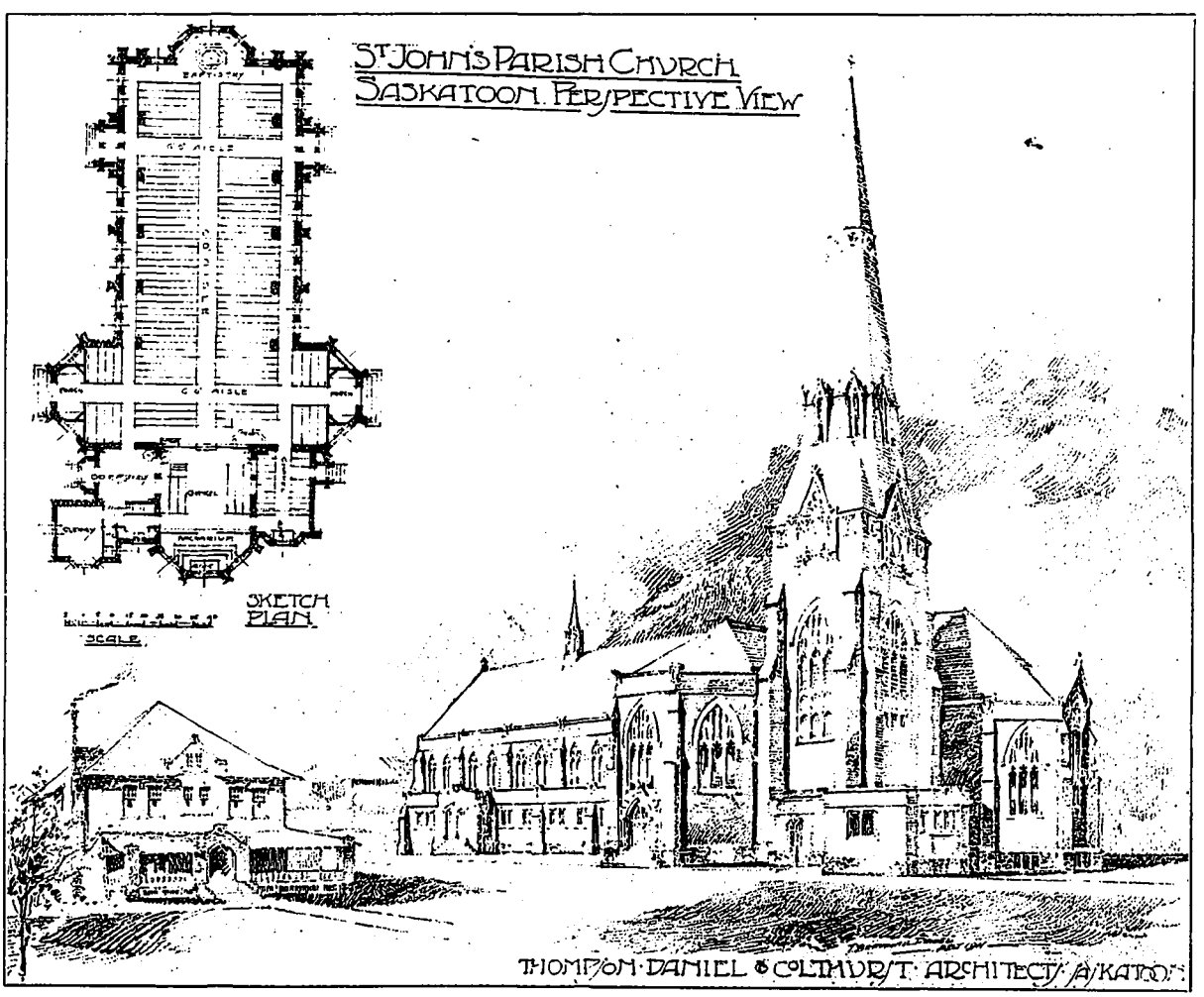
Living Room.

Residence of Geo. Brigden, Toronto, Ontario. Bond & Smith, Architects.

Detail of Mantel and Window.

Dining Room.

Residence of George Brigden, Toronto, Ontario. Bond & Smith, Architects.



Sketches illustrating the use of brick in Saskatoon. The Y.W.C.A. will be constructed in dark red Menominee brick, interior concrete and fireproof construction, with entrance and other decorative features in dull egg-shell finish green terra cotta. Cost, $75,000. St. John's Church is designed in dark red Menominee brick and buff terra cotta. Roof green slate. Seating capacity 1,200. Cost, $120,000.

too small for the stone. Some of the accepted functions of terra cotta can now be performed by moulded bricks, in forms a little larger than the wall bricks, for bands of ornament and mouldings, or as individual units of ornamental panels, through which the wall joints run, insuring a complete unity of color, texture and scale with the other parts of the wall.

In the combination of its simple, honest qualities, brickwork serves the cause of virtue as it brings to the builder the assurance of a sturdy resistance as compared to the shapeless forms of dough-like materials—such as concrete and stucco. There is less temptation and no less danger, of falling into the eccentric and the Art Nouveau when using well laid bricks. Many sins, of course, have been committed in the use of all materials. But brick can be said to be a reasonably safe material to start with.

Brick calls for strong and idiomatic handling, and the present generation of designers has but just commenced to enter upon its study. While very many edifying examples of detail are well known to exist, only a very few good buildings composed completely of brick and terra cotta could have been found in our cities before the present time; even now their number is small, for good design adapted to a newly used material develops but slowly.

The use of pattern, jointing and bond which can be successfully accomplished by any and all kinds of brick work, however, is found to interest and educate the people in brick construction and, therefore, it should greatly increase the use of brick in future. No manufacturer, whether he makes a pressed brick, wire-cut brick, rough texture or common brick, can fail to share in the coming benefit. The wooden house must inevitably go. Already it has been fully demonstrated by actual and reliable figures that the cost of the average sized house in brick is only five per cent. to six per cent. more than the same house built of wood.

The use of brick in architecture presents to us a rapidly developing field of endeavor which is bound to grow as people come to realize more and more its advantages and common sense adaptability.

Finally, it makes very little difference just what we do in architecture, but it makes all the difference in the world how we do it. With good bricks and good bricklayers available, the architects of to-day can surely be counted on to do their best in finding a way of producing an indigenous brick architecture which will become one of the most important branches of our great architectural scheme that is being developed and perfected in this broad land of ours.

LACK OF PRACTICAL KNOWLEDGE AMONG ARCHITECTS

An editorial article in the Revue Générale de la Construction by M. Jaaras demonstrates the general need of reinforced concrete construction knowledge by architects

NICE AND NANCY have been the scene of serious accidents, caused by the collapse of reinforced concrete structure, and these accidents, which have resulted in several deaths, should point a definite moral.

Heretofore, reinforced concrete construction has remained in the domain of the engineer. The architect who wishes to execute a design calling for this form of construction, arranges with a concern that takes charge of all the preliminary calculation, as well as of the execution of the work.

The importance of reinforced concrete construction has led the large builders to secure sub-contractors in all the important centres—each sub-contractor following the general methods of the larger concern, but, except in the case of very important contracts, undertaking, at their own risk and danger, the completion of the work that has been entrusted to them.

The result of this form of industrial combination is that when an accident happens, it is almost impossible to incriminate the method employed, since, in the majority of cases, it would be easy to show that the same method, followed under other conditions, would have given excellent results, without accidents, when not only were the calculations made with precision and exactness, but also—and especially—when the work had been carefully followed by those who accepted the responsibility of its execution.

In the Nice and Nancy accidents, it is necessary to choose between two conclusions—either the calculations were defective, providing beams that were too weak to carry the weight that they would have to support; or the calculations were correct and the proportions right, and it was the execution that was defective, or the inspection deficient.

The judicial investigation will no doubt decide which of these two hypotheses is correct. But without prejudicing the outcome of the inquest, there is very good reason to believe that the second hypothesis will be found to be the correct one, because it would be very surprising if men, accustomed to this kind of mathematical problems—specialists trained by the competent heads of the firms, conscientious and loyal—could have made the grave errors necessary to produce such a terrible catastrophe.

If, as we believe, it is the second cause that has produced the disaster, the responsibility of the heads of the undertaking is none the less evident, but the question of their competence can be taken out of the discussion, and it is surely a great point for French science to be freed from the suspicion of incompetence.

However, in a work of this kind, there are three heads on which the heavy responsibility of the work must rest. There is first the architect who designs the plan—the only one of whom we wished to speak here—and who, if his education were complete, ought to be able to carry out the plan in its entirety, to examine its minutest details, and to be certain that at completion the structure will be what he had aimed at.

His role should not consist merely of designing a structure and of hastening to a contractor to have the calculations of this structure made. He ought

to be able to make all the calculations himself, and those that he gets from the contractor should serve only to verify his own, or to rectify points of detail on which practical experience gives better knowledge, or to be able to reject, with good reason, definite plans that had been submitted to him.

Admitting that the causes of the collapse of the buildings at Nice and Nancy are those that we suspect, that is, the use of materials of inferior quality in the course of the work, or possibly the premature removal of the supports from the arches, the architect ought to know the constructive value of the materials that will be used, he ought to be posted on the different qualities of cement, he ought to be able to analyze those that the contractor uses, and to know definitely the exact time necessary for the cement to set; he ought to know the distinguishing qualities of a good cement or a good sand; he ought to be able to specify exact proportions, in accordance with the nature of the work to be done.

We may be told that the actual execution of a plan is the duty of a contractor in whom the architect has placed entire confidence and who could oversee the work in a dual capacity that would tend to increase the cost of the work.

This is a serious error. We must not forget that the architect is master of the work; that, being such, not only is his responsibility at stake, but his reputation is compromised if he fails to inspire the most complete confidence in his skill, and we do not believe that a contractor will ever refuse to place himself under the orders of the architect, when he feels that he has real ability before him—a man truly capable of leading and directing the work.

As a general rule, what annoys the contractor is that, in the great majority of cases, he finds himself confronted by gross ignorance, especially when it is a matter of utilizing new materials or of following new methods.

The architect is not alone responsible for this state of affairs. He can, in reality, know only what he has been taught, and it must be borne in mind that the curricula are not sufficiently modified, and do not keep pace with the constant transformations of science and industry. They still teach architecture and construction much as they did in 1691, at the foundation of the school. New science and modern materials are not mentioned except on the curricula, and it is in a very superficial manner that the professors speak of reinforced concrete of central heating, of "agglomerations" and of so many other recent products of human intelligence.

The accidents at Nice and Nancy are proofs positive of the deficiency of the architect's professional training, the legal responsibility of which is involved to an almost unknown extent, since, not being sufficiently conversant with the work that he undertakes, he finds himself at the mercy of the bad faith of certain contractors, of the carelessness of others, of the oversight of still others.

If, however, the truth of what precedes, and the sad results of the recent disasters could open the eyes of those who preside over the destinies of our schools of architecture, at the same time preserving a striking recollection of those who have sacrificed their lives to it, we could say that these disasters have at least had a practical result and an undeniable value—that of forcing the professors to extend the scope of their instruction, and that of inducing the young students to follow with greater care the practical courses of construction. But, alas *Aures habent et non audient.*

THE CHURCH OF ST. MARY THE VIRGIN

Problem of church design worked out in new edifice to be erected for Toronto congregation.

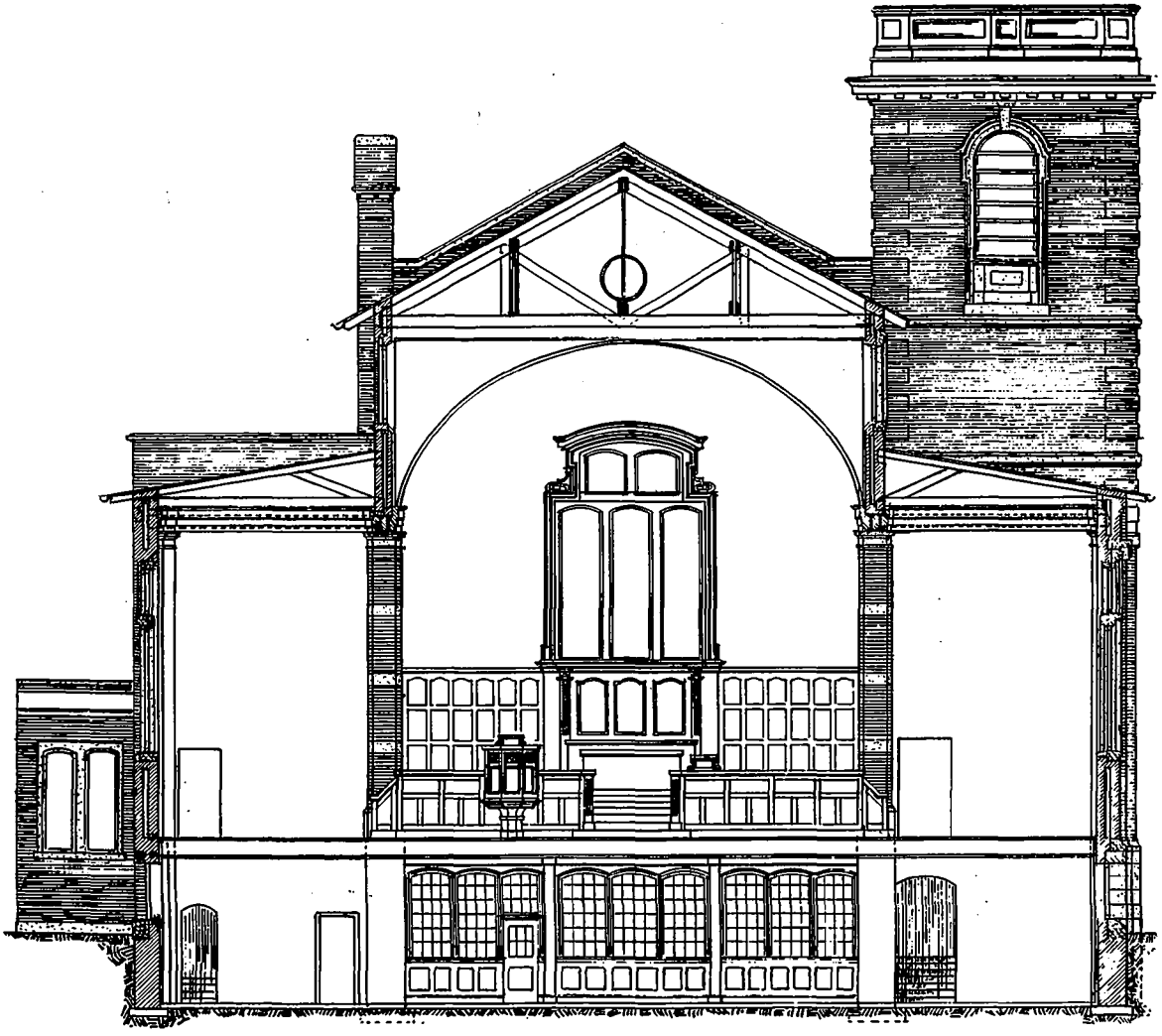
IT WAS NECESSARY to plan this church with nave and aisles, because the available ground is nearly square—100 feet by about 80—and it must all be built on, in order to give the required accommodation. The resulting form, as wide as it is long for the body of the church, could not be covered in any other way which would combine economy with beauty.

Considerations of economy cast the design in the style of the Renaissance. The beauty of Gothic architecture is in workmanship, and cut stone is its proper constructive material. The beauty of the Renaissance is in form, which is independent of material and can do with little workmanship. Moreover, in a double-aisled church, there is a great saving in material if the division of nave and aisles is made by posts and beams instead of by an arcade. The flat ceiling which results, in the aisles, is so hostile to pointed windows as to commit the question of style beyond doubt. The plaster ceiling of the nave—one of the baits of the style—is an imitation of Wren's ceiling over the nave of Christ Church, Newgate street, London. Wren used there an elliptical barrel vault, instead of the more usual circular form; and the effect is more graceful than that of any of his ceilings. The delicate elliptical curve, which is usually unpleasing in an arch that has work to do, exactly suits the lightness that one seeks for in a ceiling line. The desired lightness is further attained by a penetration over every bay, to the full height of the ceiling vault, to admit the light from a clerestory window. The window, still following Wren in form, follows the line of the penetration in its head, and in height fills the space between the crown of the vault and the top of the aisle roof outside.

So far it is easy to keep close to the model, but that must now be abandoned. The springing of Wren's ceiling, at a height 30 feet above the floor, is very noble; but even if we were prepared to invest twenty courses of bricks to attain the same nobility inside, it would go hard with the outside, which is already high enough, because of the 12-foot basement that is necessary for the secondary functions of the church. Wren's stone Corinthian columns are also inadmissible, as outside the line of strict economy. They are the less regrettable as there is a taint of

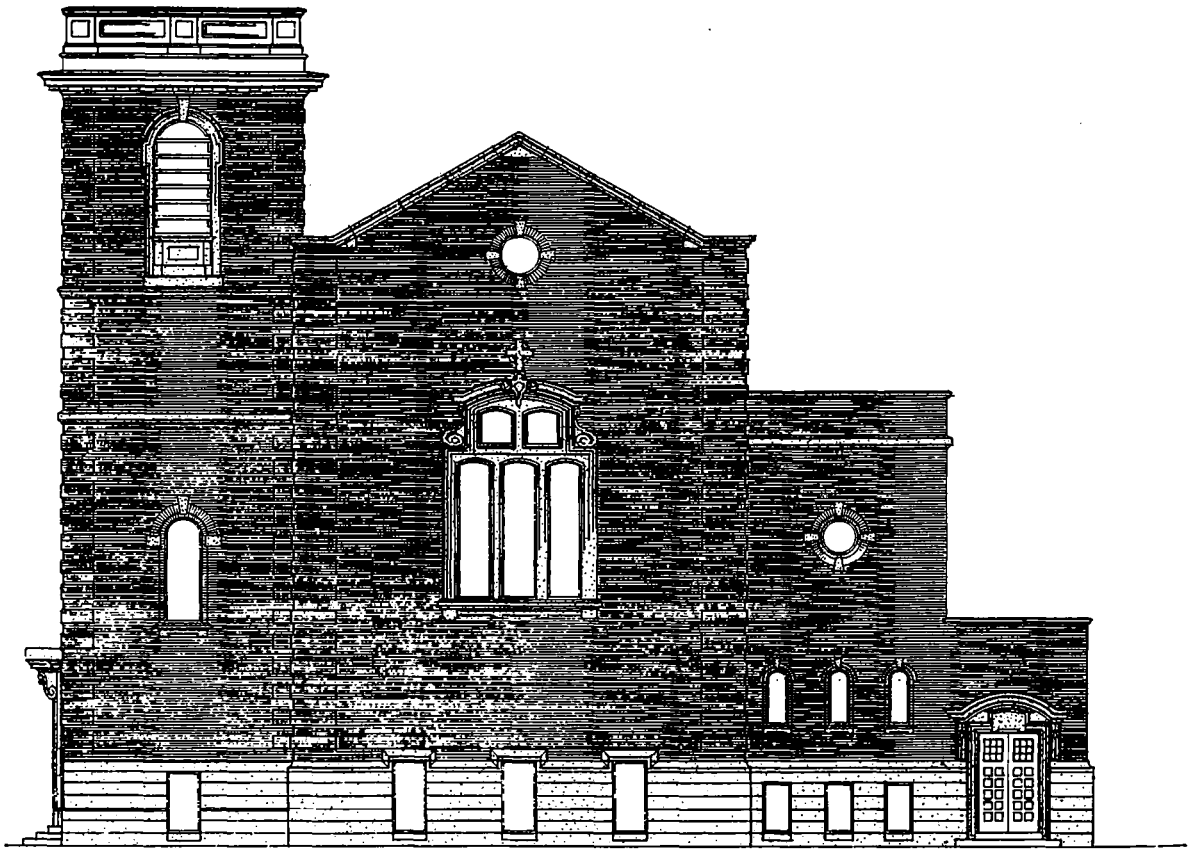
worldliness upon the Orders, owing to the frequency of their employment, in cheap form, for purposes of commercial display.

The most serious departure from Wren, however, is in the matter of windows. It would not be possible in any case to get from round-headed windows the same effect that he attained. A great part of the dignity of his windows lies in the deeply splayed jambs, which require a wall of at least three feet in thickness. But further, the round-headed Renaissance window, as wide as half its height, is inconvenient for modern church design, because it is not suited for stained glass. The field of glass is too wide, and subdivision under the round head is quite unmanageable. This is the reason for the departure, in the way of windows, shown in the elevations. It was thought necessary to have a window not wider than about a third of its height—about the proportion of a human figure, in fact. To be broad enough in mass for the style there had to be a pair; and to relieve the pair from dullness, the small opening on top was added. The result seems well suited for stained glass; the large windows below for figures, the small windows above for emblems. But it is not likely that these windows will be built. The congregation do not seem to be able to stand them; and the amount of stone trimming required to give them form does not agree very well with the programme of economy. It is intended to face the exterior walls with common red brick trimmed with Bedford limestone. The interior will probably be finished in buff pressed brick, up to the ceiling. The ceiling and the clerestory wall will be plastered. The steel beams carrying the clerestory will be cased with dark wood, and beams of the same girth will cross the aisles and mitre with a wall respond.

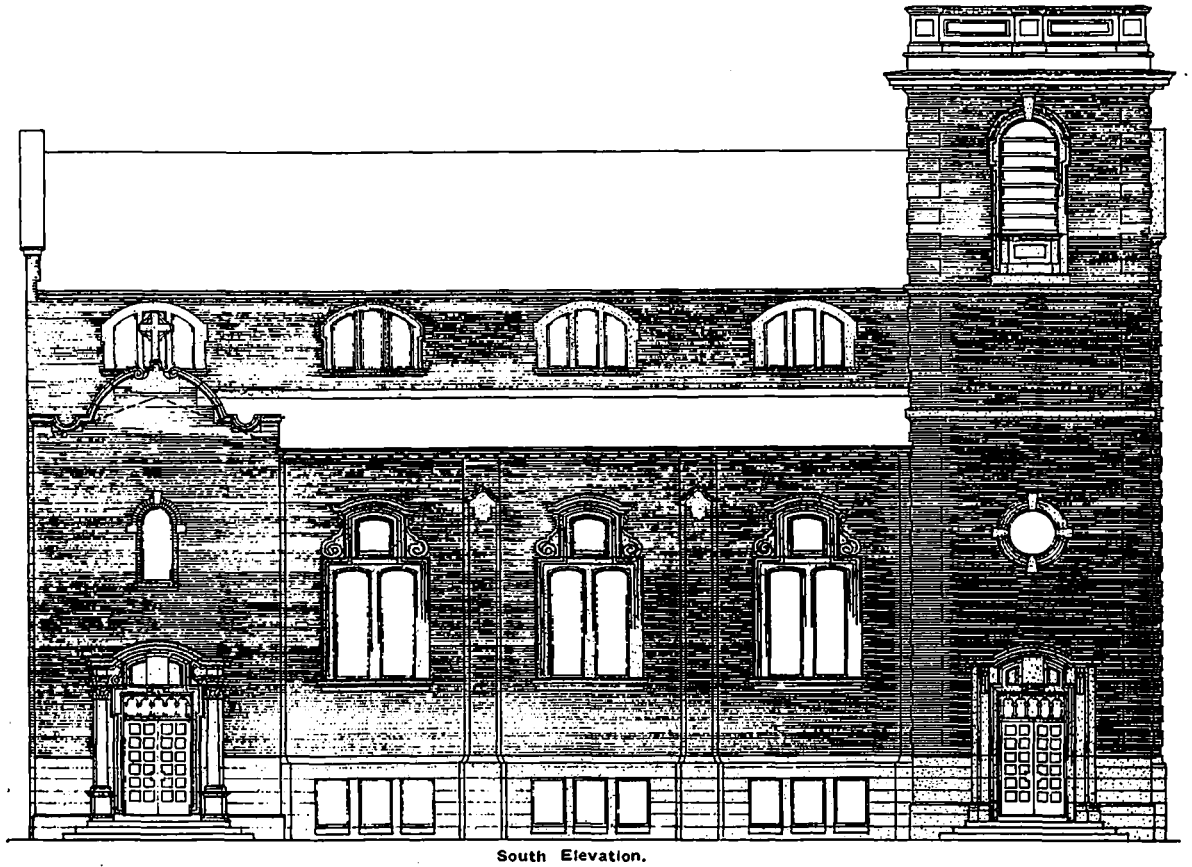


Transverse Section.

Proposed Church of St. Mary the Virgin, Toronto, Ontario. W. A. Langton, Architect.

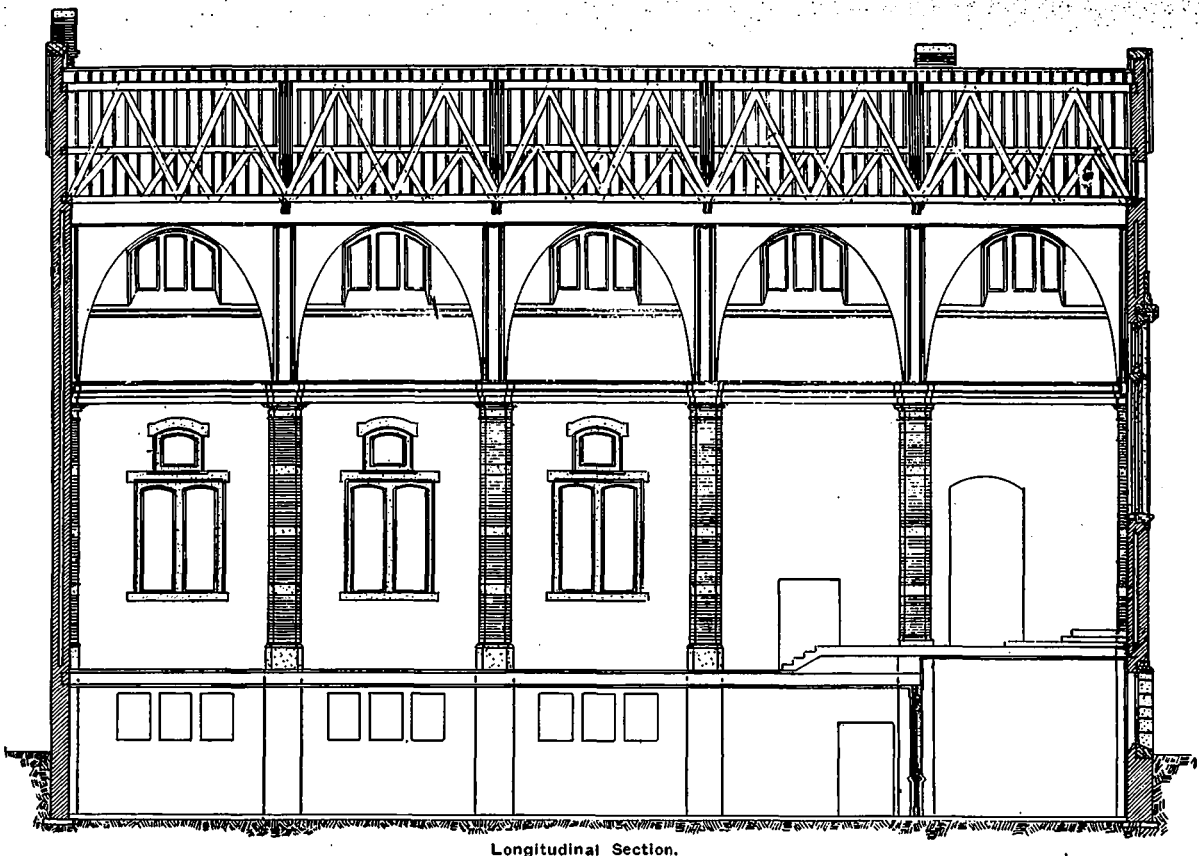


East Elevation.

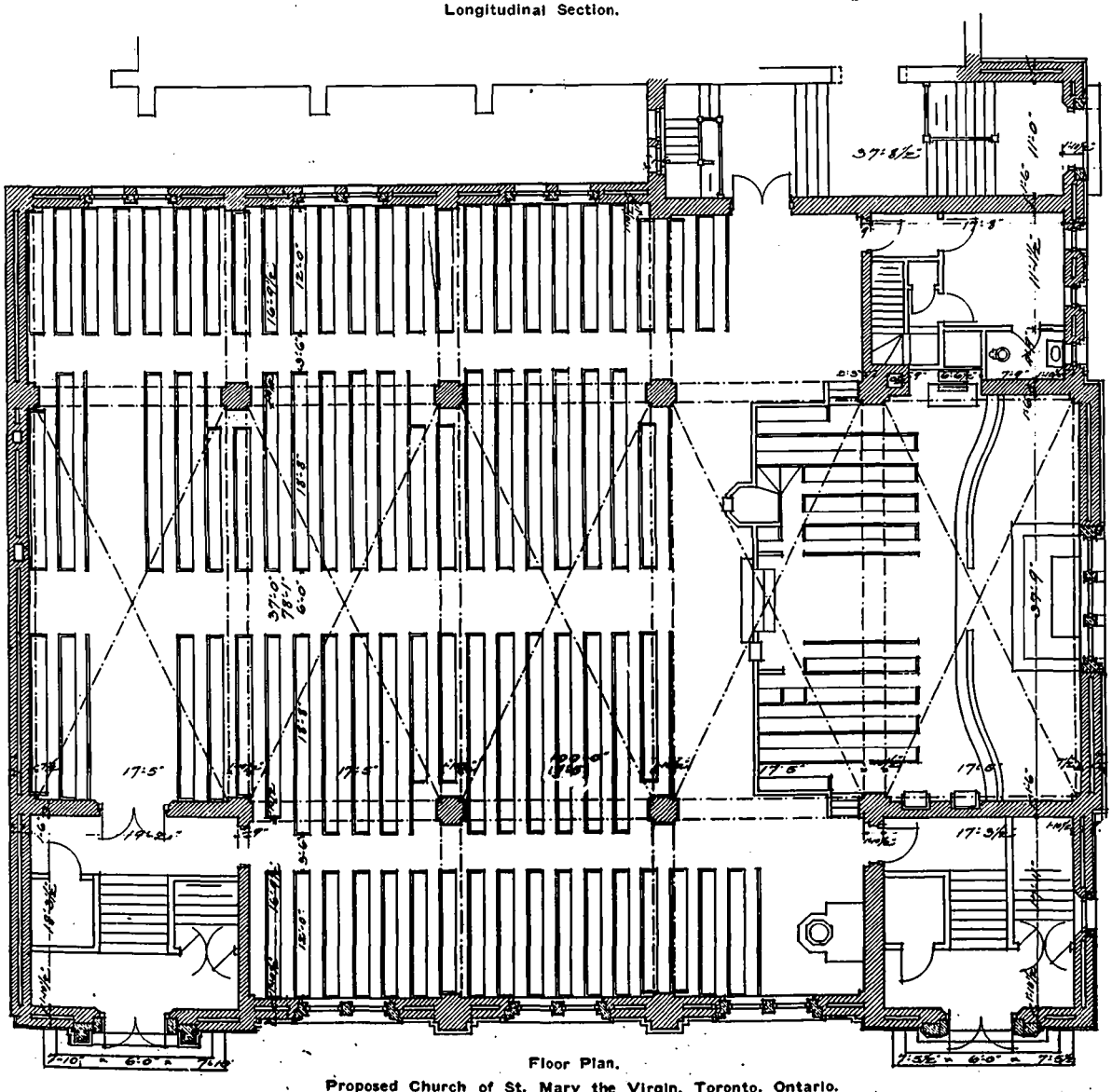


South Elevation.

Proposed Church of St. Mary the Virgin, Toronto, Ontario. W. A. Langton, Architect.



Longitudinal Section.



Floor Plan.

Proposed Church of St. Mary the Virgin, Toronto, Ontario.
W. A. Langton, Architect.

CONCRETE CONSTRUCTION SCIENTIFICALLY CONSIDERED

Abstract of a paper read before the Montreal Builders Exchange by E. Brown, Professor of Applied Mechanics and Hydraulics at McGill University.

CONCRETE CONSTRUCTION has many followers, ranging from the rabid enthusiast who will assert that it is the thing for almost every kind of building, to the more modest and perhaps more effective advocate who realizes at one and the same time its advantages and its limitations. There was a day when it had its opponents, but its record of actual achievement in the past few years has established its claim to being one of the principal forms of construction at the present day. The opponents have become friendly critics or even converts, and I imagine there are now very few who are so blind as to ignore the facts of the situation. There are, however, some who seem to think that a designer in reinforced concrete is drawing on his imagination (shall I say) to a much greater extent than a designer of steel work. Some steel designers, at all events until recently, would almost give you the impression that their work was calculated to such a nicety as compared with that possible in reinforced concrete work, that the latter by comparison had very little claims to exactitude. I am not here advocating one form of construction as against another, nor any particular type of either form, but I do say that if we set down the exact conditions of the problem confronting a designer in these rival forms of construction, there is not much to choose in the matter of exactitude. I am not here concerned with any considerations of actual construction. We can have good and bad work in any kind of construction. I am speaking of the conditions of design. The problem is always this, no matter whether it is a design for a huge bridge or for an office building or store.

(1) To make some estimate, more or less exact, of the forces which will probably be brought to bear on the structure considered. Floor loads, wind loads, etc.

(2) By some theory, more or less exact, to determine the forces which the above estimated loads will produce in the component parts of the structure.

(3) From our knowledge, more or less exact, of the physical characteristics of the materials employed in the various parts of the structure, to so proportion those parts that they may withstand successfully for an indefinite period, the forces which are estimated to come upon them.

After that it is necessary to have the work carried out in strict conformity to the designers by efficient labor, under the best supervision. In the matter of the first two processes above, designers of steel work and of reinforced concrete work are on the same footing.

As regards the third point, our knowledge of the properties of concrete, and of the effects of changes in its composition is now of considerable extent, and I do not think that a conservative designer need have any anxiety in regard to the behaviour of his structure if reasonable, sound specifications are lived up to. Steel designers, in recent years, have come to consider much more carefully than heretofore, the probable effects of eccentricity in some of their details, and in this, reinforced concrete designers, can learn from them. In the particular case of columns consisting of angle and other sections latticed and tied together, we are only in the early stage of finding out how they really act. I could show you experimentally the actual conditions of stress in such a member as a tie bar made up of two angles, back to back, connected by a plate at their ends, and separated at intervals by distance pieces—one of the commonest forms of construction imaginable. Experiments of a very interesting character are being made by one of our staff at McGill on this matter, and all I need say to emphasize the point I am now making, is that any steel designer who thinks that even such a simple built up member acts as one piece has another "think" coming to him. No, gentlemen, we are all engaged in "estimating" something. Formulae expressing the complex action which is going on in either a steel structure, or in one of reinforced concrete may be forthcoming, but of this I have grave doubts, and even if they are, we shall, for practical purposes, make such modifications of them as will eliminate from them any complexities which are due to effects which are either of small magnitude, or which can be allowed for in a simpler manner.

A survey of the development of our professional work generally will show that whenever and in so far as it has been possible to exalt any branch of that work to the rank of a science, the progress has been due to the gradual but certain development of a few fundamental ideas. Our great electrical industries of to-day have developed by applications of the great principle discovered by Faraday when he found that a closed coil of wire moved across a magnetic field generated an electric current. And while few of our branches of engineering science are as scientifically exact as the one I have just mentioned, in all or most of them there is such a mass of practical experience and of results of tests to couple with some simple fundamental ideas expressing actual conditions but inadequately, that we can go ahead with our designs with complete confidence in the results. The science of hydraulics is an instance of this phase of the work of our profession.

So that while I for one would not be prepared to admit that the steel designer can figure the actualities to a much finer degree of accuracy than the reinforced concrete designer, I do think that the latter depends to a tremendous extent on the honesty and sincerity with which his plans are carried out.

Structural mild steel is manufactured in our steel mills under reasonably uniform conditions, and speaking broadly of course, an engineer buys it in the open market with considerable confidence in its physical properties. He knows that he can figure safely on 16,000 pounds per square inch in tension, and that if he is cutting his sections as finely as possible, he may reduce them by say 10 per cent. and increase his unit stress accordingly. The properties of his material are not altered. He is *not* taking an *unknown* risk.

But in concrete construction the material by which the compressive forces in the structure are carried is made and laid on the spot and is liable to such variations in mixing as may occur in practice quite apart from any variations in quality due to change of composition. If we reduce cement by say, 10 per cent., use an inferior sand, or change the nature of the aggregate without definite knowledge of the effects of this change —if we do all or any of these things we are altering to an uncertain extent the physical properties of our concrete. We *are* taking an *unknown* risk, and one which to my mind is entirely different in character from that involved in a cut of a definite per cent. on steel sections. We know from experience that certain expectations in the properties of mild steel will almost certainly be lived up to, and it is in the power of those engaged in reinforced concrete work to produce a concrete equally uniform and reliable. A successful designer has always in mind certain possible differences between assumed and actual conditions, and it is in a proper realization of such differences, and in the capacity of the designer to appreciate the extent of their influence, that reliance must be placed. If for any reason he may fear that the concrete will only stand a compression stress of 400 pounds per square inch. instead of perhaps 600, his opportunities to make both a successful and economical design are at once limited. Poor concrete is much the same weight per cubic foot as good concrete, and if the concrete is poor, and only capable of safely carrying a small compressive stress, more is required to sustain a given compression load, and hence, more steel is required to carry the extra dead load necessitated. But we *can* get uniformly high grade concrete if proper care is exercised. At the same time the calculation of a designer can be rendered of little avail if the actual work is not carried out in a thoroughly conscientious manner.

Any theory of reinforced beams starts from the assumption that the several layers of the beam are lengthened or shortened by an amount proportional to their distance from the plane separating tension and compression areas. Careful experiment shows while this is not rigidly true in all cases, it is conformed to with reasonable accuracy in most cases. Accepting it as true we shall get different results for the bending moment which the beam can carry according as we assume.

(a) Variable modulus following assigned law.

(b) Modulus uniform during loading.

(c) Different values for the uniform modulus.

Assume a rectangular beam 10 inches deep with, say, one per cent. reinforcement. Then, taking average concrete, one should find that under working loads the distance from the steel line to the point in the section where the resulting compression acts is about

8 feet 6 inches if we assume a variable modulus with the definite law of variation,

8 feet 8 inches if we assume a uniform modulus of 3×10^6 pounds per square inch.

The safe bending moment on the beam is the product of the allowable force in the steel and one or other of the above numbers. It is evident that the difference shown in the safe bending moments is only some 2½ per cent., and any attempt to figure to such a degree of *supposed* accuracy is foolish. Rods, in practice, may easily be displaced by an amount affecting strength calculations far more than do these different theories.

These figures neglect concrete tension and their differences indicate the extent to which different methods of calculation affect the broad features of design. Under the specifications adopted by the American Society for testing materials, the Amreican Society of Civil Engineers, and the Maintenance of Ways Association, all concrete is now taken to have the same modulus, a great change since the days when cinder concrete, rock concrete, gravel concrete, etc., were all supposed to have a different modulus, and following a different law of variation as the load increased. It has been amply demonstrated that all these were unnecessary refinements and the standard specifications recently drawn up have swept them away. Similar simple specifications were drawn up earlier by the Royal Institutes of British Architects, and I would urge the adoption of some such standards here. I do not believe you have any such standards at present. When in Toronto a couple of years ago attending the Cement Association Congress I learned that their building by-laws prohibited a designer from figuring any continuity in reinforced concrete floor systems, and I believe that foolish and unjustifiable prohibition still stands. It seems to me to eliminate competition to a great extent and to leave a clear field for the steel construction. Here, in Montreal, I do not think you are hampered by any by-laws on such matters—it is more of a go as you please. You are more familiar than I can be with the results of this, but unless something miraculous happens, the usual result of such conditions is to find one design called for according to one set of specifications, another design according to another set, and so on. Now, even if all these varied specifications are beyond reasonable criticism—which is questionable—would it not be better to have a working standard? Our railroad bridges and highway bridges are built under standard specifications, and it seems to me desirable that there should be some standards in this matter also. I am sure it would be advantageous to have something of the kind, whether the architect prepares the plans in his own office or has them prepared independently by an outside firm.

PROBLEMS IN HEATING AND VENTILATION

Abstract from a lecture delivered by Mr. Arthur H. Barker, B.A., B.Sc., at the University College, London, published in The Architect.

IN TOUCHING upon the question of economy of heat by thermo-dynamic methods, Mr. Barker suggested that the heat from the air outside a building be used for warming the interior, although of a much lower temperature than that required for this purpose.

The thermo-dynamic method of producing heat consists of the simple operation of compressing a gas, which act is sufficient to raise its temperature in proportion to the amount of energy expended.

Heating engineers have yet to fully appreciate the enormous economy of such methods of heat production which resolve themselves into the provision of a cheap power supply; for it is necessary to have power before heat can be obtained from the air in this way. The provision of electrical energy without the consumption of fuel would be a solution of the problem, although not within sight of realization at the moment.

Further in co..sideration of the possibilities of utilizing waste heat from industrial enterprises for warming inhabited buildings, Mr. Barker suggested several heads, which included:

(1) Heat applied in excess of requirements, and wasted in bringing about results obtainable by a much smaller expenditure of energy if properly applied; (2) heat lost by conduction through inefficient non-conductive material or leaky pipe joints; (3) heat contained in exhaust steam or condenser water; and (4) that which found its way in the form of flue gases direct into the open air.

The heat lost under the first two heads could be regarded as irrecoverable, but there were certain possibilities in the utilization of waste energy of the nature of numbers three and four.

Other forms of energy, such as were contained in coal and dynamite, or, better still, electricity, could be transferred from place to place, but the same operation with heat must always be impossible. It was part of its very nature to get lost, inasmuch as it imparted some of its warmth to anything in contact with it or through which it passed.

At present the only purpose which the heat in the flue gases served was to create a draught through the furnace, a wasteful process when it was remembered that this could be effected quite as efficiently by means of a fan.

The present cost of fuel, however, made the existing methods possible, and it was not thought to be commercially profitable to face the outlay necessary in order to save the heat wasted in this way.

Another factor was the probable distance of the factory or works, where the heat was generated, from the building to be warmed, a consideration which limited the possibilities of the idea. Here again it was at present found cheaper to burn fresh fuel at the point where the heat was required, and the price of this fuel was the root factor of the whole problem.

The waste heat, after being collected and transferred to some medium such as water would have to be pumped from the centre through pipes to the various houses. What system could be devised for charging the consumer for this heat supply? It would be difficult to register the quantity of heat used, for although this would be simple in the case of the quantity of water which passed through the meter, it would also be necessary to take into account its temperature. The charges might be levied according to the area of radiating surface provided on the annual value of the house.

There were many difficulties in the way of adopting such a scheme which would probably prevent the practical consideration of the idea until there was either a rise in the price of fuel or a decrease in the cost of power. In our climate, where prolonged cold was unknown, the saving would be less, compared with parts of America and the Continent, where it might be worth while to incur the necessary capital outlay under present circumstances.

The possibilities of leakages from the pipes would render it necessary to construct subways, preferably of sufficient size to allow a man to walk along them. An expense of probably £8,000 per mile would thus have to be faced at the start. If steam were the medium employed, the water produced by condensation would have to be returned, and any difficulty as to levels would require a system of pumps for this purpose.

Some solution of the problem as to the expansion of large pipes was required, and here there was need for an efficient invention, there being no really satisfactory joint to provide against this.

The whole cost of a system would mean for a 4-inch pipe, £950 per mile, rising to £4,200 per mile for a pipe 9 inches in diameter, to which must be added the cost of subways, say, at 30s. per foot run, and cost of maintenance, power, and interest.

The essential hard fact was that the cost of heat saved must be sufficient to render it commercially profitable to face this capital outlay.

He had made a careful calculation of the requirements of a small establishment such as his own, and he thought that at the outside the heat necessary to warm his house was 35,000,000 thermal units per annum. Taking a thousand houses of this size, which would represent a small town of from 7,000 to 8,000 people, say two miles from a manufacturing centre, the output would need to be 20,000,000 thermal units per hour. Allowing for cost of plant, interest, and depreciation, it would then be necessary to charge each householder £15 per annum for his heat supply, and he did not think that, with coal at its present price, many people would be willing to pay this amount, when they could, with a separate plant, warm their premises at half the cost.

Added to this was the fact that in this country the prejudice in favor of the open fire was so deeply rooted as to be practically ineradicable.

BOOK REVIEWS

GOOD ENGINEERING LITERATURE. What to read and how to write, with suggestive information on allied topics. By Horwood Frost, Am.Soc.P.E.E., etc. Published by the author. Chicago Book Company, sales agents. Chicago, 1911.

Recognizing the dearth of publications upon the selection and reading of technical literature as well as upon its preparation, the author has attempted to present the subject in a concise and practical form. In this he has, with so elusive a subject, succeeded admirably. His material is largely "an elaboration of that given in addresses to engineering students." While the fact is too little appreciated by the average student-engineer in the earlier years of his work, every engineer sooner or later is called upon to do some form of literary work in connection with the routine of his profession, and the ability to speak and write clearly, and forcibly express his views upon the subject in hand so that others will understand them is one of the most valuable assets in his mental equipment. The work under consideration seeks to impress the reader with the value and need of a command of good English; to indicate something of the standards of engineering literature, and to show how to collect and arrange information, adding information in regard to the theory and practice of publication to aid the writer in the preparation and publication of his literary works. It also attempts to guide in a general way the literary aspirations in the selection and reading of professional literature and the collection and preservation of writings and addresses on engineering subjects. The volume is compiled under twenty-two chapters running through the entire subject from rhetoric and grammar to the making of a book and literary criticism. While the volume is directed mainly to the engineer, its deductions will apply to all the professions equally, and as a whole is a unique, as it should be a valuable, addition to technical literature.

NOTES ON HEATING AND VENTILATION. By John R. Allen, Professor of Mechanical Engineering, University of Michigan, M.A.S.H.V.E., etc. Third edition. Domestic Engineering Co. Chicago, 1911.

For many years editor of Domestic Engineering, a close student of heating and ventilation, particularly in its sanitary aspect, and a thoroughly equipped investigator, the author has been peculiarly fitted for the work of producing a text book that is not only valuable to the student, but to the practical workman in the more advanced forms of heating and ventilation. The subject matter of the present edition was originally contained in a series of articles published in Domestic Engineering, though in the present work the text has been re-written and a large amount of additional information incorporated in the text. The book is written mainly to show that the subject of heating and ventilation could be developed in a logical way from the fundamental principles of engineering. There has always been a great lack of specific information of an accurate nature in regard to the laws of heat and the value of the constants entering into these laws. The scientific experiments of Dean Cooley of the University of Michigan, covering over twenty years, is largely drawn upon. The results of these experiments are given in various tables and serve to give the designer data from actual experiments upon which to base his calculations. There is also a resumé of German experiments and methods for determining the heat losses in buildings that add much to the value of the volume as a text book. It contains fourteen chapters in which the author presents the theory of heat measurement and temperature, different forms of heating systems, design, ventilation and fan systems and including all the detailed minutiæ of pipe covering, auxiliary devices, connection of mains to risers, etc., that pertain to the practical design and installation of heating and ventilation plants. Mr. Allen is one of, if not the first authority on these subjects in the United States, and his present work is a distinct contribution to technical literature pertaining to heat and ventilation.

APPLIED SCIENCE. A monthly periodical incorporated with Transactions of the University of Toronto Engineering Society.

The December issue contains, besides current information, papers upon "Electrochemical and electrometallurgical developments in Canada," "Street condensing equipments," and "Street planning."

DIRECTIONS FOR LAYING VITRIFIED BRICK STREET PAVEMENTS. No. 1. Specification. Endorsed and recommended by the National Paving Brick Manufacturers Association. Cleveland, Ohio.

Illustrated with photographs and diagrams, giving minute directions from substructure and grading to rolling and tamping and filler, the installation of brick pavements is covered in every detail. The specifications have been compiled with great care by the engineers of the issuing association, aiming to set forth in a clear and practical manner the best methods of brick paving construction. Many municipalities and states, realizing their value, have already adopted them outright, and the specifications are being sought by city and county engineers and highway commissioners as well as by civic boards, and improvement associations.

HOW TO TREAT CONCRETE FLOORS. Issued by the Glidden Varnish Company of Cleveland and Toronto. The Glidden Press. 1911.

This neat leather-covered "pocket edition," gotten up in a most tasteful and artistic form of typography, is issued to lay before the trade solutions to the constantly arising problems on the treatment of concrete floors, their maintenance and decoration, in a thoroughly practical manner. Through short, concise paragraphs the reader is told how to treat concrete floors, their maintenance and protection, and their decoration and hygienic effect. The nature of the surface is gone into specifically, and their reliability under service conditions, with specifications for the treatment of proposed work, low and high temperature floors, with many other details, make up a volume that is well worth not only possessing, but using in all concrete floor work.

TRADE NOTES

CANADA CEMENT is being advertised throughout the provinces for its adaptability to the needs of the farmer. Instead of telling the farmer the many uses to which cement can be applied, through a competition program the Canada Cement Company asked the user to tell by description and photograph how he has used the material. In order to bring the largest number of responses, a series of four prizes was offered. To the farmer in each province who has used during 1911 the largest number of barrels of Canada cement, one hundred dollars; the farmer who has used Canada Cement for the greatest variety of purposes, one hundred dollars; one hundred dollars for the best and most interesting photograph of cement work done on the farm, and one hundred dollars for the best and most complete description, dealing with cost of work, etc. The method of competition was such that the farmers of each of the nine provinces compete, making a separate competition in each province. In this investment of thirty-six hundred dollars Canada Cement will certainly be well advertised. A committee of disinterested persons has been asked to adjudicate the competition, which closed this month.

Among the unique contributions received was a Scotch poem written by the wife of a farmer in Ontario, which we print herewith:

"CANADA CEMENT."

By Mrs. W. Buchanan.

Ye Farmers a', on you I ca'
Tae see if ye hae kent
The uses, different uses o'
And merits o' Cement.

If ye hae no, I'll tell ye noo,
I'll tell ye fair and square;
Ye'll never get a better thing,
For building or repair.

First buy Cement, and money spent
This way, you'll find is gain;
Then mix it right, and tamp it tight,
'Twill dry as hard's a stane.

And it will last and stand the blast,
Where nothing stood before.
If once a job is done O.K.,
'Twill ne'er need doing more.

In days gone by, materials used
Were wood, and stane, and steel.
That they were guid, I hae nae doot,
And served their purpose weel.

But noo the world is moving fast,
As ne'er before it went;
And in this age, what's all the rage,
Is "Canada Cement."

One of the most interesting photographs received was that of an old farmer and his wife, each with a hoe mixing concrete on a platform, and each with a Canada Cement bag as an apron. The judges of the competition were Professor Day of Guelph Agricultural College; Professor Gillespie of Toronto University, and Robert Craik McLean, Editor of CONSTRUCTION.

THE MOST SERIOUS problem met with in the use of steel or iron in any unprotected form is its deterioration through corrosion. Viaducts subject to the action of the elements or the corroding sulphur fumes from engines, bridges that are so apt to deteriorate in members that may be overlooked in inspection, tanks, roofs, etc., all necessitate the use of some coating that will resist corroding. Messrs. Wailes Dove and Company, of Newcastle-on-Tyne, who have opened an agency for the sale of their goods in Montreal, manufacture these materials that have been so essential to the shipbuilding, bridge building and structural steel trade in England for over twenty years. The results obtained from every character of steel structure have fully justified their use.

There are three compositions manufactured by the company. First—Bitumastic solution for protecting iron and steel work in whatever connection, from corrosion, and being perfectly elastic it does not scale off or break in any way, nor is it effected by heat or cold. This is applied like ordinary paint, and is guaranteed to last intact for years without further painting.

Second—Bitumastic enamel is of somewhat similar composition, and is used principally for coating bunker spaces, tank tops and frames of steamships and for heavy bridge work, and is exceedingly durable. This must be applied hot and will dry permanently within a few seconds of application.

Third—The third product is bituros, and this composition has been specially prepared to meet a long felt want. A composition that will permanently protect from corrosion iron and steel water tanks, used for drinking water purposes without imparting to the water any disagreeable flavor or discoloration, and being of an elastic and strongly adhesive nature it will not crack or peel off, and when once properly applied no renewal is necessary.

These various substances have been used extensively in Great Britain and the United States for many years for protecting ships, floating docks, bridges, structural iron work, roofing, tanks, refrigerating machinery and metal work of all kinds. An example of the impervious quality of Bitumastic enamel is found in a pontoon of Smith's Dry Dock Company, Newcastle-on-Tyne, which was coated with enamel. It was removed from the water recently after seventeen years in immersion, and the plates, bolts and rivets were found perfectly intact—a strong testimonial of the quality of Bitumastic enamel. Messrs. Machan and Hebron, 55 St. Francois Xavier street, Montreal, are the agents for these rust-resisting compounds.