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Customs Revenue.

JUBILATION almost akin to hysteria seizes our Canadian dailies, when the government announces that our import duties for a given month show an increase over those of the corresponding period of the preceding year. We are told that such a condition is an unmistakable sign of prosperity insofar as people cannot spend money that they haven't got, and if our people have money with which to buy foreign products, then it is a sign that we are prosperous.

When our official returns show that our government has collected a million and a half dollars more in custom duties during a certain month than the same month of a former year, it simply means that we have spent in the foreign markets of the world about eight and a half million dollars more during the month in question, than we did the corresponding period of the preceding year. These calculations are based upon the assumption that our average rate of import duties represent about 18 per cent. of the value of the imported product, and does not provide for the undervaluation of imports as is regularly practised by foreign shippers and Canadian importers of almost every important class of product brought into this country. So it is safe to say that when the custom revenue of the Dominion Government increases a million and a half, in a given month, it means that our already comparatively large expenditure in foreign markets have for that month been increased by at least Ten Million Dollars.

This, it appears to us, should give a rather weak excuse for exulation on the part of either our press, our manufacturer, the public, or the laborer. Canada is a great, undeveloped, producing country, and we surely cannot expect to build it up if we squander our money abroad in the purchase of the product of foreign labor.

What would we think of the business capabilities of a manufacturer who, upon securing his monthly statement of his receipts and expenditures, would become jubilant over the fact that his expenditures for that month had increased 20 per cent. over those for the same period of a former year, purely upon the basis of reasoning that it showed that he must have money or he could not spend it, and insofar as he had the money to spend, he is entitled to believe that his business is prosperous? If a manager of a business institution showed delight when presenting such a statement to his directors, it would be easy to foretell the consequences.

Canada is not a consuming country. At least its future, if it is to have one, is not based upon its ability to consume. It is essentially a producing country and its only hope for a future, depends upon its ability to sell its products to the world and bring back the gold with which to build up a nation industrially and financially sound. Canada is not a nation of holders of foreign dividend producing estates, industrial mining, railroad or bank stocks, that bring into the country annually vast sums that might tend to offset a balance on the wrong side of our trade ledger. We are a nation of producers, and every dollar of wealth that we may rightfully lay claim to as our own, must come from the consuming nations of the world who have a market for that which we can profitably produce.

But in the face of these indisputable facts, Canada's trade situation presents a most serious and yet ridiculous state of affairs, for our trade returns show that we actually buy more than $50,000,000 worth of foreign products more than we sell. At the present time this debit balance on our trade ledger is offset by the inflow of foreign capital for investment purposes, and the wealth brought into the country by the better class of well-to-do emigrants.

Our trade conditions present a situation very much like that of the inventor who has a good thing that it takes money to develop, and, after finding a good angel, he proceeds to spend his money on the development of his idea, without any attempt to place his business upon a commercially sound basis. He continues to spend more than he takes in, and each year has his deficit made up by additional cash from the good angel, until financial misfortune one day overtakes his moneyed friend and he finds himself without money with which to make up the deficit created by extravagant and improvident expenditures. He finally discovers, after much hardship, that a business, to be sound, must show a balance on the right side of his ledger.

This is truly our trade situation in Canada. We are safe as long as foreign capital is obtainable to offset our expenditures, in excess of our receipts, but when financial conditions in England or in the United States, abruptly cut short this source of money supply, what will then make up our minus balance? Under our present fiscal policy, we are solely at the mercy of foreign financial conditions, over which we have no control. Commercial or financial independence is impossible as long as we continue to buy more than we sell.

The very secret of the growth and wealth of the United States is in the fact that she sells annually over $500,000,000 more to the world than she buys. Canada buys more than twice as much from the United States as we sell her. Australia has an annual trade balance in her favor of over seventy millions. Is it not obvious that our trade conditions are unsound, and that, as an undeveloped producing country, our trade balance should be placed on the other side of the ledger?

The importance of this grave national problem will be all too evident when England or the United States is visited with either serious financial or national difficulties. We shall then be brought face to face with a situation that will force us to realize the false sense of security we have been laboring under, and our press will cease to be so jubilant over increases in our Customs revenue. The whole difficulty arises from our commercially unsound tariff laws. Our duties are just high enough to render this a separate market from that of the United

States, and thus encourage the dumping of surplus overproduction of foreign manufacturers, and just low enough to provide an effective adequate protection for the product of Canadian enterprise against the ruinous dumping of foreign surplus stocks and products of peasant labor.

National Status for the Profession.

A RESPONSIBILITY that cannot be measured at this time, rests with the Quebec and Ontario Associations, in the manner in which they deal with the question of federation with the Royal Architectural Institute of Canada, at their annual assemblies, to be held in the course of a few weeks. These are the two oldest, largest and most influential architectural bodies in Canada. Upon the action which they determine to take on this question, depends, to a great extent, the establishment of a national status for the architectural profession in Canada.

It is true that the provincial associations can handle best the local problems that confront the members of the profession, and it is also true that their right to deal with matters involving the interests of the profession in their respective provinces should not be interfered with, but it is equally true that there are many questions to be dealt with, that are of a national character. Problems and difficulties that are common to members of the profession in every province in Canada, should have the attention of a strong national body; an organization representative of, and backed up by all the provincial associations. As it is, the architect in Canada has no national status, and will never have such until all the architectural associations and clubs in the Dominion become federated under one charter, and agree upon a common basis of action.

This is surely a desired end toward which to work, and is a course deserving the earnest, unselfish co-operation of every self-respecting architect in Canada.

With this purpose in view, the R.A.I.C. was formed, a charter secured, and an affiliation effected with the R.I.B.A. As to whether the original methods adopted in the organization of this national body are now considered to be in due order or not, is a matter too late to discuss. As to whether the present policy of the R.A.I.C. is considered favorably or unfavorably, is a matter that has nothing to do with the importance of the work it has undertaken, nor the necessity for its existence. If it is believed by some that mistakes have been made, then it becomes the duty of these to attempt to have them rectified. But let the settlement of such differences of opinion as may exist between members of the different provincial bodies, be discussed and adjusted with that dignified spirit of common interest, that should temper the deliberations of men who belong to so ancient and honored a profession as architecture.

It would be the height of folly to undertake to establish two national architectural bodies in a country where there is such a limited number of practitioners. Such an attempt would be disastrous to the interests of the profession generally in Canada, and would make impossible for many years to come, the accomplishment of those things which a national organization should hope to secure to its members. If the profession divides against itself in dealing with such an important problem as federation, it is difficult to understand how they can expect the public they serve to be in sympathy with the cause of architecture.

The members of the Royal Architectural Institute of Canada realize that there are many differences to be adjusted before a complete federation can be effected, and are anxious to have these difficulties overcome in such a manner as will result in the common welfare of the profession. This will only be possible when the several associations will deal with the matter with that conciliatory attitude becoming earnest men. Quibbling over personal likes or dislikes, or ceremoniously standing on points of minor importance, must be made subservient to the one aim every provincial association must keep first and foremost before them, and that is the establishment of a truly national architectural organization.

Federations have been formed by men in almost every branch of human endeavor the world over, and it would seem incredible that architects should be unable to agree among themselves sufficiently to do that which has been possible by business men, doctors, lawyers and tradesmen.

It now, therefore, rests with the Ontario and Quebec associations to determine to a large extent, just what degree of the future success and usefulness of the R.A.I.C. they may rightfully be credited with. The cause is worthy of earnest thought and endeavor, and the inevitable results to be obtained, are worth the sacrifice of a few provincial ideals.

Toronto as Planned by Civic Art Guild.

WILL TORONTO ever elect a body of men to its city council who will sacrifice politics and self-interest to the extent of the appointment of a permanent board with power to carry out a systematic plan for the beautification of the city? Much has been done in this direction in other cities, but as yet Toronto has done nothing more than inspect and criticize plans, and appoint a committee for this purpose, which it has given no authority to either adopt a plan or carry out any scheme.

Despite the discouraging attitude of Toronto's city fathers, the Toronto Guild of Civic Art proceeds to work out its suggested plans with an enterprising courageousness that is to be highly commended. Most of the members of this club who have given much of their time to this apparently thankless work, can never hope to see their plans completed, even though the city accepted their suggestions and proceeded to put them into execution at once.

The most recent scheme as presented by the Toronto Guild of Civic Art, has just been issued in the form of a splendidly illustrated and printed brochure, accompanied by their report.

Accompanying the report is the plan of the proposed changes, showing by the use of colors what the Guild aims at.

In short, the plan shows two great diagonal thoroughfares from the centre of the city to the north-eastern and north-western suburbs. It is claimed that these, though costly, would more than pay for themselves. These roads are calculated for four lines of tracks. Every street north of Queen street would be crossed by one of these diagonals, which would be 125 feet wide, with broad roadways and sidewalks.

A radial road project is one part of the scheme of beautification, the other is the connecting of the various squares and parks by boulevards, driveways and parkways. The sea-wall project is a "cardinal and important section of the improvements."

The president of the Guild, Mr. John A. Ewan, says in the GLOBE: "It will be the feeling of all who give any thought to the matter that in Toronto we are at the parting of the ways with reference to what the future aspect of the city is to be. It does not need a prophet to predict that the next ten or fifteen years will see radical changes in streets and structures."

Instances and illustrations of what other cities have done are given at some length. The Kingsway, in London, cost $20,000,000, and at the date of opening the revenue derived from sales and leases was $15,000 a year in excess of what was required to carry the sinking fund.

Baltimore, after its fire, raised $30,000,000 for civic improvements. Toronto's similar opportunity was allowed to pass with the installation of a $300,000 high pressure

fire system. New York has $21,000,000 in cash over and above the outlay on establishing Central Park. Mexico is spending $100,000,000 on improvements, Buenos Ayres $70,000,000.

The park system proposes to link together the existing spaces along the waterfront to the Humber River, up the Humber valley to Lambton, thence easterly by drives in the ravines to the head of Avenue road, thence easterly to a park above Eglinton avenue, to the Don Valley, to Riverdale Park, easterly again to Scarboro' Cliffs, and back to the waterfront south of Ashbridge's Bay and on to the Island. Thirteen new parks would be included in this. Queen's Park is to be a point whence parkways run to connect it with the larger system. The establishing of twenty-eight new playgrounds in all the congested districts is no small part of the Guild's programme.

In carrying out its plans the Guild proposes the formation of a civic commission that would be a body with a continuous policy.

The report closes with an appeal to all citizens to interest themselves in the work.

Calgary's City Hall.

WHETHER TO GO on with the work and complete the new city hall, or to board it up and abandon it entirely, has been the subject of debate among the citizens of Calgary for some little time back. The city's plight as regards its "white elephant," as the unfinished municipal building has been "dubbed," is an unusual one. Not that it is an uncommon thing for a city to experience the pangs of "outrageous fortune," by being assured that a certain building, fully equipped, can be built for a specific sum, and then to find that when the structure reaches a certain stage, an excessive additional amount is required to complete the work; but because the ratepayers in this particular case stubbornly baulked when it came to approving of a further expenditure of over one-half the amount originally asked and authorized.

The practice, quite general among promoters of public buildings, of deceiving the ratepayers by underestimating the complete cost of a structure, in order to get the work under way, has a element of chicanery which is to be greatly deprecated. Originally, the city hall in question was to have cost $150,000, but now an additional sum of $80,000 is necessary to complete it. Had the proposition been put before the ratepayers clearly and frankly in the first place, the probability is that no interruption of the work would have occurred. A body of ratepayers, like an individual, is open to reason; they do not expect a better building than they are willing to pay for. Undoubtedly had matters been fully explained, and the $230,000 asked for at the outset, the amount would have been forthcoming in the same *corp d'esprit*, as the sum originally voted.

Usually in a case of this kind, a community forks out the extra sum, and regards such a procedure as a matter of maladministration or a species of graft. Graft, however, does not enter into such a deal as often as is supposed. Every dollar spent in the building in question, has been fully accounted for in the statement of expenditure filed with the city. It must be admitted, nevertheless, that there was a phase of trickery in the erection of the city hall, which places a stigma on those who were identified with its construction. This is, indeed, unfortunate, as the architect and promoters are the victims of self-created circumstances; circumstances over which they had absolute control. If a building of a certain type, equipped and furnished a certain way, cannot be built for a certain sum, then let the ratepayers be told so frankly.

The ratepayers of Calgary are not, we believe, at heart adverse to voting the sum required for the completion of the structure, but by turning the proposition down in a recent plebiscite, they showed their resentment at being "duped" at the time the erection of the buildings was first advanced. Such things have happened before, and will in all probability happen again, but never before, possibly, has a community showed its disapproval so strongly of this sort of procedure. Just so long as there is a tendency to underestimate the ultimate cost of a building, unnecessary interruptions and difficulties will arise, and those upon whom the work devolves will be charged with employing misrepresentation and shady methods at one stage or the other of its development.

Possibly the most logical way for a municipality to avoid the unpleasantness of an affair of this kind is to appoint a board of assessors, such as is demanded by the Royal Architectural Institute of Canada, to pass upon the plans and fix the complete cost of the building according to the market value of labor and the materials to be employed. The fees of such a board would be but a small consideration at the most, and the cost of the structure would—save possibly for a slight variance one way or the other—be definitely established to the satisfaction of all parties concerned.

Calgary will evidently be prepared to meet such a contingency when any like improvement comes up in future, and other municipalities will do well to profit by her present experience. As it is, the city hall stands to-day practically an abandoned project, and odium has been heaped upon the heads of those who were identified with its construction. One councilman at a recent meeting, vented his spleen by suggesting that the building be turned over to the Alberta Government and converted into a Provincial Jail, but such an act was frowned upon as being wholly destitute of civic pride. Instead, there is a feeling manifest that the citizens are now in a more generous mood, and a petition will shortly be circulated among the business men and ratepayers requesting that the council and commissioners again submit the by-law at the next municipal election. It is quite possible that if sufficient signatures are obtained, the by-law this time will be adopted.

While there is nothing to show that the money originally voted has been in any way misapplied, nevertheless, the methods of carrying out the project, and the manner in which payments were made on the work, is being made the subject of a searching investigation.

One thing in connection with the whole affair, which is quite evident, is the fact that the practice of underestimating the ultimate cost of a building to be built of certain materials and according to certain specifications, results in no good. It not only operates against the interests of the architect employed, and his client, but also casts a reflection on the standing of architecture as a profession. Ignorance is no excuse, and wiles and guiles have no place in architecture. The policy of tricksters and artificers, is something to be greatly discouraged by practitioners in general.

Discrimination in Favor of U.S. Products

NEARLY A YEAR AGO Toronto's city officials did themselves "proud", in defying the Canadian Customs authorities in an attempt to bring into the country plans for the new filtration plant, without the payment of the rightful duties. Their attitude in this matter was anything but becoming civic officials of a city that boasts so loudly of its loyalty, and shouts so vociferously the "Made in Canada" slogan. The contention of the offending authorities, in the protection of their almost untenable position was that it was impossible to secure an engineer in Canada with sufficient knowledge and experience to design the plant, Toronto had voted to build, and, while this was no excuse for the violation of our Customs laws, it was accepted for what it was worth.

But we are now presented with a case where the city has actually discriminated against Canadian pro-

ducts in favor of those of United States manufacture; a flagrant violation of every principle of good business and fair play. In fact two cases have been brought to our notice recently, and we have no doubt that investigation would bring to light many more, where American goods were adopted by the city as standards in their specifications. J. L. Mott's plumbing ware was used as the standard in the specifications for Toronto's new lavatory, and enamelled ware of another American manufactory was named at the standard in the specifications for the plumbing work in the new Public Bath House. Every architect and plumber in Canada knows that this action on the part of the authorities of Toronto, is absolutely without justification. We have plumbing enamelled ware, manufactured in Canada, by purely Canadian institutions, that equals, if not excells, in every point of comparison, (design, quality, color and price), anything that is manufactured on the globe. If there is one line of goods which goes into a building that is made in Canada of as good or better quality, and that may be obtained under as good or better conditions, as compared with the products of foreign manufacturers, it is porcelain enamelled plumbing ware.

If Toronto officials will discriminate against Canadian manufacturers of enamelled ware, they will favor goods of foreign manufacture, whenever they so please, without the least consideration of the interests of the Canadian manufacturer or laborer, in view of the fact that Toronto is one of the largest, if not the largest manufacturing centres in the Dominion, this policy is at the least highly inconsistent.

We have one manufacturer of plumbing enamelled ware in Canada, well known to every architect, builder and plumber, whose goods are specified and used in some of the largest and best equipped buildings from coast to coast; whose goods are sold in competition with the largest manufacturers in the world, in France, Belgium and other continental countries of Europe; who has built up in a few years, an enormous industry in Canada, under the most trying conditions of foreign competition, and who to-day employs upwards of four hundred men.

Surely such Canadian manufacturers should at least be given an even chance with the United States firms. Canadian architects realize and appreciate the importance of the encouragement of the establishment of such institutions in this country, and they show it in their private work, but it is left with the public servants in Canada's greatest manufacturing center, to thus operate against the industrial welfare of our country, by adopting as standards, products of the United States manufacturers.

Great is the jubilation of Toronto over the prospect of the establishment of a new industry in the city, and yet they encourage the sending of its money for public improvements out of the country to strengthen our already formidable competitors. Where ever it is at all possible, every architect, every contractor, and every government (Municipal, County, Provincial or Dominion), should use Canadian standards and if competition of foreign manufacturers is desired, let the burden of satisfying the specifications fall upon them and not upon our own manufacturers. Let the foreign products be made to suit Canadian standards instead of Canadian products to suit foreign standards.

British Architectural Drawings for C.N.E.

WHENEVER the question of Architectural Education is discussed by members of the profession, without exception, one of the most deprecated of all conditions that militate against the advancement of this branch of Art and Science, is the lack of interest and appreciation, by the lay public, of the æsthetic in architecture. While there is no art with which the general public is more materially concerned, there is none about which the layman actually knows less.

It is the layman that every well-organized architectural association has sought, and is seeking to educate to appreciate the beautiful in architecture. This undertaking has proven a most arduous and thankless task, in the New World especially, and every accomplishment that furthers the efforts of the profession in this direction is heralded with much joy and satisfaction by every architect who loves his profession.

In this direction, the Ontario Association of Architects may rightfully claim credit for having been successful in bringing about one of the greatest victories for the cause of architecture in Canada, during the past decade. At the instigation of the Toronto branch of the O.A.A., the directors of the Canadian National, last fall, set aside a portion of the Applied Arts Building, for an architectural exhibit. Designs were submitted from almost every portion of the Dominion and the interest shown by the public in this exhibit, through the constant stream of visitors, convinced the Canadian Exhibition officials of the advisability of making this new departure a permanent annual affair. With the view of adding interest to next year's exhibit, Mr. Geo. W. Gouinlock, president of the O.A.A., suggested at one of the noon-day luncheons of the Toronto branch of the association, that an effort be made to secure a number of designs and studies from some of the more prominent architects abroad. He believed that such an exhibit would estimate interest in the architectural section of the Arts building; it would prove of educational value to the architect and the student and would cultivate a better appreciation of the art by the lay public, thereby ultimately resulting in a better style of architecture in Canada.

Mr. Gouinlock was earnest in his very commendable suggestion, and prevailed upon Dr. Orr, (manager of the Exhibition), to interview some of the more prominent architects in England, where he is at present on a trip, with the view of arranging for an exhibit of the work of well-known English designers. Mr. Gouinlock brought the matter before the Royal Architectural Institute of Canada at the annual banquet recently held in Toronto, and appealed for their co-operation and support.

As a result of Mr. Gouinlock's personal efforts with the co-operation of the O.A.A., Mr. Orr has succeeded in securing an exhibit from the British Society of Architects, which will undoubtedly include specimens of the work of such men as Sir Ashton Webb, F. C. Colcott, Belcher and other noted British architects.

To thus secure to the profession of Canada, permanent facilities for an annual exhibit at the greatest yearly exhibition in the world, for an exhibit of the work of Canadian architects from the Atlantic to the Pacific, supplemented by the designs and studies of the best architects of the Mother country, where they may be viewed by more than half a million visitors every year, we maintain to be the greatest achievement for the promotion of a better appreciation of the Art of Architecture of the last decade.

Building Operations in October.

PREDICTIONS VENTURED earlier in the season as regards fall building operations, are being fully borne out as the late months materialize. October was another period of activity in which the volume of new work undertaken greatly exceeded that of the corresponding month of last year, and as yet nothing has turned up to indicate otherwise than a continuance of this prosperous condition for some time to come. Two gains are noted to every loss, and the average in-

crease for the month, as based on comparative figures supplied CONSTRUCTION, was slightly in excess of 42 per cent.

Calgary again reports the biggest increase for the month, following her phenomenal advance of 399 per cent. in September, by another sweeping gain of 355 per cent. Sydney is second in the list, with 341 per cent. to the good, while Berlin again bobs up in the third highest place with a substantial increase of 173 per cent. to her credit.

Of the places to suffer a reversal—two of which are noted in the east, three in Ontario, and two in the west—St. John and London, which experienced a decline of 67 per cent. and 47 per cent. in order named, were hit the hardest. It may be mentioned, however, in the case of London, that the total value for permits issued up to date, is just double the amount expeded for new buildings during the entire year of 1908; and also that the outlook there at the present time is anything but discouraging.

Aside from the losses at Edmonton and Regina, which fell behind their last year's figures for the month, to the extent of 15 per cent. and 10 per cent. respectively, the West, in general, more than held its own. Vancouver registered an increase of 15 per cent.; Winipeg 10 per cent.; and Victoria 5 per cent.; while Lethbridge looms up with $190,270 for new work undertaken, which brings the total value of permits for the year well over the million mark for the first time in her history. In all these places, the immediate prospects are all that could be desired. Winnipeg is displaying an activity in the realty market seldom before witnessed at this time of the year, and, as for Vancouver and Victoria, the present indications are that both of these places are just beginning to grow.

In Ontario, besides the gain in Berlin, other advances recorded were:—Toronto 51 per cent.; Fort William, 39 per cent.; and Hamilton 16 per cent. Windsor, which registers an amount of $19,500, can also be included in the list of gains, while as for Port Arthur, which had $271,000 to her credit last month, it might be explained that the small amount ($3,500), is not representative of the new work undertaken at that place, owing to the fact that there are no building regulations outside of fire limits, and hence no means of obtaining a complete record. The two set backs noted in addition to that of London's, mentioned above, are: Peterboro,, 43 per cent., and Stratford, 32 per cent. In both cases, however, the corresponding amounts for the month are relatively small, and the losses, therefore, can hardly be regarded as seriously affecting the general situation. Practically all the places mentioned are substantially ahead of 1908 in the season's work, while the amount already recorded in Toronto is greater than any previous yearly totad in the history of the city.

Farther east, Montreal again comes forward by noting an increase of 48 per cent. and as yet nothing has occurred to stay her progress. This is the tenth consecutive gain recorded, and in this respect, Montreal has perhaps showed the most consistent development throughout the year of any city in the Dominion. Halifax, however, once more lags behind her former figures, her less for the month being 25 per cent. It is quite probable, though, that a strong reaction will take place before very long, as the increasing importance of Halifax as a port entry, clearly indicates that the city has not, as yet, in any way approached the limit of its growth.

	Permits for October, 1909.	Permits for October, 1908.	Increase, per cent.	Decrease, per cent.
Berlin, Ont.	$26,550	$9,700	173.71	.....
Brandon, Man. ...	8,020	.....	.....	.....
Calgary, Alta.	403,050	88,400	355.93	.....
Edmonton, Alta. ..	83,535	98,735	.....	15.39
Fort William, Ont.	88,050	63,250	39.20	.....
Hamilton, Ont. ...	247,350	211,950	16.69	.....
Halifax, N.S.	34,200	46,160	.....	25.90
Lethbridge, Alta. .	190,270	.....	.....	.....
London, Ont.	29,880	57,210	.....	47.77
Montreal, Que. ...	628,645	422,080	48.53	.....
Peterboro, Ont. ..	16,690	29,450	.....	43.32
Port Arthur, Ont..	3,500	.....	.....	.....
Regina, Sask.	52,080	58,270	.....	10.62
St. John, N.B.	23,800	73,550	.....	67.64
Stratford, Ont. ...	4,100	6,100	.....	32.78
Sydney, N.S.	22,050	5,000	341.00	.....
Toronto, Ont.	1,540,355	1,019,492	51.09	.....
Vancouver, B.C. ..	501,975	436,080	15.11	.....
Victoria, B.C.	104,840	99,755	5.09	.....
Windsor, Ont.	19,500	.....	.....	.....
Winnipeg, Man. ..	511,850	460,400	11.17	.....
	$4,540,290	$3,185,582	42.52	.....

C.C.C.A. Board Discuss Next Convention

A DINNER was given recently at the St. Charles Hotel, by Mr. Peter Gillespie, lecturer of the Theory of Construction, Toronto University, to the members of the Executive of the Canadian Cement and Concrete Association, of which he is president.

The most important subject under discussion was the place at which the next convention and exhibition will be held, and the members present expressed in the strongest terms, their disapproval of the narrow policy of the Board of Control of the city of Toronto in charging $1,100.00 for St. Lawrence Market, which was neither heated, nor lighted, for the exhibition held last year. It was pointed out that it cost the Association, in addition to the rental, $650 to heat and light this building for one week.

This, it appears to us, is rather a short-sighted policy on the part of the officials of a city like Toronto, that is striving to establish itself as a manufacturing centre. When the National Association of Cement Users was organized in the United States, the various larger states in the middle West and the Eastern states vied with each other in offering the best inducements to bring the convention and exhibition of this newly organized Association to their cities, and in no case since the National Association of Cement Users was formed, have they ever been obliged to pay rental for convention or exhibition halls. In addition to this on several occasions have they been allowed a money grant to cover the expense of the entertainment of their visitors and members, by the cities which they had honored with their annual convention.

The convention of the Canadian Cement and Concrete Association not only brought to the city of Toronto last year in the neighborhood of 1,400 visitors, but it also served in bringing to Toronto three or four American manufacturers of cement products machinery, who have or will establish manufacturing plants in the city. After having had such an experience with the city fathers last year, the Association is not inclined to again leave themselves at the mercy of the whims of the members of the Board of Control, and, as a result, it has appointed committees of its members in Montreal, Ottawa, Hamilton, Quebec and London, to interview the business organizations of these cities, as well as the city officials, and learn what facilities could be provided in each one of these places for the next convention, to be held sometime the first of March during 1910.

There is no city in Canada that is better adapted to be the headquarters of manufacturers of cement products machinery than Toronto, and it is to be hoped that sufficient inducement may be offered to the Association to permit the next convention to take place in the Queen City.

A wood staircase in one of Toronto's schools. This view was taken shortly after the Collinwood disaster, and shows the condition generally prevalent in Toronto schools. Both stairways, it will be noted, come down to the main corridor toward the same door.

One of the "fireproof" basements in Toronto schools. It will be noted that it has not even metallic ceilings, and the furnace pipe runs directly under a wood beam above the doorway. The only protection being afforded is a piece of tin between the pipe and the beam. There is a can of oil under the table, which would contribute toward the "fireproofing" of this room.

The main corridor of the Ogden School, Toronto, showing the course taken by the children in their fire drill. "X" marks the location of the boilers under the main corridor.

The only fire escape on a Toronto school building; a wooden affair that runs down from the third story of the York Street School to the roof of another building. This was erected about the time of the Collinwood disaster.

The system of outside stairways with which the Royal Alexandra Theatre is equipped. If theatregoers are entitled to this fire protection, we ask why our school children should not receive some consideration.

Are Toronto's Schools Safe ?

Mr. C. H. Bishop,
Inspector of School Buildings, Toronto.

Dear Sir,—I am not at all surprised at the attitude assumed by yourself and Mr. Hughes, toward the charges made in an editorial "TORONTO'S SHAME," that appeared in last month's "CONSTRUCTION." The exposition of the ugly truth with regard to the real conditions of Toronto's public school buildings, does not make pleasant reading, and is not consistent with the false sense of security that yourself and Mr. Hughes have engendered in the citizens of Toronto, by your apparent confidence in the practicability of your antiquated school building methods and incongruous contentions with regard to the extent and character of the best protection to be employed against the loss of life in event of fire or panic. It is, therefore, not surprising to those who are acquainted with the real situation as well as with the tactics it is customary for you to employ in your defence whenever the structures for which you assume the responsibility, are attacked, that both yourself and Mr. Hughes should try to discredit the article in question by expressing your opinion that it was either paid for, inspired or written by a fire escape manufacturer.

Mr. Hughes is credited by a Toronto daily as having made the statement that his "detective instincts would lead him to inquire as to whether the article was paid for or not, and that trade journals would often publish such things so long as they are paid for." If Mr. Hughes had said what he thought, his statement would have read something like this: "My good sense prompts me to deem it more expedient to discredit this article, than to undertake to answer the charges contained therein." However, Mr. Hughes, whose position requires him to know but little of the details of building construction, is to be excused for this highly absurd and inconsistent attempt to question the integrity of the article in question, but for you, Mr. Bishop, who have had long experience in all the various branches of building construction, there is no excuse. I am surprised that a man in your position should, under any circumstances, make such an obviously ridiculous statement. For argument's sake, we will allow that "CONSTRUCTION'S" editorial columns are open to manufacturers who have an axe to grind or that paid matter would be accepted for publication in "CONSTRUCTION'S" columns, from manufacturers who desire to thus promote the sale of their products at so much per line. I would ask you what manufacturer of fire escapes, or combination of fire escape manufacturers would go to the trouble or expense to either pay for, or prepare such an article? There is no monopoly in the manufacture of fire escapes. Fire escapes are not patented, and there are one thousand iron workers, large and small, in Canada, who can make any fire escape required, from plans and specifications supplied them. It would, therefore be impossible for any manufacturer to expect to promote his individual business through the publication of such an article. It would be equally as reasonable to charge that every effort of the technical press in the promotion of a better type of building construction, and for the adoption of more improved equipment, was prejudiced by private interest.

A man of your experience knows better than this, Mr. Bishop, and I regret that your better judgment did not restrain you from attempting to avoid the real questions under discussion, by such an indiscreet ruse. The article in question was not written by a fire escape manufacturer, nor was it published in the interests of any private individual or corporation. It was written by the editor of "CONSTRUCTION," and was the result of a careful investigation of the conditions of Toronto's School buildings as compared with those of other large cities on the continent. I am in a position, however, to go further, and beg to inform you that "CONSTRUCTION" has never since its first issue, published a line in its reading columns, of what is usually termed "paid for matter," and in defence of the technical press "Trade Journals," I would say, as a rule it is much less subject to private monetary influence than are public officials, generally speaking.

While Mr. Hughes may give long interviews to the daily press, concurring with your represented views on the various phases of school building construction and equipment, with an effort to quiet the nerves of Toronto parents, it is you who are responsibe to the city for the safe and adequate housing of its school children. There is a law in the Province of Ontario that forces the attendance of all children under fourteen years of age, at school. Each municipality is obliged to provide adequate facilities for the education of those children. In Toronto, as in other Ontario cities, children are forced to attend the school provided for the district in which they live, it matters little whether the structure is a fire-trap or not. A store building, a theatre, a warehouse, or a church that may be considered unsafe, may be avoided by those who fear to enter them. But not so with school buildings. The same law that says the city must provide itself with schools, forces the attendance of the children of that city at those schools. Mr. Bishop, you are the School

Building Inspector of Toronto, where there are more than 30,000 school children attending schools under your inspection, and it is you and not Mr. Hughes who are legally, as well as morally, responsible for the safe condition of those schools. You have no right to shift the responsibility of avoiding loss of life, in case of fire or panic, upon the shoulders of the teachers and the pupils, by forcing them to depend upon a fire drill to get themselves safely out of a burning building. I cannot see what the practice of fire drills has to do with safe building construction. Do you work upon the principle that you can afford to take chances in an unsafe building, as long as another department will undertake to train children to be fire-proof and panic-proof. A fire drill cannot be considered as a substitute of safe building design and construction or adequate fire protection equipment.

In Toronto schools you pin your whole faith on this fire drill, the success of which depends upon the great unknown quantity, human nature. If this fails you, your children are lost.

A fire drill should be an additional precautionary measure, adopted for the increased safety of the children, whereby they are permitted to contribute to their own safety and comfort by marching orderly out of a burning building, in which every reasonable precaution has been taken advantage of, in its plan, construction and equipment to minimize the danger of fire or panic. The fire drill, as you know, Mr. Bishop, is practised with only this object in view, in every large city on the continent, with the exception of Toronto. Your responsibility is not in seeing that the fire drill is practised regularly, but in providing, primarily, safe buildings and equipping them to avoid loss of life, should the fire drill fail.

Lest you may have forgotten the horrible details of the Collinwood disaster, in which the lives of 165 children were sacrificed, I am going to quote a portion of the report of the holocaust as it appeared in the daily press, which should serve to impress upon every school architect or inspector, the extent of the responsibility that rests upon them, and the awful consequences that follow neglect of duty.

"In a frenzied rush for escape from the flames, the pupils were caught as if in a trap at the bottom of the rear stairway. Those who were alive after being trampled upon were burned to death. In the wedge of bodies that choked the exit forming a pile six feet high, children died before the eyes of mothers and fathers, fighting from without in utter helplessness to save them.

"Several parents succeeded in getting hold of the outstretched hands of their little ones, but they could not break the grip that held them from within. When the fire finally reached the prostrate mass there was nothing to do but to take one last look.

"The shrieks of the entrapped children, agonized, blood chilling cries, died away. There was a gurgle of sound—then quiet. For a few moments the rescuers were powerless to move, stunned into silence. Suddenly a grey-haired man dropped to his knees in the mud. "Oh, God, what have we done to deserve this?" he moaned, with arms outstretched toward heaven.

"Women, bareheaded and breathless, came running across the fields. They sought their children. They had not yet reached the building when they saw the old man kneeling. As if with one thought they threw themselves down in the mud and prayed to God to spare their little ones. As the words rose the dull sound of the fire engine came back as if to mock them and the hissing of the flames as if to sneer at their misery.

"The fire swept through the halls and stairways of the building like a whirlwind, laughing at fire drills and attempts at discipline. Ten minutes would have cleared the building of its population, but the ten minutes were lacking.

"Sweeping up under the front stairway the flames cut off that exit entirely, after one room full of children had passed out. This drove the great seething mass of frightened pupils into the back exit of the building.

"In that narrow stairway and vestibule, penned like rats in a great trap, poured the mob of children, fighting, screaming, pushing. Down on them poured others, jumping over the banisters, climbing over each other's heads in the last desperate attempt to reach the doorway. Into the seething death trap were drawn two of the teachers, martyrs to their attempt to pull the pupils back into the rooms of the first floor, where they could jump to safety.

"One second grade teacher, tall and strong, and nearly six feet in height, threw herself into the breach, trying to bring the pupils to their senses, but she was swept into the whirlpool of maddened children, many half grown boys and girls of the upper grades among them, and dragged down into the death pit at the door below. Another teacher in the second grade was swept into the vortex to her death. The larger boys of the sixth grades behind swept down like a tidal wave carrying teachers and pupils to death."

This is the story of a fire in a building that compared favorably with most of Toronto schools; a school in which no adequate provision was made for emergency exits to be used when the fire drill failed, and the awful holocaust that was the result, would not be only possible but probable under similar circumstances, in any one of the majority of Toronto schools. Here is what the press stated with regard to the fire drill:

"The children were under good discipline, they had been practised frequently in the fire drill, their teachers without exception retained their self-possession, showing great courage in the face of imminent death, and yet more than half of these little ones died horribly because of faulty building arrangements. The schoolhouse was two storeys and a half in height, the walls being of brick and concrete."

Mr. Hughes has stated that the great loss of life in the Collinwood fire was attributable not to the failure of the fire drill, but to the fact that the doors opened inward and that one of the entrances were locked. These statements are at variance with the facts of the case, for we find that the coroner's jury that investigated the horrible affair, found that the doors had been opened by the janitor before the children reached them, and, as for the doors opening inward, I beg to refer you to the following, which also tells how the children in their fire drills, had been accustomed to empty the school in one minute and thirty seconds:

"Miss Anna Moran, the principal of the school, denies that the doors opened inward and insists that they were never locked during school hours. She said: 'When the bell rang I, and I suppose other teachers, thought it was a regular fire drill. Every child in the school has gone out over and over again from the second floor to the open air in one minute and thirty seconds.'"

That the efficiency of even one poor fire-escape in saving life at a time of panic, was proven, is very plain in the following:

"Miss Laura Boddy, the only teacher on the third floor, formed her pupils in line and marched them down to the second floor, where, finding the flames rushing up the stairway, she turned them around and hurried them back again to the third floor. She there broke a window with a chair, and, getting on to the platform of the fire escape, lifted out her

pupils one by one and sent them down. ..Four or five children who broke from the line she had formed and ran down the stairway were killed."

In the face of these indisputable facts, why do you continue to talk about fire drills whenever the subject of the safety of Toronto's schools, comes up for discussion? Why do you not tell the parents of Toronto how you expect to get the children safely out of a burning school when the fire drill fails? Toronto children are no more panic proof than the children of any other city. They are human.

You express confidence in the present condition of your schools, because you have been sufficiently fortunate in your school fires thus far. But permit me to say that, the parents, of the children who escaped safely from these buildings, have not the Board of Education to thank but a kind Providence. Because there were no lives lost, you continue to pin your whole faith to the fire drill. I suppose if a hundred lives had been lost in one of these fires, you would have changed your policy. Then, are the citizens of Toronto to assume that to secure schools equipped with better fire protection, there must be a greater sacrifice of little lives? Surely not.

Mr. Hughes says he would never die happy if he ever recommended fire-escapes on Toronto schools. Perhaps he is right, but I am inclined to believe, with all due respect to the esteem in which he is held by his fellow citizens, that Toronto parents are somewhat more concerned about the safety of their children, than with the peace and happiness with which Mr. Hughes may be enabled to finish his life's work. However, it is my sincerest hope that fire-escapes will not be his last concern before he passes into "the great beyond."

I would say further, that it has for some time been rather a hobby with Mr. Hughes to oppose fire escapes, and it is not an easy matter for him, after he has indulged this eccentricity for so long, to do other than attempt to vindicate his position.

When Mr. Hughes was in Winnipeg he gave an interview to the daily papers there, telling them that their fire-escapes were no good. I am told by Mr. Mitchell, Commissioner of School Buildings of Winnipeg, that Mr. Hughes never saw one of these fire-escapes in operation, and I am further convinced of the authenticity of Mr. Mitchell's statement, by the extravagant remark recently made by Mr. Hughes to one of the Toronto evening papers, to the effect that the children would be crushed to death in them.

Before I go further, lest I be misrepresented, let me make it plain to you that I am not necessarily contending for outside fire-escapes. What I do maintain is that all of Toronto's three-story buildings should be equipped with adequate means of emergency exit. Inside fire stairs, cut off from the remainder of the building by fire walls and fire doors, and covered with wired glass, is the ideal type of fire-escape, but if the cost of equipping the older schools in Toronto with these would be too great the outside escape should be resorted to. The ideal school building is a two-story fireproof structure upon which fire-escapes are not required. The use of fire-escapes is purely a precautionary measure, used upon buildings where the plan and construction are faulty.

In defence of your position, you are perfectly aware of the fact that you cannot point to one authority in Canada or the United States, who will agree with you in stating that some measure of protection should not be provided, in the way of emergency exits, on such school buildings as Toronto has been building. There is not a city on the continent, of the size of the city of Toronto, that does not require on school buildings of non-fireproof construction of three stories or more in height, either an inside fireproof fire-escape, or an outside iron stairway, or what is known as the spiral slide, and, in some cases, especially in the State of Ohio, where they were visited with the holocaust in Collinwood, fire-escapes are required on non-fireproof school buildings of two stories or more in height.

I have written several building inspectors in the larger cities in Canada and the United States, asking their opinion with regard to fire-escapes or outside covered stairways on non-fireproof three-story schools, and, in not one instance have I received a reply giving the opinion that fire-escapes were unnecessary on such buildings. Some of those addressed gave their opinions on the matter, while others sent as an answer copies of their building codes covering the point.

The answers received from cities in the State of Ohio, where Collinwood is located, were most interesting. Surely you must be willing to admit that the searching investigation that followed the terrible experience, immediately in their midst, would result in the adoption of the best known system of fire protection. The following letter is from the building inspector of Cleveland. It tells its own story:

Editor "Construction,"
Toronto, Canada.

Dear Sir,—

"Immediately after the destruction of the school building at Collinwood, Ohio, a suburb of this city, which fire entailed a loss of one hundred and sixty-two (162) lives, the Board of Education of this city, together with the writer, designed a fire-escape which has since been erected on all non-fireproof public school buildings in the city, which allows the pupils to pass from the building without compelling them to pass through fire and smoke, and in my opinion is an almost ideal fire-escape for use on this class of construction.

"I am sending you herewith copy of the specifications for the construction of this escape, which is now required throughout the State of Ohio, our design having been used with the single exception that while we, in the case of Cleveland public schools, could construct the escapes so that the stairways were placed eight (8) feet from all openings in the walls of the building, it was found that this requirement could not be enforced throughout the State, for the reason that a number of the existing school buildings were so located as to preclude this arrangement; the State requirements were therefore made to compel placing of the escape two and one-half (2½) feet from the wall of the building. We were pe _

ticularly fortunate in this respect in Cleveland, as the public school buildings in every instance had sufficient property beyond the building line to allow the escape to be placed eight (8) feet from the building. In every other respect the specifications adopted by the State are identical with those compiled at the instance of this Department and the Board of Education of this City.

"While I strongly advocate the erection of an adequate number of fire-escapes on every non-fireproof school building, I do not believe that a fire-escape or a number of fire-escapes should be expected to properly safeguard the pupils in the building. It is my opinion that all school buildings more than one (1) story in height should be constructed throughout of fireproof material; this requirement is made, both in our city ordinances and in the statutes of this State, so that we now design school buildings to be perfectly safe from fire from ordinary causes, and compel erection of the escape described in the enclosed specifications on all non-fireproof school buildings more than (1) story in height."

Yours very truly,

WM. S. LOUGEE,
Inspector of Buildings.

Another letter, received from the Dayton branch of the Ohio Inspection Bureau, which will interest you, reads as follows:

"As to construction of fire escapes, this matter is entirely in the hands of the State Shop Inspector, Columbus, Ohio. A letter addressed to him would probably bring you desired information. Our state law requires the Shop Inspector to make inspections of shops, factories, schoolhouses and other buildings, and see that the state law is complied with regarding fire escapes and other requirements. **Experience has shown that in this and other states the matter of fire escapes on school houses and other buildings, is of vital importance, so much so that stringent laws have been passed requiring them, and we think it appeals to the reason of every man, that some method of escape is imperative in buildings where public gatherings are common on upper floors. The possibility of fires and panics is always present.** The means of escape should be equally in evidence and it is the **height of criminal negligence to wait for some awful calamity to demonstrate the above fact.** This state, as well as others, has been guilty of just that kind of negligence, and it took the loss of nearly 200 innocent children's lives, in one single instance, to arouse the people to a sense of duty. The fire escape should be such not only in name but in fact. Not allowed to be constructed merely to comply with the law, but to serve as a real avenue of safety and not another fire trap in itself."

Yours truly,

A. W. FOSTER,
Inspector.

Still another letter was received from Toledo, Ohio, which demonstrates that this city has also taken advantage of Collinwood's awful lesson:

"We demand that all buildings used for school purposes, that are more than **six feet from the grade line, must have fire escapes.** The inspection of school buildings in this state is very rigid. The state department will no doubt furnish you with copy of state law on school building protection.

"Trusting this will be the information desired, we are,

Yours truly,

JOSEPH McMAHON,
Chief Inspector.

You undoubtedly know that the authorities of New York city do not concur with you in your views, as is to be inferred from the following letter:

"In reply to your inquiry, relative to fire escapes on school buildings, I would say that we require regular stairs with eight-inch risers and eight-and-one-half-inch treads."

Yours truly,

EDS. S. MURPHY,
Superintendent of Buildings.

The fire marshal of Troy, N.Y., takes a sane view of the proper use of fire-escapes and the manner in which the fire drill should be practised, as is evidenced by the following letter:

"I have your communication, and in reply I will quote my suggestions as given in my report of an inspection of the schools of this City in 1908, to the Board of Education of this City, which is as follows: —

"Every school building over two stories in height should have fire escapes erected on same and these fire escapes should have balconies at least five feet wide with suitable railings and a wide stairway with easy steps and risers leading from same, and the said balconies should extend the entire length or width of the buildings, **and I believe that these fire escapes should be used by the pupils in their fire drills,** so that they might get accustomed to the use of them."

Very respectfully yours,

CHARLES ROTH,
Fire Marshal.

"P.S. I will further state that since the above report, all the school buildings in the city, where considered necessary, have been equipped as above suggested."

You will note from the following letter that Rochester, N.Y., takes advantage of every possible precaution in the erection and equipment of its schools; all schools have outside iron stairs protected with wire netting; they have fire drills once a week and no buildings are erected of over two stories of non-fireproof construction. Why should Toronto fail to protect its children to the same extent as Rochester?

Dear Sir, —

"Our building code does not allow school buildings to be erected more than two stories in height, unless of fire proof construction. We have iron stair **fire escapes on all our school buildings, and for safety, have said fire escapes** enclosed in wire netting. The principals of all schools have a fire drill at least once a week, which is an excellent practice, as it prevents a panic in case of fire. **Fire escapes should be upon all school buildings, and the fire drill practised for the safety of the pupils.'**

Respectfully yours,

HERBERT W. PIERCE,
Assistant Fire Marshal.

The inspector of buildings of Minneapolis believes schools should not be more than two stories in height and that first floor should be of fireproof construction:

Dear Sir, —

"Our present ordinance **gives me authority to demand fire escapes on all buildings three stories or more in height.**

"In regard to the necessity for fire-escapes on school buildings, I should say that it would depend entirely on the height of the building, the number and width of stairways, the condition and location of the heating plant and the type of construction of the buildings.

"In my opinion, such buildings should be limited in height, if possible, to two stories. The first floor, at least, should be constructed of fireproof materials, and the building provided with wide, easy stairways in sufficient numbers."

Yours truly,

JAS. G. HOUGHTON,
Inspector of Buildings.

Salt Lake City has both fire-escapes and fire drills. The spiral escape referred to in the following letter is of the same type as is used in Winnipeg:

"In addition to fire escapes described in Section 100 of our building code, our Board of Education are using to a more or less degree the spiral fire escape, which you probably have knowledge of, being constructed circular in form, of iron, with a spiral incline plane inside. None of these have ever been used during a fire and panic, but the school teachers and principals of our schools give a practice drill with their scholars occasionally, and seem to think they are perfectly satisfactory. Whether they would be able to handle the scholars during the excitement of fire as successfully as they do during the drill, is yet to be proven."

A. B. HIRTH,
Inspector of Buildings.

Salt Lake City, Utah.

Des Moines, Iowa, as you will note in the following letter, gives the question of fire protection in its public schools the serious consideration it deserves:

"In view of the periodical disasters caused by fires, however incipient, in school buildings, **one need not hesitate one moment to be convinced of the imperative need of the most practical fire-escape that can possibly be constructed.** The disaster at Cleveland, Ohio, where several hundred school children were trampled to death is our more recent and awful example."

Respectfully,

De Moines, Iowa. JOHN MacVICAR,
Superintendent, Department of Streets and Public Improvements.

The following letter from Mr. Mitchell, Commissioner of School Buildings of Winnipeg, I wish to especially draw your attention to, in view of the fact that he, with Mr. McIntyre, Superintendent of Schools of Winnipeg, visited fourteen cities in the United States during 1907, with the purpose of becoming acquainted with the best methods there employed in school building design, construction and equipment, and his views on this important question are worthy of your earnest consideration:

Dear Sir,—

"I have carefully read the Editorial "TORONTO'S SHAME," which appeared in the October number of "CONSTRUCTION," and while I would not care to say one word which might appear to be a criticism of either the schools or the officials connected with the schools of Toronto, the question presents itself to me in this light.

"**The general concensus of opinion on the American Continent is in favor of having fire escapes on all public buildings over two storeys in height,** more especially since the fires which occurred at Hochelaga and Collinwood, with the resultant loss of life at each. With such a warning, **why should any person or any community assume the tremendous responsibility of leaving undone anything in reason which may be the means of preventing the loss of even one life,** should a fire occur, which is always a possibility.

"Under ordinary conditions, there is no doubt but that any of the schools in Toronto could, with the admirable system of fire drill which prevails, be emptied of all the children before there was a possibility of danger, and that rightly should inspire a certain degree of confidence among all concerned, but yet there is always the possibility, however remote the contingency may seem, that **on some occasion the stairways would not be available either through fear of smoke which may be in lower halls, or the danger of a panic by the bringing together into the main halls,** the classes from several rooms, the children of which being already in a very nervous and excitable state of mind, may even lose entirely the self government preserved while in the rooms, on account of the confidence which they feel in the teacher, to whom they are accustomed.

"The decision in Winnipeg was that it would be a wise expenditure of money to provide an alternative to the exit by the stairways, so that come what might the children could get out of the building one way or the other, and even if the fire escapes should never be needed, the confidence felt by the parents in the knowledge that an alternative had been provided, and the peace of mind due to that confidence, amply justified the expenditure made in that connection.

"To sum it up somewhat shortly:—**What is a small amount of money in comparison to the life of even one child.** I think this expresses all that need be said from the Winnipeg standpoint, and if these ideas are of any use, you are at liberty to make use of them."

Yours very truly,

Winnipeg, Nov. 11, 1909. J. B. MITCHELL,
Commissioner of School Buildings.

These, sir, are only a few of the many letters received, not one of which serves to bear out your contention. Does it not occur to you that should a fatal fire occur in one of the Toronto schools, in the face of these facts, you would have a difficult task in satisfying the Toronto public that all reasonable precaution against the possibility of such a calamity had been taken? Your position in such an event would not be an enviable one. You and Mr. Hughes stand alone on this question. In so far as every recognized authority on the continent disagrees with you, have we reason to believe you right, or have we a right to assume that you are wrong?

The fact that Toronto has been fortunate in not having had to record any fatalities as a result of any of its school fires, is no reason for assuming that all reasonable precaution should not be taken advantage of. Several fires were recorded in the United States about the time the Collinwood calamity occurred, but no lives were lost in any except this unfortunate suburb of Cleveland. New York averted a catastrophe from a fire in Public School 165, through marching the 2,500 occupants orderly out of the burning building. Twelve hundred pupils marched safely out of a burning school building at the signal for the fire drill, in Grand Rapids, on March the 5th, 1908. On March the 6th, of the same year, a panic was averted without loss of life, in a burning children's home in Kalamazoo. At Sturgeon Bay, Wisconsin, on March the 5th, 1908, we also learn that a $60,000 school building burned, but without loss of life. Again on the same date, a fire occurred in a school in Colorado Springs, Colo., from the explosion of coal gas in the furnace, and the pupils were marched safely out of the building. But though the fire drill served its purpose in all of these five fires, all of which occurred about the same time, it failed in Collinwood, with the resultant enormous death toll, which would have been avoided had the buliding been provided with reasonably adequate emergency exits.

With regard to the plan and construction of your more recent schools, you maintain that all buildings constructed or remodelled during the past few years, have fireproof basements, fireproof hallways and iron stairs. It is further claimed in your behalf, that all the school buildings are of "slow burning" construction, and that students of school architecture in the United States are now inclined to favor high and compact structures, rather than low-spread buildings.

While I am free to admit that most of the additions to your schools, since the Collinwood holocaust, have been provided with fireproof entrance halls and iron stairs, I have failed to find one school building in Toronto that has been so protected throughout. I would ask you about the Ogden School, the Queen Alexandra School, the King Edward School, and the Kent School. These are four of your largest schools, and all have been erected within the past few years. I have been unable to locate an iron stairway, a fireproof hall or a truly fireproof basement in one of them.

The Ogden School, which I am told accommodates 1,400 children, and is the largest public school in Canada, has wooden stairs, its halls are plastered on wood lath, on wood joists. The only

fireproofiing I could find in the basement was corrugated ceilings nailed directly upon the wood joists, which at the best is only a make-shift. The front stairs from the basement come up directly under the stairways from the upper floors and the rear basement stairs lead directly out into the rear vestibules through which the children are bound to pass in leaving the building. The stairs from the upper floors all lead down into a central corridor, directly under which are your boilers. Should your boilers go wrong during school hours in this building, exit via all four stairs would be cut off and you would have a catastrophe worse than that which befell Collinwood. If this is the best type of building Toronto can afford, in the name of the parents whose children are forced to daily attend this school, I ask you why do you not provide it with emergency exists?

Your King Edward School is even worse than the Ogden. The entrance stairs and hallways are narrow. There are enough turns and twists in the wooden stairways to provide almost a dozen places in which a panic stricken mob of children might become blocked. The entrances are badly located and the basement has not even the "make-shift" of corrugated metal as a protection.

The Alexandra and Kent Schools are very much the same in both plan and construction. Neither has iron stairs or fireproof halls, nor are the stairs so located, wood as they are, that even a minimum of protection is provided. Both have have so many twists in the stairs that a stranger would almost require a plan of the buildings to conveniently get about in them.

You know the condition of these schools, as well as the older ones better than I do. It is useless for me to dwell upon their defects. After the Collinwood fire, you became nervous about the York Street school and you built your first fire escape on it. And a great affair it was, a wooden stairway leading down upon the roof of a lower building. If a fire escape was required, why did you not build something that would be of some service?

If schools that have not fireproof basements, fireproof hallways and iron stairs, are safe, why are you installing these expensive improvements in your new schools and additions? If they are necessary in one instance, they are required in all cases. If it required the death of one hundred and sixty-two innocents to demonstrate the necessity for fireproof corridors, and iron stairs in new buildings, what nature of disaster will have to occur before the older schools are made safe.

When the anxious parents of Parkdale, after inspecting the Queen Victoria school, accompanied with a representative of the Board of Fire Underwriters, who pointed out the many obvious unsafe features of the structure, appealed to the public press to take up an agitation for the better protection of their little ones, you aimed to discredit their observations by stating that the Board of Underwriters was biased because they wanted to improve their risks. Do you believe that you are the "soul of honor" and that all those who disagree with you on this question, are prompted in their motives by selfish interest?

With regard to the statement made in your behalf, that your buildings are of "slow-burning" construction, I would say that I am confident that such a statement never emanated from you, for as you know, there is not a "slow-burning" school in Toronto. They are of what is termed in the Toronto Building Code "ordinary construction." The only type of construction known to builders that is inferior, is known as "balloon frame construction," the type usually employed in the erection of barns.

As far as three story structures are concerned, there is not an authority, of whom I have ever heard, that would prefer "high and compact" rather than low spread structures. The almost universal tendency in the United States has been to limit the height of schools to two stories, and to adopt the best known type of fireproof construction in their erection.

To sum up the situation, I would call your attention to the fact that authorities on this continent agree upon the following:

1st—That schools should not be more than two stories in height; 2nd—that all schools should be of the best type of fireproof construction; 3rd—that all stairs should be wide and straight and as far as possible cut off from the remainder of the building; 4th—that all non-fireproof schools should have iron stairs, fireproofed basements and hallways; 5th—that all three story schools should be provided with some adequate means for emergency exit; 6th—that the fire drill should be practised weekly in schools and that children should be drilled in the use of fire escapes, as well as the natural means of exit.

What Toronto provides in its public school buildings may be summed up as follows: 1st—three story non-fireproof buildings; 2nd—buildings of a character inferior to warehouses, etc., which are usually at least "slow burning" construction; buildings that in their exterior appearance belie their interior construction; buildings of "ordinary construction"; 3rd—winding open stairways that lead directly down into the central or main corridors; 4th—with few exceptions, wooden stairs and unprotected hallways and basements; 5th—three story non-fireproof buildings without inside fire stairs, outside fire escapes, or any means whatever, for emergency exit; 6th—a fire drill that is confined to the training of the children to leave the building via the ordinary entrances, which, if

cut off by fire or smoke, or in event of panic would not only fail to get the children safely out of the building but would be worse than useless.

This is the situation, Mr. Bishop, and you are Inspector of School Buildings of Toronto. The fact that you cannot get sufficient money from the Board of Control to do those things which you must within yourself deem necessary, is no excuse. The people of the City of Toronto will vote money for a filtration plant, new exhibition buildings, a high pressure system, for the reclamation of Ashbridge's Marsh, and there is no expenditure that would meet with the hearty approval of the people more than that for the purpose of making her school buildings safe beyond all possible doubt.

Although I have in this letter, frequently referred to statements which have been reported, as having been made by Mr. Hughes, I have taken the liberty of addressing you, for the reason that you, and not Mr. Hughes, are Inspector of School buildings of Toronto. Let Mr. Hughes indulge himself in such of his hobbies as fire drills, boring holes in school floors (down which pupils may stick their pencils, waste paper, etc., and, incidentally be enabled to see the smoke when a fire takes place); or teaching children to read; instructions to teachers, or military training in schools. But your duty, Mr. Bishop, is to provide primarily, well planned, safely constructed and adequately equipped school buildings in the City of Toronto.

In closing, I beg to inform you that I have in my possession, the letters quoted herein, as well as copies of codes from almost every large city on the continent, which without exception, demand a far superior type of construction and a much more adequate fire protection equipment than obtains in Toronto Schools. These are open to inspection in my office.

Yours truly,

Editor of "CONSTRUCTION."

"THE TORONTO GLOBE" ON SCHOOL BUILDING CONSTRUCTION AND EQUIPMENT

WE reproduce herewith two editorials from "THE TORONTO GLOBE" on the subject of the condition and equipment of Toronto school buildings, which are remarkable for the expression of directly opposite views on this subject.

The first editorial appeared in "THE TORONTO GLOBE" of March 12, 1908, while the Collinwood disaster was fresh in the minds of its readers. It will be noted in this editorial, that the "GLOBE" strongly contends for two-story buildings and fire-escapes, and expresses the opinion that the best drilled class might be thrown into an uncontrollable and fatal panic, in case of fire.

The second editorial appeared in the same paper on October 23, 1909, and severely criticizes "CONSTRUCTION" for its charges in connection with the unsafe condition of Toronto schools. In this editorial, after the horrible details of the Collinwood affair had worn off, it favors three-story school buildings and criticizes fire-escapes. It further states that Toronto schools are of "slow burning" construction, which is absolutely untrue. It also states that all recent school buildings erected, or extensively remodelled during the past few years, are equipped with absolutely fireproof basements, iron stairways, and fire-proof hallways, which is also untrue.

We are inclined to ask the reason for these diverse views on this matter, and would like to know whether it would not be explained by the fact that one of the editorial writers of the "GLOBE" is at present on the Building Committee of the School Board.

If the daily press, in the discussion of this vitally important question, would adhere to facts, and not permit their views on the matter to be prejudiced by political influences, and would consent to make plain to the taxpayers of the city of Toronto the true condition of their public school buildings, there is no reason why the Queen City should not have school structures that would compare favorably with those of any city on the continent.

SAFEGUARDING PUPILS AGAINST FIRE.

The awful destruction of child life by the fire in a school near Cleveland has created a profound impression among those who are in any way responsible for the protection of the children in public educational institutions. In large cities like Chicago, New York, and London, the authorities are already investigating the conditions and finding them very unsatisfactory. Many buildings are little better than firetraps, and very few of them are as well provided as they ought to be with the means of escape, especially in the third stories, where these are in use. The Minister of Education in this Province has acted with commendable promptitude in calling attention to this matter, and especially to the necessity for providing fire escapes as a means of exit from upper floors when the stairs are by flame or smoke made unavailable for this purpose.

It is a fair question whether the Education Department should not forbid the erection of three-story schools, and the locating of assembly rooms on any other than the ground floor. The danger of loss of life by fire is more than doubled for third-story pupils. They have two stairs to descend, thus allowing more time for flames to make headway or smoke to become more dense. A still greater danger arises from the intensification of the nervous condition of the pupils during their long descent, and the exhaustion of their physical strength, which is tried with sufficient severity at ordinary times. There is no justification for adding third stories to school buildings except economy, and this will never commend itself to public opinion when a holocaust takes place.

As three-story schools are now in existence it becomes necessary to make them as safe as may be found practicable. The efficiency of various kinds of fire escapes is a matter to be determined by experts, but there can never be any doubt as to the necessity for wide corridors, broad and easy stairs, fireproof basements, and outward-opening doors. There should be fire drill of the ordinary sort, and also practice in the use of outside fire escapes. The law requires the doors of all public buildings to be made to open outward, but during school hours they should be left unlocked and unbolted. Not only should basements be themselves absolutely fireproof, but they should contain no combustible rubbish. Even a slight smoke from burning material might throw the best-drilled class into an uncontrollable and fatal panic.

FIRE-PROOF SCHOOLS AND FIRE ESCAPES.

There can be no two opinions about the importance, not to say the necessity, of safeguard- short of criminal grossly to exaggerate the destruction by fire. It is quite legitimate to utter warnings against school buildings that are from this point of view really unsafe, but it is little short of criminal to grossly exaggerate the defects of buildings that are reasonably equipped with precautionary devices for the protection of the children who attend the public schools. The writer of a recent article in "Construction," a journal devoted to the interests of the building trade, is fairly chargeable with having done so.

One of the charges brought against the Toronto schools is that "there is not one in the whole city equipped with fire-proof stairways, fire-proof entrances, or fire escapes of any kind whatever." The fact is that all the schools either erected or extensively remodelled during the past few years are equipped with absolutely fire-proof basements, iron stairways, and fire-proof hallways. The process of fire-proofing the older basements has been going on for years, and with accelerated rapidity since the great fires at Cleveland and Montreal. All doors are made to swing outward, are left unfastened during school hours, and are so easily opened as to form no obstruction. There are no "fire-escapes," and it is not at all likely there will be any; they are treated with contempt by all disinterested students of school architecture. The only trustworthy fire-escapes are wide fire-proof halls with fire-proof stairways and numerous exits.

Fault is found with school buildings of three storeys. On this point there is room for differences of opinion, and the trend in the United States cities seems at present to be in favor of high and compact rather than low and wide-spread buildings. In the last resort it is probably a matter of expense. It is quite clear that if the people of Toronto wish to have two-storey school buildings they can have them by paying from one-third to one-half more for them than they do for buildings of three storeys. Whatever danger of fire may lie in the lower buildings, it is undoubtedly enhanced in the higher one; so far as fire is concerned, this is all that can be urged against the present practice.

The great danger in case of fire is from panic, and the best means of making pupils panic-proof is to accustom them to go out in a quiet and orderly march when a fire alarm is sounded. Any school building in Toronto may be emptied of pupils within two minutes, and as all buildings are now at the worst, "slow-burning," the danger from fire has been reduced almost to a minimum. There will be further improvements, no doubt, and reasonable discussion will hasten their progress, but exaggeration should be avoided.

DRAFTSMEN'S COMPETITION.

THE DECISION of the Standard Ideal Company, of Port Hope, to conduct a draftsman's competition for the purpose of securing a cover design for the new catalogue, illustrating "Alexandra Ware," is a most commendable one. Manufacturers of building materials and supplies, with which it is their aim to have architects and draftsmen familiar, expend considerable money in making their catalogues and literature attractive. This money, as a rule, goes into the hands of the artist employed by the engraver, and in no way contributes toward the promotion of any branch of the business in which these firms are interested.

The average architectural draftsman is more or less of an artist, and work of unusual merit, with a touch of originality, may be obtained through a competition such as the above mentioned firm is conducting. In this manner, not only can superior work be obtained, but the competition in itself, if properly conducted, through the co-operation of prominent members of the profession, tends to develop the practical side of art in the draftsman, and engenders in him an increased interest and love for the noble profession he is preparing himself for.

It is to be hoped that other Canadian institutions, whose goods are specified by Canadian architects, will follow this very commendable action on the part of the Standard Ideal Company. The conditions of the competition, together with the names of the assesors, are given in full in this issue on pages 34, 35, and 36.

RESTORATION OF ANCIENT TEMPLE.

THE TEMPLE OF KARNAK, the finest ancient temple in Egypt, is to be restored perfectly where it stands. This will be a new departure in Egyptian archaeology.

To discover new treasures in Egypt it is merely necessary to dig in the sand at any of a hundred different sites. The museums of the world have been filled with remains of early Egyptian civilization, until at last the Egyptian Government had to forbid the exporting of its monuments and collect all that were found in the great museum at Cairo.

This, however, seemed almost a desecration to those who really reverenced Egypt and wished to be able to behold it in all its pristine splendor. The scholars of England and France especially urged upon the Egyptian authorities the wisdom and necessity of keeping monumental treasures where they were discovered and reconstructing temples and statues in loco, wherever that was possible.

The Egypt Exploration Fund, has not only made some remarkable discoveries at the Temple of Deir-el-Bahri, at Thebes, but has begun the work of reconstructing the sacred structures there as completely as possible.

The greatest work of restoration, however, has been going on in the Temple of Amen, at Karnak, long admitted to be the most wonderful architectural monument in all Egypt. The reconstruction of this temple has been made absolutely necessary by the calamity of 1889, when as the result of an earthquake eleven of the great columns of this temple went crashing to the ground.

The great Hypostyle Hall, in which Seti I. and Rameses II. raised one hundred and thirty-four columns seventy feet high, was in imminent danger, for much of the foundation had been eaten away, and the arches between the columns having fallen there was nothing to keep them in position, so that at the least shock they crashed to earth, breaking the magnificent capitals to bits and often being broken into pieces themselves. Some were only leaning over like the famous "leaning column," forty feet tall, seven feet in diameter, and weighing 80,000 pounds, which was held in position by a broken base, as it leaned on an adjoining column. It was astonishing that it kept its place. When in 1889 eleven of the columns of this hall fell the scholars wondered that any remained standing. It appeared that one column in falling against another, and it in turn against the others, so that eleven were prostrated.

This catastrophe awakened the scientists to the danger of the utter destruction of the greatest ancient building in the world.

The task of the reconstructors was a most difficult one. Here were columns, capitals and architraves weighing from five to forty tons to be put back into place. M. George Legrain, who was in charge of the work, began in December, 1899, and in the first campaign took down five of the leaning columns, piece by piece. In the second campaign of 1901 he cleared the ground of the fragments of the eleven fallen columns and began the rebuilding. The defect of the foundation was remedied by making solid bases of masonry for each column, and then they were put back into place.

Each column was connected with the one next to it, and by 1903, after Lord Cromer had laid the first stones, the eleven columns had been raised again to the height of twenty feet.

The pieces were cemented into place, and all was as before the crash.

EXPERIMENTS CARRIED ON during the past four years at Glasgow (Scotland) with motor driven and motor operated fire apparatus, have resulted so satisfactorily from every point of view that it is the intention to gradually substitute vehicles of this character for the present equipment, so that ultimately horse and steam power will be entirely dispensed with. At the present time in the central fire district of Glasgow, there are three petrol engines, each having four cylinders and capable of developing 50 to 55 horse power. These with their full equipment and ten men each, easily maintain a speed of 30 miles an hour. The pumps are geared to the petrol motors by means of steel shafts running down the centers of the vehicles, having spur wheels engaging with steel pinions on the first motion shafts of the gear boxes. These pinions can be thrown in and out of gear by hand levers operated from the sides of the machines, enabling the pumps to be instantly put to work on arrival at a fire. The department has also in use a motor first-aid machine to carry an officer and twelve men, with 650 yards of 2⅜-inch canvas hose, 18 feet of scaling ladder, in two lengths, ambulance box on rear foot-board, and all necessary tools and gear; while another feature is a motor fire escape which carries an extension ladder of 85 feet on a turntable. When travelling the machine is 26 feet long, 10 feet high, weighs 6½ tons, and is driven by a 4-cylinder, 30 to 40 horse power petrol motor with battery and magneto ignition.

WORK ON THE GREAT WIRELESS STATION at Coltano, Italy, which is of the Marconi ultra potent type, and will be the greatest station of its kind yet attempted, is progressing rapidly. Already the 800 horsepower generating machines are in place, and the sixteen towers for the two radiators are ready for the final connections. When completed the station will communicate with Cape Cod in the United States, with Glace Bay in Canada, and with other similar stations which Italy has erected in the Erythrea colony, in Italian Somaliland, in the Argentine Republic, and another South American state.

Hotel Mossop, Toronto, which, both externally and internally, is of absolute fireproof construction. It stands on a foundation of 18 concrete wells, carried down to bed-rock, the first foundation of its kind to be installed in Toronto. J. P. Hynes, Architect.

View of Office of Hotel Mossop, Toronto, as seen from the ladies' entrance showing the detail of marole counter and columns and rich ceiling cornice. J. P. Hynes, Architect.

TORONTO'S NEW FIREPROOF HOSTELRY.—An Interesting Eight Storey Structure in Which Every Measure for Safety Has Been Provided—Built on a Narrow Site and Supported by a Foundation of 18 Concrete Wells.—Its Plan and Interior Scheme.

HOTEL MOSSOP, Toronto's most recent addition to the city's system of hostelries, aside from being one of the most thoroughly constructed fireproof buildings in the Dominion, is noteworthy for two other reason: one, because it represents the successful solution of a most difficult problem, that of erecting a modern hotel building on an extremely narrow site; and the other, because in design, and in the materials employed, it is a structure which is mainly a Canadian product.

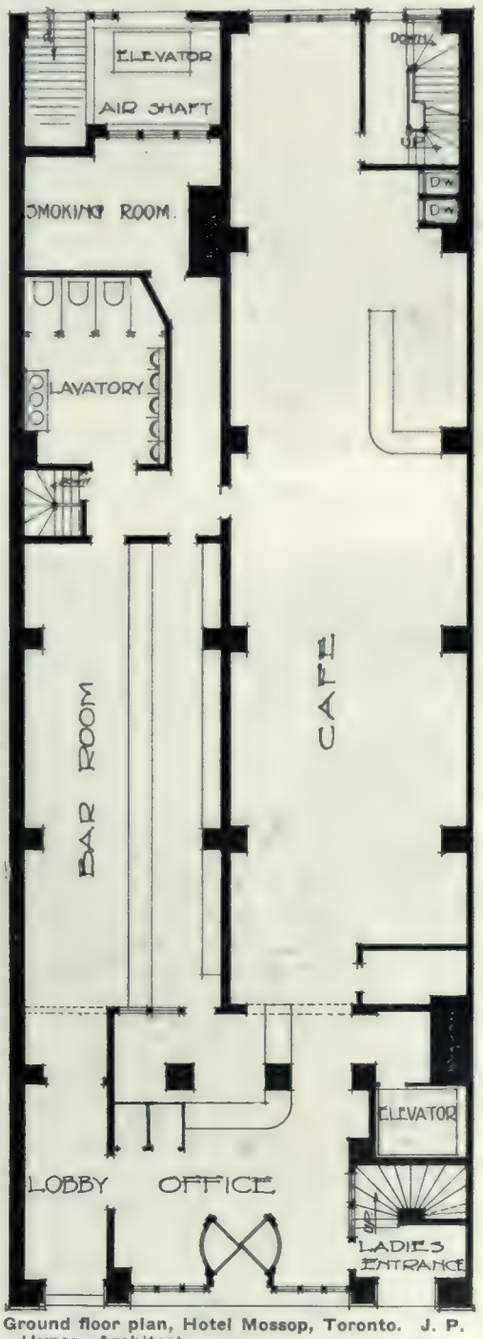
The building, which occupies a frontage of 40 feet by a depth of 112 feet, has been carried up to the height of eight stories, and is of steel frame construction with reinforced concrete and porous tile floors and porous tile partitions. It stands on a foundation of eighteen concrete wells running down to bed rock, the first foundation of its kind installed in Toronto. As a result of the thoroughness with which the building has been constructed from a fireproof standpoint, the owner has secured the lowest rate of insurance ever issued on a hotel building in Canada. All the steel work is fully protected at every point by non-combustible material; the stairways are of iron with slate treads; the elevators are enclosed in the most approved manner; and the doors and windows throughout are of metal and metal sash with extra heavy fireproof glass.

Externally, the architectural composition of the building derives its pleasing expression from simple, straight lines, rather than from any exuberance of decorative detail. The facade is of red pressed brick with cut stone piers and belt courses up to the third floor, and finished at the top story with arched opening which agreeably relieves the otherwise somewhat rigid and austere treatment of the windows. There are three distinct entrances leading from the street, the centre one of which, adorned by a wrought iron and opaque glass canopy, gives direct access to the hotel office and effects a complete separation of the ladies' entrance and the entrance used by the patrons of the bar.

While the narrowness of the lot, of necessity demanded a most compact plan in general, there is not, however, the slightest semblance of crowding of any character in the arrangement of the entire interior scheme. On the contrary, the space has been so advantageously utilized that the rooms in the main are of generous dimensions, and the character of the decorations and appointments are such as to render each interior particularly attractive and inviting.

The office, although of limited area, is so compactly arranged as to provide for a liberal public space, and direct access to any part of the hotel. It is an extremely rich interior, with mosaic floor and walls and counter of beautifully veined Missisquoi and Tennesee marbles, affecting a warm contrast; while three large square marble columns, evenly spaced, rise to an enriched beam dividing the staff ceiling done in variegated bronze, which, together with the mahogany woodwork and the brass lighting fixtures, aid materially in giving a pleasing touch of color to the general effect. To the right of the office, on entering, are the ladies' entrance and guests' elevator, while immediately to the rear is the entrance leading to the grill room, a spacious room with mosaic floor and with walls and panelled ceilings decorated in simple tints in oils. The grill itself—a large modern range—is situated at the far end of the room, while directly behind it are the dumb waiters and a stairway connecting with the main kitchen in the basement.

The bar-room, to which access is obtained either from the street or through the lobby at the left of the office on entering, in its rich mahogany counter and back-bar, dadoed walls and columns of Italian marble, and staff decorations in brass and aluminum leaf, displays the same harmony of detail as is found in the office and entrances. Beyond the bar-room proper, the space is taken up with a modern lavatory, smoking room, and service stairway and elevator.



Ground floor plan, Hotel Mossop, Toronto. J. P. Hynes, Architect.

In addition to the elevator service from the office, the ladies' entrance, which is also finished in marble, has a private stairway leading to the first floor, where the parlor, reception room, and large and small dining rooms are located. All these rooms, which are appropriately

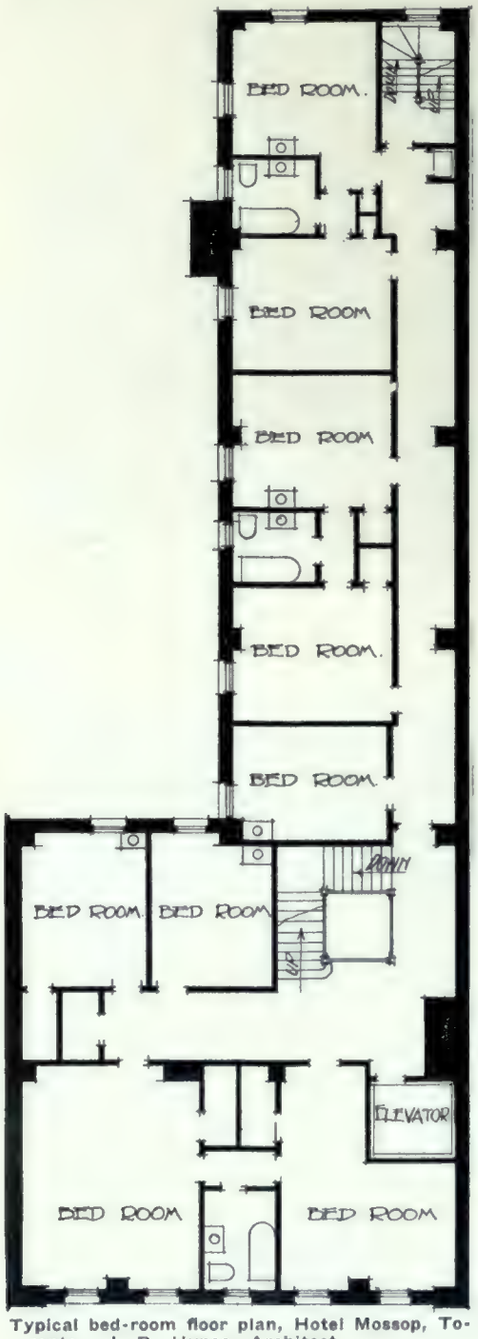
Grill Room, Hotel Mossop, Toronto. As seen from the Office. J. P. Hynes, Architect.

Main Dining Room, Hotel Mossop, Toronto. A rich interior with high panelled mahogany wainscotting, mosaic floor, and attractive ceiling scheme. J. P. Hynes, Architect.

Reception Rooms, Hotel Mossop, Toronto, showing the fireplace and general character of the decorations and furnishings. J. P. Hynes, Architect.

Interior of one of the bed-rooms, Hotel Mossop, Toronto, showing the pleasing wall scheme and the appropriateness of the furniture and hangings. J. P. Hynes, Architect.

furnished, have mosaic flooring and teko wall hanging, relieved by lightly colored staff decorations, with the exception of the main dining room, which has a high panelled mahogany wainscotting and electric ceiling lights enclosed in richly cut crystal pendants. Adjoining the dining rooms is a special kitchen for quick order, and also a serving room. The upper six floors of the building are entirely taken up by the bedrooms, the plan providing for nine rooms on each floor. The rooms adjoining the bathrooms are arranged in suites, and the other rooms have stationary basin with hot and cold water taps. In order to preclude the possibility of ad-



Typical bed-room floor plan, Hotel Mossop, Toronto. J. P. Hynes, Architect.

jacent buildings cutting off the outside light, the rooms, other than those placed at the front, are situated on a permanent court having an area approximately half as great as the width of the building. Each room is provided with individual telephone, which connect with the exchange in the hotel office, and the furnishings throughout are of a select character; the walls being decorated with imported papers, the ceiling tinted, and the carpets are laid on felt directly over the concrete floors.

The hardware throughout is in plain brass, the locks being of a special hotel corridor door type, inter-communicating doors and lavatory door locks, all master and grand master keyed.

The basement, in addition to the main kitchen, also contains the heating boilers, hot water heating apparatus, ice machine, laundry facilities, and also liquor and provision storage rooms.

The building, which cost $250,000, was designed and erected under the supervision of Architect J. P. Hynes, and the firms and contractors connected with the various branches of the work were: Brick and fireproof work, Jas. C. Claxton & Son; carpenter and wall work, Toronto Office and School Furniture Co.; ornamental iron work, Canadian Ornamental Iron Co.; hydraulic hoist, Parkin Eleveator Co.; elevators, Otis-Fensom Eleveator Co.; marble work, Hoidge Marble Co.; plastering, Hoidge & Son; tile work, Canada Glass, Mantels and Tiles, Ltd.; sheet metal work, roofing and ventilation, A. Matthews; refrigerators, John Hillock & Co.; bathroom fittings, Jas. Robertson Co.; coal chute, The John Inglis Co.; iron guards, Geo. B. Meadows Co.; safety treads, Mason Safety Treads Co.; carpet and furniture, John Kay Company, Ltd.; curtains and draperies, The Wm. A. Murray Company.

STEEL RAILWAY TIES are largely being substituted for those of wood in many of the leading industrial countries of the world. One reason for this is that their adoption is made imperative in certain localities to prevent the rapid destruction of forests. It is estimated that in Europe a mile of railway line requires about 2,500,000 cross-ties every 12 years, which means the cutting of an enormous quantity of forest trees. It is also estimated that the railways consume something like 40,000,000 ties per annum, and this consumption is said to be increasing at the rate of 3.000,000 a year. Another reason given for the utilization of steel ties is that investigation has shown that these ties when carefully constructed in order to meet the demands of modern railway traffic, are generally favored on account of their superior solidity and power of resistance. Nevertheless, their high price, certain defects in form, and the absence so far of a convenient and simple mode of attachment have prevented in a great measure their general adoption, although they are being more widely employed with each succeeding year. It is asserted, however, that the English manufacturers have on the market a tie "profile en rigole" (grooved section) that sells for $30 per ton, or less than the present cost of wooden ties. It is evident, therefore, that under these conditions the use of the steel tie would produce decided economical results for the railways. In the United States this type of tie is being subjected to a large number of experiments. The Pittsburg Gazette-Times states that the first test of steel ties by the traction lines of that city has led to a decision to place them on 1½ miles of track. If they are successful there, the entire system will be thus equipped. A steam railway operating into Pittsburg already has steel ties on five-eighths of its mileage and in a few years will have entirely replaced its wooden ties. The newspaper in question adds: The price of the steel ties is approximately $1.50 apiece, while wooden ties cost from 80 to 90 cents, but after treatment with creosote and the addition of heavy tie plates, the final cost of the wooden ties, it was explained, is nearer $1.25. And when they are worn out that is the end of them—they are burned up. But with the worn-out steel tie it is different. It can be sold as scrap and part of its original cost recovered. In the end, it is asserted, the steel tie is by far the cheaper. There is practically no wear out to it, while the wooden tie, if not treated with creosote, would last only a few years under heavy traffic conditions. In the olden days wooden ties were known to have lasted 20 years, but the conditions are very much changed now. There has been a demand all along for heavier ties to meet the increasing requirements in their use. The manufacturers naturally feel that the steel tie is the solution of the problem.

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Ivan S. Macdonald, Editor and Manager

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MONTREAL - - Board of Trade Building (Phone Main 285)
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ADVERTISEMENTS.—Changes of, or new, advertisements must reach the Head Office not later than the first of each month to ensure insertion. Advertising rates on application.

CORRESPONDENCE.—The Editor will be pleased to receive communications upon subjects of interest to the readers of this journal.

Vol. 3 Toronto, November, 1909 No. 1

Current Topics

A GIGANTIC EXPENDITURE, aggregating $133,000,000, for municipal improvements in Paris, has been proposed by the Prefect of the Seine to the Municipal Council. Of this sum it is proposed to spend $23,600,000 on water and sanitary works, and $6,600,000 on streets and parks.

* * *

OWING TO THE TRADE CRISIS which Berlin is undergoing at the present time, Germany's Capital offers but little in the way of encouragement to her architects and builders. A writer in a recent article states that the city is suffering from a glut of vacant buildings. It is estimated that 19,000 buildings are unoccupied. These include over 1,000 shops and 18,000 dwelling houses.

* * *

THE EXECUTIVE BOARD of the Architectural League of America announces that the Convention of that organization this year will be held at the Willard Hotel, Washington, D.C., December 11, 13, and 14, 1909. Further information can be obtained from the President, 1103 Union Trust Building, Detroit, Mich., or from the office of the Permanent Secretary, 729 15th Street, Washington, D.C.

* * *

A SUM OF $100,000 *PER ANNUM*, for a period of ten years, making a million in all, is to be granted from the federal funds to the civic commissioners of Ottawa, for the purpose of promoting improvements tending to beautify the city. The Government heretofore only allowed an annual grant of $10,000 for such work. With this additional appropriation, the commissioners will be enabled to carry out a number of projects which will greatly enhance Ottawa's reputation as one of the finest cities on the American continent.

THE TWO TUNNELS at Kicking Horse River, forming a part of the Canadian Pacific Railway right of way, near Field, B.C., are built on 10-deg. curves, and 1.6 per cent. grades. Together, they measure over a mile in length, and are part of an 8¼-mile cut-off, containing two loops, which allows a reduction of maximum grade from 4.4 to 2.2 per cent.

* * *

THE DISMANTLING OF FARADAY HALL at Cobourg, (Ont.) within the past couple of weeks, marks the passing away of another famous landmark to disappears in the on march of Canadian progress. The building was erected some thirty years ago as a science hall and museum in connection with the old Victoria University, and at one time was a noted seat of intellectual life.

* * *

PETERBORO'S GROWTH from a residential standpoint this year, has been most marked. It is estimated that no less than 125 new homes have so far been erected, and that the amounts expended in this respect will total $200,000 or over. A residential growth of this kind, means also a commercial and industrial growth; and if the increase in population is keeping pace with the development of new houses, the next census returns should indeed be gratifying.

* * *

A DELEGATION OF OFFICERS representing the Canadian Federation of Labor, recently visited Ottawa and laid before Sir Wilfrid Laurier, Hon. L. P. Brodeur and Hon. Mackenzie King, the resolution adopted at the annual meeting of the Federation, asking that the provisions of the Lemieux Act be extended. In addressing the delegation the Minister of Labor said that the widening of the scope of the Act should be brought about gradually and that it first might be made to apply to the building trade. The demand, however, would have to come from the trade itself. If such a request were made, he would be willing to recommend the extension of the act to his colleagues.

* * *

THE BUILDING REPORT OF HAMILTON for the year ending Oct. 31, 1909, as submitted by Inspector Anderson, shows that 730 permits entailing an expenditure of $1,547,425, were issued in the past twelve months, as compared with 623 permits totaling in value $1,531,182 in the preceding year. One of the important features of the report was the Inspector's recommendation that a special committee be appointed to revise the building by-law, so that the regulations would more adequately safeguard the interests of the city. The report also advised the inspection of a plumbing inspector whose duty will be to see that all work of this character is properly installed. It is expected that the new building code will provide most stringent regulations as regard plumbing and sanitary equipment for buildings.

* * *

CANADIAN CAPITALISTS from Toronto and Montreal, who have already expended many millions in electric railway enterprises in Mexico, says a recent press report, are preparing for the construction of a great dam across the Conclos River for the purpose of forming a reservoir which will give initial power for a 25,000 H.P. hydro-electric plant which they propose to install. In addition, the company will build a railroad 20 miles long connecting with the Mexican Central line and Santa Rosalia. We might add that it seems a long way from home for Canadians to invest their "shekels," particularly when the Dominion offers such a wealth of opportunities for industrial development and gives every assurance of the highest returns on every dollar thus expended. The investor in Canada at the present time, cannot help but become a modern day *Midas;* and outside capitalists are fast recognizing the great possibilities this country has before it.

UNUSUALLY RAPID EROSION has created a new 5-mile channel for the Sittang River, India. A ditch 6 ft. wide was dug in 1903 to drain land on a neck in a bend of the river. The tide and floods frequently overflowed the ditch and in receding rivulets toward it. In two years the ditch widened to 300 ft. The flood waters then found their way into the ditch from above and created a waterfall of 5 ft., which receded 1,000 ft. in a year, working finally into the upper river.

* * *

THE LOCATION OF THE FIRST SECTION of the Alberta and Great Waterway Railway has been completed and if favorable weather conditions continue it is expected to accomplish considerable construction work yet this year. The entire right of way to Fort McMurray will be cleared between now and spring, and a party of surveyors will be kept continually in the field until the location of the entire line is completed. Contracts for the ties and rails will be let shortly, so that they can be distributed along the road bed during the winter months.

* * *

WITH THE OFFICIAL OPENING of the new railroad thoroughfare over the River Sioule by the French Minister of Public Works, M. Viviani, the completion of the highest viaduct ever built, is brought to the attention of the engineering world. The viaduct is situated at Fades on the Orleans railway system in the Pay-de-Dome department, between the stations of Lepeyrouse and Volvic. It is 144¾ yards above the stream, and was built at a cost of $800,000, eight years being taken up with its construction. Previously the highest bridge over which a railroad passed was the Chokteik viaduct in Birmania, 139¾ yards high.

* * *

RATHER AN INTERESTING BRIDGE, said to have been built by Indians, is situated about 200 miles east of Prince Rupert, B.C., near the proposed line of the Grand Trunk Railway. It is built of round poles, fastened together with telegraph wire and wooden pins, the floor being the only part where nails are used to any extent. No two joints of the structure are made alike, but it seems, nevertheless, to do the work required of it, that of providing means of travel for pack trains to cross Bulkley River. Looking at it from a distance, it seems to be nothing but a conglomeration of poles and wire stuck together, with no particular reason for its not falling; the floor is very uneven, and the joints of the different members are made by lapping and binding them with wire. But a closer inspection show that the party who built it had a pretty good idea of engineering, for the bridge is an ingenious combination of cantilever and suspension construction.

* * *

NEW YORK'S MILLIONAIRE PLAYHOUSE, as the gorgeously appointed "New Theatre" just completed at Central Park west and 62nd street is known, was opened to the public on the night of November 8. From the outside it looks more like a Greek temple or an art museum than the particular style one is accustomed to see in structures of this kind. On the interior the color scheme throughout is driftwood and gold, relieved by a touch of cerise in tapestry and hangings, while in the panels forming the ceiling of the foyer are two magnificent oil paintings, presented by Wm. K. Vanderbilt, and taken from his own ballroom walls. The playhouse is intended to promote and elevate the legitimate drama, and its erection was made possible by a fund subscribed to by wealthy New Yorkers. E. H. Sothern and Julia Marlowe, at the head of a notable array of stars, presenting Shakespeare's "Anthony and Cleopatra," had the honor of being the first to appear before the footlights. The theatre is the finest and most costly playhouse in America.

MACHINERY IMPORTED into the Transvaal during the first quarter of 1909 amounted in value to $1,820,000, an increase of $344,648 when compared with the amount for the corresponding period of 1908. Evidently a good market in this respect will be found there for some time to come, especially in view of the fact that the government has made the first survey and completed preliminary arrangements for the extension of the railway from Pietersburg to the copper fields at Mesina, 200 miles to the north, with an ultimate continuation across the Limpopo into Rhodesia. The whole district through which the railway will run is rich in mineral resources and agricultural possibilities, and the construction of the line, which is to be proceeded with forthwith, will mark an important epoch in Transvaal development.

* * *

A STEP CONDUCIVE TO PUBLIC SAFETY has been taken at Toronto in the form of an edict issued by the Police Department prohibiting the sale of standing room tickets at any of the local theatres. That the authorities intend to apply stringent measures to suppress the practice of crowding the aisles and the space back of the seats, is evidenced in the fact that two theatre managers were, subsequent to the time when the notice was served, fined for violating the order. Other cities in Canada where a similar evil exists should follow Toronto's example. It will be recalled that the great campaign of investigations throughout the country which followed the fatal Iroquois Theatre fire in Chicago a few years ago, pointed out that just such a condition was one of the greatest dangers which confronted most municipalities as regards their playhouse. A review of the existing conditions in a large number of Canadian cities shows that the drastic measures then adopted for the safety of the public, have been but feebly carried out. Another idea, suggested by Controller Geary, in connection with the new order of things in Toronto, which should be approved of by theatre managers and enforced by the authorities, is the throwing open of fire exits after each performance, and the encouraging of the public to use these openings, so that theatregoers may familiarize themselves with their location and the point of the street to which they lead.

* * *

COINCIDENT WITH THE WIDENING of the Richelieu River Channel at the port of St. John's, Quebec, other harbor improvements, including the construction of concrete wharves and the erection of a railway bridge, are being carried out in a vigorous manner. The river channel, according to the present plans, is to have a width of 300 feet, and a depth of 14 feet; but it will require several years to complete the dredging, the object being to extend the work 3 miles to St. Theresa Island, in which event 7 miles of the Chambly Canal, through which all the vessels plying the Richelieu River have to be towed, will no longer be used. This will be of great benefit to the commerce of the river, as it will materially reduce the cost of towage, only 5 miles of the present 12-mile canal then being required for navigation purposes. The immediate benefits to be derived from the work in its present state will be a considerable reduction of the annual spring inundation of farm lands bordering the banks of the river between this port and Lake Champlain. In addition to this work, the construction of concrete wharves is at present under way, and the Canadian Pacific Railway is replacing its old bridge, built on piles, with a modern one of concrete piers and steel superstructure, at an estimated cost of $200,000. The piers will be of sufficient width to accommodate a double track, the present bridge being single tracked.

Cathedral of St. John the Divine, now in course of construction, on Morningside Heights, New York City. An idea of its great size may be obtained by comparing it with the buildings in the immediate background. Work on the Cathedral was started fifteen years ago, and, when completed, it will accommodate ten thousand worshippers.

DOME OF ST. JOHN THE DIVINE.—Construction of Immense Vault Over Partially Completed New York Cathedral Wholly Without Precedent.—Built Without Falsework or Scaffolding 200 Ft. Above the Ground.—An Edifice Which Will Accommodate 10,000 Worshippers.

IF NOT THE ARCHITECTURE of the building itself, nor the vastness of its magnificent dimensions, then the construction of its immense dome alone serves to render the Cathedral of St. John the Divine, now in process of erection on Morningside Heights, New York City, a structure of absorbing general interest. It is the first great dome in the world built without either falsework or scaffolding, and its completion marks the successful carrying out of a stupendous and daring work, which in method of construction has upset all existing theories in engineering of this kind, and excited the wonder of the architectural and engineering fraternities and the lay public alike.

This mighty vault, which rises above the centre of the structure at a distance of 200 feet from the cathedral floor, was built bit by bit over an area of absolute space. When Rafael Guastivino, Jr., began preparations for the work, builders called the undertaking visionary and foolhardy, wholly without precedent, and impossible of accomplishment. Experts were extremely dubious as to its outcome, and it was predicted that the dome was sure to collapse, carrying death and disaster in its wake, for not only would it have to support the weight of the workmen as the work progressed, but the heavy material required each day. Mr. La Farge, the architect, and Mr. Parson, the engineer of the building, alone showed their faith in Mr. Guastivino's ability to erect the massive structure without the aid of supports of any kind.

The entire dome consists of ordinary thin, flat terra cotta tile, 6 x 12 inches, and an inch thick, laid according to a method of construction involving the cantilever principle. These tiles in size and shape are much like the bricks of the ancient Romans still to be seen in the walls of the little church near Canterbury. Beginning at the bottom course, the first six or seven rows of tile were laid one over the other breaking joints, in a special cement of plaster of paris. The next course, laid in Portland cement, was held in place by overlapping the tile below, and this process was repeated until the great dome was finished.

This particular method of dome building was invented by the elder Mr. Guastivino and has been extensively employed in public and monumental building in various parts of the country. It saves thousands of dollars by dispensing with costly false work and heavy staging for domes of such magnitude. But his son's startling audacity marks a new departure in this branch of industry, as never before has this method of construction been attempted on such a gigantic scale.

The dome springs from the four massive skeleton arches 62 feet square, of solid granite, rising 145 feet above the street, with a clear span of 85 feet. These arches will eventually carry the huge tower and spire, weighing millions of pounds, shooting above the dome and church 425 feet from the pavement.

The Cathedral itself, which when finished will cost ten

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Looking up into the immense dome. Cathedral of St. John the Divine, New York City, the construction of which, being carried out in defiance to all accepted theories of engineering of this kind, is entirely without precedent. It was built without either false work or scaffolding, and is the third largest dome in the world, being 135 feet in diameter, or 7 feet less than the dome of the Pantheon in Rome.

million dollars, has the extreme dimensions of 520 x 280 feet. Work on its construction was begun first fifteen years ago, and it is estimated that twenty years more will fully elapse before it is entirely finished. At present the walls and arches of the great tower, the choir and sanctuary have been completed. The four great arches form a square of about one hundred feet exactly under the dome, which rises from its four corners, already making a vast cathedral chamber to open into the two

Cathedral of St. John the Divine, New York City. View showing one of the huge buttresses, the massive arches, and the great dome which rises above the centre of the structure at a distance of 200 feet from the Cathedral floor.

hundred foot long nave and north and south transepts.

Like most cathedrals, St. John the Divine is in the form of a cross, and the dome which is 135 feet in diameter, is one of the four great domes of the world constructed of masonry. The Pantheon, in Rome, the largest, is 142 feet across; St. Peter's, 139, and the Duomo, at Florence, about the same. The Mosque of St. Sophia is about 115 feet, while the famous dome of St. Paul, in London, is only about 112 feet.

The most impressive feature of its construction is the extreme thinness of the dome shell, and its wonderful sustaining strength. Above the base of the dome, which will eventually bear a large share of the weight of the lofty spire, the thickness of the dome does not exceed seven and a half inches, and from that point upward toward the top it diminishes gradually to three and a half inches, which seems incredible when compared with the massiveness of the other masonry of the building. Compared with the ponderous walls of the Cathedral it seems but an eggshell.

"If the present dome were built by the usual method,"

View of dome and vaulting over retrochoir, Cathedral of St. John the Divine, showing the detail of Columns, arching and groin work.

The great arches and dome, as seen from the interior of St. John the Divine's Cathedral, New York City.

said Mr. Guastivino, "a ponderous scaffold and false work would have to be erected 160 feet high, which would entail great risk and expense in building, saying nothing for the subsequent work of removing it."

Viewing the four great arches, visible for miles around, the question naturally arises as to how it was possible to start the dome at the corners formed by this juncture of the arches and carry it up so as to form a hemisphere the base of which is some one hundred and ten feet above the ground, and this so exactly built that there would not be the variation of a fraction of an inch in any part of the dome out of the true sphere. It is evident that no human eye, however trained, could outline a circle of such magnitude in imaginary curves and preserve more perfectly the lateral and upward curvature until finished at the crown.

To insure a smooth and perfect curvature at all points it was necessary at the beginning to establish a centre point from which to work, which would coincide exactly with the focal spot 'up in the blue sky,' as some of the engineers expressed it.

Anchors composed of steel pins were driven in the central point of the top of each of the four great arches and a quarter inch steel cable was thrown from each pin and fastened to a steel plate below, this plate being four inches square, with a hole drilled in each corner. This plate had in its centre a hook with turn-buckle adjustment, to which a fifth cable was attached acting as a guy to hold the point rigid.

When all was ready the men on top of the arches hoisted up the plate to the level of the imaginary centre of the great dome to be built. This imaginary centre was accurately determined by the engineer with instruments, which established the true centre of the dome. A lead of 800 pounds was fastened to the lower end of the fifth cable, suspended from the centre of the plate, hanging like a plumb line to the centre of the floor of the Cathedral, a hundred feet below, to maintain it in true position.

The eye of the hook extending through the plate constituted the centre of the dome. By stretching heavy steel tapes, marking half of the diameter of the dome,

(Continued on page 70.)

King Edward School, Winnipeg, erected in 1908, at a cost of $63,000. One of the first structures to be built in accordance with the comprehensive scheme outlined in 1907, to the Board of Education, by Commissioner of School Buildings, Mr. J. B. Mitchell, to provide adequate accommodations for educational work, and to bring the school buildings in general up to a standard of sound and safe construction.

Lord Selkirk School. Another of Winnipeg's new school buildings. This structure was built simultaneously to the King Edward School, and cost $53,000. The walls of both buildings are lined with hollow tile, to which the plaster is directly applied.

WINNIPEG'S SCHOOL BUILDING.—Commendable Enterprise of Western Metropolis in Providing Modernly Equipped Structures for Educational Work.—Expenditures in 1908 Alone Total $333,802. Several New Buildings Now in Process of Erection.

Mr. J. B. Mitchell, Commissioner of School Buildings, Winnipeg.

THERE IS NO CITY on the American continent that has shown a more liberal spirit in its diligent efforts to provide the best possible accommodation in public school training, and we are safe in saying that there is no city in Canada which has been as free in its expenditures to provide modern courses of training, competent teachers, safe and comfortable school buildings and and the best modern equipment, as has Winnipeg.

On the other hand, the problem of elementary education, as represented in the West, is one of a much more difficult solution than that with which our Eastern cities are confronted. The vast influx of settlers from Europe has rendered Winnipeg a city of many languages. These new citizens invariably have large families, and the West that is to be will, to a great extent, be influenced in its development by the character of men the West makes from these little urchins, most of whom, when they enter the public school, cannot speak the English language. Some extent of the difficulties to be encountered by the Winnipeg school authorities, may be realized from the fact that there are from fifteen to twenty nationalities represented in some schools. They are bright little folk, eager and quick to learn. The West prizes every one, and it rests with the school authorities to make stout, useful Canadian citizens of them all.

There is no race suicide in Winnipeg. Most of the people who have gone West are young. They have large families, and there is a strong prevailing sentiment that nothing is too good for the youngsters, it matters not what the cost. This most commendable attitude toward expenditures for the building and maintenance of their public schools, is directly the opposite of that assumed by the taxpayers of most of our Eastern cities, who quibble over every detail of expenditure called for in public school estimates. Property owners and their representatives in most of the Ontario cities and towns, have so brow beaten those in whose charge the erection and equipment of public school buildings has been placed, that, although the condition of many of the Ontario schools are far below what might be termed a reasonably decent standard, is well known to them, they have become too timid to ask for even those improvements that are essential to the safety and comfort of the children.

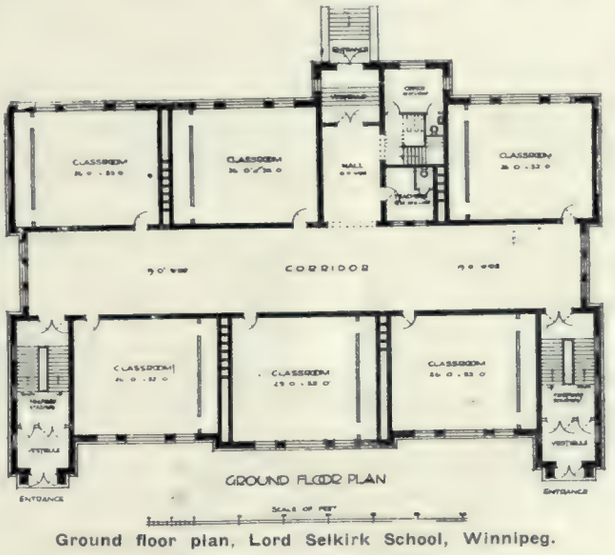
The citizens of Winnipeg have shouldered their responsibilities with that true Western spirit, and, despite the extremely high prices they are forced to pay for materials and equipment, they have to-day, generally speaking, the best constructed and the best equipped school buildings of any large city in Canada.

The fact that Winnipeg, during 1908, spent $333,802.48 in the erection of new buildings and additions and improvements of old structures, gives some idea of the extent to which the city is going, in its attempt to provide first-class buildings in its public schools. This is a fairly liberal expenditure on school buildings for a city of 100,000 population.

In order that Winnipeg schools should be abreast of the times in every particular, the School Board sent Mr. D. McIntyre, Superintendent of Schools, and Mr. J. B. Mitchell, commissioner of School Buildings, to study conditions under which every phase of school work was being carried on in the East and South. After having visited fifteen cities, in each of which they inspected an average of four schools, they came back full of ideas which the school authorities immediately proceeded to put into practice, with the result that their expenditures during 1908, for buildings, amounted to almost three hundred and fifty thousand dollars.

Mr. Mitchell, in his report, outlined generally what they had seen in the cities visited and went into the details as regards design, construction, fire protection, lighting and heating and ventilation quite thoroughly.

The portion of his report, however, that characterizes most truthfully the attitude of Winnipeg toward public school expenditures, were the opening and closing paragraphs. In opening, he gave briefly his general impression of what he had seen in the United States. He said:

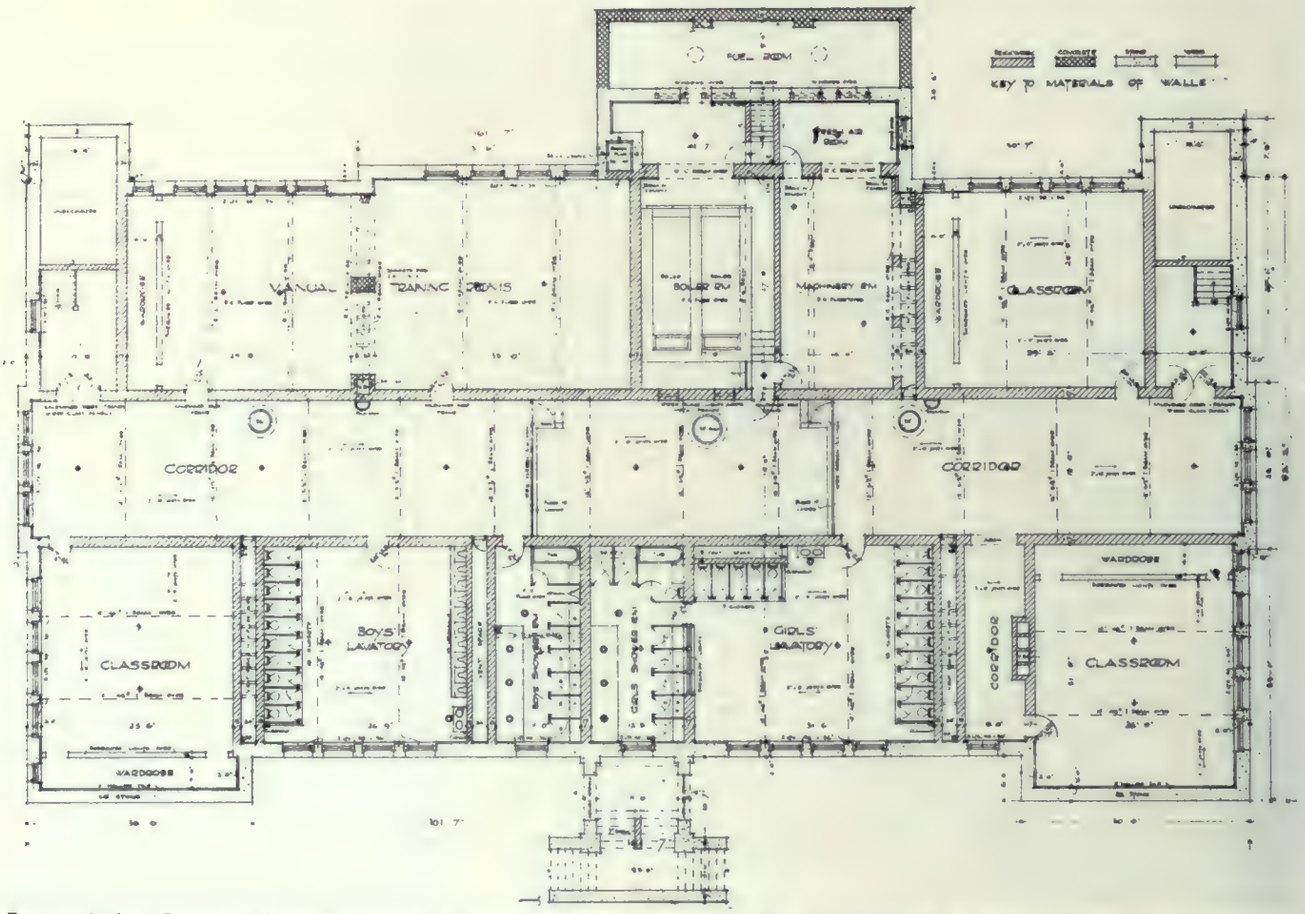


Ground floor plan, Lord Selkirk School, Winnipeg.

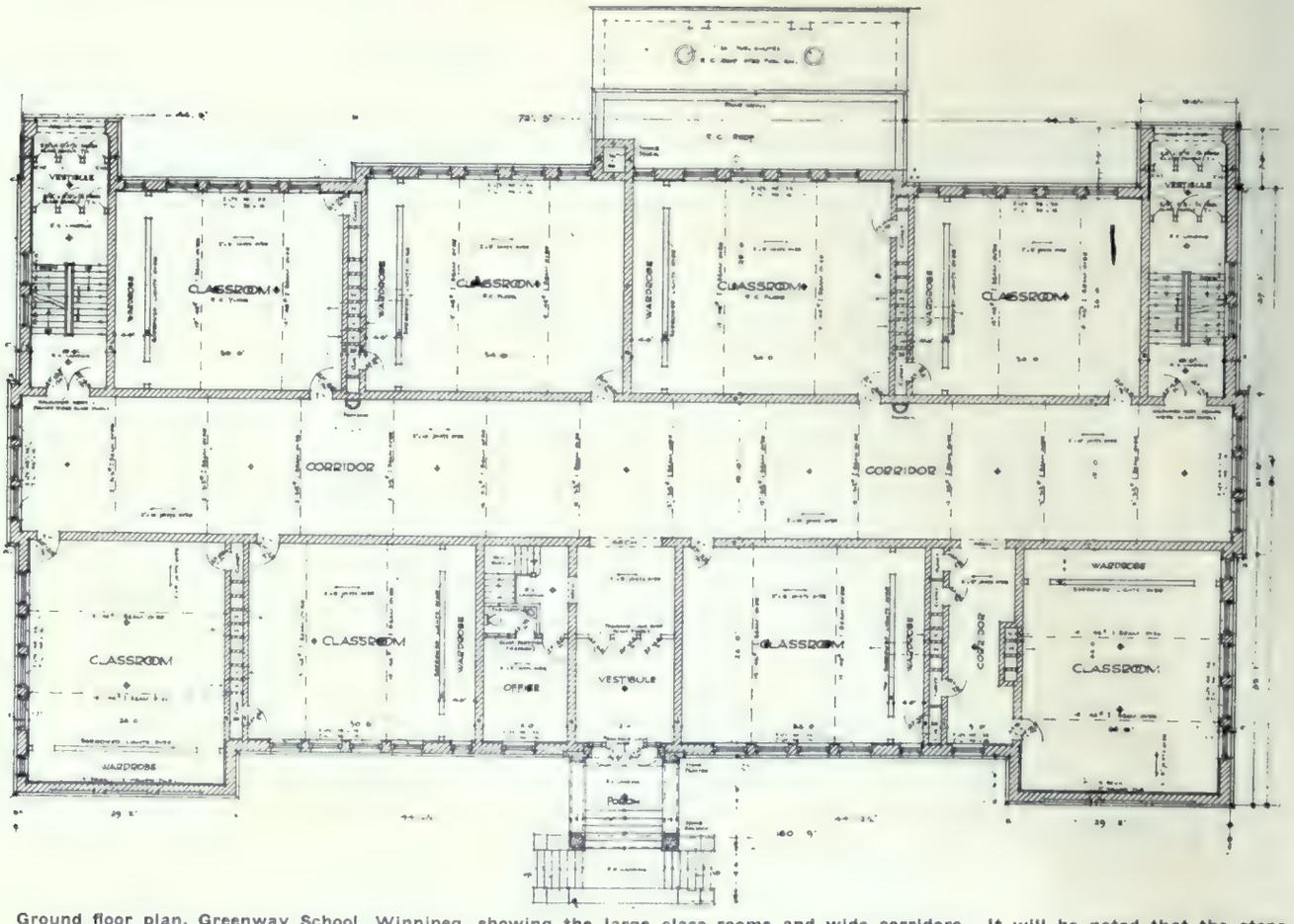
"The first impression irresistibly borne in upon my "mind is the evident pride which the average American "feels with regard to the schools, and the prominent, "the outstanding position which the public schools occupy "in the thought and life of the nation.

"The schools are viewed as a medium through which "those who in a few years are to guide the destiny and "shape the future of their country, will be trained even "to a higher degree than those who preceded them, to "use the best advantage, the physical, mental, and moral "gifts with which Providence has endowed them.

"These views lead to a cheerful and willing expendi- "ture for school purposes which, otherwise, might be



Basement plan, Greenway School, Winnipeg, a feature of which is the large floor space devoted to manual training room. The arrangement of the lavatory, providing absolute private compartments, is also noteworthy.



Ground floor plan, Greenway School, Winnipeg, showing the large class rooms and wide corridors. It will be noted that the steps leading to the grade line are placed outside of the building.

"objected to, and the result is seen in every department "of school work; buildings, first-class in every par- "ticular; style, character, appearance and conveni- "ence; every provision made for the proper heating "and ventilation of the rooms; the closet accommoda- "tion provided of the most sanitary type known; and a "liberal equipment for class rooms, manual training, and "technical work.

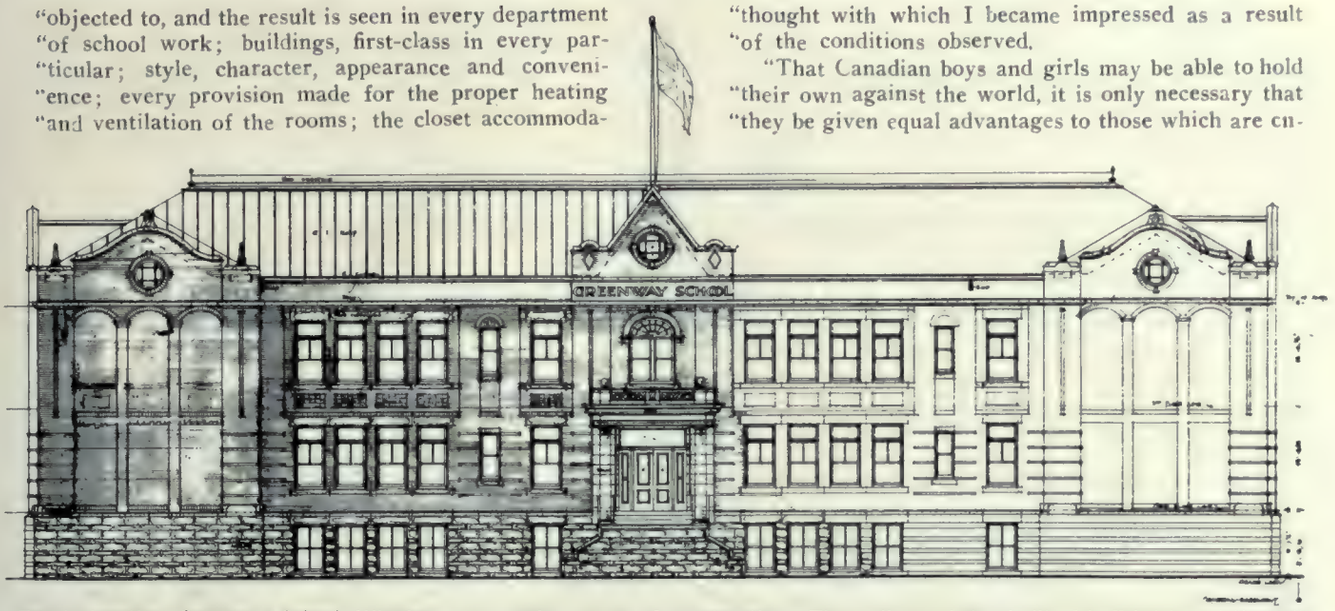
"A report from a committee from Cincinnati which "recently visited thirteen cities between the Mississippi "and Atlantic Coast, states that one-third of the funds "raised by taxation in those cities is devoted to educa- "tion, and no public money that is expended for other purposes gives such an adequate return."

It is the closing paragraphs, however, that are most interesting, in that they express in few words, the spirit that has been responsible for Winnipeg's superior school buildings. It is further interesting in that it expresses a sentiment, tempered with common sense and national pride, that should govern the work of every school board in Canada. The portion above referred to, was as follows:

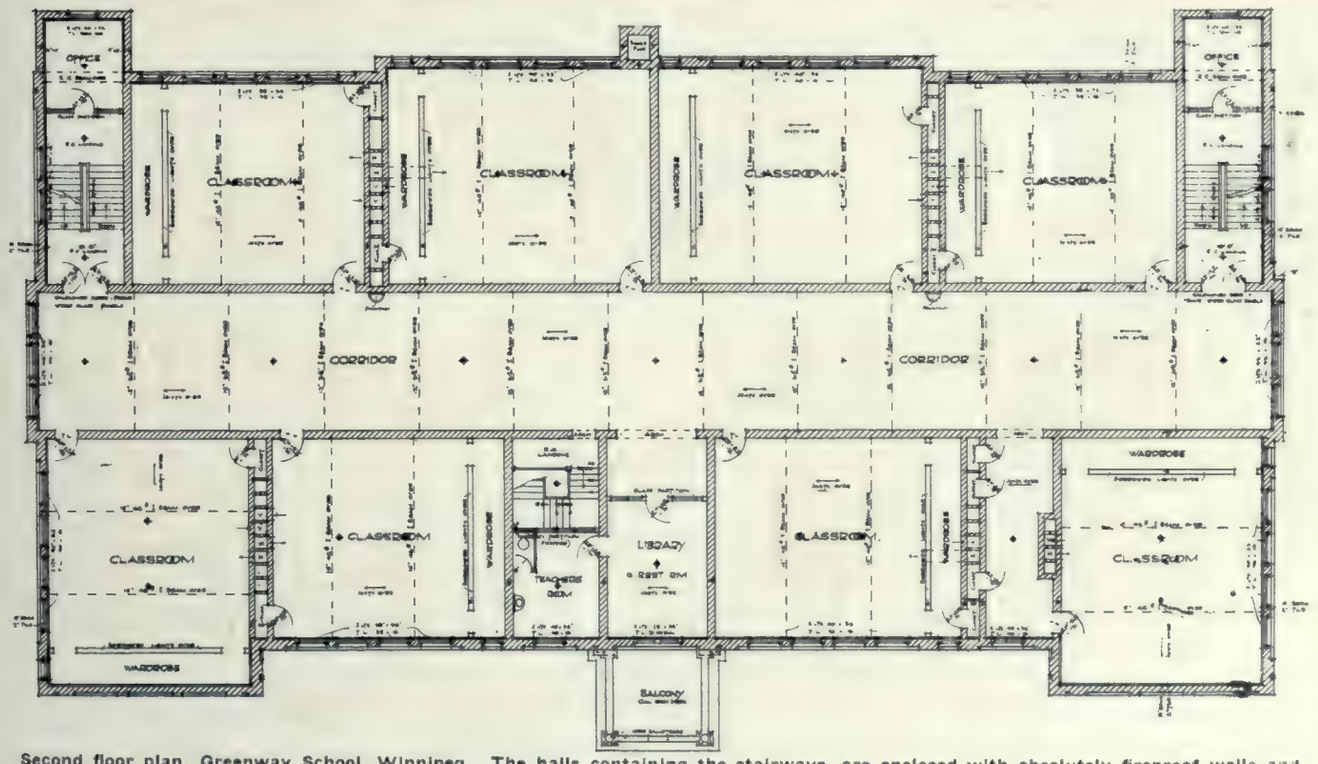
"In concluding this report, I wish to express the "thought with which I became impressed as a result "of the conditions observed.

"That Canadian boys and girls may be able to hold "their own against the world, it is only necessary that "they be given equal advantages to those which are en- "joyed by the children of any other nation, and that "they be allowed to study and do the work they are call- "ed upon to do while in school, under conditions as fav- "orable as those with whom in after life they may have "to compete.

"In keen competition, every advantage counts for "much, and remembering the efforts which are being "made throughout the United States to give the children "every facility which it is possible to do, it would seem "that the idea which should prevail in the minds of every "trustee on the school boards throughout Canada should "be: There is nothing too good for the children, and it "should be known, appreciated, and remembered by every "parent in this Dominion that education is more im- "portant than good streets, roads or sidewalks, and more "public money should be spent to thoroughly equip the "children for the battle of life, than is now being de- "voted for that purpose."

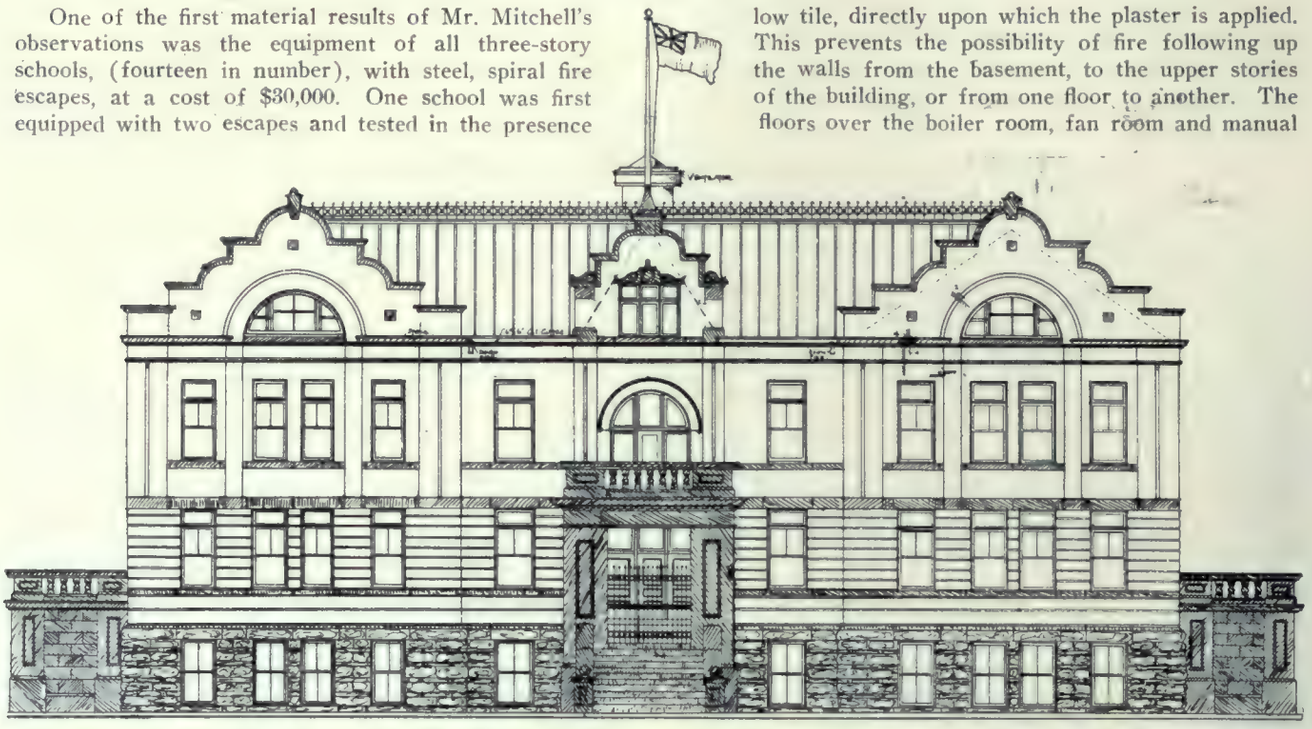


Front elevation, Greenway School, Winnipeg, now under course of construction. The walls are being built of buff brick and Tyndall stone, a combination of materials used in the exterior of all Winnipeg schools.



Second floor plan, Greenway School, Winnipeg. The halls containing the stairways, are enclosed with absolutely fireproof walls and doors, and are placed so as to assure egress in the event of any emergency.

One of the first material results of Mr. Mitchell's observations was the equipment of all three-story schools, (fourteen in number), with steel, spiral fire escapes, at a cost of $30,000. One school was first equipped with two escapes and tested in the presence of the members and officials of the school board; Fire Chief Buchannan; Building Inspector Rogers; Provincial Fire Inspectors Lindback and O'Connor, and several interested citizens. The test was unanimously agreed to be successful, and it was decided to equip all schools with two escapes each. Thus having provided their three-story schools with reasonably adequate means of protection against fire or panic, it was decided to limit the height of all schools to be erected, thereafter, to two stories, and to adopt in their construction to a greater extent than before, the use of fireproof materials.

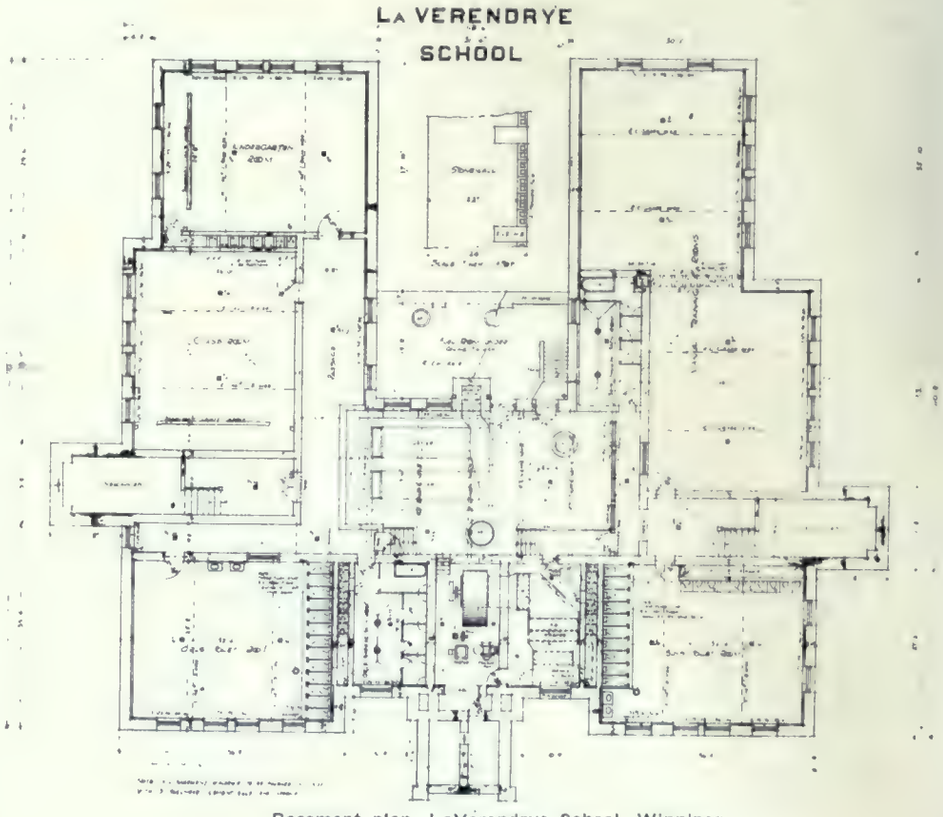


Front elevation, LaVerendrye School. Another Winnipeg structure now in process of erection, which demonstrated how thoroughly the campaign of providing the city with modern school buildings is being carried out.

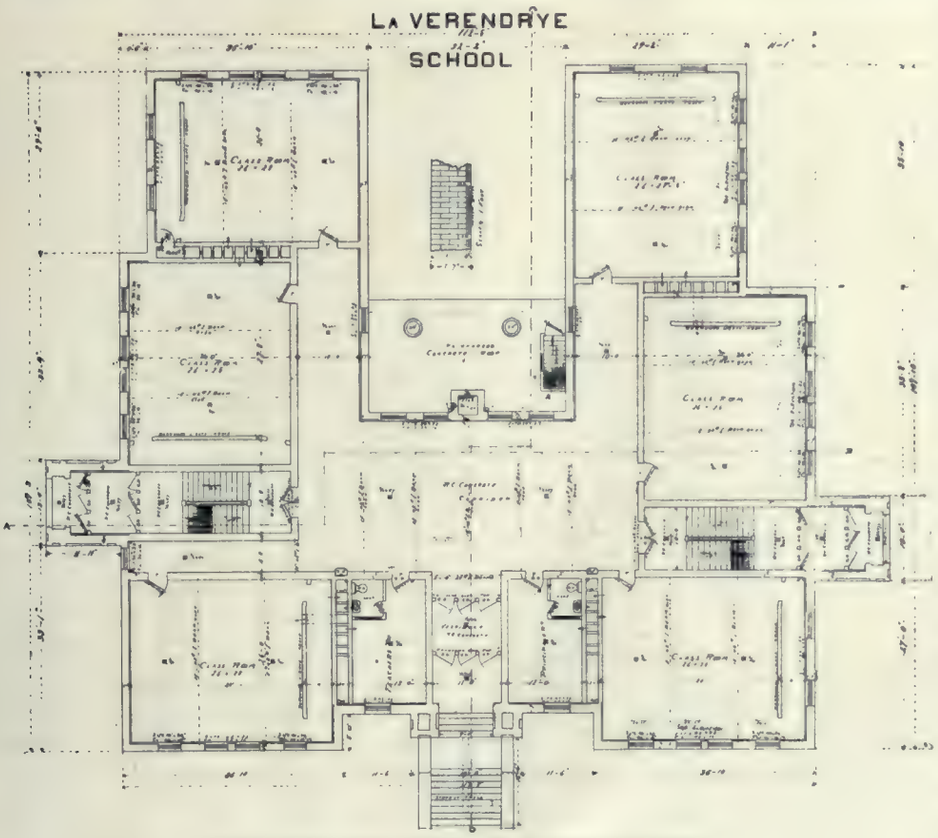
The Lord Selkirk and King Edward schools were built in 1908, at a cost, exclusive of heating and ventilating, of $59,000 and $63,300. These two structures were the first to be built after Mr. Mitchell's report had been given consideration by the school board, and they marked a distinct era in schoolhouse architecture in that city, and the features of their construction and their equipment clearly indicate the determination of the school authorities to utilize the latest ideas gathered from the experience of other cities with regard to protection against the consequences of fire or panic.

These structures are two stories in height, solidly constructed on concrete foundations, with Tyndall stone above the grade to the ground floor line, with brick walls above. A very commendable feature that serves as a very excellent fire protection, is the lining of the brick walls with hollow tile, directly upon which the plaster is applied. This prevents the possibility of fire following up the walls from the basement, to the upper stories of the building, or from one floor to another. The floors over the boiler room, fan room and manual training rooms, all of which are in the basement, are of reinforced concrete. The floors and stairways and landings throughout, are of reinforced concrete with iron stairs. Electric wires are laid in conduits and the roof covered with galvanized iron. Every precaution which experience might suggest, has been taken to lessen the danger of fire and make the schools as safe as possible.

In connection with each lavatory in the basement, the floors are tiled, shower baths were installed for the convenience of the pupils, a European idea which is fast gaining ground in America, as a recognized necessity.



Basement plan, LaVerendrye School, Winnipeg.



Ground floor plan, LaVerendrye School, Winnipeg.

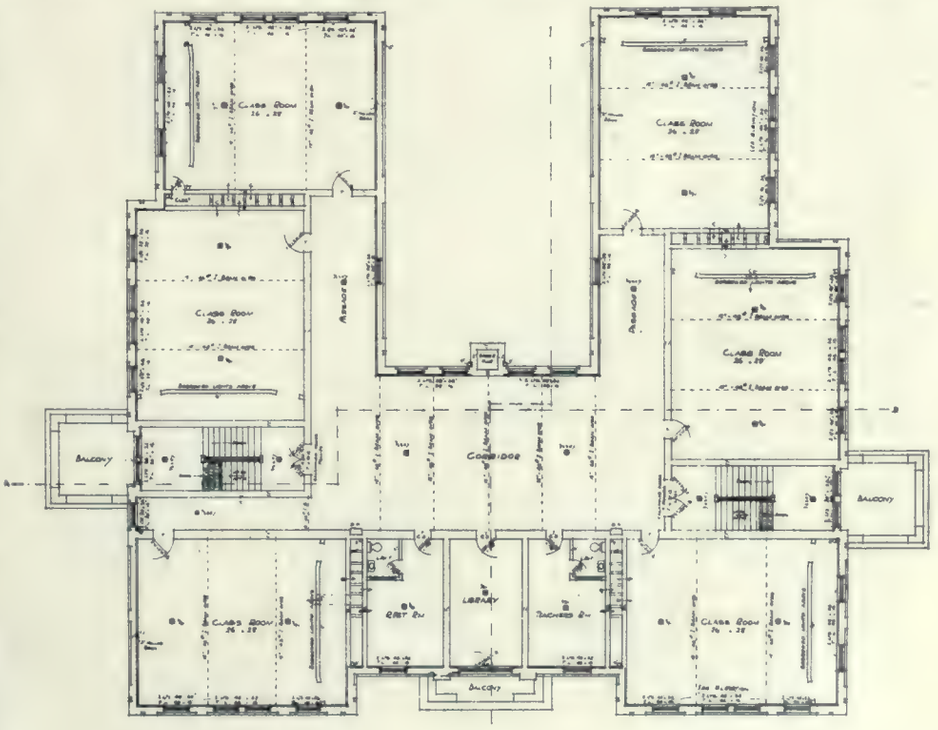
The heating and ventilating systems in these buildings are low pressure steam, supplied by two boilers with direct radiation in rooms and halls, supplemented by mechanical ventilation, fresh air passing through tempering and re-heating coils in basement and supplied to rooms by a fan driven by an electric motor, the heat being controlled by automatic temperature regulators.

While it will be seen that, architecturally, the designs of these buildings are very simple and unpretentious, the idea having been to eliminate everything in the way of useless and meaningless expenditure in superfluous decorative effects, but to give to the structure a quiet, simple dignity with an impressive appearance of massiveness and solidity. The plan of the Lord Selkirk school, which is shown herewith, gives a fair idea of the general lay-out of the two schools. It will be noted that the portion of the structure in which the fireproof stairs are located is entirely cut off from the main hall, as well as the rear entrance hall. The main corridor is 19 feet wide and the entrance halls and vestibules are 13 feet wide.

We also reproduce elevators and floor plans of two of the most recent schools, which, by the way, are at present under course of erection. They are known as the La Verendrye and Greenway schools, the former being erected in Crescentwood, and the latter at the corner of Livinice and Brunnell streets. The construction of these two buildings is very much the same as the King Edward and Lord Selkirk schools above described. The class rooms on the ground floor have a $\frac{7}{8}$ in. maple covering, laid. The reinforced concrete floor and the iron and concrete stairways have asphaltum treads.

Another fire protection which was recommended by the Board of Fire Underwriters, and which will gradually be installed in all the school buildings in Winnipeg, is the cutting off of the halls from the main building by Kalimined doors. These are fitted with door checks and springs. In all schools now erected in Winnipeg, metal ceilings are used throughout. Another innovation carried out in these last two schools, is the May-Ordway Fire Alarm System, which will ring the fire alarm at any time the temperature in any portion of the building rises above five degrees beyond what may be considered a normal temperature. This is, without question, one of the greatest advances towards protection against fire that has yet been made in school buildings. It is also the policy of the board, in connection with the city council, to have all large school buildings connected direct with the fire station, so that, when this automatic fire alarm rings, it will not only notify the teachers, but will also, at the same time, automatically give the alarm at the nearest fire station.

Some idea of the importance at present given to manual training, will be gained from a glance at the basement plans of these two school buildings. It will be



Second floor plan, LaVerendrye School, Winnipeg.

seen that a very large portion of the floor area, has been set aside for manual training classes.

In the La Verendrye school, it will be noted that all entrances lead directly to a central corridor. It will also be noticed that the manner in which the stairways are entirely cut off from this central hall, by fire walls, is a worthy feature. There are no great winding, massive wooden staircases leading down directly into the main corridor, up which the flames can shoot, and thus cut off safe exit from the building. It will be seen that there are no steps in the entrance halls, leading down from the ground floor to the grade line. These halls take the pupils directly out to the open, all steps to grade level being on the outside of the building.

The plan of the Greenway school is noteworthy for the features above mentioned in connection with the La Verendrye school, in addition to the very excellent arrangement of the entrance halls and vestibules. The corridors are wide, and the rooms are large and airy.

Architecturally, the buildings are very much better than what we usually find in the East. The combination of Tyndall stone and buff brick, which is used in the construction of all the schools in Winnipeg, produces a very excellent effect. In the La Verendrye school, Tyndall stone is used up to the ground floor line for the belt courses, and the entrance; and limestone is used from the ground floor line to the first floor line, the walls above which are constructed of local buff brick.

Mr. Mitchell, who is responsible for Winnipeg schools has been Commissioner of School Buildings in that city for sixteen years, and has, in that time, either made additions to, remodelled, or built, every school now in use in Winnipeg. Mr. J. B. Mitchell was born in Gananoque, Ont., in 1852, and was educated in both the Ontario public and high schools. He went West in 1874, after having studied drafting in Montreal, and was, for some time, connected with the North-west Mounted Police, after which he became engaged in the contracting business in Winnipeg. He was chairman of the building school committee for six years, and in 1893 was appointed to his present position.

Mr. Mitchell is a man very much interested in his work, and appears to be untiring in his efforts to provide Winnipeg with the best possible school buildings. There is no official in Winnipeg who holds, to a greater extent, the esteem and confidence of the taxpayers, than does Mr. Mitchell.

Apart from his official position, Mr. Mitchell is very prominent and popular in both the commercial and social circles of Winnipeg. He is at present president of the Canadian Club of Winnipeg, and is vice-president of the Associated Canadian Clubs, which was organized recently at a meeting in Montreal. Mr. Mitchell is a true, patriotic Canadian, who fully appreciates the responsibilities that rest upon the shoulders of our present day public officials, and he is one of the many men you find in the West, who will stoutly put their shoulder to the wheel, in shaping the destiny of the "West that is to be."

DOME OF ST. JOHN THE DIVINE.—Continued from Page 63.

the exact position where every tile should be laid was instantly shown. A piece of board, shaped exactly as a segment of the great circle, attached to these tapes enables the masons to place each tile exactly where it should go, and thus the dome progresses symmetrically and mathematically exact. No wonder in gazing at this impressive work that one becomes conscious of Emerson's words that, "The hand that rounded Peter's dome wrought in sad sincerity."

One great obstacle encountered by the men working aloft was the heavy wind prevalent on the exposed heights of Morningside Park when the work was under way. More than once it seemed as if everything, men, mortar and tiles, would be swept from the roof.

One almost regrets, standing under that impressive vault high in the heavens, to learn that the central portion is to be removed when the great spire, rising from another dome a hundred feet above the present one, is finished. Those who have stood under the dome of the Capitol at Washington may recall that above the turn of the first arch rises a series of columns forming a sort of circular portico or colonnade, and high above all is the dome proper. A somewhat similar effect is to be carried out in the Cathedral.

The present dome, however, while built for the time being only, serves a double purpose—first, it encloses the great space a hundred feet square under the dome, so that services can soon be held in the Cathedral, and practically it will serve for every church purpose, and the work of putting in the upper columns or piers between the two domes and building the spire itself will proceed without interfering with worship or imperilling the life of any one in the Cathedral below.

When all is finished about half of the present dome will be removed and a cornice put on, projecting out a little under the base of the pillars supporting the lofty dome—the true dome—under the great spire more than four hundred feet above the street. Then will appear a beautiful colonnaded space, probably with open galleries around, like the vaulted whispering gallery of St. Paul's. When completed the great structure will extend nearly to the street in front, with room for ten thousand worshippers.

THE EFFECT OF WIND ON VENTILATION and heating formed the subject of a highly interesting paper read by Mr. H. W. Whitten, before the summer meeting of the American Society of Heating and Ventilating Engineers. The most apparent effect, Mr. Whitten states is the inleakage of air through crevices while the least apparent, but nevertheless important effect, is the outflow of warmed air through crevices in the sheltered side of the building, caused by an area of low pressure in the lee of the building, which acts as a partial vacuum. As the pressure of the inside warm air is naturally outward, the combination of this pressure with the partial vacuum outside produces a greater loss than is sustained on account of inleakage, assuming the aggregate amount of crevices on each side to be equal. The author then describes a few typical tests made by him and others in this connection, some of which are given here. A room situated on the east side of a rectangular school building, with a northwest wind blowing 14.5 to 15 m.p.h. and an outside temperature of 33 deg., showed an average rate of supply velocity of 817 ft. per minute and a vent velocity of 340 ft. per minute, giving a loss of 477 ft. per minute. The inlet was 8 ft. above the floor and the outlet at the floor, both being of equal size and on side of the room opposite the windows. An air test showed 10 parts of carbon dioxide in 10,000. A test of another school building with wind at 18 m.p.h. and outside temperature of 30 deg., the building being heated and ventilated by the gravity indirect system, showed an average loss of 20 per cent. from the supply ducts and an addition of 60 per cent. to the vent velocity in rooms on the windward side. Rooms on the leeward side of the building showed an addition of 30 per cent. to the supply velocity and a reduction of 62 per cent. of the vent velocity. Another test was performed in a high-school building. After shutting down the fan the supply ducts were closed in the rooms on the exposed side of the building and, with all doors and windows closed, it was found that as much air was being removed from the vent ducts as the fan system was supposed to supply. During this test the outside wind was of moderate velocity.

The new Harbor at Dover, as seen from the English Channel, the greatest artificial enclosure for war vessels and merchantmen over constructed. Some idea of the magnitude of the undertaking may be gathered from the fact that the outer masonry walls alone measure 2½ miles in length, and necessitated in their construction over a quarter of a million barrels of Portland cement.

GREAT ADMIRALTY HARBOUR AT DOVER COMPLETED.—World's Largest Artificial Enclosure for Vessels Formally Opened by Prince of Wales.—A Stupendous Undertaking Presenting Many Engineering Difficulties Which Took Eleven Years to Build.—Outer Sea-walls Alone Measure Two-and-a-half Miles in Length. ∴ ∴

THE OPENING of the new Admiralty Harbor at Dover, England, on October 15, by the Prince of Wales, brings to the attention of the world the completion of one of the most gigantic engineering undertakings of modern times. This great artificial enclosure comprises a national harbor with a low water tide of 610 acres, together with a commercial harbor, boasting of a water area at low tide of 75 acres. In the former there is ample accommodation for a fleet of twenty-five first-class battleships, with the attendant smaller craft such as gunboats and destroyers.

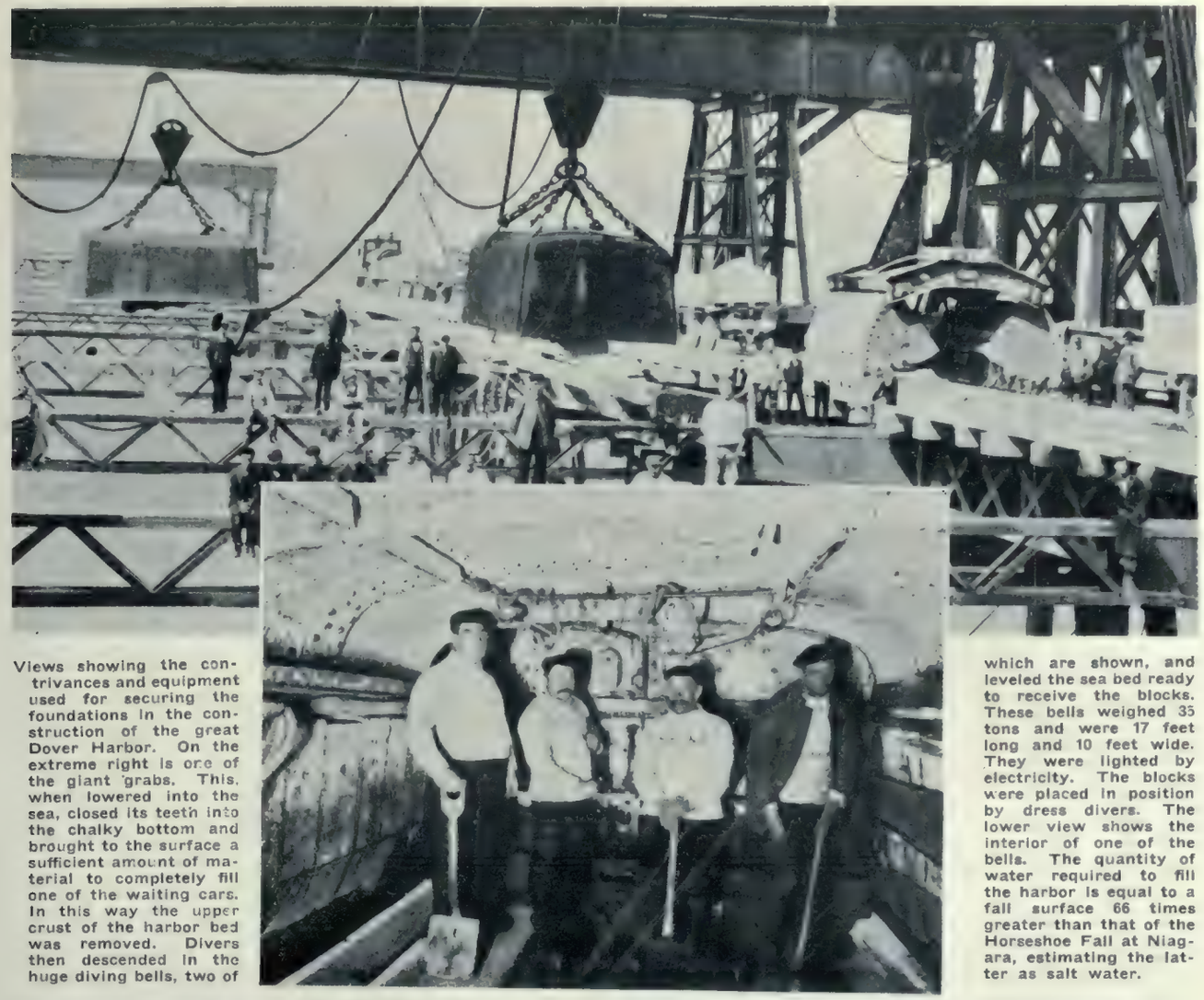
Built in the roughest part of the English Channel, and under conditions fraught with seemingly unsurmountable difficulties, the carrying out of the great project stands without a parallel in the annals of harbor construction. In order to accomplish the work, which involved a period of eleven years, it was necessary to bring huge piles, measuring 100 ft. in length and 20 in. square, from a distance of 13,000 miles. These piles were used to support the ponderous wooden staging, temporarily built, for the laying of the great concrete monoliths, which were placed only after thousands upon thousands of cubic yards of lime and chalk had been removed from the bottom of the channel, by giant grabs having a double row of formidable teeth, and the bed of the harbor leveled by men working in the largest diving balls ever used.

Some idea as to the immensity of this undertaking may be had from the fact that 66,000 massive concrete blocks, averaging in weight 35 tons each, together with 200,000 tons of granite, were required in the construction of the Admiralty Harbor alone. This masonry in itself is equal to nearly one-half the weight of the great Pyramid of Cheops, which is estimated at 6,316,000 tons. Compared with other monumental works, it would form two mammoth slabs 72¼ feet wide, 400 feet high, and 600 feet deep, with an additional slab of equal dimensions across the top, which would rise above and enclose on either side, the great cathedral of St. Paul's, London; while five of the 40 ton blocks up-ended and placed one on top of the other, would come up to the height of Cleopatra's Needle, and outweigh it by 22 tons. London's largest public grounds, Hyde Park, comprising 400 acres, would

High concrete monoliths, as they were assembled prior to being placed in the walls forming the arms of the great Dover Harbor. Sixty-five thousand blocks in all were used, averaging in weight 35 tons apiece. If placed end to end, they would extend 150 miles in length, and their total weight, together with the 200,000 tons of granite used, is equal to nearly one-half of the estimated weight of the great Pyramid of Cheops.

Admiralty Pier Extension of Dover Harbor, as it appeared in course of construction. The work on this extension consisted in carrying the old Admiralty Pier, which was 1,000 feet long, some 2,000 feet further out into the sea. It is the shortest of the three outer walls, the south breakwater, or centre wall, being 4,200 feet, and the east arm 3,320 feet.

One of the many difficulties contended with in building Dover Naval Harbor. The point at which the work was carried out is one of the roughest spots of water between England and France, being exposed to all seas from east to west. In order to place the massive concrete blocks, it was necessary to erect for temporary use a ponderous wooden staging, on huge piles of a special wood brought a distance of 13,000 miles.



Views showing the contrivances and equipment used for securing the foundations in the construction of the great Dover Harbor. On the extreme right is one of the giant grabs. This, when lowered into the sea, closed its teeth into the chalky bottom and brought to the surface a sufficient amount of material to completely fill one of the waiting cars. In this way the upper crust of the harbor bed was removed. Divers then descended in the huge diving bells, two of which are shown, and leveled the sea bed ready to receive the blocks. These bells weighed 35 tons and were 17 feet long and 10 feet wide. They were lighted by electricity. The blocks were placed in position by dress divers. The lower view shows the interior of one of the bells. The quantity of water required to fill the harbor is equal to a fall surface 66 times greater than that of the Horseshoe Fall at Niagara, estimating the latter as salt water.

Construction work on walls of the Admiralty Pier Extension of Dover Harbor, showing the masonry through frame work, as it rises above the surface. So accurately were the blocks set below the water that when the walls appeared above the surface, they were even and regularly laid. Below the water, the blocks were not cemented, but "joggled," that is, the cylindrical cavities left between them were filled in with concrete in bags, so as to prevent the possibility of any slight lateral movement under the shock of heavy storm waves. Above the surface, the blocks were joined together in the ordinary way.

fit nicely into the harbor and then admit of a channel large enough for a squadron of vessels on all four sides; while the quantity of water required to fill this great enclosure is estimated at 17 million tons, equal to a fall surface 66 times greater than that of the Horseshoe Falls at Niagara.

From time immemorial Dover has been an important strategic point, both naval and military. To say when it first became a fortified place would be difficult. It was certainly a stronghold in the days of the Saxons, for William the Conqueror hastened to possess it after he had consummated his victory at Hastings. The old fortress has been besieged over and over again, sometimes falling into the hands of the enemy and at others gallantly keeping them at bay. It fell to Stephen after a staunch resistance through treachery, but made a successful defence against French attack in 1216.

In the days of Queen Elizabeth, Sir Walter Raleigh called attention to the unique position of Dover, declaring that "no promontory, town, or haven in Christendom is so placed by nature and situation, both to gratify friends and annoy enemies, as this town of Dover. . . . Nor is there in the whole circuit of this famous isle any port, either in respect of security or of defence, or of traffic and intercourse, or rather of necessity, to be regarded than this town of Dover."

After reading this epistle Queen Elizabeth, we are told, with commendable enterprise, decided to restore and improve the harbor. The channel, which had previously been only 4 ft. deep, was extensively dredged and deepened. Successive sovereigns also gave their attention to Dover, and so things continued until it became desirable to transfer the balance of British naval strength from the Mediterranean to home waters and the North Sea. To put it bluntly, it was found expedient that the British fleet should lie near to its greatest rival in strength, Germany.

Hence it was desirable to erect a strong naval base in the English Channel at a point from which it could easily strike out into the North Sea. It was decided, therefore, to erect at Dover a great national harbor which would enclose at low tide a water area affording ample accommodation for a powerful naval fleet, and providing facilities and anchorage in the way of an inner harbor for merchantment and other vessels of high seas.

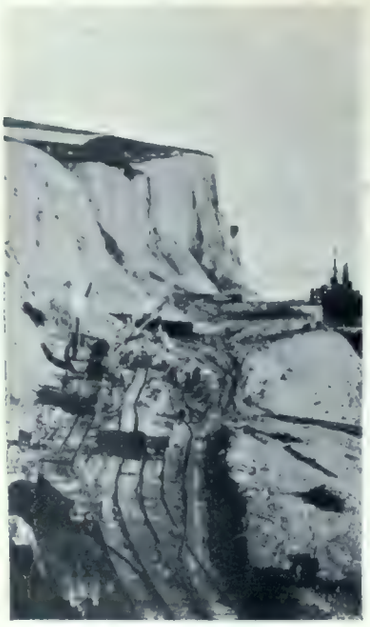
Operations were actively commenced in the summer of 1898, and after eleven years' work the great undertaking has been brought to a successful completion. The entire work was carried out by the famous firm of contractors, Messrs. S. Pearson & Sons, from the designs of the Admiralty engineers, Messrs. Coode, Son & Matthews. The harbor has been formed by the building of three huge arms or walls. The old Admiralty Pier, which boasted of a length of about 1,000 ft., has been extended some 2,000 ft., which forms the westward arm of the harbor. Then from the base of the tall cliffs, immediately below the old convict prison, a wall 3,320 ft. in length and known as the East Arm has been constructed. The third wall is the breakwater, 4,200 ft. in length, which has been erected some three-quarters of a mile from the shore and almost parallel with it.

One of the first things the builders did was to reclaim 21 acres of land to the east of the town, just below the cliffs, and convert this space into a huge brickyard and workshop, where the huge concrete blocks composing the sea walls were made. Before a single stone could be laid on the ocean-bed strong staging had to be built out into the water. This staging stood far above high-water mark and measured over 100 ft. from top to bottom, being higher, in fact, than an ordinary eight-story structure. Some of the huge piles which carried the wooden staging were 100 ft. long, 20 in. square, and weighed about 10

(*Concluded on Page* 84).

View showing three stages of the work in the construction of Dover Harbor. The carrying out of this stupendous undertaking necessitated a most thorough working organization and a vastly greater array of machinery equipment than had ever before been assembled in the execution of any similar project. The view showing the construction of the Admiralty Pier, which in itself is 3,000 feet long, gives some idea of the miles of trackage alone that was required. Preparation of the site for making the concrete blocks is seen in the centre view.

BUILDING THE ADMIRALTY PIER.



INITIAL WORK UNDER THE CHALK CLIFFS.

BLOCKS WAITING TO BE PLACED IN POSITION.

New Collegiate Institute which is now being built at Brantford, Ont., at a cost of $85,000. Chapman and McGiffin, Architects.

BRANTFORD NEW COLLEGIATE INSTITUTE.—School Building Now Under Construction Designed Along Model Lines.—Plan Provides for Large Assembly Hall, Gymnasium, and Accommodations for 500 Pupils.—All Corridors Fireproof, and Entrances So Placed as to Assure Safe Exit.

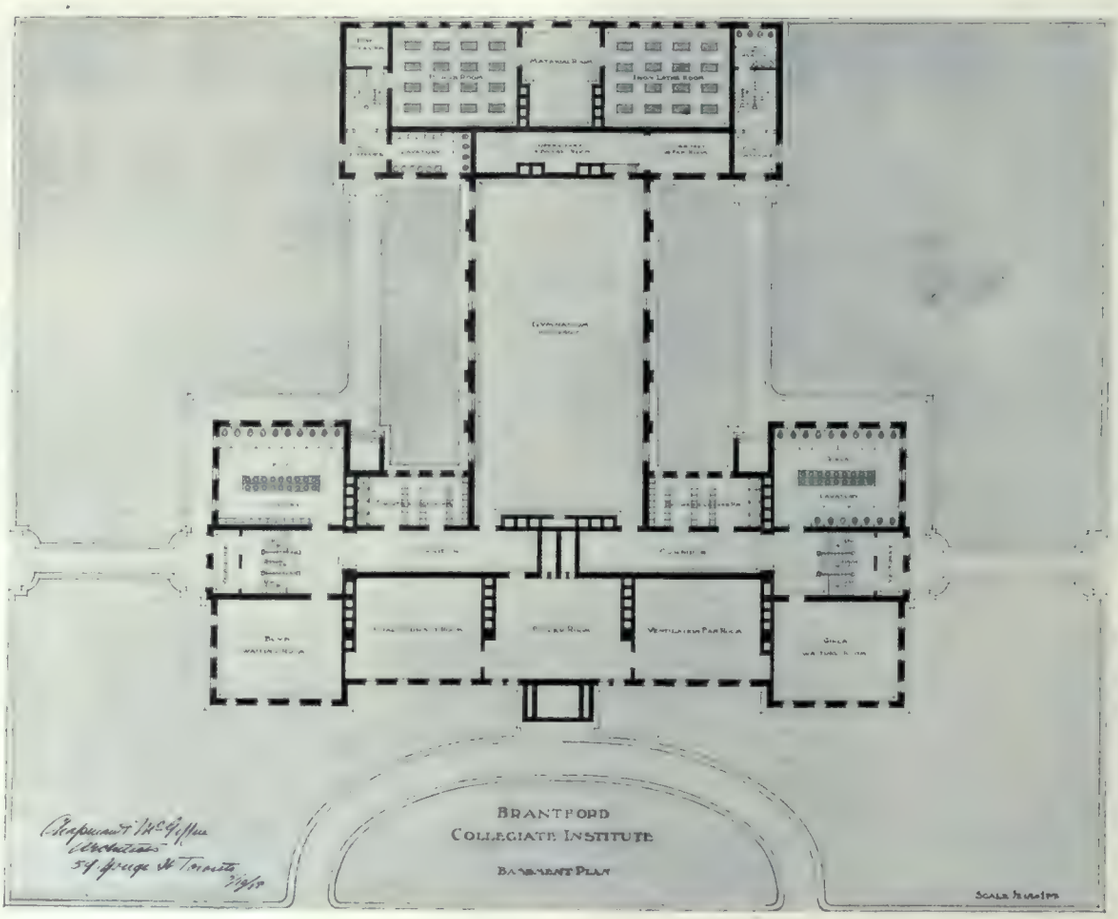
ALTHOUGH A CITY of only 20,000, Brantford considers the necessity of providing well constructed, comfortable, safe and sanitary school buildings a matter of vital importance. In the new Collegiate Institute now in process of erection at that place, the authorities have shown a broad spirit as regards their schools, and a strong desire to possess a building embodying the best methods of construction and the most modern equipment that the extent of their finances will permit.

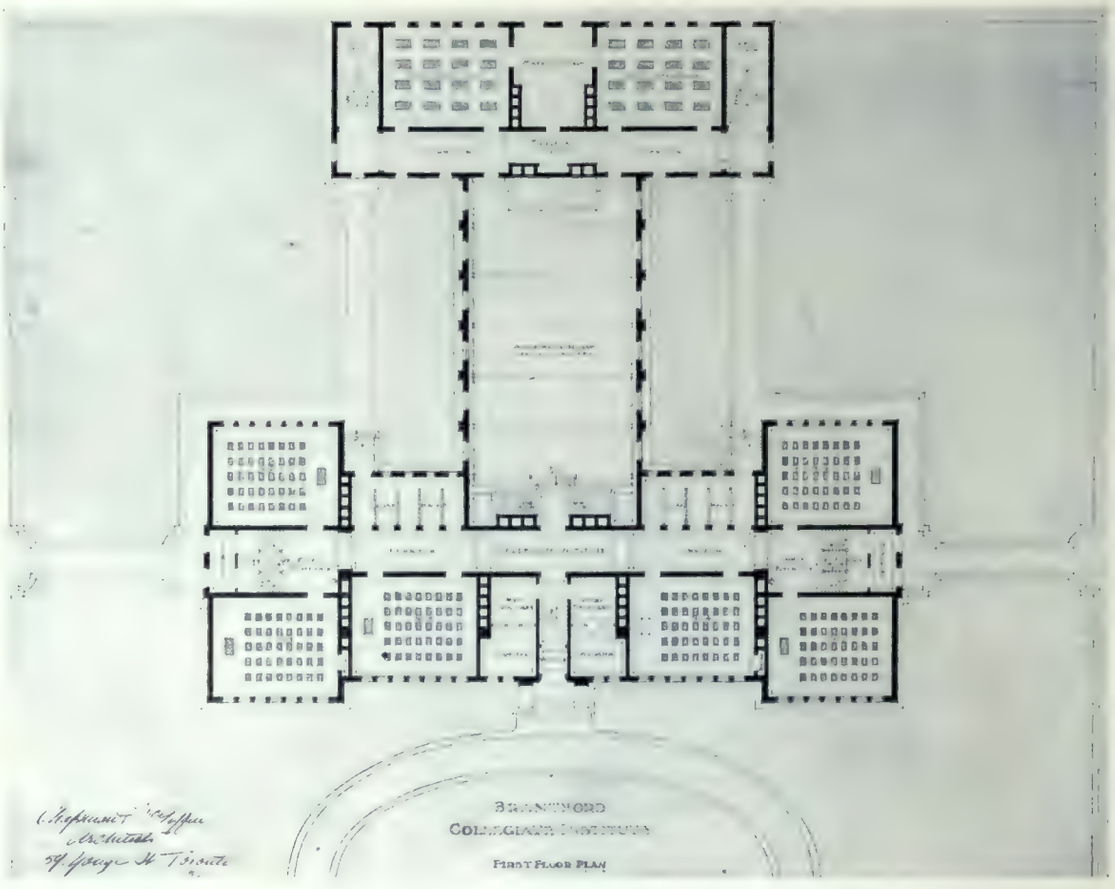
The Institute, which is wisely restricted in height to two stories, is estimated to cost $85,000, and will accommodate 500 pupils in high school and manual training classes. It is a much different type of building than box-like, joist constructed, brick enclosed schools which Mr. Bishops has provided for the city of Toronto. There is no labyrinth of winding stairways, no unnecessary turns, no narrow or unprotected corridors; but an intelligently considered, safely planned building that would fittingly dignify the school system of any city, and which convincingly demonstrates that the task of designing modern educational buildings is the work of the architect and not the mechanic.

An examination of the accompanying plans, which are those chosen by the Board from among a number of other plans submitted in a limited competition, shows an ideal arrangement, with well placed class-rooms, broad fireproofed corridors, and staircases and entrances so located at the centre and each end of the building as to practically insure safe exit from any point in case of emergency. The building that is now being erected differs in one or two minor respects from the preliminary plans; the main point of difference being the omission of the manual training department at the rear of the gymnasium. Provision for this department will be made in the northern wing of the main building.

Care has also been exercised in the selection of the site. The lot chosen is on Brant Avenue and has about 300 feet frontage. There are a number of splendid old trees along the street line and dotted over the grounds which are level for a distance from the street of about 250 feet, from which point there is a slope down to a level of 50 feet below the grade line of the building, thus forming a splendid natural amphitheatre for the exhibition of athletic games. The building will be set about 100 feet back from the street, and will be seen through the trees, the greater number of which will be left standing. The style of architecture, which is an adaptation of English Collegiate, has been chosen partly for its associations with the Universities of Great Britain, and partly because it lends itself better than any other style to the grouping of the large number of windows required. These large window areas, so necessary to the lighting and hygienic condition of the modern ideal school, are often the destructive element in the composition of school exteriors; the scale of these exteriors is necessarily rather large, owing to the height of the ceilings and the size of the windows. The composition, as seen in the perspective view shown herewith, depends mainly for its effect upon the grouping of the windows and the relation between the gable ends and the central feature. It is at this latter point where the interest has been concentrated and where the only elaboration, beyond substantial construction, has been indulged in. This centre is the pivot of the composition and the formal entrance to the building. The entrances at each end, one for boys and one for girls, are more capacious than the central entrance, but by being simpler and broader than the latter are intended to suggest the relation between the general circulation and that used on special occasions by a more limited number of people. The materials used throughout the exterior are dark red pressed brick, with a white joint and a light grey terra cotta for trimming and for the central feature. The roof will be of light green slate.

In the interior the lighting of the class rooms and corridors, the easy and simple circulation of the pupils, both for every day exercises and in case of the emergency of fire, have been the main controlling features in the arrangement of the plan. This, as seen in the ac-





Basement and first floor plan, Brantford Collegiate Institute, showing the gymnasium, assembly hall and general arrangement of lavatories, shower baths, and class-rooms. The location of the stairways and entrances at the centre and both ends of the building is particularly worthy of note. Chapman and McGiffin, Architects.

companying plans, resolved itself into a centre corridor with staircases at either end, and the entrances to the assembly hall and gynasium in the centre equally accessible to all.

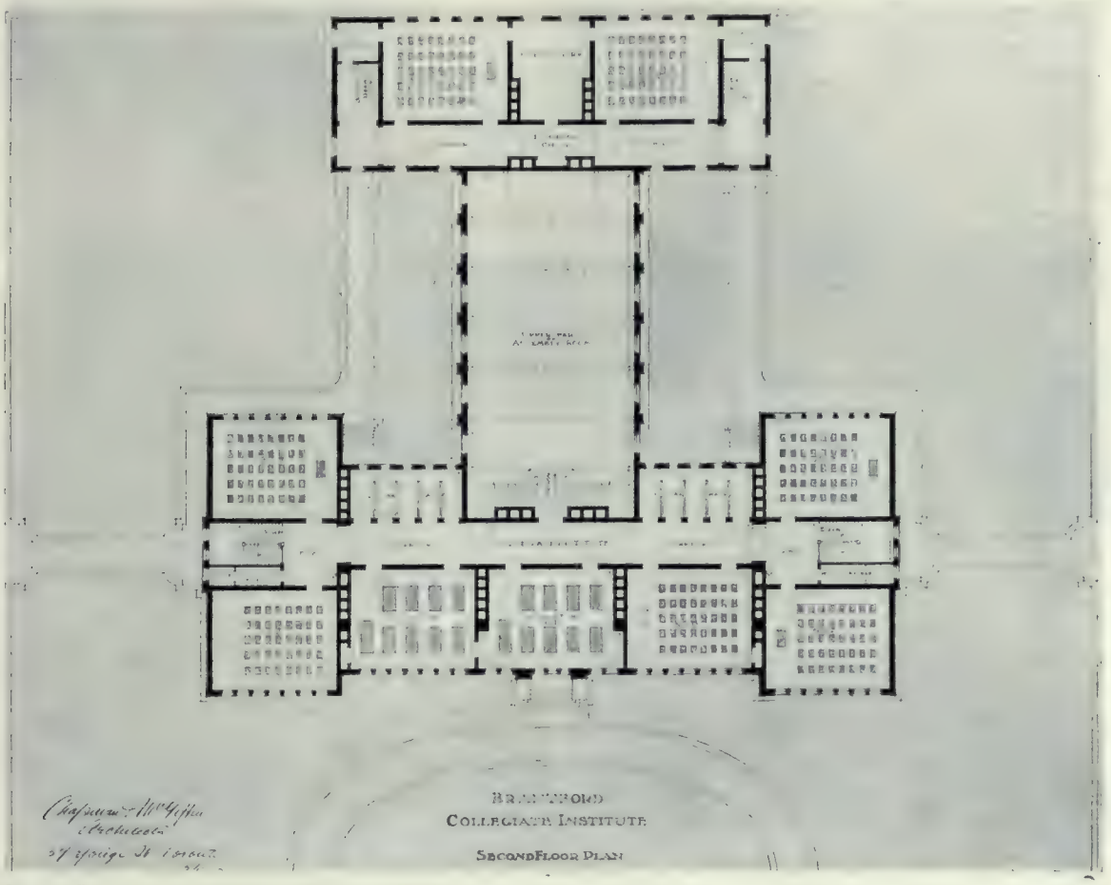
The gymnasium is the larger size required by the standard school regulations. It has the best arrangement of light for gymnasium work, and with its brick lined walls, wooden floor and ceiling and other arrangements, has been designed specially for the purpose for which it is to serve. The assembly room above the gymnasium has stucco plaster walls, exposed timber truss stained dark brown, and has been planned to seat five hundred people. It might be remarked here that arrangements have been made to extend any of the three wings to accommodate extra classes or to accommodate an increased number in the gymnasium or assembly room in case of need at any future time. This has been done in such a manner as to make the extension a natural development of the plan rather than an added excrescence, as so often happens in this rapidly developing country.

The walls of the corridors are of brick, arranged in decorative patterns in two colors, and the flooring is of composition material in colors and patterns to harmonize with the brickwork. The windows in the halls, as well as the windows in the assembly hall wing, have metal frames. The above materials have been used to give the building as solid, durable and sanitary a character as is possible in a building with the limited appropriation for buildings devoted to our schools in Canada. The thorough lighting of all parts, including the corridors, has received the most careful consideration, the latter are lighted by large windows at each end of the corridor, and by windows at each side of the assembly hall wing.

The building is ventilated throughout by mechanical draught, the fresh air being forced through a large duct formed by furring down the basement corridor, from this central duct it enters the various flues leading to the class rooms.

The ventilation of the assembly hall wing is affected by ducts under the floor of the gymnasium which distributes the air into the vertical flues leading to the gymnasium and assembly hall. The pressure caused by the large fresh air fan will force the vitiated air through registers near the floor of the class rooms into the flues provided for taking the air into the roof space from whence it escapes through a large ventilator. The only mechanical power used for the exhaust is a small fan in the roof space, which is connected to ducts exhausting the air from the lavatories and science laboratories.

The wood trim throughout is composed of ash, in order to obtain the maximum amount of durability at the minimum cost, and for the same reason maple was chosen for the flooring where composition flooring was not used.



Second floor plan, Brantford Collegiate Institute. The walls of the corridors throughout the building are of brick, arranged in decorative patterns in two colors, and the flooring is of composition material in colors and pattern to harmonize with the brick work. Chapman and McGiffin, Architects.

FRENCH SCIENTISTS and the Belgian Society of Geology, Palæontology and Hydrology have recently conducted a series of experiments with a new instrument called the "acoustele," which is designed for detecting, by means of concentrated sound, the presence of subterranean streams of waters. From the most reliable information to be obtained as to results, the acoustele has proved quite successful in certain kinds of ground—a chalky, calcareous formation being found most favorable for its use. The conditions which are most essential to its success seem to be the existence of subterranean veins or channels of water, flowing with sufficient velocity to create a rumbling or gurgling sound by their flow or fall, and a surrounding geological formation of a resonant character capable of transmitting the sound thus created to the surface of the ground, where it is detected by the delicate auditory receptivity of the instrument.

View looking along the canal with which it was necessary to surround the site of the Filtration Works so as to lower the ground water level to a point which would not interfere with the putting in of the concrete. At the head of the canal is to be seen the building housing the centrifugal pumps, which discharge 4,000 gallons of water per minute into the bay.

View showing sections of the huge concrete pipes which will form the conduits through which the raw and filtered water will flow. The manner of laying and locking the joints of these pipes will be one of the most interesting processes of the work.

TORONTO'S FILTRATION PLANT.—Interesting Engineering Undertaking Now in Process of Installation at Centre Island.—Feature of Its Design and Construction.—General Plan Admits of Further Extensions as Growth of City Might Demand. ∴ ∴ ∴

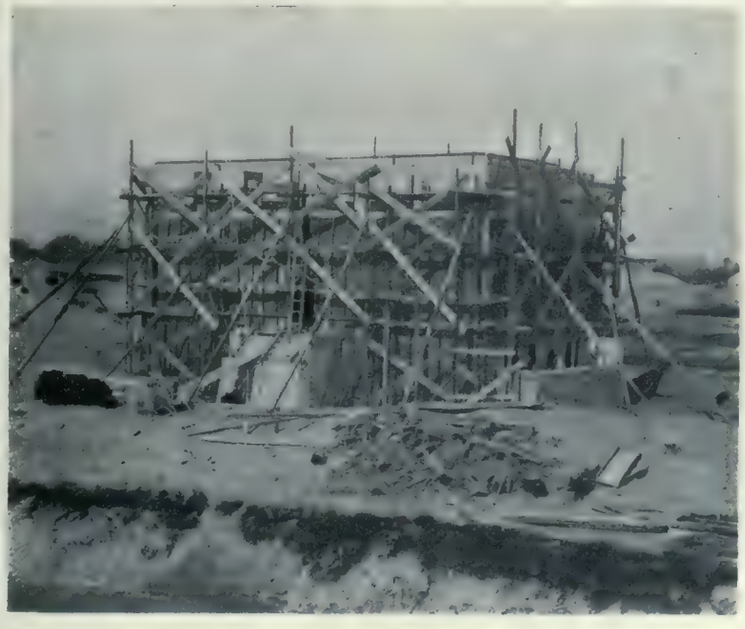
WHEN THE FILTRATION PLANT now under construction, at a cost of $750,000, is placed in operation in the spring of 1911, Toronto will have one of the most modern and thoroughly built water purification works on the American continent. Aside from being an undertaking of considerable magnitude, the fact that it is the first filtration plant of any great size to be established in the Dominion, attaches an importance to the work which renders it of especial interest to Canadian engineers, and Canadian municipalities in general.

So far, the progress of the work has been eminently satisfactory. Since operations were begun in the latter part of June, by the contractors, Messrs. Dill, Russell & Chamber, Toronto, a large force of men have been steadily employed, and the number is to be materially increased as the work progresses. Already one of the two great sections of area comprising the site of the filter beds, has been excavated and levelled preparatory to putting in the concrete work, and a portion of the 24-inch cast iron pipes to be located beneath the regulator houses between the two groups of filters, have also been set in place. The installation of the concrete foundation for the low lifting pumping station is another part of the work nearing completion; while the three-story structure, built entirely of concrete, which is to house the offices, chemical and bacteriological laboratories and provide living quarters for the employes of the plant during the winter months, is now ready for the putting on of the roof.

The plant is located at Centre Island, a little more than a mile across the bay from the city's present main pumping station, to which it will eventually connect, and the work is being carried out in accordance with the plans prepared under the supervision of Mr. Allen Hazen, whom the city has retained as consulting engineer to City Engineer, Mr. C. H. Rust. In design, the filters themselves, in that they are to be of the closed type, will differ materially from the open sand filters recommended in 1894 by the late John Mensergh, of London, England, who was retained at that time to investigate existing conditions and to report as to the most feasible means of providing the city with a pure water supply. The closed type of filter is more representative of the advancement which has taken place in the science of water purification within recent years, and is especially required in a climate where severe winters are experienced.

The plan of the works, which is shown in an accompanying illustration, provides for twelve filter beds, each 117 by 312 feet in dimensions, aligned in equal number on either side of a court containing the regulation house and sand bins. Adjoining these filters is a pure water reservoir, 312 feet square. The water will pass through the filter at the rate of 9 feet per hour, and the arrangement of the beds is such as to readily permit of further extensions as the growth of the city might demand. Owing to the fact that most of the foundations for the works are being placed below the level of the lake, it was necessary at the outset to surround the entire site with a drainage canal, so as to lower the ground water level to a point which would not interfere with the putting in of the concrete. This canal was made by a huge lake dredge which worked its way through the sandy soil, cutting a channel with a minimum depth of 7 feet below zero level of the lake and a bottom width of no less than 10 feet; and it is drained by centrifugal pumps discharging 4,000 gallons of water per minute into the bay.

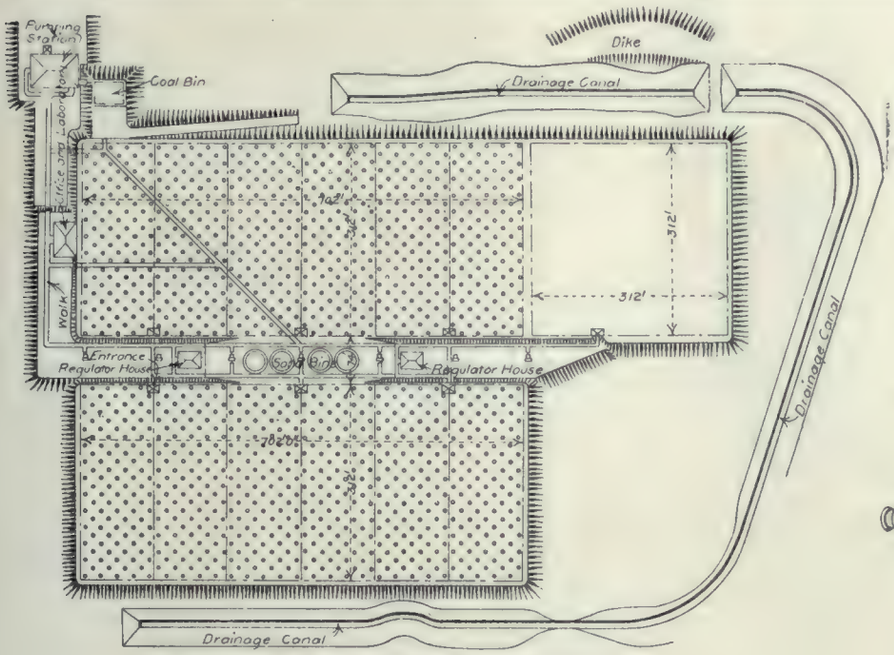
From the low-lifting pumping station, which is seen in the general plan, the water will flow through a 72-inch reinforced concrete pipe, from which 36-inch reinforced concrete pipes are taken off at right angles to the inlet chambers under each filter entrance. Similar pipes will also be used to convey the filtered water to the reservoir, and all manholes on each line and the Venturi meters will also be likewise constructed. The contract for these pipes was completed within the past week, and they are to be placed in position during the winter months. With the exception of a very limited number of smaller sections, the pipe was cast in 4 ft. lengths in cylindrical vertical moulds, the concrete used being of a proportion of one barrel of cement, 7 cu. ft. of sand and 10 cu. ft. of ballast, the latter ranging from ¼ to 1 inch in size. The sections are made in three diameters, 36, 54 and 72 inches, and in addition to the triangle mesh reinforcement, they are further reinforced by ¼ inch steel bands, spaced four inches apart, which are firmly secured to the mesh. The method of making the joints of the adjacent lengths in laying this pipe, is particularly interesting. The end of one pipe has a projecting ring which fits into a socket on the end of the other pipe. The inner form of this socket differs somewhat from the ring entering it, so that after the two parts are in place there is an annular groove on the inside of the pipe line, having a dove-tail cross-section. The operation of making the joints is conducted in two stages, first to make an exterior joint and then to complete the work from inside the pipe. The two lengths of pipe are first brought into position and the joints filled with oakum. The outer surface of the ends are then smeared with hot tar and covered with strong building paper, which is in turn smeared with tar. A second layer of paper is applied and covered with tar, and a strip



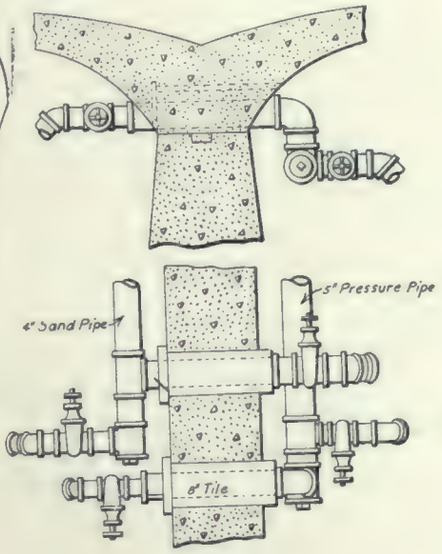
Construction work on three-storey Office and Laboratory Building at Filtration Plant, Toronto.

View showing construction of foundation for Low-lifting Pumping Station of Filtration Plant, now in process of installation at Centre Island, Toronto.

Laying the 24-inch cast iron for the Regulator Houses of Filtration Plant at Centre Island, Toronto, on either side of which are to be aligned six filter beds.



General plan of new Filtration Plant, Toronto.

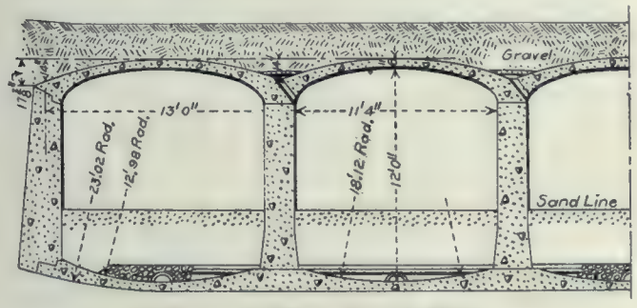


Location of sand and pressure pipes.

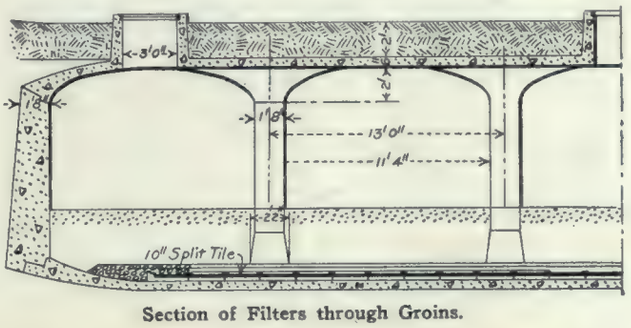
of coarse cloth is then wound around the paper and fastened with two wires.

This manner of locking the joints differs somewhat from the method usually employed in connecting sections of pipe of this kind. As a rule, the union is made by a cement grout forced into the seams by a force pump, and compressed into place by steel bands fastened at the outside and inside of the joint, which are removed when the cement is set. In the case of the Toronto plant, however, the method to be adopted in sealing the joints is deemed the most expedient, as it will enable the contractors to fully take up any spreading movement which might occur through any settling, and thus insure a perfect connection. After the joint is made sand will be placed under the pipe and on the lower quarters very carefully before the back-filling of the trench is begun. Since the steel reinforcement of the pipe is at a different part of the cross-section at the top than at the bottom, the separate lengths of pipe are marked, so that the top of each can be recognized and the inspector will be able to know that each length is in the proper position. Following the pipe laying, water will be pumped through them into the filters and maintained at the full level in the latter for at least a week. The pipes will then be pumped dry and the joints grouted from the inside under pressure.

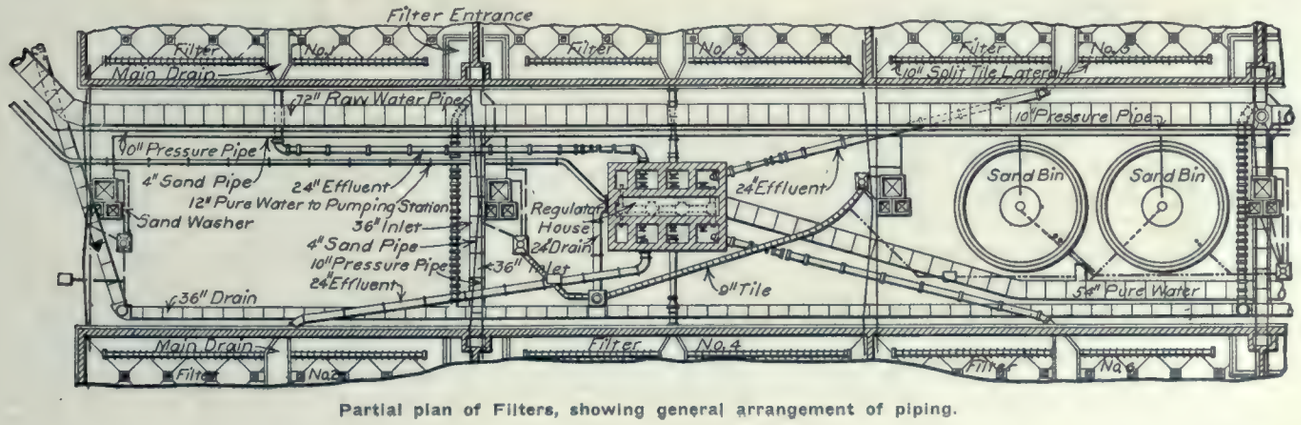
One of the interesting processes in the manufacture of these huge pipes is the manner in which they are lifted from their vertical position and placed on their side. Formerly they were simply tilted over, but this practice, owing to the fact that this part of the work is done before the pipe is fully seasoned, quite often resulted in the concrete being fractured at the end, forming the point of fulcrum. In order to overcome this danger the Lock Joint Pipe Company, in accordance with whose patent, and under whose supervision the pipes were made, now employs a derrick from which is



Section of Filters through Piers.

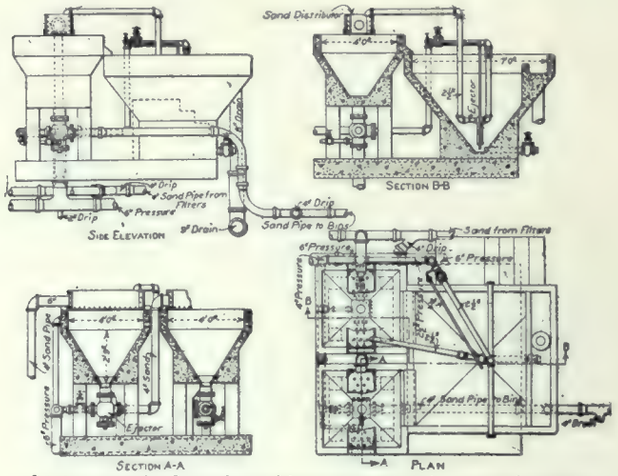


Section of Filters through Groins.



Partial plan of Filters, showing general arrangement of piping.

suspended a cross-piece that is placed athwart the top of the pipe. A rope passes at each end of the cross-piece to pulleys on either side of a steel belt, consisting of two sections, which is fastened at the centre of the pipe with turnbuckles. From the pulleys the, rope is brought down and fastened around the base of the pipe. When everything is adjusted the pipe is raised, and by the weight of two men swung into a horizontal position It is then lowered a few inches from the ground where the rope is kicked off, and the pipe placed safely on its



Arrangement of sand-washing apparatus in central court.

side. When required, the sections of the pipe will simply be rolled to the point of the trench at which they are to be lowered.

The thoroughness with which the work is to be carried out in general, is manifest in the way the filters are to be built. These are to have inverted groined arched floors, square concrete piers 13 ft. apart on centers, outside and cross walls of concrete, which will be built in sections 13 ft. long, and groined concrete roofs. The concrete will be mixed in a proportion of 1 barrel of Portland cement, 9 cu. ft. of sand and 16 cu. ft. of ballast. The contractor is required to provide centers for at least two complete filters, and no center may be struck without the express consent of the engineer. Owing to the importance of the matter of keeping the centers of such work in place, the specifications provide that: "No centers under the cylindrical vaulting near the wall shall be struck until the walls are thoroughly secured. Outside walls shall be considered as secured when the embankment is completed and compacted against them to the springing line. Cross walls shall be considered as secured when there are two rows of vaulting on the other side in place and set, whether supported by centers or not. The other arches in the roof shall be considered as secured when sufficient work is done beyond them to prevent the possibility of spreading and movement when the centers are struck, the amount of work depending somewhat upon the amount of fill already placed upon the adjoining vaulting."

The main drain which will be run down the center of each filter is to be a trough formed by depressing the concrete along this line. It will be 6 ft. 3 in. wide and covered with a reinforced concrete slab. The tile underdrains which will extend from it at intervals of 13 ft. are to be 10 in. split or channel pipes. The bottom of the filter bed will be covered with about 1 ft. of gravel or broken stone, on which the filter sand will have an average depth of 3½ ft. The sand is to have an effective size of 0.25 to 0.35 mm. and a uniformity coefficient of not more than 3.0. Not more than 1 per cent. of it may be finer than 0.13 mm., and no particles shall be above 5 mm. in diameter. The sand will be removed from the filters by portable ejector hoppers delivering it through wrought-iron pipes to sand washers. After being washed it will be delivered by ejectors to sand bins 34 ft. in diameter and 17½ ft. deep at the walls, the bottom being of a conical shape.

Provision is made for allowing the water above the sand to overflow at five elevations.

It will be impossible to use the ejectors and sand washers during the coldest winter weather. At such times the lake water is invariably clear, and the filters will clog but slowly, even though operated at the comparatively high rate that is proposed. Under these conditions it is not expected that it will be necessary to scrape the filters but once, or at most twice, during the winter. The sand taken off at such scrapings is to be piled in the filters, thrown out, together with that of the next scraping, at the time of the first cleaning, when it is warm enough to use the ejectors and washers. This procedure will reduce slightly the effective area of the filters during the winter weather, but it was found much cheaper to add an equal area to the filters than to protect the sand handling and washing apparatus so as to make it capable of use during winter weather.

The filtered water is to be delivered by the main drains of each bed through a 24 in. cast iron effluent pipe running through one of the regulating houses. Each pipe is provided with a reinforced concrete Venturi meter. The various pipes necessary for observing the head at different points on the filtration plant are to run to the regulating house, where they will be provided with the standard gauges and indicators. From the regulating house the filtered water will be delivered to a 72-in. reinforced concrete pure water pipe, which runs to the pure water reservoir constructed like the filter beds. A 72-in. outlet conduit constructed of reinforced concrete will connect the reservoir with the tunnel, through which the supply is delivered to the main pumping station of the city.

The connection of the outlet conduit with the mains laid across the bay to the city will be one of the greatest difficulties the engineers will have to contend with. How this will be accomplished has not as yet been definitely decided upon, but those in charge of the work are confident that it will be done in a remarkably short time, and without cutting off the city's water supply for more than a few hours.

After the filtration works have been completely installed, it is said that the city intend to convert the top of the filter area and the entire grounds of the plant into a public park for the residents of the Island and the many visitors who spend a great portion of their holidays during the summer months across the bay.

The engineer in direct charge of the work is Mr. F. F. Longley, and his assistant, Mr. W. Storrie,, both of whom have had a broad experience in undertakings of this character. The contract for the concrete pipes was carried out by the Lock Joint Company, under the supervision of Mr. John A. Hall, the "triangular mesh" reinforcement used in their construction being furnished by W. D. Beath & Co., Toronto.

AMONG THE EXHIBITS at the Industrial and Agricultural Exhibition, Lahore, there will be a working model of a grain elevator suitable for use in the Punjab. It is to be substituted for a full sized plant which a number of outside firms had intended to install, but abandoned owing to the time being too short for the purpose. The model, the construction of which is to be supervised by Capt. G. P. F. Osborne, R.E., manager of the Eastern Bengal State Railway, is to be about 5 feet long, 5 feet high, and show satisfactorily the working of an elevator. It is intended to show the manner in which grain can actually be handled, cleaned, put into bins, and taken out. It will be worked by electricity.

WATER POWER IN NEW YORK.—Initial Step in Great Scheme to Develop Energy for Gotham's Manufacturing and Industrial Plants.—Natural Motive Force to be Only Means of Operation Fifty Years Hence.

WATER POWER for the electrification of New York City, forms the subject of a most interesting article in a recent issue of one of the great newspapers in that city. The writer of the article in question draws a most vivid picture of the American metropolis fifty years hence when coal, as a fuel, will have vanished or at least when it will have become so scarce that its use as a fuel will be impracticable because of its almost prohibitive cost. He further declares that not only New York, but all the other large commercial and industrial centres in the American Union, in the next half century, will be forced to harness their streams for the development of power, light and heat.

Few Canadians realize, fully, what this forced development of the science of the transmission of the force of gravitation into industrial power, heat and light in these great centres, means to Canada. Other countries with their great coal deposits and wealth of petroleum, under the existing methods employed in the development of power, may have an advantage over Canada, but, with our unequalled wealth of streams, lakes and waterfalls, when the new order of things takes place, we shall be enabled to develop power, heat and light more cheaply and expeditiously than any other nation on the globe.

Sheer necessity will force the greater industrial centres of the world to encourage and aid engineering and invention in the solution of the many problems involved in the economical development of water power and every engineering accomplishment, as well as every creation of inventive genius that brings to a higher state of perfection the transmission of power from our streams and waterfalls, to a state where it represents commercial value, places Canada a notch higher, industrially, among the producing nations of the world.

When coal and petroleum cease to be available for industrial purposes, and when the industrial wealth of a nation will be dependent upon the extent of power it can develop from its streams and rivers, then will Canada be the richest spot on the globe.

Nations may burn their coal and consume their petroleum but, with reasonable care and scientifically sound engineering, our streams will run on forever.

The following is, in part, Mr. Rene Bache's article, above referred to, and is highly interesting, not only because of the importance of the subject with which it treats, but because of the graphic manner in which he describes the application of this new power and how it will serve to solve the many heating, lighting and motive problems with which, even now, this great metropolis, New York, is confronted.

The City of New York is to be run before long by water power wholly. The plans are already being made, under authority given by the Legislature of the State, and the work may be said to have fairly begun.

The metropolis as a whole may be likened to a gigantic machine, to run which requires a number of horse-power well-nigh fabulous. All of this vast aggregate of power is produced by steam, but when the work already undertaken has been carried out, practically all of it will be water power.

This water power will be transmitted in the form of electricity from distant sources. The New York of that day will be run by cataracts, mostly artificial, located on suitable rivers, in many cases hundreds of miles away. Not only New York, but Boston, Chicago, and other large cities will be run by water power half a century from now.

The work for New York City has begun with the building—by the Water Supply Commission—of great dams on the Sacandaga, the Genesee and the Racquette Rivers, for the utilization of the power of those streams. One of these, at Hadley, on the Sacandaga, about 200 miles north of New York City, is to be the greatest power dam in the world. It will be 230 feet high, and 800 feet long, and will store enough water to yield 30,000 horsepower at the dam site.

Most of the power required for running the city will come from the upper Hudson and the streams that drain the Adirondack regions. But much of it, doubtless, will be derived from dams along the Wallkill, Housatonic, Catskill, Hoosick and Susquehanna rivers, and from the Passaic Basin.

The revolution of affairs in respect to the power that runs the metropolis is destined to be brought about through the development of the possibilities of transmitting water power over wires in the form of electricity. New York is the centre of a magnificent circuit of such power, which may readily be converted into electricity; but the sources of it are so far away that no attempt has yet been made to carry it to Manhattan Island and its vicinity.

The reason why this has not been done before is that the cost of transmitting electricity over long distances has been too great. But the efficiency of transmission is being steadily and rapidly increased, and the cost is being proportionately reduced. From this time on it will continue to go lower and lower—and within a very few years it will be practicable to fetch electricity in unlimited quantities to New York from rivers 200 miles and more distant.

When this comes about, the complete electrification of New York will be undertaken. Fifty years from now, or possibly sooner, Manhattan Island and its environs will not be run by steam, as it is to-day, but by water power from dams on the Sacandaga, the Genesee, the Upper Hudson, the Racquette, the Esopus, the Wallkill, the Housatonic and other streams.

A large part of the electricity will be used for driving machinery in the factories of New York. Another considerable factor of the "fluid" will be required for traction—for running the surface, elevated and subway roads.

Gas for illumination will be entirely replaced by electricity. Already the increase in the use of power for the electric lighting of New York is very rapid, owing in part to the growth of the number of dark rooms. This is a matter which most people do not seem to notice. It is a phenomenon incidental to the development of contiguous "sky-scraper" construction.

Almost every tall building has many dark rooms, and, as the city grows, the number of such dark rooms is multiplied. Every tall building that is put up makes the city darker. A tall building on one side of a street shuts out part of the light from a shorter building on the other side.

The development of "skyscraper" construction represents a struggle not only for altitude, but for light. It is interesting to go through some of the tall buildings on lower Broadway, and to notice how many thousands of electric lights are kept burning in them all day long. Then there are the stories below ground, dug and occupied to economize precious space, which must be artificially lighted even in the day-time; and the subway tunnels and the tubes that run under the rivers require electric illumination throughout the twenty-four hours.

All of this illumination consumes a vast amount of power, demand for which is steadily and rapidly increasing. Doubtless, one of the first uses to which the electricity derived from the dams is put will be to supply this power—not only for the lighting of office buildings, subways, theatres and restaurants, but also for the dwellings of the metropolis.

In the electrified city—whether it be New York, Chicago, Boston or other large centre of population—there will be many incidental employments for the currents from the power dams, the running of thousands of elevators in office buildings and apartment houses being not least important. But one of their principal uses will be

for heating. Fifty years from now New York City will be warmed, as well as lighted, by water power.

When that time arrives, and the power is fetched over wires from distant dam sites on suitable rivers, the furnaces and steam heating apparatus in the dwellings and office buildings of New York, Chicago, Boston and other cities will be replaced with electrical contrivances. All the heat required for the warming of a house will be brought into it by a wire, and distributed by suitable connections to the various rooms.

Then there is the matter of cooking. It will be done fifty years from now, and probably very much sooner, by water power conveyed in the shape of electricity, over wires. In fact, the same current that is used for heating the house will be employed by the housewife for all of her culinary purposes. She will not be obliged to bother with a range—that clumsy piece of ironmongery being entirely done away with. Instead, her kitchen will be provided with an ordinary table, on which a few simple pieces of apparatus will stand—the requisite current for boiling, frying or any other kind of cooking, being turned on with a switch.

The discovery of the possibilities of electrical transmission over wires has called attention to what may be done with water power. When it was necessary to use such power—if employed at all—at the waterfall, the factory had to be put on the spot, whether the situation was desirable or not for commercial reasons. Thus the great Massachusetts cities of Lowell and Lawrence have literally grown up around the falls of the Merrimac; and the same may be said of many other towns, such as Holyoke on the Connecticut, and Paterson on the Passaic.

Now, however, that it has become practicable to pick up the power from a cataract and carry it on a wire over great distances there is a complete change in the problem. A waterfall is no longer a mere local interest, but a public utility. It is easily possible to establish a generating station in one spot, and from it to supply the whole of a great region. This, in fact, is the idea on which the Water Supply Commission of New York State is now busy.

The power generated and converted into electricity at dam sites on rivers will be carried to the city—whether it be New York or any other centre of population—by wires and delivered at sub-stations. For this purpose special buildings will be erected, each sub-station taking a certain amount of current off the wire, and supplying a given arena with just what it needs for lighting, heating, running machinery and other purposes.

Before very long the problem of transmitting electricity economically over 200 miles or more of wire will have been solved. But a considerable time will be required to build the dams and construct the plants for generating and transmitting the current. Also, the replacement of steam by electricity will be necessarily gradual. It is not to be expected that owners of expensive steam power machinery will hasten to throw it away the minute that wires are run into a city. Hence the estimate of fifty years as the approximate period likely to elapse before the electrification of New York will have become a fully accomplished fact.

The problem where New York is concerned is especially interesting for the reason that the metropolis—including Manhattan Island—is to-day the greatest power-utilization centre in the world. As above stated, all the power employed is now produced by steam.

But the price of coal is destined to go steadily higher and higher, and electricity, when furnished by water power, will be very much cheaper. Thus there must come a time, and that before very long, when currents from the rivers will displace steam on the island of Manhattan and its neighborhood. The burning of fuel for the production of energy will be entirely abandoned, and all the machinery of the metropolis will be driven by the flow of distant streams.

GREAT ADMIRALTY HARBOR AT DOVER COMPLETED.—Continued from Page 74.

tons. These piles were brought from Dover in Tasmania, a distance of 13,000 miles. This timber is one of the heaviest of woods, and when cast adrift sinks like a stone of account of its great density.

At intervals of every 50 ft. two sets of six piles were driven firmly into the ocean-bed opposite one another; across the piers so formed strong iron girders were placed, and in this way the temporary staging was carried seawards. Although all this work was purely temporary, it had to withstand the full force of the storms and tidal currents as well as hundreds of tons of heavy machinery. Some of the cranes upon it turned the scale at 400 tons apiece.

In the sea between these piers great blocks weighing from 26 tons to 42 tons apiece, which form the seawalls, were laid. Before they could be laid, however, it was necessary to remove the loose debris from the Channel bed. A giant grab, a jawlike contrivance with a double row of formidable teeth, descended to the bottom of the sea with open mouth. There it worked its way into the chalky bed, fastened its teeth into it, and came up with a dripping mouthful of flint and chalk that filled a railway truck. By this means the upper crust was eaten away until the solid bed was reached. Divers were then sent down in bells, whose duty it was to level the bed ready for the blocks. These bells were the largest ever used. In all seven were employed. These measured seventeen feet long and ten feet wide each. They were lighted by electricity, and fifty feet below the surface their interiors were as bright as day. As the huge blocks were lowered into the sea they were guided and placed in position by the dress-divers who worked from small boats. The walls of the National Harbor alone has cost £4,000,000, and the sum expended upon the commercial harbor amount to £1,250,000.

A NEW TEST FOR CONCRETE.

A VERY INTERESTING METHOD for the testing of concrete and materials composing the same was presented recently by Mr. J. S. Owens, Assoc. M. Institute of Civil Engineers, before the Society of Engineers in London.

Mr. Owens' methods, which are described very fully in his paper, and which are summarized here, present a new way of arriving at the various percentages of materials used in concrete and to enable the engineer to determine whether too much sand, or too much stone, has been used to the proportion of the cement required. The test may be briefly summarized as follows:

The methods which have been tried in the past to achieve this result are: (1) inspection; (2) making briquettes, breaking when set, and noting if of uniform strength; and (3) mixing pigment with the concrete, making briquettes, breaking when set, and examining fracture for even distribution of pigment. The author criticized these methods, and showed their lack of value for the purpose. He stated that it had been ascertained experimentally that inspection alone could not detect the difference between concrete having 1 part of cement to 2 of ballast, and that having 1 to 3. The following definition of properly mixed concrete was then given: "Concrete in which the various ingredients are as uniformly distributed as the size of the particles composing them will admit." He went on to say: "The question, therefore, is how to determine when this uniformity of distribution has been attained." The principle on which the author's test is based was thus described: "If we take a few small samples from different parts of the heap of concrete, and if we can tell in some simple way whether all the samples contain the same relative proportions of

stone, sand and cement, we have a means of telling whether the concrete is properly mixed or not." The author's method of comparing the samples is simply to place each in a tall glass cylinder nearly filled with water, shake them up, and allow them to settle. The rate of settlement of the cement in water was shown to be about thirty times as slow as that of the sand, which, in turn, was slower than that of the larger particles of stone; this caused the stone, sand and cement to settle on the bottom in distinct layers. It was shown that the depth of these layers was proportioned to the amount of the material present in the sample, and that in this way it was possible to tell whether each sample had the same amount of cement, sand and stone.

The precautions to be observed in making a test are as follows: "Two or three test glasses of sufficient diameter should be used, one for each sample. The same glass must not be used for each sample, as the time of exposure to water and the temperature of the water might be different in each test. A column of water, at least four times the height of the layer of sand and cement, should be used to eliminate the error due to entanglement of cement in the sand. The samples taken should be as small as is consistent with fairly accurate measurement. They should be taken from parts in the heap of concrete as far removed from each other as possible, or where a difference in appearance is noticeable. When the first test gives a positive result it should be repeated before deciding that mixing is complete. The test is very simple, and can be applied, with a little practice, by any engineer. Each test occupies about fifteen minutes, and the apparatus costs only a few shillings. Hence it may be regarded as a works test, which can be used wherever concrete is being mixed."—CEMENT AGE.

STRENGTH AND WEATHERING QUALITIES OF CANADIAN MARBLE.

THERE ARE TWO ELEMENTS to be considered in specifying marble work in addition to richness of texture,, viz., its compressive strength and its weathering qualities. If the lustrous surface is to endure, and the marble itself is to permanently serve either a structural or aesthetic purpose, both indeed are essential. There is a difference in marbles, just the same as there is in bricks, stone, and other building materials. Some are more dense, more compact, and less susceptible to disintegration than others; and nature is as varying in her handiwork as is man in the quality of the products which he invents.

Although Canadian marble was first employed in building construction as far back as a quarter of a century ago, it remained until recent years more or less of an unknown quantity. Architects and builders, as a rule, looked to foreign markets in order to meet their requirements in this respect, little realizing that their own country offered a richly veined, durable, high grade marble. That was before the day when Canada came into its own, and before the resources of the country were exploited in the manner in which they are being exploited at the present time. To-day the order of things have changed, and not only is Canadian marble to be seen in many of our splendid modern buildings, but its rare qualities are being recognized abroad, and it has been specified in several important buildings in the United States within the past few years.

An interesting test of marble from the quarries of the Missisquoi Marble Company,, at Philipburg, Que., was recently conducted by the Department of Civil Engineering and Applied Mechanics of the McGill University, Montreal. The results showed convincingly the great density and strength which is possessed by the products of this company, and how well it is suited to meet every structural requirement in architectural work. Four samples, consisting of 2-inch cubes, were submitted, two of "Windsor Gray" and two of "Eureka," and these were subjected to both compression and absorption tests. The compression tests were made in a Wicksteed Testing Machine. Sample No. 1, "Windsor Gray,," with an area of cross section 3.98 sq. inches, sustained a maximum load of 85,100 lbs., equivalent to 21,380 lbs. per sq. inch: and sample No. 2 of "Windsor Gray," with an area of cross section of 4.04 sq. inches, a maximum load of 86,000 lbs., or 21,280 lbs. to the sq. inch. With the samples of "Eureka," equally as high or better results were manifest, the two samples of relative area of cross section as the samples of "Windsor Gray" showing a compression strength of 21,600 lbs. and 22,900 lbs. per sq. inch respectively.

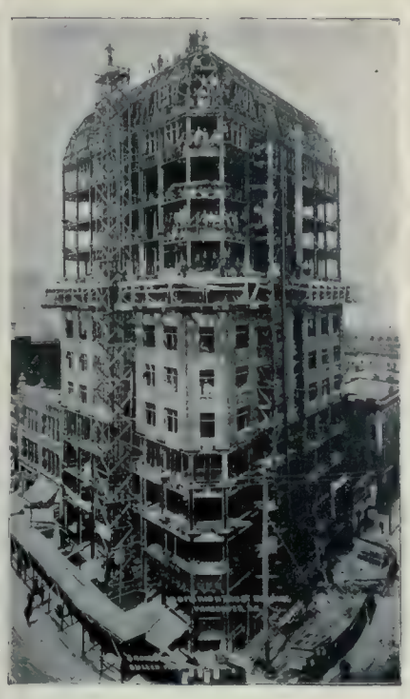
Following the compressive test, the two roughly broken samples, which, after having been thoroughly dried, were immersed in water for 48 hours, showed an extremely low absorption, the amount of moisture in each instance being but 0.072 per cent. and 0.076 per cent.

Both the compressive strength of this marble, which is extremely high, and compares favorably with the best grade of granite, and its excellent weathering qualities, which is demonstrated by the low percentage of moisture which it absorbs, makes the product of the Missisquoi Company one of the most desirable materials where marble work is specified, and it should demand the first consideration of Canadian architects and builders in the erection of their more important buildings.

ONE OF THE INTERESTING FEATURES of the Kowloon-Canton Railway, China, is the Beacon Hill tunnel, which was holed through last May. It is 7,212 ft. long, is entirely in hard granite, and will have a completed cross-section of 17 x 21 ft. It was driven with 9 x 10-ft. headings.

New Dominion Trust Building

VANCOUVER, B.C.



Building in course of erection Sept. 1st, 1909. Mr. Jno. S. Helyer, Architect, Vancouver, B. C.

The Dominion Trust Building is the largest office building in Canada, west of Toronto, and one of the finest in the Dominion.

The **Ornamental Iron** was made by us, comprising :

Iron Staircases
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Some of the Western Banking Offices for which we have recently furnished Metal Railings and Loges:

Bank of Nova Scotia, Vancouver.
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Canadian Bank of Commerce, Wetaskiwin.
Canadian Bank of Commerce, Moose Jaw.
Dominion Bank, Fort William.

Fire Escapes and Iron Work:

Flanagan Hotel, Saskatoon.

Ornamental Iron:

Winch B'lding, Vancouver.

Iron Stairs and Elevator Enclosures:

Carter-Cotton Building, Vancouver.

Ornamental Entrance Gates:

Provincial Govrnment Buildings, New Westminster, B.C.

Some Other Recent Ornamental Iron Contracts:

Caisse d'Economie, Quebec.
St. Rock Public Building, Quebec.
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Addition, General Post Office, Montreal.
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Crescent Turkish Bath Buildings, Montreal.
Jacob A. Jacobs Departmental Stores, Montreal.
St. Henri College, Montreal.
T. Eaton Co., Limited, Toronto.
Dale Presbyterian Church, Toronto.
J. C. Eaton, Esq., Residence, Toronto.
Smallman & Ingram, New Departmental Store, London.
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Killoran Building, Haileybury.
Royal Victoria Museum, Bronze Grills, Ottawa.
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House of Providence, Kingston, Ont.
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We are equipped for supplying **Ornamental Iron and Bronze** for the largest and best class of buildings.

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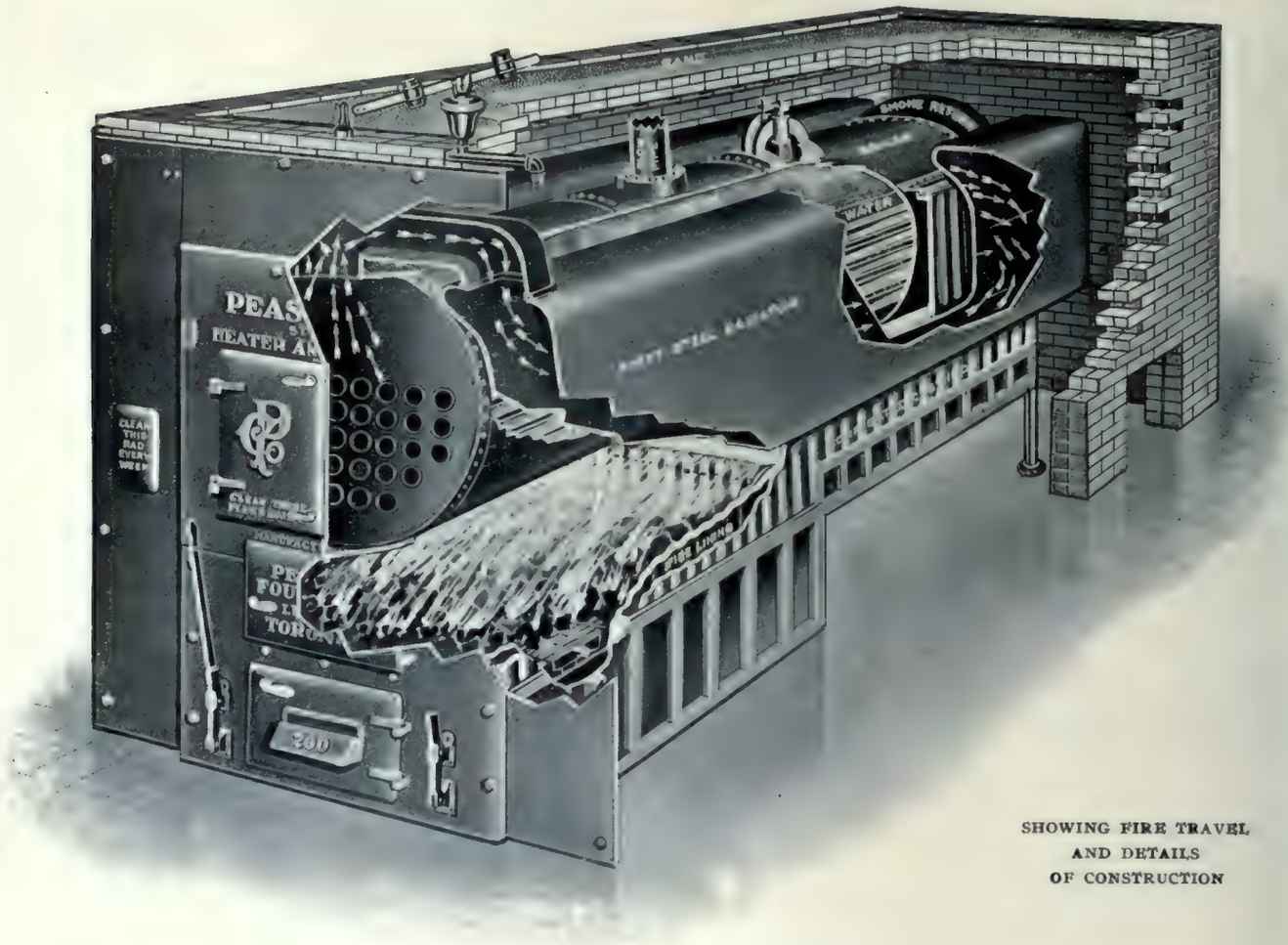
For Heating and Ventilating Schools, Churches, Stores, and other large buildings where it is desired to HEAT BY DIRECT STEAM SURFACES, and at the same time furnish large volumes of FRESH TEMPERED AIR for VENTILATION at NO ADDITIONAL FUEL COST. Can be operated on gravity principle or with fan.



SHOWING FIRE TRAVEL
AND DETAILS
OF CONSTRUCTION

A few of the cities and towns in which these heaters are doing excellent service in heating and ventilating school buildings at moderate fuel cost:

ONTARIO: Barrie, Brampton, East Toronto, Guelph, Kemptville, London, Midland, Mimico, Mount Denis, Oshawa, Peterboro, Picton, Preston, Sault Ste. Marie, Sterling, Waterloo, Weston, York.

NORTH-WEST PROVINCES: Battleford, Calgary, Carlyle, Davidson, Edmonton, Killarney, Lacombe, Lethbridge, Melita, Moose Jaw, Olds, Prince Albert, Rapid City, Red Deer, Regina, Rosthern, Saskatoon, Selkirk, Strathcona, Vermillion, Dauphin, Raymond, McGrath, McLeod, Medicine Hat, Fernie, Cranbrook, Vernon.

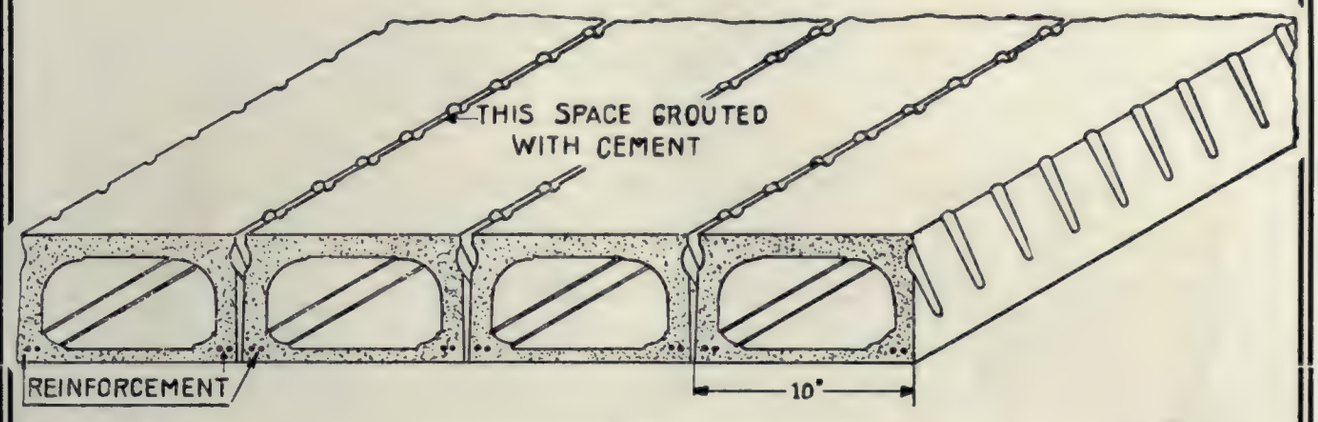
WRITE TO-DAY FOR DETAIL INFORMATION.

WESTERN SALES OFFICE:

PEASE-WALDON CO.

WINNIPEG, CAN. **LIMITED**

THE SIEGWART FIREPROOF FLOOR



VIEW SHOWING SECTION OF FLOOR.

Depth in inches		Weight per sq. ft in lbs.		Span in feet for various floor loads in lbs. per sq. ft.				
S. B.	Slab	S. B.	Slab	50	100	150	200	250
7"		45.8		15.6'	12.4'	10.7'	9 6'	
	8"		97.2	13.5'	11 7'	10 5'	9.5'	
8¼"		54.1			15-2'	13.1'	11.7'	10.7'
	10"		121.5		13.9'	12 6'	11.5'	10.7'
9"		71.6			17.1'	15.0'	13.5'	12.5'
	12"		145.7		16.3'	14.8'	13.7'	12 8'

SOME ADVANTAGES OF THE SIEGWART SYSTEM

(1) Great lightness; (2) low first cost; (3) rapidity of erection; (4) economy of erection as no forms are necessary; (5) placing into position independent of weather or temperature conditions; (6) uniformity in quality, inherent to any manufactured product; (7) high fire resisting qualities; (8) sound proof and bad conductor of temperature due to presence of air spaces; (9) no centering required; (10) a strong floor provided for working immediately upon laying beams; (11) floor is erected when perfectly dry, and brings no dampness to building, hence, floors and ceilings may be finished at once; (12) adaptation to all circumstances, easy to cut holes and apply fixtures; (13) only machine mixed concrete is used; (14) method of manufacture insures proper position of reinforcement.

THE Siegwart Floor can be briefly described as a reinforced concrete floor, quickly placed in position without centering, absolutely set and dry and hence, ready to take the load at once, while the handling for erection is reduced to a minimum. Being provided with hollow spaces, the Siegwart Floor is a bad conductor of sound and temperature.

The floor consists of hollow beams made of concrete, with steel rods imbedded therein. These beams are made in workshops, and sent to their destination in an absolutely dry and mature condition. They are placed on their supports close together and after the narrow space between is grouted, form a floor ready to bear the full load and perfectly serviceable for other building operations, as well as to receive any desired floor finish. Pipes or electric conduits can be placed inside the beams if desired.

The design of floors is based upon scientific principles, to give the greatest possible bearing capacity with the least possible dead weight. The concrete being machine mixed is of great uniformity, and the method of manufacture insures the proper location of the reinforcement.

The beams are made of a uniform width of 10½ inches and of the following depths, viz.: 4, 5, 6, 7 and 8¼ inches, while the strength of the reinforcement is made to suit the span and load to be carried.

Siegwart beams are made for all spans up to 20 ft., the usual lengths being 10 to 16 ft.

MANUFACTURED BY

The Canadian Siegwart Beam Company, Limited

MAIN OFFICE & WORKS:
THREE RIVERS, QUE.

MONTREAL OFFICE:
17 PLACE D'ARMES HILL

TELEPHONE, MAIN 375

Canada's West

ON ALL THE EARTH'S surface, there is no section of country that is experiencing such rapid growth, such substantial development, such quick changes, as that which lies north of the 49th parallel of liatitude, between the head of Lake Superior and the Rocky Mountains.

On the whole face of the globe, there is no richer country, no more more fertile land, no more productive soil than in the Canadian West.

Nowhere in the world is there a land that offers such ideal conditions under which people from the more congested, overcrowded centers of the old world, yes, and from the older sections of the new world, may undertake to build for themselves a home, a business, a fortune, as is to be found in Western Canada.

A country it is, so vast in area that the greatness of its future and its ultimate importance in the commercial and political destiny of Canada, cannot be measured—a country whose ever-increasing permanent wealth is being piled up with each harvest with a rapidity and regularity never before equalled. A country whose people are enthused with the realization of its possibilities, inspired by the development and growth everywhere evident, and made determined by the knowledge of their responsibilities to create ideal social, political and commercial conditions under which they live.

Much has been said about this wonderful country. Its wealth and possibilities have been the subject of admiration and amazement in every civilized section of the world. We have been told by surprising statistics of the vast crops that are yearly taken from the soil. But very few, except those who have been favored with a trip through this new Land of Caanan, have anything like a true conception of the manner in which the cities created by the great inflow of settlers and wealth, are being built up. It has often been said that the truest barometer of the prosperity of a community, the character and tastes of its citizens, the social, moral and political ideals of its people, is the architecture and construction of their buildings.

Realizing this, together with the importance the future of the great West bears upon the commercial growth and political destiny of Canada, the Editor of CONSTRUCTION made a recent trip through the West, with a view of making possible the publication of more of the work of Western architects, than had been the case heretofore. So much was he impressed with the truly marvellous growth of every section of the West, the highly permanent character of the buildings in the many cities, the excellent conduct of municipal affairs and the building activity everywhere evident, that it was decided to devote the largest and most profusely illustrated number we have yet attempted, solely to the work of architects of Western buildings. It is hoped, therefore, that this, our Western Number, will serve three purposes: first, to give our readers generally a fair conception of the character of buildings that are being erected in the great West; secondly, to impress Canadian manufacturers and dealers in building materials and equipment, as well as contractors, with the necessity of cultivating this field; and thirdly, to serve as a connecting link between Western architects and builders and Eastern manufacturers and contractors.

As will be seen from the pages of this number of CONSTRUCTION, the West is building of a very superior type of construction, and the many millions involved each year in the purchase of materials and equipment, renders this one of the most desirable markets in Canada. American manufacturers have realized the importance of this market, and are striving in a manner to gain a foothold that should cause Canadian manufacturers to seriously consider the importance of establishing themselves in this new field.

It is true that freight rates are to be considered, but this is a problem for the East to solve and not the West. It is also true that the building season is comparatively short, and that building operations must be carried out much more rapidly there than in the East, but this simply means that the Eastern manufacturer must prepare himself to meet such a condition and render it as convenient as possible for the Western architect and contractor to obtain his products.

The next few years will see a building boom in the West of proportions hertofore never dreamed of. Millions of dollars worth of building materials will be used, and it rests with the Canadian manufacturer and contractor to determine how much of this money will remain in Canada, and how much will go to the United States.

CONSTRUCTION will, in the course of the next twelve months, devote a very large amount of space to Western structures, with a view of giving proper recognition to the work of architects west of the Great Lakes.

More About Toronto Schools

MUCH DISCUSSION has been created over the charges contained in the open letter to Mr. C. H. Bishop, School Building Inspector of Toronto, published in November CONSTRUCTION. The Board of Control requested the Fire Chief to report upon the necessity of fire escapes on Toronto school buildings. The Board of Education saw fit to appoint a committee, consisting of Inspector Bishop, Mr. Rawlinson, chairman of the Board of Education, and Trustee Houston, chairman of the Property Committee, to report upon the present condition of Toronto's schools, with a view of making known to the Toronto public the improvements that have been made in the Queen City's schools, since the Collingwood disaster, for the purpose of reducing the danger of

loss of life in case of fire, and to thus quiet the disturbed nerves of Toronto parents.

It was most reluctantly that the Board of Education saw fit to give recognition to the charges contained in the letter in question, and it was only after a swarm of protests from both the press and public that it was finally decided that it was both expedient and necessary to make a pre-election attempt at a defence of their position, in the form of a report on the existing condition of the schools for which they are responsible.

The report (published herewith) is nothing more or less than an attempt to ease the minds of the public, and does in no manner or form indicate that it was the desire of the members of the committee to in any way render a reply to the explicit charges that were contained in the letter to Mr. Bishop. Every specific point referred to has been carefully avoided, and it says nothing that has not been said many times before.

The following is the report in full, as presented to the Board of Education:

Your Committee, on account of the anxiety of parents and others which naturally exists at all times in regard to the safety of school pupils and teachers from fire, and that this anxiety has probably been somewhat increased by references to this question which have recently appeared in some of the Toronto papers, submits the following information:

(a) With one exception, our school buildings are all so situated that there is no chance of fire reaching them from adjoining property quickly enough to cause danger to occupants.

(b) For several years past there has been an increasing amount of work done in both old and new buildings to make stairs, halls, and doors adequate for greater freedom of exit.

(c) The question of school buildings being carried more than two stories high has been fully considered by the Board, which decided against adopting such a restriction.

(d) After the great disaster last year at Collinwood, Ohio, the question of further protection for Toronto schools was promptly taken up, and since that time the basements of all new buildings and in nearly all of the old buildings have been fireproofed as follows:

(1) By building brick walls in place of all wooden partitions, covering the basement ceiling with iron, building iron stairs, and providing iron storage cupboards for oils or cans, etc.

(2) In the last thirteen enlargements or new buildings the ground floors have been laid with cement, or fireproof, as required by the city building by-law for boiler rooms.

(3) In addition to the work in basements all outside doors have been fitted with check springs so that they may be left entirely unlatched and unbolted during school hours.

(e) It is expected that by the end of the next midsummer vacation similar work will be carried out in the buildings in districts annexed since this special work was begun.

(f) Previous to this work the Board had adopted the principle of reconstructing basements and heating plants in the larger buildings, this work having been already carried out in four of the larger schools at a cost of $1,000 to $1,500 each.

(g) We believe that the greatest element of danger in every case of fire alarm in school buildings lies in the possibility of a panic, and also believe the best preventive is well-directed and frequent practice of fire drill, using the regular exits.

(h) The question of cost should not be considered as the one of greatest importance, nor should buildings be on that account made of the cheapest possible construction; but in view of the fact, that by reason of the advanced prices, the greater restrictions imposed by our recent city by-laws, and improvements introduced by the Board of Education, the cost of our school buildings has doubled in the last twelve or fifteen years, it is our opinion that we can do all that is necessary to provide safe conditions without a still further and very considerable advance in their cost through going to the extreme of what is known as thoroughly fireproof construction.

It will be noted that the above is purely a recital of what has been done by the Board since the Collingwood disaster, in the matter of attempting to remedy the gross mistakes made in the plan and construction of Toronto's older schools. The letter in question gave the Board credit for everything they have claimed to have done in the report above reproduced.

It does not tell what has been done to make the Ogden, the King Edward, the Alexandra or the Kent schools safe. It does not state what has been done in these schools with regard to fireproofing basements or putting in fireproof corridors or fireproof stairways. These, the four largest schools in Toronto, stand as three great non-fireproof structures that house daily from one thousand to fourteen hundred children, with open wooden stairways and without the least provision having been made for the safe exit of the children in case the fire drill fails or the stairways or halls become impassable either from fire or smoke.

There is not one thing in the report that renders one statement contained in the letter to Mr. Bishop one whit less true. It is true that the Board of Education has spent to the best advantage every cent they have been given by the City Council, but they have not gone far enough. They are to be censured because they have not had sufficient backbone to demand an adequate sum of money with which to properly remodel, equip and construct the buildings in their charge, and as long as they are weak enough to undertake to follow the lines of least resistance, by assuring the people that they have provided Toronto with schools that are up to the standard, they will remain the barrier between the people, its legislators, and reasonably adequate school structures, from which position they must recede or be removed.

I repeat our contentions that Toronto's schools are not to be considered safe, as three-story non-fireproof structures without emergency means of exit; that it is ill-advised and contrary to the best judgment of students of school architecture to erect schools more than two stories in height that are not of fireproof construction; that the fire drill as practised in Toronto, is an admirable protection, but altogether insufficient in itself in three-story non-fireproof structures; that the standards used in design plan and construction of Toronto schools, have been faulty and antiquated for the past twenty years, and that what is needed is not a patching up of the standards now used in Toronto, but the adoption of entirely new standards and a new system to govern the construction and equipment of schools designed to meet modern conditions and requirements.

In support of these contentions, letters have been reproduced in these columns from authorities in cities of about equal size of Toronto, in both Canada and the United States, all of which declare that our every contention is borne out by the better judgment of the best critics upon such matters. We have, however, made our position clear to our readers on the matter, and from the report of the committee appointed by the Board of Education to investigate the affair, it is plain that it is not their intention at the present time to change their policy unless some further development takes place in the near future to force their hand.

The following letter from the Building Inspector of

Cleveland, commenting upon our letter to Mr. Bishop, is interesting in that there is no man on the continent who should be better qualified to know the lessons to be learned from the Collingwood disaster than he, for he was one of the several experts appointed to investigate the catastrophe. His views upon our contentions are clearly set forth in the following:

Dear Sir,—

I have read with much interest your article on Toronto schools in your magaine of November.

The points you have brought out in your article are very important, and have all been verified, beyond a doubt, in the Collinwood fire. I am frank to say that previous to the Collinwood fire I considered this type of building perfectly safe for two stories in height without fire escapes, and up to that time I never believed it was possible but that all scholars upon the first and second floors could pass from a building through the hallways and general exits with perfect safety before fire gained sufficient headway to prevent their escape. I feel that the only safe exits for buildings of this type of construction are exterior stairways which take the scholars immediately away from fire and smoke and not into it or through it.

Anyone who is at all familiar with the details of the Collinwood disaster would not hesitate to say that all non-fireproof school buildings should be provided with exits which would allow scholars to pass from the building with perfect safety regardless of the cost of the same.

Were I a resident of Toronto, I would join you in your effort to make all non-fireproof school buildings as safe as they could possibly be made.

Trusting you will keep on with this work until your purpose has been accomplished. I am, yours truly,

WM. S. LOUGEE,
Inspector of Buildings.

Cleveland, November 29th, 1909.

Mr. Mitchell, Commissioner of School Buildings of Winnipeg, has also some interesting comments to make relative to the position of Toronto authorities with regard to fire escapes on schools. Mr. Mitchell, together with the Superintendent of Schools of Winnipeg, visited fifteen cities in Canada and the United States for the purpose of learning the most generally accepted standards in school construction and equipment. Upon his return, all three-story schools in Winnipeg were provided with fire escapes, and all new schools erected since have been limited to two stories in height. Toronto authorities have declared against fireproof schools, against limiting schools to two stories in height, and against fire escapes; quite a contrast. Mr. Mitchell's letter is as follows:

Dear Sir,—

The November copy of "Construction" came duly to hand, and the editorial "Are Toronto's Schools Safe?" read with care. While the question appears to be a very pertinent one, the first thought was, why should the Inspector of School Buildings be addressed?

I have no desire to interfere in any way in a matter which primarily affects Toronto, but occupying a somewhat similar position as that of Mr. C. H. Bishop, it may be that I look at the situation from a different viewpoint than that from which you see it.

It is conceivable that Mr. Bishop, being an official of the Toronto School Board, is loyal to that body, and is endeavouring to show that all buildings planned by him are in accordance with the ideas which are held by the Board, or with the amount of money which the people of Toronto desire to spend upon the school buildings which they are having erected, or for repairs and improvements on those already occupied, in which case he is not the one to be blamed.

Every word in the able editorial would seem to vitally concern the parents of Toronto, and upon the people should the responsibility rest of knowing that whatever is required has been done to provide safe exits for the children under all or any conditions which may at any time exist.

It seems a truism to say that the people rule, and and whatever the citizens of Toronto want in respect to the schools, if they are in earnest, they can have, and not even the School Board, much less an official, can prevent their desire from coming into force. The power is in the hands of the people at each election to place men in positions who will be anxious to carry out their will as expressed, and after the clear and convincing manner in which you have stated the situation, the public should be prepared to accept the full responsibility for whatever may occur in the future, even if it should be to the loss of bright young lives, the joy and pride of the home from which they came.

The one point in your strong and positive editorial which alone concerns Winnipeg or myself is the statement said to have been made by Mr. J. L. Hughes, the superintendent, to one of the Toronto evening papers referring to the fire escapes erected on the schools of this city to the effect that the children would be crushed to death in them. If that statement were made by Mr. Hughes, it seems incredible that a gentleman of his ability and wide experience should venture to express himself upon a subject of which he is so evidently in ignorance, and to place his opinion in opposition to that of men such as the Chief of the Winnipeg Fire Brigade, City Building Inspector, and Provincial Fire Commissioner, who admittedly are well qualified to judge of the merits of the spiral escape in use in Winnipeg, down which already thousands of children have come without injury. From my experience, I am prepared to state that under no circumstance which may arise, would there ever be a possibility of any children being crushed or even seriously injured, no matter how they came down. Once they are in the escape, they are bound to keep coming at a regulated speed until they come out at the bottom, and then they are in safety. Let this defence of the escapes on the Winnipeg Schools be my excuse for writing in connection with your editorial on the Toronto Schools. Yours very truly,

J. B. MITCHELL.
Commissioner of School Buildings.

Winnipeg, 30th November, 1909.

In view of the importance of the question of school design and construction, not only in Toronto, nor only in Ontario, but in the whole of this new country of ours, the Toronto Chapter of the Ontario Association of Architects in their usual public spirited attitude upon such questions, has appointed a committee for the purpose of inspecting Toronto's schools and investigating the requirements in other cities, the charges made in CONSTRUCTION, and the contentions of the Toronto school authorities. They will make a report in the near future, which promises to be thorough, unbiased and exhaustive. It is our intention, therefore, to let the matter rest until such time as the architects' report is made public.

THE ONTARIO ASSOCIATION OF ARCHITECTS will hold their annual meeting in Toronto on Jan. 11 and 12, at the rooms of the Toronto Chapter of that association. Two of the most important subjects under discussion will be affiliation with the R. A. I. C. and Architectural Education.

COMMERCIAL AND INDUSTRIAL DEVELOPMENT OF WINN IPEG, AS TOLD BY THE CAMERA. 1—View along Portage avenue. 2—Main street, on a busy day. 3—A section of Donald street, showing how the residential cross streets are being crowded back by big mercantile and office buildings. 4—Winnipeg yards of the C.P.R.

THE GATEWAY TO THE GRANARY OF THE BRITISH EMPIRE.—A Brief Review of Winnipeg's Progress Together with a Few Notes on the Architecture of Its More Recent Buildings.—Influence of Western Optimism on Building Design. ∴ ∴ ∴

"The visions that your old men saw fifteen years ago, I saw translated to-day into stone and brick and concrete."—RUDYARD KIPLING AT WINNIPEG, OCTOBER 4TH, 1907.

THESE WERE THE WORDS of the Empire's greatest litterateur when he gazed with wonder and admiration upon the truthful evidences of the intrinsic growth of the gateway to the granary of the British Empire. Much has been written about the great metropolis of Canada's West, but never was its marvelous development so aptly, so honestly, and yet so briefly described as in these words of Kipling.

We read with amazement and wonder, the statistics of the growth in commerce, in population, in railway building, in social and educational progress, but there is no element in the development of this, Canada's newest and most progressive city, that bespeaks so truthfully and so plainly the stability of its institutions, the character of its people, and the solidity of its growth as that of the architecture and construction of its buildings. There is no city on the American continent that, during the past three decades, has experienced such a substantial, healthy growth, as has Winnipeg, and there is not a city in Canada that is erecting a better class of buildings from the standpoints of both design and construction, than is Winnipeg.

This is not only an evidence of the earnestness and good taste of its people, and an indisputable indication of the confidence of the east in the future of the city, but it demonstrates the excellent character of men the West has attracted from other portions of the world.

Culture, good taste and refinement are everywhere evident in buildings of all classes, from the small dwelling to the costly mansion, from the store building to the skyscraper, and from the public school to the larger public and semi-public structures. While eastern architects have contributed to some extent, to the architecture of Winnipeg, most of its buildings have been designed by its own resident architects, whose work compares most favorably with that of designers to be found anywhere. The construction of these buildings bears unmistakable evidence of the ability of Western contractors, and the skill of Western mechanics. When it is realized that mostly all of the higher class of building materials and equipment have to be brought from the East, and when the high cost of labor and the short building season is considered, it is plain that Western architects and builders are deserving of exceptional credit for the excellent class of structures they have been responsible for the erection of.

An impressive feature of Winnipeg's buildings, which is peculiar to that city, is the fact that they are decidedly modern in every particular, and the optimism which seems to pervade everything in the West, shows a very marked influence in the design of its buildings. Everything is new, bright, and seems to be in keeping with the free, clear, fresh, invigorating atmosphere of the open prairie, and the beautifully bright Western sun, that are so conducive to the optimistic, progressive "go-ahead" spirit of its citizens.

From a bare trading post in 1870, Winnipeg has grown to a city with an area of 13,990 acres, and a population of 128,000, and stands to-day a living evidence of the richness of the great prairie country of Canada's Golden West, a magnificent monument to the spirit of progress that seized upon its citizens and the wealth and success that has awarded their efforts and brought into realization their dreams.

Its wide, well kept business streets, with the many large stores, stately office buildings, monumental bank buildings, and dignified public structures, give evidence of the prosperity of its business institutions. The large, substantial warehouses, and manufacturing buildings in its wholesale district, demonstrate the importance of Winnipeg as a distributing centre.

The exceptionally well equipped, well constructed colleges, public schools, libraries, hospitals and public institutions, show the degree to which the citizens have undertaken to assume their responsibilities as builders of a great city.

The beautiful residential districts, with miles of boulevarded and smoothly paved streets and tastefully designed homes gives evidence of the prosperity and culture of its people.

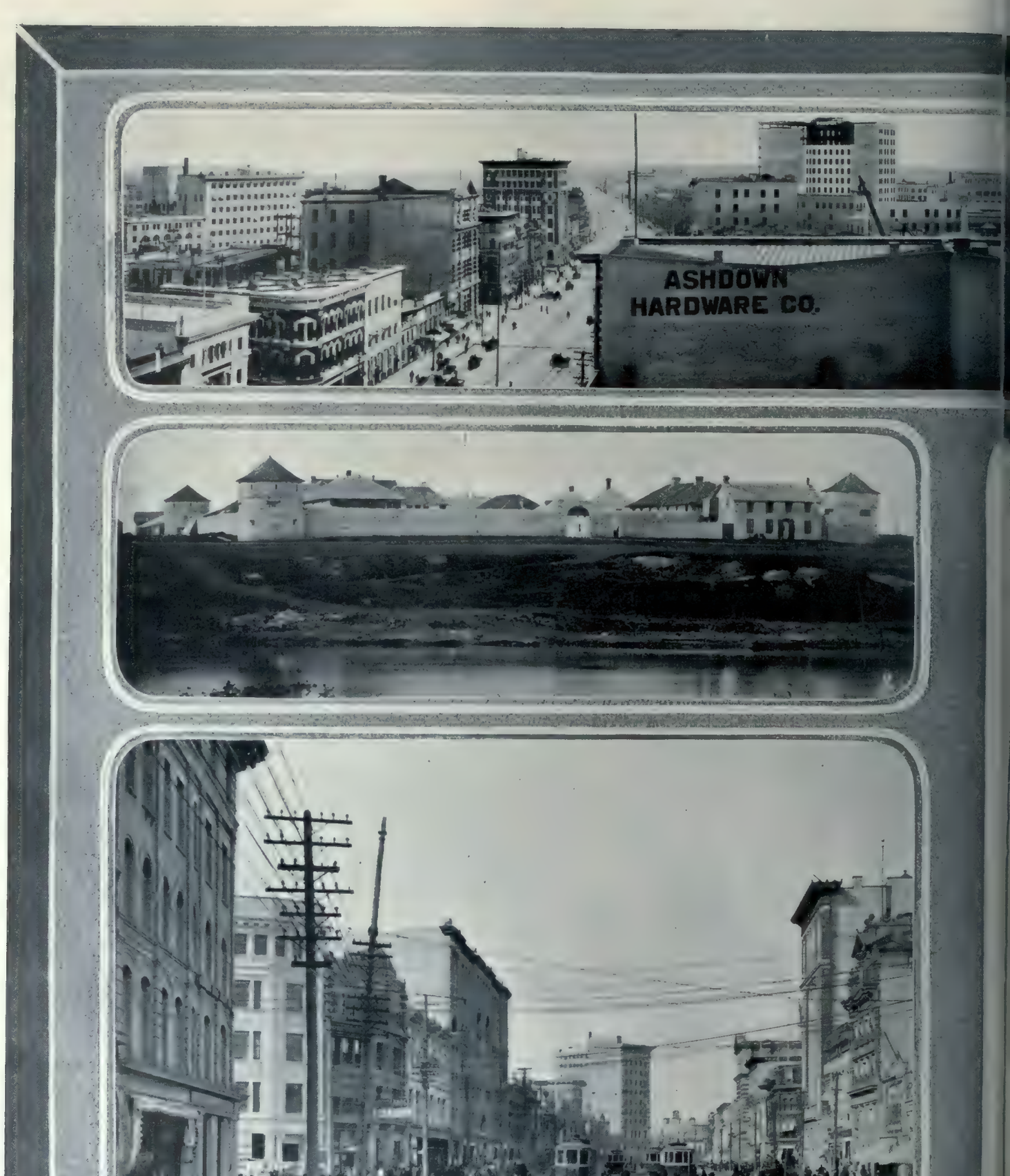
Some idea of the growth and importance of this highly prosperous city may be gained from the fact that during the past six years more than $50,000,000 has been spent in the erection of new buildings, and the expenditure in this direction for 1909 will exceed twelve million dollars, a record unparalleled by any city of its size on the North American continent.

The population has increased from 48,411 in 1902 to 128,000 in 1908. The total assessment of city property has increased from $28,615,810 in 1902 to $116,101,390 in 1908. It has eighteen chartered banks operating forty-one branches in the city, and Winnipeg bank clearings have increased from $188,370,003 in 1902 to $614,111,801 in 1908.

Vast sums have been expended during the past five years in municipal improvements, with a view to rendering it the most livable city in the country. It owns its own parks, its asphalt plant, stone quarries, waterworks and street lighting systems. It has under construction its own electric power plant, to have 60,000 h.p. capacity, and to cost $3,500,000. It has 185 miles of water mains, 166 miles of sewers, 377 miles of sidewalks, 300 miles of paved and graded streets. The city has 9 fire hall stations, with 36 fire fighting outfits, and 300 lb. high pressure water system.

As a railway centre, Winnipeg is one of the largest, if not the largest, in Canada. It is the eastern terminus of the western lines of the three great Transcontinental Roads. It has the largest individual railway yard in the world, and the Grand Trunk Pacific shops just being completed will be the largest in Canada, and with the completion of the Fort Garry station, it will have the largest joint terminal railway station in Canada. Thirty-six hundred railway employees reside in Winnipeg. Winnipeg's electric street railway has 104 miles of tracks, operates 140 cars, and during 1908 carried twenty-two million passengers with gross receipts of $2,206,094, as against three million passengers, with gross receipts of $28,132 during 1900.

The importance of Winnipeg as a distributing centre for Western Canada is shown by the fact that the wholesale turnover exceeds $90,000 annually. Nineteen hundred commercial travellers have their residence there. Winnipeg is also rapidly developing her manufacturing industries, as is shown by the fact that thirty-three new industries were added during the past three years, and in 1905 the output of manufactured products amounted to $18,983,248, as compared with $8,606,248 in 1900. The indications are that the next decade will bring a very large number of manufacturing industries to Winnipeg, that will be promoted to supply the rapidly increasing demands of the great West. Despite the marvelous commercial development of their city, the citizens have not been too busy to remember their religious obligations and



Photographic glimpses of Winnipeg, a city which has in forty years grown from a trading post of the Hudson Bay Company, to a municipality of position of importance in the commercial life of the Dominion, somewhat analagous to that held by the city of Chicago in the United States. character of its many modern buildings. 2—Fort Garry, as the city was known forty years ago, and which has long since disappeared in the we it will bear. 3—Business buildings in the down-town section, showing the Union Bank office building in the background. 4—View along Main

100,000 souls and an annual turn-over in trade amounting to over $100,000,000. Both in geographical location and in business activity, it occupies a worthy of its title, the "metropolis of Western Canada." 1—Panoramic view of the business district, giving an excellent idea of the metropolitan Canadian progress; the ground on which the old Fort stood now forms the site of the new Union Station at present under construction, whose name with, owing to its group of financial houses, has come to be known as the "Wall Street" of the Canadian West. 5—A section of the wholesale district.

THE ALEXANDRA, WINNIPEG'S NEW MODERNLY APPOINTED FIREPROOF HOTEL. 1—Rotunda. 2—Main dining room. 3—Grill room. 4—A general view of Royal Alexandra Hotel (left), and C.P.R. Station (right), showing lay-out of grounds. E. & W. S. Maxwell, Architects.

The Grain Exchange, Winnipeg, which in breadth of architectural treatment typifies the importance of the Western metropolis as the gateway of the great Western wheat belt. Darling & Pearson, Architects.

The Post Office Building, Portage avenue, Winnipeg. An architectural acquisition of which the city and Federal Government may feel justly proud. Darling & Pearson, Architects.

Union Bank premises, Main street, Winnipeg, a lofty structure which eloquently attests to the city's commercial and architectural growth. Darling & Pearson, Architects.

Merchants Bank Building, Winnipeg. An imposing structure which dignifies the business section along Main street. S. F. Peters, Architect.

educational requirements, which will be seen from the fact that it has thirty-three schools, five colleges, and one hundred and fifteen churches. It has a public library that cost $135,000. Neither have they overlooked the necessity of recreation and amusement. Winnipeg has three hundred and sixteen acres of park play grounds, two river rowing courses, lake resorts north, east and south, with steamboat and railway facilities, as well as six theatres, an amusement park, and holds annually Western Canada's Industrial Exhibition.

It has been the exigency of keeping up with the demands of such an extraordinary growth that has occasioned such a building boom in Winnipeg, and the architects and builders upon whom the responsibility falls to provide these structures have designed and built well. While wood had to be resorted to as one of the chief materials in building construction in the early days, it is not so now. Brick yards have been established that manufacture a fairly good quality of common brick, which is sold for a price that is comparatively reasonable, and brick is rapidly replacing wood in the erection of even the smaller dwellings. The city has been blessed by the existence of large stone quarries in its immediate vicinity, from which a very excellent quality of stone is procured, known as Tyndall stone. Gypsum is manufactured in the city, and steel fabricators have erected large plants there. Concrete and terra cotta are being used to a very marked extent, in all classes of business and public buildings. A very large amount of material, such as pressed brick, terra cotta, cement, etc., must be imported or brought from the East, but very large supply yards have been established where stocks of almost every material an architect or contractor should desire may be obtained upon short notice. It is thus that all the factors and the elements that make possible the erection of well designed, constructed and equipped buildings, have worked together with the western architect to give Winnipeg a class of buildings that would do credit to cities of a very much larger size in the East.

Winnipeg has simply crossed the threshold of an expansion and growth that during the next decade will outclass that of any other city in the new world, and it rests with the manufacturers of Eastern Canada to aid that growth and secure this great Western country commercially to Canada, by studying their requirements and making it as convenient as possible for the West to buy their products.

It is impossible to convey in words even a faint idea of the substantial nature of Winnipeg's growth to those who have never visited the city, but the accompanying illustrations of its streets and its buildings truthfully reflect the beauty and stability of its more recent structures.

The Grain Exchange is Winnipeg's newest and best equipped fireproof office building. It was completed almost a year ago, and, in design and construction, is modern in every particular. It was designed by Messrs. Darling & Pearson.

The exterior walls are constructed of yellow pressed brick, with white stone trimmings and is constructed of steel and concrete throughout; has reinforced concrete floors and terra cotta partitions, and has hardwood finish interior throughout the entire structure.

It is fitted with four hydraulic elevators, and has its own lighting plant, which consists mainly of two 80 kilo. alternating generators, directly connected with high speed engines. The exhaust steam is used for heating purposes. Switches controlling the building's private power, and also controlling the emergency power from the city's plant, are located on one board, and the turn of a lever transfers from one to the other.

Steam is supplied by three 150 H.P. boilers, fitted with automatic stokers. The ventilating system consists of an immense blower, which draws the air from above the roof of the building, and sucks it into the basement. Here it passes through a coil of pipes, where it is heated. From these pipes, it is shot through a film of pure water, which humidifies it and cleanses it of all dust and impurities, after which it passes through the main pipe to the top of the building, and from there it is distributed, at whatever temperature is required for the various offices, whose occupants regulate it by thermostats. Another blower is located at the top of the building, which sucks the foul air from the offices and rooms, into innumerable ventilators in the walls, and discharges it from the roof. This structure houses the offices of some of Winnipeg's most important institutions and as the Grain Exchange it is duly considered one of the city's most important business buildings.

One of Winnipeg's most imposing structures is the new Federal building, completed a little more than a year ago. It is located on Portage Avenue, and was designed by Messrs. Darling & Pearson. Although the facade is good and has been so designed as to suit the location, it is most unfortunate that a sufficiently large site could not have been provided to have permitted of some ground space around the building, that would not only have given the architects a better opportunity to do justice to an expenditure of $750,000 in the way of architectural treatment, but would have allowed for future extensions.

The design might be called English Renaissance. The base of the front is constructed of Tyndall stone up to a height of four feet, while Ohio sandstone is used above the basement walls. The building has a steel frame fireproofed with concrete, concrete floors reinforced with expanded metal, brick clothing walls and terra cotta partitions. The rotunda is wainscotted with Italian marble, while Missisquoi marble is used for the base of the counterfittings. The interior woodwork and furniture is of light finished quarter cut oak and the color scheme carried out in the rotunda is not only very pleasing but everything is light in color, thus utilizing to the best advantage all the light that pours in through the large front windows.

The heating plant of this structure is especially worthy of note. It is a combination gravity and fan system. The general gravity system for the entire building consists of a brick flume surrounding the smoke stack. This heated flume connects with all floors, and creates a constant current of air that ventilates the structure most successfully. The Fan System has been installed for the ventilation of the lavatories.

The interior arrangement is said to be admirable, providing excellent accommodation for all the various departments.

The Union Bank building is Winnipeg's tallest skyscraper. It is twelve stories high, and was designed about three years ago by Messrs. Darling & Pearson. It is of frame steel construction, fireproofed with terra cotta. The exterior walls are of yellow pressed brick, trimmed with ornamental terra cotta. It has oak interior finish, and has three elevators. The banking-room is decorated with Verd antique marble, has Scagliola columns, and mosaic floors. It was constructed by an American contracting firm, and cost $350,000.

One of the best monumental designs in bank building construction on Main st., is the Canadian Bank of Commerce building, erected about two years ago. It was designed by Messrs. Darling & Pearson. Its facade is Grecian classic and was constructed of Bedford stone. This structure is fireproof throughout, and is one of the finest bank structures in Winnipeg.

One of the newest and most notable of recent bank buildings constructed in Winnipeg, is the Bank of Nova Scotia, which will be completed in the course of a few months, at the cost of $250,000. It has a granite base, and the front walls are built of English glazed Terra cotta of a very light buff or heavy cream tone, that presents a very pleasing effect. The structure is skeleton steel, fireproofed with concrete; the columns are protected with brick and concrete. Terra cotta has been used for the partitions. The banking room has been decorated with Missisquoi marble for wainscott and Caen stone has been used above the wainscotting. The wood-

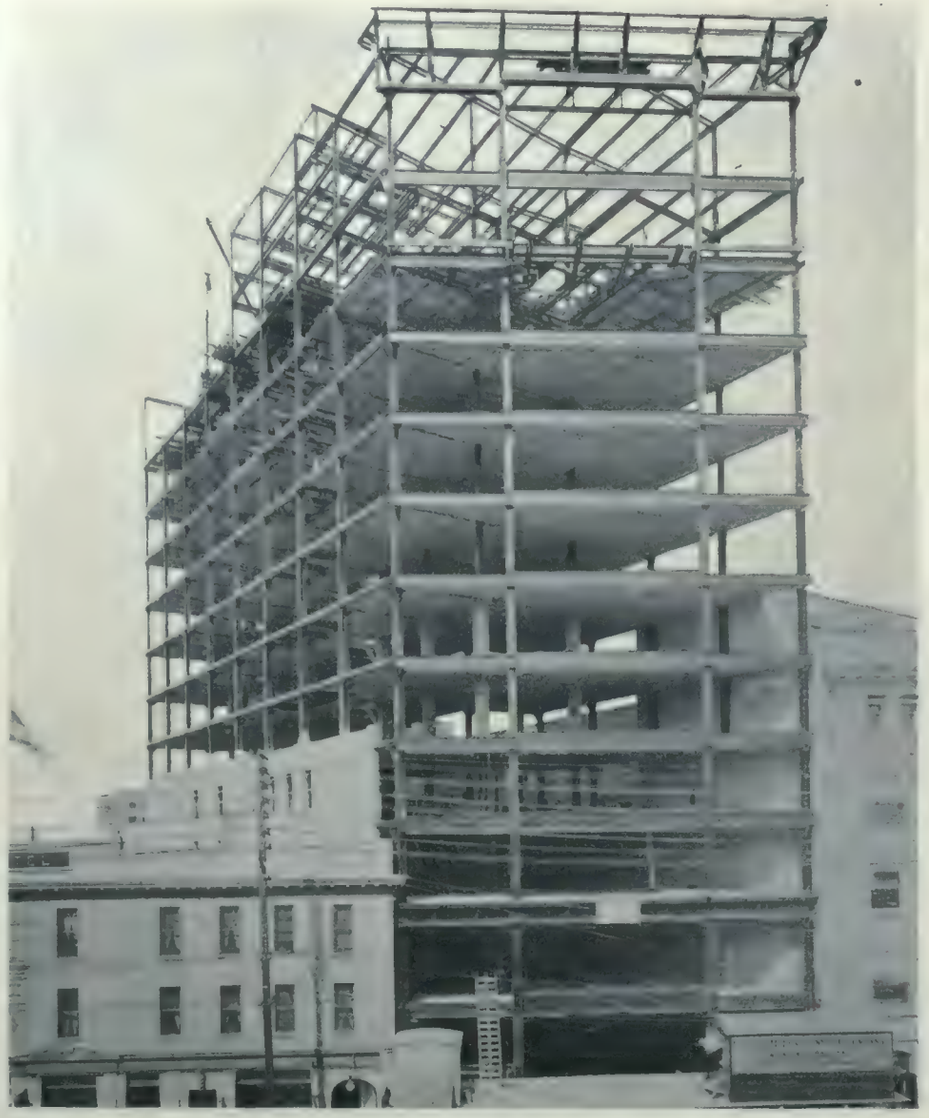
Canadian Bank of Commerce, Winnipeg. Another noteworthy example of the city's modern banking premises. Darling & Pearson, Architects.

Home of the Bank of Nova Scotia on Portage avenue, Winnipeg. Another of the city's splendid banking institutions. Darling & Pearson, Architects.

New premises of the Imperial Bank of Canada, Winnipeg. A striking reflex of Western progress in building design and construction. Darling & Pearson, Architects.

Interior of Imperial Bank, Winnipeg, showing the rich marble counters and wall and ceiling schemes. Darling & Pearson, Architects.

Nanton Chambers, corner Portage avenue and Main street. One of Winnipeg's new additions in the way of a commercial building. Darling & Pearson, Architects.



McArthur Building, Winnipeg, a twelve story steel, hollow tile and white glazed terra cotta building now in process of erection, on Portage avenue, near Main street. J. H. G. Russell, Architect.

work on the ground floor is mahogany, while the upper floors have oak interior trim. The building has fireproof windows on all exposed sides. A feature of this structure worthy of note is the fact that the terra cotta used in its construction was brought from England, while the ornamental iron stairways were constructed in Glasgow.

Another bank building, designed by Messrs. Darling & Pearson, is that of the Imperial Bank of Canada, which cost in the neighborhood of $200,000. It is of skeleton steel frame construction, fireproofed with concrete. It has floors of reinforced concrete, and its partitions are of terra cotta. The upper floors have oak trim, and the banking room is finished in mahogany. The ventilating apparatus is of the low pressure gravity system. The exterior design of this structure is such as to particularly adapt it to the corner upon which it is located, and it stands as another evidence of the confidence of Eastern banking interests in the future of the West.

Another of the recent buildings designed by Architects Darling & Pearson, is the new Nanton block, at the corner of Main st. and Portage ave., which was erected at a cost of $150,000. It has a concrete foundation, with Bedford stone front, and the structural work is of steel with reinforced concrete floors. The partition walls are constructed of galvanized iron studs and expanded metal lath, upon which cement plaster has been applied. It has fireproof windows and the interior woodwork is of oak throughout. The Nanton block occupies one of the most important and busiest sites in Winnipeg, and, from the standpoint of interior office arrangement, is one of the best in the city.

The rapid growth of Winnipeg from a commercial standpoint, as is seen in the many substantial business buildings erected within the past few years, is further evinced in the new twelve-story McArthur Building now under construction on Portage Avenue, close to the corner of Main St., the principal thoroughfare in the business district. This building, which when completed will be the highest structure in the city, is of the modern steel frame type with tile arched floors, fireproof partitions, and a facade of white glazed terra cotta. It will provide store accommodations on the ground floor, with offices above, the suites being so arranged as to insure the maximum degree of light to all interiors, thus making ideal office quarters. The central portion of the building will rise to a height of thirteen stories, to provide for the overhead apparatus of the high speed elevators, together with janitor's apartments, and store room facilities. At the present time, the structure is being enclosed, and the contractors are making excellent progress in the execution of their work. All the steel work is to be fully protected at every part, making the building absolutely fireproof, and the interior throughout will be modern in the character of its appointments, the sanitary appliances and general fittings being of the most approved pattern and type. A feature of the building will be its splendid power and machinery equipment, as not only will it be provided with its own plant for power, lighting, ventilation and heating, but it will also contain its own water supply system as well. The designing and supervising architect of the building is J. H. G. Russell, and the consulting engineer of mechanical equipment, Mr. Chas. T. Pillsbury; the work of erecting the building being executed by the Carter-Halls-Aldinger Company, contractors and engineers.

Another structure which forms a link in the chain of Winnipeg's financial houses is the Trade Bank Building on Main Street, a short distance south of the old Post Office. It is a three story building—originally having stores on the ground floor—that has been remodelled for banking and office purposes and made interesting both architecturally and in interior arrangement. The front is built of Tyndall stone, which is quarried a few miles south of the city. It is a peculiarly beautiful stone of whitish grey color with a brown veining, similar to a maple leaf, which works about like Portland or Indiana stone, but which, owing to pockets or voids, is not reliable to work with a rubbed surface—better results being obtained by tooling, crandling or cross tooth chiseling. The lower story of the facade consists of five arched doors and windows, divided off by Ionic columns, the upper portion of the building being simple and direct in its treatment, with the panels above the third story windows having effectively carved wreaths standing out from the stone in bas relief. Access to the banking room and to the hallway leading to the offices above is obtained through cast iron entrances having copper doors fitted with bronze kick and push plates. The public space in the banking room is so arranged as to provide the maximum counter space. The floor is of marble mosaic, while the counters are of Vermont marble, with Verdantique trimmings and polished bronze grilles. Ample provision is made for a ladies banking room, in a space to the right of entrance. The vault equipment is of the most approved character; and tables in the windows of the main banking room affords sufficient bulk head to adequately light the offices with basement. The structure was remodelled according to designs of Architect F. S. Baker, of Toronto, and the Bank contemplates the use of the building as their principal Winnipeg branch, until some time in the future when they propose to erect a permanent banking building along model lines.

While there is an abundance of evidence on all sides in the way of substantial business building to clearly indicate Winnipeg's great commercial growth, and its increasing importance as a distributing point, there is nothing, perhaps, which serves to more fully impress this fact than the Fort Garry station, which is being erected on Main St., opposite Broadway, for the joint use of the Canadian Northern and Grand Trunk Pacific Railways. This splendid building covers a ground area of approximately 50,000 sq. ft., the frontage on Main St. being 352 ft. and the depth 140 ft. It forms a part of a comprehensive scheme, involving an extensive system of trackage, train sheds, freight houses, etc., which will give the city one of the largest and best equipped terminals in the world. As regards construction, the station will be of steel, concrete, and stone throughout, and already the work has been carried to the point where the structure is practically enclosed. The height of the larger portion of the building is three storey and basement, with an elaborate central portion surmounted by a dome rising 100 ft. above the street level. The main entrance will be through a vestibule leading directly to the ticket lobby. This lobby, which will occupy a clear circular space 90 ft. in diameter entirely unobstructed by columns, seats or booth of any kind, is directly beneath the dome and will be exceptionally well lighted on all four sides by large arched windows. The waiting room will lie north of the ticket lobby, while adjoining it on the west side will be a lunch room and a restaurant, both having separate entrance off Main Street. The interior of the waiting room and the ticket lobby will have the effect of stone construction throughout, the wainscoting being of marble 6 ft. high and the floors of terrazzo. All stairways will be of iron with marble treads. In the south wing of the building will be located the baggage and express rooms, while the entire north wing of the basement is to be devoted to immigrants, and will provide a large waiting room, a laundry, and toilet and bath facilities for both sexes.

The second and third floors will be occupied by the offices of the two railways and by the National Transcontinental Railway, each floor providing an available office space of 25,000 sq. ft., exclusive of corridors, stairways, elevators and toilets. Provision has been made in the design of foundations and the steel structure of the building for the future addition of six office floors so that the building will then be capable of providing 200,000 sq. ft. of office room. The building is so designed that there will be no necessity of artificial lighting in any portion of the day. The heating will be done by steam, indirect system, with mechanical ventilation. The columns

View showing the steel work of Fort Garry Station, Winnipeg's new union depot which is being erected conjointly by the Canadian Northern and Grand Trunk Railways. Warren & Wetmore, Architects and Engineers.

Fort Garry Station, showing the work well under way. When completed, Winnipeg will have the most modernly equipped terminal on the American Continent, if not in the entire world. Warren & Wetmore, Architects and Engineers.

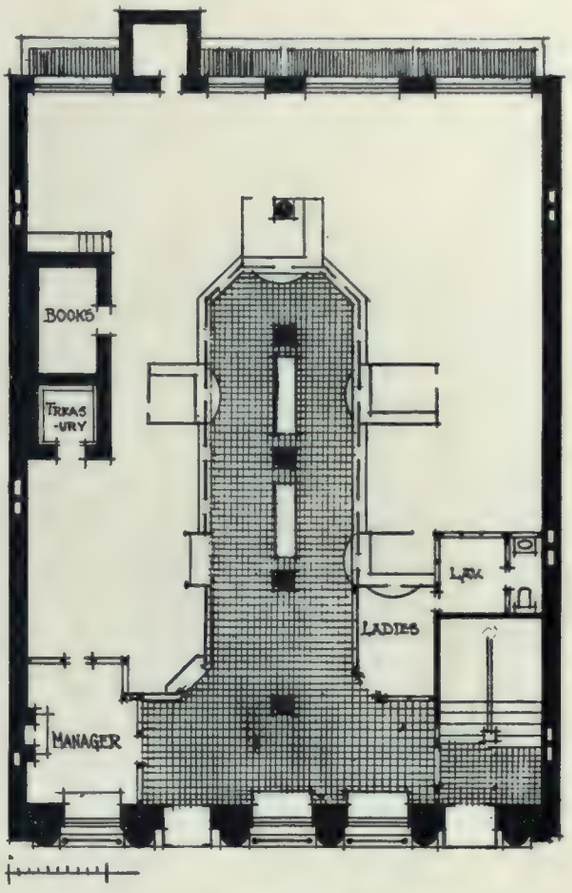
are supported at the foundations by concrete piles, this being necessary on account of the heavy column loads and the character of the blue clay underlying the city.

At the south-west corner of Portage Ave. and Hargrave St., there is at the present time under construction the Enderton Building, which will in the near future form a handsome addition to the retail section. This building, which is to be a three story structure, is designed along modern lines, with a large portion of the frontage on both streets taken up by huge plate glass windows, thus making it one of the best lighted buildings in the city. On the ground floor are to be six spacious stores, four facing Portage Ave., and two fronting on Hargrave St., while the two upper floors will contain twenty-six modern offices. Above the first floor, which will practically be enclosed on the street sides by large show windows, the walls are to be of dull glazed terra cotta of a light cream color, the large plate glass windows being uniformly marked off by Ionic pilasters and horizontal panelling between the second and third stories. The entrance to the elevator and stairway giving access to the upper

Main branch of the Traders Bank of Canada, Winnipeg, built of Tyndall stone, a peculiarly beautiful whitish grey, brown veined, stone quarried a few miles south of the city. F. S. Baker, Architect.

floors will be in the centre of Portage Ave. front, through a spacious vestibule and hall lined with marble and paved with a mosaic tile. The offices will be grouped around a large hallway or arcade extending from the second floor to the glass covered roof and running nearly the entire length of the building. This will insure every room having a maximum degree of light. Partitions separating the offices from the passages surrounding the arcade will be of plate glass, with a low marble base, and divided longitudinally into sections by columns and pilasters rising to an enriched plaster cornice. In appointments and furnishings, the building will be modern throughout. The heating will be by steam, and special attention has been given to the ventilation and sanitary requirements. Besides the space in the upper floor, additional accommodation for business purposes has been provided in the basement, which is excavated under the entire sidewalk area on both streets, and lighted by one thousand square feet of prismatic glass. The architect for the building is Mr. Wm. Fingland, and the work is being carried out by Mr. John A. Girvin, who has the general contract.

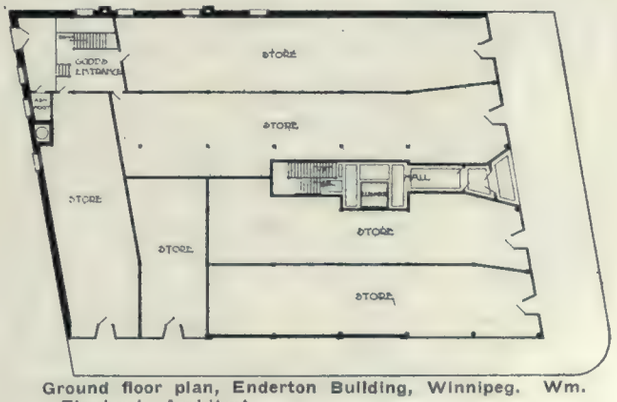
The building of the Winnipeg Horse Show Association, erected from designs by Architects Pratt & Ross,



BANKING FLOOR

Floor plan of main branch of the Traders Bank, Winnipeg. F. S. Baker, Architect.

at the corner of Osborne Place and Colony St., is another structure which speaks volumes for the progress and enterprise of the citizens of Winnipeg. It provides an amphitheatre 133 by 320 ft., with a riding academy 62 ft. wide and 132 ft. deep, adjoining it on the east side. Entrance to the main portion of the building is through massive carved oak double doors, which open into a spacious foyer. Connecting with this are, waiting rooms, for both sexes, toilet facilities, coat-rooms and offices. The amphitheatre proper, contains an arena of 220 ft.

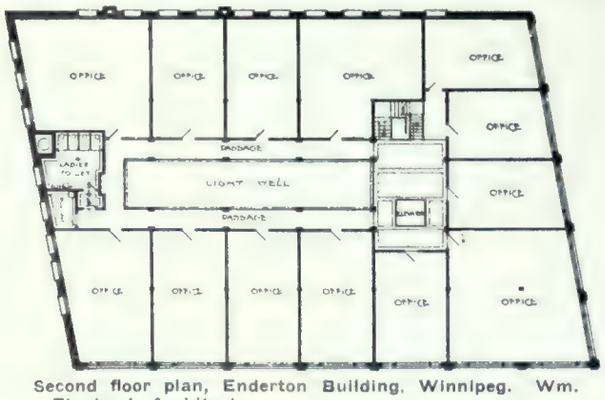


Ground floor plan, Enderton Building, Winnipeg. Wm. Fingland, Architect.

long and 86 ft. wide, which is admirably lighted by a glass covered space occupying the entire central portion of the roof, and well placed windows in the side walls. Surrounding the arena is a series of seventy-eight boxes,

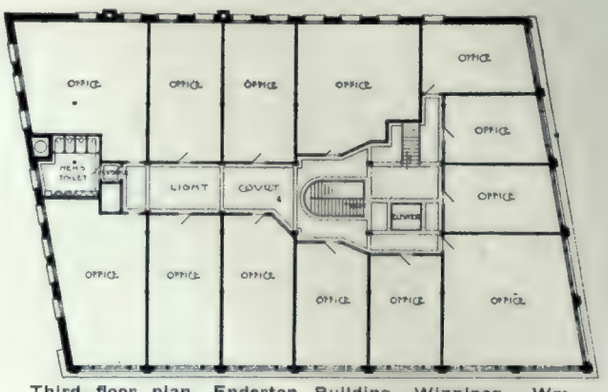
Enderton Building, corner Portage avenue and Hargrave street, a recent addition to Winnipeg's business district, which contains modern store and office accommodations. Wm. Fingland, Architect.

each providing accommodation for from six to ten persons. An excellent feature in the arrangement of the boxes is that they are elevated in such a manner that a perfect view of every part of the arena is obtainable, even though the promenade in front is crowded with spectators. On the second floor are a large and small reception room both suitable for dinner or other forms of entertainment, a committee room, ladies and gentlemen's dressing room, lavatories and shower bath, and a modernly equipped kitchen. The third floor provides quarters for the janitor, and contains a sitting room. dining room, kitchen, two bed rooms and bathrooms. The ring of the riding academy is 130 feet long by 50 feet wide, with slightly sloping sides to prevent a horse from crushing a rider's leg. A promenade gallery, 13 feet wide extends the entire length of the building, and a door, and there is an entrance from the school leading into the main arena. The building is heated by steam and lighted by both gas and electricity.



Second floor plan, Enderton Building, Winnipeg. Wm. Fingland, Architect.

In the way of public and semi-public structures, the class of buildings erected in Winnipeg will stand comparison with those of any other city of similar size on the continent. Considerable work of this character has been done by the architectural firm of Hooper & Hooper, whose senior partner, Mr. Samuel Hooper, lately deceased, was for several years back Provincial Architect of Manitoba, and Vice-President of the Royal Architectural Institute of Canada, at the time of his death. Several important buildings designed by this firm are grouped on one of the page illustrations. While the Tache School is a St. Boniface structure, it, nevertheless, is representative of the splendid character of buildings which are being erected in and about Winnipeg. The other subjects in the group include Winnipeg's Central Police Station, the Carnegie Library, the Empress Hotel at Winnipeg Beach, and the home of Hon. Robt. Rogers. All of these buildings are attractive in design and substantial in construction, and they show in a limited way,



Third floor plan, Enderton Building, Winnipeg. Wm. Fingland, Architect.

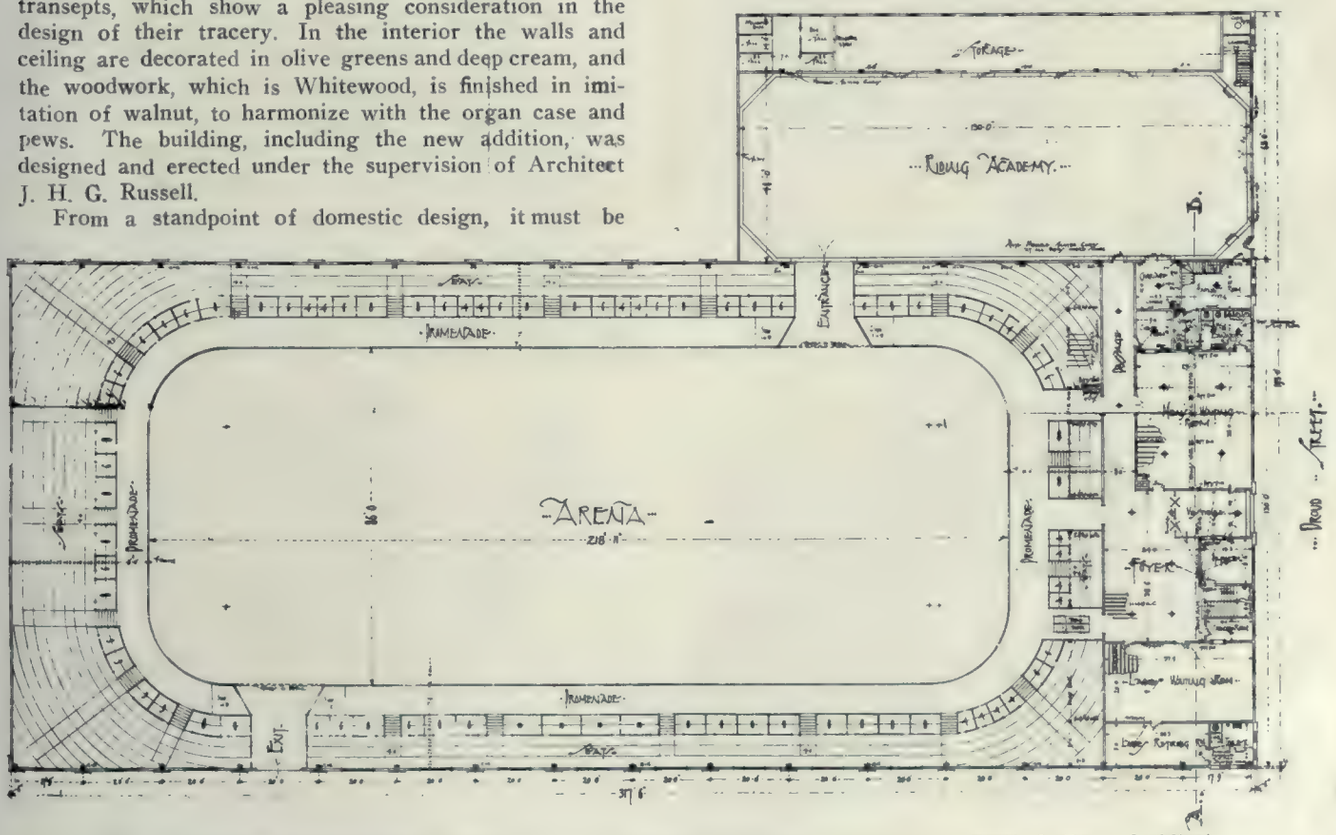
the versatility and ability of this firm as designers and some of the many important structures which have been executed under their supervision.

As regards church work, the city can point to a large

Amphitheatre and Riding Academy of the Winnipeg Horse Show Association. Another evidence of Western progress and enterprise. Pratt & Ross, Architects.

number of splendid ecclesiastical edifices to show that this important department of architecture is not being overlooked. One of the more recent examples in this respect is the Augustine Presbyterian church, which is located on River avenue, Fort Rouge, one of Winnipeg's finest residential districts. It is a large church of gothic design, to which a $25,000 extension for Sunday school and social work has just been added. The exterior walls and buttresses are built of Tyndall blue stone, and the main tower to the left of facade rises considerable above the balance of the structure. A noteworthy feature is the large five-light windows at the front and in the transepts, which show a pleasing consideration in the design of their tracery. In the interior the walls and ceiling are decorated in olive greens and deep cream, and the woodwork, which is Whitewood, is finished in imitation of walnut, to harmonize with the organ case and pews. The building, including the new addition, was designed and erected under the supervision of Architect J. H. G. Russell.

From a standpoint of domestic design, it must be said that the progress of the city has been signalized by a marked advance in this respect. One cannot be otherwise than impressed with the many fine homes and apartment houses which have come with the great period of expansion through which Winnipeg is passing. Many of these structures show a most pleasing consideration both in design and plan, and the average dwelling and apartment house will compare most favorably with similar structures of any other city on the continent. The houses illustrated on these pages show some of the more recent work in both large and small residences and apartment



Plan of Amphitheatre and Riding Academy of the Winnipeg Horse Show Association. Pratt & Ross, Architects

SOME MODERN APARTMENT BUILDINGS IN WINNIPEG. 1—Lee Court Apartments, Donald street, J. D. Atchison, Architect. 2—Devon Court Apartments, Broadway, J. D. Atchison, Architect. 3—Rosemount Apartments, Pratt & Ross, Architects. 4—Warwick Apartments, Central Park, W. W. Blair, Architect.

EXAMPLES OF WORK BY ARCHITECTS HOOPER & HOOPER, IN AND ABOUT WINNIPEG. 1—Tache School in the suburb of St. Boniface. 2—Central Police Station. 3—Empress Hotel, Winnipeg Beach. 4—Carnegie Public Library. 5—Residence of Hon. Robert Rogers.

Augustine Presbyterian Church, built of Tyndall blue stone. One of Winnipeg's new ecclesiastical edifices. J. H. G. Russell, Architect.

Home of D. R. Dingwall, Roslyn road, Winnipeg. A residence of simple and pleasing lines which in general detail exhibits a modern English feeling. J. D. Atchison, Architect.

buildings, and they serve, in a limited way, to give some idea of the work which Western designers are doing along domestic lines.

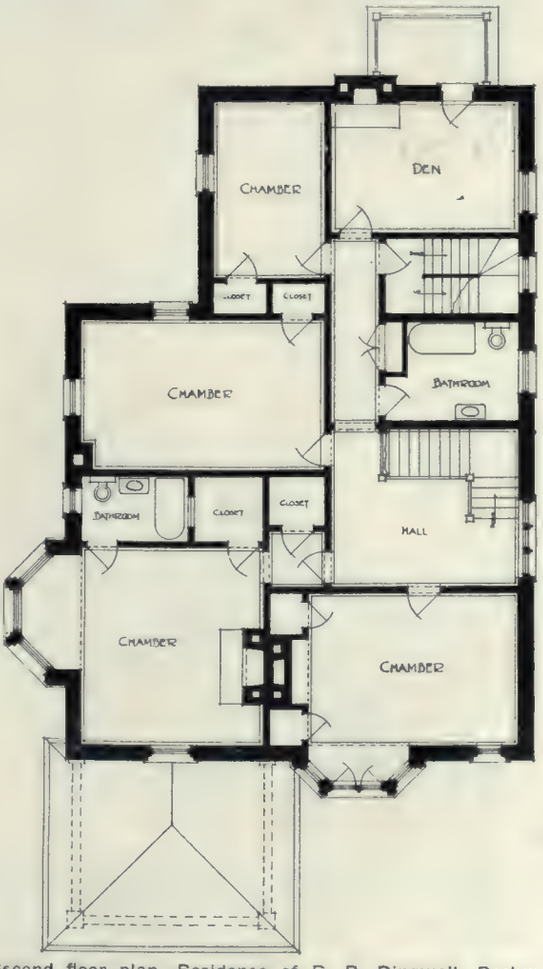
The house of D. R. Dingwall, on Roslyn Road, is a residence of simple and interesting lines, which, in

First floor plan, Residence of D. R. Dingwall, Roslyn road, Winnipeg. J. D. Atchison, Architect.

general design, exhibits a modern English feeling. It is the work of Architect J. D. Atchinson, and the walls are of red paving brick laid up in mortar of the same shade, and trimmed with first quality Tyndall stone. The first floor, in addition to the conventional number of rooms, has a servant's room so situated between the entrance and kitchen as to be quite removed from the main rooms, and yet permit the maid to either readily attend to the kitchen or front portion of the house. The hallway, and all main rooms, with the exception of the drawing room, are finished in quarter cut oak. In both the living room and dining room, the ceilings are beamed, while in the latter, the walls are finished with a high panelled wainscotting, plate rail and wood cornice. Directly opposite the bay window of the living room, is a large brick fireplace, and a pleasing feature is a spacious screened porch which opens off this room at the front of the house. This porch, and also the terrace and loggia are paved with red English quarries, laid in wide joints and pointed with black cement. The drawing room has a tile fireplace, ornamental plaster ceiling and cornice, and is finished in white enamel. Fireplaces have also been provided in two of the chambers, and den on the upper floor, which, besides the den, contains four good-sized bedrooms, having built-in clothes closets, and excellent bathroom accommodations. Walls of the rooms are of tile and keen cement, and the floors are of interlocking rubber tile laid on concrete beds.

An interesting example of the mansard roof type of residence, in which Tyndall stone and stained shingles effectively combine, is the residence of Dr. K. C. Campbell, on Ruskin avenue. The stone extends up to the second story level, above which point the walls and roof are encased with shingles, stained a dark brown, which produces a rich contrast with the lower portion and gives the house a very attractive appearance. This house has a pleasing lay-out and a spacious living room, with a beamed ceiling and a large fireplace, set in a nook with a built-in seat on either side. Casement windows open at the end of the room onto a summer porch, paved with square red tiles, which sets in under the upper story and makes a very pleasant spot on warm days. The living room, dining room and hall are finished in quarter cut oak. The hall and dining room are panelled; and all three have wood cornices. The other rooms on this floor, which consist of kitchen, pantry and closet space, are trimmed in birch, finished natural. Upstairs the entire woodwork is enamelled white. There are three bed chambers, a sleeping porch, sewing room, servant's room and three bath rooms. The bath rooms have tile floors and Keen's cement dado marked off in imitation tile. On the ground floor the flooring throughout is hardwood. The kitchen has a sanitary cement dado up to the height of five feet, and the pantry is equipped with china cupboards, pantry cases with drawers, etc. This residence is also the work of Mr. Atchison.

The house of Mr. F. Christie, on Betourney street, by the same designer, is a cement stucco house with a red brick base laid up in white mortar, which gives a warm effect to the expanse of the roughcast walls. In this house, as in many Winnipeg houses, the plaster is ap-



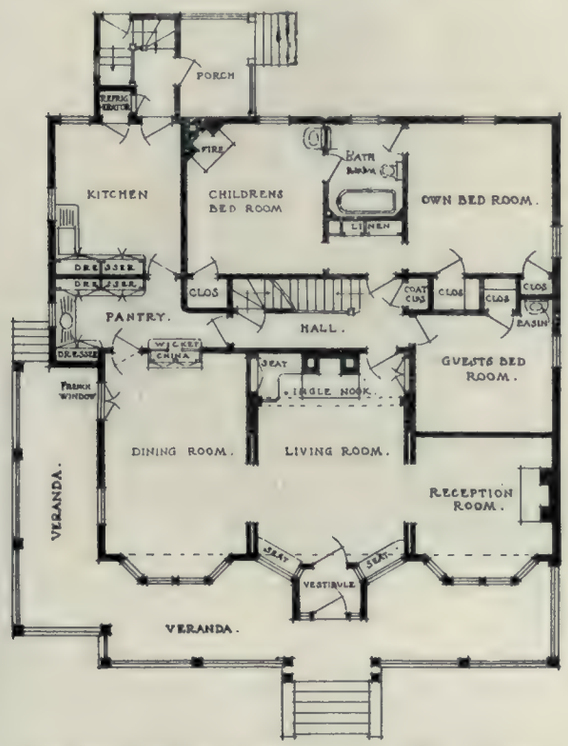
Second floor plan, Residence of D. R. Dingwall, Roslyn road, Winnipeg J. D. Atchison, Architect.

plied directly to metal lath, thus making it a durable and permanent type of construction. The entrance has an arched hood. The brick walls on either side of the stone step, as well as all chimneys, are capped with stone, and the piazza and vestibule are paved with red English

Bungalow of F. W. Pace, Wellington crescent, Winnipeg. The graceful lines, half timbered gables, and soft brown tone of woodwork, serves to give this little abode a pleasing individuality and homelike appearance. J. H. G. Russell, Architect.

Roslyn Court, Roslyn Road, Winnipeg. One of the recently completed apartment buildings, a noteworthy feature of which is the scheme of outside balconies, with doorways opening from each suite. Wm. Wallace Blair, Architect.

quarries. The vestibule, inner hall and servants' sitting room, which are on a line with the entrance, effect a separation of the large living rooms with the spacious rear verandah, and the dining room and kitchen, which takes up the left portion of the house. All rooms on this floor, with the exception of the kitchen and pantries, are finished in first quality quarter-cut oak. The living room has a beamed ceiling, large brick fireplace with oak mantels, and built-in window seat. In the dining room the walls are panelled to the plate rail. This room is connected to the kitchen, directly at the rear, by the servery and is provided with a built-in china closet. The



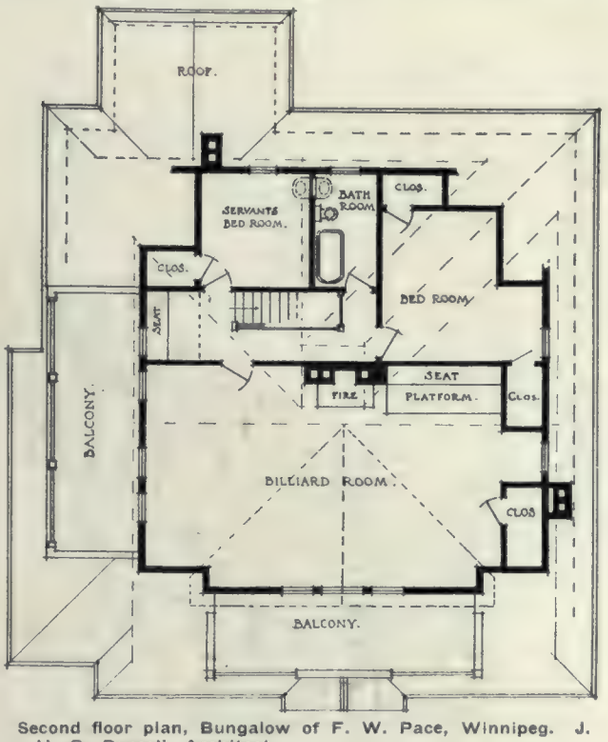
First floor plan, Bungalow of F. W. Pace, Winnipeg. J. H. G. Russell, Architect.

kitchen and pantries are trimmed in birch, and have built-in pantry cases, working counters, etc. The upper floor, which is finished in white enamel, contains a large hallway, three bedrooms, servant's room, large linen and clothes closets, and two modernly equipped bath rooms.

Architect Atchison's own residence on Nassau street, is also a roughcast house with base of red brick, having heavy spread joints of white mortar. It is not a very large house, but it is one with an interesting design, a well planned layout and rather roomy interior. The exterior is characterized by simple, straight lines and direct surfacing, and rendered particularly attractive and homelike in appearance by broad overhanging eaves and a most interestingly designed entrance. The reception room, and a good sized living room with a beamed ceiling and a large fireplace, to which it connects, both open on to a porch paved with red tile, at the side of the house. At the left of the entrance is the dining room with servery and kitchen directly at its back. All the main rooms are finished in oak, and the floors throughout are of hardwood. The vestibule, hallway and dining room have wood cornices and the latter interior has walls panelled to the plate rail. Upstairs are three bed-rooms, one of which has a fireplace, a sitting room, bath-room and a good sized hall. The exterior woodwork is stained a dark brown, and the roof shingles are stained red. The kitchen and bath-room have sanitary cement dados, and the latter is paved with a tile floor.

Another domestic structure designed by Mr. Atchison, is the home of W. C. Russell, on Ethel Ave. It is an interesting small house, built of stone, and shingles, and with a large rustic chimney rising from its base to a point slightly above the roof. The upper portion of the house is of the mansard type, with three front dormers, while the lower portion at the front is recessed and serves to form an enclosed verandah. In layout, the house follows the through central hall plan of the Colonial style. To the right is a large living room with beamed ceiling and fireplace, while to the left is located the dining room with the kitchen at the rear. These rooms, with the hallway, take up this entire floor, and all are furnished in fir stained to imitate oak. On the second floor are four chambers, a hallway and bathroom, all bedrooms and the hall are finished in white enamel, and liberal closet space is provided throughout.

Winnipeg has not been slow to recognize the advantages of the modern apartment building in solving the housing problems in her growing residential sections, and it might be said in this respect that in number, size and architectural treatment, the city's advance has been most marked. There are two reasons for the popularity of this character of building in the West. One is, that it affords accommodations in desirable localities for many new arrivals who have not fully taken up the matter of, or established, a permanent resident; and the other is, because many persons who have migrated from the East and the South, would sooner pay a little higher rental and be relieved of the certain duties which a western winter sometimes impose. In the construction of these buildings special attention has been given to the heating, ventilating and sanitary requirements. With few exceptions, the entrances are executed in marble and mosaics; the corridors, partitions and floors fireproofed; and the apartments so arranged as to obtain for each room the benefit of outside light. As a rule these structures have either spacious central courts, or are provided with a scheme of balconies, with doors opening from



Second floor plan, Bungalow of F. W. Pace, Winnipeg. J. H. G. Russell, Architect.

each suite. Two structures of the latter type are the Roslyn Court Apartments (just completed) and the Warwick Apartment, both of which were designed by Architect W. W. Blair. Of the former type, two splendid examples are found in the Lee Court and Deven Court Apartments, built from designs by Architect J. D. Achison. Another building of this character included in the accompanying illustrations, is the Rosemount Apartments. It is an interesting structure of the square type, with a pleasing exterior of direct lines. The architects of this

Home of Dr. K. C. Campbell, Ruskin Row, Winnipeg, an interesting example of a mansard-roof residence in which Tyndall stone and stained shingles are attractively combined. J. D. Atchison, Architect.

Residence of Mr. F. Christie, Betourney street. One of Winnipeg's many cement stucco houses, in which the plaster is applied directly to metal lath, thus making it a durable and permanent type of construction. J. D. Atchison, Architect.

building are Messrs. Pratt and Ross, who are doing a large amount of acceptable work both in Winnipeg and throughout the Province.

A house of the square type, which has a number of noteworthy features, is the residence of Architect John

First floor plan, Home of Dr. K. C. Campbell, Ruskin Row, Winnipeg. Note the large living room and the connection between dining-room and kitchen. J. D. Atchison, Architect.

Woodman, on River Avenue. It is a two story red brick structure, with a hip roof and dormers forming an attic floor. The roof is of slate and the foundations, porch, and trimming are of lime-stone. The side entrance and main porch show an interesting treatment, as does also the large verandah which runs the entire length of the house, on the side removed from the street. The special feature in the interior arrangement is the sun room or conservatory at the end of the dining room, with

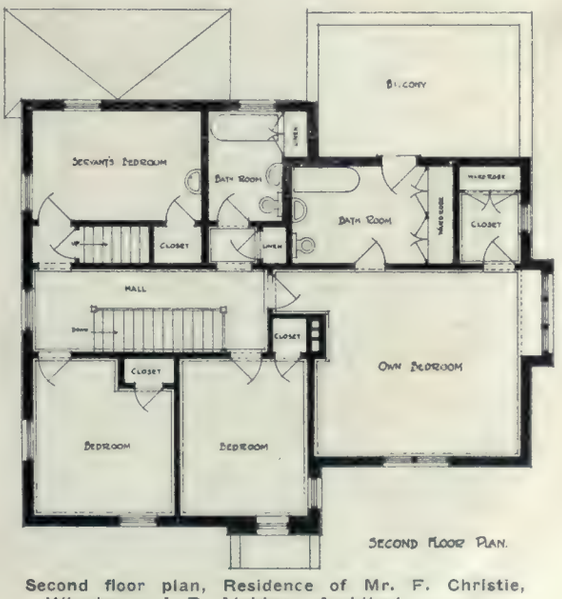
First floor plan, Residence of Mr. F. Christie, Winnipeg. J. D. Atchison, Architect.

recess in clear glass set in metal sash. This secures to the dining room the effect of the natural foliage of the plants in the sun room, and renders it a most delightful interior. In addition to the dining room, the first floor contains a drawing room and library—both of which are placed on either side of the vestibule—a large central hall, pantry and kitchen. All the main rooms are finished in hardwood; The library has a fireplace, and both the entrance porch and sun room floors are paved with tile.

Second floor plan, Home of Dr. K. C. Campbell, Winnipeg. J. D. Atchison, Architect.

Upstairs there are four bedrooms with built-in wardrobes, a large hall, and two bath-rooms. Two of the bedrooms have fire-places, and the bath-rooms have tile floors and sanitary dadoes.

The residence of F. W. Pace, on Wellington Crescent, is an attractive little house of the bungalow type, designed by Architect J. H. G. Russell. It has a low spreading roof with half timbered gables, and a verandah extending across the entire front and down a portion of the sides. The foundation is of red brick, the lower portion of the house clapboarded, and the woodwork and shingled roof are painted and stained a dark brown. The plan of the interior is noteworthy in that, while the house



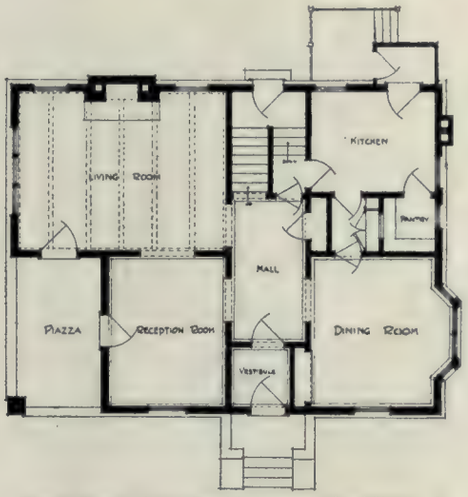
Second floor plan, Residence of Mr. F. Christie, Winnipeg. J. D. Atchison, Architect.

is only a one-story and attic structure, it, nevertheless, provides for nine fair sized rooms and a billiard chamber. The living room, with the reception room and dining room on either side, occupies the front portion of the

Residence of Architect J. D. Atchison, Nassau street, Winnipeg. A study in straight lines and direct surfacing. Note the broad eaves, the hooded entrance and extreme simplicity of the general design.

Home of W. C. Russell, Ethel avenue, Winnipeg, an attractive small house with a stained shingle exterior. J. D. Atchison, Architect.

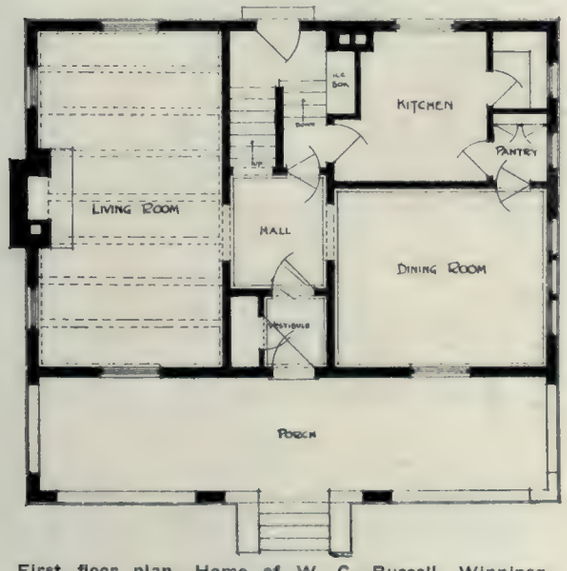
lower floor. At the back of these is a transverse hall and stairway with a large pantry at one end and a guest chamber which is situated in the space at back of reception room. Immediately beyond this is the kitchen opening on to a rear porch and a children's room and bedroom with a bath-room situated between the two. The living room has a large ingle-nook, and fire-places are found in both the reception and children's chambers. Built-in features such as china closets, kitchen cup-



First floor plan. Residence of Architect J. D. Atchison, Winnipeg.

boards and clothes closets, form a feature of the general layout. Besides the billiard room, which has a large fireplace and takes up the front portion of the attic floor, there is an additional bedroom, a servant's room, bathroom and extra closet space. Another feature is a large balcony at the side of the house over the verandah, which can be reached either from the billiard room or hallway, which has a built-in seat at the end.

Other work of a domestic character, as designed by Mr. Russell, is seen in the four larger houses grouped on page 80. These serve to give a good idea of the substantial character of Winnipeg's residential buildings.

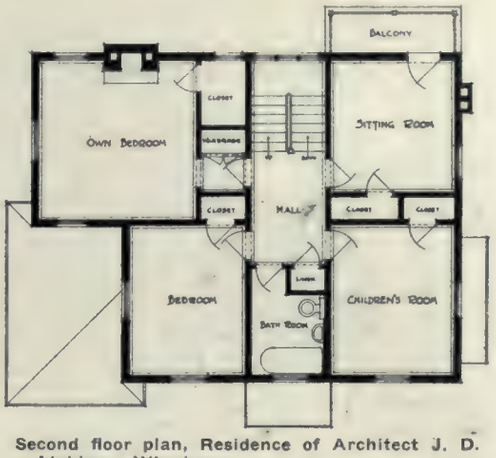


First floor plan, Home of W. C. Russell, Winnipeg, showing the compact interior arrangement. J. D. Atchison, Architect.

Three of these structures express their lines in brick and stone, while the fourth shows an interesting treatment in brick and half-timber work. They are residences of Wm. Harvey and C. H. Beckett on Armstrong Point, the home of F. J. Sharpe on Roslyn Road; and the residence of W. H. Cross on Wellington Crescent.

FERROMAC ROADWAYS—New System of Road Surfacing Now on Trial in England.

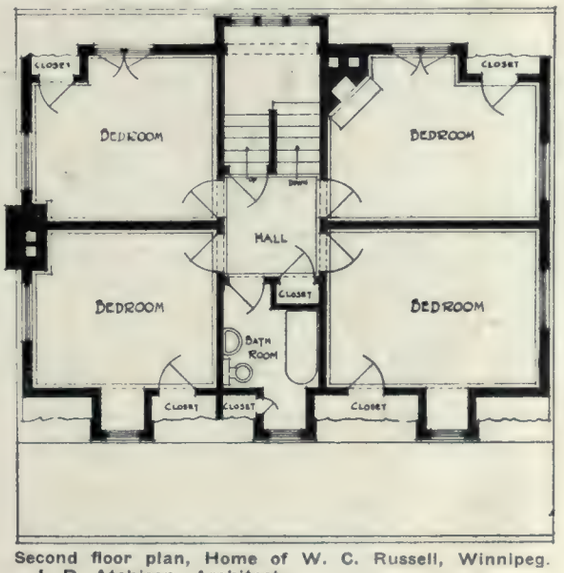
IN VIEW OF THE GENERAL AWAKENING throughout the country, to the necessity of good roads, and the vast sums which will probably be expended in this direction within the next few years, it might be well for municipalities and public boards concerned with the carrying out of such improvements, to familiarize themselves with the experiments which are now being made on the highway between Wakefield and



Second floor plan, Residence of Architect J. D. Atchison, Winnipeg.

Dewsbury, England, under what is known as the "Ferromac system." These experiments are being keenly watched by a large number of civil engineers, surveyors, and others who are interested in the work of constructing and repairing roads, and although possible, the same system could not be as advantageously employed in Canada, it may nevertheless, suggest a similar method which would permit of the construction of highways of a permanent character on a rather economic basis.

"Ferromac," itself, is a powder, the exact composition of which has not been made public. It is of a cementitious character, binding stones, cinders, and other ma-



Second floor plan, Home of W. C. Russell, Winnipeg. J. D. Atchison, Architect.

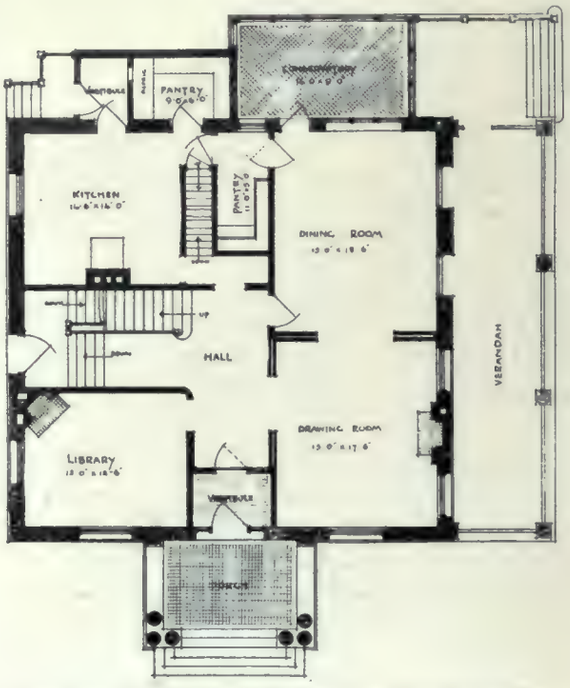
terials into a solid mass, so as to prevent internal attrition and to reduce the dust nuisance to a minimum. It contains no oil or tar and no chemicals injurious to either animal or vegetable life. The particular slag recommended for use with it as an aggregate is that procured in the Siemens-Martin acid process of steel making, but the system is adapted to other materials with equally

RESIDENTIAL WORK IN WINNIPEG, FROM DESIGNS BY ARCHITECT J. H. G. RUSSELL. 1—Residence of Wm. Harvey, Armstrong Point. 2—F. J. Sharpe's residence, Roslyn avenue. 3—Home of W. H. Cross, Wellington Crescent. 4—Residence of C. H. Beckett, Armstrong Point.

Residence of Architect John Woodman, River avenue, Winnipeg. A recent example of the square type of house which has a number of noteworthy features to commend it.

Dining-room, looking toward the drawing-room, Residence of Architect John Woodman, Winnipeg.

good results. This slag is said to contain a large percentage of iron oxide, very little lime, and consequently is hard and tough. The following chemical analysis of Siemens-Martin steel slag is given: Silica, 55; manganese oxide, 10; iron oxide, 30; lime and alumina, 5; total, 100. The cost of construction under this system is said to be not much more than good-class macadam. The cost of the work as completed near Wakefield was 42 cents per square yard, and, when the lengthened life of the



First floor plan, Residence of Architect John Woodman, Winnipeg.

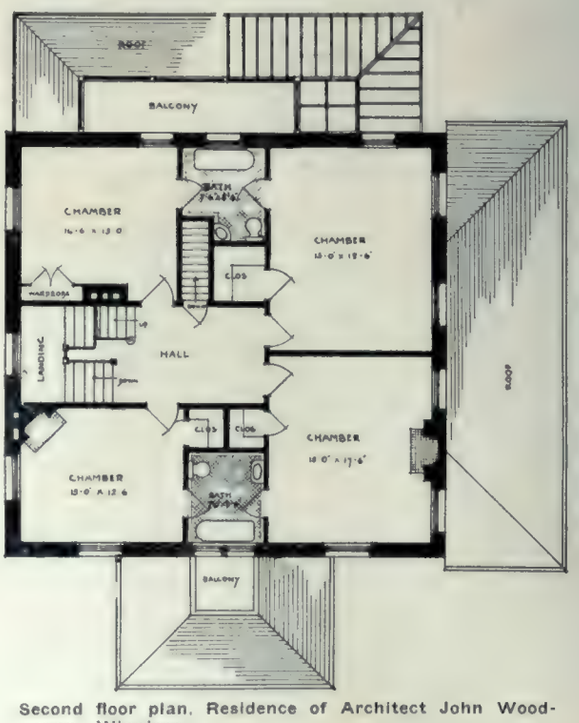
road is considered and the amount saved in repairs, it is believed to be exceedingly economical.

The system is said to be especially valuable in the reconstruction of old macadamized roads and in converting them into highways suitable for modern vehicles and heavy traffic. This process is described as follows: After scarifying the old surface, a layer of chippings and ferromac powder is put down. Over this the metal is spread about 4 inches deep. The whole is then rolled dry with a steam roller and afterwards drenched with a mixture of cementing chemicals and water and again rolled to work up the binding materials to the surface. Another layer of chippings and ferromac is then rolled in wet, converting the whole into a solid mass. In short, the familiar macadam process is followed throughout, the only difference being that instead of using mud and chippings to bind the metal together, ferromac powder and chemicals are used. But that difference means the total abolition of the deadly internal attrition, the grinding of the metal into dust, and yet more dust, which is the fatal weakness of ordinary macadam.

In addition to those already mentioned there are large number of advantages claimed for it, viz: It forms a waterproof crust which is solid throughout, adapted to wheels of all kinds, and to all gradients. It does not require any special plant, and roads can be constructed or repaired in any kind of weather except frost. It prevents mud and dust, renders scraping unnecessary, and makes a surface which is free from danger to animals and vehicles of slipping.

The work upon the Dewsbury-Wakefield road examined by West Riding road officials had been subjected to the test of two journeys daily for a period of two weeks by a large traction engine drawing three wagons, heavily loaded, the whole estimated to weigh between 50 and 60 tons. It is reported that the road suffered no "appreciable damage."

A NEW TYPE OF ENGINE suitable for either marine or stationery purposes, and designed for to use heavy crude oils, such as cost, in England, from 6 to 7 cents a gallon, has lately been turned out by an engineering firm at Duffield, Derbyshire. The engine, says a contemporary, which is produced either in a 25 h. p. size with two cylinders, or of 50 h. p. size with four cylinders runs on the Otto cycle. The vaporizer is a feature of special interest. It is heated by the exhaust gases, and in it the oil, after having been preheated by passing through a jacket around the exhaust pipe, and having been atomized by compressed air, undergoes a process or fractional distillation. The portion of the oil that is of a lower flash point than about 220 degrees F. is vaporized, and, meeting a current of air, which has also been preheated, is drawn into the cylinders; a certain amount of water is also injected, this having been found to improve the smoothness of running as well as to increase the power. The constituents of the oil that have a flash point above 220 degrees F. and form the "hard base," are thrown against a collecting surface, whence they run down into a receiver as a thick, black tarry liquid. This arrangement prevents the trouble which attends the use of heavy crude oils through the "hard base" entering and scoring the cylinders and clogging the valves. The governor regulates the supply of air and oil and the resulting vapor in such a way as to se-



Second floor plan, Residence of Architect John Woodman, Winnipeg.

cure that the mixture admitted to the cylinders is correctly proportioned to the load on the engine: and by means of a hand lever, which can be locked in any position, it can be almost instantly set to give a speed variation of over 50 per cent. For starting a spray of oil from the atomizer, worked from a reserve of oil and compressed air normally left in the tanks provided for the purpose, is lighted and directed upon the vaporizer, which in consequence is quickly heated, a few turns of the fly wheel then sufficing to set the engine in motion.

WINNIPEG BUILDERS' EXCHANGE.—Model Home of Organization with Which are Identified the Leading Supply Firms and Contractors of the City. —Present Membership Over 300.

A REVIEW OF THE PROGRESS of the "Western Metropolis," as told in the more recent architecture of its business and residential districts, would be incomplete without a word of reference to the Winnipeg Builders' Exchange.

It would possibly not be stretching the point to say that as regards organizations and accommodations, it is the largest and most representative institution of its kind in Canada. Since its inception in 1901, it has steadily grown until, to-day, it has a membership of over three hundred, which includes the largest and most prominent material supply firms and contractors in the city. Last spring the Exchange took up its abode in its present splendid quarters at the corner of Portage Ave. and Hargrave Street in the down-town district—a most central and convenient location, nearly opposite the big department store of the T. Eaton Company.

The building, which bears the name of the Builders' Exchange Building, and denotes in outline and construction the importance of the institution which exists within—is a seven story structure, containing a floor area of over seventy thousand feet. With the exception of the first three floors, the entire space is mainly taken up by the building interests. The Exchange, which is reached by two high-speed elevators, occupies the entire fifth floor, and the appointments throughout are model in character.

W. H. Carter. President.

Builders' Exchange, Winnipeg.

J. H. Buxton, Secretary.

In addition to the general offices, and secretary's room and directors' parlor, are a large assembly hall, three estimating rooms, a storage compartment, and twenty-one individual offices for members, all of which are arranged and equipped to provide every convenience and to readily facilitate the dispatch of business. While the fourth and two upper floors do not form a part of the Exchange proper, they are essentially an element in its composition, in that these floors are entirely occupied by supply firms and interests, which are allied with this institution.

It would be impossible to go fully into the duties, functions and accomplishments of the Exchange, in the limited space that is available. These, we believe, are pretty generally known to the building public. Suffice it to say that its mission is as much altruistic as commercial, and that the Exchange, under an able directorate, is gradually obtaining its object, that of promoting the best interests of the building fraternity, and bringing about a broader understanding in general, and a fair and equitable state concerning the architect, contractor, material firm, and mechanic.

Much credit is due both the past and present officials for the service they have rendered in making this institution a success, and especially to the present president, Mr. W. H. Carter, and the secretary, Mr. J. H. Buxton, who are untiring and enthusiastic in their efforts to make the Exchange the largest, most thoroughly organized, most serviceable and efficient institution of its kind in Canada.

AN AUSTRALIAN INVENTION for planing street car and other rails, without disturbing the permanent way, has just been accepted by certain street railroad companies in that country as well as by the railroad authorities in at least one of the States. The new invention, which is known as the Woods-Gilbert rail planer, is a self-contained machine which travels on the rails so that it can be worked at night without interfering with the traffic. The claim of the inventors is that by restoring a rail to its original level and evenness of surface, the cost of putting down a new rail is postponed for many years, and the inconvenience that follows the tearing up of the track is obviated. The estimated cost of relaying a mile of street car track in Australia is about $7,500, and, as only a small proportion of that cost is involved in the remodeling, it is clear that by restoring the rail to its original shape and efficiency a great saving of capital outlay will be insured. In the case of the street-car rails, the inventors are under contract to deepen the cut in the rail in which the flange runs; also to reduce the narrow outside lip to the level of the rest of the rail. This work will be done by a high-speed steel cutter, driven from the machine, in one operation, as it moves forward on the line. The great difficulty that had to be overcome was to insure accuracy of cut with a moving machine on an uneven track. This has been secured by the adoption of self-adjusting machinery.

OPENS WINNIPEG BRANCH.

EADIE-DOUGLAS, LIMITED, of Montreal, Toronto and Ottawa, who represent some of the best known houses in the building supply line, among them the Leeds Fireclay Co., England; Terrano Flooring Co., Montreal; Insulyte Company Limited, Montreal; Custodis Chimney Construction Co., New York, etc., are opening this month a Western office in Winnipeg in charge of Mr. V. C. North, who has been with them for some time in Montreal. In addition to their regular lines they will handle a special line of building supplies for Winnipeg and the Western market.

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ADVERTISEMENTS.—Changes of, or new advertisements must reach the Head Office not later than the first of each month to ensure insertion. Advertising rates on application.

CORRESPONDENCE.—The Editor will be pleased to receive communications upon subjects of interest to the readers of this journal.

Vol. 3 Toronto, December, 1909 No. 2

Current Topics

THE ANNUAL MEETING of the Canadian Society of Civil Engineers will be held at Ottawa, January 25, 26, 27, 1910. By a happy circumstance, the annual banquet will take place on Wednesday evening, January 26th, the day Parliament closes, and many of the Dominion legislators will be in attendance.

* * *

THE WORK OF BORING THROUGH THE ANDES on the line of the Trans-Andine Railway which is to extend from Arica, Chile to La Paz, Bolivia, has just been completed. The tunnel is five miles long and the highest in the world. The length of the line, when completed will be 300 miles, and the complete cost of its construction will be in the neighborhood of $15,000,000.

* * *

OTTAWA IS JUST COMING TO THE CLOSE of a most successful building year. So far the aggregate total for permits issued amount to approximately $5,000,000, or about double the figures for 1908. Although the building of the Chateau Laurier and the new Central station, has materially contributed to the gain, yet the natural growth of the city, and the many new apartment buildings undertaken, is to a great extent the cause of this marked progress.

* * *

AT THE ANNUAL MEETING of the Manitoba Association of Architects, recently held at the Grange Hotel, Winnipeg, the following officers were elected for the ensuing year: President, J. H. G. Russell; 1st vice-president, Wm. Fingland; 2nd vice-president, J. D. Atcheson; treasurer, G. W. Northwood; secretary, W. Percy Over. Following the business session the members sat down to their yearly dinner which was presided over by Past President Greenfield, and attended by prominent laymen and public officials.

THE DIAMOND SHAPED QUARRY in leaded lights, according to the IRISH BUILDER AND ENGINEER, while perhaps more preferable from an artistic viewpoint, owes its popularity primarily to the fact that the diagonal spacing throws off the water quickly, whereas the horozontal lead can retain the water, and thus increases the danger of leakage. It adds, that the manufacturers of leaded glass advise the substitution of the diamond for the rectangular quarries.

* * *

STEPS ARE NOW BEING TAKEN by the United States Government towards the erection of a wireless telegraph station on the federal reservation near Washington, D.C. Its most striking structural feature will be a gigantic concrete tower, having a diameter of 50 feet at the base and 8 feet at the top, which will thrust itself six hundred feet above the ground. It is expected to have the station in operation within a year, and the tower, it is said, will be one of the most unique structures in the world.

* * *

AN AMUSING STORY of how the Blackfriars bridge has always been painted sea green ever since it was built in 1865, is told by the IRISH TIMES. When it was nearing completion the works manager asked the contractor what color it should be painted. "See Green," replied the gentleman, referring to the principal engineer. The works manager mistook the direction for sea green, and ordered at once sufficient paint to cover the structure. Having bought the paint it was thought best to use it, and "sea green" has ever since been the color of the bridge.

* * *

A FUND IS BEING RAISED IN ENGLAND for the purpose of erecting a national theatre in London, to the memory of Shakespeare. It is proposed by the committee in charge of the project to bring the amount up to £500,000, of which sum £150,000 will be used in the construction and equipment of the building alone. According to present plans the playhouse will be opened on April 23, 1916, the tercentenary of Shakespeare's death, and it is intended that the building will be in every way a fitting tribute to his great genius and a monument worthy of his enduring fame.

* * *

CANADIAN AND BRITISH INTERESTS, says a London press despatch, have completed arrangements for the establishing of a large modern drydock plant at Levis. Those who are identified with the project are: The Can-Wolff, the Belfast shipbuilders: Sir Charles McLaren, representing the John Browne & Company, Clydebank; Mr. Davie, of Levis, who conducted the present salvage and drydock business there, and the McArthur-Perks Company. The same interests have also a proposition before the Dominion Government, for the construction of the drydocks at St. John.

* * *

THE OLDEST TEMPLE IN THE WORLD, so far discovered, has been unearthed by excavations at Bisya, in central Babylonia. The walls of the tower were first uncovered and the summit cleared. The first inscription on the surface was on a brick stamped with the name Dungi, which goes back to 2750 B. C. A little lower appeared a crumpled piece of gold with the name Param Sim, who lived in 3750 B. C. Just below were large square brick peculiar to the reign of Sargon, 3800 B. C., and who was probably the first Semitic king of Babylonia. A large platform was discovered 2½ yds. below the surface, which was constructed of peculiar convex brick such as were used in building 4500 B. C.

AT TROYES, IN FRANCE, there has just been completed, a church which was started in the third century, and has, therefore, been sixteen hundred years under construction. It is the Church of St. Urban, and was built by order of Pope Urban, on the site of the house in which he was born. Only the foundations were laid during Pope Urban's lifetime, and though the building has long been consecrated, the last remaining stones were laid this year. The church, says a contemporary, is a gem of Gothic architecture.

* * *

A NEW TYPE OF ELECTRIC LOCOMOTIVE which, it is said, will result in a revolution of the present methods of railway transportation, is now under construction in the works of the North British Locomotive Company, of Glasgow, Scotland. The engine will generate its own power as it runs, and dispense, entirely, with cables, etc. This method of operation has been made possible by adapting the steam turbine, on what is known as the Reid-Ramsay system, to generate electricity which will actuate four series of tractor motors.

* * *

THE MOST LUXURIOUS PRISON in the world, according to a recent news item, is in Japan, about fifteen miles from Tokio. "In the midst of gardens flourishing with medlars and cherry trees, where are seen ornamental ponds with water lilies, arises the palatial prison. The cells are spacious and airy. The lighting throughout is by electricity, and the apartments are furnished luxuriously. Bath-rooms with marble baths, hot and cold water being laid on, dressing-rooms and reading-rooms—nothing seems wanting to make the sojourn in this prison pleasant. In fact, it seems an ideal country residence, scarcely calculated to reduce crime."

* * *

ONE OF THE MOST REMOTE CHURCHES, says a contemporary, in Great Britain, was re-opened after restoration recently by the Archdeacon of Brecon. It stands (Partrishow by name) on the southern slopes of the Black Mountains, in Breconshire. The font dates from 1060, and a rood screen of singular beauty from about the year 1500. There are three stone altars within the old church and a little western chapel built against it, while in the churchyard stands a preaching cross, and the remains of a stone ledge or bench run along the south wall of the church, on which the congregation could seat themselves. Tradition says the church was originally built by a foreigner who was cured of leprosy by the waters of an adjacent well and who left a "hatful of gold" to build a church as a thankoffering.

* * *

AN AQUEDUCT SCHEME, which, if carried out, will be one of the most remarkable pieces of engineering ever undertaken, is now being considered by the Board of Estimates of New York city. The plans involve the expenditure of nearly $50,000,000 for the building of a great subterranean tunnel 300 hundred feet below the streets of the city for the purpose of distributing the water supply, which, in a few years, will be available from the Catskill reservoir. The aqueduct, as proposed will be fourteen feet in diameter for part of its twenty-mile stretch, will be bored through solid rock, running from the city's northern limits southward under central Park and beneath the great business districts of Lower Manhattan, thence, under East River, to Brooklyn, Williamsburg, Queen's and Staten Island. The present local system of water mains would be connected with the new aqueduct.

THE DEEPENING OF THE WELLAND CANAL was urged upon the Government by a large deputation of the Great Lakes and St. Lawrence Improvement Association, which recently called at Ottawa. It was pointed out that upon this improvement depends Canada's interests in the freight traffic between the west and the east, as the trade would follow the cheapest route, and would be lost before the Georgian Bay canal could be built. While a greater depth for the canal was immediately desired, the scheme as outlined involves the improvement of the entire system. All that is needed is a link of 58 miles to make Canada's inland waterway complete in every respect. The benefits which would accrue to the country at large, according to the deputation more than justifies the work being carried out. Freight rates for grain alone would be reduced from seven to 4½ cents per bushel, and millions would be saved to the people of the West, while Montreal and eastern shipping points would be able to successfully compete with American ports in the matter of exports. The scheme as laid down it is said, would entail an expenditure of $20,000,000.

* * *

EXPERIMENTS WITH CALCUIM OF CHLORIDE as a dust preventive on public highways, are now being conducted in various parts of Europe with such successful results, that it is predicted that tar and other preparations used for this purpose will be entirely done away with. Autoists and horse owners, who have had occasion to use roads sprinkled with calcium chloride, are universally in favor of this method of treatment owing to the fact that calcium of chloride is harmless to the touch, neither burns nor stains, and it does not attack footwear, rubber, the feet of horses, nor the varnish of motors or carriages. It has the faculty of absorbing water from the atmosphere, and when sprinkled upon a road attracts and concentrates the surrounding moisture, thus forming upon the roadway a thin damp layer which prevents the formation of dust. While calcium of chloride is generally regarded as a new method of laying dust, a Frenchman—Jobart—in 1828 followed by another—Coust?—in 1854 proposed the use of this salt, while as far back as 1876 the streets of Rouen were sprinkled with chloride of calcium, with excellent results.

* * *

DETAILS OF A PLAN to exploit the water power of the St. Lawrence river were recently outlined in a petition to the Dominion Government from the Cornwall Board of Trade, asking that the St. Lawrence Power Company be granted a franchise to utilize the channels of the river for a hydro-electric plant. This concern, it is said, with an associated American company, has already spent $1,000,000 in purchasing sites, etc. The first dam is to be built at a cost of $4,000,000 at the foot of South Sault Channel, where 65,000 to 70,000 horsepower can be developed. Later another dam is to be constructed at the foot of Sheeks Island, on the Canadian side, and finally, when needed, a dam at the foot of Bernharts Island, across the main channel of the St. Lawrence. At dam No. 1 a lock is to be erected by which the vessels can overcome the whole 40-foot fall of the rapids in one lift, whereas now six are required in the Cornwall Canal—which, however, would not be interfered with. A saving of 5 hours would be effected. The company proposes to erect power transmission lines from Cornwall to Brockville and to supply all demands for power in this section. As yet there is not sufficient demand to warrant large expenditures of money, and the projectors are urging the communities along the line of the proposed development to induce manufacturing plants to locate here.

A BRIEF SURVEY OF BUSINESS AND RESIDENTIAL SECTIONS IN REGINA. 1—View along Scarth street, the city's main business thoroughfare. 2—Victoria avenue, in the residential district. 3—Victoria Park.

Panoramic view of Regina, showing the great flat country in which it is located.

REGINA, THE "MODEL CITY OF THE WEST."—The Story of Its Development as the Capital City of the Province of Saskatchewan.—Its Municipal Improvements and Some of Its Most Noteworthy Recent Buildings.

REGINA has often been termed the "Model city of the West." Located as it is, about two hundred miles west of Winnipeg, it is immediately in the centre of the flatest and most fertile prairie land in the "Last great West." Its population has increased from 3,000in 1900, when it was the capital of the N. W. Territories, to 12,500 in 1908, and it is now the capital city of that new vast fertile province, Saskatchewan. Regina, like most western cities, is built directly along the railroad, although it extends farther back than most of them. The moment one steps off the train at the station, the first thing with which the visitor is impressed is the excellent character of its buildings in both construction and design, the general lay-out of the city and the admirable condition in which the streets are kept. There are no tumbled down "shacks," no tenderloin, no slums, everything is new and clean, even the small frame structures on the outskirts of the city.

Its business buildings are of the best permanent type of construction. Its churches and schools are models of good taste and ideal construction, and its residential districts bear every evidence of culture and prosperity. Scarth Street, which runs north from the C.P.R. tracks, has within a few blocks, more new first class business buildings, than are to be found in a like area in the best districts in eastern cities of many times the size of Regina.

Victoria Avenue ,one of the most beautiful residential streets in the West, is boulevarded the full length and is lined on either side with handsomely designed residences of the more well-to-do. Victoria Park, located almost in the heart of the city, is a landscape decoration that any city could be justly proud of. Regina has several architects who have been kept extremely busy during the past two years, designing the many public, financial, business and private buildings that have been required to keep apace with the marvelous growth of the city and the general high character of design speaks well for their ability and training. The growth of Saskatchewan, of which Regina is not only the capital, but the commercial center, has been little short of marvelous.

It was on September 1, 1905, that the districts of Assiniboia, Saskatchewan, Alberta and Athabasca were constituted the provinces of Alberta and Saskatchewan and were given self government similar to that enjoyed by the other Canadian provinces.

All western Canada, between the great lakes and the Rockey Mountains, was formerly known to the easterner either as "Manitoba' or by the vague term the "Northwest." Now, however, the name Saskatchewan is becoming as well known as Manitoba.

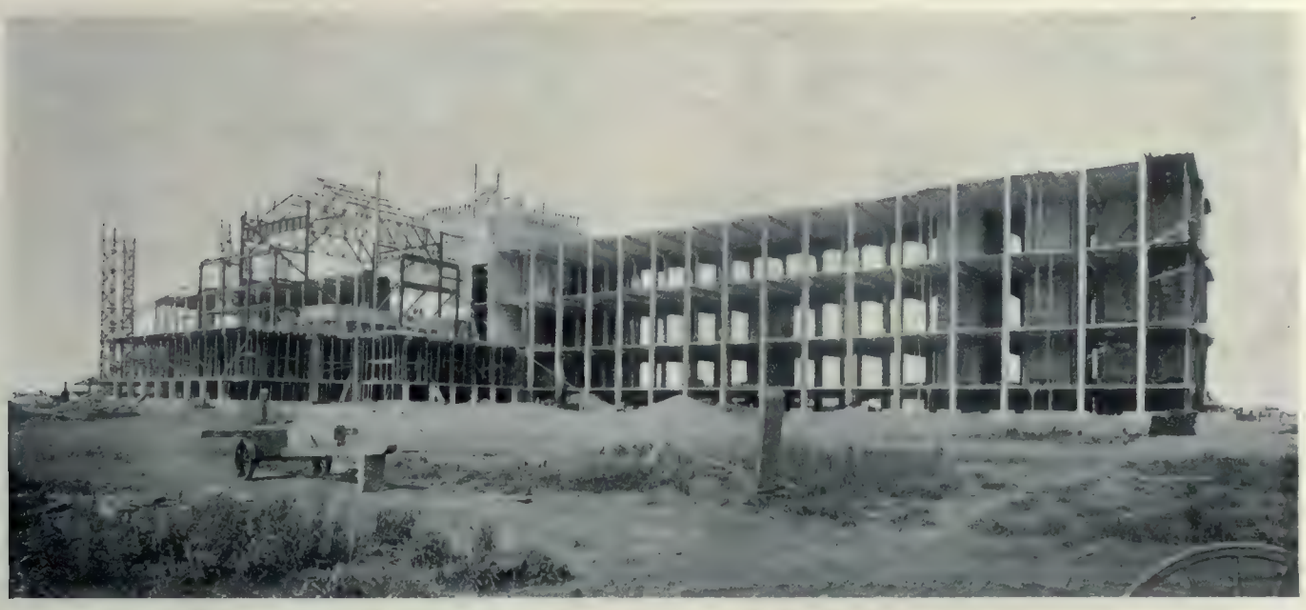
Saskatchewan lies between the 49th and 60th parallels of north latitude, and between the meridians of 102 and 110 degrees west from Greenwich, or more familiarly, its southern border is the international boundary, the dividing line between Canada and the United States. South of Saskatchewan are the states of North Dakota and Montana; east of it is the province of Manitoba; west of it is the province of Alberta, and on the north and north-east it is bounded by the unorganized North West territories.

In addition to possessing a soil, that for its fertility, is not excelled in the whole west, the province has several other natural resources, a good supply of timber, and clay suitable for the manufacture of bricks is readily available. Nor is this confined to one part of the province only. From Roches Percee and Estevan in the south, to Prince Albert in the north, and at Broadview Moose Jaw, Rosthern and other places, there is a good brick clay found, and considerable business in manufacturing bricks carried on. In the northern part of the province, extending in a northwesterly direction from the Swan River district in Manitoba are found large areas of valuable spruce forests. Saw mills are established at Prince Albert and along the line of the C.N.R., east of that city. The amount of lumber manufactured in the province annually amounts to between sixty and seventy-five million feet.

Coal, too, is abundant, at Souris river coal fields in the Estevan district cover an area of about 120 square miles and are supposed to contain about 1,000,000,000 tons of coal. Traces of coal are also found at Wood Mountain, in the Cypress hills, and at a number of points throughout the province; but none of the latter deposits have been developed, except for local use by farmers and ranchers adjacent to them.

The citizens of Regina, the capital of this rapidly progressing productive country, realize the future possibilities of their city. They are proud of its growth and alive and wide-awake in the conduct of their municipal affairs. It owns its own electric lighting plant, its waterworks system, and with its miles of paved streets, its splendid civic buildings, five schools, a surplus of over a million dollars and its low tax rate, Regina citizens can look complacently upon their accomplishments. Every visitor to the West is amazed at the wonderful substantial growth of Regina. Its hotels, its churches, its schools, its fine business blocks and its excellent

MODERN BUSINESS AND PUBLIC PREMISES IN REGINA. 1—Canada Permanent and McKenzie & Brown building, R. J. Edwards & Saunders, Architects. 2—Regina City Hall, W. M. Dodd, Architect. 3—Premises of the Northern Bank. 4—Land Titles Building, Darling & Pearson, Architects. 5—Post Office building, D. Ewart, Architect.



Process view of the Saskatchewan Parliament Buildings now under way at Regina, showing the reinforced concrete floor system and frame work in position. E. & W. S. Maxwell, Architects.

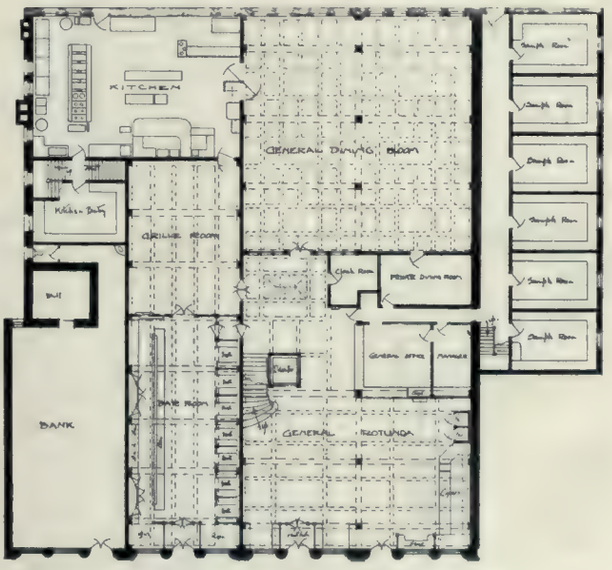
municipal improvements, make it the model Canadian city of the West.

One of the most important pieces of construction work now in progress in Regina, is the New Saskatchewan Parliament buildings, of which Messrs. E. & W. S. Maxwell, of Montreal, are the architects ,and the corner stone of which was laid under auspicious circumstances,

King's Hotel, Regina's $200,000 hostelry, which is the most modernly appointed building between Winnipeg and the Coast. Storey & Van Egmond, Architects.

by Earl Grey, Governor General of Canada, on the 4th of last October. The structure, which will be one of the most imposing and the best constructed provincial parliament buildings in Canada, has been fully described in a previous issue of CONSTRUCTION. In design it is a free adaptation of English renaissance work, with dignity, simplicity and purity of style. In construction. it is fireproof throughout, its framework being of reinforced concrete with exterior walls of Tyndall stone. Since the first sod was turned, preparatory to starting the work on July 29, last year, the contractors have made rapid progress, and out of the $1,400,000 awarded for the construction of the building, now less a sum than $750,000 has already been paid out. Within twelve months all the reinforced concrete work was completed, and the west wing shut in so that work may proceed during the winter. The power house at the rear of the building, with its smoke stack 125 feet high, has been completed. Four boilers aggregating 500 horse power have been installed, and the electric gearing will be completed before spring. The steam and hot water piping in the main building is finished. The work of installing the electric wires, plumbing, etc., is now going on and will be completed together. Preparations are complete for the 59 vaults, and three car loads of vault doors have been delivered. One hundred and seventy-five men are at present at work on the building, and more than 100 more could easily obtain employment, if the contractors could procure them.

Regina's new post office which was completed last September at a cost of $250,000, occupies a central position on Scarth Street and forms a crowning feature to the architecture of the business district. The building is absolutely of steel construction with reinforced concrete floors and absolutely fireproof throughout. It consists of three storeys and a Mansard roof, having a frontage on Eleventh Avenue of 125 feet and on Scarth



Ground floor plan, King's Hotel, Regina. Storey & Van Egmond, Architects.

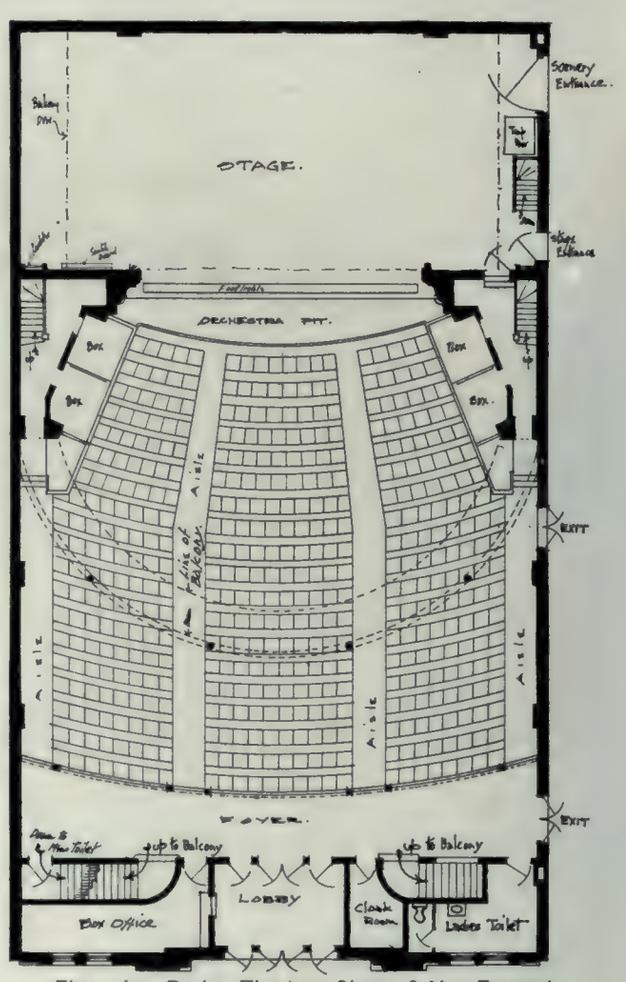
Street of 75 feet. The facades are of Tyndall stone, and Portage brick is used in the other walls. On the ground floor terrazo has been substituted for hardwood finish first specified. The height of the roof from the street is 70 feet, while the top of the flagstaff on the massive copper covered clock tower on Scarth Street

and Eleventh Avenue corner of the building is 142 feet. The arched windows of the ground floors and the twenty-two massive stone pilasters running from the second storey to the top of the third, combine to give the edifice a dignified and staple appearance. The entire ground floor is to be utilized for post office purposes, the entrance from both Scarth Street and Eleventh Avenue giving access to a public lobby running the entire length of the building. The customs house is located in the rear with an entrance from Scarth Street and access for vehicles from the lane on the east side of the building. The second floor is devoted to customs, inland revenue

New Theatre, Regina, which will be opened Christmas week. It has a seating capacity of 850, and cost complete, $25,000. Storey & Van Egmond, Architects.

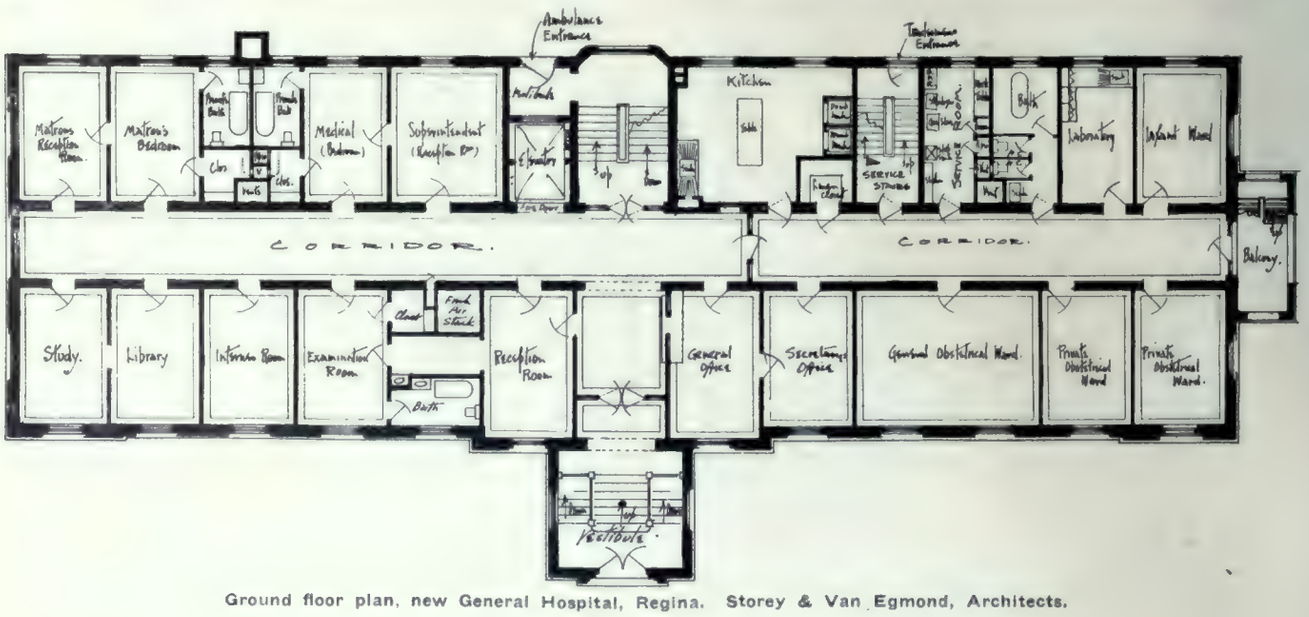
and other government offices, while the third is occupied by caretaker's quarters and store rooms. The building is equipped with electric elevators and handsomely finished throughout.

The Canada Permanent Building, to which a substantial addition is being erected at the present time, is one of Regina's more noteworthy recent buildings of the fireproof type. It is virtually a double building with a party wall between the portion owned by the Canada Permanent Mortgage Corporation, and that occupied by Messrs. McKenzie and Brown, Solicitors. In construction the building is of reinforced concrete skeleton type, with walls and partitions lined with hollow tile, and an exterior facing of Roman stone. The beams supporting the floor slabs are carried on the party and outside walls without any columnar support. They have a depth for a space of twenty-seven feet of 27 inches, including the thickness of the floor slabs. The reinforcing consists of plain and square bars, and the frame work is supported



Floor plan, Regina Theatre. Storey & Van Egmond, Architects.

by reinforced concrete spread footing, as is also the beams which carry the curtain walls. The exterior facing and hollow tile back lining are firmly secured together by steel ties, and the space between the two filled with concrete, which was put in as the work of laying up the facing progressed. As regards plastering, the mortar has been applied directly to the hollow tile and on the bottom side of floor slabs and exposed sides of

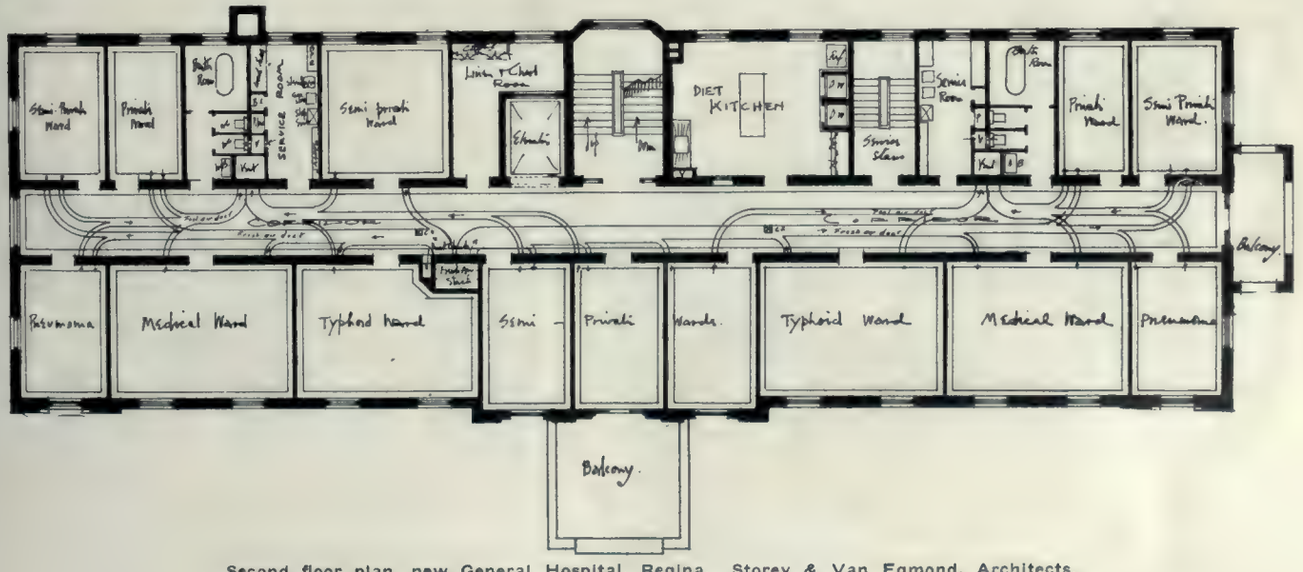


Ground floor plan, new General Hospital, Regina. Storey & Van Egmond, Architects.

Regina's New General Hospital, now being built at a cost of $105,000. Although the building is to be entirely fireproof in its construction, an additional precautionary measure is provided in an enclosed outside iron stairway, placed at end of the structure. Storey & Van Egmond, Architects.

beams. The super-floors are of hard maple nailed to bevelled wood strips secured in the concrete; and the stair system is of reinforced concrete throughout. While the construction of the building precludes any danger from fire to the structure itself, extra precautions have been taken by the installation of stand pipes with hose attachment on each floor, to quickly handle any outbreak which might occur in the furniture or equipment of any of the offices. It might be mentioned in this connection that all the vault fittings are of metal, and the vaults themselves, which are the J. & J. Taylor "burglar and fireproof type," are set in walls of concrete with hollow tile lining. The building was designed by Architect R. J. Edwards, of the firm of Edwards and Saunders, Toronto, who are now carrying out the extensions. Its cost, including furniture and fittings, was $70,000, and both from a standpoint of construction and design, it is a most acceptable commercial building.

It would be an oversight, in touching upon the building progress of Regina, to fail to say at least a brief word about the King's Hotel, the city's $200,000 hotel, which has a well deserved reputation among tourists and travellers throughout the West as being the finest and most modernly appointed hotel building between Winnipeg and the Coast. It is a four-story structure, built with fireproof partitions and floors, and designed to contribute to the safety and comfort of its guests. The front is of Tyndall stone and clinker brick; the stone being used for the entire first story which has rustic piers and arched doors and windows, for the window trimming, and for the belt course at the fourth floor where the windows are also arched. The main features

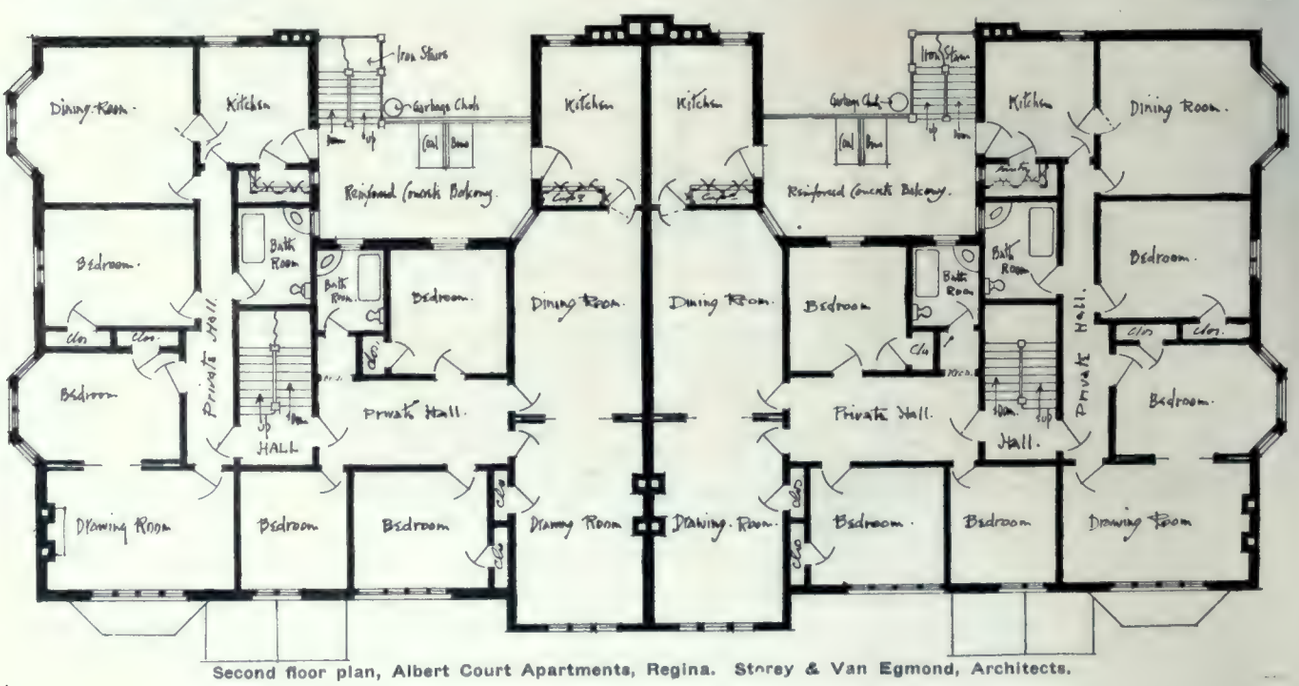


Second floor plan, new General Hospital, Regina. Storey & Van Egmond, Architects.

Albert Court Apartments, Regina. In exterior construction and architectural treatment this structure stands out in marked distinction to the usual type of apartment buildings. There is a strong domestic feeling in general lines, and a pleasing color contrast in the buff tones of the stucco walls, brown woodwork and red shingle roof. Storey & Van Egmond, Architects.

of the ground floor are the exceptionally large rotunda with adjoining dining room and grill room, and also the sanitary and convenient kitchen arrangement. In addition to these rooms, is an annex, connecting with the rotunda and containing six large sample rooms, having facilities to enable commercial travellers to advantageously show their goods. The upper floors provide for one hundred guest rooms. All are equipped with hot and cold water, and fully two-thirds of the rooms have private baths adjoining. The architects for the building were Storey and VanEgmond of Regina, and it is the intention of the management to erect a large fireproof addition in the near future.

The new theatre building now under construction at Regina, at a cost of $25,000, was also designed by Messrs. Storey and VanEgmond. This building gives a fairly good idea of the capabilities of Westerners in rapid construction work. Although work on the structure was only started on Oct. 15th, this year, it is expected to have the playhouse open Christmas week. The building is enclosed with solid brick walls, with a Roman pressed brick front trimmed with Tyndall stone; and the plastering throughout is applied directly to metal lath. Four doors at the main entrance give access to the ticket lobby, while four fire exits have been placed along the lane at the side of the building, thus assuring ample



Second floor plan, Albert Court Apartments, Regina. Storey & Van Egmond, Architects.

Residence of W. B. Van Egmond, of the architectural firm of Storey & Van Egmond, Regina. An interesting half-timbered house with decidedly unique and graceful lines, giving it a pleasing cottage effect. The exterior is of rough thrown plaster work of a light buff tone, the roof shingles and timber work of a dark brown, and window sashes painted white.

Dining-room, Residence of W. B. Van Egmond, Regina, showing the scheme of decorations and furnishings. The woodwork is stained a dark greenish brown, the walls are panelled with a yellow b rown burlap, while above the plate-rail the room is finished in stucco plaster of a lig ht buff color. Storey & Van Egmond, Architects.

means for quick egress in event of an emergency. Adjoining the lobby are retiring rooms and lavatories for both sexes, and also a large cloak room. The auditorium which is 55 by 60 ft., provides seating accommodations for 850 people. There are ten boxes in all, the four upper ones forming a continuation of the balcony floor. Underneath the stage, 28 by 55 ft., are the dressing rooms, players' lavatories, property room and furnace

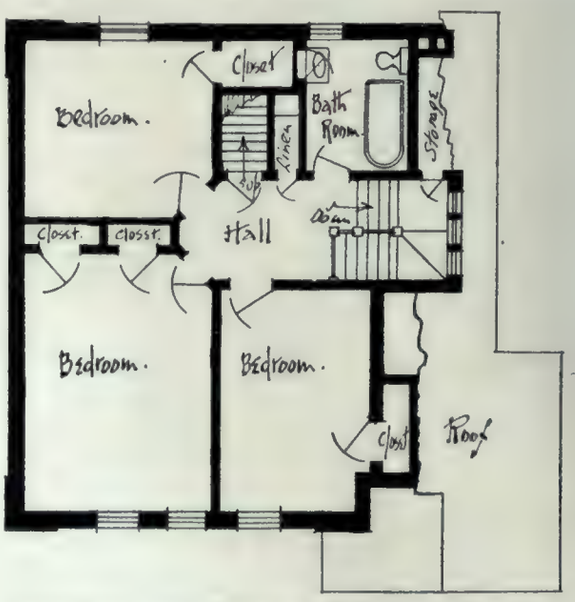
Ground floor plan, Residence of W. B. Van Egmond, Regina. Storey & Van Egmond, Architects.

compartment. The procenium arch, which has an opening of 30 by 20 ft. and the boxes and balcony rail, etc., are finished in decorative plaster work with stencil ornament and tinting. The owners of the building are Whitmore Brothers, and the contract for the work is being executed by the firm of Murphy and Martin, Regina, contractors.

Another structure of note designed by the same architects, that is now in process of erection at Regina, is the new General Hospital, which will cost complete, $105,000. This building will be entirely of fireproof construction, and it is representative of the broad spirit and thoroughness of the West in providing structures of this character. The floor system and roof will be of reinforced concrete, and the various rooms and corridors will be divided off with metal stud and lath partitions, so constructed and plastered as to be practically sound proof. Externally the building, which is a four story and basement structure, will be carried out in red pressed brick with Tyndall stone entrance, and base and belt courses. In the interior the arrangement will be direct on all floors, consisting of central corridors running the full length of the building with the various wards, operating rooms and offices aligned on either side. The stairway adjoins the ambulance entrance and elevator, opposite the main vestibule, and is carried up at this point to the upper floor. A complete fan system of ventilation is to be installed, as designed by the Architects; and, although the building is practically non-combustible in its construction, extra precaution is being taken in the way of an enclosed system of outside fire escapes, which, will open off corridors at the end of the building. The hospital will provide accommodation for one hundred patients; the hall and various rooms will have sanitary floors and wainscotting; and the fixtures and equipment throughout will be modern in character.

As regards residential buildings, Regina has made much consistent headway in this character of work. The Albert Court Apartments, which form one of the subjects in the accompanying illustrations, is a most interesting structure both in design and plan. There is a strong domestic feeling in the general lines, and a pleasing color contrast in the buff tones of the stucco plastered brick walls, the brown woodwork and red shingle roof—which render it quite distinct in architectural treatment from the conventional types of apartment buildings. At the centre of the building is a twin-gabled bay projection, half timbered in the upper portion, while at a uniform distance on either side are the entrances with gabled hood, pleasingly designed windows and interesting dormer, giving a perfect balance and symmetry to the whole. In the interior, the most impressive feature is the homelike manner in which the rooms are grouped. There are twelve suites, each containing a kitchen, dining room, bath room and from two to three bedrooms. All apartments are equipped with speaking tubes, hot and cold water, porcelain and nickel bath fixtures, etc.; while at the rear are reinforced concrete balconies with coal bins and garbage chutes, and iron stairway connecting with the grade. The building was designed by Messrs. Storey and VanEgmond, and it was erected by the Saskatchewan Building Construction Company, at a cost of $40,000.

Mr. (W. B.) VanEgmond's own residence is an unusually attractive half-timbered house with decidedly unique and graceful lines. The exterior is of rough thrown plaster work, the shingles and timber work stained a dark brown, and the window sashes painted white. The long pitch of the roof which continues down over the porch projection at the side, and the modest dormer which peeps interestingly from beneath it, overcomes the vertical panelling at the front and gives the house a decidedly pleasing cottage effect. In the construction of this house, every measure was taken to insure a dry and warm interior. The walls are of wood studs, sheathed, papered, strapped and lathed and plastered on the inside; and sheeted, papered and metal lathed for the stucco and half-timber work, outside. The interior is finished in B. C. fir, stained a dark greenish brown in the first floor, and finished with a white enamel in the rooms above; and the floors are an egge grained specie of the same wood, stained and oiled throughout. The hall, which gives ready access to all parts of the house, has a brown leather wall covering



Second floor plan, Residence of W. B. Van Egmond, Regina. Storey & Van Egmond, Architects.

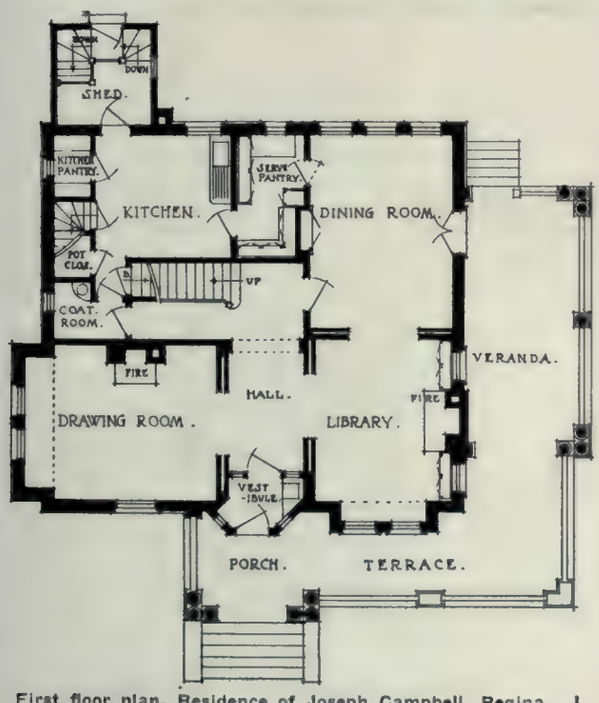
stamped in conventional design, and tinted plaster ceilings; while the den is done in red leather below the plate rail, and finished with reddish buff stucco plaster above. A feature of this floor is the built-in buffet and cupboards arrangement, which takes up the space between the dining room and kitchen. The drawing room and

dining room connect by a large arched opening; the latter room being finished with a beamed ceiling, yellow brown burlap panels up to the plate rail, and upper walls and ceilings in stucco of a buff tone. The second floor has storage space, a sanitary dadoed bath-room and three bed-rooms with built-in closets.

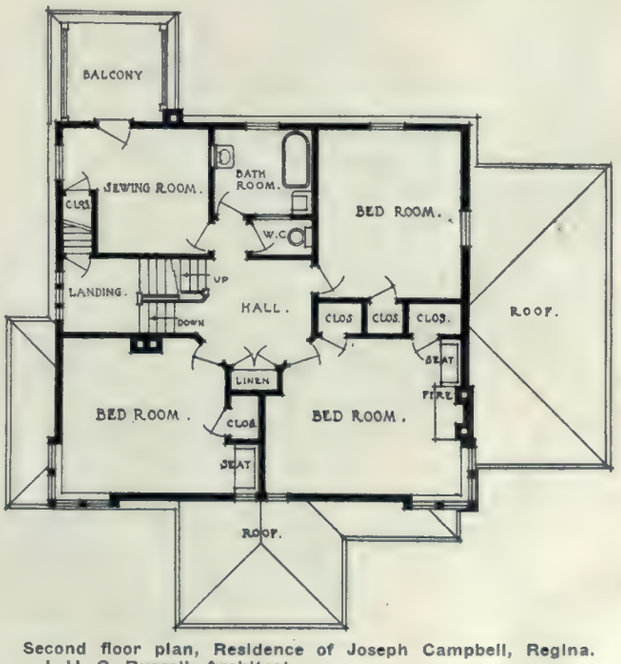
The home of Mr. Joseph Campbell, another Regina house illustrated in these pages, is a dwelling of the modern type with comfortable lines and a pleasing color scheme. A feature of the exterior is a deep covered combination porch and verandah with triple supporting columns, enclosing the front and sides of the house. The first story is of red brick, the shingle work above dark brown, and the roof stained a moss green; while giving a further touch of contrast are the window frames, having small lights in upper sashes, and painted white in keeping with the balance of the woodwork. A well proportioned chimney rises to an agreeable height. The roof, which has a dormer at the front, spreads its broad eaves in a sheltering manner over the second story. On the

(Concluded on Page 98.)

Residence of Joseph Campbell, Regina. Comfortable lines and pleasing color scheme serve to make this home an attractive abode. The walls for the first storey are red brick, with dark brown shingles above, the roof being green and the woodwork white. J. H. G. Russell, Architect.



First floor plan, Residence of Joseph Campbell, Regina. J. H. G. Russell, Architect.



Second floor plan, Residence of Joseph Campbell, Regina. J. H. G. Russell, Architect.

RECENTLY ERECTED BUSINESS AND PUBLIC BUILDINGS IN SASKATOON, FROM DESIGNS BY ARCHITECT W. W. LACHANCE. 1—Saskatoon City Hospital. 2—The Drinkle Block. 3—The Chubb Block. 4—Saskatoon's Fire Hall. 5—Partially completed Baldwin Block.

SASKATOON, A CITY OF MIGHTY STRIDES.—Population Has In reased from 200 to 8,000 in Eight Years.—Examples of Some of Its More Recent Buildings, and Brief Comment on the City's Commercial and Industrial Possibilities.

A THRIVING city in the Province of Saskatchewan that bids fair to ere long become a strong rival of Regina for supremacy as a distributing centre is Saskatoon. This city is one of the most wonderful examples of how cities are built in a day in the West. From a population of 200 in 1900, it had grown to a city of a population of 8,000 in 1908. This growth has not been of the mushroom sort, that one might be led to look for in such rapid development.

A glance at the accompanying illustrations, showing some of the recent buildings constructed in this city, will give a fair idea of the substantial community its citizens have built in so short a time.

Both nature and man have done a great deal for Saskatoon. It is surrounded in every direction by fertile country; it has three trunk railways running through it in an easterly and westerly direction, and it has other lines running north and south, so that the question of whether Saskatoon, in this great rich belt, will continue its wonderful growth, depends absolutely upon its citizens, and the optimism and good judgment of its earlier promoters, already displayed in its history, seems to warrant the contention that Saskatoon will, before many years, be one of the largest and most prosperous cities in Western Canada.

While for some little time to come, Saskatoon's chief development will be along the lines of both wholesale and retail trade, made possible by the rich adjacent farming country and the unequalled railway facilities existing, manufacturers of the lighter sort will undoubtedly follow in time. The labor market and distance from raw materials are not at present conducive to anything large this direction, but it is pointed out by its citizens that when lower freight rates, cheaper coal, and the scheme now under way for harnessing the great power of the Saskatchewan at this point, become accomplished facts, new facilities will be offered that will offset the disadvantages Saskatoon may at present have as a manufacturing city.

From a standpoint of business and municipal buildings, Saskatoon's expansion has been most pronounced. Especially can this be said of the last few years, during which a veritable boom has been experienced in this respect. In the main, the buildings are of a most acceptable type, being substantially built and of a character which leaves no doubt as to the future of the city. The accompanying group of the work of Architect W. W. La Chance, which includes the City Hospital, Fire Hall, and three business structures, are representative of the character of improvements which are being made along these lines. As regards the first-mentioned building, Saskatoon enjoys the distinction of being the first city in Western Canada to build an institution of this kind, and it must be said that in the construction of the building itself, and in the matter of internal equipment and sanitary appliances, the authorities have shown a broad spirit in the appropriation of funds in order that the hospital might be on a par with the better class of similar institutions found elsewhere. The building provides accommodation for 56 patients, 16 nurses, and service staff, and, although the structure was completed only seven months back, plans are at the present under way for two substantial wings, which will practically double the accommodations. The hospital is practically three stories high, with red brick external walls trimmed with Tyndall stone; the system of heating is steam; and the ventilation apparatus, operated on the plenum system.

In the three business buildings referred to, the main facades are of red brick, trimmed with cut stone from either the Tyndall or Bedford quarries. The floor system of the Drinkle Block, which is a four storey structure, 75 by 125 feet, is of mill or slow burning construction. On the interior the arrangement is such as to utilize all available space to the greatest advantage, the rooms are excellently lighted by large, well placed windows, and the sanitary features have been thoroughly considered in every particular. The entire first floor, which is taken up by spacious stores, is enclosed with plate glass fronts on both sides, and has central halls leading to the stairs and elevator connecting with the upper floors. The building is heated by steam, is modern in its appointments, and was erected at a cost of $75,000.

In the Baldwin Block, which is at the present time receiving its finishing touches, the exterior walls are lined with hollow tile. This building, which is a three-storey structure, 50 by 140 feet, will cost $50,000. It is to be devoted entirely to offices, and will contain, in all, thirty-two suites, comprising ninety-two rooms, all of which will be heated by steam and model as regards finish and sanitary equipment.

The Chubb Block, which was constructed at a cost of $20,000, is a building of more modest dimensions, having an interesting facade with a large plate glass store front; while the Fire Hall, the other building in the group, is a most acceptable structure, designed along conventional lines.

One of Saskatoon's public buildings of a smaller type, which is noteworthy in design and construction, is the Land Titles Building, designed by Architects Storey and Van Egmond. It is similar in dimensions to the building used for like purposes which the Saskatchewan Government has erected in Regina. Owing to the importance of the records and papers of the Government Land Department, this building is, as is also the other mentioned structure, of absolutely fireproof construction. There is not a particle of wood or other combustible matter employed in any part of the structure. All the doors, windows and casings, etc., are iron or steel clad, the roof and floors are of concrete, the partitions of hollow tile, and the exterior of dark brown clinker brick wall, trimmed with Tyndall stone of a buff tone. In the interior, which is well lighted on all sides and regulated by an automatic heating and ventilating system, the floor is finished with mosaic tile and the walls decorated by ornament plaster cornices. The building is equipped with large modern vaults, and the files and appurtenances, are of metal. Its cost complete was $30,000.

Another building included among the city's structures of a public character, is the Court House, by the same designers, which was built at a cost of $45,000. This building is well adapted to the local requirements as regards court accommodations for some time to come. The exterior is of red sand mould brick, dressing with Tyndall stone, and enclosed overhead with a metal roof. The two main floors are taken up by the courts and associate departments, while the basement is devoted to jail purposes, and equipped with modern steel cells. The walls throughout the building are tinted in agreeable tones to harmonize with the quarter-cut oak woodwork, and heat is supplied by a low pressure steam system.

As with most Western cities, the rapidly increasing population of Saskatoon, together with a desire to have properly designed and constructed school buildings, has resulted in a number of improvements as regards structures of this character. At the present time, the city has under way a new Collegiate Institute, which is being erected at a cost of $90,000, in accordance with the accepted competitive design of Architects Storey & Van-Egmond. The plan of the building, as is shown in the

Land Titles Building, Saskatoon, said to be the most thoroughly built fireproof structure in Western Canada. It is constructed of dark brown clinker brick, with Tyndall stone trimming, the floor and roof being concrete, the partitions hollow tile, and the doors and windows of the most approved fire-resisting type. Storey & Van Egmond, Architects.

accompanying illustrations, provides for a structure that will readily fulfill its purpose in the simplest and most direct manner. Access to the interior will be obtained by two centrally placed and two end entrances, and communication with the upper and basement floors will be via broad non-combustible stairways enclosed with fire walls and equipped with automatic fire doors. As regards the exterior of the building, there is no evidence of extravagant elaborations. The main entrance is distinctly but not unduly accentuated and the general lines are simple, dignified and of pleasing proportions. A feature of the ground floor will be a central rotunda to which the corridors will connect, and which will produce a more open effect than could be obtained by an elongated corridor system. This floor provides for six class rooms, principal's office, teacher's rooms, stack compartment and reading room; while the second floor, in addition to an equal number of class rooms, contains physical, chemical and biological laboratories, occupying the entire central space at the front of the building. In the basement is a large gymnasium, domestic and manlal training departments, recreation room and splendidly equipped lavatories with shower bath compartments. The floors of the corridors throughout will be fireproof, and in addition to the precaution taken in this respect, and as regards the stairways, two balcony fire escapes will be provided to insure every reasonable means of egress in event of an emergency. The building will be equipped with an approved heating and ventilating system which will produce a uniform temperature of 70 degrees, with at least six changes of air an hour, and keep the air at proper humidity.

REGINA, THE "MODEL" CITY OF THE WEST."—Continued from Page 95.

inside, the house is finished throughout in quarter sawed oak. The drawing room and library, both of which have large open fireplaces, are to the left and right of the entrance hall, while to the rear of it is a stair hall giving access to the service department and second floor. The kitchen is at the rear, and adjoining it to the right is the dining room, which has a door opening on to the verandah. The upper stairs contains several good sized bedrooms, with wardrobe facilities, and a bathroom equipped with modern plumbing and fixtures. The designer of this house was Mr. J. H. G. Russell, of Winnipeg.

A CONTRACT WITH RESTRICTIONS

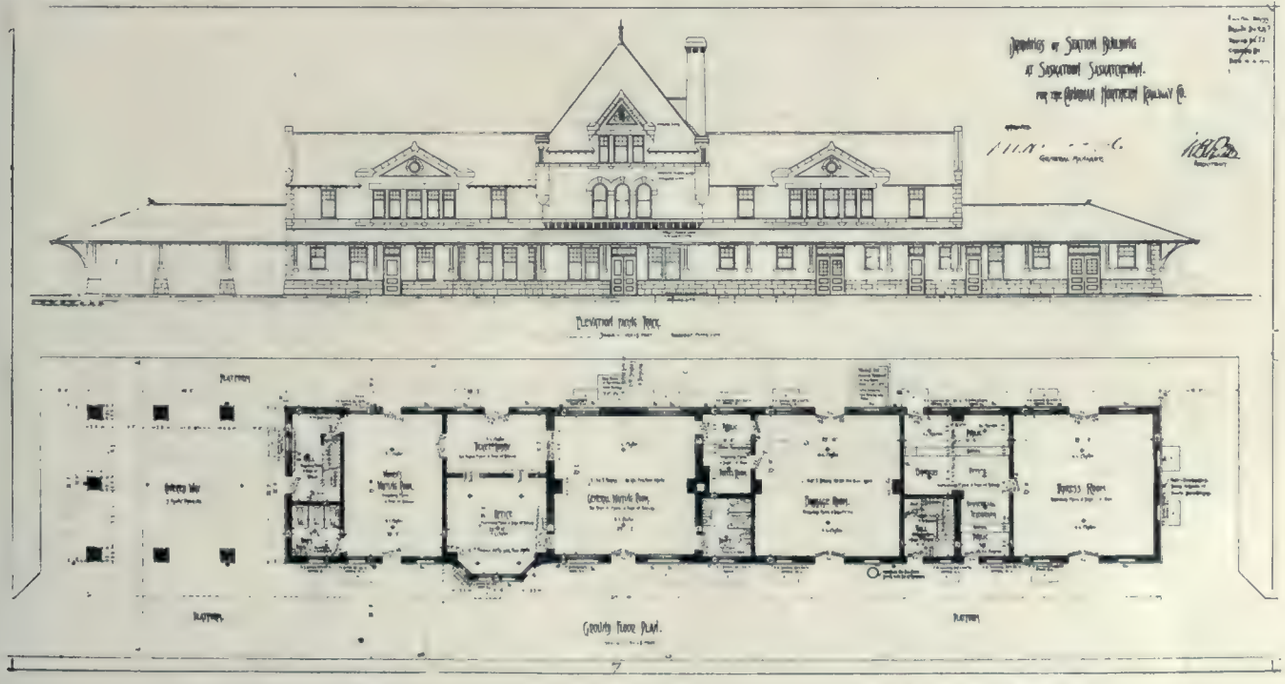
THE WATERFORD reinforced concrete bridge, which has caused so much dispute that the plans for it were finally submitted to the Privy Council of Ireland, is the subject of a recent note in "Engineering" that throws considerable light on the status of the controversy. The council had decided that a reinforced concrete bridge should be constructed, although it was contrary to the wishes of the local authorities, but in reaching a final decision it has coupled with the approval of reinforced concrete some conditions that seem decidedly unusual. It has very properly, ordered that the foundations of the work should be executed in such a manner as to be beyond question, but it has also required the contract to be so drawn that the contractor must maintain the structure for two years after its completion before its acceptance. If the experience during this period is unsatisfactory to the committee in charge of the work they are to have the privilege of requiring the contractor to maintain the structure for four more years, to the satisfaction of the engineer. The contractors are

Court House, Saskatoon, built at a cost of $45,000. The walls are of red sand mould brick, with Tyndall stone trimmings, and the interior is finished throughout in quarter-cut oak. Storey & Van Egmond, Architects.

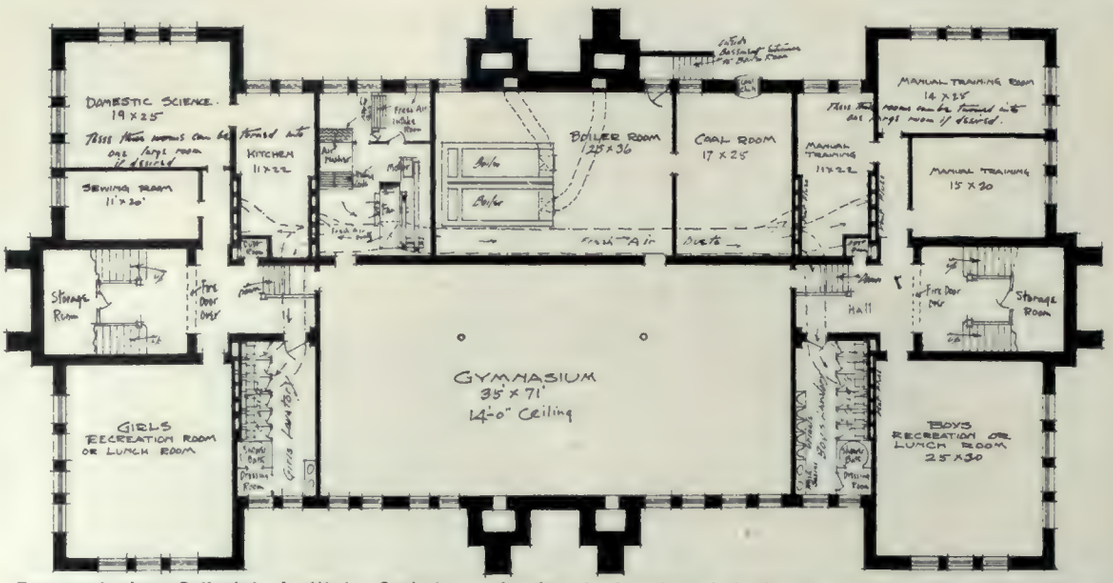
to stipulate in their tenders the amounts they will charge for its maintenance. The case is attracting so much attention in Great Britain and Ireland that for the sake of complete fairness it would seem desirable to start afresh. It is evident that whatever type of structure is constructed it will be a mark of strong criticism, which is bound to influence voters against all bridge work if carried too far; consequently, it would apparently be a good move to take the decision of the Privy Council as

Perspective view of the new Collegiate Institute, Saskatoon, which is now being erected at a cost of $90,000. This building bears additional testimony to the liberal and thorough manner in which the West in general provides for the housing of its school children. Storey & Van Egmond, Architects.

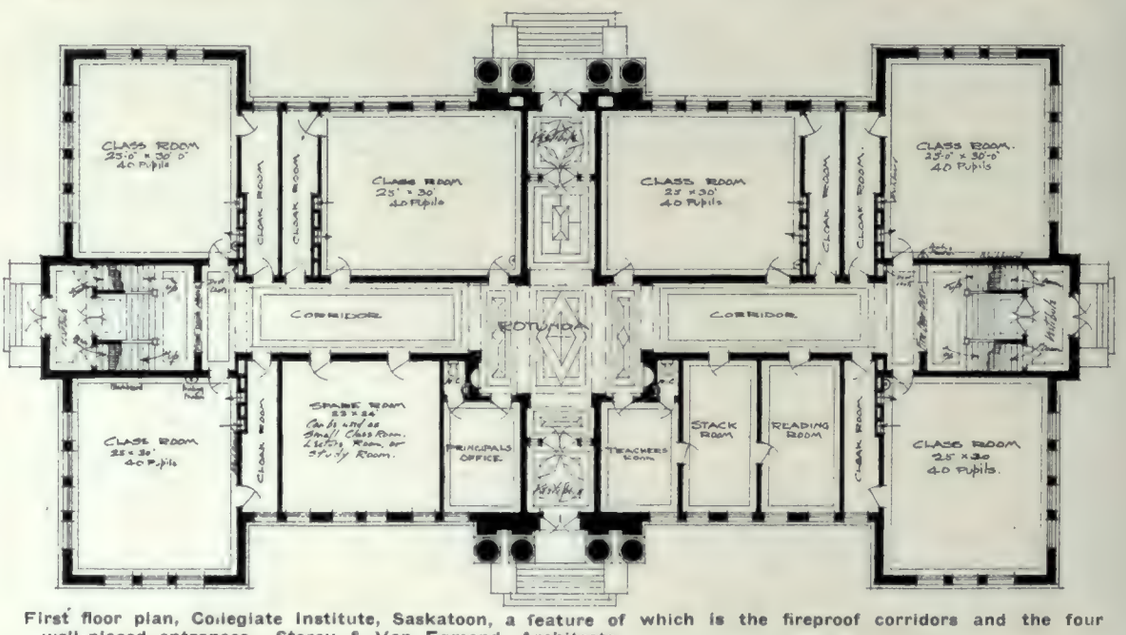
a basis for an entirely new competition. That decision stipulated quite carefully, so far as the reports of it indicate, the features of foundations and superstructure that must receive attention in any designs of reinforced concrete bridges that will be acceptable, and these requirements should be stated in the terms of a new competition in which steel and reinforced concrete builders can take part, both being under the obligation to put in satisfactory foundations and to maintain the structure, if required, for a period of six years at a definite rate. This case is apparently the first public competition between steel and reinforced concrete for an important bridge, and for this reason disinterested observers naturally hope that the conditions of the competition shall be absolutely fair to all parties. The published opinions on the case indicate the existence of a feeling that the reinforced concrete structure which has been the cause of argument was not of a sufficiently conservative design to be compared with the proposed steel bridge; whether this opinion is warranted or not it is impossible to judge from the information at hand



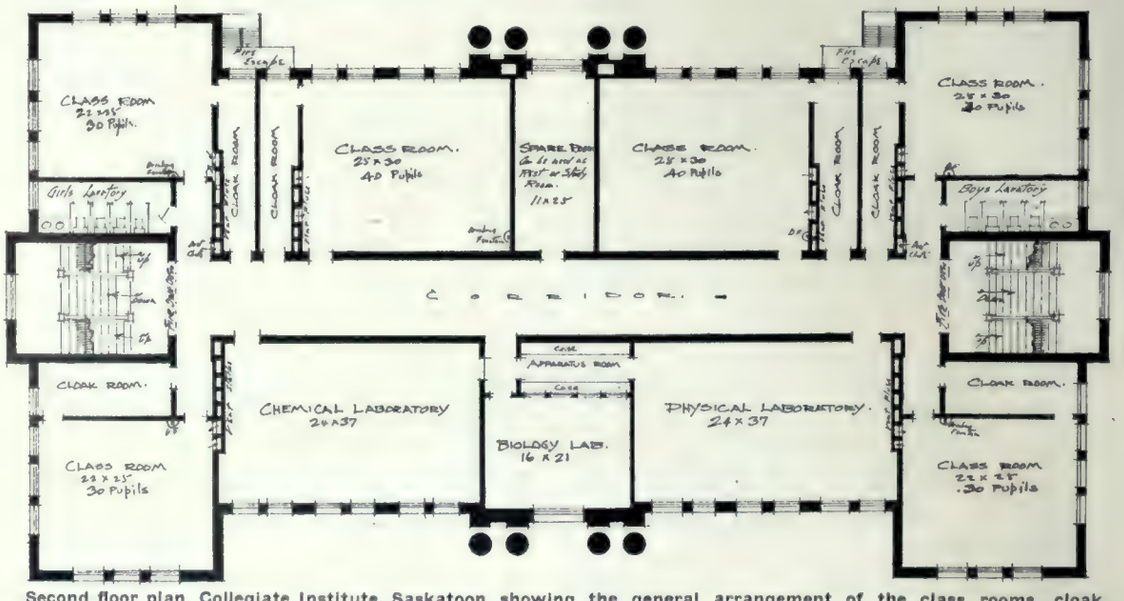
Main elevation and floor plan, Canadian Northern Depot, Saskatoon W. B. Pratt, Architect.



Basement plan, Collegiate Institute, Saskatoon, showing the location of the large gymnasium, manual training and domestic science departments, recreation room and boiler compartment. Storey & Van Egmond, Architects.



First floor plan, Collegiate Institute, Saskatoon, a feature of which is the fireproof corridors and the four well-placed entrances. Storey & Van Egmond, Architects.



Second floor plan, Collegiate Institute, Saskatoon, showing the general arrangement of the class rooms, cloak rooms and laboratories. Storey & Van Egmond, Architects.

EDMONTON, THE GATEWAY TO THE NORTH.—Its Great Growth, Possibilities, and Progress from an Architectural Standpoint Summarily Set Forth.—Substantial Development Under Way in All Classes of Buildings, and Much Large Work in Prospect.

"THE GATEWAY TO THE NORTH" is the title laid claim to for their city by the citizens of Edmonton. This wonderful new city is generally recognized as the gateway to the vast Peace River country, which has been happily and truthfully termed "The Empire of the North." The story of the growth of this city of Edmonton sounds almost like a fairy tale. Its population has increased from 3,000 in 1900 to 21,000 in 1908, and when it is realised that this rapid growth was made in the face of what, at one time, looked like insurmountable difficulties, it is doubly marvelous. Every early citizer remembers how the C. P. R. refused to come across the great ravine over the Saskatchewan River, into Edmonton, and how it looked as though, if a city were to be established in this section of the country, it would be Strathcona and not Edmonton. Despite this great disadvantage, Edmonton cortinued to grow until the Canadian Northern came into the city, since which time it has gone ahead by leaps and bounds. Edmonton proved itself stronger than the railroad; it won out, and row the C. P. R. is about to construct a great bridge across the ravine into the city. It was a case of "If the mountain will not come to Mahomet, Mahomet will go to the mountain."

The early settlers in Edmonton deserve much credit for the manner in which they laid out the town, and the present-day citizens are to be complimented upon the manner in which they are building up the city and carrying out their municipal improvement work. The city is located on the south side of a great ravine, at the bottom of which runs the Saskatchewan. The main streets run east and west, while the shorter cross town streets run north and south. The streets in both the business and residential districts are wide and well paved. In fact Winnipeg is the only city in the West whose business thoroughfares are wider than those of Edmonton. While a very large number of the earlier houses were built of wood, mostly all of the residences in the better sections of the city are now being built of brick. A number of brickyards have been established within the immediate vicinity of the city, and bricks are obtainable of a very good quality at an exceedingly reasonable price.

Jasper Avenue is the main business artery, and the business buildings, banks, and hotels on this street, as will be seen in the views that accompany this article, give evidence of the pride and confidence of the citizens in their city. A very significant fact in connection with the solidity of the growth of Edmonton is that though the volume of building during 1908 in almost every centre in Canada was below that for 1907, it was the reverse in Edmonton.

The growth and development of Edmonton during the last five years from an insignificant trading post to one of the most influential cities in the northwest is most interesting, viewed from almost any point, but especially so if we review the development of building operations as reflected by the building permits issued by the city's Building Inspector.

On looking up the records we find that while in the year 1905 the total amount was only $702,724 it rose to $1,868,069 in 1906, to $2,280,210 in 1907, to $2,498,847 in 1908, and up to the end of October, 1909, to $2,200,000.

The figures in the aggregate are interesting, but the details are equally as engaging, as they give us a reliable indication of the lines along which true development is taking place. Amongst the buildings which have been erected within the last three years may be mentioned the following:—New Post Office $250,000, Alexander Taylor School $100,000, Norwood School, $130,000, Imperial Bank $100,000, R.C. Separate School $70,000. Blowey-Henry Building $65,000, Windsor Block $60,000, McDougall Court $45,000, Arlington Apartment House $150,000, Lemarchand Block $200,000, Kelly Block $60,000, the Griffin Packing Plant represents $1,000,000, Jasper Block $45,000, Y.M.C.A. $60,000, Cristall Block $75,000, and many more.

The foregoing will give the reader some idea of the stability of the capital city of Alberta, and buildings such as above will indicate the measure of confidence which the citizens have in the future of the city.

With regard to future prospects the outlook is just as bright, if not brighter, than when viewed several years back. Amongst the buildings under way are the new Parliament Buildings which will cost some $1,300,000, the new Court House $300,000, new Methodist Church $75,000, new High School $109,000, new Union Bank $50,000, Molson's Bank $50,000, McDonald Block $50,000, extensions to the Alberta Hotel $100,000, extensions (second addition) to King Edward Hotel $60,000, City Hospital $150,000, 17th Street Public School $100,000. These figures give some idea of the still greater growth that its citizens are looking forward to.

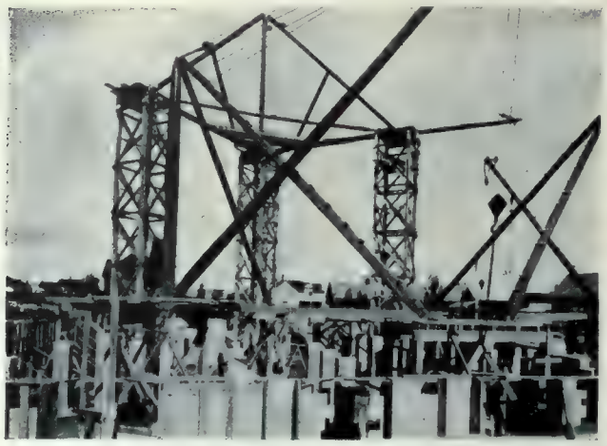
No city of Edmonton's age and size is better endowed with educational facilities. It is within two miles of the Provincial University, and has two colleges, a High School, in addition to eleven Public Schools. It has also twenty-two churches, two sanitariums, four hospitals, fourteen banks, three clubs, and twenty-two hotels. It owns its own electric plant, its own street railway, and its own waterworks. Immediately on the advent of the Canadian Northern Railway, Edmonton became a permanent distributing centre. A general readjustment of freight rates from manufacturing centres in Eastern Canada and the United States was made by the Canadian Northern Railway, whereby Edmonton was placed on an equal footing with the other distributing centres of Western Canada. In addition to the inward rates being substantially reduced the outgoing rates from Edmonton were also lowered. The Canadian Pacific Railway has definitely announced it to be part of their policy to make Edmonton a wholesale and distributing point. The arrival of the Grand Trunk Pacific in the course of a few months will place Edmonton still further to the front as in this respect.

The city of Edmonton now justly claims to be the leading packing centre of the province, in fact of the middle west. During the year 1908 there were 50,000 head of cattle, hogs, and sheep slaughtered in Edmonton and Strathcona, of which amount 70 per cent. were hogs $750,000 would be a conservative estimate to place on the year's killing. During 1909 these figures will have increased to at least double as the Swift Packing Plant was operating only during the last three months of 1908, and in that time slaughtered 30,000 head of stock. The balance of the 50,000 was handled by the smaller plants. With regard to the Swift Packing Plant, a very complete examination of Western Canada was made before it was decided to build in Edmonton. The buildings and equipment, etc., cost something like $1,000,000 The capacity of the plant is 1,000 head of cattle, 2,500 hogs, 500 sheep

VIEWS OF BUSINESS AND RESIDENTIAL STREETS IN EDMONTON. 1—A glance along Jasper avenue, the city's main business thoroughfare. 2—Jasper avenue, locking west from McDougall street. 3—Sixth street, as seen from McKay avenue. 4—Looking north on Sixth street, from the intersection of Saskatchewan avenue.

EDMONTON'S ARCHITECTURAL PROGRESS, AS REFLECTED IN SOME OF THE MORE RECENTLY ERECTED BUILDINGS. 1—The Post Office building, J. Ewart, Architect. 2—Empire Block, H. G. Johnston, Architect. 3—Canadian Bank of Commerce, Darling & Pearson, Architects. 4—Merchants Bank building. 5—Canadian Northern Railway station, Pratt & Ross, Architects. 6—Telephone Company's Exchange building.

and 300 calves per week. They have not been operating to their full capacity as the building is not quite complete. It is now being finished and the output will be greatly increased The supply of hogs, cattle and sheep is obtained from the C. N. R. district as far east as Saskatoon, along the C. P. R. as far south as Crossfield, and points on the Wetaskiwin and Lacombe branches. As a manufacturing centre, Edmonton has already gained recognition. In addition to the packing industry referred to above, there are lumber mills (capacity 20,000,000 feet per annum), brick factories, brew-



View of construction work on the new fireproof Edmonton Court House, which is being erected at a cost of $250,000, from plans prepared by A. M. Jeffers, Supervising Architect, Provincial Department of Public Works.

eries, sash and door factories, basket factories, aerated water factories, cigar factories, pickle and vinegar factories, box and tub factory, concrete block, pipe and tile factory, etc.

As in Regina, the most important buildings now under course of erection are the Parliament Buildings of the Province of Alberta, the corner stone of which was recently laid by Earl Grey, Governor-General of Canada. The structure was designed by Mr. A. M. Jeffers, provincial architect, under whose supervision the buildings are being erected. Mr. Jeffers has given most careful study to all structural details, assisted by the structural

Edmonton's new Court House, as it will appear when complete. Designed by Mr. A. M. Jeffers, Supervising Architect, Provincial Department of Public Works.

engineer, John Chalmers, and in collaboration with Mr. Fingland, structural engineer and architect of Winnipeg, who is acting in an advisory or consulting capacity for the Government in connection with the building. The complete design was submitted to Professor Nobbs, of Montreal, who is professor of architecture at McGill University, and after his revision was finally approved and adopted.

The building is situated upon the high ground at one time occupied by the residence of the chief factor of the Hudson's Bay Co., and overlooking the river hundreds of feet below and the plateau, where the fur company's old fort still stands. The structure has a site which cannot be surpassed for scenic beauty in the province, if in Western Canada. The location is nearly central in Edmonton from an easterly and westerly direction, and lies almost midway between the capital and the sister city of Strathcona upon the southern bank of the Saskatchewan. In these respects, as from a standpoint of picturesque beauty, the historic site could not have been excelled.

Although it is almost two years since work was started upon the excavations little more than the foundations have been completed up to the present time. The delay was first caused by tardy shipment of the structural steel and, later, by the slow delivery of the granite and freestone of which the super-structure will be built. On May 18th last the masonry was begun, and at present the granite basement walls have been completed three-quarter way round the buildings.

They rise to a height of over twelve feet, and present such a stately and substantial appearance that they give some idea of the magnificence of the structure when it will be completed. Inside the granite work is the brick which makes the walls over three feet thick.

The Norwood School, Edmonton. Roland W. Lines, Architect.

The structure is being built in the form of a huge "T," having the main facade parallel to and 200 feet south of Saskatchewan Avenue, on which the building fronts. The design is classical, following the lines of the Corinthian order. The main entrance or central pavilion, facing the city to the north, is 83 feet wide, flanked on the east and west sides with administrative wings. Each wing is 13 feet long, exclusive of entrance steps which extend away from the ends a distance of 42 feet each.

The main entrance pavilion, including entrance steps, extends north from the main facade, a distance of 75 feet, from which point the building measures south 290 feet. It is 58 feet high from the ground line to the top of the main cornice, and from the entrance line to the base of the lantern on the dome is 88 feet. In general the buildings occupy a plot of ground 427 feet by 290 feet, and from the ground to the top of the dome is 178 feet

The building is of strictly fireproof construction, having broad concrete footings and foundation walls up to the ground line. Above ground the exterior walls are faced with stone masonry, backed with brick work and furred on the inside faces with hollow, porous terra-cotta blocks for the purpose of providing air spaces to prevent

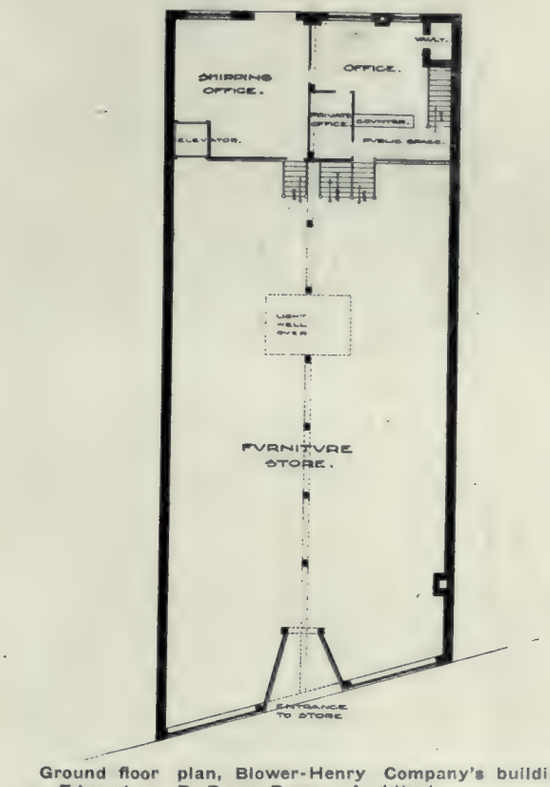
dampness and to make a solid background for plastering work. The interior is of steel construction, consisting of steel columns supported on concrete footings and steel floor beams and roof trusses. All of this steel work will be fireproof, using concrete bricks or terra-cotta as best suited for the work. The steel work is a

Alex. Taylor School, Edmonton. Roland W. Lines, Architect.

unit in itself and is not dependent on interior partitions for support. The walls of the rotunda and vaults are built of first-class brick masonry. All other interior walls are built of hollow porous terra-cotta blocks and so designed that at any time any partition or set of partitions or any floor may be removed without interfering with the construction of the building, and with a minimum interference with the business operation of any department. The walls will be of reinforced steel concrete construction or protected steel beams, having marble and tile floor finishes.

Store and warehouse of the Blower-Henry Company, Edmonton. R. Percy Barnes, Architect.

An outstanding feature in the building development of the towns and cities of the prairie provinces, is the large number of improvements which are being made as regards public buildings and school structures. Practically all sections are witnessing unusual activities in this respect, and the type of buildings erected, as a rule, are permanently constructed and well adapted to meet the requirements of the community in which they are located. One of the important structures now under way is the new Edmonton Court House, designed by Mr. A. M. Jeffers, supervising architect of Provincial Department of Public Works. In construction, the building, which is a two story and basement structure, will be of the fireproof type, enclosed by walls of Calgary stone. The two accompanying views show the progress of the work up to date, and the Court House as it will appear when completed. Owing to the location of the site, the design provides for two entrances of equal importance, one on McDougal Avenue, and the other on May Street. Both of the entrances will be similar in treatment, following the Ionic order, and be approached by broad granite steps flanked on either side



Ground floor plan, Blower-Henry Company's building, Edmonton. R. Percy Barnes, Architect.

by low masonry walls, surmounted with electroliers of an appropriate design. On the interior the plan provides for an arrangement that will readily facilitate the business of the various courts and departments. The central feature will be a spacious rotunda, finished with a panelled ceiling and having marble and plaster columns and pilasters. This will give direct entrance to the supreme court chambers, and the principal departments, and will connect with the second floor by a marble and iron staircase. On the second floor the rotunda is surrounded with a gallery, having ornamental plaster columns, pilasters and beamed ceilings, the centre feature of the ceiling being an ornamental ceiling light set in plaster work. Opening off the gallery are the public entrances to each of the four court rooms and library. Between the court rooms are located the jury room and judges' retiring room. In general, the building will be finished in oak and ornamental plaster work, being appropriately panelled and finished to harmonize with the particular use of each court or room. A system of model vaults for court records, etc., will be installed on the first floor; and in addition to the main entrance, access to the building will be obtained from two entran-

ces opening in from the lane, one of which will connect with the police headquarters located in the basement.

As regards school building construction, the accompanying ilustrations will enable the reader to form a fairly comprehensive idea, as to the substantial type of structures Edmonton is providing to meet her needs along this particular line. These are the Norwood school, and

The ability of Western contractors to carry out construction work in a thorough and expeditious manner is convincingly demonstrated in the erection of the Arlington Apartments, Edmonton. This view, which gives an excellent idea of the ground dimensions of the building, shows the stage to which the work had advanced on August 25, 1909, just thirty-five days from the date the contractors undertook the removal of a cottage which originally occupied the site. R. Percy Barnes, Architect.

the Alex. Taylor school, both of which were designed by Architect Roland W. Lines, of that city. Both are two stoory and basement structures, with brick exterior walls and cut stone entrances and trimmings. The corridors are wide and direct in their arrangement, the rooms well lighted, and the stairways so situated as to expidite access or egress to or from any part of the building. In each case approved heating and ventilating systems have been installed, and all vulnerable points, such as the portions over the boiler room, etc., are fully protected so as to minimize any danger from fire.

Included in the group of illustrations which contains Edmonton's new postoffice, are the Canadian Bank of Commerce, the Empire block, and Merchant's Bank, Tel-

Process view of Arlington Apartments, Edmonton, taken on September 4th, 1909, showing the work five weeks after the concrete foundation was installed. R. Percy Barnes, Architect.

ephone building, and the station of the Canadian Northern Railway. It is hardly necessary to dilate upon the featrues of these buildings, as in each case the external design is such as to speak for the character, equipment and advantages of the building within. Both banks are representative of the splendid structures which the Canadian financial institutions are establishing in the Western field; and the Empire block and Telephone building are, both in design and construction, buildings of which the larger Eastern cities might feel justly proud.

The Blowey-Henry block is one of Edmonton's more recent additions in the way of a commercial building, is a four-story structure, fronting on Jasper Avenue, and was erected at a cost of $60,000. It is admirably suited for the purpose for which it is used—that of housing the business of a large furniture concern—the building being splendidly lighted and allowing the maximum space for the display of goods. The ground floor is occupied by a spacious store, with the offices and shipping rooms of the company at the rear, while the entire three upper floors form three vast show rooms, in which the articles of furniture can be seen to advantage. The walls of the building are of brick, and the front, which is of steel contsruction, is faced with Calgary stone, and marble from the Kootenay quarries. The large plate glass windows of the show rooms, are pivoted to open on the Tabor patent system, and communication from one floor to the other is obtained by a broad staircase and an Otis electric elevator. Heat is supplied by a low pressure steam system, and the appointments throughout are modern in character. The designing and supervising

Arlington Apartments, Edmonton, from a view taken September 18, 1909, showing the building entirely enclosed. The building contains forty-five modern suites, and is equipped with the most approved sanitary appliances and heating and ventilating apparatus. R. Percy Barnes, Architect.

architect of the building was Mr. R. Percy Barnes, Edmonton.

That western contractors are capable of perfecting a working organization which enables them to carry out construction work in equally as thorough and expeditious a manner as the builders in the eastern provinces, and the United States, is convincingly demonstrated in the three accompanying process views of the new Arlington Apartments, Edmonton, also designed by Mr. Barnes. This building, which received its finishing touches a short time back, contains forty modern suites, and is equipped with the most approved sanitary appliances, and heating and ventilating apparatus. The first view shows the stage to which the work had advanced on August 25, 1909, just thirty-five days from the date the contractors undertook the removal of the cottage which formerly occupied the site. Considering the character, size and ground dimensions of the building, of which a comprehensive idea can be obtained from the third view, the erection of this structure was executed in a remarkably short time. Five weeks from the time the concrete foundations were installed, the brick walls

New Extension to General Hospital, Edmonton. I. A. Senecal and R. Percy Barnes, Architects.

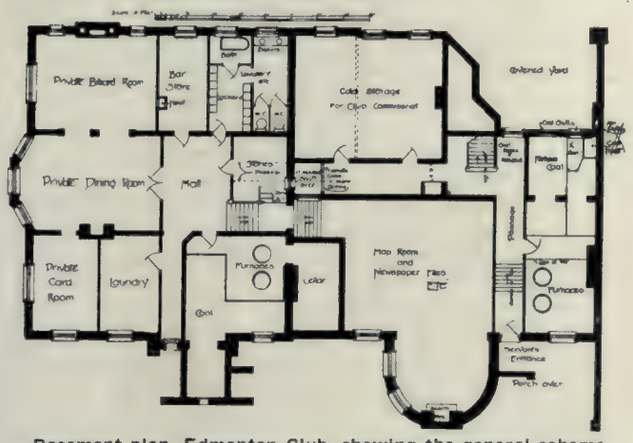
Ground floor plan, General Hospital, Edmonton. I. A. Senecal and R. Percy Barnes, Associate Architects.

The Edmonton Club, Edmonton, Alta., which has a membership of over 200 professional and business men. This view shows the building as far as it has been completed. A large addition forming a part of the original scheme is to be built to the right of the entrance, thus making the structure one of the most commodious and best appointed club houses in Western Canada. A. M. Calderon, Architect.

Writing-room, Edmonton Club, Edmonton, Alta., showing the fireplace and the general character of the appointments. A. M. Calderon, Architect.

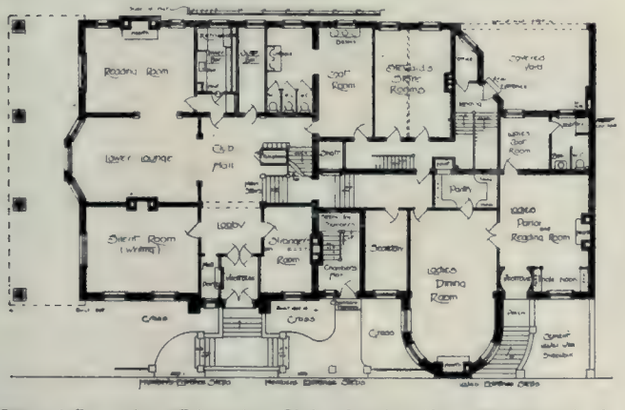
had been carried up to the fourth floor line, while on Sept. 18th, exactly fifty days from the commencement of operations, the structure was entirely enclosed and ready for the final work of the interior.

Further work of Mr. Barnes' is seen in the new extension to the Edmonton General Hospital, which he designed in collaboration with Architect I. A. Senecal.



Basement plan, Edmonton Club, showing the general scheme of rooms in the present portion of building and proposed addition. A. M. Calderon, Architect.

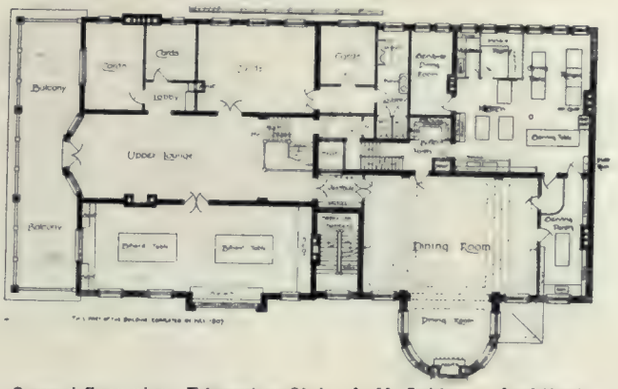
This improvement consisted of a large five story addition to the original hospital building, and a separate two story building for the accommodation of the power plant and laundry rooms. The latter structure is connected to the main building by a kitchen wing and an underground passage way. Externally, the building, which faces Victoria Avenue, is faced with local red brick and trimmed with Calgary stone, while on the interior every consideration has been given in the arrangment and finish of the various rooms and corridors, to bring the sanitary features up to the highest standard requirement. A pleasing feature of the exterior is a system of balconies opening off the corridors at the end of the building, for convalescent patients. The new addition provides accommodation for fifty patients, and in-



Ground floor plan, Edmonton Club, showing the arrangement of the present portion and the general lay-out of the rooms in the extension which is to be added to the building A. M. Calderon, Architect.

cludes a large operating room on the top floor with roof lights and north windows. The general contractors for the extension were Connell & Spencer, Edmonton, and the entire work was carried out at a total cost of $125,000.

The social feature of the business life of Edmonton centres in the new home of the Edmonton Club, a rapidly growing organization, whose membership at the present time includes over two hundred prominent business and professional men of both the city and province. This structure, which was designed by Architect A. M. Calderon, and built at a cost of $22,000, although complete in itself, represents only a portion of the building as originally planned. A large addition is to be built to the right of the main entrance (see accompanying plan), as soon as additional accommodation is necessary, thus making it one of the most commodious and best appointed houses in western Canada. The exterior of the building is of red pressed brick with cut stone trimming and belt courses, and the interior is finished largely in quarter-cut oak. Besides the usual club advantages, the plan provides for a number of interesting features. Entrance to the building is obtained by easy ascending stone steps through a panelled vestibule and hall. The club hall, which is centrally located and connected with the lower lounge by an arch door, gives direct access to all parts of the building. Upstairs the arrangement



Second floor plan, Edmonton Club. A. M. Calderon, Architect.

of the rooms obviates a system of passages. A feature of the plan is a large central hall way or lounge, with a door opening onto a balcony, 12 by 60 feet, overlooking the Saskatchewan valley.

The residence of Mr. George W. Swaisland, on Victoria Avenue, Edmonton, was also designed by Mr. Calderon. It is a solid pressed brick house, built on a concrete foundation, and was erected, including the cost of site and stable, at an outlay of $11,000. At the front is a large verandah and an upper balcony covered by a gable projection, which overlooks the Saskatchewan valley and affords a splendid outlook of the surrounding country. A feature of the interior is a large living room which takes up the entire front portion of the first floor. adjoining this room is a transverse hall, with an entrance, vestibule and staircase, and giving access to the dining room and kitchen at the rear. The dining room

Plan of third floor, Edmonton Club, which is to form a part of future extensions to the building. A. M. Calderon. Architect.

has a beamed ceiling and a large bay window, while in the living room is a large open fireplace built of Roman and Pompeian pressed brick. In addition to the second floor of the house is finished in hardwood, while the that of the living room, three bed chambers, bath room

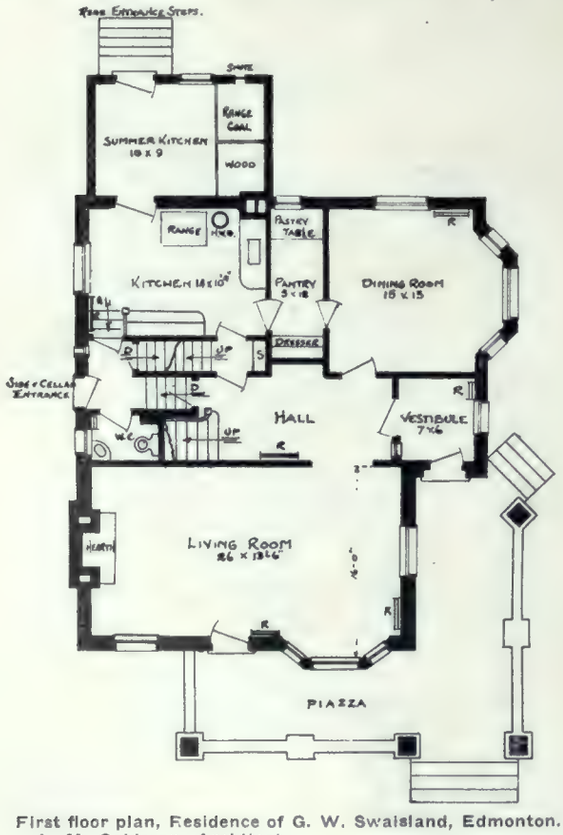
and dressing room, there is a good sized attic containing a billiard room, and servant's room. The entire lower floor of the house is finished in hardwood, while the second floor has white enamel trim and mahogany doors.

BUILDING ACTIVITIES IN NOVEMBER.

AS YET the lateness of the season has, seemingly, had no deterring effect upon operations in the building line. The sound of the hammer and the metallic ring of the trowel resounds throughout the

Residence of G. W. Swalsland, Victoria avenue, Edmonton. A. M. Calderon, Architect.

land, and even the section where the severity of the north winds usually lessens the force of activity, the march of progress still remains but little checked. While the mildness of the weather has been instrumental in giving a furthering impetus to late fall developments, yet the



First floor plan, Residence of G. W. Swalsland, Edmonton. A. M. Calderon, Architect.

needs of a great growing country and heavy demand for new accommodations are, in the main, the real motive factors in the great upbuilding which is taking place.

The returns for November show a healthy proportionate increase in all provinces in the Dominion. Permits were issued for new work representing an aggregate value practically doubling that of the same period of last year, and the comparative amounts, as supplied CONSTRUCTION, places the average gain for the month at 57 per cent., a most remarkable advance for this time of the year.

Out of the list of eighteen cities reporting, only three decreases are noted and these are so widely divergent in location as to only serve to emphasize the sound situation which still obtains in general. The three places affected were: Victoria, which suffered a decline of 46 per cent., the first loss registered this year; Edmonton, which fails to equal last year's figures for the month by 21 per cent., and London, which fell behind on the month's work to the extent of 27 per cent.

Aside from these three places, the month was characterized by a series of gains. The largest increase registered was in the case of Regina, which made a phenomenal advance of 430 per cent. Halifax, which apparently is recovering from her slump of the past few months with a vengeance, note the second highest gain, that of 403 per cent, and Fort William stands the next in order with a substantial increase of 278 per cent.

The gains in general are of most gratifying proportions, and only two cities reporting increases, have failed to double their figures by at least one half. Toronto, as usual, looms up with the largest volume of work, having issued permits aggregating in value $1,940,650, as against $1,379,749 in November, 1908, which gives the city an increase of 40 per cent. Ontario, in fact, with the exception of London forged ahead substantially. Berlin registers a 200 per cent. gain; Brantford one of 61 per cent.; and Hamilton an advance of 56 per cent. Port Arthur failed to submit comparative figures, and the amount noted only refer to work undertaken in the fire limits; and as regards London, it might be mentioned, that while the city has experienced a slight depression for the month, it has so far this season undertaken new work amounting to $818,129, as against a total of $441,860 for the entire year of 1908.

Montreal's increase of 73 per cent. reflected fully the pronounced activity in that city; while further east, in addition to splendid headway made in Halifax, (235 per cent.), Sydney's big advance, (235 per cent.), and St. John's gain of 86 per cent. shows conclusively that the forward movement in that section is quite general.

As regards the West, the month witnessed an undertaking of an unusually large amount of work. Besides Regina's great gains, as previously mentioned, Calgary annexed another enormous increase (242 per cent.), while Vancouver over-reached her last year's figures for the month to the extent of 77 per cent. Winnipeg, too, managed to top the amount for November, 1908, by 19 per cent., and Lethbridge, although not submitting comparative figures, shows by her amount of $96,175, that she is well on the safe side of the game.

	Permits for November, 1909.	Permits for November, 1908.	Increase, Per cent.	Decrease, Per cent.
Berlin, Ont.	$6,000	$2,000	200.00	.....
Brantford, Ont.	36,750	22,790	61.25	.....
Calgary, Alta.	211,550	61,700	242.86	.....
Edmonton, Alta.	63,365	80,505	.....	21.29
Fort William, Ont.	138,365	36,575	278.30	.....
Halifax, N.S.	104,575	20,750	403.97	.....
Hamilton, Ont.	165,850	165,850	56.35	.....
Lethbridge, Alta.	96,175	.....	.....	.....
London, Ont.	37,475	51,700	.....	27.51
Montreal, Que.	482,940	279,068	73.05	.....
Port Arthur, Ont.	13,350	.....	.....	.....
Regina, Sask.	49,203	9,276	430.45	.....
St. John, N.B.	33,900	18,200	86.26	.....
Sydney, N.S.	10,070	3,000	235.66	.....
Toronto, Ont.	1,940,650	1,379,749	40.65	.....
Vancouver, B.C.	615,829	346,800	77.57	.....
Victoria, B.C.	55,585	104,710	.....	46.91
Winnipeg, Man.	291,900	244,600	19.33	.....
	$4,353,534	$2,767,498	57.30	.....

CALGARY AND ITS PROGRESS.—A Rapidly Growing Industrial and Commercial City with Many Substantial Business Buildings and Splendid Homes.—Wonderful Development Reflected in Large Volume of New Construction Work.

A CITY that has taken upon itself the appearance of a busy metropolitan centre to a greater extent possibly than any other city between Winnipeg and the coast, is Calgary. The visitor to this, the last big city in Western Canada this side of the Rockies, is impressed from every side by the evidences of business development and growth. Everybody is hustling, everybody is busy, and everybody appears to be making money. Calgary's growth has been no less great than that of the many other younger cities that have sprung up in the West during the past five years, but there is an atmosphere of stability and permanance that is very often lacking in other younger Western cities. The buildings have an appearance of permanence and solidity, a condition that is not in many of our prairie cities. In fact, Calgary's buildings give it the appearance of an old wealthy aristocratic Eastern city. This is a condition undoubtedly due to the fact that stone is used to such a great extent, and Calgary is blessed with a natural resource enjoyed by few sections in the West. It has an abundant quantity of an excellent building stone, known as Calgary stone; a stone that when taken from the quarries is soft, and hence easy and inexpensive to work. It, however, has the exceptional property of hardening rapidly and ages in the walls beautifully. To the traveller it is almost a relief, after having passed through such a vast area of flat prairie country, to get into Calgary, where the land commences to take on an undulating aspect.

Calgary's streets are narrower than those of most Western towns, and the change may be said to be pleasing to the traveller. Built along the banks of the Bow river as it is, at the foot of a hill, gives it a picturesque beauty possessed by few cities. Calgary, as a distributing, as well as a manufacturing centre, is the most important at present west of Winnipeg, and the large number of big warehouses and manufacturing buildings recently erected, or now under course of construction, is an indication of its continued supremacy in these particular lines.

The architecture of its business buildings is not by any means ornate or elaborate, but there seems to be an element of stability, yes almost massiveness, generally prevalent in the buildings in the business districts. In residence architecture, we are safe in saying that Calgary has more high-class, elaborate and expensive homes than any city between Winnipeg and the coast. This indicates two things; first, that there is much wealth in Calgary, and second, that the importance of the city as a centre has attracted to it some very able architects, of which Calgary has a comparatively large list.

Calgary's population increased from 6,000 in 1900 to 23,500 in 1908, during which year her customs receipts amounted to $426,425, her bank clearings to $64,810,229, and her building permits to $1,004,520. The present year has been the busiest building year ever experienced in the city of Calgary. Permits for large buildings, totalling $2,390,000, were issued up to October 31st. This amount does not include churches, private residences, apartment blocks, and other small blocks, and the indications are that the total permits will reach the $5,500,000 mark for 1909. When it is considered that Calgary's population is less than 25,000, it will be understood what wonderful activity these figures represent.

The city covers an area of 12 square miles (7,780 acres), and has 130 miles of streets, 47 miles of grano-

The Bishop Pinkham College, one of Calgary's architectural assets in the way of an educational institulton. Hopkins & Wright, Architects.

PANORAMIC VIEWS OF THE CITY OF CALGARY, SHOWING THE GREAT EXPANSION WHICH HAS TAKEN PLACE IN RECENT YEARS, AND THE GROWING IMPORTANCE OF THE CITY AS A TRAFFIC CENTRE. 1—The city as it appears from the opposite shore of the Bow River. 2—City Park, situated between the business and residential sections. 3—View along the tracks in the C.P.R. yards.

lithic side-walks, 25 miles of plank side-walks, 7½ miles of pavements, 32 miles of sewer, 39 miles of water mains, as well as a gravity system water supply that is 14 miles

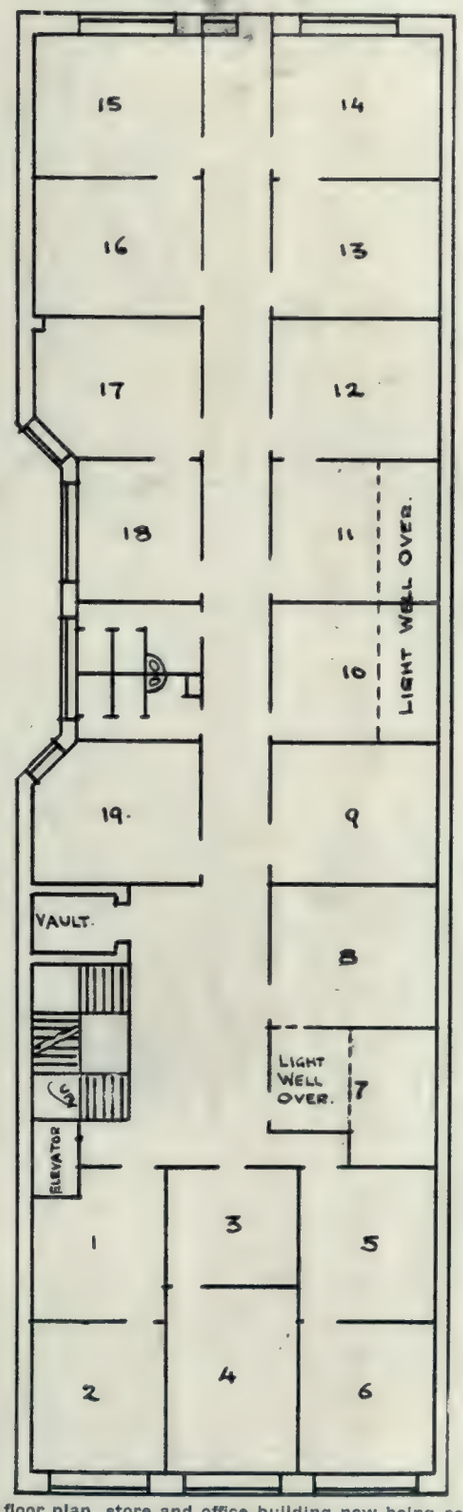
Store and office building for Mr. A. J. Samis, which is now being completed on Eighth avenue east, Calgary. Dowler & Michie, Architects.

in length before reaching the city, and has a street railway system 16 miles in length. The municipality owns and operates successfully the electric light and power system and its street railway system, the latter clearing on an average of over $5,000 per month. During the last year the city installed 5½ miles of street paving, 13 miles of granolithic side-walks, 7½ miles of sewers, 13½ miles of water mains, and the entire street railway, making a record in civic advancement that has in all probability never been surpassed.

Calgary expresses its growth various ways. New buildings have risen on every hand and within the past

Four story office and warehouse, now being built in the business district of Calgary for Dr. T. H. Blow, at a cost of $42,000. Dowler & Michie, Architects.

few years both the business and residential districts have undergone a vast transformation. Where two story business buildings served to meet the commercial requirements of yesterday, three, four and five story structures are in demand to-day. The very air breathes the prosperity which the city is enjoying, and the earth exhales the fragrance of a new and growing life. Industrially the city has made substantial progress, as is evidenced in its milling and packing plants, while in all departments of activity the sound of the builder's hammer resounds

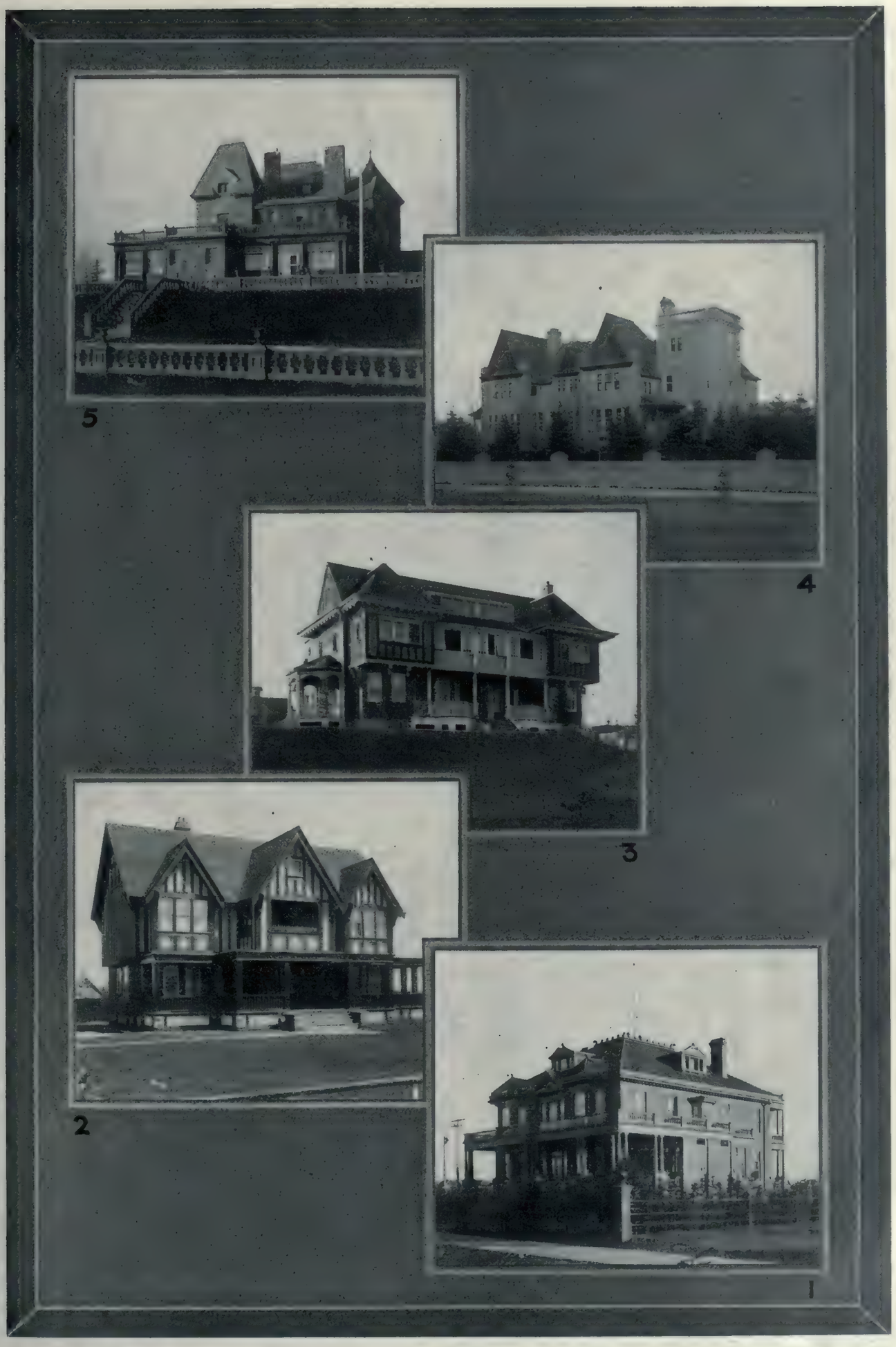


Typical floor plan, store and office building now being completed on Eighth avenue west, Calgary, for A. J. Samis. Dowler & Michie, Architects.

incessantly and re-echoes with each blow, the wonderful development that is taking place.

Such buildings as the McDougall block and Jorgenson building, both large four story structures with brick or stone fronts, together with the concrete constructed plant of the Calgary Milling Company, and the Colleg-

A FEW STRUCTURES WHICH BEAR WITNESS TO CALGARY'S SUBSTANTIAL GROWTH. 1—Process view of work on Calgary's Grain Exchange, Hodgson & Bates, Architects. 2—McDougall Block. 3—Calgary Collegiate Institute, D. S. McElroy, Architect. 4—Jorgeson Block, J. Llewellyn Wilson, Architect. 5—Plant and elevators of Calgary Milling Company.



EXAMPLES OF DOMESTIC ARCHITECTURE IN CALGARY. 1—Residence of Roper Hull, Hodgson & Bates, Architects. 2—Mr. Nunn's residence, Hodgson & Bates, Architects. 3—Residence of A. J. Sayre, Hodgson & Bates, Architects. 4—Home of P. Burns. 5—Residence of Senator Lougheed.

iate Institute and Bishop Pinkham's College, with their walls of native stone, testify in broad lines to the metropolitan proportions Calgary is attaining. But these, however, only bear witness to what has already been accomplished. Possibly the real gauge of the city's future is the large number of business buildings under way, and in immediate prospect. One of the more important of the new structures which is at the present time being erected, is the Grain Exchange building, a six story concrete structure, enclosed by walls of native stone, which, when completed, will give the city a direct com-

Business building for Bailley Bros., now being built on Eighth avenue east, Calgary, at a cost of $16,000. Dowler & Michie, Architects.

mercial advantage in handling the grain of the surrounding country. Another building is the four story brick store and office building, designed by Architects

Putting in the foundation work on Eighth avenue west, Calgary, for Alderman J. S. Mackie's new five story, brick and stone, store and office building. Dowler & Michie, Architects.

Dowler and Michie, for A. J. Samis which is now receiving its final touches on Eighth Avenue east.

All along Eighth Avenue, in fact, there is a manifest outcropping of new buildings and construction work. The concrete foundations are in for a new five-story brick and stone store and office building for Alderman J. S. Mackie, and preliminary work has been started on a

Preliminary stage in the erection of a four story brick and stone store and office building on Eighth avenue west, Calgary, for the Hon. F. A. McNaughton. Dowler & Michie, Architects.

four-story structure of similar construction, and for similar purposes for the Hon. F. A. McNaughton. In addition, a $42,000 office and warehouse, four stories high, is being completed for Dr. T. H. Blow, and other inceptive stages of the new work are everywhere visible throughout the downtown district.

All the latter mentioned structures were designed by Architects Dowler and Michie, and represent but a portion of new improvements being carried out by one firm. In each case the architects of the city are busy and there is a large volume of new work in prospect for the com-

Perspective view of Calgary's new $150,000 High School, for which contracts were recently let. Roland W. Lines, Architect.

ing year. The building reports during the past twelve months have in no way exaggerated Calgary's outspreading development and were the visitors to the city five years ago, to return to-day, they would find bigger Calgary, better and more substantial in every way than they could possibly anticipate.

As regards domestic work, it is only necessary to refer to the splendid homes of Senator Lougheed, Patrick Burns, and the residences of A. J. Sayre, Mr. Nunn and Roper Hull, designed by Architects Hodgson and Bates—to learn that Calgary is accomplishing in this respect. With the increasing wealth of the country has come a demand for substantial homes and a better appreciation of design—and it is quite probable that at no great distance in the future, we can turn to Calgary and the West for some of our best examples of buildings of this type.

MACHINERY AND TRADE

REINFORCED CONCRETE IN THE WEST.

PERHAPS ONE OF THE BEST illustrations of the confidence which the business men of the West have in the future of their country, is in the substantial class of buildings which are being erected. One cannot observe the many modern fireproof structures which are springing up in all parts without becoming conscious of the progressive spirit which is abroad. The Westerner displays a sharp discernment and a strong sense of value in the selection of his material, and he builds not for to-day alone, but for to-morrow and the future as well.

In the great development which is taking place in the West, reinforced concrete has come to be a most generally accepted method of construction. Splendid examples of use in all types of buildings can be seen from Winnipeg to the Coast, and from the International border to the most northern towns. At Regina, the new fireproof Parliament Building now under way for the Saskatchewan Government, is built throughout of concrete, reinforced according to the Kahn System. Another substantial structure is the Grain Exchange at Calgary, now nearing completion, which will be one of the finest and most thoroughly fireproof buildings in that section. Again, one can turn to such splendid Winnipeg buildings as the Kenmore Apartments, which cannot be excelled from a structural standpoint, and the Roslyn Court Apartments, and the Rookery, and the warehouse of the Gutta Percha Rubber Company, which is of the highest type of construction known. The Fort Garry Station, now being built, may also be included, in that its floor system throughout will be of reinforced concrete construction, as will also the entire new shops of the Transcontinental Railway, which are now in course of erection.

These buildings alone represent those which have been built, or are being carried out according to the Kahn System. To enumerate the entire list of reinforced concrete structures, would require more space than is at present available. They simply serve to give an idea of the progress which is being made in the West in the erection of sound, substantial buildings, and it must be admitted that the Eastern section of Canada could do no better in placing itself on a safe constructive basis, than to emulate the example set by the younger, though more progressive, Western section.

A WESTERN SUPPLY HOUSE. ∴ ∴

WITHOUT QUESTION, one of the largest building material supply firms in Canada, is Dunn Bros., of Winnipeg, with branch offices at Regina and Saskatoon. Mr. Sam. Dunn, who is the senior partner of this firm, is well known to both eastern and western architects and contractors, and has, in the last few years, built up a business that is in keeping with the progressive spirit of the West. It will be surprising for eastern firms to learn that Dunn Bros. have in their main yards in Winnipeg, seventy head of horses for the delivering of the products which they supply to the trade in Winnipeg alone. Almost everything in the shape of building material, from brick to shingle stain, is handled by this firm, including hydraulic pressed brick, terra cotta fireproofing, architectural terra cotta, Portland cement, lime, hardwall and wood fibre plasters, sewer pipe, mortar color, expanded metal and metallic lath, firebrick and clay, steel shingles, siding and ceilings, roofing tile, paints and varnishes, Cabots quilt linofelt and plaster decorations.

One of the most recent lines that this firm has undertaken to handle, is Kootenay marble, which has been used exclusively in the construction of the Great West Life Insurance Building, Winnipeg, the architect of which is John D. Atchison. It is claimed by the Canadian Marble Works, who have their main office at Nelson, B.C., that this product is the most non-absorbent and most sanitary marble quarried in Canada. The Candian Marble Works own and operate what they claim to be the largest and best equipped marble quarries in Canada, and it is contended that "Kootenay" marbles, because of their close grain, are non-absorbent and, therefore, do not stain. More than this, they are perfectly sanitary. All varieties and colors, for both exterior and interior work, are quarried, and beautiful contrasts for decorative purposes, can be supplied, that are especially adapted to bank and public building interiors. Tests of this marble made by McGill University, show the following results: compression over 10,000 lbs. per square inch; absorption (48 hours immersion) 4-5ths of 1 per cent.; analysis-calcium carbonate 99.4. In view of the exceptionally large amount of high class materials being used in the construction of Western buildings, it is fair to say that "Kootenay" marbles will become popular among architects and contractors.

FIREPROOF PARTITIONS. ∴ ∴ ∴

THE WORD FIREPROOF is used by most architects and engineers very loosely. Particularly is this so when applied to partitions. Before any intelligent discussion of fireproof partitions can take place it is necessary that we should first come to a definite understanding of what is meant by the term. To obtain a fireproof partition it is not sufficient that the material composing it should be fireproof. Expansion stresses destroy many a partition built of perfect material. Is is necessary, then, that the partitions be found standing after a fire? This question brings the term fireproof into the range of meaning of some architects and leaves it out for others. A partition which is standing in good condition after a fire is obviously non-combustible. It may, however, have allowed the fire to pass through it. For this reason it might be entirely satisfactory as a fireproof partition in some cases, but could not be regarded as fulfiling its purpose if used as walls for a vault or as a fire wall between two portions of a factory.

If, however, a partition is not only found standing after the fire, but has confined the fire to the side on which it started, there is no question of the suitability of the term. It is desirable, nevertheless, that the lesser degrees of fireproofing should be properly recognized by a generally understood technical term. Possibly two words "fire resistant" and "fire retardant" should be substituted for the word "fireproof." A fire resistant partition would be one which would be found standing after the fire, but not necessarily one which would confine the fire. The fire retardant partition would, as its name implies, be one which would confine the fire to the side on which it originated. This must be regarded as an essential quality for any partitions which are to be used as fire walls or vault walls. With this definition in mind, it is necessary to consider what degree of fireproofing should be demanded

for the generally termed fireproof partitions which are used in office buildings and apartment houses. A fire retardant partition must necessarily have all the openings protected. The high cost of metal frames and wired glass for openings and the difficulty of enforcing on the tenants irksome regulations regarding the leaving of fire doors always free to operate, all make the use of such partitions only advisable in exceptional cases. A fire resistant type —the ordinary so-called fireproof partition—is far cheaper. cheaper.

At the recent disaster at San Francisco, nearly every type of fireproof partition was presented in quantity and tested. The lessons of the fire were studied, and the results published by a number of the different engineers and committees. Probably the most carefully considered report made, was that of the committee of the American Society of Civil Engineers. Twenty-six members of the Society were resident in "'Frisco" at the time, and all

Fireproof partitions in "Men's Own" Building, Winnipeg. John D. Atchison, Architect.

of these afterwards were engaged professionally in the reconstruction of the city. The report, which contained complete data from personal observation regarding the entire extent of damage to every alleged fireproof building in San Francisco, explains that apparently all types of block partitions, such as tile, plaster block, and so forth, were affected in the same way. There was no room for expansion to take place, and the partitions consequently attempted to usurp the place of the columns and crushed themselves against the ceiling. Where this did not take place, it is said, the heat was evidently not sufficiently intense to cause the result. Herringbone lath and metal stud partitions in passing through the same experience buckled, but did not fall. There were, however, isolated instances where these partitions were attached to wood floors, and fell owing to the burning out of the floors.

The summary of the report states "that the failure of lath and stud partitions was due to the disintegration of the plaster rather than to the crushing of the material composing it. For this reason it has been suggested that the best possible fireproof partition would be made with herringbone lath and metal studs plastered with a scratch coat of Portland cement plaster, followed by succeeding coats of lime or patented plasters."

The investor demands in commercial buildings low cost and high efficiency above everything. Herringbone lath and metal stud partitions, it is claimed, stand pre-eminent in this regard. The weight of the skeleton is negligible. Practically the entire weight of the partition is that of the plaster. The saving in weight, it is said, due to the adoption of this character of partitions, is generally 8 to 10 per cent. of the total live and dead load on the floors, and consequently saves this proportion of the total cost of the framework of the building and of the foundations. It is maintained that the first cost of these partitions is considerably less than first cost of other equally fireproof types, and that their use is very rapidly increasing. Their low cost and availability, it is contended, has not only caused them to displace other types of fireproof partitions, but has made the use of fireproof partitions feasible in many situations where they could not otherwise be utilized. The general adoption of these partitions in Canada, which is slowly but surely taking place, will result in a considerable increase in the number of our Canadian fireproof buildings.

CONCRETE TILE FOR FLOORS AND PARTITIONS.

AN INNOVATION in the manufacture of structural tile, has been created by a man by the name of Pauly of Youngstown, Ohio. Mr. Pauly has invented a machine with a system and formulae, that makes possible the manufacture of concrete structural tile floor spans, partitions, etc., as well as concrete sewer pipe and fittings. The Canadian rights in connection with this most important patent have been secured by the Stinson-Reeb Builders' Supply Co., of Montreal, who have undertaken to lease these machines on a royalty basis together with instructions in regard to their use, with exclusive rights for limited territories in Canada.

The machine in question will make all useful sizes and shapes in the above mentioned materials. They are made of a wet mixture of cement and an aggregate of sand, stone or slag, are poured into moulds, then steamed and ejected in perfect forms.

The object of the Stinson-Reeb Supply Co. is to offer the opportunity to manufacture with the Pauly machines, by their methods, in various territories in Canada. It is a business that renders a good legitimate profit, where the right kind of aggregates can be had at reasonable figures. Particularly attractive is this offer, for the reason that it is of the few lines in which competition is practically eliminated. Repeated fire tests of the tiles made on this machine, have been made with the greatest possible severity, and it has been demonstrated beyond question that their fireproof value is equal, if not superior, to anything made to be used for like purposes, heretofore produced. It is contended that every engineer and architect, who has investigated this tile, has given it unreserved endorsement.

A letter to the above mentioned sole agents for Canada, will bring full details with regard to the proposition they have to offer.

"KINNEAR" DOORS.

"KINNEAR" DOORS. sold and distributed in Canada by Mussens Limited, of Montreal, have gained exceptional favor with architects in Western Canada.

It is contended by the manufacturers that the doors are the simplest, most convenient, and "with steel slats," the best doors for fire protection. They have been used extensively by architects and contractors in the East, and their sale is being pushed very strenuously in the West.

We might state here, that these doors were used in the warehouses of the International Harvester Company, at Calgary and Saskatoon, and the new Collegiate Institute at Saskatoon will also have "Kinnear" doors, which will serve to cut off the main corridors of each floor from the stair well, in a case of fire.

The firm of Mussens Limited has, undoubtedly, been more successful in the promotion of their contractors' and engineers' supply business in the west than any other eastern firm of like nature. They have a profusely illustrated catalogue, showing the application of the "Kinnear" doors in various buildings, such as warehouses, office buildings, railway shops, roundhouses, pulp

The Colonial Engineering Co.

Began operations in Canada 2½ years ago. At that time the Canadian power users had little or no confidence in the reliability of gas engine power. Several gas engine installations (undertaken by inexperienced concerns) were just being thrown out—as failures.

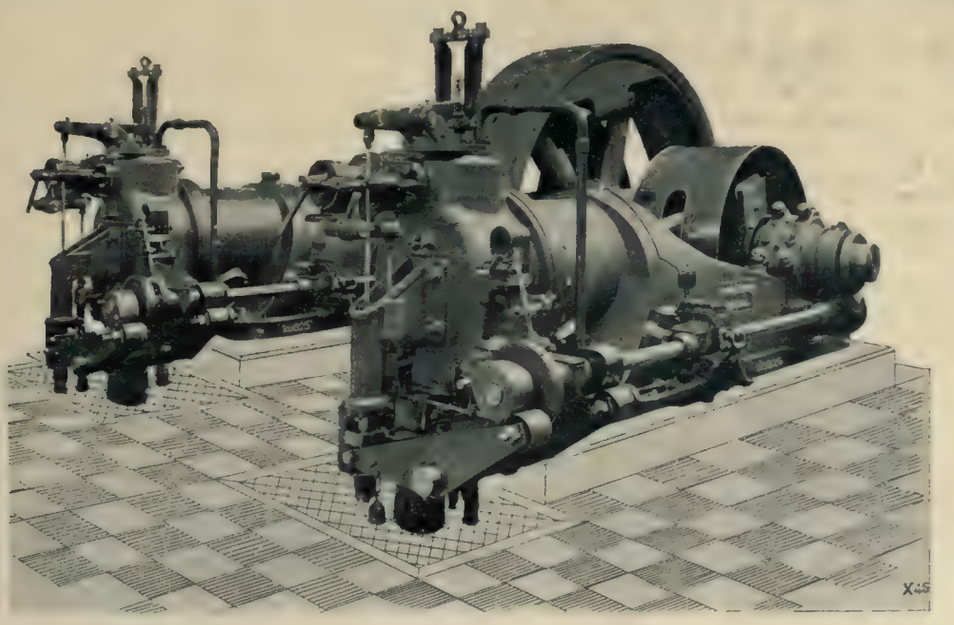
Public confidence was badly shaken—indeed there was none.

The average power user looked upon a gas engine as a wild and untried experiment. He didn't know that Thousands of the HORNSBY-STOCKPORT gas engines are actually making good all over the world and that it only remained to be demonstrated in Canada.

The first thing we did was to get Ames-Holden, Ltd. (the largest Shoe Manufacturers in the Dominion) to let us put in a 200 H.P. plant—we taking *all* the risks.

The City of Chatham, Ont., gave us a similar contract—200 H.P.—we taking *all* the risks.

The Empire Mfg. Co., London, Ont., did the same. All these plants were installed and started nearly two years ago, and they not only made good but *exceeded our representations.*



Since then we have made eleven other important installations—and with precisely the same result in each instance—*absolute success.*

And we are now installing the largest suction gas engine plant on this Continent—in Montreal, and which is guaranteed to compete successfully with water power.

There are just two reasons for our success:

FIRST—*We build the best engine in the world*—its record for efficiency and durability not having been approached by any other design.

SECOND—We know how to install such plants. We do the work right and we *stand by it.*

ADDRESS:

COLONIAL ENGINEERING CO., 222 St. James St. MONTREAL

and paper mills, schools, churches, freight sheds, elevators, etc., which they will be pleased to send to those who are interested.

PRISM GLASS.

ONE OF THE greatest mistakes that are sometimes made in the specifications for a business building is in the matter of the purchase of prism glass for basement lighting. Frequently an architect specifies a brand of prisms that thoroughly satisfies him as being the best procurable, but, either through indifference, or lack of knowledge of the great difference that exists between prism glass, he permits the contractor to substitute an inferior product for the one originally specified. The result is, he gets prism glass, but by no means the best, and, as everything effecting the lighting of the building, such as frame-work, and so forth, are what might be termed fixed charges, and in view of the fact that the cost of the glass proper is comparatively small, it is pretty much like economy in the wrong place, to permit the installation of anything but the very highest quality or grade of prism obtainable. The Luxfer Prism Company claim for their prisms, a superiority that cannot be approached by any other prism on the market in Canada, and a most determined effort to educate architects and owners to the necessity of insisting upon their original specifications being carried out by sub-contractors. It often occurs that blanket contracts, of which the installation of the basement lighting is but a small part, are taken by firms not necessarily in the prism business. These contracts are sometimes obtained by virtue of price, and it often remains for the contractor to get his profit by substituting inferior materials to those specified. When the architect considers the great importance of the lighting problem, he will realize that he can ill afford to permit any but the highest character of glass to be installed, and he can easily protect himself, as can the owner, by insisting that his specifications be not violated.

The Luxfer Prism Company are among the few manufacturers of prisms who are satisfied that they can conveniently handle the situation, and provide adequate lighting, so long as architects and owners will stand by them, and insist upon no departure from their specifications. The Luxfer Prism Company is located at 100 King st. W., Toronto, and carry a complete line of multiprisms, window prisms, art glass, canopy glass, prism frames and so forth.

A NEW WIRE LATHING.

A PRODUCT which will readily commend itself to architects and builders, is the new patent trussed hard wire lathing which the B. Greening Wire Company, Hamilton, has recently put on the market. This ingenious form of lathing combines within itself the best features found in the better class of wire and metal laths, in addition to a number of splendid individual points which will, undoubtedly, lead to it being broadly specified. One advantage claimed for this particular lathing is that owing to the trussed formation it can be nailed directly along the studs, joists or sheeting without any furring, lapping or lacing, which is a feature of considerable importance in that it insures the lowest possible cost of erecting.

Another feature is, that owing to the alterrat transverse or short wires being offset from each other in different planes the cloth has no "face," and therefore cannot be scraped free of plaster, which is a strong objection to fabrics of "face." The truss principle of this lathing, it is claimed, renders it of such a decided rigidness, that it gives a sustaining power of 3½ times that of a square mesh cloth of equal weight per square foot.

The lathing can be supplied in continuous lengths up to 100 yards, with a selveage on either side, and in widths to suit the spacing of the studs or joists; and it will be found to be particularly adapted to conform to any desired curvature, and take the bends of sharp corners without the necessity of being cut. Architects and builders will find it most profitable to investigate the merits of this product, and samples, together with additional matter relative to its many excellent points, will be gladly furnished by B. Greening Wire Company, upon request.

A TREATISE ON INSULATION.

IF NONPAREIL CORKBOARD insulation is as meritorious as the splendid volume relating to it, recently issued by the Kent Cork Company, Ltd., Montreal, then, indeed, is it an excellent product. The appearance of this most complete book is perhaps the best indication as to the sterling qualities of "corkboard," for the various purposes it is used, in that no manufacturer or firm would go to the trouble and expense which this edition involved, without the full knowledge that their product possessed every functional property, and would serve to the most efficient degree, the character of work for which it is intended. It would not be indulging the imagination to say that as a work of trade literature, this little volume stands pre-eminently in a class by itself. There is no cataloguing, nor listing of prices, no attempt at comparison, but a comprehensive treatise covering 118 pages on corkboard insulation and its various applications, together with complete specifications, as the case may be. In this respect it marks a pleasing departure from the usual publications of this character, and inaugurates a new method of propaganda which makes it a work of permanent value to the architect and engineer.

Among the many important subjects with which the volume deals, are: The Vital Importance of Insulation, Essentials Frequently Overlooked, Principals of True Economy, The Transmission of Heat, Radiation, Conduction, Convection, Old Methods versus New, etc., which, together with the data of floor, ceiling and wall construction, makes this publication of inestimable value to those who are interested in the design and construction of any type of building in which insulation is required. The volume is attractively bound, highly illustrated with halftones and sectional diagrams, and printed in a clear readable type. In short, it is a most comprehensive work of reference, and a library asset which no architect or engineer should be without.

VALLONGO SLATES.

PERHAPS THE MOST extensively used slate in the world, is the product from the Vallongo Quarries, England. It is specified in all parts of the globe, for billiard beds, brewery tanks, switchboards, sanitary work, and in all classes of construction in which slate is required. At these quarries it is nothing unusual to quarry block forty feet long and ten feet wide, so that slabs can readily be supplied to meet any given dimensions. This slate is particularly free from metal, and in England, its very superior quality in general has led largely to its adoption in the tube railways, where it is employed for platforms and footings through the tunnels. One of its advantages in this respect is that, in addition to being non-inflammable, it does not wear slippery, and is most suitable in every way for this particular class of work. For chimney pieces and enamelling it is unsurpassed in that the slate takes on a most perfect surface; while for roofing, it is a most excellent product, as the slates are most durable and never change color. These quarries are owned and operated by the Vallongo Plate and Marble Quarries Company, Ltd., of London, England, who have recently

opened an office in the Board of Trade Building, Montreal (in charge of F. Barkin), for the purpose of placing their product in the Canadian market, and Canadian architects and builders will find it greatly to their interest to investigate the many excellent merits of this splendid slate when specifying work of this nature.

A CANADIAN PRODUCT.

SINCE THE FIRST ISSUE of CONSTRUCTION it has not only been the policy of the Journal to in every possible way, promote the employment of Canadian architects, the awarding of contracts to Canadian contractors, and the buying of Canadian building materials and equipment, but the publishers themselves have adhered very religiously to the policy of giving the preference to Canadian manufacturers in the buying of the materials with which CONSTRUCTION is published. We have very often been complimented upon the high-class printing, the good paper, and excellent half-tones used in CONSTRUCTION, and would say that each and every one is a Canadian production.

The quality and texture of paper is always one of the most important elements that affect the appearance of the finished publication, and we are free to say that CONSTRUCTION'S appearance, as well as the manner in which our illustrations show up, is attributable, to a great extent, to the use of Ritchie & Ramsey's Red Seal Coated Book Paper. The very excellent surface of this paper enables us to get the results shown in the half-tones in our paper. For high-class work, whether for periodicals or catalogues, we know of no brand or make of paper, either domestic or imported, that will give better results than this Ritchie & Ramsey's Red Seal Coated Book Paper. It is with a great deal of satisfaction that we have been enabled to publish a highclass journal of the nature of CONSTRUCTION without having had to import our coated paper.

THE WORLD'S TIMBER SUPPLY.—Interesting Data Presented Before Winnipeg Meeting of British Scientists.—By Prof. Somerville.

MUCH ATTENTION has recently been given to this subject, and the general opinion is that prospects are not reassuring. Britain paid £27,000,000 for wood on the average of the five years 1904-8, as compared with £18,-00,000 in 1889-93, an increase of fifty per cent. Even Germany, with nearly twelve times the area of forest that England possesses, pays annually £12,000,000 for imported timber. Although the United States of America exports wood and wood products to the value of £20,000,-000 per annum, she has to pay as much for imports.

In Europe, Sweden and Russia are the chief timber exporting countries, and it seems unlikely that these countries can maintain supplies. Sweden, it is officially stated, is over-cutting her forests to the extent of more than 100,000,000 cubic feet yearly, while Russia is already reducing her exports. In various official publications, the Department of Agriculture of the United States has drawn attention to the prodigal method in which her forests are exploited, and has pointed out that in a few years she will not even have timber enough for her own supplies.

There are only two regions of the world that may contain sufficient areas of virgin coniferous forest appreciably to affect the situation. The one is Canada, which in the Northwest and also north and east of Lake Superior contains large tracts of untouched forest. The growing stock of extensive stretches of country west of the Rocky Mountains is undoubtedly large, and is now having an appreciable effect on market supplies.

The timber that may become available along the line of the new Grand Trunk Railway is much more problematical. The area is vast, but the density of the stock is said to be poor, and the individual trees and rate of growth are small.

The other region that contains large stretches of virgin forest is Siberia. Although the density of Siberian forests cannot compare with well-stocked land in Europe or America, her areas are so vast that it cannot be doubted that this country possesses enormous stores of wood. But the difficulty in her case is to get them out. The navigation of the Arctic Ocean is too dangerous to be undertaken for timber cargoes at anything like present prices. Nor would it be profitable to move timber along the Trans-Siberian Railway. The only way to get part of Siberia's timber to market is to float or ship it down the rivers, such as the Amur, that debouch into the Pacific. This is already being done to some extent, and in time such supplies will go some way toward satisfying the demands of China, Japan, and Australia.

The growing scarcity of supplies of timber is clearly reflected in the prices on the world's markets. Thus in Britain the largest class of timber has risen in value twenty-eight per cent. in the last fifteen years. Concurrently with the rise in price there has been a marked falling off in quality, so that the real rise in price has been much more than the figures indicate. The United States Department of Agriculture recently issued a table, which showed the prices ruling for various classes of timber in various American markets during the past twenty-two years. Of thirty-two brands of timber, nine had risen over 100 per cent. and only two had risen less than twenty-five per cent.

Effective relief through the agency of timber substitutes seems improbable. Concrete and iron are of course used to some extent in place of wood, and there is a talk of sugarcane stalks becoming important in paper making. But with it all, the demands for wood continue to grow, and although economic prophecies have often proved to be wrong, it seems impossible to escape the conclusion that the future of the world's timber supplies is distinctly disconcerting.

It would therefore appear to be in the interests of every country to take energetic steps to prevent the wasteful destruction of timber by forest fires, to see that denuded areas are at once regenerated, and to undertake the planting of all land that can be better utilized under silviculture than through the agency of pastoral occupation.

THE EFFECT OF PAINTING radiator surfaces upon the heat transmission through radiators has been investigated by Mr. John R. Allen, who embodied the results of his experiments in a paper read before the last meeting of the American Society of Heating and Ventilating Engineers. In comparing the effect of the various coats, Mr. Allen took the heat transmission of a bare radiator as standard. He found that the transmission of heat was almost the same with 14 coats of paint applied to the radiator as with two coats, and that the effect apparently depended upon the last coat applied. From this he concludes that the heating effect of the radiator is more affected by the condition of the surface than by the material through which the heat is conducted. He states, however, that the vehicle for carrying the pigment may have some effect in the value of heat transmission of paints, as better results were obtained with copper bronze and shellac than with copper bronze and linseed oil. In general, Mr. Allen is led to consider copper and aluminum bronzes the poorest coverings, and enamels as the best materials tried, while white lead and zinc paints have only slightly less transmission effect than a coat of enamel.

1909—Building Operations—1910

THE END OF 1909 brought to a close Canada's biggest building year; the beginning of 1910 ushers in what promises to be a period of still greater activity and development. Nothing more fully reflects the marvelous growth of the country, nor foretells with a more assuring degree the wonderful expansion which will take place in the next twelve months, than the remarkably sound manner in which the season closed. Operations in all sections were vigorously prosecuted up to the final day, and the existing force of activity carried into the new year with an increasing momentum which leaves no doubt as to the prospects for 1910. The losses which occurred in December, with two exceptions, affected only such places as had experienced uninterrupted progress throughout the year, and came more as a relaxation following the heavy pressure of the preceding months, and a temporary let up preparatory to resuming operations with renewed energy, than as any unfavorable indication.

Official returns as submitted to CONSTRUCTION from thirty cities located in every province and section of the Dominion records a grand total for permits issued, amounting to $68,606,821 for the past twelve months, as against $42,577,439 for the entire year of 1908, thus registering an average gain for the year of approximately 60 per cent., or a proportionate increase in the volume of work undertaken nearly two-thirds again as great as that carried out in the preceding twelve months. This average can be accepted as being representative of the general strides made throughout the country, as many cities whose exact figures are still unknown and hence not tabulated prospered to an equal or greater degree in proportion to their population, than some of the places which are included in the list.

Halifax and Edmonton were the only two cities which failed to surpass their figures for the previous year, the loss in either place being 24 per cent. and 16 per cent. in order named. Aside from these places, the year was one of complete ascendency on every hand, and a triumphal march from coast to coast. The biggest increase noted is in the case of Saskatoon, which recorded an overwhelming gain of 767 per cent.; Fernie takes second honors with an advance of 449 per cent., and Lethbridge lands in the third position by overreaching the previous year's figures to the extent of 246 per cent. These figures serve as a reflex of the West as a whole, and while the proportionate increase in all cases is not so marked, the results in general are, to say the least, gratifying to the extreme.

In Manitoba, Winnipeg looms up with an increase of 67 per cent., Brandon a gain of 19 and Portage la Prairie with one of 62 per cent., while in Saskatchewan Regina and Moose Jaw's respective advances of 56 and 157 per cent., together with Saskatoon's figures previously mentioned, indicate that the onward movement was widespread throughout that province. Winnipeg's amount of

	Permits for December, 1909.	Permits for December, 1908.	Increase, per cent.	Decrease, per cent.	Permits for 1909.	Permits for 1908.	Increase, per cent.	Decrease, per cent.
Berlin, Ont.	.....	.....	.....	.....	$278,550	$121,350	129.54	.....
Brandon, Man.	.....	.....	.....	.....	350,120	291,864	19.95	.....
Brantford, Ont.	$121,350	$9,330	1200.64	.....	438,885	289,855	51.41	.....
Calgary, Alta.	151,550	71,750	111.21	.....	2,420,452	837,100	189.14	.....
Edmonton, Alta.	9,780	45,255	.....	78.38	2,128,166	2,549,874	.....	16.53
Fernie, B.C.	.....	.....	.....	.....	1,374,700	250,000	449.88	.....
Fort William, Ont.	247,800	8,200	2921 95	.....	2,970,365	1,560,835	90.30	.....
Halifax, N.S.	14,345	33,550	.....	57.24	630,380	838,725	.....	24.84
Hamilton, Ont.	69,300	53,400	29.77	.....	1,623,100	1,394,357	16.40	.....
Kingston, Ont.	.....	.....	.....	.....	452,695	170,600	165.35	.....
Lethbridge, Alta.	33,885	.....	.....	.....	1,268,215	365,495	246.98	.....
London, Ont.	32,155	22,320	44.06	.....	850.134	464,180	83.14	.....
Medicine Hat, Alta.	.....	.....	.....	.....	249,000	153,172	62.56	.....
Montreal, Que.	166,885	501,000	.....	66.68	7,783,621	5,062,226	53.75	.....
Moose Jaw, Sask.	.....	.....	.....	.....	1,107.500	430,925	157.00	.....
Niagara Falls, Ont.	.....	.....	.....	.....	80,000	60,000	33.33	.....
Ottawa, Ont.	104,125	30,500	241.39	.....	4,527,590	1,794,075	152.36	.....
Peterboro', Ont.	2,095	1,990	5.27	.....	343,489	238,963	43.74	.....
Port Arthur, Ont.	.....	.....	.....	.....	584,810	.....	.....	.....
Portage la Prairie, M.	.....	.....	.....	.....	195,000	120,000	62.50	.....
Regina, Sask.	9,025	1,465	516.04	.....	744,479	476,654	56.18	.....
St. John, N.B.	4,800	7,500	.....	36.00	.....	.....	.....	.....
St. Thomas, Ont.	.....	.....	.....	.....	260,000	236,000	10.16	.....
Saskatoon, Sask.	.....	.....	.....	.....	1,002,905	115,625	767.37	.....
Sydney, N.S.	7,290	1,020	614.70	.....	160,470	67,015	139.45	.....
Toronto, Ont.	1,428,250	778,185	83.53	.....	18,200,000	11,795,436	54.29	.....
Vancouver, B.C.	567,709	314,408	80.56	.....	7,258,565	5,950,893	21.97	.....
Victoria, B.C.	71,700	113,025	.....	36.56	1,673,420	1,130,740	47.99	.....
Windsor, Ont.	2,500	.....	.....	.....	423,885	297,780	42.34	.....
Winnipeg, Man.	33,425	89,000	.....	62.44	9,226,325	5,513,700	67.33	.....
Totals	$3,077,969	$2,081,898	46.09	.....	$68,606,821	$42,577,439	59.76	.....

$9,226,325, it might be mentioned, is the second largest total registered in the Dominion, and represents a jump of nearly four millions over her amount of the preceding year.

Equally as marked progress is also noted in Alberta, as besides Lethbridge's gain, previously referred to, Calgary annexed a gain of 189 per cent., and Medicine Hat advanced 62 per cent. Edmonton's loss cannot be regarded seriously, as her total of $2,128,166 shows that the city is, and will continue to be, for some time to come, an important factor in the building line.

As regards Ontario, this province presents a series of bewildering gains. Toronto's total of $18,200,000 shows the greatest volume of work undertaken in any city in the Dominion. It is a record of which Canada can be justly proud, as there is possibly no city of like size in the world that can boast of such pronounced growth. Ottawa also forged ahead in a most striking manner, her total for permits issued being $4,527,590, as against $1,794,075, a gain of 152 per cent., while other advances which give evidence to the gigantic strides which are being made are: Kingston, 165 per cent.; Berlin, 129; Fort William, 90; London, 83; Peterboro, 43; Windsor, 42; Niagara Falls, 33; and Hamilton, 16 per cent. Although Port Arthur failed to submit comparative figures, it is known that her total of $584,810 is also in excess of the amount registered in 1908.

In the east, Montreal recorded an increase of 53 per cent. and Sydney a gain of 139 per cent. The activity shown in these two places is more or less representative of the progress made in most of the Eastern towns and cities. Apart from Halifax, few, if any, places met with reversals. Three Rivers, as is generally known, spent huge sums in the rebuilding of her burnt district, but in this and other instances, no record of operations have apparently been kept.

Regarding operations in December, Fort William's and Brantford's gains of 2921 per cent. and 1200 per cent. respectively are by far the outstanding feature. The other increases noted are, however, of a most substantial nature, and while smaller amounts are registered in some cases, as compared with the corresponding month in 1908, these represent, as stated above, the aftermath of a most gratifying harvest and the preparation of the "soil" for a more prolific crop.

All in all, 1910 promises much. Toronto predicts a total of $23.000,000; Winnipeg expects to build to the extent of $14,000,000; Montreal reports the outlook as "roseate"; and Vancouver says that she is just beginning to grow. This is only an idea of the optimism which pervades the entire country. Prospects for both large and small work were never better, and architects and builders can look forward to an extremely busy season. To sum up the situation in a word, 1909 has been a great year, but 1910 will, unless all signs fail, be a greater one in every respect.

A Nation's Prodigality.

FIRE LOSSES in the new world have reached such stupendous proportions that it seems almost impossible that people should give this criminal waste of our resources so little consideration. Portions of the globe, less rich in natural resources, would fall under the stress of so wanton a prodigality of much smaller proportions. We stand aghast at the monstrous expenditures of the countries of the old world, in the building of Dreadnaughts, and the maintenance of vast armies, while we, through pure neglect and improvidence, stand by and watch over two hundred millions of dollars go up in smoke every year, a sinful waste for which there is no excuse; a waste that, if not remedied, will eventually effect our ruin.

Sins of commission, and sins of omission both contribute to this enormous annual fire loss. The causes are dealt with from time to time in the public press, and it would seem that we should soon awaken to the need of correcting conditions responsible for a ruinous waste almost unparalleled in the history of the growth of nations. Some statistician has recently compiled figures showing the great property loss due to the seemingly harmless "parlor match." It is maintained that a large percentage of the fire loss in the United States is due to the careless use of the "parlor match." In support of this contention, the following figures are given:

"In Massachusetts in 1907 there were 5,794 fires, 1,230 of which, entailing a loss of $658,346, were caused by matches.

"Within sixty days, 25 fires, involving a loss of $106,327, were traceable directly to the parlor match.

"In one year 446 fires from matches in Ohio, 122 were caused by children, 298 by carelessness of adults, 26 by rats and mice—also carelessness of adults.

"The number of persons burned to death in the United States each year by the parlor match is between eight and nine hundred, and the property loss more than two million."

It is pointed out that a law was recently enacted in Great Britain, prohibiting the use of any but "safety matches."

While the accuracy of the above figures is not to be questioned, and the suggestion for the prohibition of the use of overly sensitive lucifers is a good one, this is not the basic reason for the extremely large fire loss. It is not the indiscriminate use of the "parlor match" that accounts for the vast difference in the average per capita fire loss on this continent, as compared with that of the countries in Central, Western and Southern Europe, which is $3.02 for the former and 33 cents for the latter. The real cause lies in the "flimsy" character of our buildings. In this connection, F. W. Fitzpatrick, the great "fire fighter" and exponent of safe building construction, in a recent article in a United States publication, gave some interesting figures as follows:

"Despite the wonderful advance made in so many sciences, we remain a *wooden* people. Even in the year 1907, 61 per cent. of all the construction carried on in the United States was of wood—well-seasoned fuel for future fire. In that same year we did a vast amount of building. In fifty-five of our leading cities the total reached was $580,000,000. But in that same space of time we also burnt up in that same number of cities, $215,000,000 worth of property. Plus that, our fire departments, water service and those alleged cures for fire, cost us another $200,000,000 and more. Then, we also paid out over $195,000,000 to our friends, the insurance people, who always accommodatingly bet with us on the question of fire. We paid that out in premiums and we got from them in return $95,000,000 to apply on the $415,000,000 of fire waste. A simple addition will show you the terrific cost of fire in this country. No other tax equals it. No other waste of a frightfully prodigal people comes within a stone's throw of it; and yet we pat ourselves on the back and say we are the most progressive and sensible people on earth."

We are following fast in the footsteps of our Southern neighbors; we are adopting, to a great extent, United States building methods, and what Mr. Fitzpatrick says of conditions in the United States, is equally true of Canada.

In the days of our early pioneers, before the advent of steel frame and reinforced concrete construction, and when terra cotta, tile, cement, asbestos, metallic lath, fireproof doors and windows, and iron stairs were unheard of, there might have been some excuse for the indiscriminate use of wood in building construction; not so to-day. With every conceivable material and device within easy reach of every builder, at a cost so comparatively little in advance of combustible materials, and with the experiences of the neighboring Republic to profit by, there is no

excuse for the use of highly combustible building materials and the erection of inadequately protected structures. It is well that we should prohibit the use of "parlor matches," but why not get at the seat of the trouble, and build incombustible materials rather than of "tinder" to be licked up by the fire fiend.

$1,500,000 Canadian Money to be Spent by U.S. Architect

WE HAVE VERY OFTEN referred in these columns to the tendency of some of our larger banking institutions and corporations to employ American architects to design their larger structures. We have gone into the evils connected with this unpatriotic practice on several occasions, to a considerable length, and from time to time concrete instances have been brought to the attention of our readers, but it has rested with the premier banking institution of Canada, The Bank of Montreal, the bank that has been built and supported by Canadian progress, the one that might be considered Canada's National Banking Institution, the daughter of the National Banking Institution of the British Empire, to go on record as having given us the most colossal instance of this unfortunate lack of consideration for the Canadian architectural profession and the building interests of this country. It is almost unthinkable that a banking institution that is almost a part of our national life, an institution whose President has been honored by our King with Knighthood, an institution whose general manager has been mentioned as a possibility for the position that is the greatest gift of the Canadian people, the Canadian High Commissioner to England, should above all others, show such a gross lack of consideration for the principles upon which depend the very commercial existence of our country.

We have often pointed out that such a procedure on the part of the moneyed interests of Canada does not only militate against the welfare of the architectural profession, but the contractor, building material manufacturer, as well as the laborer, are all equally effected. It is well known that American architectural firms show little or no consideration to Canadian contractors or manufacturers, and when, as in this case, an American architect has been employed to erect a building to cost $1,500,000, it simply means that at least 80% of that money leaves this country. At a meeting of the Bankers Association held not long ago, it was pointed out by several of the members that the cause for the recent money stringency in Canada was the lack of capital. There was not sufficient money in this country to finance our rapidly developing enterprises, and that Canadian banks must look for capital from foreign countries. In the face of this indisputable fact, it seems rather inconsistent that the Bank of Montreal's vanity in its desire to erect such a colossal monument to itself in the Western country, should carry it so far as to assume the position that there was nothing in Canada good enough for it.

When we say that there is no city or town in the United States, of a population that might compare with that of any of our Canadian towns or cities, that has as a rule, from the standpoint of both architecture and construction, banking buildings that compare with those in Canada, most of which have been designed by Canadian architects and built by Canadian contractors, we are stating a fact that stands without dispute.

The Canadian daily press, which, up to this time, has either failed to fully realize the evil of this practice of going abroad for the designers of Canadian buildings, or were not sufficiently bold to attack our larger corporations, have ignored this subject, and it is with considerable delight that we learn that the "Winnipeg Tribune" has taken up the cudgel on behalf of Canadian interests. We reproduce below their editorial, which should prove most interesting to the profession and the building fraternity alike, together with the comments upon same by a Canadian contractor in Winnipeg and his correspondence with the general manager of the Bank of Montreal, in an effort to get a square deal.

* * *

The following is the editorial from the "Winnipeg Tribune," under the heading "Is This Canadianism?":—

"The Bank of Montreal is about to erect a building in Winnipeg which is to cost one million and a half of dollars. The contract has been let to a firm of contractors which hails from the United States.

"Some time ago a very prominent bank building in course of construction bore a huge placard proclaiming that the builders were of Boston, New York, Worcester and Cleveland. It was simply an intimation that while certain institutions in Canada could pay for fine buildings there was nobody in Canada who could put them up.

"The Telegram at the time vigorously protested against the implication of this legend and in deference to this protest Winnipeg and Toronto were added to the various domiciles of this firm for local and probably temporary purposes.

"Now the Bank of Montreal has placed the profit of a huge expenditure in the hands of a United States firm of contractors. The Bank of Montreal ranks almost as a national institution. It is one of the great banks of the world. It bulges with money every single dollar of which was won by Canadian labor from Canadian soil. Nobody questions the vast services which the Bank of Montreal has rendered to Canada, but it is a creature of Canadian legislation and the services it has rendered to Canada are by no means so great as the services Canada has rendered to it.

"Our banks have at least this great advantage over others of less favored countries that even if they do absorb too large a proportion of the wealth of the community they use it judiciously to beautify our streets. They do not hide their wealth as bankers were wont to do in less civilized times. They blazon it forth in the construction of palaces.

"But a bank like the Bank of Montreal, the creation of the Canadian government, the beneficiary of Canadian labor, should be content to limit itself to such inhabitations as Canadian ability is capable of constructing. Canadian constructive talent is equal to that of any other country. And it may be fairly asked of the Bank of Montreal whether it considers it just to give the country which has nursed it to its present greatness the injurious advertisement involved in awarding a very large contract to a foreign firm."

This stand, taken by a Canadian daily, should inspire the Canadian press generally to be bold enough to assert the rights of the Canadian people, with regard to the sending of their money out of the country, by corporations who wish to purchase abroad those things which may be obtained in Canada.

* * *

The following letter to the "Telegram," from Mr. Kelly, gives a very excellent idea as to just how Canadian contractors and material dealers are treated by American architects. It will be noted that Mr. Kelly states that he agreed to take $75,000 off his tender, providing he were permitted to use Canadian marble in the place of that which had been specified. The correspondence between Mr. Kelly and Sir Edward Clouston shows just how helpless a Canadian owner is, after he places himself in the hands of a United States architect.

Winnipeg, Dec. 21, 1909.

To the Editor of The Telegram, City.

Dear Sir,—I have read with great interest your comments on the management of the Bank of Montreal, in going to New York for their architects and contractors for their new bank building here. I regret very much that there are not more like you in the newspaper business, who have the courage of their convictions in showing up institutions like the Bank of Montreal, which has been

fostered, nursed and fed by the Canadian people. When they have anything to give, instead of giving it to their own people, who have placed them in the financial position they now occupy, they hand it out to Americans on a silver tray.

It has never come under my notice where Mr. Yankee has handed over very much to Canadians, in a like manner. To bear out my contention, there are thousands of Canadians at different times caught on the other side with Bank of Montreal bills in their pockets, and when they wanted them changed they were asked as high as 10 per cent. discount.

Under such conditions, I do not think we owe the Americans very much, and it has never come to my notice where an American city has placed their bond issue in the hands of the Bank of Montreal and given them carte blanche to dispose of them at whatever profit they felt disposed to charge, as the city of Winnipeg has done. In return, the citizens of Winnipeg will soon see adorning the site of the new premises the sign, "Norcross Bros., Ltd., Contractors, Worcester, New York, Pittsburg and Chicago."

This is the gratitude shown the citizens of Winnipeg, when there were firms here who were just as competent in every way to erect their building, and the public should bear this in mind and patronize banks that are loyal to their country. It was like pulling eye teeth to get a chance to figure on this work, as I happened to be one of the two Canadian firms tendering, and my letter to the general manager and his reply will show what consideration was shown to Winnipeg contractors.

It might be mentioned that I offered to reduce my tender $75,000 if allowed to use Canadian marble instead of the marble specified, but this offer was not considered.

Thanking you for space in your valuable paper. Yours truly,

THOMAS KELLY.

* * *

Following is Mr. Kelly's first communication to Sir Edward Clouston:

Winnipeg, Man., Nov. 12, 1909.

Sir Edward S. Clouston, Bart.,
General Manager, Bank of Montreal,
Montreal, P.Q.

Dear Sir,—Our attention has been called to the fact that the bank's architect, who has the plans out for your new building here, is asking New York contractors for bids on this work, ignoring Winnipeg contractors altogether. Although Winnipeg is far from being as large a city as New York, that is no reason why there should not be men in the contracting business in this western country endowed with just as much brains as New York contractors, and whose ability to carry work of this nature to a successful completion is just as good as New York men. Of course it is quite natural for New York architects to favor New York contractors with whom they have had experience, to the detriment of local firms, but we think that we ought to have an opportunity of figuring on this building.

We wish to call your attention to some of the buildings that we have erected within the last few years here and at Vancouver, B.C., and we feel that you will be quite satisfied after looking into same, that we are quite capable of giving every satisfaction in connection with a building, such as you intend to build, providing we were fortunate enough to get the contract to erect same. We might also state that we are as well equipped as any firm in America to carry out this class of work.

The following is a list of some of the buildings we have erected:

The Winnipeg post office building, which is a fireproof structure, built of Cleveland sandstone, finished with marble inside, and which cost $565,000.

The Winnipeg Grain Exchange, also a fireproof building, and which cost $600,000.

The Bank of Toronto in Winnipeg, built of Vancouver granite and Georgia marble, with banking room finished in marble, costing about $200,000.

The Imperial Bank in Winnipeg, built of Cleveland sandstone, with banking room finished in marble, costing in the neighborhood of $200,000.

The Bank of Nova Scotia in Winnipeg, built of Vancouver granite and English terra cotta, costing $250,000.

The Dominion Government Post Office building in Vancouver, B.C., built of Vancouver granite and costing about $500,000.

The Canadian Bank of Commerce in Vancouver, B.C., built of Vancouver granite and costing $350,000, which is conceded to be one of the finest buildings in Vancouver, B.C., built of

In conclusion, we think we are safe in saying that the buildings mentioned are second to none in the Dominion of Canada as far as workmanship is concerned, and we trust that you will do what you can and see that we are given an opportunity of figuring on your building.

Thanking you in anticipation.

Yours very truly,

THOS. KELLY & SONS,
Per Thos. Kelly.

* * *

In reply, this firm of contractors received the following letter:—

Montreal, Nov. 15, 1909.

Messrs. Thos. Kelly & Sons,
P.O. Box 457, Winnipeg, Man.

Dear Sirs,—I have to acknowledge receipt of your letter of the 12th inst., and have sent it on to the architects in New York, who are in complete charge of the proposed building. I understand there is a limit of time for tenders to be in, and if it is not too late, I feel sure the architects will give your proposal all due consideration.

Yours faithfully,

E. S. CLOUSTON,
General Manager.

* * *

This subesquent letter to the General Manager of the Bank of Montreal, from Mr. Kelly, shows how his firm, owing to the limited time available, was at a disadvantage in the preparation of their tender.

Winnipeg, Nov. 19, 1909.

Sir Edwin S. Clouston, Bart.,
Vice-President and General Manager,
Bank of Montreal,
Montreal, P.Q.

Dear Sir,—We are in receipt of your letter of the 15th inst., re Bank of Montreal building here. In reply we wish to state that we received plans and specifications of the proposed building this morning, for which we thank you. We wish to state that the time for making up our tender is very limited, and it is a question as to whether we can have the same ready in time, as it must be in the hands of the architects on the 29th of this month; this gives us but a week to prepare our bid. We do not consider that we are getting the same treatment as New York contractors, as they have now had the plans for several weeks, as they have been making inquiries from sub-contractors here in the city for figures

The site will not be available until March 10, 1910, so we feel that it would not be detrimental to the bank's interests if the architects could see their way clear to give us an extra week or ten days to make up our tender.

We trust that you will use your influence to obtain

this favor for us. Thanking you in anticipation, we remain

Very truly yours,
THOS. KELLY & SONS, per T. K.

Sir Edward S. Clouston's reply to the above letter was as follows:—

Montreal, Nov. 22, 1909.

Messrs. Thos. Kelly & Sons,
Winnipeg, Man.

Dear Sirs,—I have to acknowledge receipt of your letter of the 19th inst., and have forwarded it to Messrs. McKim, Mead & White, at New York, who, I am sure, will give it every consideration.

Yours faithfully,
E. S. CLOUSTON,
General Manager.

* * *

Designs for Rural School Houses.

"PLANS FOR RURAL SCHOOL BUILDINGS" is the title of a one hundred and twenty page book just issued by the Ontario Department of Education for distribution among the rural school boards throughout the province.

In addition to a half-tone frontispiece showing a "Model School Building, Grounds, and School Gardens," and four colored plates giving suggestions for various color schemes for interior decoration, it contains reproductions of line drawings showing perspectives, elevations and plans of thirty-six designs for rural schools of one, two and three class-rooms. Several pages are devoted to construction details, heating and ventilating plans, plans for closets and illustrated suggestions as to the proper location and construction of privy vaults.

The text includes some valuable suggestions as to selection of site, materials to be used in construction; size, location, equipment and decoration of class-rooms halls and cloak rooms; selection, size, location of desks; selection, size and care of blackboards; size and location of windows and kind of glass to be used in same; color and character of blinds; and some very excellent pointers as to the heating and ventilation system best suited to small rural schools. Twelve pages are devoted to school grounds, disposal of refuse, water supply and closets, in which many valuable suggestions are given as to precautionary measures that should be employed to ensure the health and comfort of the children.

Appendix B gives a recommended form of specifications to be adopted by school boards, which is simple, concise and comprenensive, and Appendix C gives a recommended form of building contract. Inasmuch as many of our rural schools are not erected after plans prepared by an architect, but usually built by a local contractor or mechanic with whom the school board has to deal directly, these simple forms of specifications and contracts, endorsed as they are by the Provincial Government, will prove invaluable to school boards, the members of which cannot, ordinarily, be expected to be informed on matters pertaining to school building construction.

The object of the publication and the conditions that prompted the Department of Education to issue it, are best explained in its introductory paragraphs.

"'Show me your school-houses,' said a shrewd farmer. 'They will tell me more about the people of your township than I can learn in any other way. The school houses have no prejudices, they speak the truth, and the whole truth, about the attitude of your municipality towards all that makes for genuine progress.' That farmer was right. 'Like people, like school,' is true oftener than it is not.

"The school is closely related to the home. The progress of the one should keep pace with the progress of the other. The log school-house belonged to the days of the log shanty with its trough-covered roof. The unpainted, box-shaped, dilapidated, desolate looking school should pass away with the log shanty and the old frame dwelling house we have outgrown. The houses of to-day indicate prosperity, comfort, and growing good taste. So should the school. We should build schools in keeping with our new homes, or, better still, with those we expect to have ten years hence. Moreover, we should have the best school-houses we can afford, and we can afford to have them a little better than the average home of the section. The new house, or barn, or stable, or pig pen is not built on the same plan as the one of forty years ago. The farmer has seen something better than the old one, and so he builds, not according to the past, but for the future, and if possible he makes some improvement on what he has seen. So, too, the school-house should not be patterned after the old one, not even after the best one in the township, but after the best one that can be found in the Province.


Design 13.

"And there are other and greater considerations. Architecture is the highest of the Industrial Arts, and the most useful of the Fine Arts. Its function is to please the eye as well as to satisfy the requirements of convenience and stability. The most perfect building, accordingly, is that which combines convenience, stability, and beauty. Of the public buildings in a community, the school building is the most important. If we are to cultivate the taste of the pupils and of the rest of the community, both it and its surroundings must be an example of taste, simplicity, and dignity in form and design.


Design 14.

"But, in the matter of school architecture, trustees are handicapped. They do not themselves know from experience what the good points are, nearly so well as they know the good points of the farm and other buildings they use every day. To provide them with help they need, this book has been prepared by the Department of Education. In addition to plans for schools with one, two, or three teachers it contains the substance of the Departmental Regulations (Circular No. 33) regarding accommodations, in an amended form, with suggestions and recommendations to school boards. The plans are merely suggestive and may be modified with the approval of the Inspector to suit special conditions. For the further guidance of school boards this book contains also suggestions for color schemes, an estimate of the cost of the different classes of school buildings and draft forms of specifications and agreements."


Design 16.

The suggestions given for the selection of site, and pointers as to details of construction, are also of interest.

"The school building should be well constructed of brick, stone, or cement, with brick partitions. It should have a southern or south-eastern exposure and shall be at least thirty feet from the public highway. Its site and its architectural appearance should also be most carefully considered. The entrance shall have a vesti-

"bule or covered porch, with doors swinging outwards "or either way. At least in schools with more than one "teacher there should be separate entrances and separate "exits to the closets. Where there are two stories, the "second floor shall be made sound-proof with mortar, felt, "or other suitable mater- "ial. A school bell and, "in schools with more "than one story, a fire "alarm gong shall be "provided. Every school "should have, as a re- "creation room, a base- "ment, at least seven "feet high in the clear; "ceiled with wood or "metal sheeting, to keep "the floors above warm "(plaster obviously objectionable); and floored with "pine, hardwood, or (preferably) cement."

Design 25.

With regard to the thirty-six designs shown, we are sorry to say that they are, as a whole, not up to the standard that we might have been entitled to expect in a Government publication of this character. Apart from the designs themselves, the perspectives are crude and the elevations and floor plans do not give sufficient detail.

Twelve designs for one-room schools are shown, to cost from $1,200 to $2,520, and, apart from the lack of originality in design, the plans are most commendable, and with the application of good taste in the alteration of some minor details, these designs provide for some very attractive little structures.

In the twelve designs for two room buildings, (to cost from $2,000 to $3,150, the same hackneyed style in exterior design seems to have been carried out, although the one-story designs numbers 19, 21, 22, 24, treated with reasonably bright exterior color scheme. would make very bright little school houses. But we cannot understand why the Government should encourage two-story two-room rural schools, as it has in designs numbers 13, 14, 15, 16, 17, 18. There is no combination of circumstances that we can conceive of that would justify a rural school board in the selection of any one of these designs, from the standpoint of design, plan or economy.

Among the twelve three-room school designs, for buildings to cost from $3,800 to $6,000, are to be found the best and the worst in the book. A man could hardly design a barn more crudely than the schools shown in designs 25, 26, 28. Number 25 gives the appearance of an uninteresting, badly planned two-story two-room school with a one-story one-room extension. Apart from the crudity of the design, the structure would prove both difficult and expensive to heat.

We are at a complete loss to know what result the designer of number 26 was attempting to arrive at. It looks as though he must have received his inspiration from the transformation of a private house into a boarding school, and drew upon his imagination for the belfry. There is one consolation, however, with regard to this design, and that is the fact that its most atrocious crudity will repel even the most unlearned member of a rural school board.

Design 26.

Design number 27 is, without question, the most dangerous in the whole series; a three-story, three-room school building of a design that would shock our grandfathers, in whose early log-schools we find homely beauty and an atmosphere of warmth and comfort. It is difficult to understand the object of the Department of Education in allowing this design to be included in the series, especially in view of the fact that it has become universally acknowledged by students of school architecture, that even the largest city schools, where land is at a premium, should not be more than two stories in height. Some of the largest cities in the United States have gone so far as to make it unlawful to build schools higher than two stories, even though they are of fireproof construction.

Design 27.

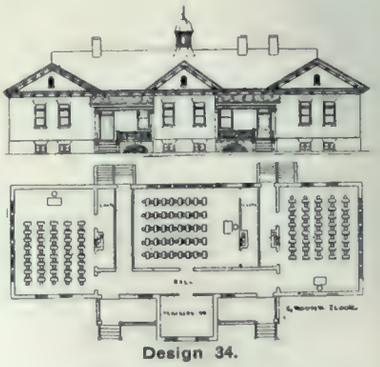
It appears to us that the discouragement of the erection of three-story schools should have been one of the most important objects to be attained by the department in the issuing of this book of suggestions. Instead of that, they have suggested a design that takes advantage of the least possible excuse (three rooms) for the construction of a type of building that is universally condemned by all recognized authorities. Another feature of this design that is open to severe criticism is the location of the stairways, facing each other as they do at the front of the building Also the built-on entry with doors at each side, instead of in front. In case of a rush for the door, there would be serious danger of this entry becoming blocked, and in such a contingency, with the pressure of the onrushing pupils, the safe exit from the building would be rendered impossible. This design has not one point in its favor, and it has every undesirable feature that a faulty three-room school could be provided with.

Design 28.

Number 28, architecturally, is uninteresting to a degree that offends. It represents the solution of the problem of erecting a two-story three-room school building, as might be conceived of by an untrained mechanic. The country carpenter could produce nothing less interesting.

The one-story three-room schools shown in designs 29, 32, 33, although there is a marked similarity running through them, with becoming color treatment and some few alterations to give them a touch of originality, would in both floor plan and exterior effect be much more attractive than most of the rural schools we find at present in the province of Ontario.

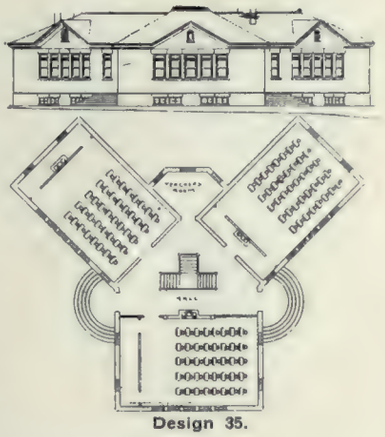
Designs 34, 35, and 36 are in both plan and exterior treatment, the best to be found in the book, and a school built after any one would be an ornament and a credit to a community and it is to be regretted that it is impossible to say the same of every one of the 36 designs.



Design 34.

The declared object of the Government in issuing this book is an excellent one. It has been a step in the right

direction, and it is to be hoped that every rural school board official that is appointed on a school building committee, will pay heed to the suggestions given in the text of this book, and that he will see and appreciate the good designs and overlook or forget the bad ones.



Design 35.

The 36 designs bear every evidence of all having been the work of one man, whose name we do not know.

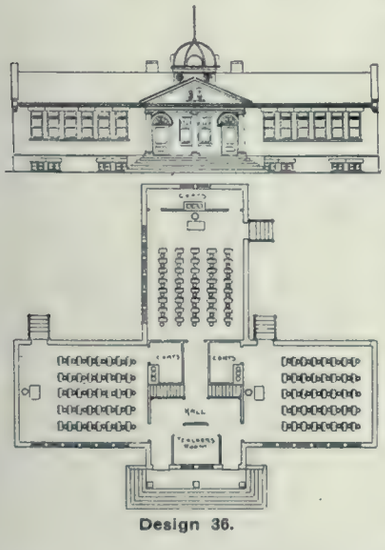
It is next to impossible to get any one designer to create a masterpiece in every one of the 36 structures, where the requirements are similar. Had the government conducted a draftsmen's competition, as has been done in similar cases in many cities in the United States, it would have secured designs that, for exterior treatment and interior arrangement, would have been superior to 36 designs of any individual architect.

The government assumes a great responsibility in the publication of a work of this nature, and the effect of the suggestions contained therein, are much greater, either for good or for bad, than those contained in any publication that might be issued by a private concern. The text of the book is excellent, the perspectives poorly drawn, some of the designs commendable, and some bad in the extreme.

Under any circumstances, however, the school board that seeks the best possible structure for the least money, a school suited to local conditions, a building that is designed for its site—though it is to be small,—will show wise judgment in the employment of a competent architect.

Correction

WE DESIRE TO CALL our readers' attention to an error which occurred in the previous number of CONSTRUCTION. In a brief commentary on the work of Architects Hooper and Hooper, of Winnipeg, we referred to the senior member of the firm as the late Sam'l. Hooper. That we spoke out of turn is evident from a letter received from the person in question to the effect that he is very much alive, and that the report of his death, like that of Mark Twain, was greatly exaggerated. The previous news concerning Mr. Hooper came from what has always proven heretofore to be a reliable source. However, we are glad to know that our informant was not only in error, but further to learn that Mr. Hooper, in the best of health, is at the present time actively engaged in looking after his duties as Provincial Architect of Manitoba, and furthering the interest of the R.A.I.C. in that section of the country in which he resides. We assure our readers that it gives us great pleasure to make the correction.



Design 36.

New President R.A.I.C.

MR. A. F. DUNLOP, who for the past two years has been President of the R. A. I. C., recently resigned at the meeting of the Council in Montreal. Mr. F. S. Baker, F.R.I.B.A., who has been one of the most active workers in this new Dominion organization of architects, was appointed to fill the vacancy. Mr. Baker is a very energetic member of the profession, and we are sure that under his direction the Institute will be enabled to solve many of the problems of federation, etc., now before it.

There were several other very important matters discussed at the meeting of the Council which will be dealt with in the next issue of CONSTRUCTION.

Meeting of Montreal Exchange

THE ANNUAL REPORT of the Board of Directors for the Montreal Builders' Exchange and the financial statement of the Secretary-Treasurer, Mr. J. H. Laurey, presented at the yearly meeting of that organization, recently held, show the affairs of the Exchange to be in a most satisfactory condition.

In proposing the adoption of the report, the Secretary drew attention to the many important subjects which had come up for consideration during the past year, and the volume of work which had been accomplished through its agency. In the first place the Exchange had established itself in its new, modernly appointed home in the East Township Bank Building, and despite the large financial responsibility involved, the entire additional expense had been met by the current revenue. The annual statement, in fact, showed a larger balance on hand at the close of the year than at the commencement.

The most important local work in connection with the Exchange was the establishment of a Department of Permanent Exhibits, open daily to the public free of charge, and which is the first of its kind to be instituted in Canada. The exhibit is open to the public, and an invitation is extended to all interested to view the display and familiarize themselves with the various materials and latest devices used in connection with building construction.

As regards technical education, reference was made to the splendid schools for this purpose now being erected by the Quebec Government, and attention was drawn to the importance of not emphasizing the theoretical side to the exclusion of the practical, in training the future craftman and mechanic. The new buildings offer ample room for the inclusion of a trade school department, and it was to be hoped that the Governing Board would establish this feature, so that the mechanic can have means of obtaining the fundamental training, now denied him by the passing of the old order of apprenticeship.

The Builders' Exchange had also, according to Mr. Laurer, exercised its customary supervision in matters pertaining to Federal Legislation, in which respect two important measures now under consideration merit the attention of the employers throughout Canada—namely, the endeavor to extend the operation of the Lemeuix "Investigation and Industrial Disputes Act" to all current branches of trade, and the annual appearance of Mr. Verville's "Eight Hour Day Bill" on all Government Public Works. The most important fruit of Provincial Legislation was "Compensation for Workmen for Accidents Bill," which however had not produced so favorable an effect upon insurance rates as employers were entitled to anticipate.

The election of Officers for the current year was as follows: President, J. N. Arcand; Vice President, Jas. Ballantyne; Board of Directors, A. Bremner, Jos. Brunet, E. G. M. Cape, K. D. Church, W. T. Castle, Thos. Gilday, J. W. Hughes, Wm. Rutherford, T. A. Morrison, Frank Pauze, E. W. Sayer.

TWENTY-SECOND ANNUAL MEETING OF O.A.A.—President's Address Shows Progress of Association.—Date of Annual Meeting Changed.—Title of 'Registered' to be Retained.—Conciliatory Attitude Advocated for the Promotion of Architectural Education.

THE ONTARIO ASSOCIATION OF ARCHITECTS held its Twenty-second Annual Convention at the rooms of the Toronto Chapter, 96 King street west, Toronto, Jan. 11 and 12.

The meeting was one of the most spirited and most interesting in the history of the Association, and several questions which vitally effect the future and status of the organization were discussed by the many members attending, with vigorous interest. At the opening of the meeting, the members seemed to have widely different ideas on the several important matters discussed, but the excellent good nature that prevailed throughout the entire convention, made possible the arriving at unanimous action on all matters in question.

The meeting was opened at two o'clock on Tuesday afternoon, and after the adoption of the minutes of the last meeting, President Gouinlock read his address, which showed the very excellent progress that had been made by the organization during the past year, in dealing with the many matters of import that were before them, as well as making plain the prosperous state of building operations throughout the entire Province of Ontario. Mr. Gouinlock's address was as follows:

President's Address

IT IS MY PRIVILEGE to voice the welcome which the council and Toronto members of the Ontario Association of Architects cordially extend to the members generally at this the twenty-second annual convention of the Association.

These meetings give us almost the only opportunities we are afforded of coming into personal relations with any but our local members, and the yearly communion with our professional brethren from other cities and localities must tend to widen our horizon, broaden our sympathies, and deepen our knowledge. Thus we are benefited in cubic measure, so to speak.

We may congratulate ourselves upon the unusually prosperous year in building operations which has just closed (the most successful in the history of architecture in Ontario), and we can look, I believe, with cheerful confidence to a continuance of that prosperity during the present year, and we hope, for many successive years.

To show the extent in which building operations are advancing, I quote a few comparative figures from the leading cities and towns of the province, for which I am indebted to the editor of CONSTRUCTION:

Town.	1909.	1908.	Per Cent. Increase.
London.	$ 860,134	$ 464,180	83.
Hamilton.	1,623,100	1,394,359	16.
Ottawa.	4,527,590	1,794,075	162.
Toronto.	18,200,000	11 795,436	54.
Berlin.	278,550	121,350	129.
Brantford.	488,885	289,855	61.
Fort William.	2,970,365	1,560,835	90.
Windsor.	423,885	297,780	42.
Port Arthur.	584,810	. . . . .	..
	$29,372,509	$17,717,870	65.

Our country is developing with astounding rapidity its material resources, is extending its manufacturing and commercial interests day by day—but best of all, an intelligent appreciation of, and desire for the less material but none the less essential facets of our complex civilization is steadily growing—the beautiful, the graceful, the true—and while buildings are demanded that shall fit defined uses of unending variety, it is required with more and more insistence that they shall also adorn the localities in which they are erected; that while a building shall be built to last, it shall also be, the poets' definition of durability, "a thing of beauty."

But while we of the present generation of architects may be justly proud in our modest way, of our own efforts in the noble art we profess, we are not unmindful of the limitation which circumstances have placed upon our powers, and we have sufficient disinterested regard for the profession to desire the removal of some at least of these disabilities from the path of our successors.

In various ways we have endeavored to afford our students means of improving their knowledge and of broadening their outlook, by holding classes of instruction in planning, designing and construction, offering prizes and conducting examinations.

Mr. A. Frank Wickson, Toronto, newly elected President of the Ontario Association of Architects.

Last year an exhibit of architectural drawings and designs was held at the Canadian National Exhibition, which proved distinctly interesting and educative. Arrangements have been made for a loan exhibit from the Royal Institute of British Architects at the Canadian Na-

tional Exhibition in September of this year. The large room in the Applied Arts Building will be used exclusively for this exhibit, which we hope will include numerous examples from our Canadian architects. On this account the council decided to have no exhibit at this convention. We hope to have each year some exhibit of the kind at the Canadian National Exhibition, which cannot fail to have a distinctly educative effect upon all of us, but especially upon the more impressionable minds of the students.

The question of higher education for our students has been very earnestly discussed among us, and the Ontario Government has been asked to assist us in establishing a certain standard to which it shall be necessary for persons to attain before entering upon the study of architecture as a profession. The safety of the public demands trustworthy and scientific building construction in all its varied ramifications. Its requirements and moral well-being necessitates well planned and tastefully designed buildings. But the profession should further ask a degree of culture and general knowledge, a sense of honor, and a regard for ethics, not *only* professional but a tone that would seem to be best secured by a university education.

To attain this we should require that the student should enter an architectural course at a university before obtaining admittance to the office of any member of this Association.

It is to be regretted that up to the present the University of Toronto has been unable to see its way to establishing a Chair of Architecture, for such a chair, combined with a course in arts, would undoubtedly promote the best interests of our profession. There is a joint committee of our Association and the Toronto Society of Architects appointed to formulate a scheme for the higher education of the architectural students, and you will no doubt receive a report from that committee during this meeting.

There have been various charges made with regard to the safety of Toronto public school buildings, and while we have appreciated as a body of architects for some time the fact that Toronto school buildings in the matter of architectural design have been inferior to almost every other type or class in buildings it is customary to erect in Toronto, the question of safety of the school children is one which has never been widely discussed by us as an architectural body. We owe it to ourselves as well as the public at large to make an investigation into just what protection is really afforded the children in our schools, and a committee of our Association has been appointed with this object in view.

In October last we had the pleasure of granting the use of our rooms to the Royal Institute of Canada, in which to hold their second annual assembly, the Toronto Chapter of our Association inviting the assembly to lunch both days of their meeting. A committee of our Association was appointed to confer with the Royal Institute to discuss the subject of affiliating with the latter body. A report from that committee will be submitted to you during this meeting.

I am proud to say that our Association is progressing splendidly, and will eventually, I am sure, succeed in attaining its main object, that is, the elevation of the profession to the plane which it properly deserves by the educating of the student and the awakening of public interest.

I regret that the members of our Association in the cities of Hamilton and London have not yet formed local chapters, for I feel certain such chapters promote the best in the way of good feeling and fellowship among its members as well as strengthening the Association as a whole. I feel that the past year has developed an excellent spirit among the members of our profession, no doubt due greatly to the social intercourse we enjoy through the local chapter.

In conclusion, gentlemen, I must thank you again for the honor you did me in electing me your president for the past year. The members of the council have been very assiduous in their attention to the duties devolving upon them, and have given freely of their time and thought to the Association's welfare..

Reports were received from the various committees, which showed among other things, that the membership of the Association is at present 87, of which three are honorary members, 49 regular members, and 35 regular members in other places.

Examinations had been held during the year, and which five students passed the first examination, five passed the second, and one, Mr. W. D. Chown, passed the final examination. It was also shown by the report of the Treasurer, that the Association had a balance on hand at the present time of $773.97.

These reports were all adopted, with little comment.

Title "Registered" Discussed.

There were three important questions before the meeting, first, the motion to apply to the Legislature to change a portion of the charter, in eliminating the title "Registered" in connection with Architect, and using in its stead, "Member of Ontario Association of Architects." The reason given by the movers of this motion, was that the title "Registered" has been very little used by the members of the Association, either in connection with their signs denoting the location of their offices, or on their stationery, and that the title "Member of Ontario Association of Architects," had been used by 75 per cent.; that there were members of the profession, who at present did not belong to the Association, that objected to the title "Registered," and who had stated their willingness to join, providing the title "Registered" be eliminated. It was thought by some of the members that, in so far as the title "Registered" had become obsolete, as far as a large number of the members of the profession were concerned, and that, in view of the possibility of securing to the Association a number of highly desirable new members, the change should be made. However, it was pointed out by the Ottawa Chapter, that they had used the title since it had been granted and protected by the Ontario Government, and felt that it would be a hardship as far as they were concerned, after having established their practice under "Registered Architect," to have it taken from them. Mr. Horwood, who represented the Ottawa Chapter, showed no hesitancy in declaring very plainly the feeling of the Chapter which he represented on the matter. Other members from smaller towns declared that the title had been used by them in many instances, to very excellent advantage, and did not appreciate having its future use denied them. After some lengthy discussion, it almost appeared as if the Association were going to give up this title for "Member of the Ontario Association of Architects," but after a careful consideration by many of the members, it was decided that at this time it would be inexpedient to deny the members who had used the title "Registered," the privilege of its future use, and that the matter as it now stood, was in the best interests of the Association in general.

Next Convention.

Another very important matter was the changing of the date of the annual meeting, from January to September. This question brought forth a large amount of discussion, the members being very anxious to thrash out the several points in connection with this very radical change. The reason given for the change was to enable the members from various portions of the Province to come to Toronto and view the Architectural Exhibit that will be held at the Canadian National Exhibition, under the auspices of the Asociation. It was believed that the holding of the Convention at that time, would not only serve to secure a larger attendance of members from outside towns, but would also increase the interest in this exhibit at Canada's greatest Exhibition, which the architects are so anxious to make one of the finest annual

architectural exhibits on the continent. It was finally decided that the change be made.

Architectural Education.

The other question that took up a large amount of time was the report of the joint committee of the Toronto Society of Architects and the O. A. A., on Architectural Education. This report recommended that the Association approach the Toronto University authorities with regard to increasing the facilities for architectural education. The report also gave the curriculum they suggested as being the best to adopt by the University authorities in their Department of Architecture.

Prof. Wright, of the University, who was present, gave a very excellent talk, in which he outlined the history of the Department of Architecture in the University, from the date of its inception. He followed very carefully the progress that had been made by this department. He was free to admit that the scientific and mathematical side of the profession had been given prominence over the æsthetic branch, but pointed out that this was really what the Ontario Association of Architects asked the Province of Ontario for in 1887 or 1888. He was free also to admit that the Architectural Department had not expanded as it should have, and that the changes in the Government, and many other incidentals, had prevented the matter of architectural education being taken up separately. However, the whole question of University Education had been taken up by a Royal Commission which had reported. As a result of that report, the University organization was on a different basis. The new Board of Governors and the new President had been in office but a short time. He believed, therefore,, that while they were taking up the whole matter of education, the present time gave a very excellent opportunity of taking up the matter of Architectural Education.

Mr. Wright went very thoroughly into the Departments of Architecture in the larger Universities in the United States, and traced the manner in which they were first established, and pointed out the lines along which they had grown. He believed that if the members of the Ontario Association and members of the Toronto Society of Architects, would join hands and approach the University, and say to the University authorities, "Gentlemen, we demand that the Department of Architecture shall be developed along the line of design and æsthetics," he believed they would accomplish it. Mr. Wright went into the present facilities that they have at the University, and stated that they had at present on their staff, a lecturer, a Toronto University graduate, who has had office experience and office practice, who had taken a summer course at Harvard University in design, and who spent six months in solid work in Paris last year, and that he was making very excellent progress with the students.

He also pointed out the very excellent library the students at Toronto University had access to, which was in charge of Mr. Langton, brother of Mr. W. A. Langton, the architect, and whose sympathies were with architecture. The department had grown, the work had grown, and he hoped it would always grow. He wished the members of the profession, as well as the members of the staff of the department, would seek for the best that was obtainable in architectural education.

Mr. Wright's remarks were followed by considerable discussion as to just how the University should be approached. It was finally decided that he report be adopted, as presented, with some few changes.

Prof. Percy E. Nobbs gave a paper, published elsewhere in this issue, on "Architectural Education in Canada," that was well received, and proved most interesting.

Mr. John M. Lyle, of Toronto, gave a very excellent paper on "Architecture and its Relation to Art," which is also published in this issue.

Another paper was read by I. S. Macdonald, entitled "The Architectural Profession from the Outside."

Annual Banquet.

On Tuesday evening, Jan. 11, the Association held its annual banquet at the National Club, which was one of the most successful in the history of the Association. President Gouinlock and the committee who were in charge of this banquet, are to be congratulated upon its success throughout. The speeches were short, to the point, and full of humor and good nature.

"Our Legislators" was proposed by Mr. M. Symons, of Toronto, and replied to by Mr. A. W. Campbell, Deputy Minister of Public Works.

"Kindred Societies," was proposed by Mr. H. E. Moore, and responded to by Messrs. C. M. Caniff, President of the Engineers' Club of Toronto; John Ewan, President of the Guild of Civic Art, and C. H. Acton Bond, President of the Toronto Society of Architects.

"Our Guests," was proposed by Prof. C. H. C. Wright, of Toronto University, and responded to by Prof. Nobbs, of McGill University, Dean Galbraith, of the Faculty of Applied Science, and Messrs. John M. Lyle, of Toronto; E. L. Horwood, of Ottawa, and Arthur Dennis, President of the Toronto Builders' Exchange.

Officers for 1910.

New members of the Council, elected, were as follows:—Mr. A. E. Nicholson, St. Catharines; Mr. Jules F. Wegman, Prof| C. H. C. Wright, Toronto. The following officers were elected for 1910:—President, Mr. A. Frank Wickson; First Vice-President, Prof. C. H. C. Wright; Second Vice-President, Mr. Henry Sproatt; Treasurer, Mr. Grant Helliwell.

The members of the Association regretted very much the resignation of Mr. W. R. Gregg, who had served the Association as Registrar very faithfully for the past ten years. His successor has not as yet been appointed.

It might be said that the 1910 meeting, as a whole, brought one thing out very clearly, and that is that the Ontario Association of Architects are year after year getting within their grasp more thoroughly, the problems which affect the profession of architecture in Ontario, and it is to be hoped that the coming year will show still greater progress than the past, and that, at least, some of the many things that still have to be accomplished by the architects in Ontario, may be realized. Mr. Gouinlock, retiring President, had done some very active work during the past year, and one of his greatest accomplishments was the bringing into closer touch the members of the Toronto Society of Architects and the Ontario Association. We believe that the time has come when the architects of Ontario should bury their hatchets and get together on a common, solid, practical basis, for the purpose of developing the interests of the profession in this Province.

ARCHITECTURAL EDUCATION IN CANADA

By PROF. PERCY E. NOBBS

OF THE MANY KINDNESSES and encouragements I have received at your hands, your president's request to me to speak on "Architectural Education in Canada" is the greatest compliment. I assume it is not an historic retrospect that you desire of me, but rather a statement of what I consider may be done in this field of activity to-day, with some reference to what we should aim at on the morrow, that was implied by the addition of the words "in Canada" to the phrase "Architectural Education"; for architectural education among us is just beginning, and it is a good time now to consider whether the foundations we are laying are adequate to their future loads. To save your time, and mine, I shall adopt a somewhat dogmatic method of exposition, which I trust will have the incidental result of bringing out some criticism and discussion. I knew there is another side to all the aspects of the questions with which I shall deal, and I have the deepest respect for the views of my most direct opponents. What I feel is not so much that we of the Unacademic School mis-

understand our Academic friends, as that they are uninformed about our principles. This opportunity is therefore doubly welcome to me.

I shall try to divide the question before us into two parts: (1) College work, and (2) Outside influences. I use the word "outside" advisedly, for I am here, I know, in virtue of my post at McGill University.

To begin with, I suppose we are all agreed that it is desirable that every professional man should take a college course if he can afford it, an ordinary Arts course if possible. As very few can afford that luxury of time and money, the next best thing is to devise university work in connection with professional study. Of course there are lots of people about a university who can say a good deal to prove that technical and professional training is essentially different from, and of no service to, general culture; and there are lots of professional people who are quite eloquent on the uselessness of theoretical training in comparison with what they call "practical work." Still, the compromise has much to be said for it. It all depends, like the cherry, on the spirit in which it is offered. Now, a *"School of Art,"* as the term is understood to-day, is a different thing from a *"Department of Architecture"* at a self-respecting university, and yet the department of architecture has to do some school of art work.

By a school of art we mean a place where young people (for the most part of inferior education, I am sorry to say), are taught to be very skilful at drawing in various media, charcoal, water color, oil paint, and at modelling in clay and wax and at designing imaginary buildings and representing their intentions in black and white; a school of art is, in fact, a place where people learn a good deal of slight of hand and slight of eye, and very little about things in general, past, present and yet to be.

Now, of course, we all know that one cannot either study, gain experience in or achieve architecture to-day without great skill in drawing, and this takes an unconscionable time to acquire. Some departments of architecture at American universities try to be just schools of art in this sense, and I think their success as schools of architecture is in inverse ratio to their success as mere schools of art. The public, alas, understands by the word art just drawing, and I have used the word so far in this narrow and vulgar sense.

The school of architecture should require a very fair performance in draughtsmanship of those who come to it to study; its teaching must, of necessity, be largely conducted through the medium of drawing and its graduates should incidentally go out far better draughtsmen than they went in, but it is no part of its business to teach drawing as a thing in itself, or to teach anything by drawing which can be taught in a more rapid way by other methods. The graduate must be turned out ready to be a useful office hand, but the success of the school is not to be gauged by the good office hands it turns out, but by the progress of these good office hands to positions of trust and responsibility and independence after leaving college. Design, and not drawing, is the main end of such a department. Those things which tell in later life when a man begins to think for himself are what the school of architecture has to do with. Drawing is a matter for the school of art and the office to teach.

Perhaps I have labored this point unnecessarily, but the good of the art must be thought of apart from the good of the existing members of the profession when we talk of education. Cultivated gentlemen cannot be produced except by accident, by a system which prides itself of teaching all that an architect need know *"par le crayon"* —by the pencil. This question of drawing being disposed of for the present, let us consider the branches of study in an Architectural Department of a University. They are six in number:

(a) Design; (b) Aesthetic; (c) Archæology; (d) Science; (e) Construction; (f) Professional Practice.

Design.

Design can, of course, only be taught "by the pencil," and I am of opinion also that it should only be taught by people engaged in the active practice of their profession, and that it is an honor to be allowed to teach it. In this I concur most heartily with the official views of the A.I.A. Also, there is only one best way of running design classes, and that is by the accepted Beaux Arts method of sketches done without assistance, elaborated under criticism and guidance. At the beginning, frequent subjects, though they result in nothing that can be exhibited to passing strangers and give the teacher much to ponder over, lead, I think, to more rapid progress than the elaboration of what must of necessity be poor designs. It is practice in getting ideas together and knocking them into shape that a school of architecture can give. Time enough will be found in offices to learn to make a complete set of drawings.

Aesthetic.

Aesthetic may sound rather a portentious word, but it is useful as including the theoretic studies which may with advantage be associated with work in design. The elements of architecture, the theory of design and theory of planning, and, I think, ornament and decoration (if the arts of the ornamentalist are considered in relation to material and technique, and not historically) may be grouped under this head. A sketch of my courses in these subjects will develop the view I take, so I must ask your indulgence while I explain what is, after all, a personal matter of opinion and prejudice.

The things that really matter for the expression of sentiment in building (and that is a fair definition of architecture) are proportion and scale above all things. Next come such matters as refinement, grace, breadth, and all the more or less abstract qualities of character. The meaning of these things should be learned early in order that criticism may be understood and historical examples be appreciated. Then there are the material elements—masonry and roofing and vaulting, etc.—and the physical elements—plinths, voids, solids and features to consider. By the principles of composition, the chief of which is unity, something can be taught of the instinct whereby all these abstract, physical and material elements can be composed in one thing, revealing meaning and emotion, through mere sensuous beauty of line, form, mass and color. That is what I mean by the elements of architecture.

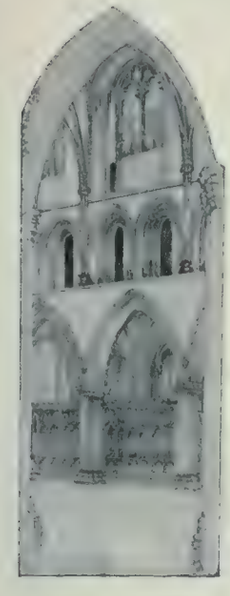
The theory of design may be taken to mean the first principles of art and their application to practical design. The senses, the phenomena of pleasure and pain and expression explain the art impulse. Beauty and its relation to the arts through subject matter, emotional content and physical media affords a basis of appreciation and criticism. Pure design in nature and in art and ornament, with its moral or significant aspect and its material logic, throw light on the evolution of architectural form. Such matters are in the domain of philosophy.

The theory of planning affords practice in methodical thinking—dimensions, arrangement, scales, aspect, prospect are common considerations for all problems. The study of domestic art illustrates the evolution from simple cottages to complex mansions of what is after all one organism—the house. Ecclesiastical art shows small differences of use affecting vitally the layout of typical examples within one class of problems. Libraries, fire stations, hospitals and the like show extreme specialization of type, while public buildings on analysis afford good illustration of various nationalistic sentiments expressing themselves almost independently of use and pur-

(*Continued on page 74.*)

Traders Bank of Canada, Head Office Building, Toronto. F. S. Baker, F.R.I.B.A., and Carrere and Hastings, Associate Architects.

THE WORK OF F. S. BAKER, F.R.I.B.A.—A Canadian Architect Who in His Work Has Shown a Consideration for the Utilitarian as Well as the Aesthetic.—A Business Man as Well as an Architect.—His Own Story of His Professional Career. ∴ ∴



North Transept, Wells Cathedral.

FEW VISITORS who are entitled to consider themselves architectural critics, come to Canada without being impressed with the architecture of our country, generally. As in other new countries, our designers have made mistakes, and we have the bad work as have other countries, together with work of a more creditable character. As a rule, however, we are safe in saying that, while we have not as yet developed a Canadian architecture, our buildings in the matter of both design and construction, give evidence of culture and good taste, together with the stable characteristics of our people.

During the two years of "CONSTRUCTION'S" career, we have illustrated many individual noteworthy designs by Canadian architects, in an endeavor to reflect as truthfully as possible, the work of Canadian designers. It is impossible, nevertheless, to give any fair conception of the ability of our Canadian architects, together with the character of their work, through a criticism of one of their individual designs. We have, therefore, decided to make a feature in each individual issue of "CONSTRUCTION," of the work of one or two prominent Canadian architects, with the hope of placing in a concise, readable form before the profession, as well as the building public, the character of work being done by our best Canadian designers. It will not be our policy, in connection with the publication of these articles, to give a criticism of the work of the architect whose buildings we shall treat, so much as to give the architect's own story of his experiences and views in connection with the practice of his profession. The professional development of an architect is indicated by his work as he progresses from year to year, and it will be our object to publish a sufficient amount of the work of each individual architect, to show in the best possible manner, the progressive stages through which he has passed.

Entrance to Vicar Close. Sketch by F. S. Baker, F.R.I.B.A.

In this number, we are publishing some of the work of Mr. F. S. Baker, F.R.I.B.A., of Toronto, executed since 1902. Previous to this time, his efforts were entirely devoted to partnership interests. Mr. Baker commenced practice in Toronto in 1892, after the completion of a course of study extending over eight years in Canada, the United States, England, and the Continental Countries of Europe. During this time, he took the examinations of the Royal Institute of British Architects in London, and qualified for membership in the Ontario Association of Architects. In the latter body, Mr. Baker served several years on the Council, and for some time past has been the Honorary Secretary for Canada, of the R.I.B.A. He also is a member of the Council of the Royal Architectural Institute of Canada, the headquarters of which are at Ottawa. It might be said that a great deal of the success of the R.A.I.C., has been attributable to the efforts of Mr. Baker, both in view of the fact that he has been very active in the establishing of the existing status of this Dominion Association of Architects, and also because he was successful in having same affiliated with the R.I.B.A. of England.

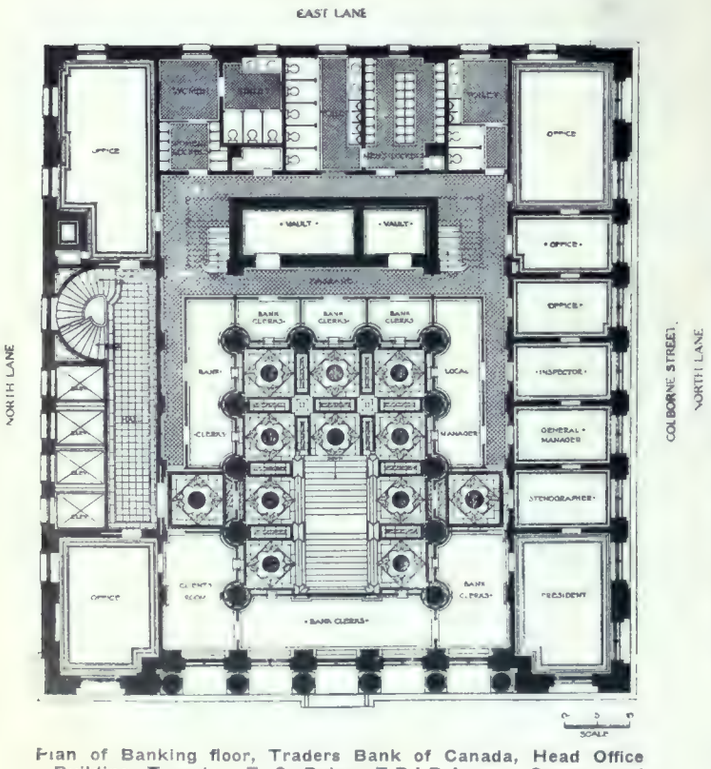
As will be noted in the several designs that are published herewith, Mr. Baker's work is purely of the New World type, meaningless ornamentation and decoration having been studiously avoided. Mr. Baker is a great believer in the necessity of an architect being a business man as well as an artist. He believes that no building, however beautiful in design or decoration, is a success without it is economically planned and constructed according to the most practical methods of modern construction. Mr. Baker is, therefore, a practical business man, as well as a capable architect, and it may be said that it is this type of designer that Canada is at present, in the greatest need of. American architects are successful in securing Canadian work only because they are enabled to shoulder the business end of it, in the shape of merit of investment and practicability of plan, together with architectural design.

While Mr. Baker has religiously carried out in his work, his contention that it is the duty of an architect to equip himself to be able to successfully work out investment from the standpoint of his client, his work demonstrates clearly that he has by no means lost sight of the importance of the æsthetics. His work that covers almost every type of structure bears evidence of an intelligent appreciation of art in architecture. There is not in one of his designs, however, any evidence of an attempt at meaningless ornamentation or elaboration.

Mr. Baker has taken a most active interest in archi-

Checque Table of Istrian marble, Head Office Building, Traders Bank of Canada, Toronto. F. S. Baker, F.R.I.B.A., Architect.

Colonade, Yonge St. facade, Traders Bank of Canada, Head Office Building, Toronto. F. S. Baker, F.R.I.B.A., and Carrere and Hastings, Associate Architects.

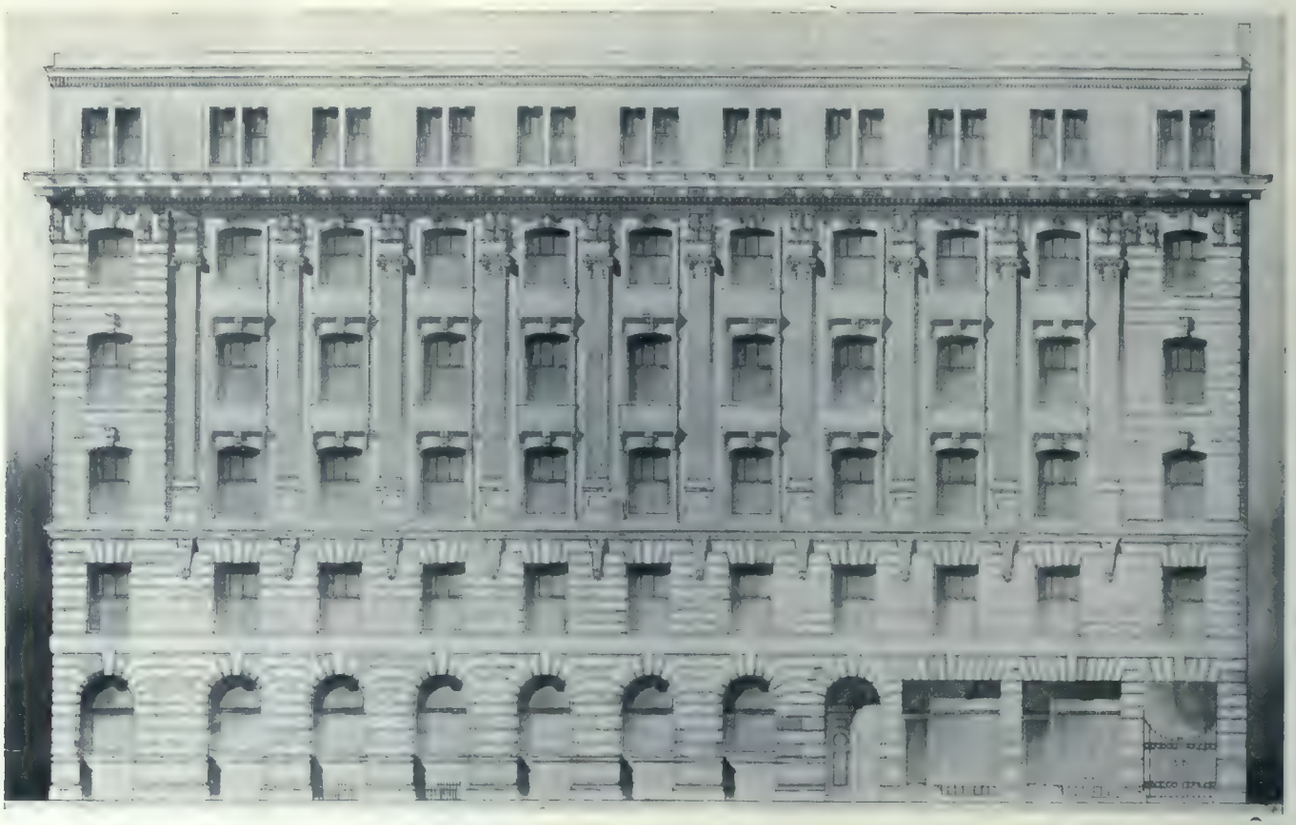


Plan of Banking floor, Traders Bank of Canada, Head Office Building, Toronto. F. S. Baker, F.R.I.B.A., and Carrere and Hastings, Associate Architects.

Typical office floor plan, Traders Bank of Canada, Head Office Building, Toronto. F. S. Baker, F.R.I.B.A., and Carrere and Hastings, Associate Architects.

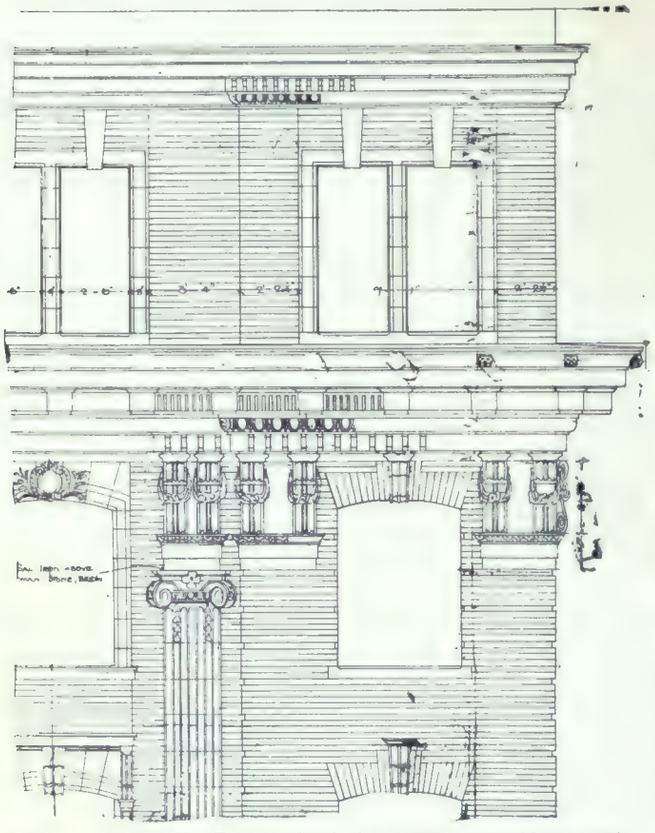
Traders Bank Apartments, cor. Yonge and Bloor Sts., Toronto. F. S. Baker, F.R.I.B.A., Architect.

Banking Room, Traders Bank Apartments, cor. Yonge and Bloor Sts., Toronto. F. S. Baker, F.R.I.B.A., Architect.



Bloor Street Elevation, Traders Bank Apartments, cor. Yonge and Bloor Sts., Toronto. F. S. Baker, F.R.I.B.A., Architect.

tectural education and is to be found in fore of every movement that is designed to promote the art and the interests of the profession in Canada and his own story of his profsssional career as an architect should serve



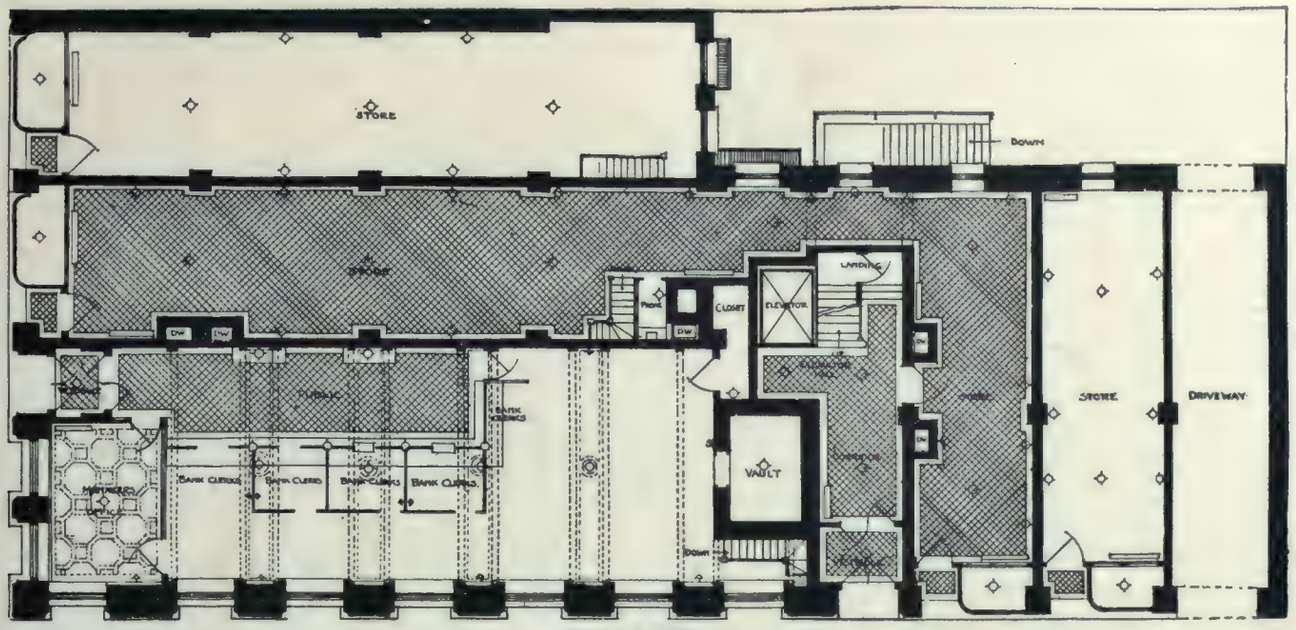
Section of elevation, Traders Bank Apartments, cor. Yonge and Bloor Sts., Toronto. F. S. Baker, F.R.I.B.A., Architect.

as an inspiration for every student in architecture in Canada.

Speaking of his experience as an architect, Mr. Baker says:

"As a first year student, I can remember being very much discouraged with the feeling that there was very little in the professios or study of architecture. Twenty-five years later that feelinfg seems hard to understand, and yet there is no doubt that the general public are enlightened very little by what they see of an architect's work, either on paper or in buildings. During the first three or four years, the study gets hold of a student by slow degrees, but he is staggered from time to time by the amount of ground which he has to cover and the immense variety of knowledge required in the work. I do not think a young student should remain in one office for a long period. A change is desirable after say three or four years, and then it seems wise to make several changes during the remainder of his time as a stu-

dent. This relieves the monotony and enables him to see the different points of view taken by different designers, for after all, the study of architecture is the study of design, the practical work being incidental to a real mastery of the principles of design; thus if a student devotes himself to a careful study of the principles of and practice of design in architecture, he must become a fair builder, because in undertaking the application of design, he must understand the construction. Of course there are men to whom the practical end of an architects practice is distasteful, and who are most comfortable at a drawing board. It is unfair, however, to say that these men are not good builders, as far as the practical knowledge of construction goes.



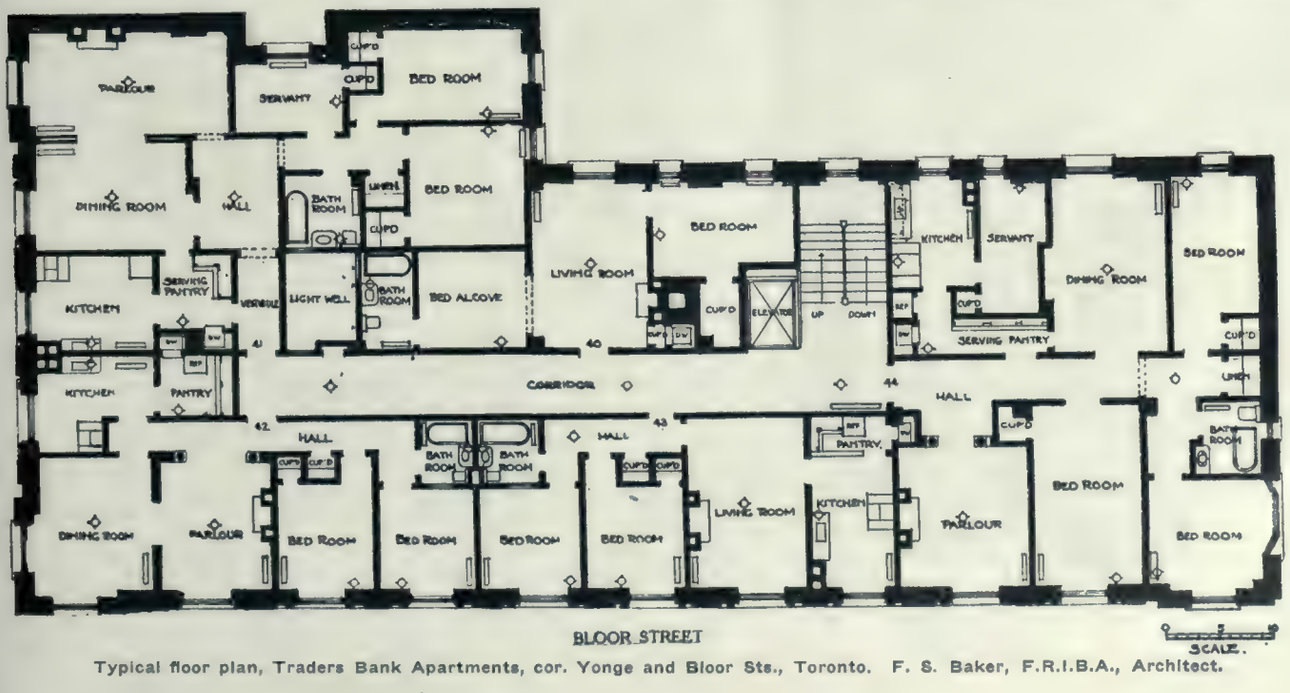
Ground floor plan, Traders Bank Apartments, cor. Yonge and Bloor Sts., Toronto. F. S. Baker, F.R.I.B.A., Architect.

A knowledge of design, however, does not presuppose a knowledge of the executive or business end of an architect's work, and this is where many young architects fail lamentably. Practically a client comes to an architect and says: "Here is a sum of money and I have written on this piece of paper what I require, you will be good enough to invest this money for me in such a way that I will obtain these requirements in proper form." Thus the architect must be a good business man if he is to expend this money in a thrifty manner; he must be a good designer to obtain the requirements in proper form, and a good builder to see them properly put together. When a man is practising alone, I am of the opinion that his success is more likely, if he has more ability as a business man, and less ability as a designer, than the contrary.

During a man's student days, which, of course, includes his days employed as a draughtsman, he sees very little of the business end of an architect's office, and further than that he cannot help seeing the degree of methodical system attached to the routine of the office. The keeping of accounts and the handling of men are things in which he obtains little experience, unless he includes in his time of studentship, a period as "clerk of works," or "builder's clerk," when an immense amount of useful knowledge is acquired by the student.

Every student should lay himself out to travel abroad as much as he can conveniently arrange. In this way his judgment is immensely strengthened, and his ability to compare and differentiate between good and bad work, is vastly improved. Free hand sketching and photographing of good work is of the greatest value to the student and should be encouraged by all schools: Proportion, fenestration, the application of ornament and features, breadth, grouping and color schemes pass under his eye as he moves from one country to another, and his developing sense as an artist instinctively selects the best as he goes along. He is also greatly benefitted by meeting students and discussing with them the various problems which confront the student, also in attending exhibitions of architectural drawings where a surprising number of good points as to methods in design and rendering are picked up by the observing student.

The great desideratum in the student is that he works



Typical floor plan, Traders Bank Apartments, cor. Yonge and Bloor Sts., Toronto. F. S. Baker, F.R.I.B.A., Architect.

Branch premises, Traders Bank of Canada, King St. and Spadina Ave., Toronto. F. S. Baker, F.R.I.B.A., Architect.

Kaiserhof Hotel, Berlin, Ont. F. S. Baker, F.R.I.B.A., Architect.

to the limit that his bodily health will stand, applying himself diligently from the very beginning, as the larger the quantity of material he produces, the wider will be his knowledge. The man who commences practice after a very hard working studentship, if he applies the same methods to his work, cannot fail to succeed, barring accident, and the hard workers are generally the most careful in this respect. Culture and refinement, together with physical strength and an ability to convey to the lay mind the artistic intention of the design, both by drawings and explanation I consider of great value to an architect.

I am convinced that the courses of study in the Universities, Art Schools and Classes throughout the world

Warehouse of A. Bradshaw & Son, Wellington St. West, Toronto. F. S. Baker, F.R.I.B.A., Architect.

Huyler's Store Building, Yonge St., Toronto. F. S. Baker, F.R.I.B.A., Architect.

at the present time are doing much to improve the art of architecture.

I think the architects of Canada should, as soon as possible, get themselves organized on a national basis, and that conferences should be devoted to the development of a Canadian style of architecture, a style which in all classes of building will be suited to the rigorous weather of the winter months, and to the balmy air of the summer months, a style which should obviously express a country occupied by clean-cut, physically and mentally healthy people, such as the population of this country on account of its nature is bound to be.

Speaking of materials used in the construction of the various kinds of buildings, it is interesting to note the immense variety of brick work and the different ways in which it can be applied. For residences it is probable that common red stock brick, well burned, laid in a white mortar joint about ⅜ in. thick, neatly struck with a trowel gives the best result where reasonably large areas of wall surface are treated. The use of red mortar joint or any dark joint is not desirable, inasmuch as it takes away from the character of the brick work, producing a wall of one mass, which at a distance might appear to be formed of other material than brick. For work other than domestic work, many splendid pressed bricks are made in this country and in the United States. I consider they should be laid as nearly like common bricks as possible, for the reasons cited above. In residence work the pressed brick is not so desirable on account of its smooth shiny surface which is not picturesque. The use of deformed bricks which are thrown aside from the brick kiln as useless for exterior brick work, is an absurdity and produces a most incongruous result, obviously a striving after the picturesque which hinders the real artistic result.

From a constructional point of view the bricks obtained in Canada could hardly be surpassed anywhere, indeed, in every respect we are particularly fortunate in its supply of bricks of all kinds.

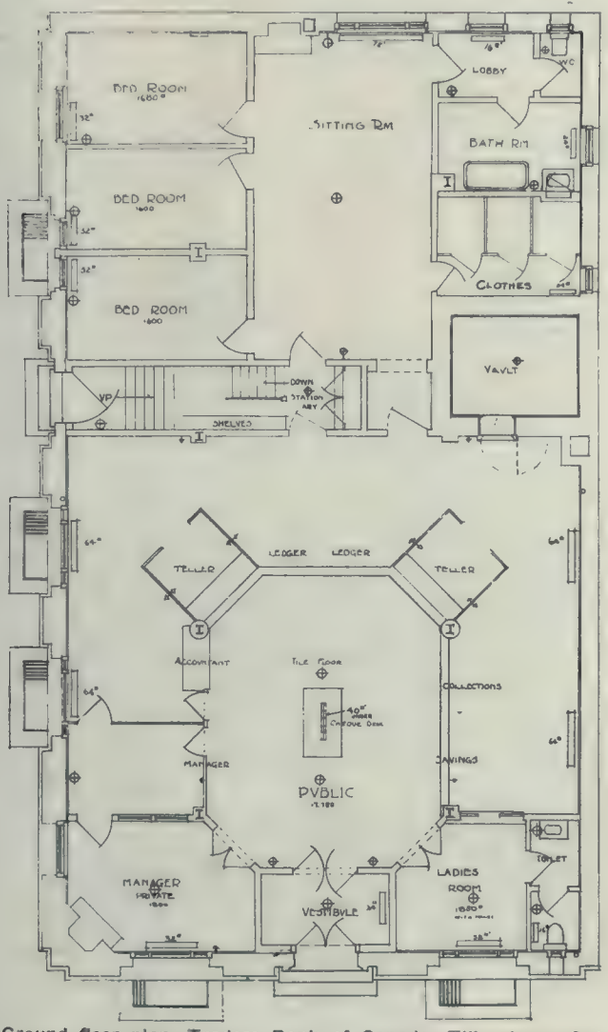
Stone work of a great number of varieties is also easily obtainable in Toronto and other parts of the Dominion, as are also excellent masons who are thoroughly

Premises of Traders Bank of Canada, Sudbury, Ont. F. S. Baker, F.R.I.B.A., Architect.

Premises of Traders Bank of Canada, Tillsonburg, Ont. F. S. Baker, F.R.I.B.A., Architect.

capable of faithfully interpreting the architect's ideas. In my experience, the stone mason gives less trouble perhaps, than any other class of mechanic, as regards intelligence in executing work. The neighborhood of Winnipeg is fortunate in having a stone known as Tyndall stone, a limestone resembling, in character, a Portland stone, but contains a beautiful rust brown veining, which I have not seen in any other stone so far. The beds, however, have not been obtained in large enough size to make rubbing a safe finish, but any tooled surface is quite safe. Artificial stone of a high grade is obtainable, and I have used it with considerable freedom in my work. As yet I have to find a case of serious defect in this material, the color of which is very satisfactory.

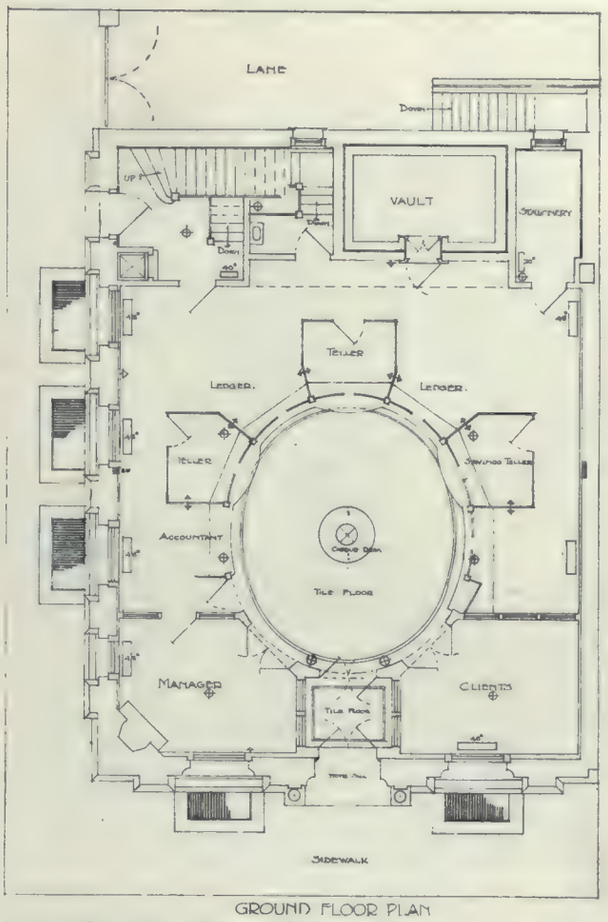
Lathing and plastering is one of the biggest difficulties an architect has to contend with, but the use of



Ground floor plan, Traders Bank of Canada, Tillsonburg, Ont.
F. S. Baker, F.R.I.B.A., Architect.

metal lath and cement plaster has given some relief. It is to be hoped that the plaster wall board which is simply nailed to the studding will be obtainable at such a price as to make its use possible in all classes of work where wood studding is used. Ornamental plaster work of the very highest class is now obtainable and is a great boom to the architect. Very nice effects are obtained in residential work with different grades of stucco finish, ranging from very coarse to very fine, and these are managed with either coved ceilings, plaster or wood mouldings. Cement stucco dados are now largely used where wood sheeting was formerly applied.

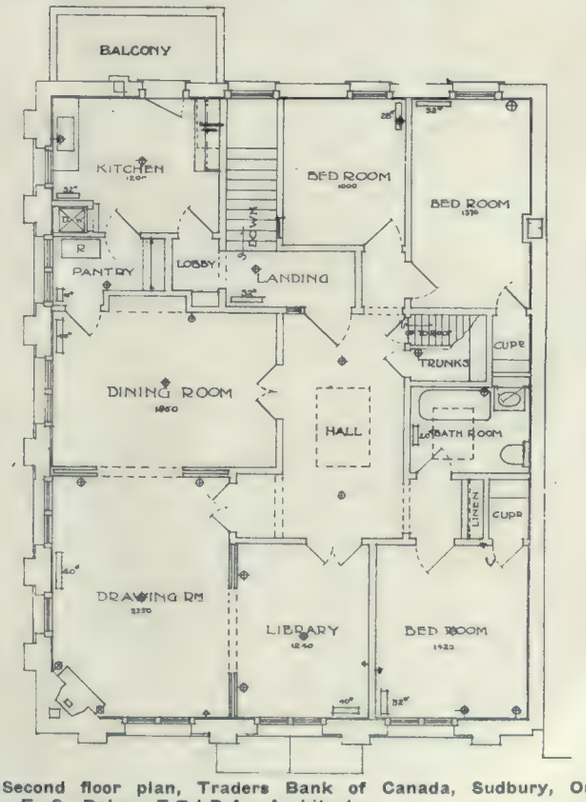
Stucco plaster is also being used a great deal in various parts of Canada on the exterior of residences, sometimes in wood panels in imitation of English half-timbered work, and frequently in broad surfaces. This is often colored by the introduction of coloring matter in the mixing of the mortar. To be satisfactory this must; when



GROUND FLOOR PLAN

Ground floor plan, Traders Bank of Canada, Sudbury, Ont.
F. S. Baker, F.R.I.B.A., Architect.

not applied to masonry walls, be used with metal lath. It is obvious that stucco on the exterior of build-



Second floor plan, Traders Bank of Canada, Sudbury, Ont.
F. S. Baker, F.R.I.B.A., Architect.

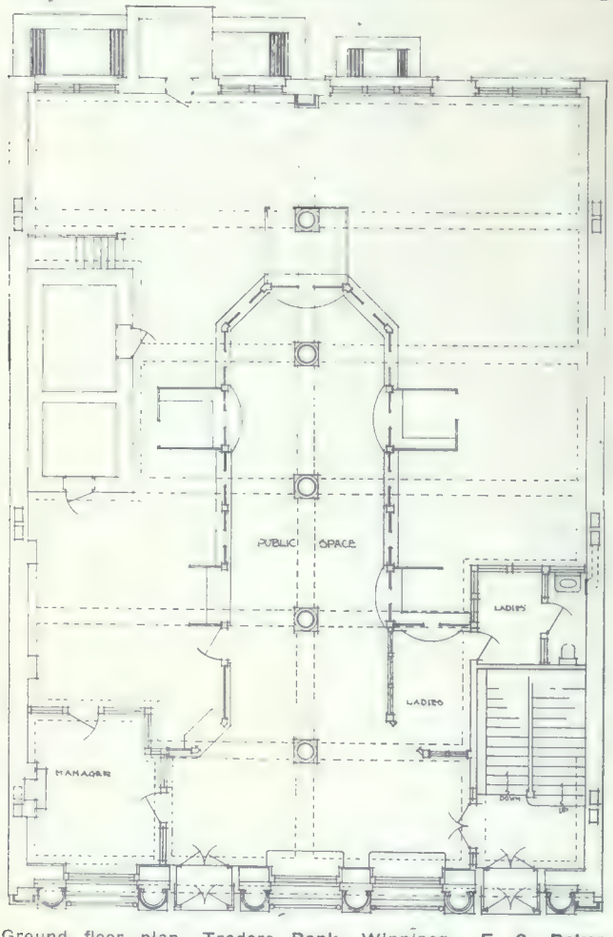
ings will produce a very warm wall. Scrafito work, or modelled plaster friezes, etc., both for interior and ex-

Traders Bank of Canada, Winnipeg. F. S. Baker, F.R.I.B.A., Architect.

terior work, makes a very rich decoration, and it may be said that this part of Canada is fortunate in having several very clever modellers, a study to which the architectural student does not pay as much attention to as he should.

The great variety of Canadian woods has enabled the architect to produce very interesting effects in the finishing of the interiors of the buildings, thus a residence may have the entrance hall, staircases, etc., finished in quarter-cut white oak, the library may be finished in walnut or in butternut, or in black birch, the dining room may be finished in any of these woods, or in white pine, or southern pine, or sycamore, while the bed rooms are generally finished in white pine with the doors possibly of hardwood.

All of these woods can be stained to any shade which the architect may decide upon in considering the decorating and finishing of the various rooms. Floors of hardwood all over are very popular, and these are better to be 7/8 inch thick at least, rather than 3/8 inch as sometimes used. The latter produces a hollow sound when

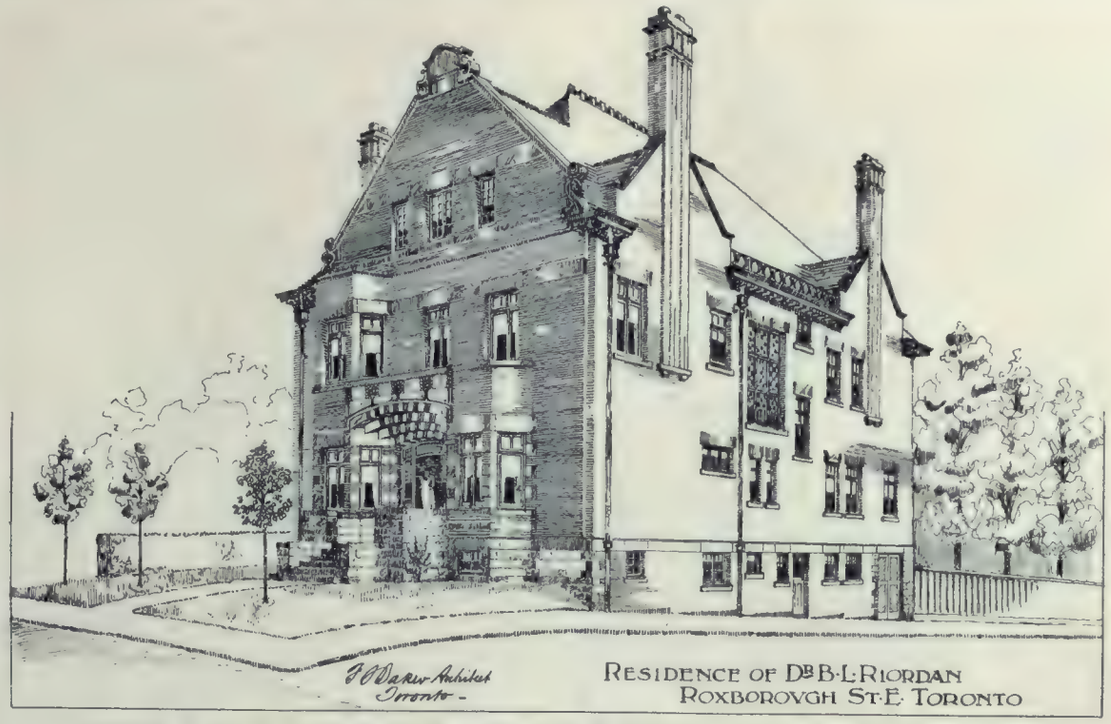


Ground floor plan, Traders Bank, Winnipeg. F. S. Baker, F.R.I.B.A., Architect.

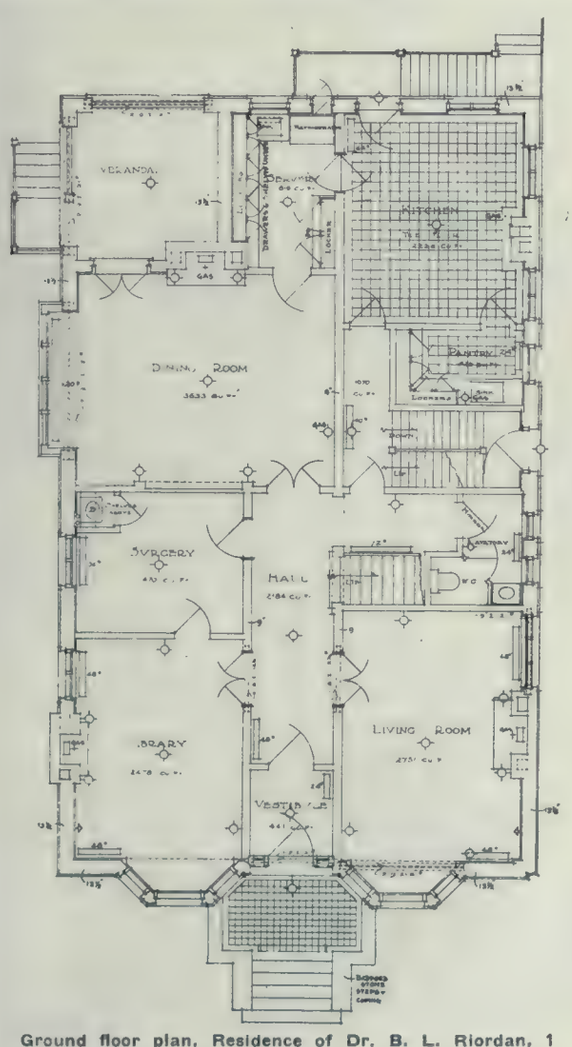
Factory of the Nordheimer Piano and Music Company, West Toronto. F. S. Baker, F.R.I.B.A., Architect.

walked upon, and in case of the introduction of any dampness is very liable to warp. Any architect prefers to have borders of hardwood with the centre floor slightly sunk to receive a rug of definite size. This, of course, only applies to rooms which are not intended to be used for dancing.

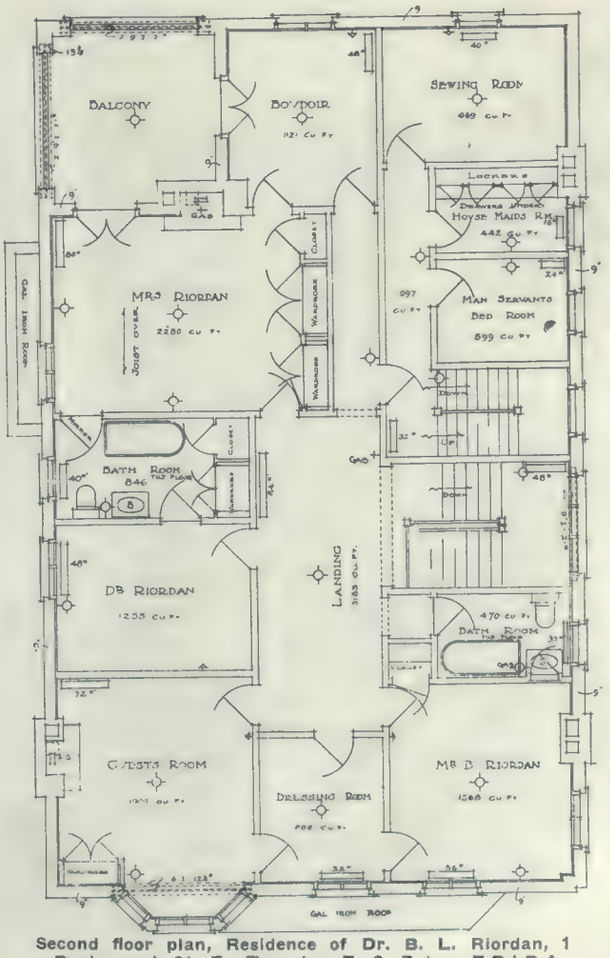
One of the greatest difficulties which faces an architect in Canada is the method of heating buildings. It is generally conceded that hot water circulation is the best system of heating for a residence. To be comfortable a very large amount of radiation is necessary, and up to this time the placing of radiators in recesses, and under windows, seats, etc., has not been very successfully established. The accumulation of dirt in these recesses being one of the objections and another the obstructing of the radiation of heat, we, therefore, have the large cast iron radiators, (for the pressed steel radiator has



Residence of Dr. B. L. Riordan, 1 Roxborough St. E., Toronto. F. S. Baker, F.R.I.B.A., Architect.



Ground floor plan, Residence of Dr. B. L. Riordan, 1 Roxborough St. E., Toronto. F. S. Baker, F.R.I.B.A., Architect.

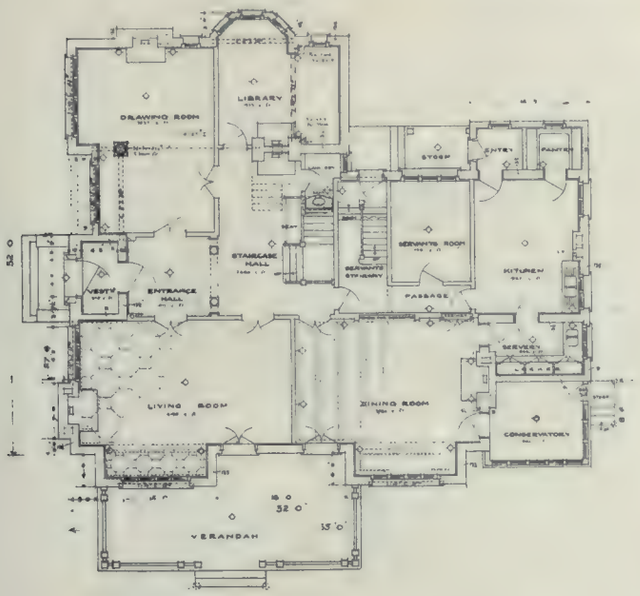


Second floor plan, Residence of Dr. B. L. Riordan, 1 Roxborough St. E., Toronto. F. S. Baker, F.R.I.B.A., Architect.

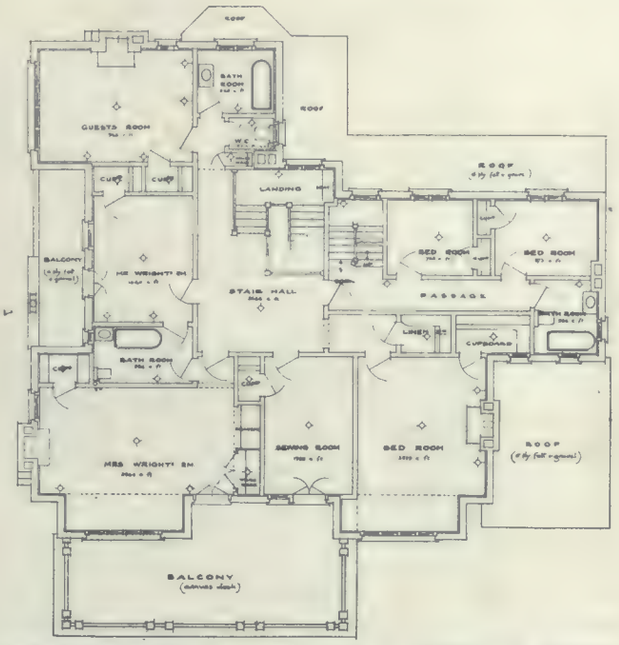
Residence of H. J. Wright, 35 Chestnut Park Road, Toronto. F. S. Baker, F.R.I.B.A., Architect.

Living Room, Residence of H. J. Wright, 35 Chestnut Park Road, Toronto. F. S. Baker, F.R.I.B.A., Architect.

not yet been universally adopted), standing out along the walls, or in the windows of the various rooms, taking up a large amount of floor space and very unsightly. Some success has been obtained by those architects who have neatly detailed wooden shelves placed above the radiators, and these are used by the housekeeper for the reception of bric-a-brac, etc. Indirect heating for houses



Ground floor plan, Residence of H. J. Wright, 35 Chestnut Park Road, Toronto. F. S. Baker, F.R.I.B.A., Architect.



Second floor plan, Residence of H. J. Wright, 35 Chestnut Park Road, Toronto. F. S. Baker, F.R.I.B.A., Architect.

being very expensive, both in installation and in consumption of fuel, has not been largely used. The lack of moisture in this class of heating is another difficulty which is left for some clever architect to overcome. In public buildings and in commercial buildings, low pressure steam heating on the two pipe system has been found the most successful. It is obvious that in either systems

order, and in this department no difficulty in obtaining successful heating systems is encountered. The same may be said of hot air heating installations, which in smaller buildings give very satisfactory results.

The universal use of electric light for all classes of buildings, where it is available, has greatly improved their comfort, and the ease with which these lights are controlled by switches has added much to the beauty of the interior effects.

It is possible now to obtain a lighting fixture of a very high order, and while they are very expensive, beautiful decorative effects can be obtained in the selection and placing of these fixtures.

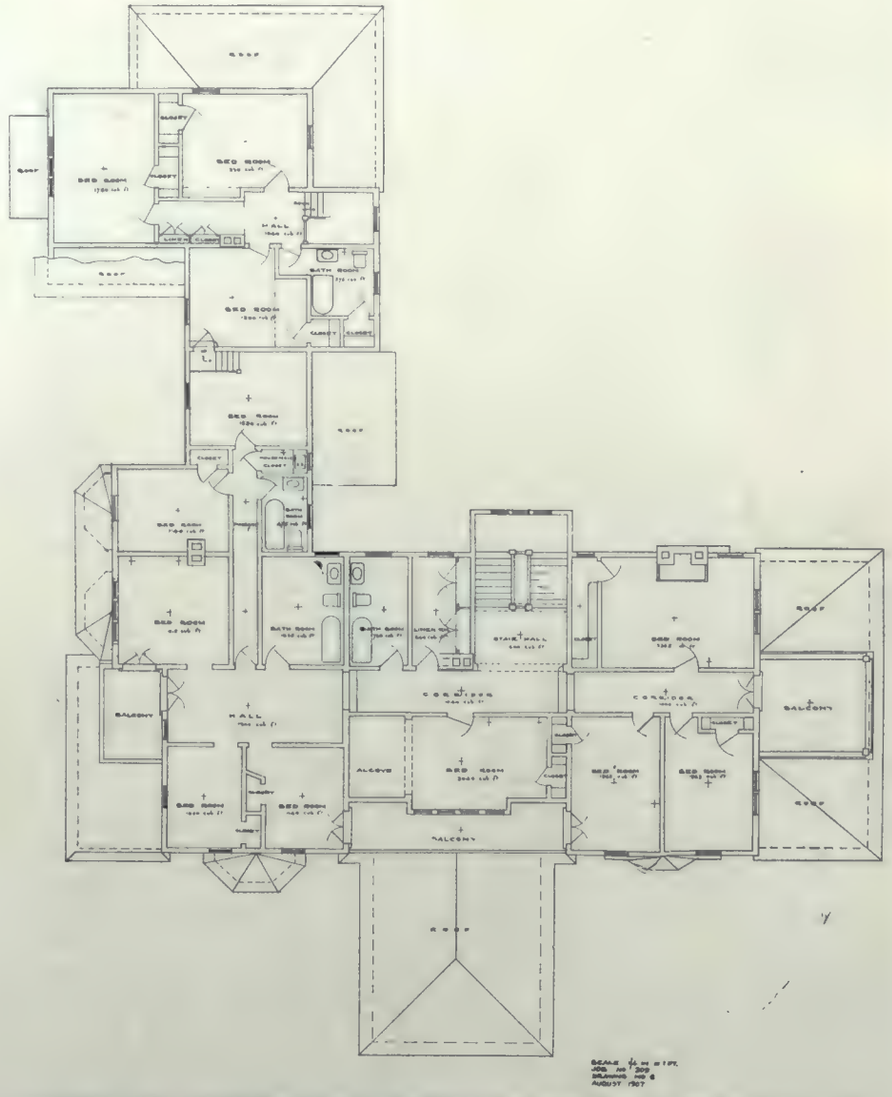
"Grenvilla Lodge," Residence of W. H. Brouse, Lake Shore Road, Oakville, Ont. F. S. Baker, F.R.I.B.A., Architect.

ample valves should be provided to control the various branches.

The various cast iron hot water and steam boilers at present on the market in Canada, are of a very high

Altogether, casting one's eye over the whole world at the present time, it seems that this section of Canada is very fortunate in respect of all classes of the building materials.

Ground floor plan, Residence of W. H. Brouse, Lake Shore Road, Oakville, Ont. F. S. Baker, F.R.I.B.A., Architect.



Second floor plan, Residence of W. H. Brouse, Lake Shore Road, Oakville, Ont. F. S. Baker, F.R.I.B.A., Architect.

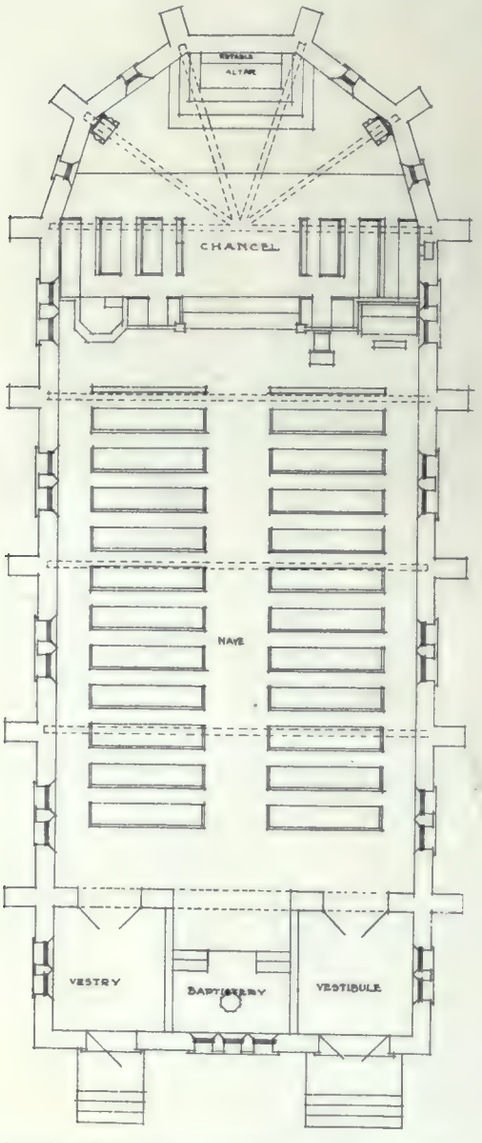
St. Alban's Episcopal Church, Glen Williams, Ont. F. S. Baker, F.R.I.B.A., Architect.

Residence of N. Hillary, cor. Bernard Ave. and Admiral Road, Toronto. F. S. Baker, F.R.I.B.A., Architect.

COPYRIGHT FOR ARCHITECTURAL DESIGN.—Report of Committee in England Favors Extension of Present Law. ∴ ∴ ∴

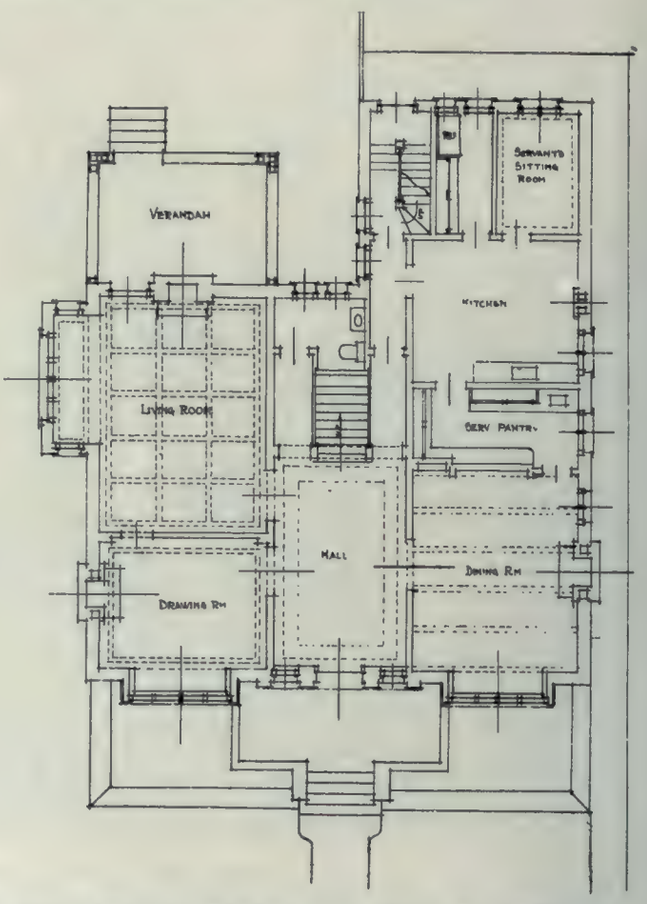
THERE IS A movement on foot in England seeking an extension of the copyright law to include architectural design. The committee appointed to consider the advisability of such a step, by a large majority, have come to the conclusion that after due consideration of the evidence, that it is desirable to recommend that architecture be accepted as matter to be protected, both for the sake of uniformity and because it deserves to be protected, and presents no difference in the principle from that applicable to the sister arts.

In commenting on the subject editorially, the



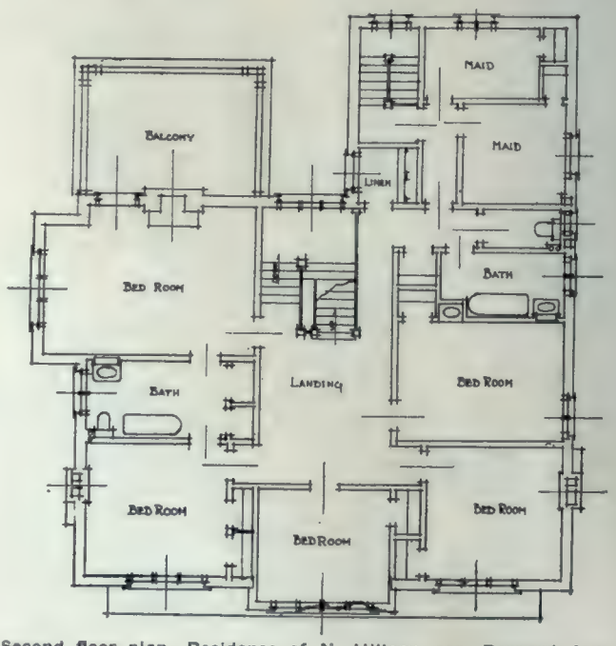
Floor plan, St. Alban's Episcopal Church, Glen Williams, Ont. F. S. Baker, F.R.I.B.A., Architect.

ARCHITECT, London, says: Although the Fine Arts Copyright Act, 1862, gives copyright for the life of the author and seven years after in the case of a painting, drawing, or photograph made by a British subject or any person resident in the British dominions, this does not benefit architects in the ordinary way, for case-made law deprives the architect of any right of property in the drawings prepared for an employer, whether the building whose design is expressed on the drawings is erected or not. The Fine Arts Copyright Act also lays it down that on the first sale of any painting, drawing, or photograph the copyright shall belong to the purchaser or person for or on whose behalf a work is made for valuable consideration. Thus the architect not only has no copyright in his building, but except by special agreement has no copyright in the drawing made for the building.



Ground floor plan, Residence of N. Hillary, cor. Bernard Ave. and Admiral Road, Toronto. F. S. Baker, F.R.I.B.A., Architect.

It has been announced, the Committee on the Law of Copyright, in their report to the President of the Board of Trade, have decided to recommend an alteration of the



Second floor plan, Residence of N. Hillary, cor. Bernard Ave. and Admiral Road, Toronto. F. S. Baker, F.R.I.B.A., Architect.

British law of copyright, which admits architecture to a position alongside of literature, music, the drama, painting and sculpture.

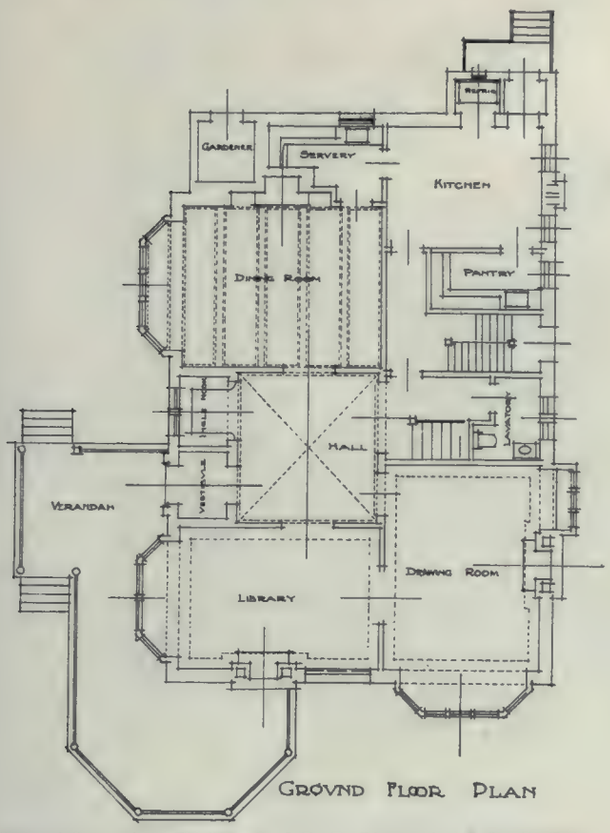
Residence of D. E. Bigwood, 145 South Drive, Toronto. F. S. Baker, F.R.I.B.A., Architect.

Residence of D. E. Bigwood, 145 South Drive, Toronto. F. S. Baker, F.R.I.B.A., Architect.

Residence of Thomas Baker, 630 Talbot Street, London, Ont. F. S. Baker, F.R.I.B.A., Architect.

Residence of Thomas Baker, 630 Talbot Street, London, Ont. F. S. Baker. F.R.I.B.A., Architect.

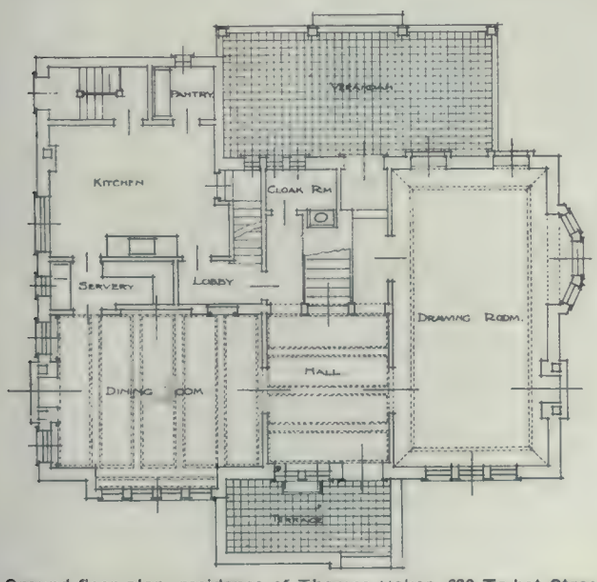
The reference to the Committee was:—"To examine the various points in which the revised International Copyright Convention signed at Berlin on November 13, 1908, is not in accordance with the law of the United



Ground floor plan, Residence of D. E. Bigwood, 145 South Drive, Toronto. F. S. Baker, F.R.I.B.A., Architect.

Kingdom, including those points which are expressly left to the internal legislation of each country, and to consider in each case whether that law should be altered so as to enable is Majesty's Government to give effect to the Revised Convention."

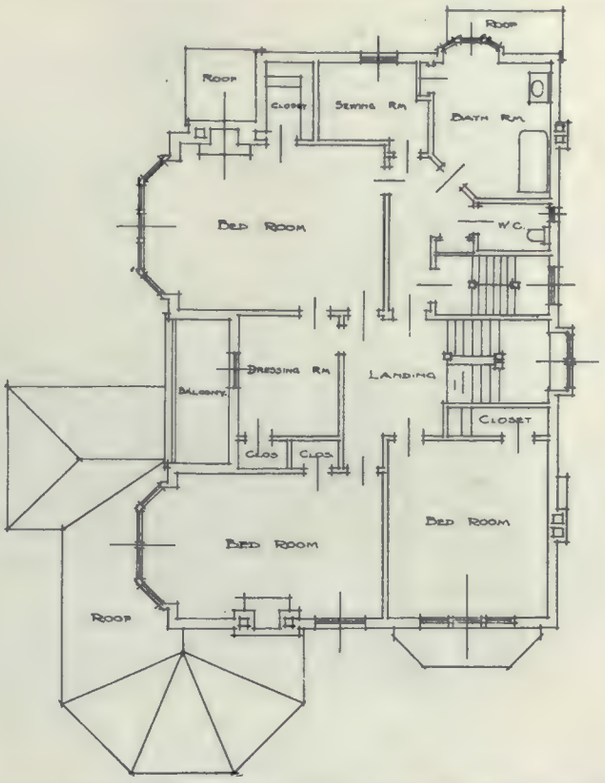
This Revised Convention modified the basis of international copyright as agreed in the Berne Convention of September 9, 1886, and the Additional Act of Paris and Interpretative Declaration of May 4, 1896. In the Berne



Ground floor plan, residence of Thomas Baker, 630 Talbot Street, London, Ont. F. S. Baker, F.R.I.B.A., Architect.

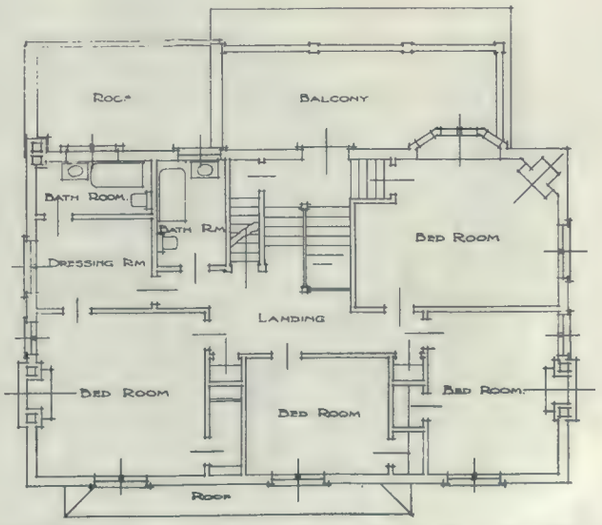
Convention, plans, sketches, and plastic works relating to architecture were protected; now international copyright is to be extended to "works" of architecture.

It is thus internationally recognized that an architect's production is a building, not a drawing by which he conveys to others an idea of a building; the drawing is but a means to an end, a tool for the formation of a "work"; the "work" is the building. This is quite a new conception of architecture and architects' work to many of the



Second floor plan, Residence of D. E. Bigwood, 145 South Drive, Toronto. F. S. Baker, F.R.I.B.A., Architect.

British public, and especially to the legal portion of the public, who have persistently looked upon an architect as a man who makes a drawing, or "plan," as it is generally described in the law courts, whether it be truly a plan or an elevation or a section or a perspective. The legal view has been that the architect is the man who makes the "plans," and when he has made them, and been paid, he has been paid for making the "plans," and so must hand them over to his employer, with the copyright attaching to them.



Second floor plan, residence of Thomas Baker, 630 Talbot Street, London, Ont. F. S. Baker, F.R.I.B.A., Architect.

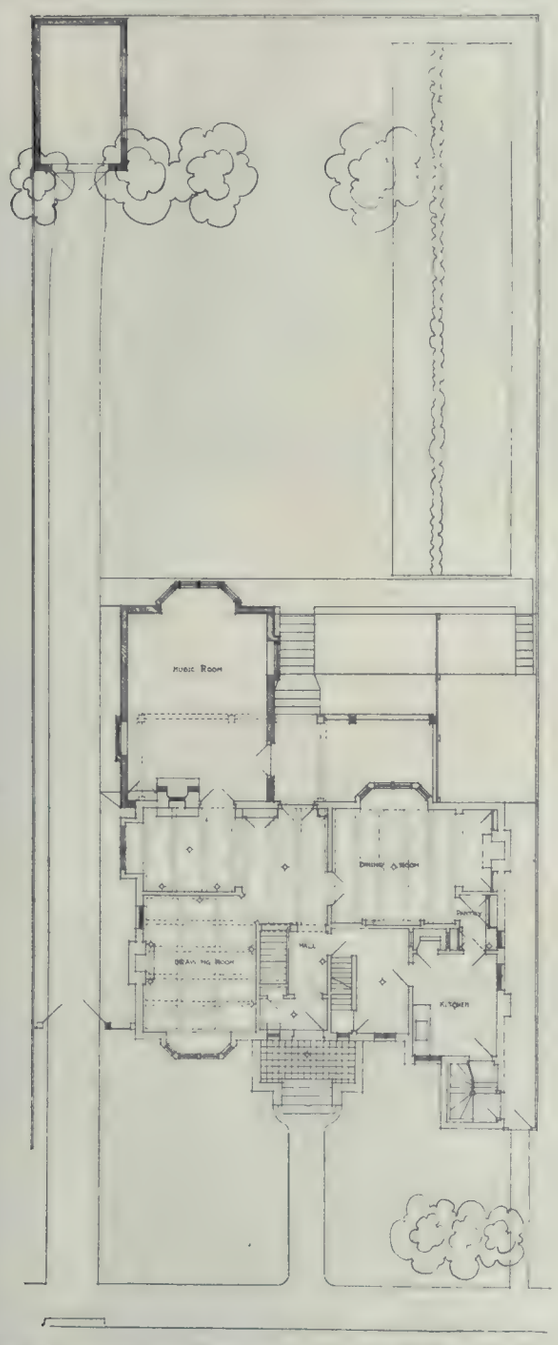
The present Committee has been led to form a different opinion to that of the Royal Commissioners of 1878, who considered that it would not be practicable to give

Residence of Architect F. S. Baker, F.R.I.B.A., 185 Balmoral Ave., Toronto.

Residence of E. A. Kantel, 74 Binscarth Road, Toronto. F. S. Baker, F.R.I.B.A., Architect.

the protection now suggested to architects, and the Committee has been influenced to their decision by the evidence that has been brought before them to show that no difficulty in affording this protection has been found in other countries.

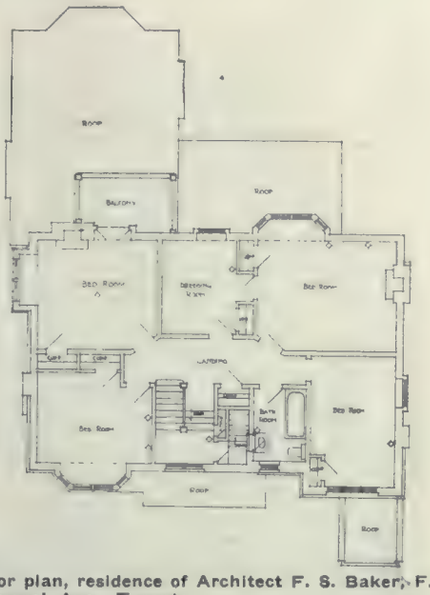
When, as will probably be the case, the report of the Committee comes to be embodied in a Bill for the modification and codification of the British law of copyright, this Bill will require very careful watching on behalf of architecture and architects, for it is evident that even on the Committee, who have taken so broad-minded view, there are doubts. There are some few members of the



Plan of grounds and lower floor, residence of Architect F. S. Baker, F.R.I.B.A., 185 Balmoral Ave., Toronto.

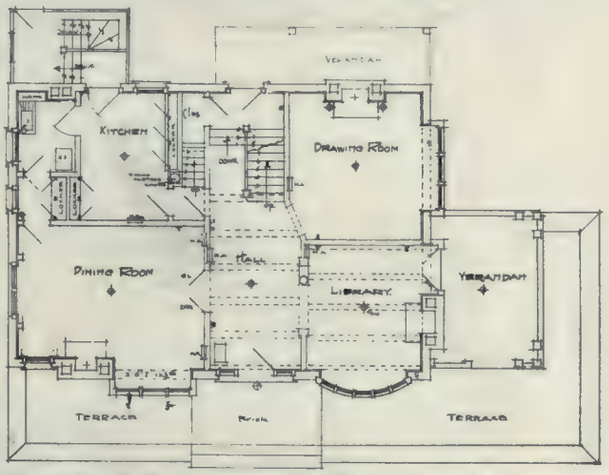
Committee who are opposed to the inclusion of works of architecture as proper subject matter for copyright, whilst the report itself suggests that there may be difficulties of proof of infringement and difficulties as to remedies.

We do not see that there would be any great difficulty with regard to remedies. The report suggests that "penalties might be awarded against anyone who copies or is a party to copying," and precludes the idea that it should be necessary for the architect whose building is piratically copied to prove damage in a technical legal sense, or that remedy should be given by the destruction of the building which is a copy. There cannot, we think, be any difficulty



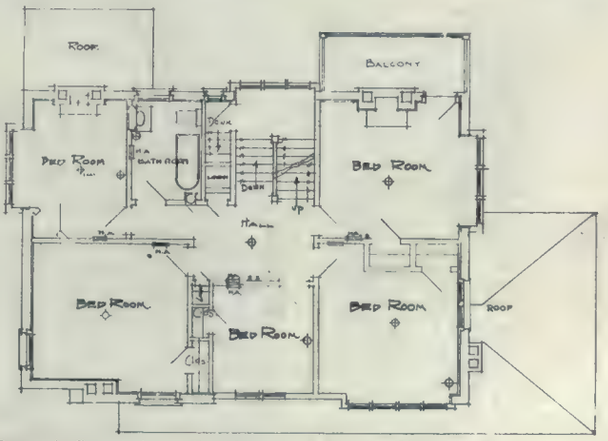
Second floor plan, residence of Architect F. S. Baker, F.R.I.B.A., 185 Balmoral Ave., Toronto.

in arranging a scale of penalties, which might be based either as a recompense to the original author or as a



Ground floor plan, Residence of E. A. Kantel 74 Binscarth Road, Toronto. F. S. Baker, F.R.I.B.A., Architect.

deterrent to piratical copyism. In some of the older copyright Acts there was a provision that an author whose



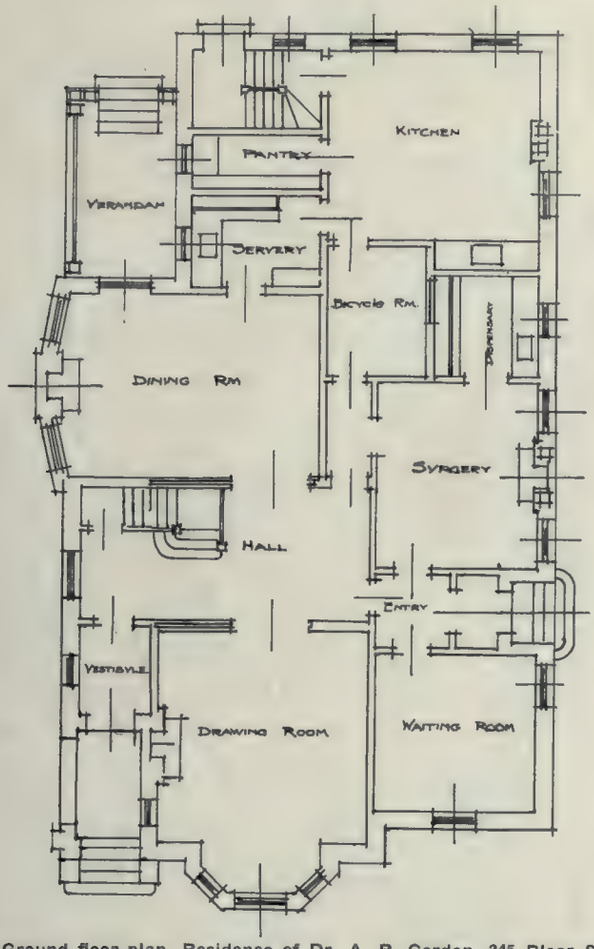
Second floor plan, Residence of E. A. Kantel, 74 Binscarth Road, Toronto. F. S. Baker, F.R.I.B.A., Architect.

work was copied might sue for damages and double costs, and herein lies, we think, a suggestion. Suppose an

Residence of Dr. A. R. Gordon, 345 Bloor Street West, Toronto. F. S. Baker, F.R.I.B.A., Architect.

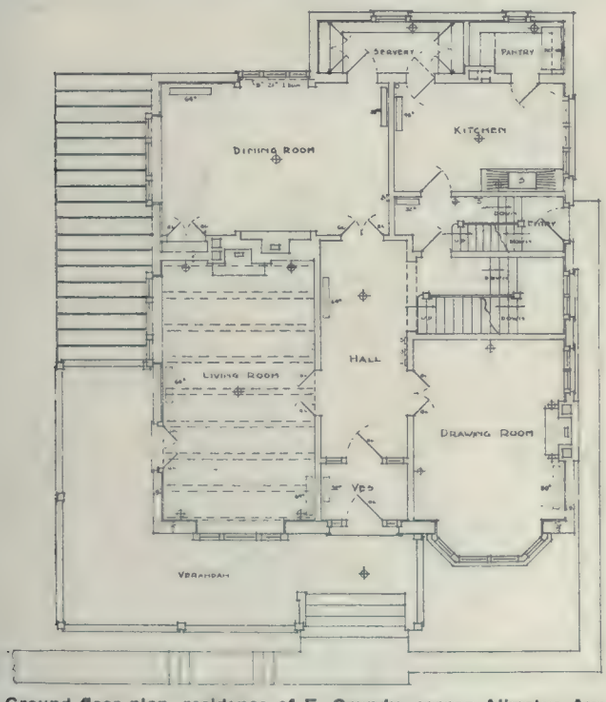
Residence of F. Grundy, corner Albertus Ave. and Yonge Street, Eglinton. F. S. Baker, F.R.I.B.A., Architect.

architect has designed an original building for which he has received, let us say, a fee or payment of a thousand



Ground floor plan, Residence of Dr. A. R. Gordon, 345 Bloor St. West, Toronto. F. S. Baker, F.R.I.B.A., Architect.

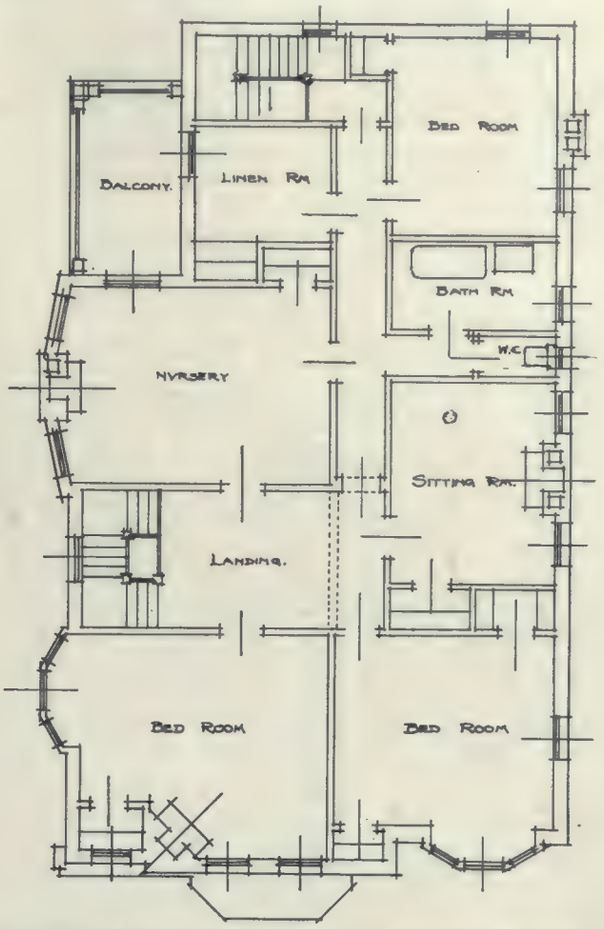
guineas, and that this building has been copied. If the infringement, on proof, were followed by a penalty of



Ground floor plan, residence of F. Grundy, corner Albertus Ave. and Yonge Street, Eglinton. F. S. Baker, F.R.I.B.A., Architect.

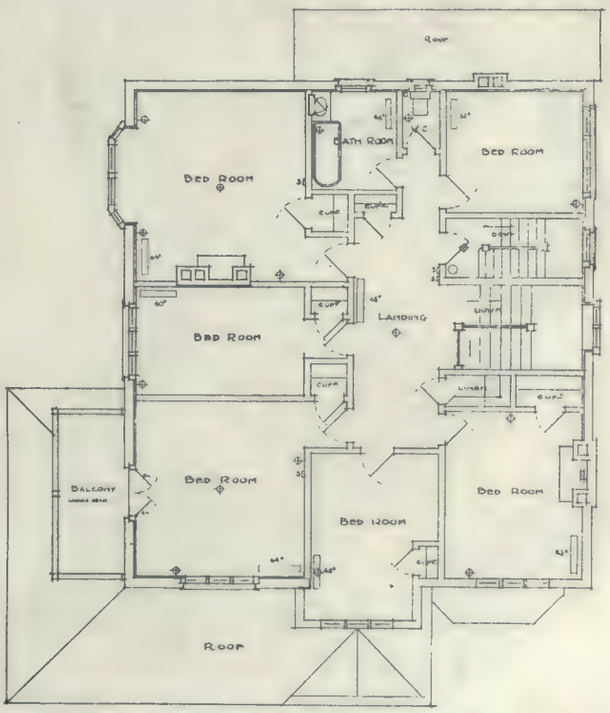
twice one thousand guineas, half to go to the author of the original design and half to the owner of the building,

both the injured parties, the architect and the client, would be recompensed, and the penalty would be in the nature of a deterrent.



Second floor plan, Residence of Dr. A. R. Gordon, 345 Bloor St. West, Toronto. F. S. Baker, F.R.I.B.A., Architect.

The difficulty of proof of infringement is, in our opinion, more imaginary than real. It has not prevented suc-



Second floor plan, residence of F. Grundy, corner Albertus Ave. and Yongt Street, Eglinton. F. S. Baker, F.R.I.B.A., Architect.

cessful actions in other countries of the Union, and it ought not, therefore, to be insuperable in Great Britain.

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CORRESPONDENCE.—The Editor will be pleased to receive communications upon subjects of interest to the readers of this journal.

Vol. 3 Toronto, January, 1910 No. 3

Current Topics

THE FIVE AND ONE-HALF MILE TRESTLE on the line of the Norfolk and Southern Ry., across the Albemarle Sound, N.C., has just been completed and thrown open for traffic. It is the longest structure of its kind in the world, and was built at a cost of $1,000,000.

* * *

SKYSCRAPERS IN VANCOUVER are to be tabooed, if the Property Owners Association of that city is to have its way. At a meeting held recently in the Board of Trade rooms, that body went on record as being opposed to structures of a greater height than ten storeys, or one hundred and fifty feet. However, before the association takes up the matter with the city council, it will acquaint itself fully with a restrictive ordinance of the kind which is at present in force in Spokane.

* * *

PARIS IS SHORTLY TO UNDERGO a number of physical changes which will greatly add to the prestige the city has already attained as the world's most beautiful municipality. The French Chamber of Deputies has just authorized the city to contract for the loan of 900,000,000 francs ($180,000,000), for an elaborate scheme of improvements, including the demolition of unsanitary quarters, the construction of new streets, gardens, and schools, and other important public work.

* * *

OFFICERS FOR 1910, as elected at the annual meeting of the Toronto branch of the Canadian Society of Civil Engineers recently held, are as follows: Chairman, A. W. Campbell, Deputy Minister of Public Works, Ontario; Secretary-Treasurer, Peter Gillespie, lecturer in applied mechanics, Toronto University; Councillors, T. S. Scott, Assistant City Engineer, T. C. Irving, O. W. Smith, N. H. McLeod, and A. W. Connor. Mr. Cecil B. Smith presided at the meeting, prior to which a dinner was held at the St. Charles.

EXCLUSIVE OF LARGE SUMS expended in the way of public improvement, it is estimated that the value for new buildings undertaken in Prince Rupert during the last six months of 1909, was considerable in excess of $300,000. These figures leave no doubt as to the progress and future of the place which only two years ago was little more than a name.

* * *

THE INTERNATIONAL EXPOSITION to be held at Roubaix, France, from April to October, 1911, will embrace seventy classes of exhibits, including architecture, decorative art, general mechanics and civil engineering in all its branches. The exhibits will be divided into fifteen sections or groups and be arranged in accordance to their degree of relation to one another. All goods, drawing, etc., for display purposes only, will be exempt from duty.

* * *

RECENT EXCAVATIONS on the site of Christ's Hospital, in the angle of Gillspur and Newgate streets, have brought to light a new portion of the great Roman wall built around London in the fourth or fifth century. The masonry is similar to previous discovered portions, being characterized by large Roman bricks and layers or bands of red tiles, and remarkable for its hardness and solidity. In contour, the wall resembles an interrogation mark, being about fifty feet long, and nearly eight feet high.

* * *

A NOVEL MANNER of calling church-goers to evening services has just been adopted in Brooklyn, (N.Y.,) where a powerful searchlight has been placed on the spire of the First Reformed Church at a distance of 200 feet from the ground. At a fixed time before the services, a flood of light is directed over the community and the flashing is continued through the church hours to attract the tardy and back-sliders. This departure is due to the opposition of the pastor to bell-ringing at night, which he believes only tends to awaken the sick and annoy the aged and infirm in the neighborhood.

* * *

A HOTEL OF 1,000 *ROOMS,* an Italian garden and casino, and a permanent exposition building, for the sale of goods by samples, constitute a scheme which a party of capitalists propose to carry out at Chicago this year. The building will be located at the south end of Lake Shore Drive, which marks the beginning of the fashionable north side district, and it is quite possible that an auditorium, to be used exclusively for grand opera, will also be included in the group. As it stands, the enterprise will represent an outlay of at least $6,000,000, of which sum $2,500,000 will be expended on the hotel alone.

* * *

TWENTY-EIGHT MILLION DOLLARS were spent in railway construction in the West during 1909, and it is expected that an equal or greater amount will be spent this year. The C.P.R. laid 404 miles of new track, the Canadian Northern 250 miles and the G.T.R. 403 miles, making 1057 miles in all. In addition, the Great Northern undertook and carried out considerable work in British Columbia, the exact figures, however, not being available at the present time. Eastern Canada has also witnessed a number of important developments. In fact, all sections are experiencing new improvements and extensions. Preparations have been made to rush the large volume of work now under construction, and to take up at an early date a large portion of the additional mileage projected.

TORONTO HAS MADE A FURTHER EXTENSION to its brick limits, Vancouver asks for an increase in its staff of building inspectors, and Montreal, in the person of the City Architect, recommends a revision of its building regulations and the appointment of more assistants. All of which is healthy indication of building progress, and a desire for properly supervised and well built structures.

* * *

A NEWS ITEM from Vancouver states that work has already been started in Okanagan Valley on the construction of the first gyroscope railway in America to be devoted to commercial transportation purposes. The route will encircle Okanagan Lake, touching all points on shores of that body of water, and the work will be pushed so that the line may be ready for business during the coming season.

* * *

THE TOWN-HOUSE of the late Otto Beit, more familiarly known as the "Beit Bungalow," and possibly the most magnificent and costly mansion in London, is reported to be in the market for a buyer. It is designed in Louis XVI. style, and overlooks a choice part of Hyde Park, being near the Houses of Parliament and the Buckingham Palace. Beit was a nephew of Barney Barnato, the South African diamond king who planned the house but did not live to see it built.

* * *

BONDING NEW AND OLD CONCRETE can be accomplished, it is said, in the following manner: Clean the surface of the old concrete with clear water and a stiff broom. Apply a mixture of one part of hydrochloric acid and three parts of water with a brush, making several applications one after the other. Then scrub the surface with clean water and a stiff brush until all acid is washed away and the surface is perfectly clean and free from loose particles. While it is still wet apply the fresh concrete, and keep the new concrete damp for at least a week, being careful not to allow it to become dry at any time.

* * *

A DEVICE WHICH WILL INDICATE the location of a wrecked vessel, the date when it met with the disaster, the depth at which the wreck lies, and also the course that he vessel was taking and the port that it was making for when it met disaster, has been invented by a native of Melbourne, Australia, whose name is Ernest H. W. Crossley. The apparatus, which is in the form of a buoy, is released automatically from the bridge deck when the vessel meets disaster, and a wire attachment holds it over the spot where the vessel disappears. The apparatus would prove useful, the inventor claims, should a vessel become helpless in midocean through an accident to her machinery, as specially floating "messengers" could be set adrift in prevailing currents.

* * *

A MOVING PLATFORM is the latest scheme advanced in New York city as a solution of the transportation problem. In a recent report, the chief engineer of the public service commission recommends that a route be laid out under Broadway between 10th and 42nd streets for a system of this kind which a local syndicate has announced that it is willing to build. Between the points the traffic is extremely dense, and the moving platform, it is said, will afford the most efficient and economical means of relieving the present conditions, in addition to meeting any future requirements which at the present time can be forseen. Aside from the advantages which this means of transportation will offer in the way of seats and accommodation for all passengers, speed, safe travel and no waiting for trains, there is also a possibility of a one or two cent fare between the points mentioned.

A NEW METHOD OF WIRING HOUSES for electric lighting and service systems, which it is claimed will reduce the cost by about one half, is briefly referred to in a recent report of Canadian Trade Commissioner McNamara, at Manchester, England. The method, which is the invention of Mr. Sarfield Martin, A.M., I.E.E., is described as being extremely simple and obviating in application all chance of defective work and danger from leakage. When joining up the wires they are simply placed between two metal discs, and by one turn of the screw the discs are clamped together, making a fast connection. The discs are insulated from one another, and any number of wires can be connected by simply using more of them. The system also enables a room to be wired up with great rapidity.

* * *

OTTAWA'S PROPOSED BUILDING BY-LAW was again up for consideration recently when the relative merits of certain provisions were discussed at length. There seems to be some slight opposition to the measure as framed, on the ground that it plays too strongly into the hands of the architects by whom the regulations were drafted. An examination, however, of the somewhat fragmentary facts available, indicates that there is no tenable grounds for such apprehension. On the contrary, possibly with the exception of one or two minor points which can be satisfactorily revised, the by-law is apparently moulded to serve the best interest of the city both æsthetically and from a standpoint of safety and sanitation; and now with the Builders' Exchange, Real Estate Board, and other factions keeping the issue alive from one side or the other, something tangible in the way of a code should emerge in the near future.

* * *

REPRESENTATIVE BRIDGE CONCERNS of England, the United States and Canada are now considering alternate plans and procuring information preparatory to tendering on the superstructures of the new Quebec Bridge No definite date as to when tenders shall be in has, as yet, been made public, and it is understood that owing to the magnitude and importance of the undertaking that the contracting firms will be allowed two or three months in which to fully familiarize themselves with every detail of the work before submitting their bid. The plans call for a structure having a 1758 ft. span and a width of 88 feet, and it is expected that it will take four years to carry the construction work to completion. The bridge including the piers, for which the contract was recently awarded, will, it is roughly estimated, cost in the neighborhood of $10,000,000, and the contract for the superstructure will, in all probability, be awarded sometime during the coming fall.

* * *

RECENT EXPERIENCES WITH SAND-LIME bricks in Germany show, according to the "Builder," London, that humic acid, which enters into combination with part of the lime, tends to disintegrate the bricks. As this acid is formed from impurities, the obvious remedy is to use nothing but well washed sand. In Holland, sand-lime bricks made from hydraulic lime frequently suffer by the detachment of flakes, chiefly from the upper part of the surface, which effect is rare in cases where fat lime is employed. The explanation put forward is that the mortar mixed with hydraulic lime encourages the formation of an outer layer of calcium silicate, which absorbs moisture from the atmosphere and does not adhere effectively to the interior mass of the molded brick. The procedure generally recommended in Europe is to avoid the use of hydraulic limes, to employ mortar with a sufficient proportion of water, and to introduce steam into the curing chamber. Hydraulic limes, however, must be used for bricks, if they are to be placed beneath the water surface.

ARCHITECTURAL EDUCATION IN CANADA.—By Prof. Percy E. Nobbs.—Continued from Page 47.

pose. These subjects afford valuable side lights on the work of the design classes.

Archaeology.

Archæology as an architectural subject may be shorn of much of the connotation of Hitites and Babylonian captivities with which recent research has invested it. The traditions of our civilization, however, involve some study of the buildings of the Biblical peoples as well as the Greeks and the Romans. Mediæval France and England have a very special bearing on ourselves, for it was through these countries that Italian art comes to us. France, never as long as she had any connection with this land, quite lost the mystery of her Gothic period, while England in her most classic phases has always retained something of the patent honesty of design which culminated in the fourteenth century. But, perhaps, things being as they are, the Renaissance in Italy and the later art of France and England, contain the main body of tradition for us, and though the Greek and Roman work explains much of these things. I feel very strongly that it is enough for us to direct the chief efforts of our scholarships to France and England, rather than to Greece and Rome. Revivals are excellent influences within reasonable limits; their weakness is their self-consciousness. Roman revivals meant something to fifteenth century Italians; Greek revivals meant something to eighteenth century Frenchmen; French revivals even meant a good deal to nineteenth century Americans; but to twentieth century Canadians, English revivals will have a more real meaning, and there is this to be said for them, that mere imitation in this case is out of the question. The serene sentiment, traditional in English art, we may hope to continue to achieve; we must, however, give up the physical details of mullioned ranges of lights and parapeted roofs—therein there is hope for Canadian architecture as such. It must invent!

The study of archæology of our traditions needs a background (and the historical department of any university should be able to provide that) before a beginning is made with the history of architecture. That is the weak point of lectures on ancient architecture to the public or to students in offices. Half the meaning of St. Peter's, and Westminster, and the Parthenon is lost if Papal, Edwardian and Periclean olicies and the popular forces behind them are not subconsciously applied by those who would learn their secrets.

Science.

Science for an architect is, after all, not a very serious affair; of course, a thorough scientific training is a very desirable thing, but *"life is short and art is long,"* and literature and history are, I firmly believe, of more importance to an architect. His mathematics may well stop short of the calculus. Physics is vital up to a certain point, but the ultimate constitution of matter will not help him to "build for eternity," as Wren expressed it, or express human sentiment in what he builds. Chemistry bears directly, it is true, on hygiene, but hygiene (from questions of pure air and pure water to those of heating and ventilation appliances) can, I think, be grasped in principle with very little chemical knowledge.

Construction.

Construction may be regarded as the architect's branch of applied science. Possibly elementary construction can be best learned by practical experience, but as it is quite as impossible to teach composition in architecture to people who do not know how roofs and floors and windows are made, as to teach literary composition to folk who cannot parse words and analyze sentences, even elementary building construction (mere technology as it is) has to find a place in a university course. Structural design is a subject scientific enough to be admitted by a university faculty without protest. My own view is that an architect should know just enough about structural engineering to have the fear of death and judgment always by him and induce him to call in the engineer before, rather than after, things have been built. Familiarity with the stresses in a 100-foot roof truss will certainly not breed contempt for the possibilities and responsibilities involved.

Professional Practice.

Professional practice is a matter on which I should like to say a great deal, but time will not permit. To speak and write the King's English and one other language; to know how to construct a short essay, report paper or speech; to behave to inferiors, equals and superiors respectively, with courtesy, charity and dignity. These things are expected of a college man, and by hook or crook a good deal can be done even in an architectural department to justify the expectation. It was done by Prof. Ware at Columbia.

Specification writing is very badly done all over the world, and yet no better exercise in form and construction could be undertaken by a student of literature. By lectures and exercises much can be done to show how to say what has to be said, briefly and in order and once only.

Conditions of contract and building by-laws, I almost think, should form a part of any good citizen's education, while certain aspect of law which can be dealt with in university courses to architectural students should prove invaluable in later life.

Drawing.

Drawing.—In administering to the student the many subjects which fall within the six groups—design, æsthetic, archæology, science, construction and practice—one lecture to three hours of graphical work will be found to work out well.

Eye and hand, and imagination. too can, I think, be trained far more rapidly by modelling than by drawing and for the sake of this technical suavity, modelling all through the course is desirable. Freehand drawing, as such, is hardly a subject.

All sorts of drawing and sketching are connected with the work in design and rapid memory sketching. freehand and mechanical, and elaborate measured drawings, are all involved in the study of archæology.

The ornament and decoration in connection with æsthetic implies a good deal of water color work and free sketching.

Construction gives ample opportunities for practice in the preparation of general working drawings and also for steel plans.

Descriptive geometry, sciography, stereotomy and perspective, besides their scientific value, afford good practice in mechanical drawing and are essentials. in my opinion, in the work of the earlier years.

These (counting the incidental drawing as one) seven parts of architectural education can be begun in a college course, and for an ordinary general practitioner of our trade, is to be hoped that none of them would end there.

Some of these things may be held unnecessary. and I wish I could be convinced of that, for the expense of my department, where these things are all done as I have explained, is a grievous question with those responsible. Some things, such as post-graduate work in Ecclesiastical and Landscape Art, might be thought desirable, but I feel that these can only be studied on the higher plane where they exist, in merry England, happy France and smiling Italy, and this brings me to outside influences in architectural education in Canada.

Outside we have no museums as yet, but we shall have some soon, and it is devoutly to be hoped that the

nation's traditions will find adequate representation in them and that they will not degenerate into mere treasure houses of curios, bric-a-brac, pictures and things rich and rare. There is some reason to hope that at the Victoria Memorial Museum at Ottawa parallel type collections of French and British art (architectural detail and decorative sculpture that is) from 1000-1800, will be installed, together with a library of art, a collection of industrial arts, and a gallery of home industries. But all that is another story, and His Majesty's Ministers have not yet dealt with the petition concerning these things.

Outside we have few old buildings worth measuring. though quite a number that should be preserved. In Montreal there are some examples of the purest Louis XV. and the late Georgian work. Still, our architectural students must go far afield for their direct study of past tradition, and it is high time that every Province had a good scholarship to take a man to England, France and Italy for a year, and that the Dominion had a series of travelling scholarships for special study in the realms of art.

Hitherto the main outside influence in professional training has been due to the fact that at no great distance, in the cities of the United States, more work and better work was being done. Thither went, and still go, the Canadian students of architecture, to bring back second hand ideals of the Beaux Arts school, which were, perhaps, better than nothing, but very far from supplying us with national traditions. For what has Canada, either French or English, Lower or Upper, Maritime or Northwest, to do with 19th century Paris? The far flung vault of Beauvis, the jewelled walls of Blois might well inspire a Quebecer, but latter day French academic design, a petrified art lagging behind the emancipation of French painting and French sculpture and oscillating between the Neo-Grec and the Louis XIV. What, I ask, has that to do with us?

Now we are beginning at last to achieve as good work as our friends to the South, and it is the museums, libraries and design schools of the United States, quite as much as the office work, that still draws so many of our students across the line; and the libraries and museums of Canada will soon, I believe, be adequate to our needs. What about the offices?—for we can do without colleges, museums and libraries, but we cannot train architects without properly organized office experience and practical work.

In older lands, where a thousand years of architectural history stands revered and respected in every city, an apprenticeship or a pupilage system, though apt to shorten the general education of the architects, is adquate, but we, here, must rely on college education, museums and libraries, instead of old buildings, and woul make a fatal mistake if we did not organize our office training better in the future than we have done in the past. Of course, supply and demand must be taken into account but I think four or five years. bound to principal, or, in case of college students, say three years, part of which could be done in the long vacation, should be made a universal requirement. The power to do this rests with the Provincial organizations. It is bad for the student to get a little experience here and a little there and it is cruelly unfair to the careful architect whose office has an educational influence, that no sooner has he taught a boy something than he is held up for a rise or given the slip.

The architect who is an artist deserves his help cheaper than the architect who is a commercial agent only, and without cheaper help the best kind of work cannot be done. When things are slack it should not be necessary, as it now is, to disband the office. By the present arrangement the art suffers, the office student suffers, and the architect suffers.

We can only make a good thing of our trade by doing far too many jobs at a time as things are. If an architect could, by exercising some restraint on his output and by doing things more to his own real satisfaction, at the same time establish a reputation for giving good experience, pupils, apprentices and improvers would help him out, provided such status were recognized and encouraged by the by-laws of the associations. The assistant paid rather more than he is worth cannot be spared to run about on the job, and cannot be expected to identify his interests with those of his master, when he only sees one end of the work.

There is a tendency among some of my friends here to have a childlike faith in what the university can do. In future let us hope to see the offices doing their *full share* of the teaching, the schools of architetcure doing their little part, the local public their by providing museums and libraries, and the Government theirs, by endowing scholarships.

The teaching of architecture generally will, I think, undergo some drastic changes before long. The history of architecture has to be approached in a new light—it has been regarded as technical education—as a means for enabling people to forge and imitate past styles in approximate purity. It should, I think, be treated as a purely "culture subject," like Latin and Greek and Anglo-Saxon, as a means of enabling people to understand what the art of design is—the great popular art of expressing national sentiment.

The public at present suffers from that little knowledge which is such a dangerous thing. They know the difference between Norman work and Roccocco in a superficial sort of way, by sight, not by feeling. and they think the greatest compliment they can offer one of us is to recognize in our performances some resemblance to past types, and "fellows of the baser sort" trade upon this poor thin semblance of culture and give them modern forgeries, more or less ingenious, of Tudor, or Francis I., or Early English, or what not. If the much abused word "style' could just be stricken from the vocabulary of every architect for a decade, the educational value of the omission to the public would be immense. We would, I think, get some real style into our work without having to break our hearts over it.

Our architecture should be "solid, proportional, according to the rules" (which means that effects should be calculated and not be accidental), "masculine and unaffected." That is how Inigo Jones put it, and "built for eternity," as Wren used to say. Our architecture should be as logical to our climate and our materials as were the flat-pitched colonaded fanes of Greece and the steep-roofed buttressed churches of England. It should be simple, natural, dignified, true to its purpose, whether cottage, house, shop, office, church or town hall;—a fruit of the glorious traditions we inherit from our fathers, with nothing of the "insolent boast" and the "slaves' nightmare" which Morris saw and fought against in the artificial art "all French and fine" which hails from the place and period most away from all our aspirations—the court of Versailles.

ARCHITECTURE AND ITS RELATION TO ART.

By JOHN M. LYLE

THE TITLE of this paper is somewhat misleading —"Architecture and its Relation to Art"—for architecture is a fine art—the greatest of all, a combination of many arts. The first question that naturally arises in one's mind is—what is architecture? There are many definitions to be found in the different text books available, but none of them quite explain the com-

plex combination that is called to mind by the word "architecture," so I have dared to suggest this definition.

"Architecture is the art of expressing in concrete form the structural needs and decorative ideals of man." When you consider the many arts which are covered in this definition, you begin to realize the complex meaning of the word "architecture," and incidentally, the demands on those who—like ourselves—are worshipping at the shrine of the Goddess of Architecture.

The late M. Paul Blondel, one of France's most distinguished architects, in speaking of architecture described her as a jealous mistress, who yielded her favors but rarely, and then only after the most earnest and persistent endeavors on the part of her devotees—the architects.

As I am addressing a meeting of architects, it occurred to me that it might be more profitable to us all, if we were to consider not only Architecture as an art—a study necessarily in the abstract—but Architecture, *the* art, which concerns us in our daily practice.

In Canada, we find a deplorable ignorance as to what architecture is; a deplorable lack of consideration for the architect; a deplorable lack of taste. In short, we have to contend with the ideals of a new country, absorbed in the development of its industrial resources, and not as yet ready to listen to the importuning of Venus. It is our duty as architects to educate public opinion to a better understanding of what architecture really is.

We ought to have a chair in architecture in every university in Canada, where architecture could be studied as a fine art. We ought to urge upon the Government the necessity of having our new cities—and our old ones too—planned and re-planned by architects and not by engineers. In my humble opinion, engineers have been the curse of Canadian and American city planning. Their laying out of our streets, avenues, and squares has been stupid in the extreme, and without any consideration of the aesthetic side nor of the practical. The plans of our cities are almost criminal in their stupidity, and worst of all is the fact that the engineers are still "on the job"—doing their best to damn the future cities of our land.

We ought to arrange lectures, illustrated with lantern slides—which would stimulate public interest in the study of architecture as a fine art. For instance, there are many men and women now taking an interest in furniture, and in decoration, as applied to the home. A series of lectures could be arranged covering the different styles of interior decoration.

Once create an interest in the decorative side of architecture, and you have the kernel of a growth that in its ramification opens up unlimited possibilities. We ought to have an architectural journal that would put before the reading public not only the utilitarian side, but also the aesthetic. A journal devoted to the high ideal of architecture as a fine art. May I presume to suggest to our architectural press that it would have the hearty support of the architects of this country in its endeavors to devote more attention to this side of architecture.

We ought by our example in the office to inspire our draughtsmen, the contractors, our clients with the idea that there is more in architecture than the mere erection of a structure to shelter their heads, and to give them the necessary accommodation for their daily wants. That the mason, the bricklayer, the carpenter, the plasterer—all should be encouraged to live up to the highest possible standard of excellence in their work.

I am quite aware that it is absolutely impossible in modern practice to obtain ideal conditions in the execution of work in Canada. On the other hand, it is certainly our duty, as architects, to raise the standard of execution by every legitimate means in our power. If I might be allowed to suggest one method of raising the standard along certain lines, it would be that the architect spend more time in studying his drawings, and also in making more complete ¾-inch and full size details for the contractors' use. Contrasted with the best French and American practice, with which I am familiar, I might say that there is no comparison in the number of drawings and attention paid to studying of details as between the practice of these countries and that of Canada.

We might introduce "quantity surveying" into Canadian architectural life. We often find that there is the greatest variance in prices submitted by different contractors. Time and again we are obliged to accept the lowest tender, with the result that the contractor finds out, possibly, that he has made a mistake in his quantities; consequently, he is forced either to accept a loss, or to skimp his work in order to come out even. Would it not be much better to have the English idea of quantity surveying adopted in this country; it seems to me that the introduction of this system would materially aid in uplifting "architecture as a fine art."

We ought to educate the public to the fact that it is necessary to have plenty of time for the erection of our buildings, and that speed is not the only consideration. Structures are run up here or "slapped" up at break-neck speed—the result being that woodwork is put on top of wet plaster, and everything is rushed forward pell-mell. How often we hear people say that the only way to get workmen out of a house is to move in. Would it not be well for the architects to explain to their clients the great necessity in building operations of making haste slowly. We certainly can do some missionary work along these lines to the decided advantage of architecture as a fine art.

Surely we architects have in Canada to-day great responsibilities and great opportunities. It rests very largely with ourselves what the architecture of the future in Canada is to be. Let us unite in trying to further the study of architecture as a fine art; let us by our efforts aim to uplift the architectural ideals of to-day. Surely much ambition is worthy of our united efforts from a purely patriotic point of view—aside entirely from any actual benefits that may accrue to us individually. It seems to me that at this stage of Canada's development, we are—more or less—pioneers in our own particular field; in the past, there have not been many trained architects in Canada. The unlimited wealth and the great buildings which are sure to be erected in the future ought to inspire us to more determined efforts to upbuild our profession, and to place architecture where she belongs—at the head of all the arts.

NEW ARCHITECTURAL OFFICE.

ARCHITECT HERBERT E. MOORE, Toronto, who, for the past three and a half years, has been associated with Architect John M. Lyle, 14 Leader Lane, has opened an office and drafting rooms in the Trust and Guarantee Building, where he will be pleased to receive samples, price lists, etc., from supply firms and manufacturers. Mr. Moore is a member of Council of the O.A.A. and is held in high esteem by the members of the profession in general.

A SUCTION-GAS PRODUCER BOAT has been put in service on the Rhine, according to the London "Times." It is 65½ ft. long, 21¼ ft. wide and draws nearly 5 ft. with 10 tons of fuel on board. The producers use lignite briquettes and are located forward. The gas-holder and two four-cylinder 200-h.p. engines are amidships, and the crew's quarters are aft. Each engine drives a propeller shaft carrying two screws, the blades of which can be reversed by gearing controlled from the engine room. About 1.1 lb. of fuel per h.p. hour is used.

GOTHIC ARCHITECTURE.—The Abiding Lessons Which It Teaches.—All Its Beauty and Inspiration the Outgrowth of Sound Construction.—The Early Craftsman, His Motives, and His Work.—A Resume of Mediaeval Industrial Art.

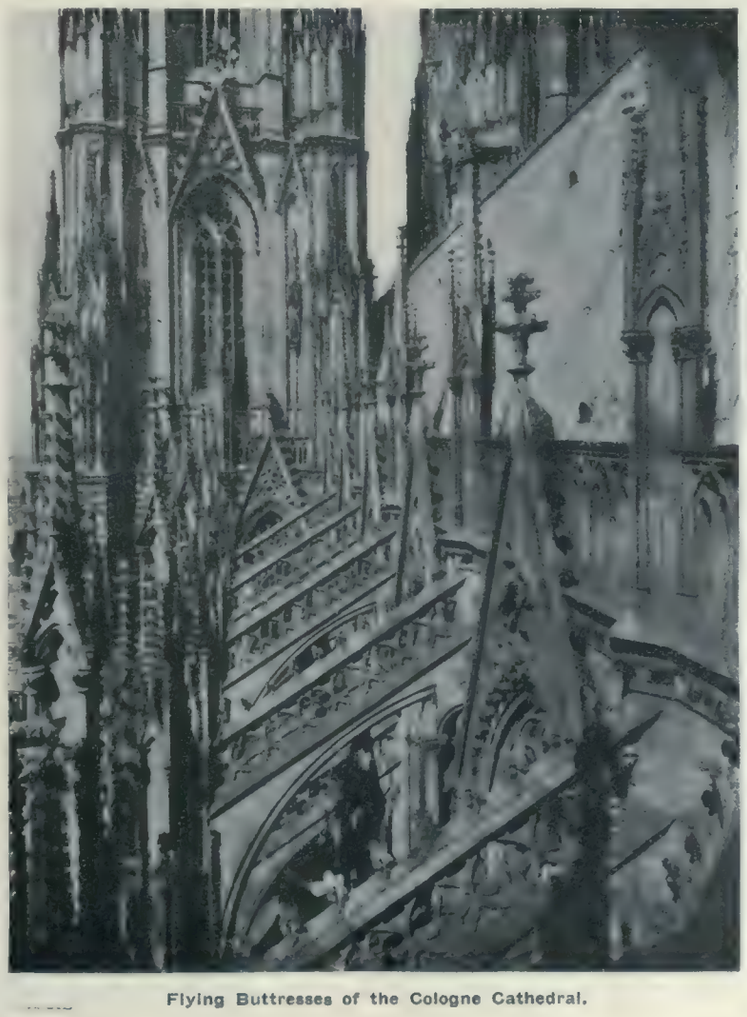
By ERNEST A. BATCHELDER

While architects of the present day regard the work of the Mediaeval builder, as is still to be seen in some of the great cathedrals and buildings of Europe, with a feeling of almost reverential awe, many of them seemingly fail to appreciate the underlying principle observed in the creation of these enduring structures, or to grasp the abiding lessons which they teach. How the great structures were built, rather than why they were built; and how the early craftsman wrought with the materials, tools and processes of his time; together with how he solved his problems, met definite conditions, developed each structural feature and evolved beauty from utility, is vividly told in the following article by Mr. Batchelder, which we reproduce in full from the CRAFTSMAN, *believing that it will be found of especial interest to our readers.*—EDITOR.

IT IS NOT THE PURPOSE of this article to attempt anything in the nature of a history of Mediæval industrial art. Within the limits of the space available little more could be done than to set forth in dry, uninteresting data the work of that period. There were many workers in many materials, widely separated as distances were necessarily computed in those days of insecure and inadequate transportation, laboring in different environments and under different influences. There is an abundance of literature on the subject of Mediæval history, the life and customs of the time, the development institutions, its architecture and its industrial activities. From this material and from personal observation and study it is the writer's intention to choose certain examples of work in stone, wood, iron, etc., and discuss them from a design point of view, how they were produced rather than why they were produced, and to tell the story in a way that may be of interest to the general reader.

Indeed, the question of how things were made the study of constructive problems and the conditions under which they were solved, may after all take one nearest to the true spirit of the work. We are apt to see the craftsman of the past as a light in a mist, a vague blur without personality. A philosophy of art fails to reach him; a discussion of abstract ideals leaves him as an unreal factor in the background. We read into his work sentiments and emotions that would cause him to scratch his head in bewilderment if he were to hear them—for his work, like all true creative art, was not conceived as a conscious message to future generations; it was merely an unconscious expression of immediate needs and convictions. It was a spontaneous development. The man at the bench did not stop to analyze motives; his interest was centered upon technical problems, how to secure a given result and meet definite conditions with the materials, tools and processes at hand. To really appreciate the beauty of nature one must turn to others than the poets for an interpretation of what we find. And to understand the spirit in which Mediæval industrial work was wrought we must push through the halo of romance and chivalry; through the abstract ideal of the philosopher, even through many of the æsthetic and sentimental motives that legend ascribes to the workers, and penetrate into the crooked narrow streets of the old-world town where the pigs roamed at will. The descent is sudden; but it is necessary if we wish to visit the workers in their shops and watch them as they hammer away at their trades quite unconscious that their product, or such scraps of it as time has spared, is to be reverently treasured under glass by a distant generation.

Now, the life and the thought of the thirteenth century have slipped beyond recall into the past We would not, if we could, revert to the conditions of that day, nor can we hope to coax beauty back into the world by adopting its industrial methods. That art was vital, as few arts have been, because it interpreted so forcefully and clearly the thoughts that had penetrated into the lives of the people. We cannot by any conscious effort of thought put ourselves back into Mediæval times; that is to say, we cannot look out upon the world through the eyes of the Mediæval people, see things as they saw and understood them. Little enough remains of their activities—here a church, there the ruins of a castle, again a little cluster of half-timbered houses huddled together in some byway where the current of modern life has passed them, a few manuscripts and utensils gathered into museums where we trea-



Flying Buttresses of the Cologne Cathedral.

sure them as priceless relics. Scanty as are the remains, however, their art was so intimately related to their lives that we may know how they dressed and worked, how they fought and played; even the minute details of daily life are wrought in stone and wood, iron and glass; but when we think that we are getting into close fellowship with the Mediæval worker, when his personality is almost within reach, he suddenly vanishes again. For in the presence of his greatest achievement, the Gothic cathedral, he slips away into the background, a vague figure, impersonal, more inexplainable than when we first began to make his acquaintance. Here is an expression of the thought that penetrated deepest into his life, and in its presence we feel only a sense of our own littleness and insignificance. It thrusts its gray old towers and pinnacles from out of the Middle Ages above our own petty affairs, and we are almost willing to accept the legends, the stories of wonderful miracles that cluster about it. For we who order our churches ready made much as we do our clothes and groceries,

Façade of the Gothic Cathedral at Amiens.

can never hope to understand the spirit that moved men to give of their time, money and labor to the construction of the cathedral, building it and rebuilding it on nobler and grander lines whenever fire or the wanton destruction of war razed it to the ground. Of the old town then clustered about the church we know there were dark, noisesome streets, unsafe and unlighted at night, where plague and pestilence often found a breeding place, dingy houses and shops. And yet from these streets, so strangely at variance with the church, came those who wrought these miracles in stone, choosing one from their number as master builder, the rest voluntarily giving to its construction and enrichment the best of their linear thoughts and efforts. The French cathedrals were, in a peculiar sense, the result of communal efforts. Nor was there any thought for fame, for very few even of the master builders are known to us, and the countless craftsmen who labored so industriously to give beauty to all the details of the fabric have left no marks by which we may speak their names. It was all for the glory of God, with an element of communal pride, a combination of religious fervor and popular enthusiasm.

To us the cathedral seems as stable and enduring as the hills or as the cliffs that rise from the sea . It appeals to our imagination so strongly that we are loath to pry into more practical questions of ways and means. We would rather turn to the poets for an interpretation of why it was done than to those practical persons who have clambered over the edifice with rule and compass to tell us how it was done. And yet, in the plain recital of the means adopted to maintain the stability of the structure is a story of absorbing interest. We may then understand

Cathedral Rosace at Le Mans.

what a French writer of keen insight meant when he said that the Gothic cathedral was more like a modern engine than a building, in the sense that it was an active thing, pushing, thrusting, filled with energy and requiring unceasing attention to keep it in working order. And we shall come closer to the builders when we examine the constructive problems that confronted them, problems that had never been solved before; when we study the conditions under which they worked in their earnest efforts to give beauty to the structure that was rising under their hands. Here were simple stone masons and carpenters building as experience taught them and clothing their work with an interest and beauty that were inevitable under conditions of true craftsmanship. And they left behind them the last word in constructive skill, combining original thought and deep artistic feeling; but withal, a structure in which every feature is organic in

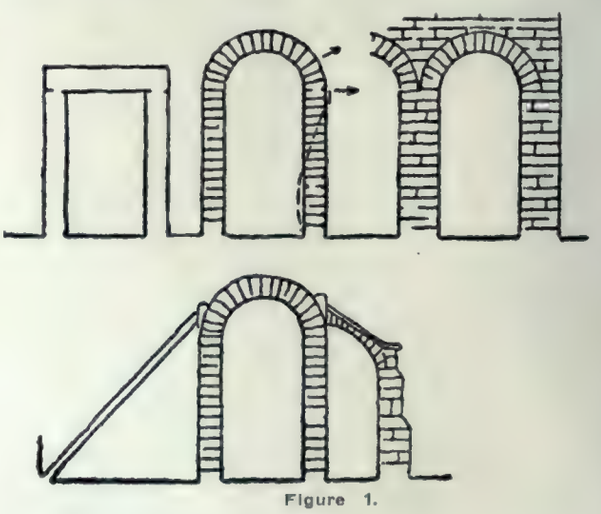


Figure 1.

character and may be traced back to its simple utilitarian origin.

The building grew as a plant grows. It was not all planned beforehand on paper to the last detail, with malice aforethought, like modern buildings. The master builder lived on the works where he was able to take advantage of every unforeseen circumstance that arose and apply new ideas that came to him as the building progressed.

A large measure of the distinction that attaches to the result is due to the shrewd common sense and orderly thought of the "master maker of churches" and to the structural devices that necessity forced him to adopt in order to hold the building intact.

An architectural "style" is very often spoken of as if it were a question of columns and capitals and moldings. There are many writers who leave us with the impression that architecture and building are two different things, telling us much about the "orders" and "periods," but little about the mechanical problems and constructive

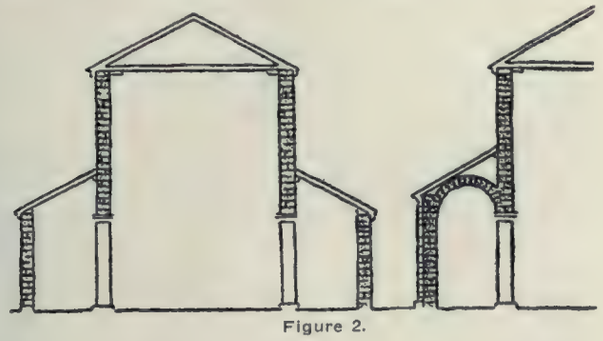


Figure 2.

methods involved, as if these were of minor importance. If, for example, we compare the outward aspects of the temples left us by the Egyptian and Greek builders, many points of difference may be noted; likewise we may have resemblances in details and in the disposition of the ornament pointing to influences extending from one to the other. But there was little difference in the constructive methods employed. On the other hand, there are constructive differences between all of those buildings and the churches left by the Mediæval craftsmen, differences in the use of materials and in the solution of mechanical problems, that place the latter in a class apart, a new principle, a new thought. And we have no sufficient clue to the radical differences in the ornamental "styles" until we have studied closely the development of construction, for in each case the ornament was a logical outcome of the structural principles employed. If the Greek builders had discovered and developed the new type of construction, even though they still remained pagans, their ornament would have undergone a complete and inevitable change. Incidentally, there is a grim, pathetic sort of humor in the effort that one finds here and there of an architect of the Renaissance struggling to redress a Gothic cathedral in a conventional garb of classic ornament. It is difficult to believe that men could have so little understood the real points of difference. The result always looks, as some writer has put it, "like the dead branch of a tree suspended among the living branches."

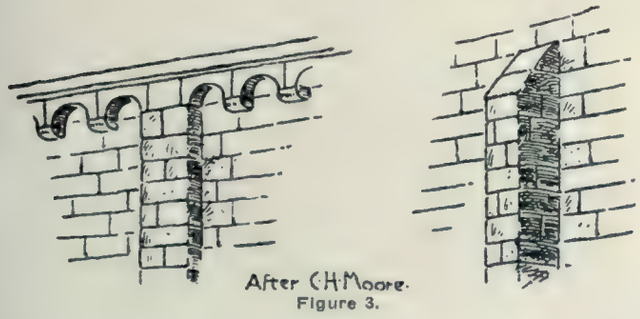


Figure 3.

This last sentence describes in a few words the essential differences. In all that preceded Gothic work the principle may be stated as dead, inert, inactive; in Gothic work it may be called alive, active. Constructively, the point may be illustrated by the simple pier and lintel, as shown in Fig. 1. If a horizontal is placed upon two verticals it is readily seen that there is nothing involved beyond the downward weight of dead material. The uprights must be sufficiently strong to support this weight. Of such character was a Greek temple with its wooden roof. But if an arch is built over the opening between the two uprights another problem must be faced, for an arch exerts a horizontal thrust or pressure as well as a downward weight. It brings to the problem the element of unrest. If the arch is not securely braced or held in place it will spread outward, somewhat as indicated by the dotted line. The Romans held their arches and vaults intact by so building them that the thrust would always be overcome by a dead weight of material.

Now in direct contrast to this inert principle is the method so largely employed by the builders of the North. In fact, it is so primitive and obvious in its idea that none but simple-minded stonecutters would ever have puzzled it out. Why not securely brace the thing from the outside? And so in doing that which was most simple and logical, best adapted to the constructive problems that arose, they created a new style in architecture. Simple as the idea seems, however, it took many long years of patient work, many experiments, often disastrous, before it was perfected; for it leads to the active principle of construction, the nicely calculated adjustment of one thrust against another. A cathedral is no mere mass of stone; it is a veritable organism, alive with energy, pushing, straining. "Hold steady," one member says to another. "If you fail me we all go down together"—and so, pushing this way and that as the builders disposed,

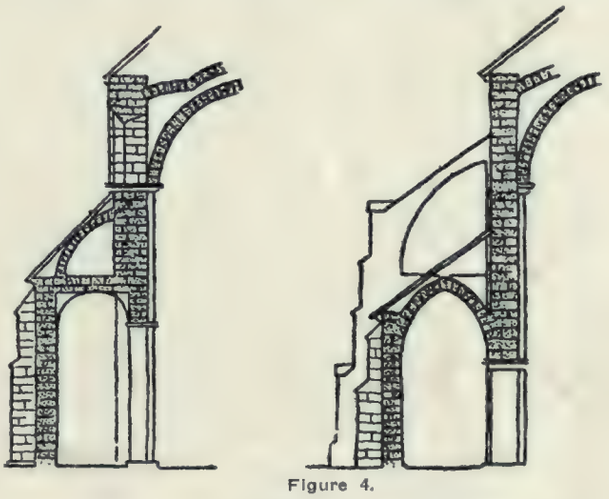


Figure 4.

the fabric has been held intact for seven or eight hundred years. The modern engineer can figure on paper exactly how it was done; but those men worked it all out through dearly bought experience in handling stone. There were many experiments and discouraging failures; but they dared to try, and try again, until the whole system stood complete. Applied to an arch the idea is of course inadequate; it was only when churches were built throughout with stone that the development of the outer bracing occurred. And in the perfection of the idea, what do we find? Essentially this: A vast, immensely heavy, vaulted roof of stone poised high in the air upon slender piers, the powerful side thrusts of the vaults caught on the outside by flying buttresses and transmitted to other buttresses with their feet securely braced at the ground. There is no use for walls; the space from pier to pier is filled in with glass. One is amazed at the very thought of such a daring concept of a building. Patience and brute strength were sufficient to build the temples of Egypt; but here are men playing with the laws of gravitation. Surely it is interesting to trace some of the steps in such development.

The earlier churches were built with wooden roofs over both nave and aisles (Fig. 2). Constructively, they presented few difficulties; their walls were heavy with small windows above the lean-to roof of the aisle, with

columns carrying longitudinal arches to separate the nave from the aisles. The first efforts of the builders to vault their roofs with stone were in the aisles where the vaults were comparatively small and exerted very little pressure. But the pressure of a vault is steady and persistent; so the outer wall was strengthened with a simple pilaster (Fig. 3). In time this developed into a real buttress of more pronounced form. Now the point to be noted is that we may already tell from the exterior of the building something of its interior construction, whether its

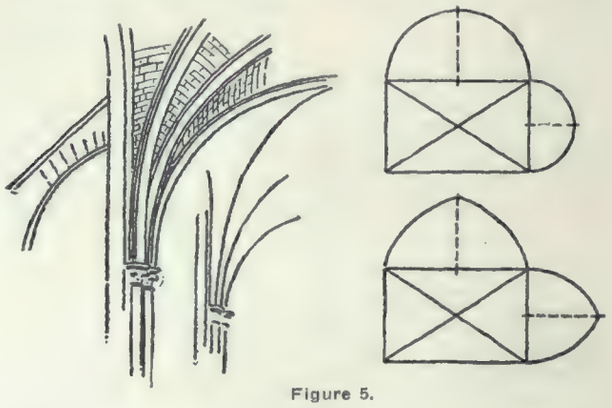


Figure 5.

roof is of stone or of wood. But this, of course, is a long way from that system which we know as Gothic.

It was when the builders sought to discard the wooden roof and vault the larger expanse of the nave that the complications began. It may be presumed that the step was taken primarily to give a more enduring form to the building, for we know that the wooden roofs were often destroyed by fire or in other ways. The early struggles of the builders to grapple with this new problem afford sufficient material for a book of intense interest. There are numerous ways in which a vault of stone may be constructed; but the subject is one of too technical a nature to follow here. In their early efforts the builders threw strong supporting arches across the nave and built vaults of the old Roman form between the arches. To strengthen the walls against the arches on the outside, buttresses of the pilaster type indicated in Fig. 3 were built; but in later years these were found to be insuffi-

Figure 6.

cient. The roofs threatened to fall and another type of bracing had to be devised (Fig. 6). Another experiment is shown in Fig. 4, one of the abbey churches at Caen. Here the walls are very heavy and the window openings are still small. In this church one finds an apparent clumsiness in the workmanship, too; but these men were feeling a way into new and undeveloped principles. They had no reference library to turn to; no collection of casts, photographs and picture post cards to help them. They were thrown upon their own resources and inventive skill. The roof of the aisle was raised enough to enable them to construct a long half-barrel vault against the outer wall to transmit the thrust of the big nave vault across the aisle to the strong buttresses and thence to the ground. Time showed this to be another mistake, for the vault over the aisle is too low to catch the full force of the pressure from above.

But about this time necessity compelled these persevering workers to complete another important structural device without which, even to this point in fact, progress would have ceased. It must be understood that to build a vault of stone, of the Roman type, a very expensive and a complicated framework of wood is necessary. Furthermore the vault when completed is very heavy and unwieldy, exerting powerful side thrusts. Again, with Roman mortar the vault was practically a solid when completed, and we know that the Mediæval builders had no such mortar; it may be that the secret was lost. So they attacked the problem in a different way, and after many experiments devised a skeleton of stone ribs into which the roof proper was fitted and upon which it rested.

Figure 7.

And with this new device in hand they again forged ahead to the perfection of their system. The advantages were many, economically and structurally. It did away with much of the expensive preliminary work in wood, strengthened the ribs of the vault and divided the roof into sections so that a weakness in one part could be repaired without affecting the rest of the vault, it greatly diminished the outward pressure, and, perhaps most important of all, the skeleton frame of ribs, by sustaining the weight of the vault, enabled the builders to distribute the weight and the thrusts to definite points where they could deal with them in the most effective way (Fig. 5).

Now, after more than one roof fell in from insufficient external support, the next step was to frankly adopt the primitive idea noted in Fig. 1, push above the roof of the aisle and throw a flying buttress up against the point where the pressure of the big vault was strongest. There was no precedent for such a unique constructive device; but it is ever a mark of genius to dare that which others hesitate to do because no one has ever done it before. They seemed to give no heed to the odd appearance that such a feature would inevitably give to the exterior of their buildings; it was necessary for the stability of the

structure and that was reason enough for employing it—and therein is the abiding lesson of Gothic architecture; the craftsmen always accepted without reserve the clue that sound construction offered them, giving to each feature such beauty as they could. In later years more sophisticated architects, hidebound to the "true style" and the "five orders," deplored all of the above as a relic of barbarism and diligently strove to hide their construction. Not so the Gothic builders; once established the flying buttress was seized upon joyfully and given endless variations.

On its first appearance it was treated much as if it were a part of the roof itself (Fig. 6). Then the forms changed; a pinnacle was added—for beauty? Indeed no; for weight at a point where weight was needed. Again they accepted the clue and the pinnacles sprang upward into countless beautiful forms. The top of the buttress was scooped out to conduct water from the main roof, and a spout naturally appeared to throw the water away from the building in order that ice might not form on the walls. This feature in turn became a source of joy to the stone carvers and was wrought into all manner of fanciful gargoyles (Figs. 7 and 8).

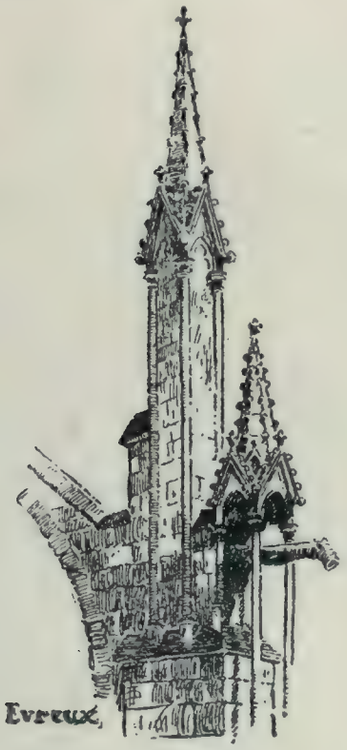


Figure 8.

Constructive logic developed another feature that is always associated with Gothic architecture—the pointed arch. Its origin, at least with the Mediæval builders, was not from æsthetic motives; clear-headed common sense brought it into general use. And here again it was a question of vaulting. A round arch vault has a very powerful side thrust; and moreover it will be noted from Fig. 5 that it is unsuited for the vaulting of oblong areas. As the height of a round arch is necessarily governed by its span, difficulties are presented which are done away with when a pointed arch is used. In the intersection of two pointed vaults the heights can be adjusted at will regardless of their respective spans. Once in use the pointed form of opening then extended to the windows and doors of the church.

With the pointed vault, the skeleton frame and the buttress system, the new constructive principle involved is apparent. It was not in those features alone, however, that the genius of the builders appeared. In the same logical way the west front was developed from a bare wall with simple doors and windows to the magnificent portals of Rheims. The spires of Chartres, before which one feels like taking a new grip of life, arose through many experiments from a simple belfry roof. And within the church, what one might call the nervous system of the thing is so organic that a near-sighted man may hasten to an examination of the base of a pier and know almost as much about the character of the structure above as the rest of us. For every molding and rib of the huge skeleton is articulated through the piers. Indeed, the pier seems more like a bundle of withes bound together than a single piece of masonry. And as the window openings were enlarged the glass workers filled the space from pier to pier with that hopelessly beautiful wealth of color, most of which, alas! has been shattered and destroyed. With an assured construction the stone carvers multiplied; from bottom stone to topmost pinnacle they wrought with a fertility of invention and imagination that never ceases to excite our wonder and admiration. In fact, there came a time when they were lost in the bewildering maze of their own fancies and staked their skill against the material in which they worked; it seemed more like lace on a delicate tracery of cobweb than stone. And therein came the inevitable decline. For the very life and vitality of a designer's work ebbs away whenever he turns from constructive problems and endeavors to create beauty for its own sake.

IT IS NOW POSSIBLE to melt wood by heating it in vacuum, the product being a hard homogeneous substance that apparently has an industrial future before it, says the LOS ANGELES (Cal.) TIMES. Messrs. Bizouard and Lenoir, of France, after a year's experimenting, solved the problem of fusing wood, and their work has been taken up by others.

A metal receiver, a sort of boiler having a double bottom through which super-heated steam passes, is filled with bits of wood; it is closed by a lid similar to that used in autoclaves, and provided with a tube and stopcock communicating with an apparatus for exhausting the air.

When the wood thus kept in vacuum is heated above 284 degrees F. the water and other volatile substances are given off first, and are drawn off by means of the exhausting apparatus, after which the heating is continued for about three hours. Then there takes place a complex series of reactions and phenomena analogous to those that accompany the distillation of wood in a closed vessel, and in this way all the so-called pyrogenous products are separated; these, in turn, are drawn off, condensed and separated so that they may be utilized commercially.

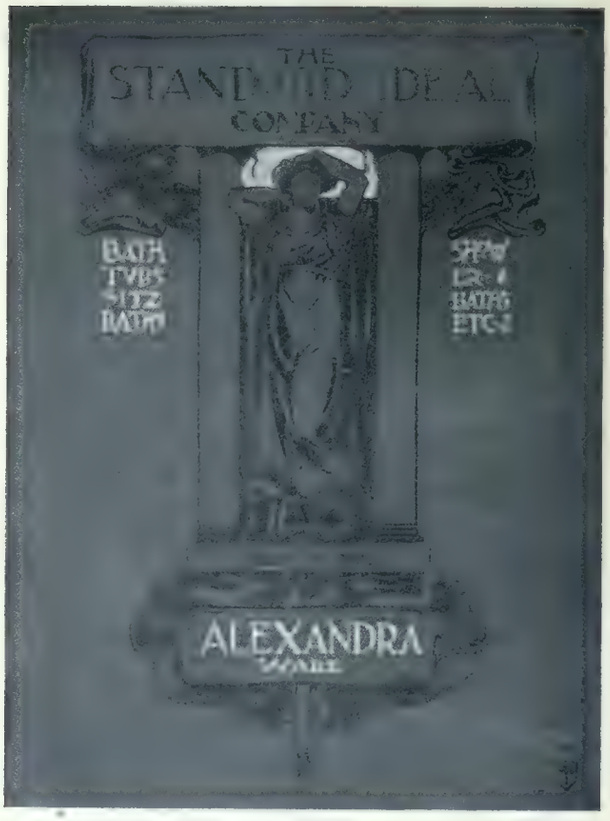
Then there remain in the receptacle only the fibrous skeleton of the wood and the mineral salts, which, taken together, constitute a fusible mass. This is allowed to cool slowly, out of contact with the air, and then placed in a second boiler, which, after the air has been exhausted, is filled with nitrogen under a pressure of 1.5 to 2 atmospheres.

The whole is heated to 1,500 degrees F. for two hours, and at the end of this time, the wood is melted into a homogeneous, hard mass which may be easily cast and molded into all sorts of shapes, and by adding preservatives to it during the melting process it may be rendered practically indestructible.

THE EXECUTIVE of the Ontario Good Roads Association have decided to hold the annual Good Roads Convention in Toronto on the 2nd, 3rd and 4th of March. The sessions will be held in the county buildings. All county and township councils will be asked to send delegates, also the granges and other farmers' associations, and the boards of trade.

PRIZE AWARDS IN COVER COMPETITION.—Successful Designs for "Alexandra" Ware Catalogue Cover Conducted by the Standard Ideal Co.—Designs Submitted Considered Generally Creditable.

WE REPRODUCE HEREWITH the successful designs in the recent competition conducted by the Standard Ideal Company of Port Hope, for a front cover for a new catalogue they are issuing devoted to their "Alexandra Ware." This competition was announced in November CONSTRUCTION, and provided that the designs should be suitable for a catalogue 9 by 12 inches, and that they should be mounted on cardboard 15 by 16 inches. Each design should be such as could be



First Prize—M. McLeish, 5 Beaver Hall Square, Montreal.

reproduced by the three color process. It provided further, that the general outlines of the design should be bold in character, so that they could be reproduced for use in smaller size for a catalogue or for pamphlets. An important point that each contestant was required to take into consideration was that the word "Alexandra" should be designed in special characters and should be given prominence, as it was the intention of the company to use this special wording in all printed matter referring to "Alexandra Ware." Another provision was that all designs should bear sufficient originality to avoid any similarity to designs that had been used or may have been in use at the time, by manufacturers of sanitary ware or any other product.

Three prizes were awarded: First prize, $50; second prize, $25; and third prize, $15.

It was required that all those who wished to enter the competition, should notify the Standard Ideal Company, at Port Hope, of their participation in the competition, not later than December 15, and further, that all designs should be delivered at the Toronto office of this company, not later than December 31. There were twenty-five notifications of intention to participate, and nineteen designs were finally submitted before the appointed time.

As a rule, the designs show a very fair study of the subject in hand, and, while they were not what could be expected from commercial artists, as executions in commercial work by architectural draftsmen, they were considered very creditable. Most of the competitors adhered very closely to the requirements of the competition.

The designs were displayed in the rooms of the Ontario Association of Architects, and the prizes were awarded as follows: First prize, M. McLeish, 5 Beaver Hall Square, Montreal; second prize, Hope Stewart, 1016 St. Urbain street, Montreal; third prize, Hon. C. Bekett, Hamilton, Ont; honorable mentions, Arthur J. Everett, 32 Grove avenue, Toronto; Arthwell Martin, 59 Yonge street, Toronto.

We regret very much that it is impossible for us to reproduce these designs in their original colors, as the plain black half-tone does not in any way do them justice.

The first prize design was black, bronze and white, on an olive green background. The second prize design was

Second Prize—Hope Stewart, 1016 St. Urbain St., Montreal.

in black, red and white, on a grey background. The third prize design had a green and gold border, green and gold trade mark, with lettering in blue, green and gold on a grey background. The design of Arthur J. Everett, Toronto, given honorable mention, had a green border, with lettering in black and red, trade mark in green, yellow, red and purple, on a background shaded from white at the bottom to a buff tone at the top. The design of Arth-

well Martin, Toronto, given honorable mention, had white and black lettering, with shaded brown panels and a border of purple and gold on a background of white.

Third Prize—Harold C. Beckett, Hamilton, Ont.

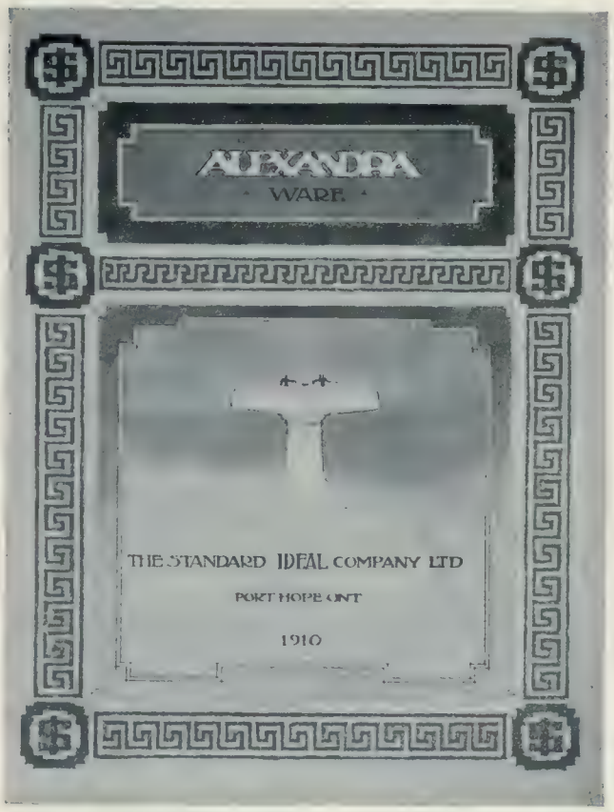
The decision of the judges was influenced by the fact that it was a catalogue cover design that was required,

Honorable Mention—Arthur J. Everett, 42 Grove Ave., Toronto.

and, although many of the designs submitted, from the artistic point of view, were excellent, the prizes of necessity, were awarded to those which were best suited for the purpose. The judges were as follows: Geo. W. Gouinlock, O.A.A.; John M. Lyle, T.A.C. and A.L.A., F. S. Baker, F.R.A.I.C., O.A.A., and F.R.I.B.A.; H. T. Bush, president of the Ideal Company, and the editor of CONSTRUCTION.

The Standard Ideal Company is to be complimented upon this innovation, and it is to be hoped that other manufacturers will follow their lead. We are satisfied that with each competition, the interest and the efficiency of architectural draftsmen in commercial design will be increased.

A DESPATCH FROM MEXICO CITY states that one of the most important discoveries which has been made in many years is the recent unearthing by Professor Ramon, Mena, the noted archæologist of Mexico, of the ancient Texcocab city of Otumba, which is located about five miles from the present city of Otumba and about fifteen miles from San Juan to Teotihuacna. Two houses



Honorable Mention—Arthwell Martin, 59 Yonge St., Toronto

were unearthed, the first of which is of stone, with the stone walls, or what is left of them, about 6 feet in height. The other house, probably the residence of some priest of very high rank, was of cement; floors of cement and walls of cement, the latter being frescoed in red and blue—the whole being in a perfect state of preservation. This house contains three rooms and a cellar. The cellar also contains several rooms, all with floors of cement.—CEMENT AGE.

AT THE ANNUAL MEETING of the Quebec Branch of the Canadian Society of Civil Engineers, held recently in Quebec City, the following officers were elected for 1910: President, Capt. A. E. Doucet; secretary, P. E. Parent; councillors, Messrs. Valles. O'Donnell, Decary, E. A. Hoare and A. Leoford. After the meeting the members repaired to the City Hall. where they were entertained in the office of Mr. Leoford.

BOOK NOTICES

LIGHT AND HEAVY TIMBER FRAMING MADE EASY. By Fred. T. Hodgson, F.R.A.I.C. Over 350 pages, fully illustrated, large mo. cloth binding. Published by Frederick J. Drake & Co., Chicago, Ill. Price $2.00.

The author, who is the editor of the NATIONAL BUILDER, has, in this work, as in his previous books, taken up his subject in a most thorough and comprehensive manner. Framing in nearly all its branches is treated in a plain, intelligent manner, and the various modes of building and preparing timber are described, with a clearness and simplicity that makes his volume of great value to anyone interested in the work of this character. Apart from the easy system of balloon framing, the work explains the methods for taking hewn timber out of "wind," hewing, counter-hewing, sizing, boxing, drawboring, gaining, mortising, tenoning, kerfing, splicing, and all other details in connection with timber framing in barns, bridges, centers, shoring, needling, groins, timber houses, churches, spires, towers, factories, warehouses, and all other similar works. The principal object of this book is to elucidate the principles of heavy framing, a liberal space being devoted to designs in timber work of all kinds, including roofs, domes, framed walls, bridges, towers, centre spires and other work of a similar nature. All of the numerous types of joints employed in wood work, either heavy, or of the balloon or scantling type, of the latest and most approved form are clearly described, and illustrated. In the examples of balloon framing shown, special effort has been put forth to present the reader with the results of experiences which have proven to be the best for the purposes to which they were applied. Regarding heavy timber framing the author has followed the best known methods, to which he has added the results of his own experience of more than thirty years in the designing and erection of heavy structures in wood. The work is illustrated with over 400 examples of framing of all kinds; and the text is printed in a clear and readable type.

THE "PRACTICAL ENGINEER" POCKET BOOK AND DIARY FOR 1910.

Compiled and published by the Technical Publishing Company, Limited, 55-77 Chancery Lane, London, Eng. Cloth, price. 1s. net. Leather. gilt with Diary on ruled section paper, 1s. 6d net. Postage extra.

The need for a reliable reference manual and convenient form of record, in engineering work, is most admirably met by this handy little volume. It contains a wealth of carefully compiled data and information, dealing in a concise and comprehensive manner, with practically every phase of mechanics, motive force, pressures, hydraulics, electricity, transmission, heating surface, radiation, ventilation, construction, materials, weights, volumes, areas, and a multiplicity of other subjects included in the field of engineering activity. In undertaking this volume, the publishers' aim to produce a book that would serve its purpose to the fullest extent, has met with every success. The text of the previous editions has been completely revised, and the work brought up to a higher plane of usefulness, by additional information, comprising, among other things, notes on fuel testing, condensers, friction of air and water in pipes, alloys, table of properties of metals, pyrometry, suction gas producers, emery grinding, etc., etc. Of interest to archtects is the data relating to reinforced concrete, tensile and compressive strength of materials, floor and roof loads, as well as many of the numerous tests and tables found throughout the volume. The book is a splendid time saver in either the field or shop; the subject matter is carefully indexed to admit of the quickest reference; and although the text contains approximately 700 pages, the manual is of a convenient size to fit readily into either the coat or hip pocket.

NEW EASTERN SALES MANAGER

THE STANDARD IDEAL COMPANY, Port Hope, Ont., has appointed Mr. John J. Laferme, F.I.S.E., who, until recently, represented the company's interest in Europe, as Eastern sales manager for the Dominion, with headquarters in Montreal.

Mr. Laferme assumes his new office with a broad experience in the sale and installation of sanitary fixtures and equipment, having been in charge of the foreign sales department of the Standard Sanitary Company of Pittsburg before joining the Standard Ideal. In addition to being a Fellow to the Institute of Sanitary Engineers, of England, Mr. Laferme has also qualified himself from

John J. Laferme, who has been appointed Eastern Sales Manager for the Standard Ideal Company, with headquarters in Montreal.

an architectural standpoint by several years' study in Paris, and is, therefore, able to offer invaluable assitance and co-operation to the architects in the East, in specifying modern plumbing fixtures, and carrying out the sanitary features of a building. Mr. Laferme has had conferred upon him by the French Government the distinction of "Officier d'Academies," for the valuable service which he rendered to that country and the United States at the Paris Exposition in 1900.

The sales department of the Standard Ideal Company in Paris, under a capable head, will continue to look after the interests of the company in continental Europe.

SEAMEN, KENT EMPLOYES DINE

THE SEAMAN, KENT COMPANY, manufacturers of the popular "Beaver Brand" hardwood flooring, are at present formulating a co-operative plan for the benefit of those who have been in their employ for a certain period. An announcement to this effect was made by Mr. F. Kent, at the annual banquet recently tendered by the company to its employees, at Meaford, Ont. The affair was a notable one, as indicating to an unusual degree, the strong feeling of harmony which exists between the company and its men. Over one hundred and fifty of the working and business staff sat down to dinner, and appropriate toasts, songs and speeches, in capable hands,

contributed to the zest and enjoyment of an evening that is long to be remembered. Among the invited guests who honored the occasion with their presence were: Mayor Clarke, Major Cleland, and several prominent members of the official and business life of Meaford.

The many excellent qualities of "Beaver Brand" flooring and the uniformity of output of the Seaman, Kent factories, is due in no little measure, to the fact that the company has at all times succeeded in retaining in its employ a full staff of capable and efficient hands. The new co-operative policy announced by Mr. Kent, which is to benefit all who have been in their employ for five years or more, is to go into effect some time this year. It is but another evidence of the warm interest which the company has always taken in the welfare of its workmen, and is something that can well commend itself to other Canadian manufacturers.

CALENDERS

"CONSTRUCTION" is indebted to Francis Hyde and Company, Montreal, the well-known dealers in contractors' and builders' supplies and equipment, for one of the handsomest calendars which the firm is mailing to its patrons and friends. This splendid art offering, entitled "The Parisenne," is reproduced from an original painting exhibited at the Paris Salon in 1906, by Jean Sala, a Spanish artist, where it won most favorable approval as a distinguished example of French figure painting. The picture tells a story of a fair demoiselle starting from her home and the collie who hopes to accompany her. The thoroughbred creature waits the call of her voice. Every muscle is quivering with supressed excitement, and his wistful eyes are fixed on those of his mistress with that dumb looke which is more elouquent than words. The girl knows her power over him and for the moment, in a spirit of mischief, seems to invite him with look and gesture. The very figure is expressive. From the tilt of the hat, through the turn of the head on its slender neck, the poise of the trim shoulders and the supple grace of the body, there flows a charm of movement as eloquent as it is full of sprightly life. Not less attractive than the human interest of the picture, is the handsome composition of form and color which the two figures make against the background. Francis Hyde and Company are to be congratulated on the selection of their subject, as it makes a most acceptable wall piece for either the office or the home.

"AT THE CLOSE OF DAY," is the title of an especially fine calendar to reach our office, from The Sand and Dredging, Limited, of Toronto. It is a color photographic reproduction from an original painting by Jean Beauduin, a native of Belgium, who in 1893 won the medal of honor at the Paris Salon. It depicts an eventide scene in Flanders, where a peasant lass, seated on a stone bench on the hillside above her home, snatches a moment relaxation after a hard day's work. There is a shade of pensiveness in the maid's face, which takes a strong hold of one's feelings, and a peculiar picturesqueness in sturdy masonry and house-tops and hill beyond, which gives a striking insight into the simple and quaint surroundings of Belgium peasant life. Mr. Beauduin's work has attracted considerable attention from the critics, because of its luminosity of color and intensity of subject; and "At The Close of Day" is regarded as one of his best paintings. In the selection of this calendar, the choice of The Sand and Dredging, Limited, could hardly be improved upon, and the subject is well worth framing, after the date pad has served its usefulness.

WE ALSO DESIRE to thank the Toronto office of the Crushed Stone, Limited, for being remembered in the distributios of their annual calendar, which we might say is equal or superior, to any of the many excellent offerings of the character which the company has made in the past. The subject, that of a beautiful young woman, apparently making afteronon calls, is well chosen, and the color composition interesting as a study of delicate tints. It is something which must be seen to be appreciated. and those whose names are on the company's mailing list are indeed fortunate.

A NEW SYSTEM OF REINFORCED CONCRETE construction in which beams and girders are eliminated, and the walls and columns carry continuous reinforced floor slabs, is being introduced by Francis M. Burton, Chicago, the architect for the Royal Insurance building. The columns are formed of four angle irons which are spaced, bolted and hooped together. The columns are three storeys high set into bases which are lined up 16 feet from centers, at the height of each floor carrying rods radiate from each column and extend to the full width of the span to the next set of columns and properly anchored distributing rods are then placed over the tension or conveying rods. The columns are either wire bound or hooped. The false work consists of forms for the columns, which are enlarged in the form of an inverted bell just below the false work upon which the floor slabs are formed. Where the outside walls are in place two storeys high the concreting can be done on both storeys at the same time.

THREE HUNDRED AND SIXTY-SIX new corporations, with an aggregate capitalization of $119,324,875, were organized in Canada during the fiscal year ended March 31st, 1909, while the capitalization of existing companies was increased by $72,293,000.

THE KAISER'S NEW PALACE which is now being erected in Posen at a cost of $7,000,000, follows, in style, the mediæval fortress with characteristic ramparts, bastions and towers. It was designed by Frans Schwetens, and will be shortly ready for occupancy.

SATISFACTION GUARANTEED

Elevator Successfully Tested

The F. J. Castle Company, Limited, Wholesale Grocers, Ottawa, have just had installed in their building at 53 Queen street, which they formerly occupied for their wholesale grocery business, and which they are now converting into a first-class office building, one of the Parkin Elevator Company's high class, high speed, direct connected, electric passenger elevators.

On Saturday afternoon last, a most successful test and demonstration took place in the presence of the Messrs. Chamberlin & Gardiner and their expert, one of the leading electricians of the city; all of the various safety devices with which this installation is equipped were put to the test, and it was shown that they were all available, in the event of an accident occurring, for the absolute protection of occupants of the car, the automatic limit stops and slack cable devices working perfectly, as also did the speed governor and compression safety device, when by absolutely releasing the car, it was brought to an easy and complete stop in about a six-foot drop, and simultaneously disconnecting the current and stopping the winding gear; within a period of ninety seconds; the safety was released, power was connected, and the car was again in operation. Mr. L. Fradenburgh, one of the Parkin Elevator Company's experts, and who is stopping at the Windsor Hotel, was in charge of the installation.

ELEVATORS

INDEPENDENT PRICES

Electric, Hydraulic, Belted and Hand Power

The Parkin Elevator Co., Limited

Head Office and Works : HESPELER, ONT.

TORONTO OFFICE: 18 Toronto St.

MONTREAL OFFICE: Eastern Townships Bank Bldg.

WINNIPEG OFFICE: 412 McIntyre Bldg.

Building Statistics for January.

THERE IS EVERY INDICATION that Canada is just entering on the greatest period of building activity the country has ever experienced. Judging from the pace established at the outset, the volume of work to be undertaken will practically double that which was recorded in the remarkable year just past. January completely submerged all previous high water marks for that month, and all sections between orient and occident, and from boundary to hinterland, went flying past the boards as regards previous operations at this time of the year.

The average gain for the month, as based on comparative figures supplied CONSTRUCTION, was 94 per cnt. and of the nineteen cities reporting, only two show a falling off. These losses are noted in the case of Brantford and Sydney, but the amounts recorded for both last year and this, in either instance, are of such small proportions as to really denote nothing except a usual condition of mid-winter inactivity.

St. John, N.B., with a gain of 860 per cent., has the biggest increase for the month. Regina has the second highest standing, with an advance of 719 per cent. and Calgary comes next with a gain of 319 per cent.

The largest volume of work, however, was registered at Toronto, although Vancouver proved herself a most worthy competitor for first place in this respect. Both of these cities exceeded the six hundred thousand mark, which is almost double the amount recorded last year, the increase in either case being 79 per cent. and 72 per cent. in order named.

In fact, all cities, both large and small, forged ahead most substantially. Winnipeg over-shot last year's mark for the month, to the extent of 264 per cent.; Victoria annexed a gain of 65 per cent.; while Montreal came forward with an advance of 32 per cent. It might be mentioned in this connection, that Winnipeg, during the month, refused permits aggregating $875,000, owing to recent changes made in the building by law regarding the first class fire limits, apartment houses and surface foundations. All of these permits will be applied for again as soon as plans and specifications have been altered to meet the new requirements, so it is quite evident that this city is preparing to hold its own as regards building expansion during the coming year. Montreal and Victoria also, it might be added, have most excellent prospects immediately ahead, particularly in the way of important office and commercial buildings.

Other Western cities besides those already mentioned, to show gratifying increases, are Edmonton, which notes an increase of 117 per cent., and Lethbridge where an advance of 270 per cent. has been recorded. Prince Albert, but as yet an embryo town, indicates by an amount of $16,175, that the place is marching onward in a promising manner, especially so when one considers that in the same period in 1909 not one single project in the way of new buildings was undertaken.

In Ontario, besides Toronto's gain, other advances noted are: Ottawa, 141 per cent.; Peterboro, 210; London, 153, and Fort William, 16 per cent. Windsor neither advanced or fell back, but simply broke even, registering the same amount as was recorded in the corresponding period of last year.

As for the East, this section of the country got away with a much better start than was experienced last year. Halifax, in attaching a gain of 74 per cent., finds herself in the very opposite condition from that which obtained at the beginning of 1909. This increase, together with the splendid advance made by St. John, precedes what is predicted to be one of the most active periods of development the East has ever enjoyed.

Sizing up the situation in general, the prospects are most brilliant. All sections send in promises of big things for the immediate future, and every sign and token indicates that within the next sixty days every branch of the building trades will be moving forward in a manner never experienced before.

	Permits for January, 1910.	Permits for January, 1909.	Increase, Per cent.	Decrease, Per cent.
Brantford, Ont.	$2,350	3,640	.....	35.43
Calgary, Alta.	106,500	21,650	391.91	.....
Edmonton, Alta.	44,090	20,240	117.83	.....
Fort William, Ont.	36,890	17.050	116.36	.....
Halifax, N.S.	30,650	17,545	74.69	.....
Lethbridge. Alta.	51,015	13,770	270.47	.....
London, Ont.	61,810	24,385	153.47	.....
Montreal, Que.	159,510	120,120	32.79	.....
Ottawa, Ont.	57.650	23,900	141.21	.....
Peterboro', Ont.	7,150	2,300	210.86	.....
Prince Albert, Sask.	16,175	.....	.....	.....
Regina, Sask.	24,585	3,000	719.50	.....
St. John, N. B.	24,000	2,500	860.00	.....
Sydney, N.S.	1,200	2,300	.....	47.82
Toronto, Ont.	682,098	380,025	79.48	.....
Vancouver, B.C.	631,311	365,630	72.66	.....
Victoria, B.C.	128,985	78,080	65.19	.....
Windsor, Ont.	5,550	5,500	.....	.....
Winnipeg. Man.	183,400	50,300	264.61	.....
	$2,254,919	$1,153,735	94.34	.....

Technical Education.

TECHNICAL EDUCATION is at present, in Canada, a problem that we in our great measure of development, must solve, and is one in which architects and contractors have reason to take especial interest. The extent of the usefulness to himself and the community of our newly adopted citizen, demands it and the proper utilization of the talents of our own young Canadian, renders it most necessary. Germany is the greatest industrial country in the world, despite the fact that her area is small, her natural resources limited, and her population large. The secret of Germany's industrial supremacy, is a perfect system of technical education. Her people are the greatest genuine producers in the world ,and she is, therefore, enabled to produce a better quality of manufactured product at a lower cost than can any other of the great nations.

Canada, it is true, is an agricultural country and it may be argued that our first and last duty should be to keep our citizens on the farm, and not through the establishment of technical schools, attract them to other occupations. In the first place, this is impossible, and in the second, it is impracticable, for the reason that it matters not how attractive agricultural life may be made, there are many men whom you cannot send to the farms. Then, again, we know that our agricultural greatness demands railroads, steamboats, agricultural implements, building materials, manufactured products of all sorts, and as a nation, we must endeavor to see that these are manufactured at home at as low a cost as the products that may be brought from abroad.

The farmer as a buyer, creates cities, cities consume the farmers' products, and it is in this manner that a country is made industrially rich, and less dependent upon the foreign market. We have in our cities to-day, thousands of capable young men who reach the age of maturity without having been trained for any trade or profession. Farm life does not suit them and their especial make-up would not suit them to farm life, and they float through life working first behind the ribbon counter, driving a bakery wagon, selling books, working as a factory hand, living on their wits or living by whatever occupation they are able to get, at a wage at the best 50 per cent. lower than that which is paid a mechanic. They must have a living, and they employ the most convenient means to secure it.

If these men had been rendered actual producers through a technical education, they would render twice the service to the country and their services would be of double value to themselves. It is discouraging to see the vast amount of American manufactured goods being sold in the West, despite the fact that it has been principally Eastern Canadian money that has made this country possible. The West is made up of people who come from almost every clime. They have come to Western Canada to make money, and the very atmosphere breathes "Get rich quick." The settler in the West has no sentiment. He went West to make money, and has no sympathy with the slogan "Made in Canada." He buys from the most convenient and cheapest market. So what is necessary for the Eastern manufacturer to do to secure the Western market, is first to make it more convenient for people of the West to secure his product, and secondly, through economical methods of manufacture and the thorough training of his workers, be able to produce as cheaply as his American competitor.

Technical schools will go a long way towards solving this problem, and there is no branch of our industrial life that will profit more materially through the establishment of a thorough system of technical education, than the building industry. Defective work in our buildings; bad carpentry, poor masonry, faulty plumbing and heating, together with the scarcity of trained mechanics in the building trades, all may be attributed to the fact that in our rapid growth we have neglected to an alarming extent, technical education. It is, therefore, the duty of every architect, builder and contractor, through their several associations, as well as individually, to give this timely agitation their fullest co-operation.

Report of U.S. Federal Bureau.

IN VIEW OF THE RECENT DECISION of the Ottawa Government to appoint a Commission to investigate what has been accomplished along the lines of technical education in various countries, the Report issued by the United States Federal Bureau of Education, giving the study of the apprenticeship system in its relation to industrial education, by Carroll D. Wright, president of Clark College, will prove of interest. Education by apprenticeship and education by schools has gone on for many generations side by side as two entirely distinct relative forms of education, and the new movements are concerned with bringing these two kinds of education together and making for them a new kind of education which shall train equally for skill and for intelligence. The substance of Mr. Wright's argument and findings is covered in what follows:

There are three methods of securing greater skill for industries. First, the apprentice system; second, trade schools; third, industrial schools. The old system of indenturing young men for industrial purposes was greatly modified by the introduction of labor saving devices and the industrial revolution of the nineteenth century. As, however, the need of skilled workmen still exists and the present system of trade and industrial schools has not proved altogether satisfactory in turning out practical, as well as theoretical workmen, some co-ordination is needed whereby the good of the apprentice system and the modern trade and industrial schools may be combined.

Trade schools have proved themselves inadequate, nevertheless, their power and influence must be recognized. The best equipped public industrial schools, however, have all the machinery and appliances for the instruction of students. In industrial schools as distinguished from trade schools the academic work is the more valuable because allied to industrial training.

Contrary to popular belief, the old system of apprenticeship now exists to a large degree in the United States, but is very quietly and rapidly giving way to the modern. This system varies with localities, but investigation has developed the fact that the apprenticeship system is a power to be recognized with and that it exists in all parts of the Union.

All but three of the States have enacted statutory regulations relating to the employment of apprentices, while the laws of 38 States provide that in addition to the trade, the apprentices must be taught the common English branches of education and receive such schooling as every youth entering business should have.

Trade unions are as a rule opposed to trade schools principally in apprehension that in strikes the apprentices might be employed as strike breakers. This prejudice is not deep-seated, however, as shown by the resolutions adopted by the 1907 annual convention of the American Federation of Labor. Everywhere it is beginning to be understood that industrial education does not injure those already engaged in industry and the antagonism is disappearing. When union regulations relative to the employment of apprentices do exist, they are often disregarded wholly or in part by both unionists and their employers, both of whom must realize that the effectual expansion of the system with an increase of skill and consequently of wages, must prove to their mutual advantage.

The proprietors of the industrial establishments at the present time are not blind to the necessity of training labor in their own works. There is hardly a manufacturing firm to-day, especially in the jewelry and shipbuilding trades, which does not have some form of apprenticeship whereby boys are indentured for a term of years to the trade. The point of consideration is to what extent do these systems meet the arguments advanced for the introduction of industrial education as a part of the public school system. All employers realize the value of such education and those who can afford it, prefer it to their own system. A careful investigation, however, shows a wide variance in their procedures. Some have no system, while the majority have a system of indenture for a term of years and a few have an elaborate scheme of training, comparing favorably with the best public training that can b afforded.

Careful selection of boys fitted for the particular work is the first step. They must pass also a physical,

mental and moral examination. Their rate of pay is determined beforehand and increased now and then for encouragement. The kind of work the boys do is varied, and their future is considered as well as the profits to be derived from their service. In brief, it is a shop course of study, much as any industrial school might be expected to have. Academic work to supplement the work in the shops is arranged for by nearly all the best concerns, and generally imparted by one of the engineering staff. In the case of advanced apprenticeships the boys are paid for their time. This is the essential feature of the modern apprenticeship system. The boys are encouraged to attend evening classes or take correspondence lessons, but investigation shows that this encouragement lacks definite results. The cause of this lack of interest shown by employers in following up the results of this encouragement, and in this respect the apprentice system, as now carried on, differs materially from the work done in the regular industrial schools.

Up to this point the argument has concerned itself with two phases of the apprentice system—one a definite and complete system, which may or may not be substituted for a trade school; the other an indefinite and incomplete system which lacks the fulfilling of a mutual obligation, which is very essential to a properly constructed apprenticeship course. Another type of apprenticeship now in existence is where the lad is indentured to one department only, there to specialize. The plan is popular because it enables the boy to receive higher wages and the employer to get more efficiency in a comparatively short time. As a rule, however specialization limits the capacity and narrows the mind. It is right as it secures special skill, but there should be something more in order to train the all-round man.

The demand for trade schools comes from employers who have no systematic, definite method of training their apprentices. These superintendents of industrial organizations who have this advanced type of apprenticeship, combining shop and academic training, do not feel that the local schools will meet the demand of their factories. This feeling exists very strongly among the managers of the various railroads which have adopted an apprentice system.

Let the Architect "Finish His Work."

AS TO WHETHER CANADA is to have an architecture worthy of the name in her future public buildings is something which at the present time lays wavering in the balance. It seems as though the stimulus in this respect, given by the Government some little time back, in holding a competition for the proposed Departmental and Justice Buildings, is now to be destroyed by setting aside the successful design and entrusting the planning and carrying out of this important project to the architectural staff of the Department of Public Works. When these buldings were first proposed, it looked as though Canada was about to adopt the more advanced methods employed by the progressive nations of the world in the erection of their public buildings; but a more recent announcement indicates that instead the Government intends to take a step which, if persisted in, will result in the development of a class of federal buildings which will place the standard of architecture in Canada in this respect on a plane far inferior to that which has been attained in other countries.

There is every valid reason why the Government should adhere to its original program, and not commit the serious blunder in this respect which in all likelihood it unconsciously invites. To enforce its intention to erect the buildings in question on its own accord would simply mean that the Government violates what was virtually implied and understood by the terms of the competition; and it would be difficult in the fact of this to conceive how any self-respecting architect could have confidence in any future project of the kind that the Government might advance. Thus the best professional service in this, and possibly future undertakings, would be lost to the Government, and the interest of the public would be sacrificed in consequence thereof.

The object of any competition is to bring forth the best talents, and obtain the highest results possible, by spurring men on to extra effort. Without some incentive, creative genius lies dormant. This was fully realized by Hon. Mr. Hyman, at that time Minister of Public Works, when in 1905 the buildings were first proposed, and this was the feeling in 1907 that instituted the competition which gave the Government the best which the collective architectural brains of the Dominion had to offer.

In view of this fact, and especially so, as it was with this understanding that a large number of men were induced to give their time, effort and study to something of national interest, the only fair, reasonable and honorable thing the Government can do is to retain the author of the successful design to carry the work through to completion. It is the author only who in full sympathy with his creation, can carry out the work in a manner that will give the building the individuality, and the artistic and utilitarian value, that such a structure should essentially possess. By developing the design on its own accord, or what would be far worse, to beg and borrow from the four prize designs, as it has announced it proposes to do, the Government would commit a rank injustice to the architects of the Dominion, and in all probability produce a structure belabored and mechanical in character, and more akin to an architectural ollapodria than to anything else.

The failure of the Government to recognize the more progressive method adopted by the United States, Great Britain, Germany, France, Austria, Italy and all other countries where art is encouraged, and where such splendid results are attained, is indeed to be deprecated; and it is sincerely to be hoped that the petition voicing the protests of the architectural bodies of the Dominion, against the proposed policy of the Government in the erection of the Departmental Buildings, will have sufficient weight and influence to deter the Government from taking this unfair step, and to induce it to carry out this work according to the terms of the competition as they were implied and understood.

These protests, it might be added, have the approval and support of the intelligent and broad thinking element of the lay public, which is in sympathy with the efforts that are being made by members of the profession, both individually and collectively, to raise the standard of architecture in Canada to a higher and more esteemed plane.

We believe that the slogan used by the Government in appealing to the electors in the last campaign to let the man at the helm of state "finish his work," might apply just as effectively in this instance. There is just as good or a greater reason for it, as architecture is an important work, a dignified work, one that mirrors more than anything else a nation's progress and culture, and one that is worthy of the broadest support and encouragement that any government can possibly bestow. Let the authors of the successful design "finish their work."

RENEWED AGITATION in support of the proposed Forth to Clyde Canal has been brought about in England and Scotland as the result of the report of the Royal Commission advocating the immediate State control, and upbuilding of Great Britain's inland waterways. This plan proposes neither more nor less than a 35-mile battleship canal between the Firth of Forth, via Stirling, Loch Lomond and Loch Long and the Firth of Clyde. By its consummation the shipping interests of the country would obtain an inland waterway across Scotland, 36 feet in depth and 65 miles in its total length, that would reduce all existing routes by from one hundred to six hundred miles. Engineers have figured that the work could be completed in nine years at an aggregate expenditure approximating $100,000,000.

FEDERATION WITH R.A.I.C.—New Proposal for Consideration of Provincial Associations. . .

RECENT DEVELOPMENTS indicate that the difficulties encountered in federating the several provincial architectural associations, into one great Dominion body, that will be representative generally of the profession in Canada, will shortly be overcome and that at last the efforts of the organizers and promoters of the R. A. I. C. will be realized. We have pointed out several times the effective work that could be successfully undertaken by a body that would be comprised of architects in every portion of Canada. We have further pointed out the many problems that the profession is confronted with in Canada at the present time, that cannot be consistently dealt with by any one of the individual provincial organizations. It seemed for a while that great difficulties were to be encountered and many stumbling blocks to be overcome, together with some apparently serious grievances of some of the provincial bodies, before the objects of those who worked earnestly and diligently for the consummation of plans for an efficient Dominion organization were to be accomplished.

However, at a joint conference held in Montreal during January, of representatives of the Ontario Association of Architects, and the Province of Quebec Association of Architects, a plan was drawn up to formulate a basis upon which federation of the several provincial associations with the Royal Architectural Institute of Canada could be brought about. This proposal will in due order be submitted to the various provincial associations, and, insofar as it apparently overcomes the differences of opinion that up to this conference had existed in connection with federation, it is altogether probable that it will meet with their unanimous approval.

In drawing up these suggestions, the conference aimed to fully conserve the interests of the representative provincial associations. The report is given in the form of nine clauses.

Clause 1 lays down the principle that a Dominion Institute of Architects must be composed of a federation of provincial associations, and not an affiliation of private individuals. The conference considered that some difficulty would be met with if it were to recognize architectural societies which were not provincial in their scope or nature, and further recommended the formation of such provincial associations in all provinces.

Clause 2 establishes the principle that all provincial associations be organized on the same basis as those mentioned, and that the examination qualifications be of a uniform standard.

Clause 3 aims to insure the autonomy of the provincial associations, and provides that nothing will be done to override their charter. The conference recognized that entrance to the provincial association must come first, and that upon their own shoulders must the onus be retained of upholding the standard of qualifications.

In Clause 4, provision is made for a certain uniformity of standard being upheld, throughout the Dominion and in order to insure this, an advisory board will be appointed by the Dominion Institute, whose duty will be to see that the examinations as set by the provincial boards, are of a satisfactory standard.

Clause 5 provides that membership in the Institute rests entirely upon membership in provincial associations, and that membership, therefore, in the latter will constitute "ipso facto" membership in the former. This is done in order to carry out the full spirit of federation, so that the Institute will be composed therefore, of every member on the rolls of the provincial associations. Provision is also made in this clause to protect the rights of the provincial associations, so that membership in the provincial association is necessary to constitute membership in the Institute, but the converse will not apply.

In Clause 6, provision is made to render the Governing Council of the Institute really a representative body of all provincial associations.

Clause 7 provides for the election of officers by the council, and not by individual members. The conference considered that these delegates or members of council were the proper ones to select the higher officers.

Clause 8 provides for ways and means to carry on the work in the Institute. The exact manner of apportioning the fee is open to discussion, possibly a per capita fee being the most satisfactory.

Clause 9 provides that the existing provincial associations favor federation on the foregoing lines, it is the intention of the conference to approach the executive of the Royal Architectural Institute of Canada, with the request that their charter be amended accordingly.

It is greatly to be desired that the provincial associations in Canada will look favorably upon this plan, and that the R. A. I. C. will appreciate the necessity of acceeding to their wishes by making the requested amendments to their charter.

A MODEL SCHOOLHOUSE. . . . .

AS INDICATING the attention which is being given to schoolhouse construction and the thought given to the health and comfort of the pupils, it is interesting to note the movement at present under way to erect in the city of Chicago a school building which will be a model in its way. The features of the school will be a bathroom, kitchen, dining room, ventilated cloak rooms, manual training benches in every class room and emergency exits for all rooms. The "typical classroom," as it is called, will be 22 x 33 ft. in size, and will have seats for 40 pupils. Each child will have an additional square foot of space and 10 cu. ft. of air more than is available for the child of the average classroom now constructed. The seats will be in five rows of eight each, and two sides of the room will have manual training benches with accommodations for 20 pupils at one time. The idea is to have one class of pupils reciting, while another of 20 pupils is working at the manual training benches. The cloak room will extend along the entire length of another side of the room, wilh sufficient vertically sliding doors thereto, so that all the pupils may get in the cloak room in 15 sec. The blackboard of each room will be of slate and in one piece.

The ventilating apparatus will be so constructed that the air will be forced into the room near the ceiling and forced out near the door, passing through the wraps of the pupils, so that they will receive a thorough airing. Every room will have emergency exits, with automatic locks, opening into the fire escape, or onto the ground, according to the location of the room.

The plans which have been drawn for this model school building call for a fireproof construction, the floor and wall beams being of steel with fire brick between.

PROSPECTIVE CONSTRUCTION WORK in Montreal includes three ten story buildings to be erected during the coming summer, within the immediate vicinity of the Post Office. The old Seminary property, which has been leased for a period of ninety years by the Grand Trunk Pacific, will be occupied by a ten story structure. The one on the opposite corner, the old St. Lawrence Hall landmark, will be replaced by another ten story building to be used by the Canadian Pacific for their down town offices, while the third skyscraper will be built on the same street directly opposite the St. Lawrence Hall by the Yorkshire Insurance Company.

COMPETITION FOR DESIGN FOR MEMORIAL TOWER.—
Canadian Architects and Draftsmen are Invited to Submit Competitive Designs for a National Memorial Tower to Commemorate the Establishment of Self Government in Canada.—A Great Patriotic Work.

A wise nation preserves its records, gathers its mun ments, decorates the tombs of its illustrious dead, repairs its great public structures, and fosters national pride and love of country by perpetual references to the sacrifices and glories of the past.
—JOSEPH HOWE.

IT IS THIS GREAT NATIONAL and patriotic spirit uttered so beautifully in these words of the great Nova Scotian that has served as the inspiration of the citizens of Nova Scotia in their determination to erect a National Memorial Tower to commemorate the one hundred and fiftieth anniversary of the origin of parliamentary government within the limits of the Dominion of Canada: a historical monument that will commemorate a national epoch of profound significance to every Canadian and to the people of the British world. As Canadians, we owe a duty to ourselves and still more to the Motherland, and to our successors, that we should in a befitting manner commemorate our priceless heritage.

With this patriotic object in view, the citizens of Nova Scotia have undertaken the erection of this Memorial Tower on a beautiful site of about one hundred acres of park land, donated to the province of Nova Scotia by Sir Sandford Fleming. No more entrancing scene could be imagined than that to be had from the top of the promontory, ninety feet above the sea level, upon which the tower is to be located. It will stand at a point which gives a clean sweep up to the head of the Northwest Arm and beyond, looking south, straight to the sea. When it is erected, the view from an altitude of nearly 200 feet will command a portion of the city of Halifax and will reveal the sea and land for many miles around.

Appreciating the patriotic character and national significance of the undertaking, the committee in charge have decided to give every architect and draftsman in Canada, who is a British subject, an opportunity to present a design for the structure, by placing the whole affair in the hands of the R.A.I.C., who will conduct a competition as per the conditions set forth herewith

It is certain that a subject of this character will appeal strongly to every Canadian architect, and though the work entailed will be small, merely the design, practically no planning, the honor of having executed the successful design will be such as to touch the patriotic pride of every architect in Canada, thus rendering the competition an extensive one.

CONDITIONS OF COMPETITION.

It is proposed to erect a Tower commemorative of the Federation of the various Provinces whereby the Dominion of Canada came into existence, in 1867.

View showing the exact location of the proposed Memorial Tower, giving a fair idea of the beautifully wooded site selected on the promontory at the narrow neck of the North-West Arm. The commanding position of the tower rising 190 feet above sea level is denoted in the illustration.

This Tower is to be erected on the North West Arm at Halifax, N.S.

The competition is open to Canadian architects and draughtsmen who are British subjects, and will be conducted as follows, by the Royal Architectural Institute of Canada:

1st. The official Provincial Association in each Province will invite its members to submit competitive designs for the Tower.

2nd. Each Provincial Association will then select the three best designs from those submitted and forward them to the Royal Architectural Institute, which body will make a final selection from the plans so submitted. Members of the Royal Architectural Institute who reside in a Province where there is no organized Provincial Associa-

Panoramic view of the North-West Arm, showing the City of Halifax in the background, and the 100 acre park donated by Sir Sandford Fle
will be noted that this proposed site on a promontory

tion of Architects, will send their designs direct to the Secretary of the Royal Architectural Institute before the 25th May, 1910. These drawing will be submitted to the Council of the Royal Architectural Institute, who will select three plans to go forward to the final competition as set forth in Condition 6.

3rd. Medals will be awarded by the Royal Architectural Institute suitably inscribed. To the author of the design placed first, a gold medal; author of the design placed second, a silver medal; author of the design placed third, a bronze medal.

4th. The author of the design placed first by the Royal Architectural Institute as the winner of the whole competition will be asked to prepare working drawings and specifications with sufficient details to carry out the work. It is felt that the patriotism of Canadian architects can be counted upon in this respect, the elimination of profit being in the nature of a contribution.

5th. The Tower is to be built of local ironstone rubble laid in cement mortar, cost per cubic foot, 50 cents. All dressed work, such as strings, quoins, etc., to be of granite, cost per cubic foot, $3.

The height of the Tower to be not less than 100 feet. The walls to be solid rubble pointed inside and outside—no plastering. The floors to be fireproof. The stairs also to be of fireproof material.

The location is indicated on the panoramic view of the North West Arm at Halifax.

The cost of the building is not to exceed $22,000.

6th. The drawings submitted in each Province will be submitted to a Board of Assessors composed of the President and two members of the Council of the Provincial Associations, who will select the three plans to go forward to the final competition, where the designs will be submitted to the final selection made by the Professor of Architecture at McGill University, Montreal; the Professor of Architecture at the University of Toronto, and the President of the Royal Architectural Institute.

7th. Any intending competitors wishing to ask any questions may do so by writing to the Secretary at any time previous to April 10, 1910. All questions thus received will be answered in one document, which will be sent to the Secretaries of the various Associations to whom Conditions of Competition have been supplied immediately following the date of the 10th April.

8th. The drawings in each Provincial Competition as mentioned in Condition 2 are to be handed to the Registrar or Secretary of the Association before the 25th of May, 1910, and the final award will be made as soon as possible thereafter. The drawings, which are to be made at the scale of ¼ inch to the foot, are to consist of two sheets, one showing the plan, elevations and sections, and the other a perspective view of the exterior of the building. The latter may be rendered in pencil, pen and ink, pastel, wash or water color, as the competitor may decide, but the perspective is not to be drawn at a smaller scale than ⅛ inch to the foot.

The Secretary of the whole competition is

MR. JOHN A. PEARSON,
Darling & Pearson,
Imperial Bank Building,
Toronto.

HISTORICAL SIGNIFICANCE.

The establishment of self government in the Dominion in 1758, which this Memorial Tower is to commemorate, cannot be regarded as merely an incident in history. We must consider it in association with a great policy—a policy which has increased the power and broadened the influence of the British people. The importance of this occurrence must be judged by the results, and we find results in every country over which floats that flag which is the emblem of liberty and justice, of peace and of patriotism—that flag which for so many generations has given us freedom to flourish in the highest degree.

With an event so important in the history of Canada, as well as to the British world, associated as it was with a period so glorious in British history and which was followed by occurrences in later years brought about by so many of our great men, the Canadian architect is given

Nova Scotia, as a site for the proposed National Memorial Tower, in the foreground. "A" marks the proposed location of the Tower. It ces it within view of a vast sweep of both land and sea.

a subject which for inspiration and incentive, should bring forth his best efforts.

While Quebec has undoubted claims to be regarded as the "birthplace of Canada," the great Motherland has placed Nova Scotia in a position regarded as the "cradle of the Empire," and Halifax its constitutional birthplace. The architects of Canada have been asked to design a Tower that will befittingly mark this birthplace.

While every designer will be permitted to plan his tower in accordance with his individual conception, the Canadian Club of Halifax, which has assumed the responsibility of carrying out the project, in a recent pamphlet made some suggestions that may serve to give some idea as to just how this historical edifice might be carried out to properly commemorate the various events connected with the history of Nova Scotia as a province, in which responsible Government was first established in Canada. It, however, is not necessary, nor would it be advisable for designers to follow in every particular these suggestions. The tower shown in the suggestion referred to, is designed to be of noble proportions, and the first course of masonry, laid on the bed rock of native Nova Scotia granite, would typify the beginning of representative Government in the year 1758, associated so closely with the foundation of the Empire. In this particular conception, each course of massive masonry upwards, would have its meaning, and would be adorned by reference to the names and deeds of distinguished men who have served their country. Before going further with the description of this suggestion, we wish to make it very clearly understood that no designer is especially requested to follow out the ideas contained in this suggested design. We give it here purely for the purpose of denoting the historical events as they occurred, and how they could be carried out in accordance with one man's idea.

The historical purpose of the edifice must always be held in view. It was many years before representative Government developed into responsible Government, not indeed until 1841-48. Accordingly, for a space above the foundation of over eighty years, this suggested design would be characterized by massive simplicity of outline. Again in 1867, Nova Scotia federated with other provinces to form the Canadian Dominion, and from the natal day (July 1), from that year onwards, the pioneer province by the sea has done its full share in promoting the general progress.

It should be the aim of the design to denote all such matters in the architectural features of the tower, so that it would strike the beholder as, even in external appearance, appropriately fulfilling the purpose of its erection. The structure itself should be able to tell its tale to the spectator in after years, when present actors may be forgotten. It should practically and unmistakably proclaim the spirit of these words: "This is a birthday tower, erected by a grateful people to inform the world that a new nation was born, and with its birth the old mother became larger, nobler, more perfect than before."

One of the most important events in the formative days of the Empire was the opening of the doors of a legislative assembly in Halifax, by direction of the King, to receive the elected representatives of the early settlers of Nova Scotia. The exact date is almost identical with another event, which occurred in another part of the world. The Nova Scotia representatives had scarcely left their homes to pursue their journey through the woods to Halifax, to meet in assembly for the first time, when a child was born in a country parish in England; a child who lived to make his mark as a naval officer as no other has done since the world began. That child received the name of Horatio Nelson, and at his death some forty-seven years afterwards, no man could have done more to place our Empire on a broad and lasting basis than the great admiral. Trafalgar cleared the European atmosphere, and contributed in a marked degree to render our colonial empire possible. Up to the date of that glorious victory, as should be indicated on the proposed tower, the structure might be characterized by the greatest simplicity in its external outline.

Some nine months before Nelson passed to his reward, a great man—one of the greatest which Canada ever produced—was born in a little cottage on the shores of the North West Arm. The upper half of the tower might be enriched by a reference to the grateful services to his

country of Joseph Howe, a man who has done so much to render his name immortal in the hearts of his countrymen. That famous Nova Scotian has provided abundant opportunities for the architectural adornment of the tower.

There are many other distinguished names which should find places of honor at various stages—that of the Hon. J. W. Johnston would especially be one of them. The efforts of this statesman were greatly valued for a lengthened period, and on no occasion more so than in the complete development of responsible government, the only basis of colonial government upon which the empire of the future can be built up.

As all the world knows, Nova Scotia filled a large place in the first establishment of steam communication between Great Britain and North America, chiefly through the enterprise and foresight of a Halifax merchant, Sir Samuel Cunard.

The first steamship to cross the Atlantic wholly under steam sailed from Pictou, Nova Scotia, August, 1833.

Nova Scotia has done much to advance submarine telegraphy. It is now fifty years since the first Atlantic cable was laid.

The Prince of Wales, now King Edward, arrived in Halifax in 1860.

The confederation of the provinces of the Dominion was effected in 1867, of which one of the most powerful advocates was that distinguished and remarkable Nova Scotian, Sir Charles Tupper.

These events and much more of high interest might fittingly be denoted. There might be half a dozen or more galleries in the tower, and places might be provided for references to the names and good deeds of all who have specially served their country.

A striking feature of the general appearance of the edifice would be the modest massiveness of its base in contrast with the more elevated portions, gradually increasing in architectural beauty until crowned by the finale.

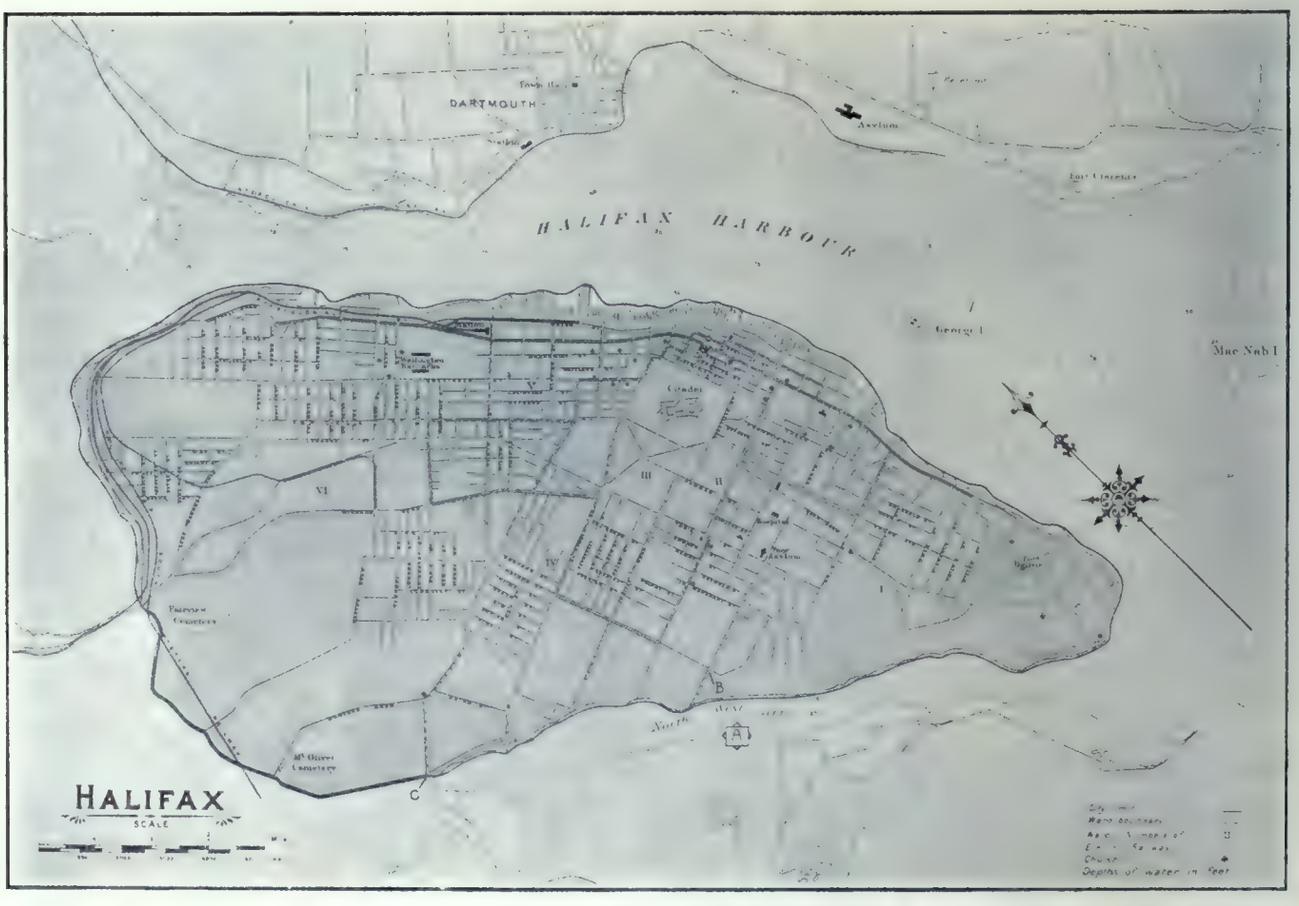
In this manner it will be seen that the purpose of the design is to raise a mural symbolic memorial of men distinguished in the public service, and of great events which have occurred at all stages of the history of Nova Scotia; the whole combining the spirit of colonial liberty with imperial stability.

A SITE FOR THE TOWER.

The selection of a proper place for the erection of the commemorative edifice is a matter that has been given careful consideration. Obviously the building should be erected on some conspiciuous site, where it would be seen to the best advantage by the greatest number.

Every citizen and every visitor to the capital of Nova Scotia is familiar with the position and charms of that sheltered inlet of the Atlantic Ocean known as the North West Arm. "The Arm," as generally termed, is about three miles in length, situated in the immediate rear of the city, and as indicated on the map its greater portion is but little more than a mile and a half distant in an air line from the City Hall. For the most part the Arm is within easy reach of all the residential sections of the city. The water is of the purest description, being renewed twice daily from the Atlantic by tidal influence. There are no mud banks or reefs or shoals. The surface is generally unruffled, as it is sheltered from every quarter by foliage-clad, lofty banks; in consequence the Arm is unsurpassed in many respects for boating and canoeing, while it is navigable at all conditions of tide for vessels of any draft.

Midway between Point Pleasant at the entrance, and the head of the Arm, an elevated promontory from the western shore contracts the waterway and forms "the



Map of Halifax and environs. "A" marks the proposed location of the tower overlooking the city of Halifax and the entrance to Halifax Harbor. "B" denotes the corner of Oxford and South Streets, from which point the distance across the Arm to the proposed site of the tower will only be 1,500 feet. "C" marks the continuation of North Street around the head of the Arm, in which it is proposed to lay a street car line, so that the tower may be reached either by ferry across the Arm or by street car on North Street, around the head of the Arm.

narrows," where it is only 600 feet wide from shore to shore. At this point the Arm is divided into two lake-like expanses of great beauty, and on the elevated promontory mentioned it has been decided as the site for the historical tower. This is an ideal site, in full view of the eastern and western halves of the Arm, and regarded as a whole, there are few localities more attractive. The Mayor of Halifax, than whom there can be no better authority, is an official communication (April 11, 1908) respecting the portion of land desired for Park purposes, employs these words: "The North West Arm has of re-"cent years become probably the chief pleasure resort of "our citizens, and it is eminently desirable that a portion "of its shores should be kept open to the use of the public, "and for that purpose no portion is so well adapted as "that proposed to be dedicated."

A memorial tower, placed as suggested, would be seen from a long distance on every side, even from far out on the Atlantic. It would be conspicuous throughout the Arm. It would be in the midst of associations made memorable as the homes or haunts of the Howes, Hills, Thomsons, Cunards, Haliburtons, Tuppers, Jones', Stairs', Morrows, Kennys, Pryors, Ritchies, Duffus' and other sons of Nova Scotia, and thus in a neighborhood of old memories and on ground already historic.

In a few years great changes would be effected. Biological and other museums and buildings would probably be grouped around the tower for educational purposes. A simple cable ferry, spanning the narrows of the Arm, would bring the Tower and the Park within easy reach of the city electric railway. In an air-line, the actual distance from the proposed site of the Tower to the intersection of Oxford and South streets, the present end of the street railway is only 1,500 feet. By this means and by another extension of the street railway system around the head of the Arm, the proposed new Park and the Tower would readily be approached from both sides.

TECHNICAL EDUCATION.—Toronto's Chief Librarian on the Subject.

TORONTO'S NEW CHIEF LIBRARIAN, Dr. C. H. Locke, in a recent lecture, made some exceedingly pertinent remarks as to why we should take the question of trade schools more seriously at this time.

Dr. Locke is a man with ideas, and although we cannot say that we can agree with all the details of the several reforms he has proposed since he has been made chief librarian of the Toronto Public Library, his views on the question of technical education cannot but meet with the approval of every thinking man in Canada. The following is a resume of his remarks:

We need a revival in education that the people may see that education is the great end, making all things possible to those who have it. Much stress was laid upon the necessity for some means of education for those children who left the public schools at an early age without the training to fit them for the business of life. For them trade schools should be established wherein they could attain the knowledge to enable them to earn their livelihood. City children, in particular, were wanting in concentration, resourcefulness and the aptitude for business or the handicrafts.

The science of education is in much the same position as the tariff, in that it is ever changing, and as religion, in that every man has his own views on the subject.

The man who hopes for the return of the old methods and the professor who says that teachers are born not made, should be shut up in an educational museum. The most hopeful tendency for the present is the recognition of the fact that education was a process not a state or the possession of certain qualifications. Too long have we suffered from the terminology in education, which includes such terms as 'inculcate,' 'discipline,' which implies punishment, "broad and deep foundation" and "one stone upon another." In education, as in architecture ,there should be beauty and proportion, as well as strength. People complain of the lack of originality and ideas, yet we are turning out children, as has been said, like dollars with the stamp of nationality on one side and a mere difference of date on the other.

The student should be made to appreciate the end to be attained in his studies. The examination should be used only to reveal to the pupil what he knew or what he did not know, to organize his knowledge and to show the teacher wherein he had failed. Hence the examination should be conducted by the teacher and not by a stranger.

To-day children left the public school at the age of 12 or 14 years, and very few went to the high school. For these children training or industrial schools—trade schools in fact—were requird. City children are wanting in concentration and resourcefulness, and were handicapped in the world of action because of the lack of the training which used to be obtained about the home. These boys and girls are not helped by the evening schools, which were attended chiefly by adults and foreigners. The need of some form of education for young boys and girls who have shown by the popularity of the correspondence study courses. In Germany there are useful continuation classes, where the theory of trades is taught. Such schools may be established in Canada, in addition to the trade schools, where four-year courses should be given, the first two years devoted to general studies and the second two years to special studies.

BEAUTIFYING CITY HOMES.

SOME INTERESTING COMMENTS concerning the exterior decoration of house and apartments in Leipzic, Germany, are furnished in a recent report by S. P. Warner, U.S. Consul at that place.

The endeavor of the people there to add to the attractiveness of their individual homes, and thus to the general beauty of the city, has been greatly stimulated by the offering of prizes for the best and most artistically decorated houses. These prizes, which consist principally of objects of art and of valuable growing plants, are offered by the Der Verkehrsverein Association, while the Leipzic City Council contributes a considerable annual sum for prizes. Persons desiring to compete send in their addresses to the association, which furnishes free illustrated pamphlets containing valuable suggestions about growing plants and flowers, and using them most advantageously for exterior decoration.

The most practicable and popular method of decorating houses is by placing artistically painted wooden boxes containing collections of variegated flowers upon the window sills. The windows are frequently entirely framed in by climbing vines. Porches and balconies are better suited for floral decoration, as large pot plants and all sorts of vines can be used. In the residential sections of Leipzic nearly every house has some floral decoration Small, unostentatious houses thus frequently attract much attention.

A SUSPENSION BRIDGE, the ropes of which are composed of pliable roots and vines, spans the River Apurimac, in Central Peru. The planks of the bridge are made of branches. In the moist climate of Peru it would not be extraordinary if this vegetable bridge were one day to start growing.

Home of J. Y. Reid, Winnipeg, a concrete residence in modern Colonial design, the stone, which is made of white Portland cement, ground stone, white sand and marble dust, being hollow, tool faced, and of the color and texture of natural stone. Herbert B. Rugh, Architect.

Sun Porch, Home of J. Y. Reid, Winnipeg, which affords a delightful outlook along the river. Note the treatment of the walls and the rich texture of the concrete stone. Herbert B. Rugh, Architect.

RESIDENTIAL WORK OF WESTERN ARCHITECT.—Four Attractive Winnipeg Homes Designed by Architect H. B. Rugh.—A Concrete Stone House in "Modern Colonial" Design—an Interesting Frame Dwelling—Two Examples of Red Brick and Cement Stucco. ∴

MANUFACTURED STONE is something seldom looked for and more rarely found in residences of the Georgian or Colonial type. Invariably one associates with this style of house, red brick and white mortar joints, or white painted brick or clapboard surfaces, and these elements have seemingly become accepted as the traditional "media" more particularly possessed of the quality of "eternal fitness" in designing work in this "period." The residence of Mr. J. Y. Reid, one of the four Winnipeg houses designed by Architect Herbert B. Rugh, which are illustrated in this instance, is however, a noteworthy exception. This house not only shows the former material to advantage, but the perfect co-relation which exists between the concrete stone and the design itself, strikingly demonstrates the adaptibility of the material and suggests its broader use in work of this character.

Two things which have greatly contributed to the success of the house have been the careful selection of the aggregates, and the intelligent execution of the workmanship. Quite frequently one finds examples of domestic work which leaves the merits of artificial stone for certain classes of residences, in serious doubt, but in this case the results clearly show that the material when properly handled, makes a most acceptable building product. The stone consists of tooled faced hollow blocks made from white Portland cement, ground stone, and marble dust. With the exception of the upper story, the blocks are laid with flush vertical joints and marked off with direct continuous depressed joints about an inch wide, producing effective horizontal lines and a treatment which most acceptably deviates from the harsh bevelling and other equally unsatisfactory results so often found where material of this nature is employed. A noteworthy feature is the free manner in which the material has met the requirements of the design, and also the texture and color of the concrete itself, a good idea of the latter being obtained from the view showing the spacious screened verandah which overlooks the grounds and the river at the rear.

In arrangement, the house follows the central hall plan, characteristic of this type of dwelling—a large living room with adjoining library at rear, occupying one side and the dining room, kitchen and pantry space the other. There is a pleasing degree of consonance in the decorative scheme and furnishings and a feeling of homelike comfort which makes the whole extremely inviting. The hall is finished in white enamel and mahogany woodwork, and this combination is further carried out in the dining room where the walls above the white wainscotting are covered with an imported paper having considerable color depth, and finished at the top with a heavy mahogany cornice. Both the living room, finished in mahogany and the library, which is trimmed with brown British Columbia fir, have beamed ceilings and fire-places, while all connecting doors throughout the floor are of mahogany, and either richly pnaelled or set in with plate glass divided into small panes.

Hallway, Home of J. Y. Reid, Winnipeg. Herbert B. Rugh, Architect.

Upstairs a similar sense of harmony prevails; delicate wall papers, white woodwork, mahogany doors, and appropriate furniture producing a most cheerful scheme. There are five good sized bed rooms with ample linen and wardrobe accommodations, two bathrooms, and a play room, the latter having a doorway leading onto a screened balcony which affords the same delightful view of the river and surroundings as is obtained from the spacious verandah over which it is placed.

The basement is occupied to large extent by a well appointed billiard room and a card parlor which are one of the features of the house, while the remaining portion of the space is taken up by the furnace and storage compartment and other offices of a household nature.

Another decidedly attractive Colonial home designed by Mr. Rugh, is the frame residence of E. H. Heath. This house stands on a large open site, and is sufficiently removed from the street line to have a proper setting; and with its deep porch spanning the entire front, its large enclosing columns, and interesting balcony arrangement, it is a structure which readily commands attention.

Although wood, owing to its inflamable nature, is becoming more generally debarred from external construction in the more thickly settled residential sections of our more progressive towns and cities, it would be difficult to conceive of this particular dwelling in any other garb than that which has been chosen for it, and still picture the same pleasing results. Here the white clad siding enhances the value of the design, and shows the author's rare discernment and proper appreciation of the adaptability of the material which is employed.

The interior of the house is compact and convenient in its layout, the woodwork and wall scheme consistent in treatment, and the appointments in general, well selected. There is a large reception hall, with a living room taking up the entire floor space one side, and the dining room and kitchen, the other. A richly panelled door connects with the rear passage leading to the kitchen and basement, and gives additional access to the den or library, which forms an alcove off the living room, at the back of the staircase.

The living room, which has a beamed ceiling and a

Living room, Home of J. Y. Reid, Winnipeg, looking towards the entrance hall. Herbert B. Rugh, Architect.

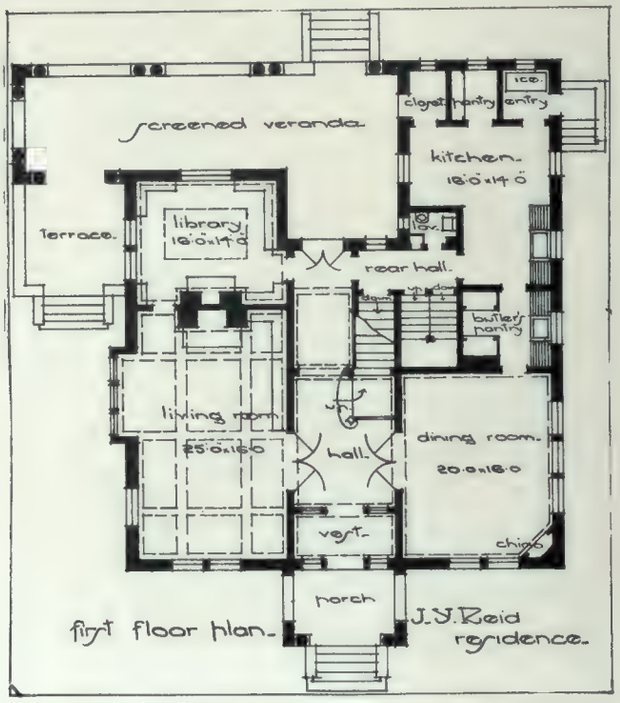
Dining room, Home of J. Y. Reid, Winnipeg, showing the white enamelled wainscotting and pleasing wall decorations. Herbert B. Rugh, Architect.

Library, Home of J. Y. Reid, Winnipeg, showing the fireplace and built-in bookcases. Note the simple and effective wall treatment. Herbert B. Rugh, Architect.

Bedroom, Home of J. Y. Reid, Winnipeg. Note the perfect harmony in the wall treatment, hangings and furniture. Herbert B. Rugh, Architect.

large brick fire-place, is finished in mahogany and white enamel, as is also the hall and all the other rooms in the house, with the exception of the dining room, which is trimmed in stained oak.

There are three large bedrooms on the second floor, together with a bath room, dressing room, and a large nook at the end of the hallway with door leading onto



First floor plan, Home of J. Y. Reid, Winnipeg. Herbert B. Rugh, Architect.

the balcony; while on the third floor are two additional bed rooms, a bath room and a spacious billiard room, all of which take up the space available in the most advantageous manner.

As with most Western cities, many of Winnipeg's recently erected residences are of the cement stucco type. In some cases, in conjunction with the use of metal lath and studs, this form of construction is carried out to a point which practically renders a house fireproof; but whether or not fireproofing is attempted, the plaster is at all times applied directly to metal lath, thus producing a far more stable and permanent building than the roughcast house of common plaster and wood lath of the early days, and still indeed permitted to be erected in some parts in the Eastern section of the Dominion.

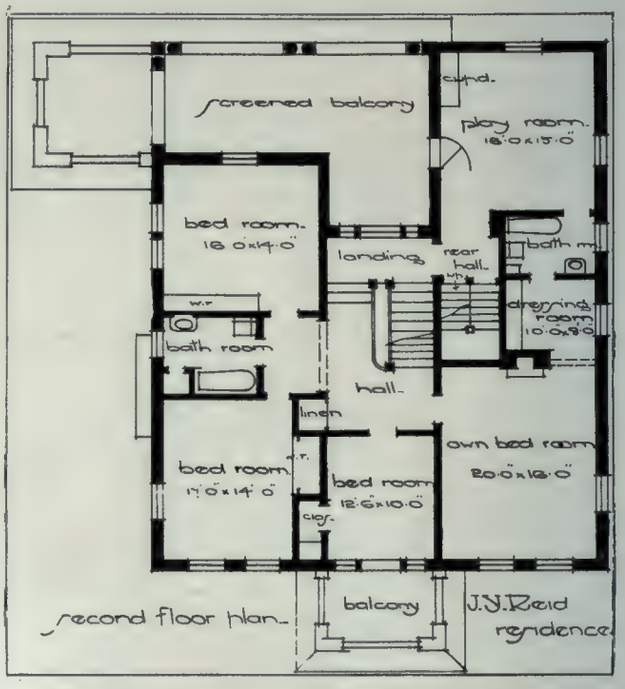
An interesting use of this material is seen in the residence of Mr. George Stephen, which has an attractive gable arrangement, unobstrusive bays, and hooded entrances of modest dimensions. With the exception of the red sand mould brick base course, which gives an effective touch to the color scheme, the entire body of the house is of rough cement stucco on metal lath. The entrance hall forms the key to a well laid out plan. There is a large living room, taking up the entire front portion of the floor, with the dining room adjoining it at the rear. Opening off the dining room is a large screened verandah with sloping balcony above. This latter feature is rather unusual, in that it is carried out to partake of the architectural composition of the body of the house proper.

The living room has a large brick fire-place, and built-in book cases, beamed ceiling and trim, all in mahogany stained birch; while the dining room is finished in a walnut stained birch, with panelled walls, plate rail and half beamed ceiling. The arrangement of the kitchen, pantry and rear hall, works out a splendid economy as regards space. The manner in which the outside kitchen door and basement entrance are combined, doing away with an extra door in kitchen and thereby giving more working space, is noteworthy.

On the second floor are two large bed-rooms, bath room, and a den having a brick fire-place; while on the third floor are two additional bed-rooms and ample linen and storage accommodations.

The house of Mr. C. D. Shepard is a residence that is well planned to meet the requirements of the average family. There is a large living room, dining room, hall, kitchen and pantry on the first floor, and four good sized bed rooms with wardrobe accommodations, and a bath room on the second.

The construction of the house is of frame, with red sand mould brick veneer for the first story and cement stucco on metal lath and half timbered gables above. There is a side terrace and porch which makes an interesting entrance. Both the living room and dining room, which have beamed ceilings, are finished in British Columbia fir. In the former room is a large open brick fireplace, while in the latter the walls have high panelled wainscotting with a plate rail at the top.



Second floor plan, Home of J. Y. Reid, Winnipeg. Herbert B. Rugh, Architect.

The second floor is finished throughout with the exception of the bath room, in British Columbia fir, stained in lighter shades than the living rooms in the floor below.

A SUPER-HYGIENIC JAPANESE HOME.

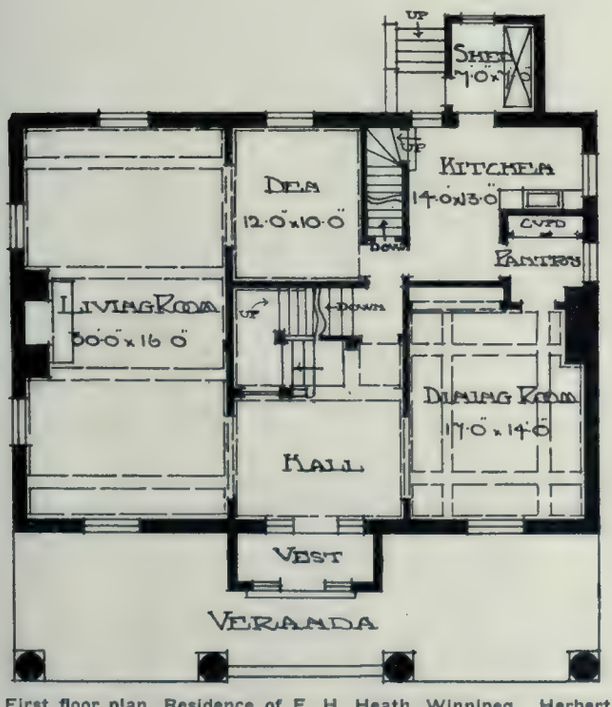
A HOUSE HAS BEEN ERECTED at Yokohama, Japan, to fulfil the following requirements: 1. To embody all desirable conditions possible from a hygienic standpoint. 2. To protect the inhabitants against sharp changes of temperature. 3. To reduce to a minimum the consumption of fuel. 4. To provide the residence against the numerous earthquakes of the country. In general dimensions the house, according to the description in a French contemporary, is 44 ft. long, 23 ft. wide, 17 ft. high. In exterior appearance it has the form of a rectangular box well lighted, though it has no doors nor windows, and presents no joints or crevices through which air, moisture in the atmosphere, dust, insects or microbes can enter. It appears to be a veritable dream of the sanitarian. It is constructed of glass in the form of slabs

Residence of E. H. Heath, Winnipeg. An interesting frame house designed along lines in keeping with the Georgian period. Herbert B. Rugh, Architect.

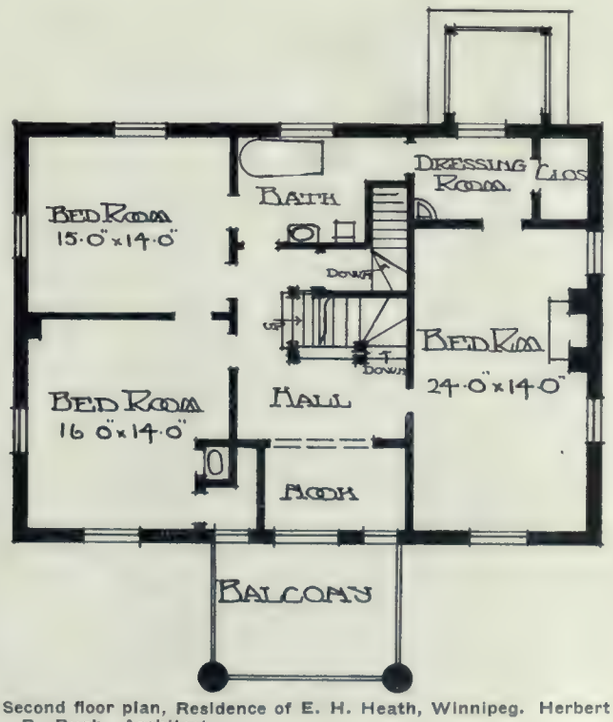
about 36 in. long, 24 in. wide and 5 in. thick. The wall contains an air space 4 in. thick filled with a saturated aqueous solution of alum or of a salt of sodium, like common salt.

The two glass surfaces forming the wall with its air space are fitted to a framework of cast iron. The roof is made with glass tiles, with the joints closed by means of rubber. On the tiles is laid a bed of cinders, and finally is laid a lattice work of wood covered with cement. The roof is thus translucent like the walls, but does not resist to so great an extent the penetration of heat from outside or the loss from the interior. The saline solution between the faces of the walls can be colored to suit the taste of the owner, and under the action of the intense rays of the sun the light, it is stated, enters diffused and softened. The main floor is formed of two layers of boards separated by a cushion of sawdust. The air to the building is admitted through grills.

It is through the cellar that one enters the house, passing through a lobby leading to a stairway from the cellar.



First floor plan, Residence of E. H. Heath, Winnipeg. Herbert B. Rugh, Architect.

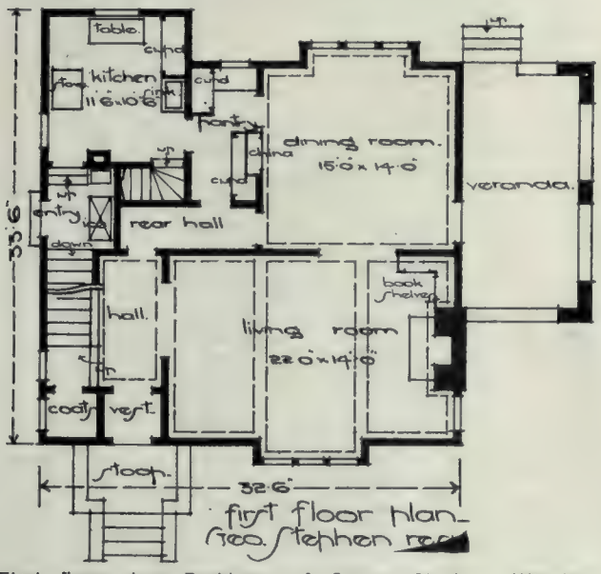


Second floor plan, Residence of E. H. Heath, Winnipeg. Herbert B. Rugh, Architect.

Residence of George Stephen, Winnipeg. A modern cement stucco house with straight lines and pleasing gables, and attractively set off by red sand mould brick up to the first floor window sills. Herbert B. Rugh, Architect.

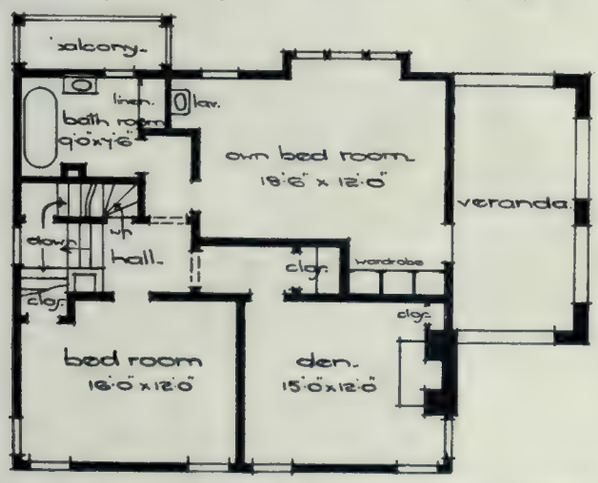
Home of C. D. Shepard, Winnipeg. A noteworthy moderate sized dwelling with red brick and cement stucco walls and half timbered gables. Herbert B. Rugh, Architect.

The doors of the lobby are arranged so that on going in or out a person moves a minimum quantity of air. The supply of air is obtained by means of pipes which rise vertically above the ground at a distance from the house,



First floor plan, Residence of George Stephen, Winnipeg. Herbert B. Rugh, Architect.

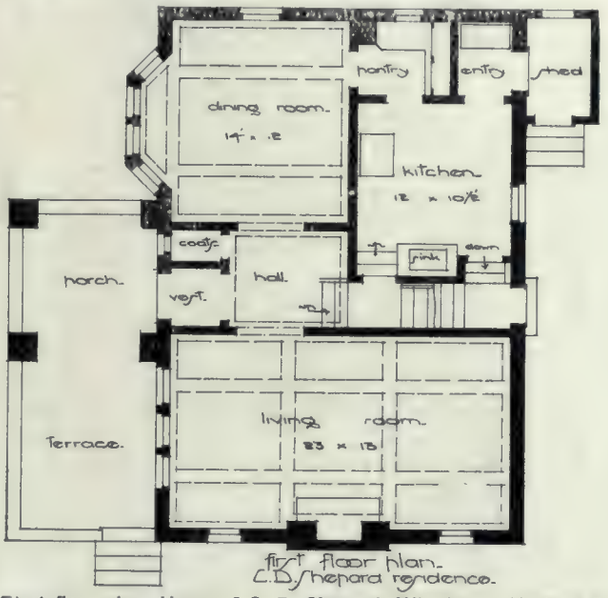
communicating with other pipes discharging into an air chamber. Before its admission into this space the air is filtered by passing through cotton and then on merging from the cotton flows over a large glass plate coated with glycerine to retain the microbes which the cotton has allowed to pass. Thus purified, the air enters the main part of the house through the grills mentioned, of which the openings can be regulated at will. The outflow of the air is effected through openings at points where in our houses a molding would be located. At this level the building is encircled on the outside by a sort of boxing of ordinary vitrified glass, with which the openings men-



Second floor plan, Residence of George Stephen, Winnipeg. Herbert B. Rugh, Architect.

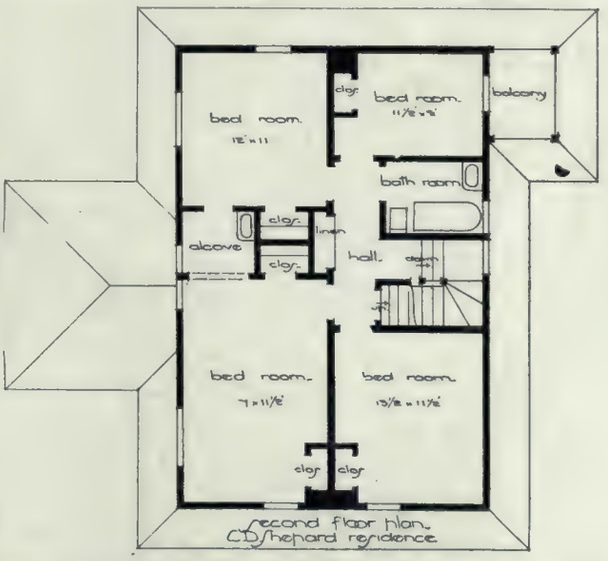
tioned communicate. The heat developed in this box by the sun's rays is generally sufficient to establish a draft and bring about a current of air toward an exhaust chimney, which is also constructed to take advantage of the sun's rays. An opening allows for discharging rain water at the base of this chimney in such a manner as to assist the draft. The result is that the greater the strength of the sun or the greater the quantity of the rainfall, the greater the degree of ventilation. If, on the other hand, heat from the sun is deficient and it is not raining at the same time the draft necessary can be obtained by a small stove installed in the air chamber. To resist earthquakes the piers of the foundation of the building are on the lower part rounded so as to rest freely in hemispherical holes. Since the erection of the building, it has resisted more than 300 earthquakes of more or less intensity.

ODD AND INTERESTING BITS of architecture are continually being brought to light by journalists and travellers in their meanderings through various countries. The latest in this respect is an ancient church, built in the great rock which rises from the river in the quaint old German town of Oberstein. "The front of



First floor plan, Home of C. D. Shepard, Winnipeg. Herbert B. Rugh, Architect.

building," says a writer in the February Wide World Magazine, is "of stone, but the church itself is hollowed out of the rock and penetrates far into its heart. Tradition says that in the 14th century the Count of Oberstein, one of the old robber barons, fell deeply in love with a beautiful young lady, the daughter of a neighboring knight. His brother also sought the fair maiden's



Second floor plan, Home of C. D. Shepard, Winnipeg. Herbert B. Rugh, Architect.

hand and the two suitors had a violent quarrel. The upshot was that the Count flung his hapless brother from the top of his castle wall, high up the precipitous cliff. Repenting of his awful deed, the Count vowed that he would build a church where his brother's body first touched the ground. He did so, excavating the church in the rock; and tradition goes on to say a miraculous spring of clear water sprang from the crag as a token that heaven was appeased. This curious church is now the only Protestant place of worship in the town."

REGISTRATION OF ARCHITECTS IN THE TRANSVAAL.
—Text of Law Recently Passed by South African Legislators.—Places Conduct of Profession in Hands of Newly Formed Transvaal Association.—Powers of Governor-in-Council.—Non-accepted Applicants Privileged to Appeal to Supreme Court.

Architectural Registration, or the Licensing of Architects, continues to be a live question with architectural organizations the world over. CONSTRUCTION *recently called attention to the fact that the Transvaal Institute of Architects had been successful in securing a legal status for the profession in South Africa. In addition to this, the architects in the state of Missouri, in the United States, have been successful in securing a Licensing Law, similar to that in the state of Illinois. The architects of New South Wales, Australia, are contending for legal recognition, and the architectural associations of Great Britain have joined hands in requesting such legislation in the British Isles. The architects in Quebec province have at present a Close Corporation Charter, as well as has the province of Alberta. The Ontario Association of Architects have for some time been clamoring for legislation that will place the practice of architecture within government control, and, with any degree of co-operation from members of the profession, who do not belong to the Ontario Association, and with such co-operation as they are entitled to have from the lay public in Ontario, they should be successful in securing such legislation. We publish below, in full, the Bill recently passed in Transvaal, which should prove of exceptional interest to both the exponents and opponents of the Registration of Architects in the Province of Ontario.*—EDITOR.

WHEREAS it is expedient to provide for the registration of persons publicly practising, or entitled to practice publicly, as architects in The Transvaal, so as to distinguish qualified from unqualified persons;

And whereas it is necessary to provide a qualification for admission to the Register of Architects;

BE IT ENACTED by the King's Most Excellent Majesty by and with the advice and consent of the Legislative Council and Legislative Assembly of The Transvaal as follows:—

Use of Title of Architect Restricted.

1. After the expiration of six months from the coming into operation of this Act no person shall describe or hold himself out as an architect or use any name, title, addition, or description, or letters indicating that he is an architect, whether by advertisement, by description in or at his place of business, or residence, by any document, or otherwise, unless he is registered as an architect in pursuance of this Act.

Penalty for Infringement.

2. Any person contravening any of the provisions of section one hereof shall be liable to a fine not exceeding one hundred pounds for each offence and in default of payment to imprisonment for a period not exceeding six months.

Association of Transvaal Architects.

3. Upon the coming into operation of this Act there shall come into existence a body corporate by the name of "The Association of Transvaal Architects" with perpetual succession and the right to use a common seal and to sue and be sued in its corporate capacity, and the said body corporate shall be capable in law of taking and holding any movable or immovable property for the benefits and purposes of the association with power to dispose thereof, but so that the association shall apply its funds and assets in promoting the objects of the association and shall not at any time pay any dividend to its members. Every person registered as an architect as hereinafter provided shall upon such registration ipso facto become a member of the said association.

Appointment of the Provisional Council.

4. Upon the coming into operation of this Act there shall come into existence a provisional council consisting of the following persons, namely:—

Walter Reid, F.R.I.B.A.	J. F. Beardwood, M.S.A.
Herbert Baker. F.R.I.B.A.	R. Howden, A.R.V.I.A., M.S.A.
G. A. H. Dickson, F.R.I.B.A.	G. H. Veale.
Frank Emley, F.R.I.B.A.	F. G. McIntosh.
Archer Hosking, A.R.I.B.A.	W. J. D. Swaan.
W. H. Stucke, A.R.I.B.A.	G. St. J. Cottrill.
Harry Clayton, M.S.A.	

who shall be the first members of the Association of Transvaal Architects and shall forthwith cause their names to be entered upon the register thereof. The provisional council shall, subject to the provisions of this Act, exercise all the powers of the association until the council hereinafter mentioned shall come into office.

Should any of the said persons die or become incapacitated, or refuse to become or remain members of the said provisional council, the Governor-in-Council may appoint other qualified persons in their place.

Proceedings of the Provisional Council.

5. Upon a day to be fixed by the President of the Transvaal Institute of Architects, but not later than one month from the coming into operation of this Act, the provisional council shall meet at Johannesburg and shall at such meeting elect a president. In the absence of the president at any meeting the members of the provisional council present shall elect one of their number to preside.

At any meeting of the provisional council five members personally present shall constitute a quorum, and a majority of the members present shall decide every question to be decided by such meeting, except admission to the register, on which a majority of the whole council shall vote, and fourteen days' notice shall be given of all meetings at which the admission of members is to be dealt with.

Subject to the provisions of this Act the provisional council are hereby empowered to regulate their meetings and the proceedings thereat and the mode of carrying on the business of the association and shall remain in office until six months after the date of the coming into operation of this Act.

The provisional council shall have power to appoint a clerk or registrar and such other officers as they may deem necessary for the purpose of the association.

Persons Entitled to be Registered by the Provisional Council.

6. The provisional council shall forthwith open a register in which any person shall be entitled to be registered as an architect in pursuance of this Act who proves to the satisfaction of the provisional council within six months next after the coming into operation of this Act that at the date of the coming into operation of this Act he was resident in British South Africa, and

(a) was a member of the Transvaal Institute of Architects or of any other institute or society of architects of equal standing; or
(b) was publicly and bona fide practising as an architect in The Transvaal; or
(c) was at such aforesaid time, or prior to the coming into operation of this Act, engaged as an assistant to an architect in The Transvaal and has had at least seven years' professional experience; or
(d) that he is possessed of qualifications and experience which may be declared by the Governor-in-Council by proclamation to be equal to those in one or other of the foregoing instances.

Persons Entitled to be Registered by the Council.

7. Upon the expiration of six months from the date of the coming into operation of this Act no person shall be entitled to be registered in the said register as an architect unless he shall prove to the satisfaction of the majority of the whole council hereinafter mentioned that at the date of his application for registration he is resident in British South Africa and has attained the age of twenty-one years; and

(a) has passed the examination for associateship of the Royal Institute of British Architects or the examination for membership of the Society of Architects of London or the examination or examinations conducted by the council and prescribed by the bye-laws of the association or some other examination which may be declared by the Governor-in-Council by proclamation to be equivalent to one or any of these examinations, and has in addition had at least four years' professional and practical experience as an assistant to an architect; or

(b) that prior to, or at any time of, the coming into operation of this Act he was registered as an associate or fellow of the Royal Institute of British Architects or as a member of the Society of Architects of London or the Transvaal Institute of Architects or of some society or institute of architects which the Governor-in-Council may by proclamation declare to be of a standing equal to that of one of the said institutions.

Applicant Refused by Council May Apply to Supreme Court.

8. Where the council has refused to register the name of a person applying to be registered under sections six and seven, such person may apply on notice of motion to the Supreme Court for a review of the decision of the council, and the said Court may thereupon make such order as it may deem fit.

Register.

9. The provisional council or the council, as the case may be, shall, within a week after the registration of any person under this Act, transmit to the Colonial Secretary a duplicate of the said entry and the Colonial Secretary shall cause a duplicate of the aforesaid register to be kept in his office. Every change affecting the Register shall be noted therein and notified to the Colonial Secretary.

Registration Fees.

10. No person shall be placed upon the register until he has paid such registration fee, not exceeding five guineas, as shall be fixed by the provisional council or the council, as the case may be.

Resignation by Members.

11. It shall be lawful for any person whose name has been placed on the said register and whose professional conduct is not then the subject of investigation at any time to resign by writing under his hand addressed and delivered to the council and thereupon his name shall be removed from the said register and he shall cease to be registered as an architect and to be a member of the association.

Annual Subscription.

12. Every member of the association shall pay an annual subscription at such time and of such amount as shall be fixed by the by-laws framed as hereinafter provided: provided, however, that members who have ceased to practice shall be entitled to remain on the register without being liable to pay such subscription, but shall not be entitled to be officers of the association or to be present or vote at any of the proceedings of the association, or to be reckoned in any quorum unless they shall have paid such subscription.

Recovery of Subscription.

13. All sums of money due by members to the association for registration fees or subscriptions may be recovered in the court of any resident magistrate within whose jurisdiction the debtor may reside. An affidavit by the secretary setting forth the necessary facts shall, in cases by default, be prima facie evidence upon which the court may grant an order or pronounce judgment by default in such suit and such judgment shall be enforceable in ordinary course of law.

Election of the Council.

14. On such day during the currency of the sixth month next after the date of the coming into operation of this Act as the provisional council shall appoint they shall convene a meeting in Johannesburg of all persons whose names appear upon the register at the date on which the notices convening such meeting are issued, such notices to be posted to the registered address of such persons at least fourteen days before the date fixed for the said meeting, and at such meeting the persons present or represented by proxy in writing shall proceed to elect in a manner to be provided by the provisional council a council of twelve members who shall come into office upon the expiration of six months from the date of the coming into operation of this Act and thereupon the provisional council shall cease to exist. The council shall hold office until the date of the first or next annual general meeting as the case may be when they shall retire from office.

Offences.

15. The following acts and practices, whether of commission or omission, upon the part of any architect, shall be offences under the provisions of this Act, and if found guilty by the Supreme Court of having committed or engaged in any one or more of such acts or practices, such architect shall be liable to be suspended from practice for any period that may be decided on by the said court, or to have his name removed from the register as hereinafter provided; that is to say—

(a) allowing any person except a registered architect in partnership with himself to practise in his name as an architect;

(b) directly or indirectly sharing his professional remuneration with any person, not being a registered architect in partnership with him, or directly or indirectly accepting any share of the professional remuneration of such person or any commission or bonus thereon;

(c) signing accounts, statements, reports, specifications, plans, or other documents purporting to represent any architectural work performed by himself which work shall not have been performed under his personal supervision or direction;

(d) directly or indirectly paying a person a commission for bringing him work, giving any person monetary or other consideration as a remuneration for bringing him work, or for inducing other persons to give him work;

(e) touting or otherwise improperly obtaining or attempting to obtain work;

(f) performing any architectural work in connection with any matter which is the subject of dispute or litigation upon condition that only in the event of the said dispute or litigation ending favorably for the party for whom the work is performed shall payment be made for such work;

(g) conducting himself unprofessionally or dishonorably in connection with any work performed by him as an architect;

(h) wilfully disobeying, refusing, or neglecting to carry out and perform any by-law or order lawfully adopted and established by the association regarding any point of professional practice;

(i) engaging in any practices or performing any acts similar to those acts and practices prohibited in the aforegoing sections.

Inquiries Into Conduct of Members.

16. If the conduct or behavior of a member of the association shall appear to the provisional council or the council to require investigation, they shall, before proceeding against such member in the Supreme Court as provided in the next succeeding section, hold an inquiry and, if required by such member, hear evidence on the matter. Eight days' written notice of the charges against him and of the date of such inquiry shall be given to the member concerned, who shall be entitled to appear at such inquiry to answer such charges and to produce evidence on his behalf, and his own evidence (if any) shall be admissible against him in any other proceedings, civil or criminal. If such member requires evidence to be heard, the provisional council or council may also hear evidence against such member. Where evidence is to be heard the president or vice-president may administer the oath to witnesses, and such witnesses shall be subject to the law relating to perjury.

Proceedings for Suspension and Removal of Members.

17. In the event of any member of the association being in the opinion of the provisional council or council guilty of any act or omission prohibited by this Act, or offending against any by-law or regulation framed thereunder, the provisional council or the council may call upon any such member to show cause to the Supreme Court of this Colony why he should not be prohibited from practising as an architect, and why his name should not be removed from the register. All such proceedings shall be taken in the name of the association. Upon the hearing of any such matter the court may suspend such member from practice, remove his name from the register, or make such other order as may seem fit, and may further make such order as to costs as may seem fit. In case of such suspension or removal, copies of the order of Court shall be lodged with the Colonial Secretary and the association and noted in the register.

Penalties.

18. In case any member of the association shall in consequence of an order of Court be suspended from practising as an architect in this Colony, such person shall during such time as he is suspended, cease to be a member of the association, but shall nevertheless be liable to pay all moneys due by him up to the date of such suspension.

Persons Having No Claim Against the Assets of the Association.

19. No claim against the assets of the association shall exist in the case of, or be made by, any person whose name has ceased to appear upon the register of the association.

Titles Allowed to Members of the Association.

20. Every person whose name appears on the register shall be entitled to style himself "Registered Architect, Transvaal."

Rules and Regulations for Examinations.

21. The council shall, upon being elected to office, forthwith frame rules and regulations for regulating the examinations or equivalents thereto which shall be required of applicants for registration under section seven of this Act.

Powers of the Council.

22. The council shall have power to do each and all of the following acts:

(a) to manage and superintend the affairs of the association;
(b) to appoint and remove any servants of the association and to determine the duty, salary, and remuneration of the same;
(c) to accept or refuse for good cause any application for registration made in pursuance of this Act;
(d) to hold examinations for applicants for registration and to grant certificates to such persons as have satisfied the examiners in such examinations;
(e) generally to exercise all the powers of the association, except such powers as are expressly reserved by this Act to the association in general meeting.

Persons in Arrear With Subscription Not Qualified to Vote.

23. No person who is in arrear with his subscription shall be qualified to be present, or vote, or be reckoned in a quorum at any meeting of the provisional council, or council, or of members, while he is so in arrear.

General Meetings.

24. There shall be held once in each year a general meeting of the association whereat every architect upon the register who is not disqualified under section twelve hereof shall be entitled to vote personally or by proxy in writing. The quorum for such general meeting shall be fixed by the by-laws.

Any question to be decided at such meeting shall be decided by a majority of the members present or represented thereat.

The council shall prepare as at the thirty-first of December in each year a balance sheet of the affairs of the association and an account of all moneys received and expended by the association, and submit such account duly audited to the association at such general meeting for discussion and approval. The officers of the association who shall consist of the members of the council and of a president and two vice-presidents (who shall, however, be members of the council) shall be elected annually, at such meeting, and the said officer shall retire annually but shall be eligible for re-election.

It shall be lawful for any member or members of the association at such meeting to move any resolution which is not consistent with the purposes and provisions of this Act.

Chairman's Vote.

25. The person presiding over the provisional council or council or at any general meeting, shall have a deliberate as well as a casting vote.

Meeting to Pass By-laws.

26. The provisional council shall forthwith prepare draft by-laws for the association for the purposes enumerated in the next succeeding section, and shall convene a special general meeting of the association in Johannesburg to be held not later than six months from the date of the coming into operation of this Act for the purpose of considering and, if approved, of adopting the said by-laws. The notice convening such meeting shall be sent to the registered address of each member of the association not later than fourteen days before the day appointed for such meeting and shall be accompanied by a copy of the said by-laws.

A majority of the members personally present or represented by proxy in writing at such meeting shall be sufficient to determine all matters to be decided thereat and the non-receipt of the said notice or copy of the proposed by-laws by any member or members shall not invalidate the proceedings at the said meeting, provided that one-third of the number of members then on the register shall be present personally or be represented by proxy in writing.

Purposes For Which By-laws May be Made.

27. The council may, from time to time, subject to the approval of the association assembled in a special general meeting called for the purpose, make by-laws for any of the following purposes, provided that such by-laws be not inconsistent with the provisions of this Act, and may alter, amend, or repeal such by-laws including the by-laws framed under the last preceding section, that is to say:—

(a) for fixing the amount of the annual subscription payable by members and the time of payment of the same;
(b) for defining what shall be considered unprofessional or dishonorable conduct on the part of an architect;
(c) for regulating the time, mode, and place of summoning and holding ordinary and special general meetings and the quorum to be present thereat and the mode of voting and the conduct of proceedings at any such meetings and the regulations for the adjournment thereof;
(d) for regulating the meetings of the council and the quorum to be present thereat;
(e) for regulating the mode of nomination of members for election to the council and the mode of filling casual vacancies thereon;
(f) for regulating the times and places for holding examinations of applicants for registration and the subjects and the manner of conducting or holding any such examinations, and for fixing a reasonable fee to be paid by applicants and the conditions on which the examiners shall hold office and their remuneration;
(g) for regulating the mode of election of the officers of the association;
(h) for fixing a tariff prescribing the remuneration which architects shall be entitled to charge for their services;
(i) for determining the qualification and disqualification of councillors;
(j) and generally such by-laws as from time to time seem to the association requisite for giving effect to the provisions of this Act and for the furtherance of the objects of the association.

Alteration of By-laws.

28. No alteration in the by-laws as adopted at the special general meeting referred to in section twenty-six shall be made save by a majority of two-thirds of the members personally present or represented by proxy in writing at the special general meeting convened for the

(*Concluded on page* 65.)

The new Jacobs Building, the largest reinforced concrete building in Canada, which is now nearing completion at the corner of St. Catherine and St. Alexander streets, Montreal. Mitchell and Creighton, Architects.

CANADA'S LARGEST CONCRETE BUILDING.—Splendid Modern Commercial Structure Now Nearing Completion at Montreal —Will House a Number of Diverse Business Interests.—Features of Its Design, and Power and Machinery Equipment. ∴ ∴ ∴

THE NEW JACOBS' BUILDING, now nearing completion at Montreal, gives to that city what is claimed to be a structure which is as thoroughly fireproof as modern building science has made possible. Aside from this, it is notable as the largest reinforced concrete building in Canada, while still another interest is attached in the fact that, despite of the difficulties encountered in the early stages of the work, the remarkably short time in which the building was erected, demonstrates the rapidity of progress which working organizations and engineering skill have made possible in the method of construction adopted.

The building, which is seven stories high, and designed to carry three additional stories as the need for further accommodations might demand, has a frontage along St. Catherines street of 265 feet, and a depth on St. Alexander street of 136 feet. The main facades, designed in the French Renaissance style, are of glazed terra cotta, with ornamental cast iron store fronts, cornices and mullions; the entire space between the pilasters being devoted to windows, so as to provide an area in this respect, which will adequately serve to light all parts of the interior.

Built on a site which was originally an old river bed, the work on the foundations necessitated the most careful procedure, in that a modern theatre building adjoined one corner of the lot, and also because of the fact that the frontage of the site extends along a street where there is a continuous heavy traffic, including an uninterrupted trolley service.

Excavation for the structure was begun during the second week in April, 1909, and this work, together with the preparing of the foundations, was found to be a very difficult, tedious and costly proposition. Test holes, sunk on the site, disclosed the fact that the upper layer of soil consisted of a very soft form of wet blue clay, this clay becoming softer on the continued lower levels. At the 23-foot level the soil changed to a very wet sandy substance which might almost be termed a wet quicksand, being really a mixture of quicksand and slimy clay. It was necessary to go through about 12 feet of this formation before striking hard pan.

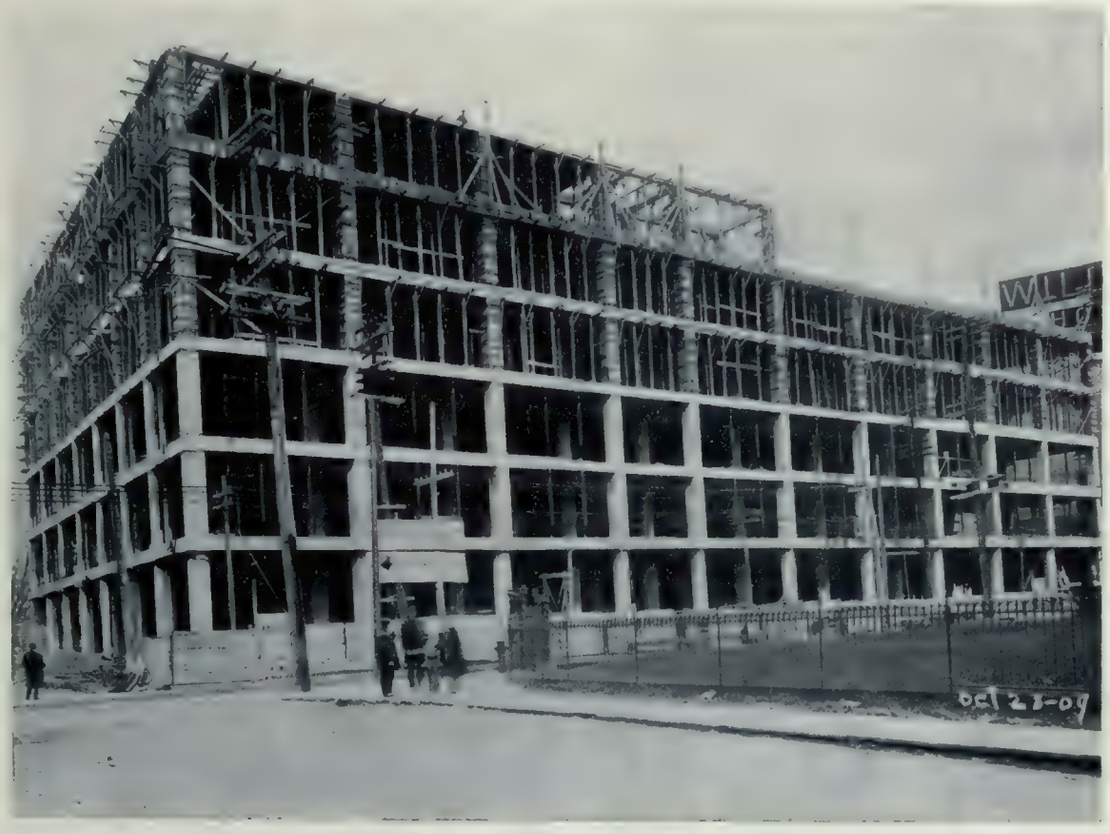
To reach hard pan, in carrying out the foundation work, it was necessary to sink caissons. These caissons were composed of 3-in. tongued and grooved planks, placed in circular form. They were driven down in two lengths by means of steam hammers, and excavation was then carried on inside thereof. The lower 10 feet, before reaching hard pan, had to be removed with tripods and buckets, the substance encountered being too thick to handle with pumps, and not stiff enough to permit of being dug. Besides this work, a general excavation to the depth of 11 feet and 6 inches, necessitating the removal of 12,000 cubic yards of earth, was carried out in order to provide for the machinery, etc., which occupies a large portion of the basement; the machinery room being 4 feet 6 inches below the general basement floor level. In all, there are eighty-five circular concrete foundation piers, distributed over an area of 30,000 square feet. These piers have an average diameter of 4 feet, the footing area being increased to a diameter of about eight feet in order to maintain a uniform distribution of the load figured.

Great care had to be exercised when the quicksand was reached to prevent the sheeting from collapsing on account of the pressure from the surrounding buildings. Another difficulty was met with in guarding against accident to the Princess Theatre building which adjoined the property on the west-end, and also extended part way along the south side. This, however, was finally overcome by using stout shores braced back to the piers which had already been installed. After this the piers on the property line were sunk and filled, and cantilever beams extending back to the inside row of columns and under the theatre walls, were built to carry the masonry underpinning

The structure, which is built according to the Kahn

Foundation work on the new Jacobs Building, St. Catherine and St. Alexander streets, Montreal, showing the caissons and reinforcing for the concrete supporting piers. The site of the structure covers an area of 30,000 square feet and 85 piers in all were required. This view was taken on August 5th, 1909, thirteen days before the superstructure was started, and while excavation was still in progress. Mitchell and Creighton, Architects.

View of the new Jacobs Building, Montreal, taken on October 9th, showing the construction of superstructure. The foreground shows the finished centering ready for concreting, and the background the form work in course of erection for the next floor. The large building under course of erection in the distance, is another modern business structure which is being built according to the same system of construction. Mitchell and Creighton, Architects.



New Jacobs Building, Montreal, as it appeared on October 28th, seventy days after the foundation was completed. This view gives an excellent idea of the rapidity with which the work progressed. The time required for setting up the forms for the ground floor was ten days, and for the other floors, an average of eight days to the floor. Mitchell and Creighton, Architects.

View of new Jacobs Building, Montreal, taken on December 4th, showing the building practically enclosed, and also the superstructure or seventh floor, which will eventually cover the entire area of the building and form a portion of the future extension of four floors provided for in the design and construction of the building. Mitchell and Creighton, Architects.

System of reinforced concrete construction, will house a number of diverse interest.

The lower portion of the west end of the building is to be occupied by the St. Regis Hotel Co., for hotel and cafe purposes. The hotel kitchen, serving rooms, etc., will be located in the basement. The cafe, dining room, office and bar will be located in the ground floor, a number of private dining rooms on the first floor and bed rooms on the second and third floors. Private bathrooms will adjoin each bed room. The interior finish of the hotel portion of the building is fully in keeping with the high class of the building in general. The balance of the ground floor is to be used for retail mercantile stores. The T. Eaton Co. will occupy three entire floors of the building for manufacturing purposes. The upper two floors will be arranged for offices. The entire seventh floor, which is really a superstructure over the building proper, not covering the entire ground area, is utilized for offices for the varied business interests with which the owner, Mr. Jacobs, is connected.

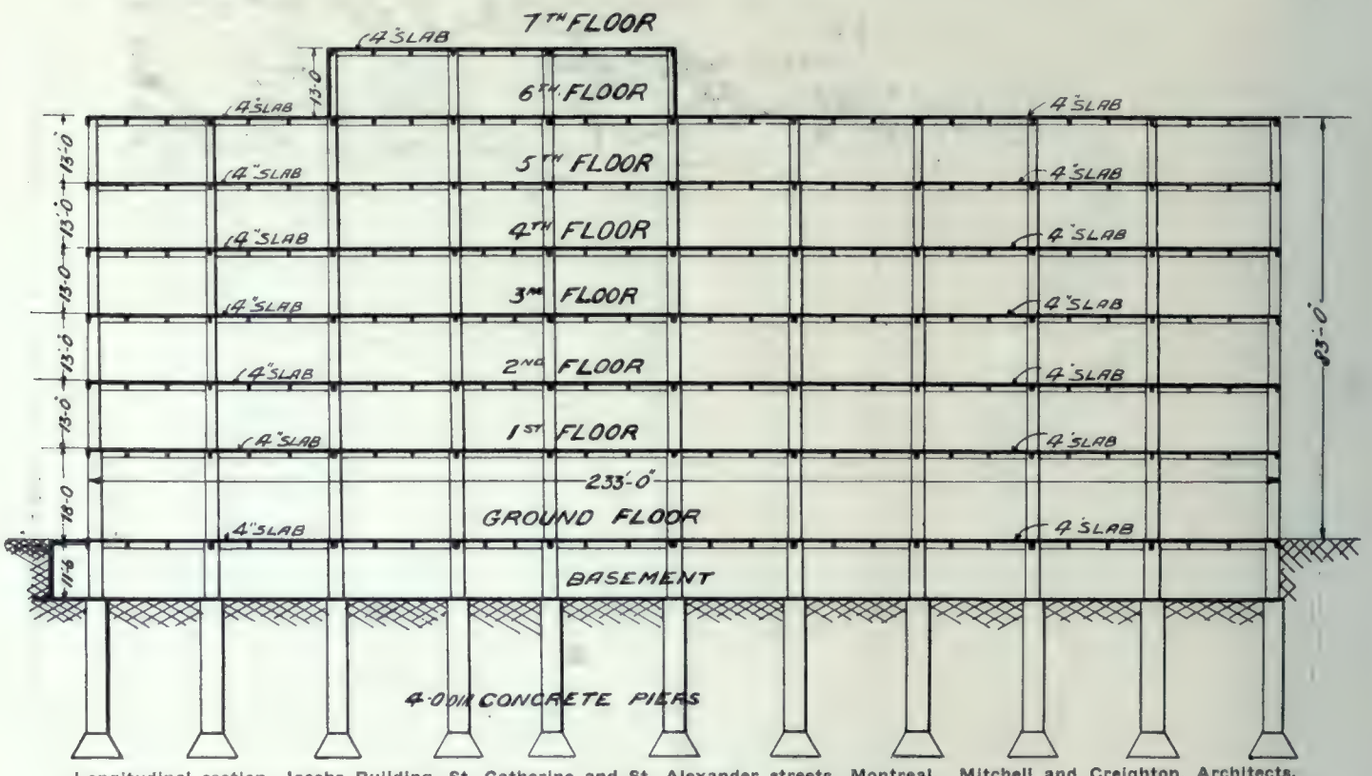
It is interesting to note the rapidity with which the concrete skeleton of the structure was carried up. The foundation work and excavation was completed by August 18, but previous to this the erection of forms had been started, and the first concrete for the superstructure was poured on August 20. In order to expedite the work, the forms for the first three stories were made up at the contractors' planing mill, and delivered to the job ready for assembling and erecting. Ten days were required for the erection of the first floor forms, but the form work on the other floors was accomplished on the average of eight days to the floor. The forms in all cases were allowed to stand for three weeks before stripping was commenced, and were then carefully taken down and rebuilt if necessary before being hoisted for the floor above.

The lumber used for this purpose consisted mostly of 2-in. spruce, dressed on one side, and two edges for beams and columns, with 1-in. floor decking; a small chamfer strip being inserted in the angles of all beams and also at the intersection of beams and slab. The interior columns are all octagonal in shape, and the forms for the concrete were all clamped with specially made steel clamps.

The concrete for the entire structure was mixed in the proportion of 1, 2, 4, the stone for the columns being such as would pass through a half-inch ring, and for beams and slab of a size to pass through a ¾-in. ring. All concrete was mixed to a sloppy consistency, and great care was taken to have same well puddled and spaded in the forms, the work being subjected at all times to a rigid inspection.

As regards equipment, the contractors' plant consisted of a small circular saw, motor driven, a No. 2½ Ransom mixer discharging into a 20 cu. ft. Ransom bucket, which in turn dripped into a receiving hopper equipped with two gates. Steam for the mixer and two hoisting engines was supplied by a horizontal boiler, and two small stiffff leg derricks were used for hoisting the reinforcing steel and lumber.

The extra excavation work in the basement, which was decided on after the building was up several stories, was handled by using two half yard mining skips on narrow gauge tracks. These skips dumped automatically directly into carts driven in on the ground floor, and were run by cable off the drum of a hoisting engine, which also operated the wheelbarrow hoist for brick, etc.



Longitudinal section, Jacobs Building, St. Catherine and St. Alexander streets, Montreal. Mitchell and Creighton, Architects.

STRUCTURAL FEATURES.

The building is designed to carry a live load of 150 lbs. per sq. ft. on the ground floor, 125 lbs. per sq. ft. on the upper floors. The columns throughout the building are octagonal in shape, and vary in size from 32 in. in cellar to 20 in. in upper story. When the additional stories are placed on the structure the size of the upper columns will be 12 in. The main girders, which span 17 ft. 9 in., are 12 in. x 24½ in., and are reinforced with two 1¾ in. x 2¾ in. Kahn bars and one 1 in. cup bar. The intermediate beams which run opposite to and frame into the main girders are 8 in. x 18 in. size, and are reinforced with 1 in. x 3 in. Kahn and one ⅝ in. cup bars. All columns are reinforced with steel rods, hooped with 5-16 in. and ⅜ in. round steel hooping varying in pitch from 1¼ in. to 2 in., according to loading; the concrete inside the hooping being figured for 750 lbs. per sq. in.

An interesting feature in the arrangement of the ground floor is the central portion around the elevators and stairways, which is raised two feet above the general floor level, and also the lowering of the floor back of the elevator, two feet, to allow the teams to drive in on the laneway level, and load directly onto the wagons. Another interesting feature of the design is the cantilever beams under the basement floor, carrying the columns in the outer west wall, as well as the wall itself. These cantilever beams were necessary on account of the building proper extending to the extreme western limits of the property; the caissons under these beams being fully a foot inside the property, and the columns above overhanging the outer edge of these caissons by this margin. The centres of these columns are actually 2 ft. 6 in. off the centres of the caissons. The beam over the driveway on the ground floor of building is also worthy of note. This beam is of 26 ft. 2½ in. span, and carries a concentrated load of 445,000 lbs. 9 ft. 6 in. from the point of support, and in addition thereto a load of 46,400 lbs. equally distributed over the entire span; this beam is 24 in. x 84 in., and is reinforced with five 2 in. x 3½ in. two freight elevators discharging to the loading platform which has already been described.

Wherever it was deemed likely that openings for stairways, elevators, etc., might be required in the future, lifting slabs were provided. In this case the main slab was left with a rebate, and tar paper was placed over the joint before the removable slab was concreted.

There were approximately 10,300 yards of concrete used to complete the structure. The structure is equipped with two Otis-Fensom electric passenger elevators and two high speed electric freight elevators. There are two sets of reinforced concrete stairs running from basement to roof, and also a set of iron stairs. All elevators are motor driven.

POWER AND MACHINERY EQUIPMENT.

The building is heated by steam, lighted by electricity and also by means of Blau gas. This latter, by the way, is a most interesting product, and though well known in Germany, is new in this country. The gas is manufactured in central plants and delivered under high pressure in cylinders, the cylinders being connected to the piping

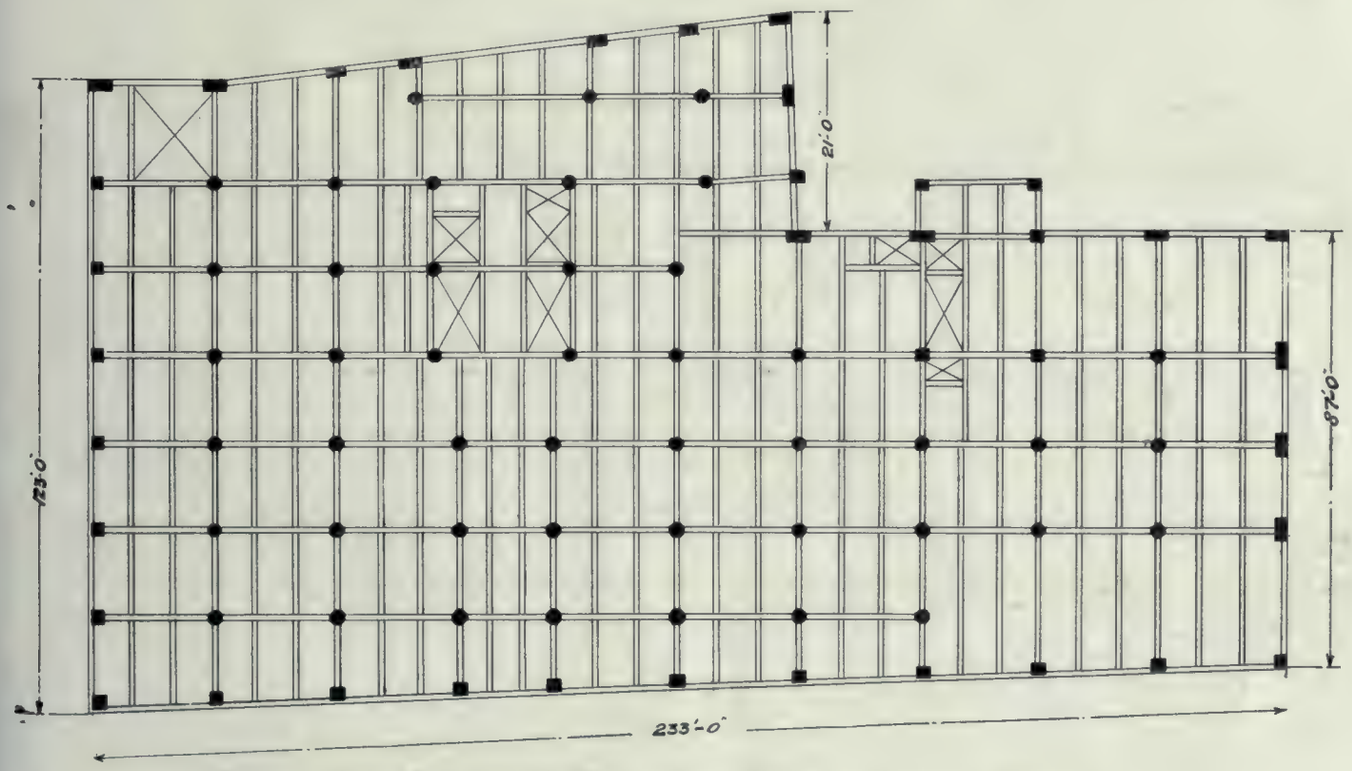


Diagram of typical floor, Jacobs Building, Montreal. Mitchell and Creighton, Architects.

Kahn and ten 1 in. cup bars. The floor slabs throughout are 4 in. thick, and are reinforced with No. 6 Kahn rib metal, this metal having a cross sectional area of .18 sq. in. of steel per foot.

The interior partitions are all constructed of hollow terra cotta tile, and the entire ground floor ceiling is of expanded metal suspended to cover the sprinkler pipes, plumbing and electric wiring, etc. The south and west curtain walls between the columns and beams are filled in with red ascot brick, and the concrete columns and beams are exposed and dressed with bush hammers, which gives a very pleasing effect.

All the exterior facing is carried on the concrete; the outside floor beams being offset beyond the face of the columns to give a bearing for same.

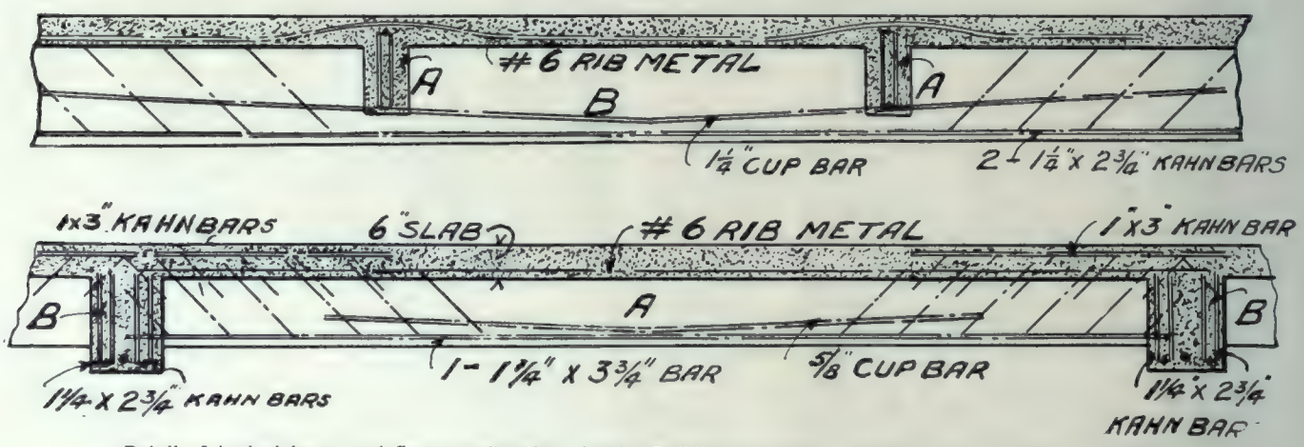
The interior plan and arrangement of the building has been very consistently worked out, ample shipping facilities being provided in the way of driveways, etc., with system in the basement of the building in which it is to be used. The company manufacturing this gas are at present completing a new factory building in Montreal.

In the basement of the building will be located an absolutely complete power plant, power being produced by steam and also by means of a gas suction plant. In addition to adequately meeting the requirements of the building itself, this plant will also supply heat and power to adjacent buildings. The power equipment will consist of one 150 h.p. Belliss & Morcom compound steam engine, four 150 h.p. Tubular steam boilers, and one 150 h.p Hornsby-Stockport suction gas engine equipment, together with suction gas producer plant and the necessary switchboard for handling the above-named equipment, and any additional current that the building might require from the outside. The steam engine will be direct coupled to a 100 k.w. Allis-Chamers-Bullock 240 volts, direct current generator. These generators are of the 3-wire type, and will be operated either in parallel or separately. The wiring throughout the building is, therefore, a 3-wire system,

and the lighting will be done on a basis of 110 volts. The incandescent lamps (if metallic filament) will be hung in series, and the motor-elevators and light manufacturing which will be done in the building, will all be operated on 220 volt basis. There will also be provided a transformer room for receiving alternating current from the outside which will, as alternating current, be stepped down to the proper voltage and distributed through the lighting circuits, separating, in that case, the power from the lighting; a motor-generator set for conversion of alternating current into direct current will be installed should the equipment in the building be insufficient to take care of the total requirements.

The Belliss & Morcom steam engine and the Hornsby-Stockport gas engine are both of English manufacture. The gas engine set is the Otto cycle single cylinder type, with extra heavy flywheel, and governing on the "hit and miss" plan. The relation between the gas producer and the engine is automatic, it being necessary for the attendant merely to put coal in the hopper of the producer and see to the lubrication.

The plan of operation anticipates the running of the steam engine in the winter only, which will result practically in the use of the steam engine as a reducing valve, for the reason that the main object of the steam boiler plant is for heating and is of sufficient capacity to take



Detail of typical beam and floor construction, Jacobs Building, Montreal. Mitchell and Creighton, Architects.

care of several adjacent buildings. Economy, therefore, is obtainable by passing the steam through the 150 h.p. steam engine, utilizing the exhaust steam for heating. In the spring, after the heating season is over, operation of the steam engine will be discontinued, but the gas engine will be operated during the entire year, and the additional current for power or lighting which may be required will be brought in from the outside.

From a standpoint of power equipment and general flexibility, the entire property with its lighting and power equipment, comes up to a very high standard. There is no especially novel feature except that the power equipment combines gas and steam engines—operating, as stated, the steam engine in the winter only.

The plumbing and ventilation throughout the structure embody the most approved sanitary features. The building is equipped with a complete sprinkling system. The ground floor is finished with ceramic tile and the upper stories in maple, this maple super-flooring being practically the only unprotected wood in the building. The interior doors and trimmings are kalameined.

The architects for the building were Messrs. Mitchell & Creighton, of Montreal, and all the concrete work was done in accordance with the standard specifications for reinforced concrete as advocated by the Trussed Concrete Steel Company of Canada, Ltd., of which the following is an abstract:

CEMENT.

"All cement furnished for this work is subject to inspection and tests as hereinafter specified.

All inspections and sampling shall be made by Inspectors, appointed by the architect, at the point of manufacture sending samples to their laboratory for tests and only cement that has been previously accepted will be allowed on the work.

In cases where special conditions make inspection at factory impracticable, inspection at the job may be substituted, subject to approval of the architect. When job inspection is permitted the cement shall be delivered at the job at least two weeks before required for use so as to allow ample time for necessary tests by the laboratory. During this interval the cement shall be stored in weather-tight building and proper care taken to so separate the individual cars that they can be easily identified if found unsatisfactory.

The cement will be accepted at the work packed in stout paper, cloth or canvas sacks. Each package shall be plainly labeled with the name of the brand and the manufacturer. Any package broken or containing damaged cement may be rejected as a fraction package at the option of the engineer in-charge of the work.

The acceptance or rejection of cement used under this specification shall be based on the following requirements.

Fineness of grinding, time of setting, specific gravity, constancy of volume, chemical composition, strength—cohesive and adhesive, microscopic test.

Fineness of Grinding.—After being gently shaken for five minutes, the cement must not leave more than eight per cent. residue on a sieve having between ninety-six and one hundred meshes per lineal inch, the size of the wire being 0.0045 inches; or after being gently shaken for ten minutes must not leave a residue of over 24 per cent. on a sieve having between 192 and 200 meshes to the linear inch; the size of wire being 0.00235 inches.

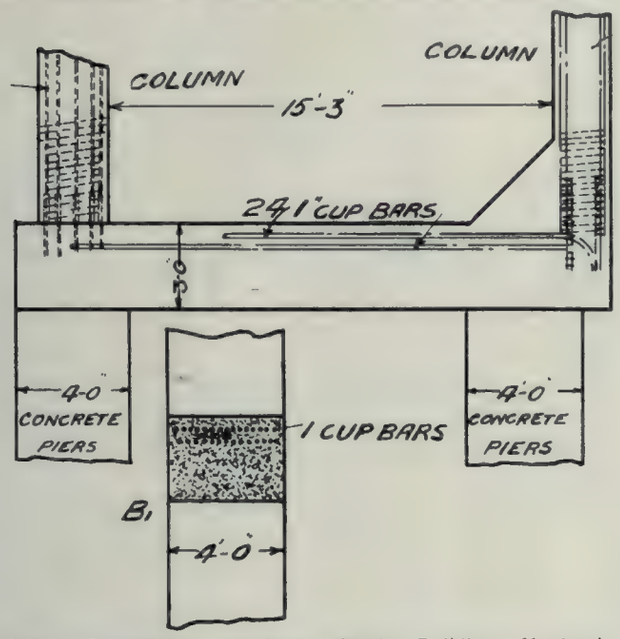
Time of Setting.—On being mixed for three minutes on a non-absorbent surface with the proper percentage of water to produce normal consistency, the paste shall not develop initial set under twenty-five minutes or final set under four hours, or even ten hours. The paste to be kept in a moist atmosphere at about sixty-five degrees Fahr. during the tests and results taken with Vicat apparatus.

Specific Gravity.—The specific gravity of fresh cement must not be less than 3.15 or more than 3.25. On seasoned material the specific gravity must not be less than 3.08.

Constancy of Volume.—A pat about three inches in

diameter, one quarter inch thick at centre and tapering to a thin edge made from paste mixed for three minutes on a non-absorbent surface with proper percentage of water to produce normal consistency, shall be placed on a glass plate and allowed to set in a moist closet at a temperature of 65 degrees Fahr. for twenty-four hours. It shall then be placed in cold water, which shall be raised to boiling point and kept boiling three hours. The pat after boiling shall show no signs of cracking, warping or similar indications of disintegration.

Strength—Cohesive.—The cement shall be mixed for no less than three minutes on a non-absorbent surface



Detail of basement cantilever, Jacobs Building, Montreal. Mitchell and Creighton, Architects.

with water to produce a paste of normal consistency; it shall then be pressed into oiled moulds with the fingers, but in no case rammed. The test specimens (briquettes) shall be placed in moist closet maintained at a temperature of 65 degrees F. for twenty-four hours, after which the moulds shall be removed and the briquettes placed in cold water until tested. The average of five briquettes broken at each period must exceed the following values:

2 days after gauging—275 pounds per sq. in.
4 days after gauging—400 pounds per sq. in.
7 days after gauging—500 pounds per sq. in.
28 days after gauging—600 pounds per sq. in

There must be a rise in strength of at least fifty pounds between each period; the stress to be applied at the rate of 100 pounds per ten seconds.

Strength—Adhesive.—The mortar shall be mixed for three minutes on a non-absorbent surface in the proportion by weight of one of cement to three standard "Ottawa" sand, which has passed the 20 x 20 sieve and been retained on a 30 x 30 sieve. Nine per cent. of water of the combined weight of sand and cement shall be used.

This mortar shall be reasonably rammed into moulds resting on a glass surface previously coated with a thin coat of mineral oil. The briquettes shall be placed in moist closet for twenty-four hours and then removed and placed under water until tested. The average five briquettes broken at each period must not exceed the following values:

7 days after moulding—200 pounds per sq. in.
28 days after moulding—290 pounds per sq. in.

There must be a rise in strength of at least fifty pounds per sq. in. between each period. The stress to be applied at the rate of 100 pounds per ten seconds.

SAND.

The sand shall consist of grains of any moderately hard rock that is perfectly sound. Any sand showing signs of disintegration shall be unconditionally rejected. The sand shall be well graded from coarse to fine. Any sand containing over 5 per cent. of loam or clay will be rejected.

BROKEN STONE OR GRAVEL.

The aggregate shall be composed of broken stone or screened gravel. The broken stone shall be of a hard, close-grained quality, free from dust and crushed so that its largest dimension shall pass through a ring one inch in diameter. Gravel shall be free from dirt and sand and shall range in size from that of a pea to an inch. Disintegrated stone or broken stone containing mica shall be rejected.

PROPORTIONS.

All concrete shall be proportioned of one part Portland cement, two parts sand and four parts broken stone or screened gravel.

RE-INFORCED STEEL.

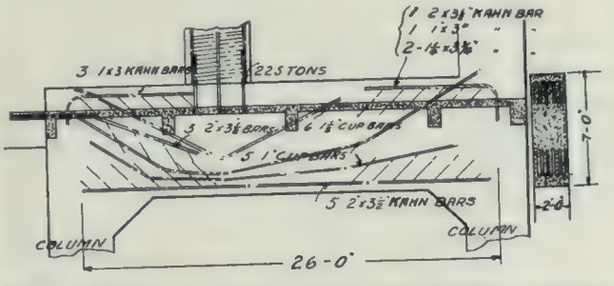
Steel used shall be medium open hearth steel to be rolled from new stock and to meet the manufacturer's standard specifications. Ultimate strength 60,000 to 70,000 lbs. per square inch. Elastic limit not less than half the ultimate strength. Minimum elongation twenty (20) per cent. Bending test 180 degrees to a diameter equal to thickness of piece tested without fracture on outside of bent portion. All steel shall be free from paint, oil or heavy rust or scale.

RE-INFORCEMENT FOR SOLID SLABS.

For solid concrete slabs the reinforcement shall be a steel fabric made of open hearth steel and provided in flat sheets. The main tension members shall be at right angles to the supports, have a maximum spacing of 8 inches and shall be accurately spaced by rigidly attached cross members preferably made from same sheet of steel. The cross members shall not be spaced farther apart than the spacing of the main tension members.

REINFORCEMENT FOR BEAMS.

For joists, beams, and girders no reinforcement shall be considered that does not provide for shearing stresses



Detail of heavy beam over driveway, Jacobs Building, Montreal. Mitchell and Creigton, Architects.

as well as direct tension. Shear members shall be inclined at an angle of 45 degrees, pointing up and towards the supports and shall be rigidly connected to the main tension member by shearing up its flanges. There shall be suffiicent shear reinforcement so that the concrete will be obliged to resist only diagonal tension and shear up to 50 lbs. per sq. in.

MINIMUM PROTECTION.

The minimum protection for reinforcing steel which shall be taken as the distance from the surface of the steel bar to the nearest concrete surface shall be: (a) For slabs ¾ inch. (b) For beams, girders and columns 1½ inches. Steel shall be placed in exact accordance with detail drawings.

BASIS OF CALCULATION.

In calculation of stresses the following assumptions shall be made:

Modulus of elasticity of steel Es= 30,000,000
Modulus of elasticity of concrete, Ec= 2,000,000
Whence $\frac{Es}{Ec} = M = 15$

The value of M given above remains constant at working stresses.

A plane section before bending remains a plane section after bending; that is, the stress in any fibre is directly proportional to its distance from the neutral axis. The tensile strength of concrete shall be neglected.

ALLOWABLE STRESSES.

The following maximum stresses based on figuring full live and dead loads shall be used in the design of reinforced concrete work. Steel in tension = 16,000 lbs. per square inch. Extreme fibre stress in concrete in compression in slabs, beams and girders = 750 lbs. per square inch. Concrete in shear = 50 lbs. per square inch.

The minimum longitudinal reinforcement in any column regardless of the load carried by same, shall be one per cent. of the cross sectional area. For columns reinforced with longitudinal bars tied at intervals of not less than the diameter of the column, the safe load shall be computed as follows: Safe load (in pounds) = 500 Ac + 7500 As. Ac net cross sectional area of column in square inches. As = cross sectional area of longitudinal reinforcement in square inches.

For columns reinforced with longitudinal steel and with spirally wound hoopwing the safe load shall be computed as follows: Safe load = Ac + 15 fc (As + 2. 4A $1\frac{1}{8}$). Where fc = allowable stress on concrete in compression, to be taken at 750 lbs. per square inch. Ac = net area of concrete enclosed in hooping. As = cross sectional area of longitudinal reinforcement. A $\frac{1}{8}$ = cross sectional area of imaginary vertical rods having same quantity of steel as the hooping per lineal foot of column. For all columns the above safe carrying capacities shall be reduced 20 per cent.; for corner columns reduced 30 per cent.

The stresses allowed above shall be used only in the case where the unsupported length of the column is not greater than 15 times the least diameter. Where the length exceeds this limit the allowable stress shall be reduced according to the standard formulas.

Where columns are subjected to loads of known eccentricity the combined stress in the extreme fibre due to direct compression and bending moment shall not exceed that allowed in slabs and beams.

CONTINUOUS ACTION.

The bending moment for slabs and beams which are not continuous over supports shall be taken at $\frac{1}{8}$WL. Where W = total dead and live load uniformly distriuted on the member. 1 = clear span of same. When slabs and beams are built continuous over both supports the bending moment shall be taken at not less than 1/10 WL. Where slabs and beams are continuous over one support only the bending moment shall be taken not less than 1/9 WL. In case of square panels reinforced in both directions and continuous over all supports the bending moment shall be taken not less than 1/20 WL.

When above reductions in bending moments are allowed, provide in the top of the slab or beam over the support at least one quarter of the maximum area of reinforcement in the bottom of the adjacent span.

T BEAMS.

If the slabs, beams and girders in the floor construction are poured in one continuous operation, the width of the adjacent floor slab on each side of beam or girder that may be figured in the compression flange, must not exceed twice the width of the beam or girder of four times the thickness of the slab.

In the case of a floor system consisting of slabs, beams and girders, where the slab reinforcement runs parallel to the girder, the portion of the slab as noted above cannot be figured as part of the compression flange unless reinforcement be placed in the slab at right angles to the girder to insure that the two act together.

COMPRESSION STEEL IN BEAMS.

When it is necessary to introduce steel to take compression in slabs. beams, or girders. the compressive stress allowed on such steel shall not exceed 15 times the computed compressive stress in the concrete at the same distance from the neutral axis.

MIXING CONCRETE.

All concrete must be machine mixed using a batch mixer of an approved design. Fresh clean water, free from acids or strong alkalies shall be used and in sufficient quantity so that the resulting mixture will flow readily around the reinforcing bars. All materials shall be thoroughly mixed dry, after which the proper amount of water shall be added, and the mixing continued until the concrete is uniform. A competent foreman must be in constant attendance at the mixer to give his approval of every batch which leaves the machine. ,

PLACING CONCRETE.

All forms must be absolutely clean and free from shavings or foreign matter before any concrete is placed. All concrete must be deposited in forms within ten minutes after leaving the mixer. All beams and slabs must be filled to the top surface in one continuous operation, that is from the bottom of the beam to the top of the floor construction, care being taken to see that the concrete flows around and under all reinforcing members.

During the operation of pouring, the sides of all beams and girders shall be well spaded so as to obtain a perfectly smooth surface when the forms are removed. All columns shall be poured six to eight hours ahead of the beams and slabs, and the concrete during the operation of filling shall be constantly puddled by means of a rod to expel all bubbles of air and give a smooth finish to the finished structure. The pouring of the column must be a continuous operation to the bottom of the beam or girder it supports. Concrete, after it has been poured, must not be disturbed by walking or wheeling over same till it has thoroughly set.

STOPPING WORK.

When concreting is once commenced it must be carried on vigorously to completion if possible. If concreting must be stopped before an entire floor is completed, the stop shall be made in the centre of beams and center of floor slabs. The plane where concrete work is stopped must be vertical and at right angles to the direction of the beam or slab. In no event shall work be terminated in beams or floor slabs where future shearing action becomes great, as at their ends or directly under a heavily concentrated load.

CENTERING.

The centering must be true and rigid, properly braced and of sufficient strength to carry the dead weight of the construction as a liquid without deflection. All joints must be tight so as to prevent the leakage of the liquid masses. Beam and girder forms should be crowned or cambered $\frac{1}{4}$ inch to every 10 feet. The centering must be so built that the various parts can be taken down in the following order:—Two sides of columns, floor forms,

sides of beams, sides of girders, remaining sides of columns, and the supports for beams and girders.

REMOVAL OF CENTERING.

Centering shall not be removed until the concrete is thoroughly set and is of sufficient strength to carry its own weight besides whatever live load is liable to come on the construction. No falsework shall be removed without the approval of the architect or engineer in charge. Beams and girders shall remain supported for at least two weeks after all other falsework has been removed. Columns shall not be given their full loading in less than five weeks.

After the forms are removed any small cavities or openings in the concrete shall be neatly filled with mortar.

FREEZING WEATHER.

Placing concrete in freezing weather shall be avoided whenever possible, and when necessary special precautions shall be taken to prevent the concrete freezing, such as heating the building with salamanders; covering the concrete with sawdust, straw or manure, heating the materials and adding calcium chloride (8 lbs. per barrel of cement) to the water used in mixing the concrete. All concrete which is frozen shall be removed. The centering shall not be removed until the concrete has thoroughly set and aged.

TESTS.

Floors where directed shall be tested after the centering has been removed one month, to a uniformly distributed load equal to twice the safe load. With this load there must be no deflection exceeding 1/400 part of the span, and the floor must return to its normal position after removal of the load.

The Trussed Concrete Steel Company of Canada, Limited, G. B. Reynolds, local representative, were the structural engineers; and the general contract was carried out by Messrs. D. G. Loomis & Sons. The superintendent of construction was Mr. Beck, assisted by H. McGill Allen, who had charge of the placing of the reinforcing steel and concrete work. All cement used on the job was supplied by the Lakefield Portland Cement Company, and the terra cotta, both for the exterior walls and the partitions, was furnished by the Eadie-Douglas Company, Limited.

REGISTRATION OF ARCHITECTS IN THE TRANSVAAL.—Continued from Page 54.

purpose of sanctioning such alteration. Notice of such meeting, and of the alteration or alterations to be proposed thereat, shall be sent by post to the registered address of each member of the association at least fourteen days before the date fixed for the meeting, but the non-receipt of such notice by any member or members shall not invalidate the proceedings thereat, provided that one-third of the members then on the register shall be personally present or be represented by proxy in writing.

By-laws—When to Take Effect.

29. No by-law framed and adopted under sections twenty-six and twenty-seven of this Act and no alteration, amendment or repeal of any such by-law shall have any force and effect until the same shall have been approved of by the Government-in-Council and published in the "Gazette" whereupon they shall have the force of the law and shall be binding upon all members of the association in so far as the same are not in conflict with the provisions of this Act.

Repeal of By-laws by Governor-in-Council.

30. The Governor-in-Council shall at all times have the power to repeal the existing by-laws of the association and may, from time to time alter, amend and add to such by-laws, provided that such alteration, amendment and addition be not in conflict with the provisions of this Act.

Costs of Promoting This Act.

31. The council may allocate such sum or sums of money as shall be proved to their satisfaction to have been expended in promoting this Act, and which sum or sums are, in the opinion of the council, reasonable, and may order the same to be paid through their treasurer to the body or bodies, person or persons, who may establish the claim or claims within twelve months of the coming into operation of this Act.

Title and Date of Operation of Act.

32. This Act may be cited for all purposes as the Architects' Private Act, 1909, and shall come into operation and have the force of law on the publication thereof in the "Gazette."

CODE OF ETHIC: to be included in the by-laws of the Transvaal Association of Architects, Incorporated under the Architects' Private Act, 1909. Promulgated in Government "Gazette" of 21st July, 1909.

1. Clause 15 of the Act is included in this code, and the following are given in further explanation of pars. *g*, *h* and *i* of Clause 15, also par. *b* of Clause 27.

2. No member shall have any financial interest in or otherwise combine any other business with that of architecture, such as building and contracting, house and estate agency, auctioneering, merchants or any such like as the council may from time to time decide.

3. A member shall not receive, directly or indirectly, any royalty, gratuity or commission on any patented or protected article used on work which he is carrying out for his clients without authority in writing from those clients.

4. A member shall not participate in or be the medium of payments of prime cost sums or other payments made on his clients' behalf to any builder, contractor or business firm, without authority in writing from those clients. He may issue certificates or recommendations for payment by his clients.

5. No member shall guarantee an estimate or contract by personal bond, nor be party to a building contract except as owner.

6. No member shall attempt to supplant another architect after definite steps have been taken towards his employment.

7. No member shall advertise in any publication or in any other way than by a card or plate, giving name, address and profession. It is undesirable to do so on boards or boardings in front of buildings in course of construction.

8. No member shall criticize in public print the professional conduct or work of another architect except over his own name.

9. No member shall furnish designs in competition in private work or public work except under conditions and assessors previously approved by the council of the association.

10. No member shall submit drawings in any competition not designed and prepared under his personal supervision; nor shall any member attempt to secure any work for which a competition remains undecided.

11. The schedule of charges as sanctioned under the Act shall be the minimum rates for the services rendered.

Court of Farnese Palace. The architecture of this palace, and more especially that of the arcades of its court, is regarded by students of design, as the most perfect example of ancient arrangement adapted to modern conditions and requirements.

THE FARNESE PALACE.—Beautiful Edifice Designed by San Gallo, and Finished by Michael Angelo.—Regarded by Students of Design as the Most Perfect Example of Ancient Architecture Adapted to Modern Conditions and Requirements.

OF ALL THE BEAUTIFUL PALACES in Rome which are conceded to be the finest architectural works in Europe, none equals Farnese. This magnificent edifice was erected by Pope Paul III. before his accession to the Holy See, after the designs of Antonio Cordiani da San Gallo, and was completed by Michael Angelo. It obtained its name from the illustrious Italian family of which Cardinal Alessandro Farnese, who was raised to the Papal throne as Paul III. in 1534, was a member.

The Farnese Palace forms a quadrangle of 256 ft. by 185 ft. It is constructed of brick, with the exception of the dressings of the doors and windows, the quoins of the fronts, and the entablature and loggia in the Strada Giulia, which are of travertine stone. Of the same stone, beautifully wrought, is the interior of the court.

The building consists of three stories, including that on the ground, which, in the elevations or facades, are separated by impost cornices. The only break in its symmetry and simplicity occurs in the loggia, placed in the centre of the first story, which connects the windows on each side of it by four columns. On the ground story the windows are decorated with square-headed dressings of extremely simple design; in the next story they are flanked by columns, whose entablatures are crowned alternately with triangular and circular pediments; and in the third story are circular-headed windows, crowned throughout with triangular pediments. The taste in which these last is composed is not so good as the rest, though they were probably the work of Michael Angelo.

The facade towards the Strada Giulia is different from the other points in the centre only, wherein there are three stories of arcades to the loggia, each of whose piers are decorated with columns of the Doric, Ionic and Corinthian orders in the respective stories as they rise, and these in form and dimensions correspond with the three ranks of arcades towards the court. It appears probable that this central arrangement was not in the original design of San Gallo but introduced when the third story was completed.

Magnificent as is the exterior of this palace, it does not exceed the beauty of the interior. The quadrangle of the court is 88 ft. square between the columns of the arcades, and is composed with three stories, in which the central arrangement above mentioned towards the Strada Giulia is repeated on the two lower stories, over the upper whereof is a solid wall pierced in the windows.

The piers of the lower arcade are ornamented with Doric columns, whose entablature is charged with triglyphs in its frieze, and its metopae are sculptured with various symbols. The imposts of the piers are very finely profiled, so as to form the entablatures when continued over the columns of the entrance vestibule. In the Ionic arcade, over this, the frieze of the order is decorated with a series of festoons.

The distribution of the different apartments and passage is well contrived. All about the building is on a scale of great grandeur. Though long unoccupied, and a large portion of its internal ornaments has disappeared, it still commands admiration in the Carracci Gallery, which has continued to serve as a model for all subsequent works of the kind. The antique sculptures for which it was formerly renowned, are now in the museum in Naples; a few of the classic works, however, are still to be seen in the great hall.

The architecture of the Farnese Palace, more especially as respects the arcades of its court, is the most perfect adaptation of ancient arrangement to more modern habits that has ever been designed. We here allude more particularly to the arcades, upon whose piers orders of columns are introduced. This species of composition, heavier, doubtless, less elegant, yet more solid than simple colonnades, is, on the last account, preferable to them, where several stories rise above one another. The idea was, certainly, conceived from the practice in the ancient theatres and amphitheatres; and its application at the Farnese Palace rivals in beauty all that antiquity makes one in its remains acquainted with.

Antonio Cordiani da San Gallo, (1485-1546), its architect, belonged to a celebrated family of architects of the Renaissance. His father, Giuliano (1445-1516), the first to be distinguished and most important member of the family was born in Florence, the oldest son of Francesco Giamberti, a woodworker. Although Giuliano, his father, was one of the most important architects of the Early Renaissance, his work as as architect was somewhat overshadowed by his prowess as a military engineer. Among some of his important work was the beautiful Church of Madonna delle Carceri at Prato; the Augustine convent at Florence; the Gondi Palace; the celebrated Strozze Palace for which Benedette da Majano has received the credit; the fortress at Ostia; the ceiling of Santa Maria Maggiore and the cloister of San Pietro in Vincoli. In 1503 he designed the first plans for Saint Peter's having been replaced by Bramante. Later he was associated with Raphael on Saint Peter's, serving in this capacity for two years.

Antonio Cordiani da San Gallo proved himself a worthy son of so illustrous a father. He went to Rome at eighteen years of age, studied with Bramnate, and did important work for forty-one years under Pope Leo X., Clement VII. and Paul III. He was employed on the Castle of Sant' Angelo and at Saint Peters, nearly finished the Farnese Palace, and completed the Santa Maria di Loreto at Loreto. With his brother, Ballista, he was engaged upon the Villa Madama in Rome, usually attributed to Raphael. In 1518 he was appointed to succeed Raphael as architect of Saint Peter's and of the Vatican Palace. His model for the church is still in existence. His work as a military engineer was very extensive, comprising more than a dozen fortifications. He died at Ferni, October 3, 1546.

It is questionable if there is in history any one family of architects that have so much exceptional work to their credit. Antonio Cordiani da San Gallo had an uncle known as Antonio da San Gallo "the elder" who had a career very similar to that of his brother Giuliano, excelling both as an architect and military engineer. He was employed by Pope Alexander VI. in fortification work at the Castle of Sant' Angelo, at Civita Castellana, and at Nepi. He re-constructed the church at Arezzo and built the fine Portico of the Annunziata, Florence, for Pope Leo X. His best work as an architect is the Church of the Madonna di San Biagio, at Monte Pulciano, where he also built the Cervini, Tarugi and Bellarmini Palaces. He took part in the defence of Florence when it was besieged in 1530, and died December 7th, 1534.

The Farnese Palace, the most magnificent of all the beautiful palaces for which Rome is renowned. It was erected by Pope Paul III., before his accession to the Holy See, after designs by Antonio Cordiana de San Gallo, and was completed by Michael Angelo.

Court of Farnese Palace, showing the Doric, Ionic and Corinthian Columns which decorate the piers in the respective stories as they rise, and the general treatment of window scheme and cornices.

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CORRESPONDENCE.—The Editor will be pleased to receive communications upon subjects of interest to the readers of this journal.

Vol. 3 Toronto, March, 1910 No. 4

Current Topics

A ROMAN TOMB of the second century B.C., containing a marble sarcophagus of exquisite workmanship, five feet long and admirably preserved, has been discovered at Grosseto.

* * *

THE VANCOUVER SCHOOL BOARD has decided to appoint a permanent architect to its staff at an annual salary of $2,500, instead of engaging one from year to year as has been the custom.

* * *

OFFICERS FOR 1910, as elected by the Quebec Association of Architects at the annual meeting recently held, are as follows: President, Thos. Raymond, Quebec; first vice-president, J. R. Gardiner, Montreal; second vice-president, L. Lemieux, Montreal; treasurer, W. Maxwell, Montreal; secretary, J. E. Vanier.

* * *

TORONTO'S CONTRIBUTION to the fire fiend in 1909 was $177,405, or over $300,000 less than in the preceding year. The total loss in this respect amounted to $740,931.78, and the insurance to $563,526.78. The total insurance on the properties affected was $2,531,741.35 of which amount $1,240,155.40 was on the buildings, and $1,291,586.35 on the contents.

* * *

PETROL DRIVEN STREET CARS are being put in service in Karachi, India, with a view of bringing about a more speedy service without the cost of changing the system to an electric line. The cars, which seat 46 people, are driven by a Lucas valveless engine of 25 horse-power capacity, and are capable of making about ten miles an hour. This departure is said to be the first application of petrol engines to street railway traffic.

REAL ESTATE IN MONTREAL is booming. An unusually large number of deals in the down-town district involving huge sums are now in course of negotiation, and land values in the suburbs are on the advance. Local contractors look forward to an extremely busy building year.

* * *

THE BUILDERS' ASSOCIATION of St. Thomas, Ont., have elected the following officers for 1910: Pres., Geo. Wilson; vice-pres., A. E. Hamilton; treas., Chas. Lee; sec., Geo. Tyler; auditors, L. Shaffer and W. J. Green; finance committee, John Scrace (chairman), A. E. Hamilton, Geo. W. Wilson; chairman of committee on games, Wm. Rose; chairman of grounds committee, John McCallum; chairman of printing, Dell Shafer; chairman of parade, John Scrace; chairman of entertainment, Clarence Lee. Arrangements for the annual outing will be made at a later date.

* * *

A NEW PROCESS for utilizing the waste slag of blast furnaces, with a view of converting it into glass, by adding sand and sulphate of soda, and in some cases a little lime, is now being tested in Liverpool. With or without enclosed wire, this glass may be cast or rolled into artificial slates, paving blocks, building blocks, bricks, slabs or tiles. Much is expected from the material as regards slag roofing slate, which, it is said, costs less than half as much as the natural slate of Wales, is translucent, can be made of any size or shape and in any one of several colors, and is absolutely rainproof.

* * *

NEW YORK'S NEW SUBWAY, it is estimated, will cost in big round figures, at least $240,000,000, making it the most costly railroad in the world. The present system cost $35,000,000 to build and lay down, and $45,000,000 more to equip, making $80,000,000 in all. The new system will cost $100,000,000 to bore and lay down, and when ready for operation, with all stations built and an adequate equipment of power houses and cars, will have necessitated an additional expenditure of $140,000,000. This huge outlay will be expended on a strip of tracks but little more than twenty-six miles long, so that the average cost per mile will approximate $923,765.

* * *

AT THE TWELFTH ANNUAL MEETING of the London Builders' Exchange held recently, the following officers were elected for the ensuing year: President, Geo. Everett; first vice-president, John Jones; second vice-president, William Nutkins; secretary-treasurer, George S. Gould, assistant secretary-treasurer, A C. Nobbs; Auditors, D. Ferguson and T. R. Wright; directors, J. Moran, E. Gerry, G. Belton, E. R. Dennis and W. T. Brown. Representatives on Western Fair board, Geo. Everett and Geo. Belton; delegates to the Canadian Builders' Convention, Messrs. Everett, Ferguson and Stevely; alternatives, J. Jones, Stratford and L. H. Martyn.

* * *

TAKING THE BUILDING RETURNS for 1909 on a per capita basis, Vancouver stands highest of any of the large cities of the Dominion. At least this is how it is figured by Building Inspector Jarrett of that place, who summarizes the year as follows: Toronto with 300,000 population, records building permits to the amount of $18,154,037. Winnipeg, standing second in building totals in the Dominion, reports an aggregate of $9,226,325; but this business is to be reckoned on a population stated to be nearly 200,000. Montreal comes third on the list with $7,783,531 as its total and a population of about 400,000. Vancouver, which is fourth with a total of $7,258,565 has as yet but a population of 100,000; and has therefore made a greater advance per capita than any other Canadian city in the metropolitan class.

TESTS ARE NOW BEING MADE in the United States with the Edison storage battery, which, according to the inventor, will supercede the trolley, and revolutionize the building of automobiles. Trial runs with a 26 foot experimental car carrying thirty passengers, which were made recently at Orange, N. J., before several street railway experts proved to be highly successful. The power was generated from 210 cell arranged under the seats, ten of which were used for lighting purposes. Mr. Edison is now at work on a patent electric heater, which he says, for cheapness and radiating power, will discount anything yet produced.

* * *

OFFICERS OF THE OTTAWA BUILDERS' EXCHANGE as elected at the recent annual meeting are as follows: President, George A. Crain, (re-elected); first vice-president, August Boehmer; second vice-president, J. Thorpe Blythe, (re-elected); treasurer, James Ritchie. The yearly report of the directors showed that the Exchange is making very substantial progress. A number of new names were added to the membership during the past twelve months, and the absence of strikes or labor trouble in the building trades had permitted operation to go uninterrupted. Reference was also made to the uniform form of contract, framed last season, which has just been put in printed form and is now receiving the attention of the builders and architects.

* * *

IN ORDER TO BETTER PROTECT THE PUBLIC the Home Secretary of England has made a series of regulations governing cinematrograph or moving picture entertainment in theatres and other buildings. These provide that the cinematograph apparatus shall be placed in an enclosure of sufficient dimensions to allow the operator to work freely, and except in the case of a movable building or structure the enclosure shall be of a permanent nature. Such enclosure must be placed outside of the building or auditorium, and, constructed of fire-resisting material, or lined internally with the same, and so ventilated as to prevent the escape of smoke into the auditorium. The entrance to the enclosure must be fitted with a self-closing smoke-proof door of fire-resisting material. Provision is also made for the protection of the openings for projection of the pictures, each opening to be fitted with an automatically-closing fireproof screen. The film boxes must also be made safe, and in the use of limelight gas bags are prohibited.

* * *

REPRESENTATIVES OF THE GOOD ROADS ASS'N of Ontario will gather in Toronto on March 2nd, 3rd and 4th, in what promises to be one of the most important and successful conventions in the history of the organization. The Association considers the time favorable for a concerted advance in the construction of new roads throughout the Province, and with this end in view efforts are being made to secure the attendance of members not only from county councils, but from the township bodies, and all other associations that are interested in improving the roads of the country, such as the Farmers' Institutes, agricultural societies, fair organizations, the various live stock associations, fruit-growers and others. The movement of the association is widespread in extent, and is now being taken up by the towns and cities. In addition to a valuable series of addresses from the superintendents of country road systems in which the cost, machinery and material used and method of construction employed will be explained, the programme provides for a number of interesting papers by experts from New York, Pennsylvania, Massachusetts and other States where the finest roads in America have been built.

BY THE PROVISIONS OF A NEW BY-LAW decided upon by the Winnipeg authorities all master plumbers will, hereafter, have to take out licenses, which will be renewable annually. They will also have to make and bear the cost of smoke testing. Taps and valves, however, will be tested by the city's plumbing inspector. The registration fee is to be ten dollars, and the annual fee one dollar.

* * *

A NEW YORK REPORT, regarding the cement production in the United States in the past year, says: Increased demand for cement during 1909 is attributable largely to activity in building. As construction work far surpassed 1908, consumption was considerably greater. The year's business was practically closed by November 1, and conditions since have shown an appreciable change. For the year mills operated between 60 and 65 per cent. of capacity, while total production was about 62 000,000 barrels, or an increase over 1908 of nearly 10,000,000. The high price for the year was $1.53 per barrel, and this declined to a low level of $1.33, rising again to $1.43, the present quotation to the dealer. A fair average price would be about $1.38. In general, prices have been rather unsatisfactory, manufacturers claiming that margin of profit has not been commensurate with cost of production. The cement production of 1908 was approximately 53,000,000 barrels, valued at $44,000 000; during preceding year production was about 49,000,000 barrels, valued at $54,000,000. This increase of about 2,000,000 barrels in production and decrease of about $10,000,000 in valuation was in the nature of a report from the industrial clearing house, such as the manufacturer had never encountered before. Nobody was quite certain as to how much cement the country could really consume. It served to show the present needs of the country and the extent to which competition had developed.

* * *

A TRACKLESS TROLLEY SYSTEM, the invention of Herr Ludwig Stoll, of Vienna, a leading official of the Austrian Daimler Motor Company, has for some time been working successfully near Vienna and elsewhere in Austria-Hungary. Current is taken from the overhead positive wire by flexible cables, and not by a pole or boom. Instead of an underrunning wheel or overrunning shoe, the head or actual current collector is a frame with two small grooved wheels on each side. One pair of wheels runs on the positive, the other on the negative wire, and the cable is suspended from the centre of the frame, from which point also is suspended a weighted pendulum, which keeps the wheels well pressed down on the wires. The wheels (or pulleys) run on ball bearings. The trolley runs without sparking. The pull of the cable acting on a very short lever arm, and the centre of gravity of the trolley being low, no deviation of the trolley is possible, even in strong transverse pulls. The conducting cable can be lengthened to follow the car by two appliances—an upper sliding knot tied upon the pendulum weight and stretched by a string in the latter, and a cable roller (on the left) with 10 to 12 yards of cable, which can be rolled up or let out by a spiral spring. Thus the car is allowed to run on any part of the road, to overtake other carriages, or to turn anywhere, accommodation itself to all kinds of traffic. When two cars running in opposite directions meet, the drivers interchange the trolley conduits by detachable contact boxes, an important advantage over a tram line with one track, on which the loss of time in waiting at passing places is sometimes considerable. The vehicle having this flexible means of taking the current can, it is stated, move as far as 20 meters (65 feet) away from the wire, and thus has powers of adaptability which would be rarely exercised to the full extent.

Lt.-Col. H. N. Ruttan, Winnipeg, the newly elected President of the Canadian Society of Civil Engineers.

CONVENTION OF CAN. SOC. OF C.E.—Twenty-Fourth Annual Meeting Brings Representative Gathering to "Capital" City.—Gist of Committee Reports and Business Sessions.—Status of Engineer Subject of Broad Discussion.—Officers for 1910. ∴ ∴ ∴ ∴

ALTHOUGH THE 24th ANNUAL CONVENTION of the Canadian Society of Civil Engineers is now a thing of the past, the many vital subjects which occupied the three days time at Ottawa, and the important work which the Society has laid out for the promotion of the engineering fraternity in Canada, marks it as a cardinal event in the history of this organization, and one from which will eventually accrue such results as will be of immeasurable benefit to the engineer both individually and collectively.

If, perhaps, the meeting, in point of attendance, did not quite come up to the big convention held in Montreal two years ago, it certainly exceeded it in genuine enthusiasm, important business, and the promise of something in the way of actual accomplishment. In the latter respect, the Convention was particularly notable, not only as it concerns the interests of the engineer, but the interests of the entire country.

Possibly at no previous time has the status of the engineer been more broadly discussed and probably never before were more definite steps taken to bring about the advancement of the profession in the Dominion. The great interest awakened in this respect, was brought about by an address made by Mr. Dodwell, Halifax, at the annual smoker, in which he referred to the speech made in the House of Commons by Mr. Warburton, M.P., from Prince Edward Island, in behalf of the civil engineer, and which resulted in a committee of the Society being appointed to memorialize the Government on the subject of an improved engineering service, and a more deserved recognition for the members of the profession in its employ.

Mr. Dodwell's position as Resident Engineer of the Department of Public Works for Nova Scotia, made him particularly well qualified to go fully into the subject which he had chosen, and to call attention to the lack of success which has attended the efforts to improve the Department, that had been made in the past.

In the course of his remarks, Mr. Dodwell said that no more important subject has come before the Society since its organization—and this not because a good number of the members as in the Provincial or Federal Government, but because of the functions of the Society to guard the profession as a whole. There was urgent need for a higher professional standing in the Federal Service, together with an official status of enrolment and a system of pension and superannuation. No standard whatever, at the present, is required, and the engineers entering the Government service are not obliged to pass an examination or to produce testimonials. Any of them may be put into a position of responsibility when wise expenditures or extravagant waste will result, according to his ability and common sense or the absence of such qualities. In the report of the Department of Public Works could be found the names of caretakers, stationary engineers, and others, but not those of civil engineers. If proper organization existed the Department of Civil Engineering would be one of the most profitable institutions in the country, considering the capabilities of the engineer and the industrial advantages which his service makes possible. He believed that he voiced the sentiments of the Society in declaring that no civil engineer should be appointed by the civil service unless he was a member in good standing in their organization. In touching upon a recognized official status for the engineer with enrolment in the Civil Service, Mr. Dodwell said that no provision is made for a corps of engineers in the Federal Service, and that the Civil Service Act has always excluded civil engineers in a manner which looked very much like design or intent. There was no reason why engineers should not enjoy security of tenure and other privileges provided by the Civil Service Act. As it is, Mr. Dodwell intimated, there is a distinction between the inside and outside services. No engineer outside of Ottawa, notwithstanding the rank he holds, may have his name put on the Civil list as an engineer, and he believed that a man should be equally a servant of the Government, whether in Ottawa or Vancouver. As regards pensions and superannuations, under the existing conditions no provision was made for the engineer or for his family in case of death, and there were a number of engineers in the Public Works and Railway and Canal Department, whose period of office has been from fifteen to forty years. Other employees of the Government were taken care of in this respect, and this indifference to the engineer, in the opinion of the speaker, was a discrimination, unjust, ungenerous and remedial.

Reference was made to what has been accomplished by the Public Works Departments of India and Australia, and the measures adopted for the protection of the engineer's interest, or those of his family in case of his demise. The speaker wished to be understood that his arguments were not made for the purpose of increased salaries, but for an improved standard in the Federal Service, and a broader recognition from the Government, as he believed that it would serve to promote the interests of the engineer in general, and raise the status of the profession in Canada to a higher and more dignified plane.

Mr. Butler supplemented Mr. Dodwell's speech with an appropriate address in which he stated that the civil engineers are the most important factors in modern civilization, and that no other profession could lay claim to the all-absorbing quality possessed by the engineering profession. He laid stress on the importance of the civil engineer as being practical as well as scientific, and stated that the members of the profession in Canada should be among the best in the world. The transportation problem in the Dominion required a higher degree of skill on the part of the engineer, than in any other country, and any failure on his part would prove a menace to the political future of the country. It was essential that the transportation problem in Canada be worked out an east and west lines, and not north and south, if foreign territory is to be avoided. M. Butler hoped that the younger men would take some of his ideas home and think them over, and he wished to emphasize in particular the great disadvantage resulting from the lack of business acumen on the part of those engaged in engineering work.

President's Address

IN CLOSING MY YEAR as President of the Canadian Society of Civil Engineers, I desire to express my appreciation of the honour which has been conferred upon me and of the personal consideration of the members. My interest in the welfare and future of the Society will always continue, and I shall be ready to add my efforts to those of other members for its advancement.

I am pleased to be able to report the continued growth of the Society, in the ranks of which are now included practically all the engineers of the Dominion in every branch of engineering. During the past year we have added two hundred and forty members and students to our rolls; so that we now have a total membership of two thousand five hundred and sixty-nine, of which the Honorary Members, Members, Associate Members, and Associates number fourteen hundred and five, and Students eleven hundred and sixty-four. This must be very gratifying to the members of the Society, and is of interest to the country at large, in that it shows a marked advance in all branches of engineering which are so closely connected with the development of Canada.

The Canadian Society of Civil Engineers is an organization national in character, aim, and outlook, and is of recognized high standing. It must grow and increase in influence. The Society, as you are aware, some years ago formed itself into four sections: General, Electric, Mechanical, and Mining. The object in view was to centralize the interests of the different departments of engineering and enhance the attractiveness of the meetings to those especially concerned in only one branch of the profession. While the home of the Society is established in Montreal, where practically all the business is transacted, the occasional change of place for the annual meeting has, in my opinion, served to join the men of the far east and the far west with their brothers of the great middle country. The formation of our local branches, which extend from the Pacific Ocean to the tide-waters of the Atlantic Ocean, while preventing decentralization, has done much to reconcile diversified views. The prime reason for the organized existence of the Society is to afford an opportunity for interchange of views on matters of interest to the members, thereby facilitating the advancement of engineering knowledge and benefiting not only themselves but also the community at large.

In order to give effective assistance in the advancement of engineering practice, it is important that we contribute to the work of our committees, so that their reports may be exhaustive and conclusive. It is not expected that these reports shall be final, as this would leave no room for improvement and further development. The reports should express the combined judgment of the members of the committees with regard to the practice which it desires the Society to approve, keeping always in mind the fact that such approval is subject to revision as circumstances justify.

Canada's great problem to-day is transportation. While the possibilities and even the necessities of water transportation in Canada are great, the problem will, I think, be largely solved by the network of steel which is being rapidly spread over the country.

We have, without doubt, entered upon one of the greatest years, if not the greatest, of railway development in our country. This is noticeable not only in regard to additional mileage, but particularly in the tremendous increase of motive power now being applied in the operation of railroads. Locomotives have been designed and put into use of a size that a few years ago would not be thought of, and, in addition to this, railway gradients have been reduced at enormous expenditure. These grade reductions are such that they have more than doubled the haulage capacity for a given engine.

In the development of water power, Canada, from one end of the country to the other, has made phenomenal strides. We constantly read of new water power construction and the resulting increase in the industrial development of the country. There has also been great progress made in the electrical transmission of energy from the centres of water powers. Only a few years ago high tension transmission power lines were operating at a maximum of 30,000 volts, while this year the Hydro-Electric Commission of Ontario is constructing lines carrying 110,000 volts. In the application of electrical construction to railroads, the great improvement and added comfort in travelling is very noticeable, especially in tunnels, where trains are not now detained on account of gases generated by the coal-burning of the locomotives.

In the mining industries of the Dominion great strides have been made by the mining engineer, particularly in the construction and installation of machinery designed to handle in the most economical manner the riches beneath the soil. These new appliances have made it possible to develop properties which, in the days when only the pick and shovel were used, were without value, owing to the great cost of these old methods. Civil engineers engaged in municipal works have shown great advancement in the construction of waterworks, the proper disposal of sewage, and notably in the construction of roadbeds and pavements of all descriptions of highways.

In bridge engineering the problems which now face us are stupendous. Members of the Society are engaged in the building and construction of bridges with spans of 1,800 feet, in which also occur some most complex problems in substructure. The strength of bridges has been largely increased; in my own experience, almost threefold. It was said some two years ago that nearly everything had been discovered or invented except the flying machine and the North Pole. Since that statement was made the North Pole has been explored and flying machine construction rapidly advanced. I venture to predict that the progress of scientific engineering will in the next fifty years exceed that of the past fifty, great as that has been. Problems in engineering at which we now stand aghast will come to be matters of everyday practice. The members of the Canadian Society of Civil Engineers have undoubtedly lived up to the motto of the Society, whereby the great sources of power in Nature are converted, adapted, and applied to the use and convenience of man. The world owes more to the profession of engineering than to all the other professions combined.

I now wish to say a few words on the subject which, at the present time, is most interesting to me in my professional work. I refer to my connection with the Engineering Department of the Board of Railway Commissioners for Canada, of which I have the honor to be chief. You are, no doubt, aware that the Board of Railway Commissioners was formed for the purpose of dealing with matters relating to railway construction and maintenance, operation and traffic. The Engineering Department of the Board has to deal with construction and maintenance, and it is in regard thereto that I wish to speak specially. After a great deal of care and research, rules and regulations of the Board, specifying the proper method of presenting and filing plans, profiles, and details of all works in connection with railway matters, were drafted and approved. Plans of location of railways are now coming to the Board in great and apparently increasing volume from all parts of the Dominion. The Engineering Department, in examining these plans, has in view the following: That no infringement on other locations are allowed; that the proper location of railways over all streams has been observed; and that there is no interference with adequate drainage of the country. In connection with bridge work, the strain sheets are checked to see that they are in accordance with the standard specifications. After the plans of the bridges have been approved, the completed structures are inspected on the ground to see that the plans have been carried out.

All plans, which are forwarded to the Board with applications of railways for the crossing of highways,

are examined to see if the crossing is a proper one, and to endeavor to obtain grade separation in order to carry the railway over or under the highway, as the case may be. In addition to the above, many cases are also submitted, both by railway companies and municipalities, for the purpose of safeguarding the public by the application of grade separation to these thoroughfares. Scores of highway crossings are examined monthly by the engineers of this Department, and voluminous reports are made on the subject of eliminating grade crossings. In the older parts of the country, railway development in some places has reached a stage at which, on account of the great number of intersecting lines, care must be exercised in order to make these railway crossings separate by means of overhead or subway construction. Such construction is, of course, not yet possible in the prairie country of the West, where the ground does not lend itself to these conditions.

Great care is taken in the crossing of railways by high power electric transmission lines, in order to protect the public from dangers that might arise by breakage of these power lines. Such accidents are minimized by the construction of cables of reduced spans and greater tensile strength. The construction of all classes of conduits under the railway roadbeds for the conveyance of water, gas, and drainage is also a matter which demands close inspection. All plans of these are carefully looked into, so as not to impair the efficiency of the roadbed in the interests of the safety of the travelling public and trainmen.

The rules and regulations, after several minor amendments, have been thoroughly tested, and have apparently worked with equity to all whose cases have come before the Board for adjustment.

In closing my year of service in your cause, I desire to express my appreciation of the cordial assistance rendered by my colleagues on the Council and by your indefatigable Secretary. To this combined force I attribute whatever success in advancement your interests has fallen to the year of my administration.

Reports of the Various Committees

The report of the council showed the affairs of the Society to be in a most satisfactory condition. The treasurer's statement gave the year's receipts as $16,578, as against an expenditure of $12,421; and the annual enrollment had increased the membership to 2,659.

Government Testing Laboratory.

One of the most important reports considered, was that of the committee appointed at the previous convention to approach the Dominion Government regarding the desirability of establishing Federal testing laboratories for the investigation of structural and other materials. The committee had waited upon the Minister of Public Works, and had subsequently prepared a memorandum at his request in which attention was called to the work which has been done and is still being accomplished by the United States Government through its splendidly equipped testing laboratories at St. Louis and Pittsburg. The taking of a similar step on the part of the Dominion Government as the largest consumer of structural materials in Canada, would prove to be a wise and economical undertaking, besides being of great benefit to the public at large, through the printed reports of the results of the investigations. There is, it was pointed out, a great variety of structural materials in Canada, about the physical properties of which very little is definitely known, and whose relative values could be ascertained and exploited to the advantage of the country, if proper testing facilities were provided.

However, nothing as yet has been done by the Government regarding the project. It was the opinion of the convention that the Government should be furnished with more detailed data as regards the expenditure that the cost of erection, equipment and maintenance of such a laboratory would involve. With this object in view, a resolution was passed authorizing that the committee on the establishment of testing laboratories be continued, and that they be instructed to urge upon the Government, through the council, the desirability of appointing a commission to visit the United States testing laboratories at St. Louis and Pittsburg, and also the government laboratories in other places, for the purpose of gaining the necessary information to the establishment of a Canadian laboratory.

Rail, Fastenings and Tie Plates.

The report on transportation, which was presented by the various sub-committees appointed to consider this comprehensive question, dealt with what had been accomplished in this respect during the past year.

Mr. Kelly, chairman of the sub-committee of Rails, Fastenings and Tie Plates, stated that in considering the work assigned to them, his committee had deemed it advisable not to attempt to cover the whole field in one year, but to take up one subject at a time, and to deal with it as fully as possible, so that the report would afford useful information for the members. The report of the committee was as follows:—

"In the report of your Sub-committee on Rails, Fastenings, and Tie-Plates, at the last annual meeting, consideration was given to a comparison of the various standard and proposed sections in use by the railways of North America.

"It was hoped that, during the year, sufficient information would have been obtained from the reports of the various railways to enable the sub-committee to present at least a study of the comparative results from the use of the various sections, but it has been impossible to do so up to this time.

"Naturally, there was much diversity of opinion among the users of rails with respect to the typical sections which might promise the best results, and there was some hesitancy upon the part of the majority of railways to abandon their past standards and experiment with any of the proposed types.

"Some of the railways, however, have made use of new types. The Canadian Pacific Railway have a new section embodying features of both the sections 'A' and 'B' proposed by the American Railway Association; and some of the railways in the United States have made experimental rollings with both sections 'A' and 'B,' drawings of which were shown in the last report of your committee.

"One difficulty in making a comparison of the tests of the different sections was apparent at the start, and consisted in the variety of designs for the different drop testing machines in use at the various mills. To overcome this variation of conditions, some of the mills voluntarily offered to construct a machine upon uniform and scientific principles, with the result that most of the mills have now installed such a machine, from which the tests made at one mill become comparable with those made at any other mill.

"The description or specification and a drawing of this machine accompany this report.

"It has been found, from a series of tests with the new machine, that the deflections obtained upon the test rails at different heights of drop are greater and more uniform than the deflections obtained upon the old machine under the same conditions, and therefore, give more accurate information upon which to base a study of the properties of the rails.

"It is the opinion of your sub-committee, therefore, that new specifications for rails should embody a requirement to use the Standard Drop Testing Machine.

"It is to be hoped that within the next year the records of use of the various new sections will have been

sufficiently far advanced and tabulated to enable an opinion to be formed as to the merits of the suggestions and principles embodied in their designs."

The report of the Committee on Ties, was substantially the same as the preceding year. It was pointed out that the Government had created a conservation committee which had taken some of the steps recommended in the report, although the report of the committee had not been brought to the attention of the Government.

Roadbeds and Ballasting.

As regards roadbeds and ballasting, the committee on this subject reported that a committee composed of practical railway men were at present reviewing a specification covering these points, which was already in use in the United States. This review would be published this spring, but not until it had received a thorough overhauling at the hands of three or four hundred practical engineers. As the men engaged in this undertaking were connected with railways in every portion of the North American Continent, the committee felt that it could safely wait until they got the specification, and if there was anything different in it required by the conditions in Canada, they could supplement it to suit the needs of this country. The Society could rest assured that at the next annual meeting there would be something definite to present in reference to specifications for roadbeds and ballasting, as applicable in Canada.

Transportation.

In the absence of Mr. Tye, President Mountain presented the report of the sub-committee on Transportation. He explained that the committee had gone into the question of economical routes from east to west both as regards rail and water transportation, and had gathered a large amount of information on the subject. In carrying out their duties, the committee had asked to confer with them the big men in railway and steamship lines in other branches than pure engineering, believing that more correct conclusions could be arrived at in this way. Attention was called to a suggestion embodied in the report to the effect that the committee, owing to the specific nature of its work, should constitute an independent unit in itself, and not be a sub-committee of a largeer committee on transportation. Mr. Mountain was of the opinion that this suggestion should be carried out in regard to each of the sub-committees on transportation, as each, in fact, have had to do their work independently, and he believed they should be continued that way. Further remarks on the report were made by Mr. Coultee, who stated that the idea of the committee had been to investigate the subject of transportation in Canada on rather new lines and to go into the physical features of the railway and water routes and their combinations, with a view to ascertaining the actual cost of haulage from two or three different standpoints. Perheps the best known system was that of train mileage and not the cost per ton mile. The latter, it was pointed out was very deceptive when the distance is long, and the committee had therefore, laid this phase of the question somewhat to one side, although it was also to be fully investigated. As far as the railways were concerned, they were trying to estimate the transportation on the basis of cost per train mile. In working on this basis, it was necessary to have full data on the physical features of railways and other systems, and the committee, therefore, wish to appeal to the members of the Society of their co-operation in this respect.

On motion of Mr. Sing, who paid a tribute to the profession by stating that he felt that the engineers were in every way qualified to give an expression of the opinion on the transportation of any country, the report was adopted.

Standard Specifications for Cement.

Considerable discussion was brought about by the report of the committee on Standard Methods of Testing and Specifications for Portland Cement. Following the presentation of the report, Chairman Jamieson explained that the committee had thought it advisable to formulate a specification for the use of members of the Society, and that he hoped it would be adopted and officially sanctioned with this end in view. During the year, considerable correspondence had been received from different members calling attention to various points, but the committee did not consider that it could make any material change from what was presented last year, although with further knowledge gained as regards chemistry of cement, it will be necessary to change and improve the specifications and rules for testing from time to time. The matter of a standard package for Portland cement was again brought to the attention of the Society and it was pointed out that the merger of the cement companies made the present time opportune for following up the question. In reply to a question regarding the quality of sand necessary in the mixing of cement for mortar, Mr. Jamieson stated that the committee had not gone into the question in detail and had therefore prepared no report on the subject. This question, he said, was next in importance to the question of cement itself, and it really formed another large subject that should be dealt with as a whole.

As regards the suitability of concrete for structures in sea water, the committee, it was said, had accumulated a large amount of data relative to this subject, but as yet no recommendation had been made. There was a large amount of evidence, Mr. Jamieson declared, to show that there is no material difficulty in using well made concrete in sea water. He thought that the greater amount of disintegration was due to porosity and freezing. It was, however, difficult to give anything definite in the present state of investigation, because of certain chemical re-actions that experts are scarcely capable of giving an opinion on as yet. It would seem that what was needed was a cement as low in magnesia and containing as little free lime as possible, and it was preferable to have the cement set in the way of blocks, instead of despositing it in a semi-fluid state, and allowing it to harden. A query as to whether the committee had gathered any data on the use of cement slag in this respect, brought forth the statement that there is a cement manufactured in Germany for which large claims have been made in the way of superiority in sea work and in which they use oxide of iron and reduce the aluminum, that is using the silica containing less alumina and using the iron as a flux. After further discussion dealing with the question of sand, the report of the committee was adopted.

New Committees.

Other business of the convention consisted of the appointment of a committee to investigate and report on the question of "Sewage Disposal with reference to the pollution of lakes and streams in Canada"; the nomination of members for the proposed Canadian National Committee of the International Electro-Technical Commission; and the appointment of a standing committee, as suggested by the Hon. Mr. Sifton, to co-operate with the Dominion Government regarding the conservation of national resources. This last named committee will have twenty members distributed through the entire country, whose duty will be to call the Conservation Commission's attention to waste of lands, forests, minerals or water power, and to the lack of development of natural resources.

The annual banquet of the Society, which was held in the Russell House, proved to be a most enjoyable affair in every particular. Over two hundred members and guests were present, including Hon. G. P. Graham, Minister of Railways and Canals; Hon. William Pugsley, Minister of Public Works; Hon. Clifford Sifton, Chairman of Conservation Commission; Professor Mc-

Lean, of the Railway Commission; Dr. W. F. King, Chief of Boundary survey; Professor Adam Shortt, Senator Edwards, Mayor Hopewell and Controller Champagne.

Officers for 1910.

The election of officers for 1910, resulted as follows:

President: Col. H. N. Ruttan, Winnipeg.

Vice-presidents: W. F. Tye, Montreal; C. H. Rust, Toronto; R. W. Leonard, St. Catharines.

Members of Council: C. R. Coultee, Ottawa; J. A. Bell, St. Thomas; J. M. R. Fairbairn, Montreal; A. W. Campbell, Toronto; F. L. Wanklyn, Montreal; C. E. W. Dodwell, Halifax; Phelps Johnston, Montreal; Duncan Macpherson, Ottawa; C. N. Monsarrat, Montreal; W. J. Francis, Montreal; A. E. Doucet, Quebec; H. J. Cambie, Vancouver.

General Section: H. G. Kelley and J. G. Sullivan, Montreal.

Electrical Section: L. A. Herdt and R. S. Kelsch, Montreal.

Mechanical Section: R. J. Durley and H. H. Vaughan, Montreal.

Mining Section: J. E. Hardman, Montreal; H. E. T. Haultain, Toronto.

The New President.

Lieut.-Col. H. N. Ruttan, the newly elected President for the Canadian Society of Civil Engineers, has been the City Engineer of Winnipeg for the past twenty-five years, and is one of the best known and most highly respected engineers in Canada. Col. Ruttan began his engineering work in the railway service, his first position being under Mr. E. P. Hannaford, Chief Engineer of the Grand Trunk Railway. When the construction of the Intercolonial Railway began, Mr. Ruttan was employed upon it as a junior in the staff of Sir Sandford Fleming, the Chief Engineer. He remained on this work, first as assistant engineer and later as division engineer, until the construction was practically completed. It was here that he obtained his first experience in the management of construction work. On section 6 of the road, the original contractors gave up their contract and the work was finished by the Government, with Mr. Ruttan as the manager of construction.

When the Canadian Pacific Railway was first projected, Mr. Ruttan was placed in charge of a party which made the first surveys in 1875 along the shore of Lake Superior between the Pic and Nepigon rivers. In the following year, 1876, he was sent to the Far Northwest and placed in charge of a party which made first the preliminary and later the location survey between Edmonton and the Yellow Head Pass. On this work he spent nearly two years. In 1877, while the construction work on the Canadian Pacific was going on, Mr. Ruttan was employed as contractors' engineer by Mr. Joseph Whitehead on contract 15, between Cross Lake and Rat Portage. Here he had charge of both the engineering and the construction cost departments. In 1880, Col. Ruttan took up his residence in Winnipeg and went into business on his own account as an engineer and contractor. Between 1880 and 1883 he constructed the present Canadian Pacific Railway line between Portage la Prairie and Gladstone. He also built the Canadian Pacific Railway Southwestern between Winnipeg and Carman.

In 1883 Col. Ruttan took up the study of municipal engineering problems, and spent the next two years in close examination of engineering work in various cities of the United States. Following this, in 1885, he was appointed City Engineer of Winnipeg, which was then a straggling frontier town with a population of about 16,000 The present population, twenty-five years after, is estimated at 150,000. The municipal works of the city are in keeping with the best engineering practice, and they are all practically the creation of Col. Ruttan. Particularly noteworthy is his work in the creation of the water supply system. The domestic supply of the city is obtained from seven artesian wells, each of which has an output of three-quarters of a million to five million gallons per day. There is also a special fire protection system supplied by pumps with a capacity of 9,000 gallons per minute, delivering water at a pressure of 300 pounds per square inch. The cast-iron mains for this high-pressure fire service have a total extent of eight miles through the business district of the city. The city is now constructing a hydro-electric plant for the supply of light and power on the Winnipeg River. The chief engineer of this work is Mr. C. B. Smith, and Col. Ruttan is a member of the Consulting Board of Engineers in connection with the work, the other members being Mr. William Kennedy, Jr., and Prof. L. A. Herdt, of Montreal.

Col. Ruttan was prominent in the movement which led to the organization of the Canadian Society of Civil Engineers in 1887, and is a charter member of the Society. He also holds membership in the Institution of Civil Engineers of Great Britain, the American Society of Civil Engineers, the American Water Works Association, the American Society of Municipal Improvements, and the Concrete Institute of Great Britain.

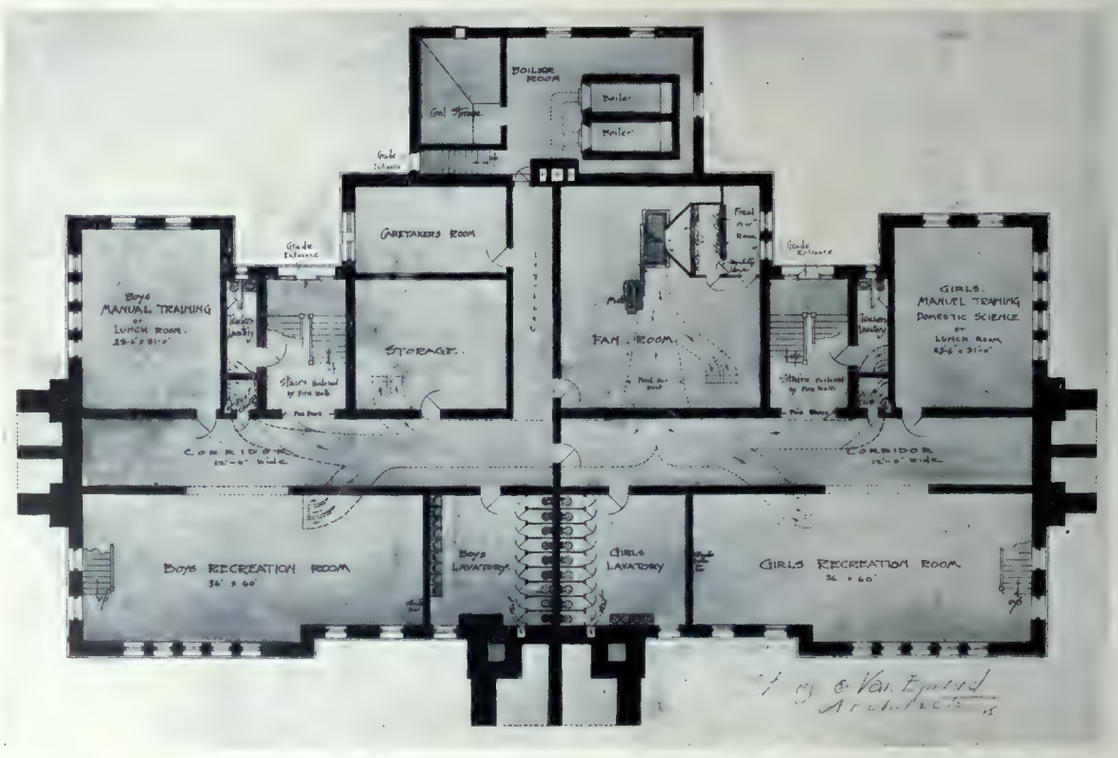
THE CONSTANT GROWTH in population and the real necessity for increased business accommodation, in certain communities, is apparently overcoming the prejudices which has existed against tall office building construction. Those who have opposed high buildings for æsthetic reasons, are now yielding the point that where the ground area of a municipality is limited by certain natural conditions, and where trade conditions are continually expanding, there is no other choice but to build upwards. A United States contemporary in touching upon this change in sentiment, comments as follows: Art is now coming to the rescue of the skyscraper. We have nothing against the skyscraper while the artists always have been embittered by its presence and therefore it appears to be a far cry for art to approve of it, but in the recent discussion of the questions in New York City, the artists came out in a letter in which they put themselves on record in a very sensible way—almost too sensible for an artist—and that is what makes one wonder all the more. It appears that the Municipal Art Society, through Chairman John De Witt Warner of the municipal charter revision committee, has sent the board of aldermen a protest against the proposition to limit the height of skyscrapers. The society comes out for the skyscraper on the ground that New York's business and rapidly growing population admit no alternative. The committee's report says:

The real questions involved are how our air can be kept pure for our people, natural light most liberally provided for a great number consistent with their business convenience, and free access and communication.

Protection of light and aid and access are, therefore, the aim. Regulation of plans rather than restriction of heights of buildings are the simple means by which this can be promoted. A 5,000,000 city is upon us; a 10,000,000 one is in sight. Every transportation improvement that promotes residence at a greater distance from business adds correspondingly to the tendency of business toward a center where the most facilities can be provided for it.

Tall buildings, taller buildings, tallest buildings that are at once practical and tolerable are the most obvious recourse. Our aim, therefore, must be to encourage them to work out conditions under which they may be built highest with least curtailment of other essentials—safety, air, light and access.

Regina's new Collegiate Institute, built at a cost of $110,000. An evidence of the safe and substantial manner in which the West provides for the housing of her school children. The building is practically fireproof, the walls being of buff brick and Tyndall stone, the floors of reinforced concrete and the partitions of the metal stud and metal lath type.



Basement plan, Regina Collegiate Institute, showing the location of the manual training, domestic science and recreation rooms. Note the location of the boilers which are placed outside of the building proper, in the extension at the rear. Storey & Van Egmond, Architects.

REGINA'S NEW COLLEGIATE INSTITUTE.—A Modernly Planned School Building in Which "Merit of Investment" is Well Exemplified.—Floor System, Walls and Partitions of Fireproof Construction.—Designed with a View to Future Extensions.

FROM A STANDPOINT of constructive economy and as a building which fulfils its usefulness in the most direct manner, the new Regina Collegiate can well commend itself to all municipalities which are at the present time concerned with the necessity of providing school buildings to more adequately meet their growing requirements.

A writer in a recent magazine article says, that "when a man looks over his yearly tax assessment, he is apt to take an interest in the matter of school buildings and their equipment, and to begin to realize the permanent investment he has helped to make in the cause of education." Foresight as to "merit of investment," and the element of safe construction, however, should come first and self-satisfaction and reflection afterwards. The former must obtain if the later is to prevail, and it is with this conviction and with the knowledge that "a thing half done is never done," that the more thoughtful communities are really beginning to take an advanced step along this line.

The new Regina Institute was erected at a cost of $110,000; but it is in the initial cost and not in subsequent improvements, where the burden of the expense falls. Its construction gives the city a permanent investment, and a building of good appearance, in which every reasonable provision has been made for the safety of the pupils, and in which the cost of insurance and upkeep has been reduced to a minimum. The exterior, which is carried out in buff pressed brick and Tyndall stone, shows no evidence of extravagant detail or unnecessary elaboration in its architectural treatment. The lines are simple and dignified; the entrance distinctly, but not unduly accentuated; and the structure in general of excellent proportions.

As regards construction, the building is about as thoroughly fireproof as the modern application of the term implies. There is little or nothing in its entire physical make-up of a combustible or inflammable nature. Reinforced concrete floors and solid brick bearing walls are employed throughout; the partitions are all of metal stud and lath construction; and the outside walls are lined with hollow tile to which the plaster is directly applied. Further than this, the main staircases are entirely cut off by fire walls and automatic rolling fire doors. The stairs have cast iron newels and risers, wrought iron hand rails, and slate treads, and are so arranged as to preclude any possibility of the scholars being entrapped in case of emergency.

A feature of the ground floor is a central rotunda finished in keeping with the corridors to which it connects, with terrazo flooring in three colors and enamel brick wainscotting in tones of green and brown.

This floor provides for a principal's room, a reception room, two rooms for the teaching staff, and six large class rooms. In addition to the central and end entrances, there are two grade entrances at the rear, giving access to the stair landings, thus providing ample means of ingress or egress to and from the building.

On the upper floor are four class rooms, two thoroughly equipped laboratories for chemical and physical research, and an assembly hall equipped with stage and dressing rooms and capable of comfortably seating 500 people. All class rooms have spacious wardrobes, and each room is provided with a self-winding electric clock, regulated from a master clock in the principal's room, by an automatic ringing device.

In the construction of the building, the essentials of school hygiene have been carefully considered as regards the lighting, heating and ventilating of class rooms, cloak rooms and corridors, and also as regards class room decoration, and the sanitary equipment in general.

The basement of the building is reached by four staircases, two at the rear and one at either end of the structure, off the corridor. This part contains the manual training and domestic science rooms, two large recreation halls with laboratories adjoining, together with storage and caretaker's compartments and fan room. These rooms are so arranged as to bring about a complete division between the boys' and girls' space. The boilers and storage for coal occupy an addition outside of the building proper.

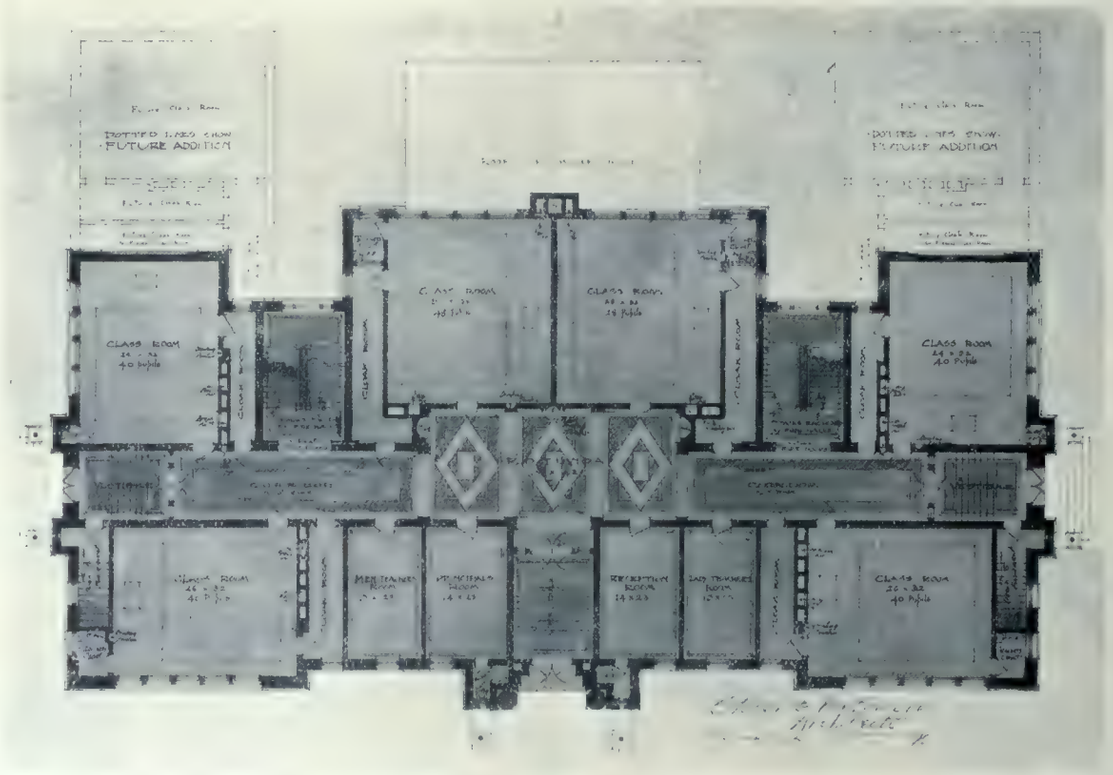
The heating and ventilating features of the building have been carefully designed to ensure a uniform temperature of 68 degrees at all times and at least six changes of air per hour in all class rooms and assembly hall. Low pressure, direct and indirect plenum system of heating and ventilation is used with automatic temperature regulation by thermostats, governing both the direct radiators and fresh air flues. The fresh air enters the building at the intake windows in basement, and into the fresh air room where it is heated by passing over steam coils provided with an automatic regulating damper, and thence through water spray which cleanses the air of all dust and brings it to the proper humidity. The air is then drawn into the fan and forced through the fresh air ducts, from which it passes into the various rooms at a height of eight feet above the floor. The vitiated air is in turn forced into foul air flues at the floor line, and carried off above the roof. The boiler installation consists of two return tubular units twinned together in order that one may be operated independent of the other during mild weather, which is more economical than where one boiler only is employed.

The thoroughness with which the building has been constructed and the consummate manner in which every detail has been considered as regards protection from fire, is such as to relieve the citizens of Regina of any apprehension in this respect, and to give to them a satisfying knowledge of having left no stone unturned in the fulfilment of their obligation.

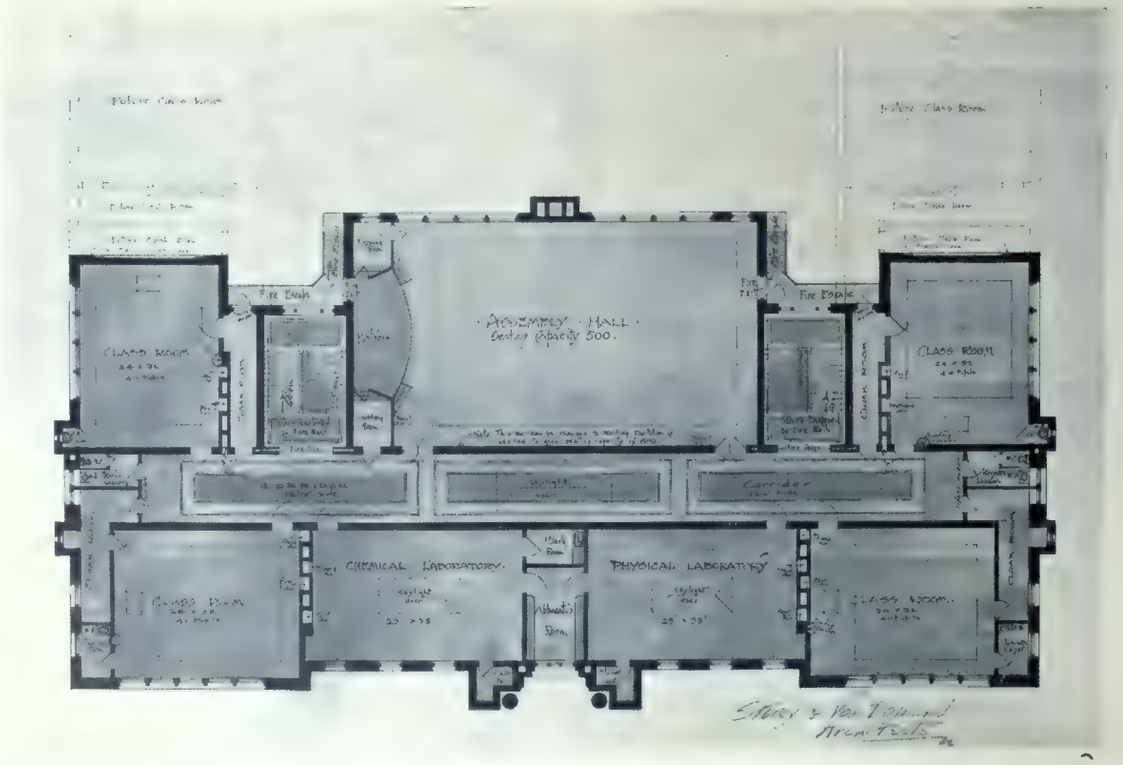
Although the structure is only two stories high, practically non-combustible, and provided with enclosed staircase, wide corridors and well placed entrances, extra means for safety have been provided in the way of two large iron balconies and fire escapes at the rear of the building, onto which four exits open.

The building, it might be remarked, is designed to permit of further extensions as the occasion for additional accommodations should demand. These additions will be carried out at the rear of either end of the structure in shape of projecting wings, and will form a natural development of the plan, instead of any added excrescence, as is too often the case in rapidly growing communities. Four extra class rooms will be provided for in this manner, making the school in all an eighteen-room structure, apart from the assembly hall, various offices, and recreation rooms.

The building was designed and erected under the supervision of Architects Storey and Van Egmond, Regina, the general contract being executed by Messrs. Wilson & Wilson, a firm of local contractors.



Ground floor plan, Regina Collegiate Institute, showing the location of stairways which are enclosed by fire-walls, and the arrangement of the class rooms. Storey & Van Egmond, Architects.



Second floor plan, Regina Collegiate Institute, showing the location of emergency exits and fire escapes. Storey & Van Egmond, Architects.

THE ARCHITECT AND THE HEATING AND VENTILATING ENGINEER.—Problems of Modern Heating Installations Require the Attention of the Expert Engineer.—Various Methods Employed and the Conditions Responsible for the Heating and Ventilating Troubles of the Architect.

PROFESSOR WARE, in a recent letter to one of our American contemporaries, said—"The old notion that an architect owes it to himself to keep everything in his own hands, passing as a past master of all arts and crafts, was never a tenable one, even for a man born with the gift of universal genius. Few men have ever entered into this birtnright, and the notion that every architect should pretend to it has fostered an untenable and preposterous attitude which has brought deserved discredit upon the profession.

"All that the ordinary practitioner can honestly undertake is to understand these matters well enough to discuss them intelligently with his advisers, reserving to himself the freedom to follow the advice given or not, according as it does or does not promote further practical or artistic ends he has in view."

These views of Professor Ware, are widely shared by the foremost members of the architectural profession on this continent. It is foolish for an architect to believe that he should be a civil engineer, a heating engineer, a plumbing engineer, and an authority on every branch of modern building construction. He certainly should have a knowledge of the basic principles, and the proper requirements in the various branches of building construction, but he cannot give to his client the best service unless he is prepared to accept the assistance and advice of the best authorities in the various lines connected with the construction of a building.

In Canada, there is one factor in building design, in which architects do not only show a gross lack of knowledge, but in many cases are seemingly unprepared to solicit or accept expert advice. This factor we speak of, is heating and ventilating, which in the modern day building, has become a science, and to have the knowledge and practical experience to properly and adequately heat a given building, to suit modern requiremtns according to our best known methods, is to-day not tne work of an architect, but the work of an engineering expert.

The science, if such it may be called, of heating and ventilating engineering, is one that is founded almost completely upon the laws of thermodynamics. It is not what one might call an exact science, but in its rational design and application, the engineer may work with a reasonable degree of exactness. Most of the points of interest in the subject, may be theoretically developed; yet, as in all branches of engineering design, some parts require theory modified by good judgment and practical experience.

Despite the fact that some features of heating engineering are as yet experimental and not as definitely understood as they might be, there is no reason why the installation of heating and ventilating apparatus should be undertaken by those who are not thoroughly trained in both theory and practice, and neither a heating contractor, nor an engineer has a right to nor is he justified in installing a job that scarcely shows any of the ear marks of theoretical investigation.

The time has come when it may be demanded of every architect who undertakes to design a modern building, to employ men to install the heating and ventilating apparatus for that building, who are capable of following closely the fundamental branches, and be prepared to furnish proof for every and any step taken in their work.

Contracts for heating and ventilating apparatus usually are let in one of the four following ways: (a) Some person, called for convenience, the dealer contractor, draws up a rough layout of the work, guarantees to install satisfactory apparatus for a stated sum of money, buys his apparatus from the manufacturer, installs it according to his own personal ideas, or according to the plans laid down by the manufacturers, and in a general way guarantees it to give good service; (b) a manufacturing firm draws up a plan and contracts to install, for a stated amount of money, satisfactory apparatus, usually made by the same company, guaranteeing its successful operation; (c) a responsible engineer is retained, who draws up plans and specifications for the work, and, upon competitive bids, the successful contractor installs the apparatus in accordance with these plans and specifications, the engineer being the judge of the quality of the work and material; (d) a responsible engineer designs the system and assumes all the responsibility in its erection, looking toward a certain required output or result. Materials are purchased in the open market and installed to his satisfaction, and after completion, if the final tests are acceptable, the purchaser pays the bills and takes charge of the completed plant.

The last method is looked upon as being possibly the safest and most practical, and is one that guarantees the architect that his owner's building will be properly, adequately and safely heated, and that the responsibility for all mistakes and errors is lifted from his shoulders. It safeguards the owner, in that the engineering contracting firm that so undertakes to heat a building assumes all responsibility for any mistakes made through lack of knowledge or lack of training, or unsuccessful experiments. He has thus obviated the unfortunate uncertainty, as to whether his building, when completed, will be one that for all time will be unhealthy and uncomfortable and expensive to heat.

A further great mistake made by many architects in the design of their buildings, is that their plans are often made without a proper consideration for the heating. In other words, an architect proceeds to plan his building without having consulted a competent heating engineer, and expects tnat the heating plans are to be made to fit the plans of his building. It is only fair to say that the average architect knows little or nothing of either the theory or practice of heating and ventilating engineering, but it is too often the case that his own private opinion of his own work in such matters, is highly satisfactory, and, consequently there is set up a different view point from the designer of the building and the designer of the heating apparatus, much to the detriment of the efficiency of the plan, very much at the expense of the interests of the client. A condition that causes the architect needless annoyances after his building is supposed to have been completed.

To get the best possible results, the system of heating should be selected first. A competent heating engineer should be called in to consult the architect before his plans are completed, so that proper and adequate allowance should be made in both the building and heating plans, to provide in the finished building, one which will give satisfaction to both the architect and his client.

This is no hardship to the architect, since many slight changes, any one of which would possibly be in favor

of the heating engineer, may be made in his plans, without causing any trouble.

In a simple building, such as a residence, to be heated by a furnace, we might say some of these points that could be mentioned, would be as follows: size and location of the chimney; the running of the cellar partition walls to accommodate the location of the furnace and the coal bin; the height of the basement ceiling to allow sufficient inclination of the leader pipes; the construction of the partition walls between the rooms to allow for riser pipes of sufficient size to heat large upstair rooms; the planning of the walls to avoid horizontal runs of heat ducts in the second floor to reach a room otherwise inaccessible, and many other points. All heating engineers know that the range of locations for a furnace, relative to the house plans, is very limited, and that in many cases it is an absolute necessity, after a house is completed, to set the furnace out of its desired location, thus compromising the efficiency of the system; also that the basement ceiling in many cases is so low that the leaders are required to be run nearly horizontal, thus reducing the draught in them; also that a six inch studded wall in many cases could easily have been substituted for the four inch wall, with little additional cost, and have improved the system immensely; also that certain walls absolutely prohibit all running of stacks to the desired spot in the room, and that with a slight change, this could have been arranged without in any way injuring the architect's plans.

We mention these few details in connection with the simplest type of heating, to show how necessary it is that the architect should consult a competent engineer in preparing plans for a building of any size. These difficulties that arise in the heating of small houses, with a hot air furnace, only go to prove how inconsistent it is for the average architect to assume the position that the matter of heating and ventilating his building is one of the simplest he has to contend with, and that any "rule of thumb" contractor can install a system after plans drawn up on a piece of note paper.

Another difficulty that arises in the selection of the heating contractor, is that most architects cannot see, (so long as a certain boiler or a certain radiator is specified), that he is paying for an adequate, efficient heating system, and that the brand of boilers or radiators is a matter of minor importance in the problem of properly heating any building. The result is that the contract is awarded to the lowest bidder and, insofar as the architect cannot be termed a heating engineer, it is impossible for him to properly superintend the work of an incompetent contractor, so that he may rectify mistakes as they are made and as the installation progresses but all he can judge from is the efficiency of the installation in the finished building. If for some reason, which he cannot understand, or which the contractor cannot explain, certain parts of the building are uncomfortable because they are too warm, while other portions are uncomfortable because they are too cool, and some parts of the building may be ventilated to the extent that a draught is created, while it may be impossible to ventilate other parts the whole job is a failure, the owner dissatisfied and the architect given no end of annoyance.

The architect in advising his client as to which tender to accept for carpenter work, interior woodwork, or masonry work, would never think of recommending a contractor unknown to him, even though his tender were the lowest. He invariably would say to his client: "This man I do not believe to be competent, and, although he has the lowest tender, I would not suggest its acceptance; this man I know—he knows his business; he does good work, and when the work is completed, it will be satisfactory, I believe that he will be the cheapest man in the long run although his tender is a little higher."

But it so often occurs in the selection of the heating contractor that after the architect has specified the apparatus to be used, he believes he is safe in awarding the contract to the lowest bidder. This is a great mistake, as has been learned by many architects, after some very dear experience. It seems to us that in the awarding of heating contracts, the architect should, in the first place, know that the man who has drawn his plans and who undertakes the installation of the apparatus, is responsible; in the second place, he should know that this man through training and experience, is capable of preparing the plans and installing an efficient system; in the third place, he should demand that this engineering contractor should assume all responsibility in providing a successful and satisfactory result in his finished job. It is true that engineers who accept such responsibility and are prepared to give such a service, will not be the lowest tenderers, but their work, after it has been completed, as has been the experience of our foremost architects, will prove the cheapest and most satisfactory in the end.

We have called these matters to the attention of our readers, for the reason that we find that one of the greatest complaints found by tenants and by owners of some of our best buildings, is the fact that they can never get their heating and ventilating apparatus to render the required serivice. Nine times out of ten, when the difficulty has been followed down, it develops tnat some "rule of thumb" heating contractor had installed the apparatus according to the specifications of the architect and in compliance with the heating plans that were made after the building plans had been completed, or from heating plans that did not show any of the ear marks of either theory or good practice. We believe that the heating problem is one which our Canadian architects could well afford to give a great amount of attention.

BOOK NOTICE.

MODERN LETTERING—ARTISTIC AND PRACTICAL.—A course for artists, architects, sign writers and decorators. The Construction of Pen and Ink Designs for Commercial Uses,, Advertisements, Letter Heads, Business Cards, Memorials, Resolutions, etc. By William Heyny. With 35 Plates, Drawings by the Author. New York: Wm. T. Comstock. Oblong volume, cloth; 136 pages, 7x10 inches. Price, $2.

A book of instruction primarily, valuable in the hands of the beginner and of assistance to the experienced workman, "Modern Lettering" essays the subject from the practical standpoint from cover to cover. The author. a man of experience and of artistic temperament, boldly sets forth his ideas and propounds his methods in concise language. Directions even to minute details are given, all of which are valuable to the student.

The Roman letters taken as the fountain head of all present systems, are exhaustively dealt with. Their construction is treated in the text, letter by letter, and the author's methods of drawing the "Modern Roman" alphabet are delineated in six full-page plates.

The alphabets treated and shown in the plates are Modern Roman, Classic Roman, French Roman, Antique Roman, Ornamental Roman and Century Roman, Roman Italics, Plain Round, Square and Spurred, Block and Ornamental Block Letters, Architects' Single Stroke Alphabets, Modern Script, German Gothic, Old English and Modern Unicals.

Much valuable information, the fruit of the author's long experience, is given on the choice of alphabets, the arrangement of words, and the spacing of letters, with good criticism of faults of modern letterers.

From the practical standpoint of use, the book is excellent. Treated in four parts, each heading in the contents is emphasized in italics in the text which facilitates reference. There is also an index.

CONVENTION AND EXHIBITION OF C.C.C.A.—London Selected for Second Annual Event.—Splendid Accommodations and Facilities Provided for Visitors and Exhibitors.—Present Indication Promises Big Attendance.

THE SECOND ANNUAL CONVENTION and exhibition of the Canadian Cement and Concrete Association bids fair to far outclass the initial meeting and show of this Association, held in Toronto in 1909. The show held at St. Lawrence Arena last year attracted hundreds of visitors from all parts of the Eastern Provinces, and the convention was well attended by those who appreciated the importance this new industry bears upon the future upbuilding of Canada.

The exhibits last year included almost every conceivable type of machinery employed in connection with the use of cement, as well as cement and concrete products of a scope and variety that surpassed the expectations of even those connected with the promotion of the Association. This first exhibition proved beyond all question that the cement industry is of such importance in Canada that the future of the organization was thoroughly assured.

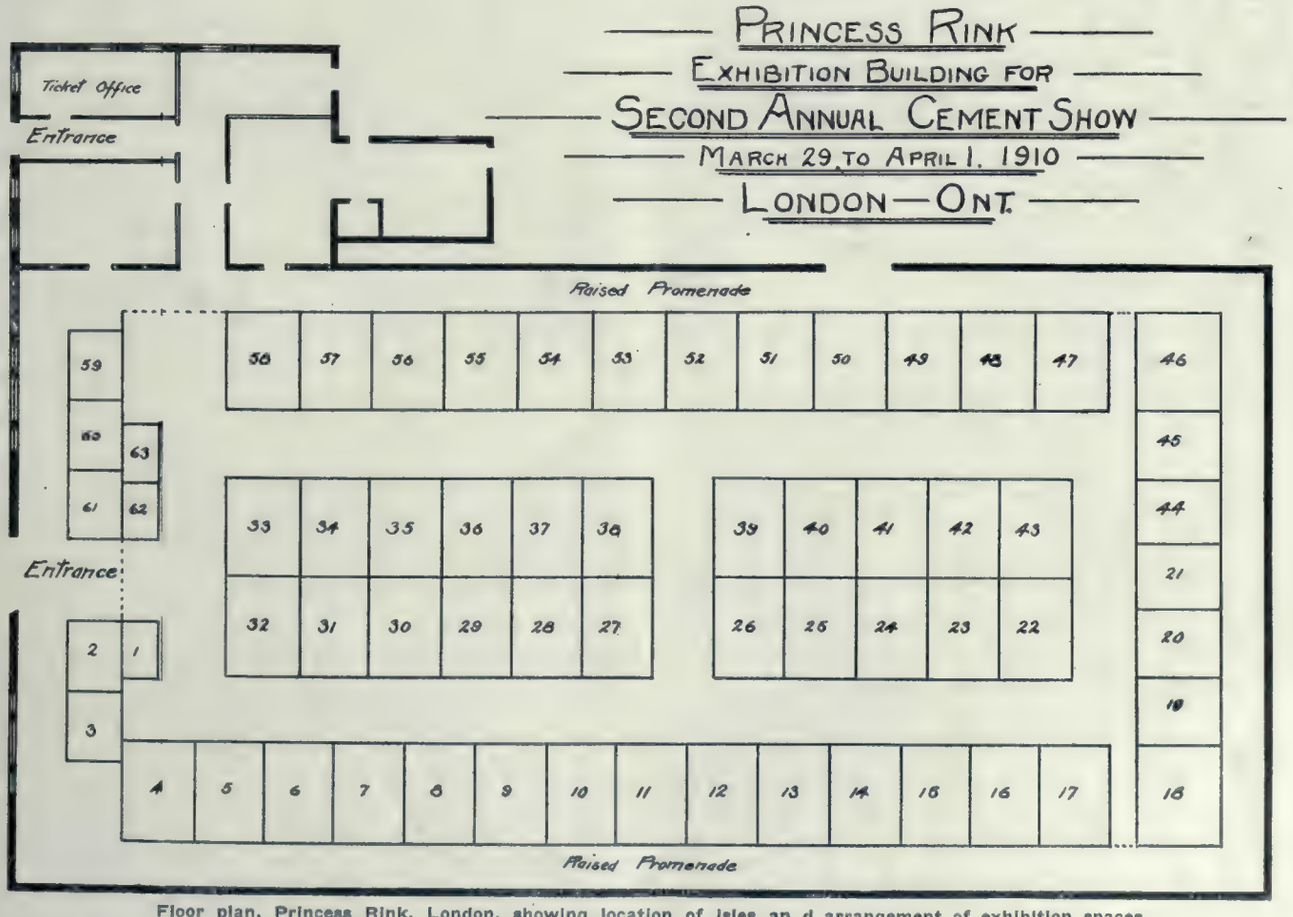
The National Association of Cement Users of the United States, which was started under much less auspicious circumstances a few years ago, is to-day the largest association of its kind in the world, as well as one of the strongest and most influential organizations connected with the structural and engineering industries in the United States. Therefore, if, as is predicted, the second convention and exhibition of the C. C. C. A. will surpass the initial one, both in the matter of exhibits and in interest in the convention proceedings, we feel that we are justified in assuming that this next meeting at London will be the greatest of its kind ever held in Canada.

The officers and council have worked diligently during the past year, and, although many difficulties have had to be encountered, they have been successful in establishing in material form an organization that last year was, to say the best, in an embryonic state.

The association has much to thank the City Fathers

Princess Rink, London, where the Second Annual Exhibition of the Canadian Cement and Concrete Association will be held March 29 to April 1st, inclusive.

of London for. This progressive Western Ontario city, realizing the importance of such a meeting being held in their midst, authorized Mr. C. F. Pulfer to offer the



Floor plan, Princess Rink, London, showing location of isles an d arrangement of exhibition spaces.

association at a recent meeting of the executive in Toronto free use of the Princess Rink for the exhibition, together with a hall suitable for holding the meetings of the association. Offers were received from several other cities, but the executive committee finally decided in favor of the city of London.

The Princess Rink, as will be seen by the accompanying plan, will serve as a large, well appointed exhibition hall. The floors are of concrete, and large wide entrances are provided, through which machinery of amost any dimensions can be passed without difficulty.

The association was furthermore particularly fortunate in securing Mr. R. M. Hunt as manager for their exhibition. Mr. Hunt is Secretary of the Western Fair of London, in connection with which position he is well known throughout the Province of Ontario. He has had long experience in matters of this character, and is well qualified, possibly better than any other available man in Canada, to look after the interests of the association in this respect.

Mr. R. E. W. Hagarty was appointed as permanent secretary. Mr. Hagarty is a graduate of the School of Practical Science, and is at present employed in university work at this college. The association was again particularly fortunate in having been able to procure

Interior view, Princess Rink, London, showing the great unobstructed floor area. This floor is of concrete.

the services of a man of Mr. Hagarty's ability and qualifications, and it can be assured that under his secretaryship the growth of the organization will continue to be more rapid and substantial in the future than it has even been in the past.

Mr. C. F. Pulfer, Mr. Martin and Mr. Pocock constitute the local committee at London. These gentlemen were particularly active in bringing the convention to that city. Already this local committee has started a very active advertising and organization campaign, and we learn that, even at this early date, a large number of spaces have been sold.

The program of the convention has not as yet reached us, but we understand that a number of the best authorities on the various branches connected with the cement and concrete industry will be present to give papers and take part in the discussion.

The Officers and Executive Committee for 1910 are as follows:—

President, Peter Gillespie; Vice-President, Gustave Kahn; Chairman of Finance, C. F. Pulfer; Secretary, R. E. W. Hagarty; Councillors, T. L. Dates, J. G. Murphy, Kennedy Stinson, C. H. Thompson, D. C. Raymond, C. M. Canniff, James Pearson, A. E. Uren, Ivan S. Macdonald.

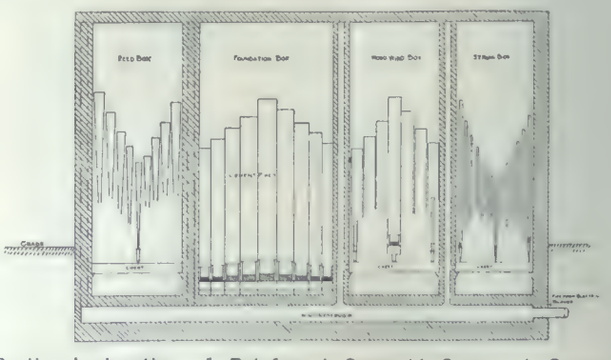
A REINFORCED CONCRETE ORGAN.—Unique Orchestral Unit Installed at Ocean Grove, N.J.—Introduces a Number of New Features in Organ Construction.

ANOTHER use has been discovered for cement, says Cement Age. An organ builder of Elmira, N.Y., has set the musical age in a flutter of excitement over the wonderful musical effect produced by his Orchestral Unit Organ—largely constructed of reinforced concrete.

Interior view of Auditorium, Ocean Grove, N.J., showing the organ that is largely constructed of reinforced concrete.

A specimen of his work at the great Auditorium, Ocean Grove, N.J., has been attracting much attention Madam Schuman-Heink describes it as "the most wonderful organ in the world," while Nordica and other great singers, are equally loud in their praise. Composers, such as Hadley and Homer-Bardtlet, declare that it marks the dawn of a new era in orchestral music. The National Association of Organists held a great convention at Ocean Grove, N.J., attended by hundreds of organists drawn from practically every state in the union. The Association unanimously passed a resolution acknowledging "the epoch-making advance" achieved and saying that if the inventor's genious has free scope a marked uplift to the musical life of the world will result.

The new form of organ has, therefore, evidently come to stay and we present a few of the details of construction.



Sectional elevation of Reinforced Concreté Organ at Ocean Grove, N.J., Auditorium.

The instrument at Ocean Grove is not a perfect and complete example of the builder's wonderful invention, yet it has attracted such general attention that over 100,000 people have paid for the privilege of hearing it during the summer and more than half of the cost of the instrument has thus been recovered in less than three months.

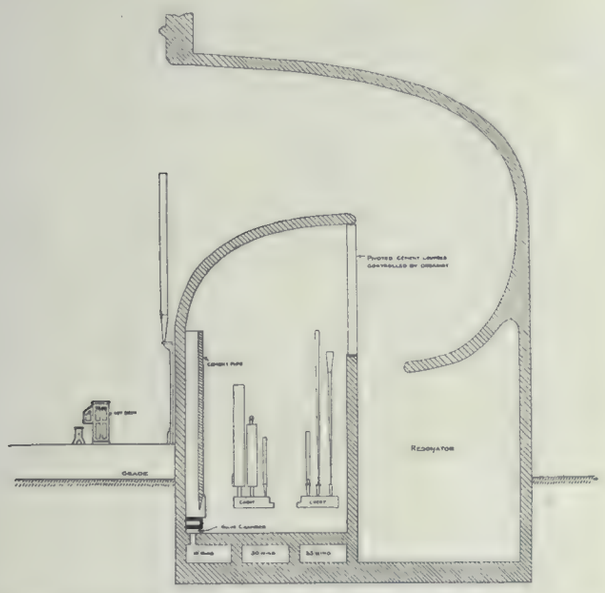
The Orchestral Unit Organ is like the church and

concert organ in but one particular, namely, that in each, the tone is produced by wind blown through pipes. Even here the resemblance is not great, for in the church organ a great quantity of air at a low pressure is used to blow many thousands of pipes, whereas in the Orchestral Unit Organ there are but few pipes and the wind used is of high pressure.

Apart from the metal pipes, the church or concert organ is a delicate machine constructed mostly of wood, leather and glue—affected by every change of temperature and readily damaged by moisture. On the other hand, the Orchestral Unit Organ is constructed largely of reinforced concrete, has practically neither leather nor glue and is absolutely impervious to weather changes.

The Orchestral Unit Organ is smaller and less complex than its older rival. It is also less costly, though it produces much louder and more expressive musical tones

Hitherto it has been considered for reasons having to do with acoustics, that wood should be employed in the construction or lining of organ chambers. Architects will be interested to learn that Robert Hope-Jones, the inventor of the Orchestral Unit Organ, judges wood to be about the worst possible material for employment in this capacity, and considers concrete or stone to be the best. In all organs the tone originates in the air and contact with anything calculated to absorb this tone is to be avoided. That is why he prefers concrete to wood.



Sectional end elevation of Reinforced Concrete Organ at Ocean Grove, N.J., Auditorium.

It is stated that the effects he obtains border on the marvelous. The Ocean Grove organ has but 14 ranks of pipes—as compared with 100 or even 140 in other organs—yet the Ocean Grove is easily the most powerful organ in the world. All its tones are reinforced and reflected by cement.

In the Orchestral Unit Organ monolithic construction is, where possible, employed. There are chambers and passages for compressed air, including four or five chambers for the pipes. The larger of these pipes are themselves of concrete, being formed in the walls of said chambers. Other features are, parabolic tone reflectors, resonance chambers, supporting corbels, and cylinders for shutter motors, etc.

There are no bellows, regulators or moving wind reservoirs. Electric motors compress the air at definite pressure into the concrete chambers and the wind chests and pipes are in direct and ample communication with these chambers. By this means a perfectly steady supply of wind is at all times available. This plan of relying upon the compressibility of air itself instead of upon the varying capacity of a collapsible reservoir is absolutely revolutionary in organ work, though it was tentatively tried by Mr. Hope-Jones in the organ he built for Worcester Cathedral, England, in 1895.

Each of the four or five chambers named above for containing pipes will measure perhaps 8 or 10 feet in each dimension (dependent, of course, on the size of the instrument). The top of each chamber is closed by a set of Venetian shutters with patent sound trap joints. These shutters can be opened or closed at the will of the organist—thus enabling him to govern the amount of tone emitted from each chamber. One chamber contains the foundation tones of the organ (Diaphones, Tibias and Diapasons)—one, the "wood wind,"—another the orchestral "string" tones—another the "brass" and a fifth the "percussion." By this means each department of the orchestra is properly represented and each is under separate control. The performer can control any of the pipes at any pitch and power, from any keyboard he may be playing upon.

The reeds used in the Orchestral Unit Organ have no tuning wires. They stand in tune of themselves and do not require the constant tuning and attention demanded in the case of church, concert and house organs as hitherto constructed.

The Orchestral Unit Organ being independent of climatic conditions is suited for out-of-door use in public parks, recreation grounds, etc. At the moment of writing one is being arranged to go below high water level, under a sea shore pavilion, the tone being reflected in parallel lines over the entire floor of the pavilion and from there to the end of the pier. The parabolic concrete reflectors direct the tone wherever desired and prevent its dissipation into the surrounding air—just as is done with light waves in the case of a search light.

EARTHQUAKE-PROOF DOMICILES

AS A PROTECTION from earthquakes, many of the natives in the territory around Chilpancingo and other towns in the State of Guerrero, Mexico, build their homes in trees, says the Kansas City Star. Some of these tree homes are of large size and are ingeniously constructed. Reeds and grasses are interwoven with the twigs and branches of the trees, much in the manner that a bird builds its nest.

The strongest wind seldom loosens these houses from the tree. Where the trees are large and stand closely together, houses of two and three rooms are frequently built in their branches. These houses also afford protection from the "tigers" and other wild animals found in that region in large numbers. It is claimed that "tiger" will not attack its prey unless it is upon the ground. The prime object of elevating these houses into the trees, however, is to keep them from being shaken down by the severe earthquakes which visit the Guerrero territory at frequent intervals.

The rocking of the earth gives the trees a swaying motion that does no damages to the houses. In some localities whole villages of these tree homes are to be seen. None of them suffered damage from the recent earthquakes which wrought such ruin to the buildings on the ground.

FIVE MILLION DOLLARS is to be spent by the Canadian Northern for the construction of a modern station and terminal facilities at Montral. An announcement to this effect was recently made by W. D. Barclay, manager of the Quebec division, who stated that plans for he project have been completed and that the work, in all probability, would be started in the near future.

A PROMINENT PERSONALITY IN THE CEMENT INDUSTRY.

MR. W. H. FORD, Montreal, has recently been placed at the head of the Sales Department of the Canada Cement Company. It is interesting to note that this department controls the most extensive interests in cement, of any similar department in the world. The appointment of Mr. Ford, who is but thirty years of age, to this highly responsible position, is due to the manner in which he so successfully conducted the interests of the Wm. G. Hartranft Cement Co., Ltd., during the last three years, when he was one of the best known figures in the hotly contested battles that were waged between the various cement interests in this country, and now that they have all been shepherded into one fold, it is surely a mark of distinction that the youngest of the gladiators should be placed in supreme command of the output of the eleven mills forming the merger. Mr. Ford feels that he has his hands pretty full in his new position, but we are fairly certain that he will be equal to the demands upon him, for he is not a man who permits himself to be worn out with office drudgery, but it has been his custom to frequently go forth into the wilds of nature, and there, while

Mr. W. H. Ford, General Sales Manager for the Canada Cement Company, which controls the output of eleven mills.

stalking the moose, dream out the tactics of a future battle in the industrial field. For Mr. Ford is an ardent hunter, and some of our finest examples of Canadian big game, are his trophies, and he tracks down a hundred thousand barrel order with the same assuidity that he follows the lordly monarch of the woods, to his retreat.

In fact he is always looking for things that are big. That was what brought him up from the Southern States three years ago, to associate himself with Canadian development, and he found about as big possibilities in this field, as could be found anywhere. The cement business has been his life work. When he was quite a young man he took a four years' mechanical drafting course, and upon graduating, entered the office of W. B. W. Howe, Consulting Engineer, Spartanburg, S.C. Mr. Howe was one of the special committee appointed by the American Society of Civil Engineers, to draft a uniform set of specifications for Portland Cement. His associations with Mr. Howe, especially fitted him for a career in cement. On Jan. 1, 1903, at the age of twenty-four, he engaged with the Carolina Portland Cement Co., of Charlestown, S.C. Shortly after this he was transferred by this Company to the Atlanta (Ga.) Office, as Assistant Manager, where he spent two years, after which he went to Louisville, Kentucky, as Manager of the Sales Department for the Kosmos Portland Cement Co.

On the death of the Vice-President of the Wm. G. Hartranft Cement Co., of Philadelphia, Mr. Ford was appointed in his stead, and later came to Montreal as Vice-President and Manager of their Canadian Company. Before settling down in this new capacity, he spent six months in touring Canada, becoming familiar with conditions, and making himself known in every city and town in the Dominion. He still retains his position as Vice-President of the Hartranft Cement Co., is a member of the Sales Managers Section of the American Society of Portland Cement Manufacturers, is on the Executive Committee of the Canadian Cement and Concrete Association, and also a member of the Canadian Manufacturers Association. Wherever a Cement Convention is in session, there you will find Mr. Ford, active in the promotion of its interests. His one object in his new capacity is to make the Canada Cement Company a popular national institution, and he is satisfied that very shortly the public will know that its object is not to demand unreasonable prices, but rather to increase the consumption of cement, and it naturally follows that with the desire to increase the consumption, the prices necessarily will have to be of such a character as to induce people to use cement in preference to other building materials. The plants of the Canada Cement Co. are widely distributed, there being two in Montreal, one in Hull, one in Marlbank, one in Lakefield, two in Belleville, one in Owen Sound, one in Port Colborne, one in Calgary, and one in Point au Tremble, P.Q. Sales Offices—Halifax, Montreal, Toronto, Winnipeg, Calgary, and possibly Vancouver. Such wide spreading interests will provide Mr. Ford with about as big a task as has ever been undertaken in Canada, by so young a man.

A HANDSOME OFFICE CALENDAR.

THE HOIDGE MARBLE COMPANY, Toronto, as is their usual custom, are mailing to their patrons and friends, a handsome wall calendar, for one of which we herewith extend our thanks. The date pad is of sufficient size to make it especially useful in either a large or small office, while the subject of the calendar itself possesses an artistic merit that makes it highly acceptable to the recipient. The company has recently purchased a large interest in the marble quarries located south of Renfrew, Ont., in addition to making several important improvements to their Toronto plant.

ARCHITECTURAL FINISHES AND STAINS

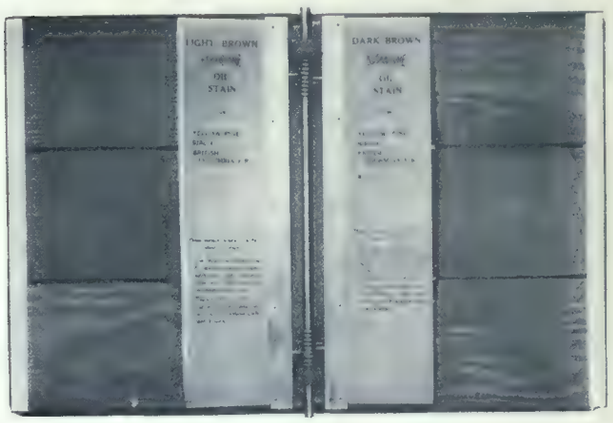
BY FAR one of the most ingenious and useful devices placed in the architects hands in some time, is the portfolio of "Architectural Finishes and Stains," which the International Varnish Company, Ltd., Toronto, is mailing to the profession. This portfolio or display book is intended by the donor to assist the architect to readily select any particular finish he may desire for the woodwork and also to enable him to make clear to his client

the exact scheme which he may have in mind. There are forty-eight sample boards in all, demonstrating in a practical way a variety of finishes (both in oil and acid stains), for woods which the architects are continually specifying, such as yellow pine, quartered oak, birch, British Columbia Fir, etc.

These sample boards are arranged in nickel bound leaves, having three specimens on either side; the leaves being adjusted by a patented fastening device in such a manner as to permit the book to be opened flat at any part. Each stain or finish is accompanied by a description of the treatment employed to obtain the particular effect or polish procured, thus enabling the architect to readily specify what is required in this respect.

Another feature which greatly enhances the value of this book, is the complete specifications for finishing different varieties of wood, and also the splendid treatise on varnish, both of which in themselves are of inestimable value.

The portfolio is cleverly conceived, and splendidly gotten up. It has a usefulness that makes it a desirable asset, in that it is in the form of a book, handsomely bound in leather, and of a size that will conveniently fit any library shelf. The International Company makes a



Display Book of International Varnish Company, showing the manner in which the book opens, and how the sample boards are arranged and described.

number of special claims for its wood stains over other makes, particularly as regards British Columbia Fir and other native woods, and judging from the specimens shown, these claims are certainly well founded.

The Company's "Elastica Finishes" are used extensively in residences, office buildings, hotels, etc., where quality is the dominating essential. These were the first proprietory varnishes introduced to and specified by architects in Canada and the United States, and the increasing number of prominent architects who are regularly endorsing these finishes, is perhaps the best proof of their superior quality, uniformity, durability and elegance.

SANITOR TANKS AND CLOSET TANKS.

SOMETHING IN THE WAY of sanitary equipment which will interest architects and builders, is the new "Sanitor" tanks and closet seats which the Canadian H. W. Johns-Manville Company have just put on the market. These seats and tanks are moulded in one piece from indurated fibre, a material with which most of us have been familiar for some years back in connection with a very serviceable type of water parts, tubs, water tanks, etc. One of the advantages claimed for this material is that being non-porous and hence non-absorbant, it does not swell, shrink, warp, crack or sweat, and is, therefore, unusually meritorious from either a constructive or hygienic point of view. Another feature to which attention is called, is the fact that in the manufacture of "Sanitor" tanks, the very nature of the material obviates the necessity of any lining, and therefore does away with the dangers of corrosion.

By a clever mechanical process, the exact grain of mahogany and oak is transferred to these seats and tanks. This is done so perfectly that few would be able to distinguish them from wood. The manufacturers are sending a sample of this material and descriptive booklet to interested parties.

The company also announces that they are now prepared to receive enquiries and orders for fuses, fuse plugs, fuse blocks, fuse and service blocks and accessories for all voltages. They carry a large stock of N. E. C. S. fuse material in their Toronto warerooms, and are able to supply the requirements of their patrons immediately upon receipt of order.

THE ANNUAL CONVENTION of the Canadian National Builders' Association, held recently at London, Ont., proved to be one of the most successfull and representative gatherings ever held in the history of the organization. Delegates were present from all sections of the country, and a large number of subjects having a vital bearing on the interests of the organization, were presented and discussed. One of the more important topics before the convention, was the matter of trade schools, and a resolution was adopted authorizing the affiliated exchanges in each province to petition their respective governments, asking that when technical schools are established, a practical trade school department be included for the training and development of mechanics. The "eight-hour limit" on Government contracts was also broadly discussed, and a resolution was adopted voicing the sentiment of the convention, as being opposed to the measure on the ground that it would increase the cost of building operations, and interfere with the liberty of the individual. Other measures dealt with were the "calling for tenders," and "indenturing of apprentices." Winnipeg was chosen as the place for the 1910 convention.

February's Building Returns.

BUILDING RETURNS for February, while not indicating as high a percentage gain as the preceding months, show the situation general to be most satisfactory. Despite the fact that there were more individual losses noted in the towns and cities reporting to CONSTRUCTION than at any previous time in the past two years, the month nevertheless registers an average gain of 7 per cent. over the corresponding period of 1909, which is indeed most gratifying to say the least, considering that the previous February was an abnormally active month in which a large number of projects matured that were laid over at the time of the money stringency. On the whole, there is nothing to indicate other than that the highly satisfactory and prosperous condition that has obtained for some time past will continue; in fact, the totals in a number of instances are such as to presage a greater activity in many localities than even the most ardent optimist has ventured to predict.

The fortunes of the month seem to have particularly favored the West. Aside from Fernie's loss of 90 per cent.—the biggest decrease noted—and Edmonton's decline of 74 per cent., the advance was both general and substantial. Saskatoon soared to the zenith in a most spectacular fashion, having by a gain of 1,955 per cent. registered the greatest increase noted. Regina rose to second position by an increase of 821 per cent.; while Vancouver, with a total of $880,795, and a gain of 115 per cent., records the largest volume of work undertaken, and thus secures the distinction for the month of being the premier city in the Dominion in this respect.

A strong forward movement was also manifest in Calgary, which annexed a gain of 117 per cent., and in Victoria, where the total for permits issued was 23 per cent. in excess of the aggregate amount for the same month last year. Again, Lethbridge's upturn of 41 per cent. bears evidence of a wholesome tendency, while Winnipeg's gain of 101 per cent., especially considering the amount of work undertaken and the enormous increase made in the preceding month, demonstrates plainly the gigantic strides which are being taken in the upbuilding of the Western metropolis.

It might be explained in the case of Fernie, that in the corresponding period of last year, the rebuilding of the fire-swept district was at its height, hence the remarkably large total, which could hardly be expected to be repeated under less extreme conditions.

As regards Ontario, the outcropping of decrease was a trifle more pronounced. Fort William suffered a reversal of 89 per cent.; London declined 71 per cent., and Kingston and Windsor fell back to the extent of 69 per cent., respectively. These setbacks, however, should in no way be regarded as alarming, as all these centres have excellent prospects immediately ahead, and will evidently show a steady expansion from now on. On the other hand, Hamilton made an excellent showing, registering an increase of 251 per cent.; Toronto slightly topped her figures for the corresponding month, and Brantford and Ottawa netted increases of 80 per cent. and 40 per cent. in order named.

Farther East, Montreal reports a gain of 16 per cent., and St. John, which lead the field in January, an advance of 225 per cent. Halifax and Sydney, however, are in the arrear to the extent of 34 per cent. and 44 per cent., respectively. Sydney's amount in either case is extremely small, and therefore, hardly material as indicating her progress. Both of these places are substantially ahead so far for the year's work.

	Permits for February, 1910.	Permits for February, 1909.	Increase, per cent.	Decrease, per cent.
Brantford, Ont. ...	2,800	1,550	80.64	.....
Calgary, Alta.	169,800	78,050	117.55	.....
Edmonton, Alta. ..	29,030	112,400	.....	74.17
Fernie, B.C.	35,000	370,000	.....	90.54
Fort William, Ont.	32,725	315,625	.....	89.63
Halifax, N.S.	14,525	22,070	.....	34.18
Hamilton, Ont. ...	37,650	10,700	251.86	.....
Kingston, Ont. ...	4,050	13,200	.....	69.31
Lethbridge, Alta. .	37,070	26,160	41.70	.....
London, Ont.	20,322	70,800	.....	71.29
Montreal, Que. ...	274,030	235,330	16.44	.....
Moose Jaw, Sask..	8,000	.....	.....	.....
Ottawa, Ont.	94,200	66,940	40.72	.....
Regina, Sask.	28,255	3,065	821.86	.....
St. John, N.B.	22,000	6,750	225.92	.....
Saskatoon, Sask. .	55,500	2,700	1,955.55	.....
Sydney, N.S.	1,775	3,200	.....	44.53
Toronto, Ont.	860,440	853,035	0	.....
Vancouver, B.C. .	880,795	409,655	115.00	.....
Victoria, B.C.	151,760	122,680	23.62	.....
Windsor, Ont.	5,200	17,075	.....	69.54
Winnipeg, Man. ..	318,600	158,500	101.00	.....
	3,075,527	2,899,485	6.07	.....

Toronto's Myopic School Board.

UNLESS THE UNEXPECTED OCCURS, Toronto's proposed $500,000 Technical School is to be erected after the plans prepared by Mr. C. H. Bishop, Public School Building Inspector of that city, with the aid of his staff of draughtsmen.

It is difficult to understand why "in the face of the many protests from Toronto citizens who are in a position to appreciate the danger of having a man so untrained in architectural design, erect so important a building," Toronto's School Board insists upon carrying out this determination to impose this task upon Mr. Bishop. To those who are in a position to intelligently look the affair squarely in the face, it appears that this body of men who expend annually vast sums of money on Toronto's new school buildings, are without the least conception of the extent of their responsibilities. They show conclusively that they have little appreciation for symmetry and beauty in architectural design, or the psychological effect of good architecture upon a community. A procedure of this nature might be excused if Toronto was still a country town, but the Queen City has grown

out of its swaddling clothes, and it seems only reasonable that its school officials should understand that they do not belong to a country school board.

At the time when the public is showing a greater appreciation of architectural design, a time when the Toronto Guild of Civic Art is making such earnest endeavors towards the beautifying of the city of Toronto, at a time when the city is spending large sums of money in parks and driveways, it seems almost incredible that a body of men responsible for the public school educational system of that city should show such an extraordinary lack of appreciation of architectural design as to make the unprecedented blunder of having so important a structure erected by an untrained man.

If the city gets value received for its expenditure, it will have one of the largest and best equipped technical schools on the continent. It will be by all odds the largest in Canada, and should be one that would stand as a model for other municipalities, many of which will erect structures to be used for a like purpose, within the next few years. This structure will be the largest individual educational building in the province of Ontario, and, therefore, should be one such as Torontonians could point to with justifiable pride. It will be the most important structure erected by the city of Toronto, with the exception of the General Hospital building, since the City Hall was completed.

The Technical School provides the most difficult task in designing and planning that has been presented in Toronto for many years, in that the designer has few successful precedents to follow. In other words, Toronto is spending in $500,000 a sufficient sum of money to erect a structure of which her citizens might rightfully be proud, a structure that should take precedent over all others, to be used in connection with the rapidly growing movement for the establishment of better facilities for technical education on this continent.

In view of these facts, it is obvious that the task of designing the Technical School is by no means a small one, even for our most thoroughly trained and best experienced architects. There is no architect in Canada who would undertake such a problem without first having given it long and careful study.

The Board of Education has evidently waived all these points as being of little importance, and are apparently under the impression that anything large enough, with four walls, a roof and the necessary partitions, is all that the people have a right to expect for their $500.000.

Mr. Bishop is admittedly not an architect. He has had neither the training nor practice to justify his being commissioned to design a $10,000 residence, let alone a $500,000 school building. His staff is inferior as compared with those in the better class of architects' offices, and cannot be expected to be equal to the task the Board of Education would impose upon them.

It is true some members of the Board of Education, together with Mr. Bishop, were sent to visit some more prominent technical schools in the United States, with a view to becoming acquainted with the usual requirements of such buildings, but you might just as well expect a sign painter, after having visited the art centres of Europe, to execute a Raphael, as to expect a man untrained in architectural design, to successfully design a $500,000 building after having viewed a few worthy structures.

Then, again, a private individual or corporation selects an architect to design a given building, only after having been satisfied by his (the architect's) former work, that he is equal to the commission. Every commission given to an architect is therefore justified, in the mind of his client, by the character of his former work. Can it be then, that in the minds of the members of the Board of Education, Mr. Bishop's public school structures in Toronto, justify his being commissioned to design this $500,000 building, a structure to be one of Toronto's most ambitious pieces of architecture? Surely not!

It is not our object here to discuss Toronto's public schools, but it is an undeniable fact that from the standpoint of either plan or design, Toronto's schools do not bear one mark of having been the work of a man trained in architectural design, merit of investment, knowledge of materials, or utility in planning. If the average architect had only such work to his credit, his chances for building a practice would be very small. But Mr. Bishop is to design Toronto's $500,000 Technical School.

Unless we are very much mistaken in the calibre of men we have on the Board of Education, it has not a member who would think of building a factory, a warehouse or a $10,000 residence, without the aid of an architect. One prominent member built not very long ago, a large storage warehouse. It was designed by a well-known firm of architects, and although the structure is simple, it bears evidence of good taste and shows a regard for the value of good materials, good proportions and the functions of the building. If private individuals find it expedient to employ trained men in such simple work as warehouses, factories or residences, how much more are the best of trained men required to design an educational building to cost $500,000?

The action of the Board of Education and Mr. Bishop's willingness to undertake a task he himself must know is so much beyond him, is without precedent. Never before in Canada, or the United States, has an untrained man been commissioned to design a structure of such proportions, a building so important, a work with so many problems. The outrage is without precedent.

The Board of Education has remained sullen and unresponsive to all the appeals that have been made to induce them to provide means whereby the city of Toronto would be given something for its $500,000 besides a meaningless unattractive structure with the necessary holes in the wall, a skylight or two in the roof for light, an elaborated entrance or two, and coping on the top to protect the walls from the elements.

The reason for this attitude seems inexplainable. Is it that the men to whom the citizens of Toronto have entrusted the conduct of all affairs pertaining to public education in the city are sufficiently lacking in culture and refinement to appreciate the educational importance of good design? Is it that they believe they are going to save money, or has Mr. Bishop actually convinced them that he, untrained as he is, is equal to the task of designing this great public structure?

It has been stated that an architecturally elaborate structure was not desired, but that a simple, dignified building, upon which no money was wasted on extravagant design, was to be preferred. This fact does not make the work one whit simpler; in fact, it renders it more difficult from the standpoint of good design. The popular belief that an architect's function is purely æsthetic, is entirely erroneous. The function of the architect is just as much utilitarian as it is æsthetic. Architectural training and practice is required to design a utilitarian structure, devoid of all ornament, just as much as it is required in designing monumental buildings of great cost. The trained architect will relieve the utilitarian building from monotony by the intelligent disposition of its parts to best express its function. He will produce a structure correct in detail and symmetrical in proportions, that betrays a strict regard for the value of good plain materials. It is the untrained man that belabors his building with a lot of cheap, meretricious ornament ill suited to the purposes of the building. A design that will give a rational expression to a utilitarian building, is what is required for the Technical School. To create such a design, is the work of a man trained in architectural design.

The argument that the Board would save the architect's commission by having Mr. Bishop undertake the work, is absolutely wrong. A good architect, if given a definite programme, by working economies in design and

construction, will more than save his commissions on any building, large or small. Apart from this, the superior class of work obtainable after the plans and under the supervision of a competent architect, warrants his employment. It is, therefore, quite clear that the Board of Education will make an unpardonable blunder if it persists in its present course and if the Technical School is built after the plans of Mr. Bishop, the city of Toronto will have erected a monument to the mismanagement and uncultured egotism of the Board of Education of 1910.

Toronto architects have filed their protest with the School Board, but it seems to have had little effect. The Board of Education appears to think that the architects' sole concern in the matter is prompted by their own professional interests. This is entirely erroneous. Architects should be given credit for having a public interest in such matters, unbiased by their own private interest. The architects of Toronto do not insist that a Toronto architect should design the building, but have asked that it be designed by a trained man. They were prompted in their protest against this ill-advised procedure, purely by their knowledge of the importance of such a problem, and the training that a man requires to successfully undertake such a work. The profession has not gone far enough. If it cannot get a fair hearing from the School Board, and a definite statement as to their position, a campaign should be organized whereby Toronto's citizens who have an intelligent interest in the city's welfare, would be made to see the horrible blunder that Toronto is about to make in connection with the erection of this important educational building.

The work is of sufficient magnitude to warrant a competition open to all architects in the province of Ontario, or the Dominion of Canada, while another plan would be to invite six or eight of Canada's foremost architects to prepare competitive plans. The programme could be drawn up by Mr. Bishop and his staff, and three or five eminent authorities could be brought from the United States to act as judges. I suggest from the United States, because Canada's more prominent architects would undoubtedly be competing.

In this way, it would be possible for the city to get the product of Canada's best trained architects, and the result would be somewhat different from what we might expect from one man, untrained in architectural design. A bad building once erected, is a mistake that cannot be rectified.

Architectural Services and Remuneration

FOR THE BENEFIT of the architects who have not as yet heard of this golden opportunity, we reproduce herewith an advertisement appearing under the heading of "general announcements" in one of the daily papers, believing that it will cause a general scramble for the draughting board as soon as the information contained therein has spread among the members of the profession.

TO ARCHITECTS.

The undersigned will receive competitive plans and specifications for an eight-room School House with basement, plans to provide for heating and ventilating, for Eganville Public School. Price of plans and specifications accepted to be seventy-five dollars.

It shall not be necessary for the Board to accept any plans submitted. The plans adopted to be the property of the Board. All others will be returned. Competitors to give approximate cost, exclusive of furnishings. Proposed cost of building from $10,000 to $12,000.

J. R. CAMPBELL,
Secretary, Eganville, Ont.

Seventy-five dollars for the accepted plans and specifications. Surely this is a recompense for service that borders on wanton prodigality. Would it have not been better to divide this sum into prizes, and to have had it so arranged that the first prize would include the fees of the successful architect. This would have at least given one or two others a chance "to get in on the money." Nothing is said in the advertisement about supervising the erection of the building, but from the munificent amount that the Board is willing to pay for the plans and specifications, it is only natural to assume, that this is to be expected.

Can anyone picture anything more preposterous or ridiculous than the terms of this announcement? Is it purely a case of gross ignorance as to value of architectural services; is it genuine parsimony, or an indirect appeal for charity? Possibly it is a combination of the three, but more likely it is the result of a niggardly policy which for genuine tight fistedness, surpasses anything that has heretofore come to our attention. The School Board desires a $10,000 or $12,000 school building and presumably one in which the plumbing, heating, ventilation, lighting of class rooms, and other sanitary features have been thoroughly considered, and in which adequate means of circulation and ingress and egress are provided. Tersely, it wants as good a structure as the money available will erect, and with this object in view it is willing to spend in one lump the sum of *seventy-five dollars* for the best ideas the architects may have to offer. Truly magnanimous, is it not? And yet, at that, there is no assurance that even this meagre stipend will be forthcoming, as the Board candidly stipulates that "it shall not be necessary to accept any plans submitted." The members must be fully satisfied that the design and plan of the building comes at least up to their expectations, aesthetically, constructively and economically, before any sordid designer can wrest the coveted amount from their hands.

There is a popular misconception on the part of many individuals that all an architect has to do is to submit sketches and plans of proposed structures for which he hasn't even a definite prospect of securing a commission; that the work of getting out such drawings is a mere trifle; and the outlay involved, simply nothing. They do not consider office rents, draughtsmen's salaries, the cost of workshop materials, and a number of other expenses which the architect has to meet. They merely regard him as a someone to whom they are absolutely indispensable, as one who must meet as many demands as they may make without any certain assurance of recompense.

The above case is quite typical in this respect. It invites the collective time and labor of as many architects as will compete for a picayunist consideration. In other words, the Board is willing to trade a seed for a watermelon, providing they cut and feast on it alone. But whatever may be advanced in the way of adverse criticism as regards the advertisement in question, it still possesses the virtue of open frankness. The facts are pertinently stated, and the architect knows just what he is up against.

Quite frequently we learn of library boards and other public committees who are guilty of unduly encroaching upon the architect's time, owing to gross irregularity in their mode of conducting competitions. We have had lately brought to our attention, a case of a Western Ontario town, where the library board, after keeping the competing architect in darkness for several months, finally rejected all designs submitted for a $25,000 building, and instituted a program on somewhat different lines for a second competition. The first competition provided that the author of the successful plans *would be requested* to furnish detailed plans and specifications, and that prizes of $50.00 and $25.00 respectively would be awarded for second and third choice. The second program, however, makes no stipulation of the kind; no award is promised, and there is nothing to indicate otherwise than that the competitors' efforts will again be in vain.

Taking these facts and conditions into consideration, it appears that the several architectural organizations would do their individual members and the profession in general a real material service by organizing bureaus that would keep the profession in touch with all competitions of this nature. Every competition should be carefully investigated the moment it is announced, and every member should receive notification from the secretary of the Association to which he belongs, stating whether such competition has secured the stamp of approval by the Association's committee, appointed for such purpose.

The popular conception that an architect's interest in his work, or his success in his profession, is measured, purely, by his ability to procure work and the collection of fees, is entirely erroneous. Every building designed by an architect, is an immovable evidence of either his skill or his incompetence, and in justice to himself, his client, and the profession generally, he must insist that the conditions under which he is employed, are such that will permit him to produce a finished structure such as he believes to do justice to his best ability. When the critical eye of the public passes over a building, it is judged as a finished work. Nobody ever inquires as to how much the owner paid the architect for professional services; nobody asks whether the architect received sufficient remuneration to permit him to erect a decent building; nobody asks whether the architect was responsible for the working drawings, nor whether the building was constructed as originally designed. The public simply looks upon the structure as the work of a certain architect, and criticizes it without any consideration for the conditions under which it was designed or built. For this reason, it is most important that every architect should take especial care that the conditions of his employment are such as to permit him to produce a finished structure, upon which he is willing to stake his professional reputation.

When an architect undertakes to do a given piece of work, at a price below that which his professional services are really worth, he undertakes to operate under conditions which do not permit him to carry out his work in a manner either creditable to himself or the profession. An architect should furthermore be very careful as to whose hands he permits his design and plans to go into, and in most cases should insist that the final working drawings should be prepared by himself, and that he be given the privilege to supervise the erection of the structure. Both he, the owner and the public would profit thereby.

To offer a nominal sum for a successful design with plans, and then carry out the erection of the building without the service of the author of the plans, may be termed an economy, but it is of the false variety. It is about the surest way to provide means for the squandering of money on a badly planned, poorly constructed and inadequately equipped mass of building materials.

It will be interesting to know just how many architects have prepared competitive plans for the Eganville school. We would like to give space to the three best designs, in "CONSTRUCTION." It would be interesting to see how much a man can get for $75.00 in the way of design for a $12,000 school. We doubt very much, however, as to whether the Board's inducement will prove sufficiently attractive to secure enough designs to provide for very much of a selection, unless it appeals to the "mail order architect," whom it might give an opportunity to job off one of his "hand-me-down" plans, with specifications, and working drawings thrown in to "cinch" the bargain. It is possible that the school board of Eganville, when they examine their competitive designs, will have a very poor opinion of the "Arch-e-teck's" ability to plan school buildings, and will possibly follow the usual course of village school boards, by giving the contract to a carpenter or mason to plan as well as build the schoolhouse, and Ontario will have added another to its long list of school building abortions for which it now enjoys a shameful distinction.

The "Big Stick" Measured.

AS WE GO TO PRESS a tariff war between Canada and the United States is imminent. The dictatorial, overbearing attitude of the American republic in demanding the same tariff concessions as Canada gave France under a reciprocal arrangement, with the threat of applying their maxmum tariff schedule against Canadian products, is perfectly in keeping with the egotistical trad epolicy of the myopic Yankee.

Before Canada came into her own, there was a time when she was in sore need of a market for her raw products. The United States seemed to be its logical and natural customer. We appealed to the American Government for a trade arrangement but our trade emissaries returned home empty handed—smarting under the almost discourteous treatment they received at the hands of the officials at the capitol, where the "big stick" is paraded.

Blaine told Canada plainly that she had to choose between two things—"secession from the Mother Country or commercial isolation as far as the United States was concerned." We chose the latter course and now that we have worked out our own destiny with the aid of the Motherland, in spite of the threatened commercial isolation, the commercial enemy of our youth comes to us with friendly representations and a "big stick" to attempt to cadjole us into the purchase of a highly polished "gold brick."

We are surprised that Uncle Sam, as crafty as he is, should have undertaken to awaken the "sleeping dog." Why he should attempt to disturb a condition that has been working so materially to his own advantage, is not quite clear, for by the application of the maximum tariff against Canadian goods, the United States will have done more to promote the policy of high protection than all the political agitators in Canada could ever hope to accomplish.

According to the report of the Department of Trade and Commerce, for nine months ending December, 1909, Canada imported $161,013,916 worth of merchandise from the United States, the greater portion of which was manufactured products. During the same period Canada's exports to that country amounted to $79,333,930 which was constituted almost wholly of raw materials. This gives the United States a trade balance in its favor of $81,680,033. During this period Canada's imports from all the other countries in the world, including Great Britain, amounted to only $110,783,437. In other words Canada bought, during the first nine months of the present fiscal year, $50,230,462 more from the United States than from Great Britain and all the other countries of the world combined.

More than this, we find during this same period that $75,025,145 worth of merchandise was admitted duty free from the United States, as against a total of $33,495,'88 of duty free merchandise from Great Britain and all the other countries combined. In the face of these facts, Washington maintains that the United States is being unduly discriminated against and threatens Canada with a sound tariff thrashing if additional concessions are not made. The "big stick" loses its terrors with the man who carries a stick of dynamite.

The majority of Canadians have for the past ten years realized that our tariff rates were inadequate. They have not been sufficiently high to prevent the dumping of surplus foreign manufactured products. As a result, our industrial equilibrum has often been disturbed and the trade against us has been too great to create a healthy condition of trade. But political policies and prejudices have set many obstacles in the way of

a sane solution of the difficulties with which a re-adjustment of our tariff laws is fraught.

Again, our forests are being demanded to keep the great paper mills of the United States, that employ thousands of hands ,in operation. Our asbestos mines are operated mostly by American capital and the raw product is being carried off to the United States to be manufactured by American labor, from whence it is brought back and sold to us in commercial forms. Our nickle mines—the richest in the world—give up their wealth to be carried off across the border where it is used in connection with the manufacture of inumerable articles that are brought back and sold to Canadians.

Our wheat is taken into Minnesota where it is mixed with an inferior grade and the flour thus manufactured is sold on the English market as No. 1 hard wheat flour, in competition with the product of uor own mills.

These are conditions that every thinking Canadian has deprecated, but the proper solution of them has never been quite clear. It has remained with Uncle Sam to point the way, and the tariff war he threatens to force upon Canada will operate directly in taking the last leg from under high tariff opponents, and will unite every Canadian, without regard to party politics, in the determination to correct the unhealthy conditions that have existed between the two countries. If the United States carries out its declared intention, the Canadian parliament will be forced to put an export duty upon raw products and a surtax upon imports from the United States. It will thus have a two-fold effect in promoting Canadian industry and enterprise.

The business man of the United States will not consent to have the Canadian market taken from him. If it becomes unprofitable to export goods to Canada, he will build a factory to supply his Canadian trade.

British capital will flow into the country, in the establishment of factories and warehouses and Canadian manufacturers will be adequately protected against the now ruinous dumping from the United States.

As regards building materials and equipment, we know of nothing that we import to-day that cannot either be produced in Canada or purchased in the English market. When such a condition has been brought about, Canada will keep to herself a very much larger percentage of the vast sums now being expended in building and engineering operations, than she does at present.

Canada, threfore, welcomes the tariff war that the United States seems determined to force upon her, as a solution of a perplexing trade problem.

EXAMPLES OF VENETIAN GOTHIC.—Ca d' Oro and Contarini Fasan Palaces.

ALTHOUGH ITALY cannot be said to have ever had a Gothic style, we can speak of a Gothic Age in Italy. The Italians never mastered or cared to master the principles underlying Gothic construction, but adopted at their good pleasure, and with modifications to suit their genius, a good proportion of Gothic forms. During the thirteenth and fourteenth centuries nearly all of Italy's architects were monks. Both the Dominicans and the Franciscans accepted the Gothic type and it is the churches of these two orders at Bologna (San Francisco San Domenico), Florence (Santa Maria Novella Santa Croce), Venice, Santi Giovanni e Paolo (Santa Maria, Sopra Minerva), etc., in which the type of Italian Gothic churches is developed.

It was in civil architecture, however, that the Italians excelled, and it is Venice that represents the full flower of the transition from the Byzantine ideals to the Renaissance through the Romanesque and the Gothic, in its numerous notable palaces and public edifices.

The pleasure palace of Venice, beginning as a Byzantine and Romanesque type, developed during the Gothic period into a beautiful creation, whose climax is the Ca d' Oro and the Doges Palace. The Venetian palaces are distinguished by their many loggie and colonnades, by their wealth of exterior decoration and colored surfaces; while their interiors are enriched by the brushes of the many superb Venetian colorists.

The celebrated Ca d' Oro is one of the many beautiful Venetian Gothic palaces on the Grand Canal, and is united with some three or four of these palaces of rather early date. It is difficult to secure a description of this palace, as it was originally built, owing to the fact that it was restored to render it fit for the occupation of Ma lle Taglioni, and much of the elaborate decoration, from which it originally derived its name, has perished or been destroyed. As it stands, however, it is still a very sumptuous example of the later Fourteenth Century Venetian Gothic. Its whole face is inlaid with squares of red and white marble, and a great amount of carving is spread over the entire surface around and between the windows. This is very flat, but good in its effect. The open arcade on the water story and the traceried arcade above, all open into recessed courts, an arrangement peculiar to this house, and so far similar in its purpose to the arcades in the Ducal Palace. Some of the balconies are considered exceptionally good, and the carving of the capitals and moulding of the window traceries are characteristic of Venetian Pointed.

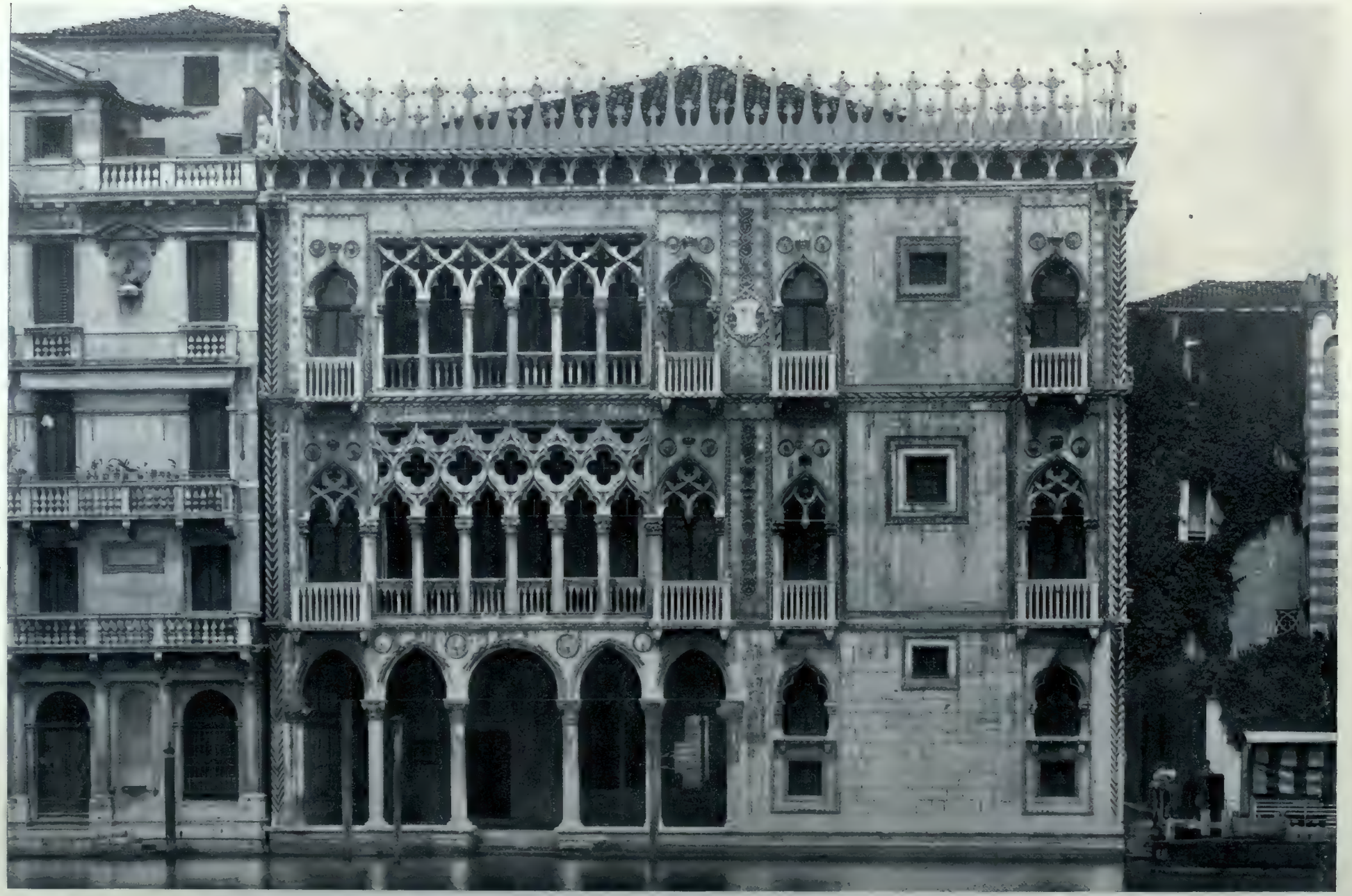
The whole design is criticized as being one-sided, thus giving the impression of a house to which an additional wing has been added. The water stage consists of an open arcade of five arches, the central arch round, and the remainder pointed. To one side of these are two windows and a continuous balcony. The second and third stages have above the five open arches, elaborate traceried windows of less than eight lights in width, filling almost the entire front, the outside lights having balconies while the others have balustrades. Over the two windows of the water stage, are single light windows in each stage. Throughout this front there are many medallions of dark marble, which let into a field of light marble and are most brilliant in effect.

The most remarkable features of the Ca d' Oro are, however, the triple and elaborately carved chamfroned angle shafts, which are nowhere else to be found, and the very singular parapet. The height of this is greater about the centre and at the two ends than elsewhere, but it appears to have been done rather with the intention of carrying up to the very top the noticeable division in the building itself, than for any other reason. A very small portion only of the parapet is perfect, but its general effect will be understood on reference to the illustrations. The small balls of marble affixed at the outer edge at the trifoils, are like those in the tracery of the Ducal Palace, and in the centre of the medallions of marble, everywhere throughout the city their effect is very piquant.

Palazzo Contarini Fasan.

The Palazzo Contarini Fasan, which is often shown as the house of Desdemona, is the most exquisite of small Gothic structures on the Grand Canal. It has corded edges and traceried balconies of surpassing richness supported on richly sculptured corbels. This house, which was built in the fourteenth century, is the only palace in Venice that has traceried balconies.

A GERMAN MACHINE MANUFACTURER in Magedeburg has devised a new means for power transmission in the shape of a wire belting. It is claimed for this invention which substitutes thin endless wires for leather belts, steel bands, chains, etc., that it equals other systems as regards efficiency and wearing qualities, and is considerably cheaper.



The Cà d'Oro Palace, Venice, erected during the Fourteenth century. This celebrated palace represents the beautiful creation in the Venetian palace, that was the climax of the transition from the Romanesque to the Gothic type. The most remarkable features of this structure are the triple and elaborately carved and chafroned angle shafts and the very singular parapet, together with the tracery of the loggie and the windows and the carved work around and between the windows.

Detail of first and second stages of the Cà d'Oro Palace, Venice. In this detail the exquisite carved work and beautiful medallions may be seen. The small balls of marble affixed to the outer edge of the trefoils are like those in the tracery of the Ducal palace, and the balls in the centre of the medallions of marble are like those seen everywhere throughout the city.

The Contarini-Fasan, Venice, built during the fourteenth centur y. This palace, which is often shown as the house of Desdemona, is one of the most exquisite of small Gothic structures in Venice, and is th e only structure in that city that has traceried balconies.

ARCHITECTURAL EDUCATION IN TORONTO.—Beaux Art System of Training Adopted by Aspiring Draughtsmen.—Classes Held Under Patronage of Local Architectural Society.—Work of Students and Life at Atelier Lyle. ∴ ∴ ∴ ∴ ∴

WITHOUT ADEQUATE FACILITIES in our Canadian universities for instruction in architectural design, the responsibility of the proper training of the architect-to-be rests entirely with the practicing architect of to-day. It is true that the several architectural organizations in Canada are clamoring for the establishment of courses in architectural training in our colleges that will prove equal to the duties imposed upon them by a country that has yet to establish an architecture of its own. Their efforts in this direction have, however, met with little encouragement. The lay public in Canada does not seem to recognize the important position the architect occupies in our social, moral and industrial fabric. Canadians take pride in the facilities afforded in their universities for almost every other branch of learning, but we are not as yet sufficiently appreciative of design to have due consideration for the importance of architectural education.

Educators recognize—at least to some degree—the necessity for better facilities for architectural training, but the rapidly increasing demands in other branches of learning, together with the apathetic attitude of the lay public, precludes such action in this direction, that they personally might be inclined to take. It is not to be inferred from this that the laudable efforts of the several architectural bodies in Canada to induce our university authorities to give architecture as an art, the recognition that it deserves, will be of no avail. We are merely outlining a condition that has existed up to this time, and it is to be hoped that in the near future architecture will be placed on a par with the other courses of training now carried on in our universities.

In the meantime, the training of the student and the education of the lay public rests entirely with the architects of Canada, individually and collectively. By the quality of their own work, by training the young men in their offices, and by organizing classes in architectural design and practice, the architects of Canada will do much of a real material nature to elevate the standards of public taste and of the profession. In this way will a higher order of things be brought about that will place architecture in the important position it merits.

In Canada we have no museums, we have no notable monuments of architecture, our students cannot take a day's excursion to view the treasures of Rome and Italy, the picturesque monuments of Spain and Germany, the beautiful old cathedrals of England, or the architectural masterpieces of France. The student in Canada lives in a utilitarian atmosphere—as a people we have not found time to become artistic. Utility and cost are the predominating considerations in almost all our public enterprises. It is right that the student be impressed with the importance of the business phase of the profession, but not to the extent that it crushes out the vital spark of imagination, thus rendering symmetry and beauty, the least important of the factors in architectural design. These are some of the disadvantages and handicaps that the architect must meet before we can expect to elevate the standard of the profession in Canada to a point that will render a Canadian architecture possible. To this end several of the architectural bodies in Canada have established classes of instruction, and several members of the profession who have been fortunate in having had the opportunity of securing a superior training have and are giving up much of their time to this praiseworthy cause, under conditions that are trying, if not at times discouraging. To the instructions received in these classes, many architects practicing to-day owe at least their initial training. The success of such classes depends upon two things: the interest and diligent application of the student, and the patience, perseverance, unselfish sincerity and self-sacrificing devotion of the instructors.

In the absence of environment that promotes the appreciation for the aesthetic, many students become indifferent—they would like to take the short cut—"touch the high spots" as it were—and while it is this apathy on the part of the student that is most discouraging to the architect-instructor, it is here that heroic work has to be done. The students must be encouraged, goaded on—interest must be created and maintained. The most attractive and suitable conditions must be provided under which they work—they must be taught to take a mutual interest in each other's work. They must understand that they are all working for a common purpose toward a common end. Yet there must be a friendly rivalry and criticism to create an unwavering enthusiasm and determination to excel.

In the absence of the artistic atmosphere of Europe or the university courses such as are provided in the United States, it is only through the establishment and successful conduct of such night classes that students in Canada will be given an opportunity to secure systematic training in architectural design.

Before the establishment of architectural courses in the United States universities, the condition there was much worse than that which now obtains in Canada. About thirty years ago, after the civil war, there were few educated architects; the popular standards of design were almost grotesquely inartistic, and really fine architecture was nearly as impossible to execute as improbable to be appreciated. However, the appreciation of the beautiful in architecture was not entirely dead, and a few brave, earnest men strove by the excellence of their work, the training of their draftsmen, and the general interest they took in the advancement of the profession, to bring about just what Canadian architects are to-day striving for in Canada—better facilities for architectural education.

Professor Hamlin, executive head of the School of Architecture of Columbia University, places three names "foremost in this roll of honor," R. M. Hunt, H. H. Richardson, and W. R. Ware; Mr. Hunt and Mr. Richardson for the educational work carried on in their offices, as well as for their professional achievements in practice; Mr. Ware for the organization of the earliest United States School of Architecture in the Massachusetts Institutes of Technology in Boston. It was not, however, until 1876 that the herculean efforts commenced to bear fruit, when they became acknowledged leaders of a movement that eventually placed architecture in the United States on a higher plane. In 1880 the Columbia University established a Department of Architecture, and to-day there are four universities in the United States that conduct architectural courses that in almost every point of comparison are equal to those of the old world.

Canada is just now passing through this transitional stage, and it rests with the practising members of the profession to take care of the education of the student until such time as a condition may be created whereby public opinion and sheer necessity will demand the establishment of university courses in architectural instruction, such as will compare favorably with those of colleges in other countries.

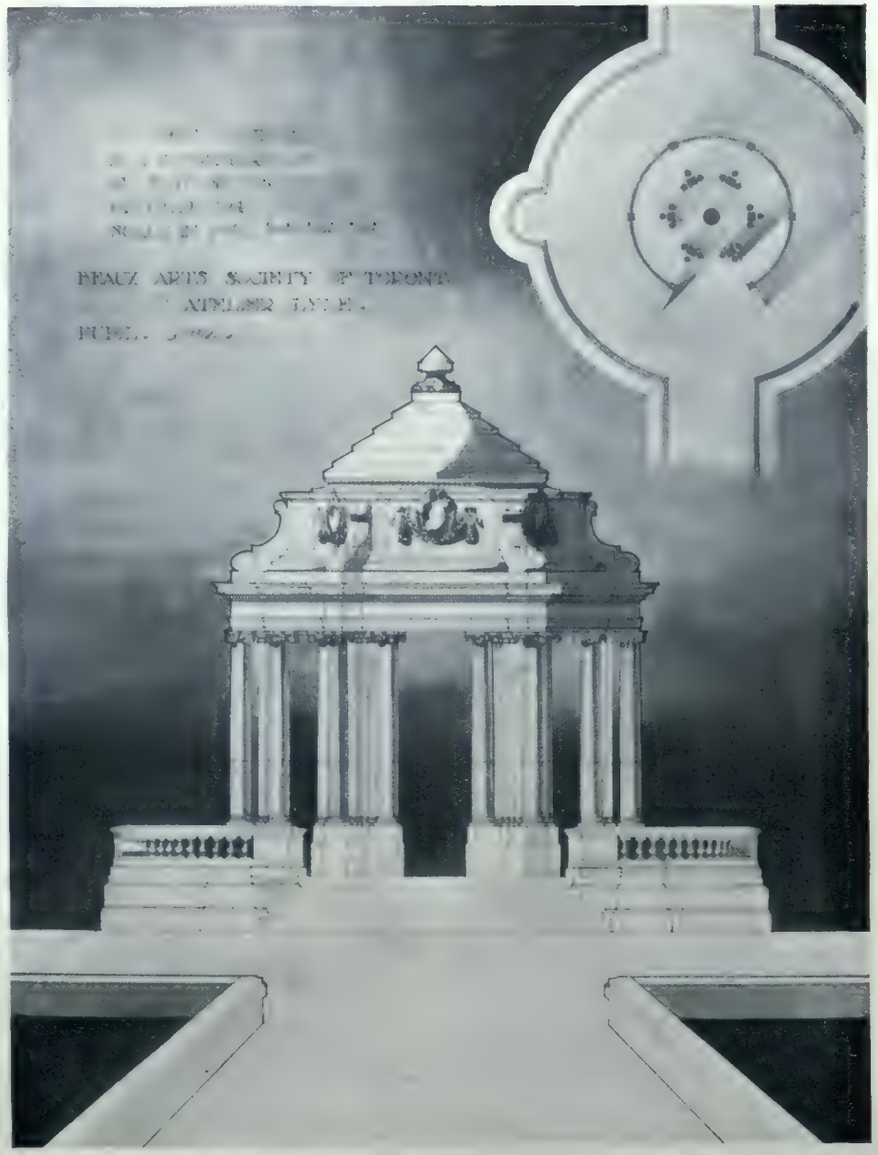
Among the several architectural organizations that have assumed their responsibilities in this direction is the Toronto Society of Architects, under whose auspices

Design No. 1.—Open Pavilion—Toronto Beaux Art Society Competition—Second Mention—A. E. Martin, Atlier Lyle.

Design No. 2.—Open Pavilion—Toronto Beaux Art Society Competition—Second Mention—D. E. Kertland, Atelier Lyle.

Design No. 3.—Open Pavilion—Toronto Beaux Art Society Competition—Second Mention—A. J. Everett, Atelier Lyle.

Design No. 4.—Open Pavilion—Toronto Beaux Art Society Competition—Mention—G. West, Atelier Lyle.



Design No. 5 —Open Pavilion—Toronto Beaux Art Society Competition—Mention I. Feldman, Atelier Lyle.

Design No 6.—Open Pavilion—Toronto Beaux Art Society Competition—A. E. Watson, Atelier Lyle.

Design No. 1.—Art Museum—Toronto Beaux Art Society Competition—A. E. Watson, Atelier Lyle.

"the Atelier Lyle" is conducted. The success of this class has been due almost entirely to the persistent efforts of Mr. John M. Lyle, who was invited by the students at its inauguration to become the *atelier patron* and *critic*, in which capacity he has acted for two years. The methods of instruction are similar to those in vogue at the celebrated Ecole des Beaux Arts of Paris, and we believe a short description of the *atelier* and its life would be of interest to the readers of CONSTRUCTION.

Mr. Lyle, who has had a "Beaux Arts" training, is well qualified to act as *patron* of this Beaux Arts class of Toronto. In the Paris school he was permitted to breathe an aesthetically exhilarating and illuminating atmosphere, and the influence of the material consideration imposed upon him in his practice since he returned has been toned down by the more highly artistic taste he developed when abroad.

Despite the contentions of many architects that the Beaux Arts system is weak, in that it does not encourage the mechanical and utilitarian details, it is an incontestable fact that it opens the student's eyes to the artistic factors and possibilities of a problem. He is taught to think of a building as an artistic unit, as primarily and always a work of art, an object of artistic design in plan, composition and detail. The results of Mr. Lyle's educational work are shown by the illustrations of the several drawings by his students as published herewith. Generally speaking, the designs show intelligent thought, careful rendering and good composition.

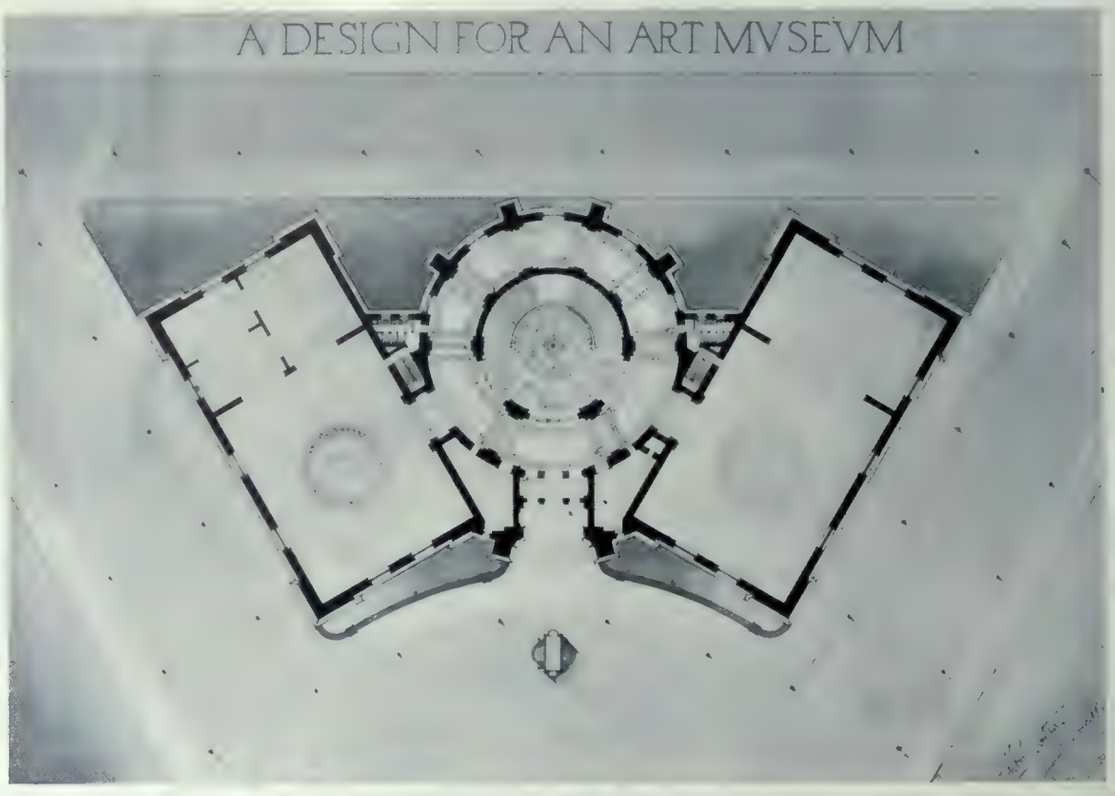
The home of this youthful band of aspirants to the architectural honors of the future, is on the second storey of an old brick building of Georgian simplicity—situated on Bloor street near Yonge. The environment is of the humblest—the unkept condition of the rooms reminds one of the abode of an artist—everything that might tend to give the quarters a utilitarian atmosphere has been studiously avoided. A cabinetmaker occupies one of the lower storeys. A Chinese laundry is also located in this old building, and the whole Bohemian atmosphere is accentuated by the pungent odor peculiar to Oriental emporiums of this nature.

The *atelier* or workshop occupies a long room, the draughting room and smaller adjoining room—the library; neither one bears evidence of having imposed any undue responsibilities upon the class for their upkeep; they are unkept and in a state of chaos, as most workshops are. The rooms are full of plaster casts, drawings, sketches and at times much smoke and hilarity. The students are left free to do much as they please—there being no recognized code or rules of conduct.

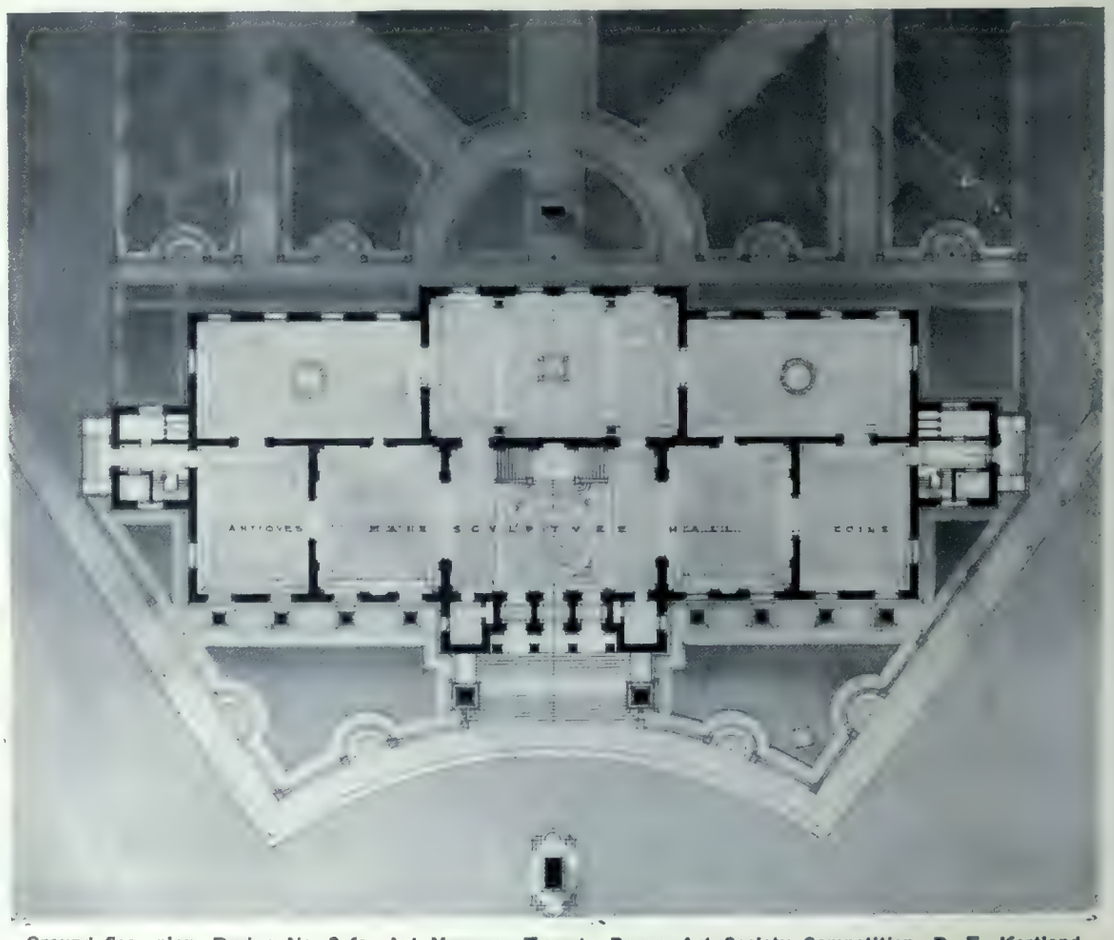
The *atelier* is managed by a board, composed of A. E. Watson, *massier;* D. E. Kertland, W. L. Somerville, G. West, I. Feldman, and A. N. Martin.

The *patron* has nothing to do with the actual management of the *atelier*—his function is to act as critic, guide and friend to the men. His duty is to set the programme, to criticize twice a week, and direct the efforts of his pupils. The programmes set are those used by The

Design No. 2.—Art Museum—Toronto Beaux Art Society Competition—D. E Kertland, Atelier Lyle.



Ground floor plan, Design No. 1 for Art Museum, Toronto Beaux Art Society Competition—A. E Watson, Atelier Lyle.



Ground floor plan, Design No. 2 for Art Museum, Toronto Beaux Art Society Competition—D. E. Kertland, Atelier Lyle.

Design No. 1.—Boundary Monument on a Bridge—Toronto Beaux Art Society Competition—Second Mention—W. L. Somerville, Atelier Lyle.

Beaux Arts Society of New York, according to which the students are required to make a rough sketch in one evening; a copy of this sketch is kept and filed with the secretary. The student has a limited time within which to develop his scheme, and make his final drawings. The majority of the problems are short, requiring about three weeks' work. When the final drawing are completed, they are hung, together with the original sketch, for judgment.

The jury is composed of three practicing architects, together with the *patron;* the latter having no vote in awarding the mentions, but is present to explain and to defend his pupils' work. Each project is judged by a separate jury. If the jury think that the student has departed too much from his original sketch, they may withhold judgment on his drawings.

The *atelier* is divided into two classes—"A" and "B," or senior and junior. The drawings are marked as follows—"1st Mention, 2nd Mention, and Mention"—the former being the highest award and is rarely given—only in the case of exceptional ability.

OPEN PAVILION.

The programme for the first competition we illustrate herewith provided for an archæological problem of an open pavilion covering a well or fountain situated in the gateway of an English institution of learning. It provided that the floor level of the fountain should be raised above the level of the yard. The structure itself was to be round or polygonal, and could not exceed 20 feet in diameter. The style to be followed was English Renaissance. The scale of the drawings used, to be ½-inch to the foot.

Criticism.

Design No. 1, by A. N. Martin, which received second mention, is subject to the following criticism: General character, very good; stony character, excellent; treatment of angles, very interesting; mass, very good, with exception of base, which is rather thin and out of character with the superstructure; detail, good; presentation, very good; drawing and rendering, both good.

The criticism of design No. 2, by D. E. Kertland, which received second mention, is as follows: General character, good; mass, good; detail, also good, except-

Design No. 2.—Boundary Monument on a Bridge—Toronto Beaux Art Society Competition—Second Mention—A. N. Martin, Atelier Lyle.

ing possibly the character of the foundation base, which does not quite harmonize with the general scheme; presentation, very good, excepting that the shade is wrongly cast.

Design No. 3 in this competition, by Mr. A. J. Everett, which received second mention, in general character might be considered good. The dome, which appears to be somewhat squashed down, might have been higher. The presentation is only fair, the drawing being too faint and undecided, not vigorous enough. The background is too strong, as compared with the subject, thus tending to kill the manument.

Design No. 4, by Mr. G. West, which was given mention, may be criticized as follows: General appearance, fairly good; central motive, somewhat out of character with side wings, thus detaching itself and marring the ensemble; presentation, fair.

Design No. 5, by I. Feldman, which received mention, in general character is fair but uninteresting. The mass is only fair, the upper portion being too heavy for the columns. The approach and balustrades are rather stiff and uninteresting. The detail is fair and the presentation good.

Design No. 6, by A. E. Watson, in general character is good, with the exception that the monument should not have been square. The mass is good, and the English Renaissance character of the detail is very good; presentation, drawing and rendering, very good.

ART MUSEUM.

The second competition we illustrate herewith is an Art Museum, on a lot fronting on a circle, which forms the termination of an avenue. It provided that on the ground floor should be found a vestibule, a monumental staircase, a great hall for architectural casts, galleries for sculpture, architectural fragments, remains showing the civilization of the various nations of antiquity, each one having its special gallery, varying in length. Small rooms were to be provided for a collection of coins, gems and small articles of virtu. Several secondary staircases and arrangements for checking coats, toilet rooms, etc., were to be arranged for. It was further provided that the second floor was to be reserved for picture galleries, some spacious ones for decorative canvases, some small for showing enamels and miniatures, and that one room in a central position was to be reserved for the *chef d'aeuvres* of the collection, as in the *Salon Caree* of the *Louvre*. For the *ecquisse,* one plan at 1-32nd inch scale and a facade of 1-16th inch scale were required. For the *rendu* the plan at 1-16th inch scale and the facade at ⅛th inch scale were required.

Criticism.

The general character of design No. 1, by A. E. Watson, was fairly good, though somewhat sombre and heavy in character. It is nevertheless interesting. The mass is fairly good, though the lower story is badly lit. The centre motive is rather weak and the angle treatment too massive. The details are good, and the presentation is good, though the rendering is rather hard.

The general character of design No. 2, by D. E. Kertland, is very good, and expresses the museum character. In mass it is very good, simple, stony and well composed, with the exception of the doubtful general form of the building, which does not carry out the intention of the programme. The details are good and of a simple character, and the presentation is very good.

A BOUNDARY MONUMENT ON A BRIDGE.

The third competition illustrated in this article provided for a monument indicating a demarkation between two states, to be built on the bridge's centre pier, in the middle of a small river. The monument was to be set to one side of the road on an extension of the pier, and to be provided with tablets for suitable inscriptions. The bridge itself was to be composed of a series of low arches, with the roadbed 16 feet above the water. Plan and section ⅛th inch to the foot, and elevation ¼ inch to the foot, were required.

Criticism.

Design No. 1, by Mr. W. L. Somerville, which received second mention, in general character, is fairly good. The mass is fair, but the span of the arches is too long and low. The centre pylon lacks interest, but the side approaches are good. Both detail and presentation are good as well.

Design No. 2, by A. N. Martin, which also received second mention, in general character is fair, the round type of monument being less suggestive of a boundary mark than the pylon type. The water approach is good and well treated. In mass it is fairly good, with the exception of the central motive, which is not well married to the lower base; detail is good; presentation only fair —the rendering being rather hard, and the trees in the background too wooden.

ANNUAL DINNER OF THE BEAUX ARTS CLUB OF TORONTO.

The annual banquet of The Beaux Arts Club of Toronto, in honor of its *patron,* Mr. John M. Lyle, was held at the St. Charles Hotel on February 8. About twenty-five men were present to enjoy the interesting speeches on various architectural subjects, and the numerous well rendered songs. The toast to the *patron* was proposed by D. E. Kertland. "The Profession" was proposed by F. Carney, and responded to by James Govan. Mr. Lyle gave a very interesting and instructive speech on present-day architectural conditions in Canada and the United States.

During the evening, Mr. A. E. Watson, secretary of the club, presented Mr. Lyle with a solid silver cigarette case, as a slight token of appreciation of his labors for the higher education of the students of architecture in Toronto.

The evening passed with unrestrained jollity, and the midnight hour had tolled before the guests made their departure. This, the first banquet of the *atelier,* terminated with much *eclat,* leaving a lasting impression on those *atelonians* who were present, and a singleness of mind, propitious to the greater development of the *atelier,* and the teaching of the art of architecture.

COST OF THE GREAT PYRAMID. ∴ ∴

A PAINSTAKING COMPILER has written a paper, says the SLATE TRADE GAZETTE which gives the estimated cost of producing the Great Pyramid of Cheops. The author asumes that the material should be equally as good as that of the original, and that all the chambers and pasages should be reproduced. The length of the sides of the Pyramid are at present 746 ft., the height 454ft., and the area of the base 12¾ acres. To build it there would be required: 3,313,000 cubic yards of coarse limestone as backing stone, 140,000,000 cubic yards of fine limestone as facing stone, and 2,000 cubic yards of polished facing granite. The total cost of the above would be at least &£7,200,000 and the labor required would be 24,000,000 days' work, which is equivalent to the work of 40,000 men for a period of two years. Assuming that the labor required to re-produce Egypt's wonderful Pyramid would cost no more than an average of 6s. per day for each workman, this item would reach a total for the two years of £7,200,000, which would take the total for material and labor £14,400,000. To this figure must be added at least £600,000 for transportation and smaller items, and, practically, wherever built, the cost of a suitable foundation would also have to be considered. The Pyramid of Cheops stands on a foundation of solid rock 120 ft. deep, and if a foundation this depth were built, an additional 2,600,000 cubic yards of material would have to be used, bringing the total cost of the reproduction up to £20,000,000. The Pyramid of Cheops consumed the labor of 100,000 men for thirty years, which is about 900,000,000 days' work.

PROFESSIONAL STANDING OF THE ARCHITECT.—A United States Contemporary Makes a Strong Plea for Recognition of Architecture as a Profession by National Government.—Legislation Necessary to Place Architect in Proper Relation to His Client.

THERE CAN BE NO DOUBT that a more stable pecuniary relation between an architect and his clients, says the Architectural Record, is of signal importance to the building public, as well as to the profession. Neither can one doubt that the basis of remuneration upon which an architect renders his services is of equal account to the buildings he creates. But of greater moment to the successful prosecution of building operations is the professional standing which the architect has with his clients. And it will hardly be maintained by the most enthusiastic supporters of the architectural profession that this standing in America is anywhere near as high as it should be. There are, to-day, in this country, engaged in designing buildings, more individuals than ever who have a right to call themselves architects, that is, who have received training in an architectural school or in an office under the direction of a competent architect. And it may be added that the standard of requirements for architects has been raised fully as much as for the practice of medicine or law. While the standing of the doctors and lawyers has, in consequence, experienced a decided turn for the better, the architect has not been so favored, in spite of his more thorough preparation and the greater demands which have been made upon his ingenuity and talents.

The difficulty with which the architectural profession has always had and still has to contend is the possibility of extensive quackery and the popularity of ready-made methods which are alleged to be cheaper and more direct than the real services. The major part of the vast amount of building done annually in this country is, consequently, still carried on without its assistance—on the assumption that architectural services are merely a frill which increase the cost of building and are well enough for anyone who can afford to make an investment yielding no return. This is, of course, a great fallacy, as an architect has no more to do with increasing the expense of building than he has with the cheapening of it. That is not what he aims to accomplish. His object is rather to ascertain accurately his client's needs, and with the money put at his command, to secure his client the best value for his money. In securing the client his money's worth many things are involved: he must be thoroughly acquainted with the purpose which the building is to serve, and he must possess the ingenuity to so dispose the various parts as to most effectively and economically serve this purpose. Then, in addition to regarding his building strictly from the standpoint of utility, he must work with a trained artist's instinct of producing comeliness and harmony beween its many and diverse elements. His motto is to produce the most with what is available, whether the subject be space, efficiency or beauty. His chief concern is always of utility, even as regards the production of effect which is apt to be considered outside the province of the useful. The effectiveness of appearance possessed by a building as part and parcel of its value is second only to its rental income.

It is only recently that American architects have been allowed to demonstrate the use of architectural services in such important works of utility as our great stone and steel bridges, though, it must be admitted that the architects have done more to retard their professional standing by their tacit acquiescence in conditions than have outsiders by opposing their progress. The American architect has not succeeded in arousing the curiosity of a large part of those who might be his prospective clients. This he can hope to do only by having it perfectly understood what he stands for. The insinuation ascribed to Speaker Cannon, of U.S. Congress, a few years ago, on the subject of the architect's professional standing, still measures the extent of popular knowledge of what that profesion stands for.

If there is any profession which depends more than another for its efficiency upon its standing, it is that of the architect whose function requires his employer's complete confidence. The architect of a building must of necessity set himself up as the court of final resort on all matters in which the owner's interests are involved and his decisions must be consistent at the same time with his standing among his professional colleagues. Such a course he cannot sail successfully without his employer's entire assent, and failing in this, his position becomes one of vacillation towards him making efficient creative services impossible. Moreover, his direction of the contractors becomes feeble, and they are obliged to and do have recourse to the owner to settle their points of difficulty in the prosecution of their work. Of course, an architect who permits himself to be placed in such an awkward position is to be pitied, but unless he speedily changes his course deserves the contempt with which he is is sure to be treated by his colleagues, as well as by future clients.

One of the most frequent causes that help an architect to lose his professional standing with his clients is the cutting of his fees. We do not believe, however, that in every case where an architect agrees to accept a commission at a cut rate, such a concession necessarily implies a loss of professional standing with the owner. If it results so, one cannot but impute ulterior motives, to use no harsher phrase, to those architects who indulge in the practice. A recent communication from an architect in good standing cites circumstances in which it would be justifiable to cut the rate without doing an injustice to the profession or in any way neglecting his duties towards the man who employs him. He says, in part: "Among the 'special cases' referred to above, where I believe it may be allowable for an architect to reduce the rate of his commission and still receive adequate compensation for his services, is in the event of his receiving commissions to design a number of similar types of buildings in one locality, where the cost to the architect of superintendence, and of constructional details is obviously lessened. Also upon the receipt of the first commission for a type of building wholly different from the kind with which the architect has been familiar, it would seem to be his privilege to accept from the owner a lower commission than the expert would be entitled to charge and to receive. Again, in 'hard times,' and when one's necessary income may be seriously threatened from lack of business, a lower rate must often be accepted from sheer necessity." The last of these reasons is the one most frequently given by architects for rate-cutting, and where rate-cutting comes from this cause it is not infrequently accompanied by a loss of professional standing, making it exceedingly difficult for him to recover in another case the prestige which he has thereby lost. On the whole it is difficult to make an owner believe that his architect's services have more than the lowest value which he places on them, although it may, as our correspondent points out, be maintained with absolute honesty that the opposite is true.

It sometimes occurs that architects lose standing with clients from another cause. A client may possess an excellent sense of business values, better than his architect in fact. In such a case the architect's position is apt to be extremely difficult, regardless of his technical and practical knowledge of building affairs, and the more difficult in proportion to his high standing in the profession. The higher he is rated as a professional man, the more will be expected of him by his client in those matters of business detail which are inseparable from the complexity of present-day building operations. His ability as a practical designer and experienced builder can secure him no commutation of sentence if he fails to measure up to the business standards of such a client. Architects are realizing, more and more, that if they would improve their relations, pecuniary and professional, with their clients, they must lay in an always-ready store of commercial knowledge which is to the layman the most comprehensible evidence of an architect's fitness.

On the other side, it may be said that in order to allow an architect to render the most efficient services on which his fee should always be based, the client must be willing to meet him on the same common-sense basis on which he meets members of other learned professions. He must be willing to believe that just as the prescription which a doctor of medicine writes for him is only the result of his deliberations of the case, so also, are drawings, the evidences of work which the architect produces for the guidance of the contractor who combines the various materials and realizes the architect's intentions. The learned professions are alike in that whosoever would avail himself of their services must have faith in them, for there is no tangible guarantee beforehand of exactly what is to be produced. To the purchaser of professional services the only guarantee in any case lies in the record of the profession rendering them. An expert can, of course, produce concrete evidences of his fitness to perform the sort of services required by exhibiting the results of similar services rendered for others in the past. An architect is particularly fortunate in this respect, for he can always refer prospective clients to the buildings he has designed. But this advantage carries with it a notable disadvantage, for it requires, in the one who is so referred, the ability to appraise the evidence of fitness at its proper valuation, implying a degree of well-founded popular knowledge not at present existent. The possession of such knowledge means the ability to discriminate, in the case of the architect, between good building and the inferior article; it implies the ability to select the most competent architect to design a given class of structure which results show conclusively to be an unwarranted assumption. For the present, therefore, the architect cannot hope for much reward from the evidences of merit to which he can point in his buildings, as there is, at present, a very limited class capable of appreciating such merit. His greatest hope lies in his ability to arouse a livelier general interest in building. The sooner he can advance his position to the point at which his public will compare his work with that of his competitors who are engaged in designing similar buildings, the better it will be for the standing of the entire architectural profession and the sooner will spring up a public opinion, insecurely founded at first, perhaps, but an opinion, at any rate, instead of the placid indifference to architects and their work which now exists.

It is not at all necessary or even desirable that public notice should so much be directed to architecture as an art. There is enough useful every-day information contained in building and buildings without bringing into play the debatable questions of beauty and style the appreciation of which comes only after the most prolonged interest in and association with the best architecture that has been produced. There is an every-day side to architecture which brings into action, in some way, almost every activity of the day, and is, in fact, one of the truest records of our progress. Arouse that interest in our buildings and a truer and brighter light will, in time, be thrown upon the more serious aspects of architecture and upon those who create it.

While architects, as a class, have been very slow in putting forth their best efforts to stimulate such an interest in their work, another influence has been at work with a far less competent direction calculated to accomplish such an end. The method employed has been the publication during the past five years of a mass of photographs of buildings, especially of the less expensive suburban and country house type, in connection with glowing descriptions as to alleged style, construction and cost. Such information does not inform. On the contrary, it misleads the layman because he is not in position to test the accuracy of the statements which he is asked to take for granted. And it is not intended by this method to instruct the reader and make him think, but merely to attract his eye superficially, without giving him any real insight into an architect's work.

A source from which the layman, in limited numbers, has derived some measure of architectural appreciation, is foreign travel. Travel, no doubt, affords a cultural effect not to be despised, but its value to create for the layman the basis of an architectural judgment may be questioned. It probably does produce superficial likes and dislikes of buildings, but of a kind resulting in little material help to the traveller, unless directed by one who is professionally interested in the subject. As a rule, the traveler's mind, though more receptive, when he reaches home than when he left, is more astray than ever concerning the architect and his profession.

To improve the architect's standing, professionally, two very important steps are essential: government recognition of architecture as a profession, not merely recognition by several of the States individually; and a uniform system in the different States of the most rigid requirements for qualification to practice it. The first of these steps is, of course, the more important—official recognition by the national government of the fact that architecture is a profession which it is essential to place and keep on as high a level as medicine, and the law is sufficient notice to the public that an architect's services are valuable and that he is not to be trifled with in their discharge. Such recognition, backed up by proper legislation, would speedily eliminate from the field those who are merely quacks, and this would at once impose upon those properly qualified greatly increased responsibilities. Until these two very important steps are accomplished, the architect's standing will depend very largely upon the influence which he is able to exert by his personality upon his individual clients. The building public will continue to be incompetent to discriminate between good and bad architectural services, and its interest in the subject will be no keener until the architect is officially held up to its view and stamped with the seal of the government.

ST. ANDREW'S RAPIDS DAM.—Successful Movable Structure Built Across Red River to Increase Navigable Distance of Stream.—First Structure of Its Kind on Western Hemisphere.—Only Two Other Similarly Operated Dams in the World.—Its Construction and Engineering Features.

By H. P. BORDEN,* A.M. Can. Soc. C.E.

THE ST. ANDREWS RAPIDS are situated on the Red River, which flows north between the States of Dakota and Minnesota in the United States, through the Province of Manitoba in Canada, past the city of Winnipeg, finally emptying into Lake Winnipeg. In the summer months the Red River is a shallow river, having little value as a waterway, except for pleasure boats, and then, owing to rapids and other obstructions, only for short distances. For about twenty miles of its length, or from the mouth of the river to West Selkirk, a town about half-way between Winnipeg and the lake and directly below the St. Andrews Rapids, the river is navigable for the lake steamers during the season of low water. During the early spring, however, the river presents altogether a different aspect. The source of the river, springing as it does in the warmer provinces to the south, begins to receive the melted snow and rains of early spring at a time when the northern end of the river is still securely bound by ice. The result is that the river is filled to the top of its banks with a body of water, which if held too long by the ice barriers at its mouth, will overflow its banks and the surrounding low-lying country. What is known as the "Red River flood" of 1852, when there was eight feet of water in the streets of what is now the City of Winnipeg, is evidence of what may be expected under extraordinary conditions.

Lake Winnipeg is a very large body of water, having an area of between 8,000 and 9,000 square miles, and a shore line of nearly 800 miles. There are some thirty steamers plying on the Lake at the present time, and as their cargoes must in all cases be finally delivered at Winnipeg, it is evident that this business is very seriously interrupted by the shallow water in the river.

When the Department of Public Works at Ottawa took up the matter of providing a navigable river for the entire season from Lake Winnipeg, direct to the city of Winnipeg, they found that the characteristics of the river were such that all ordinary methods of overcoming similar difficulties would be entirely inadequate in view of the local conditions above referred to.

In order to give the depth of water required for safe navigation, the level of the river had to be raised about six feet at Winnipeg. This meant raising the level some 20 feet at the St. Andrews Rapids. The usual procedure under ordinary circumstances would be to erect a dam at this point, with a short section of canal and a lock at the side.

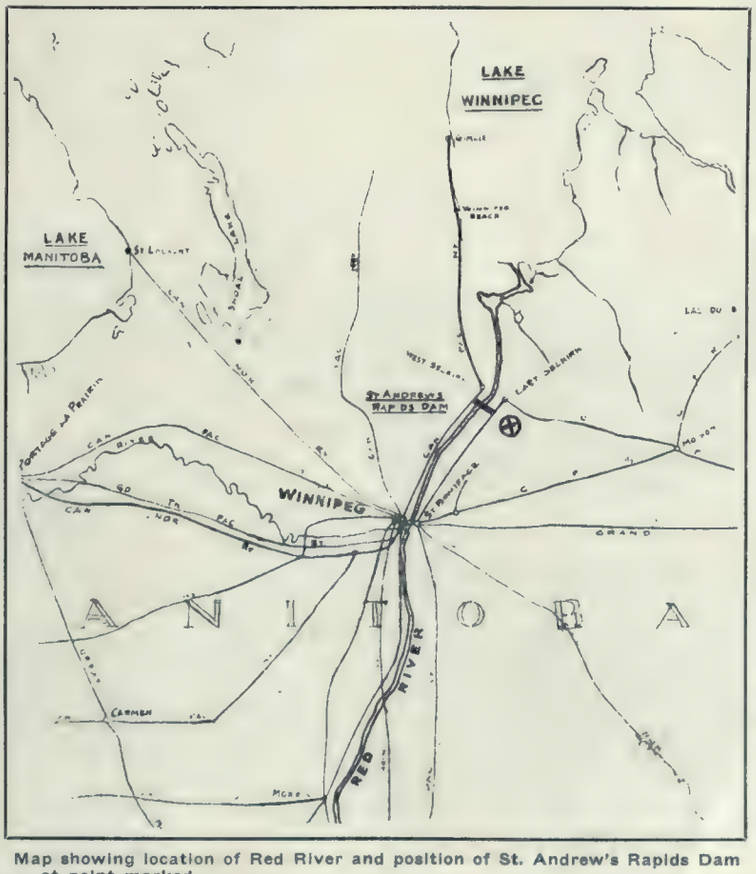
Under the conditions prevailing, however, a permanent obstruction in the river reducing the effective discharge area to any appreciable extent would be entirely out of the question. It was evident that the only way of raising the level of the water was by means of a dam of some kind that could be entirely removed during the period of flood. To design such a structure with stability sufficient to retain a head of water 21 feet in height and some 800 feet in length and yet be of such a nature that it could be put in place in the spring and removed in the fall without undue labor, cost, or loss of time was the problem that confronted the Government, and it is the solution of this problem that is just being worked out at the present time.

This dam is of the type known as a "Camere curtain dam," and is the first to be constructed on either of the American continents. While this type of dam has been more or less familiar to engineers for some years, yet there are only two in operation in the world; both having been constructed by the French Government on the river Seine in France. These dams have been in active operation for some twenty years and have given perfect satisfaction in every respect.

GENERAL DESCRIPTION.

Plans Nos. 1 and 2 give a good idea of the dimensions, construction details and manner of operation. The river at this point is about 800 feet across. Heavy concrete piers have been placed in the bed of the river spaced 133 feet 8 inches centre to centre. Running between those piers and embodied with them is a heavy concrete submerged dam, extending 7 feet 6 inches above extreme low water, its top providing a seat for the castings carrying the foot of the curtain frame girders.

The supporting frame work of the dam consists of a series of steel truss bridges resting on these piers. Six of these bridges are composed of three heavy trusses, while the seventh span at the extreme east end is composed of two trusses only. Spans 1 to 6 inclusive, form the working portion of the structure, being over the water and the dam proper. Span 7 forms a



Map showing location of Red River and position of St. Andrew's Rapids Dam at point marked.

*Assistant Engineer, Board of Engineers, Quebec Bridge.

Progress view, St. Andrew's Rapids Dam, showing the stage to which the work had advanced in April, 1909. H. E. Vautelet, Consulting Engineer.

General view of St. Andrew's Rapids Dam, showing four sections of the curtain frames in place. H. E. Vautelet, Consulting Engineer.

part of the shore approach and is used as a means of communicating with the tracks underneath leading to the power house, machine and storage shops. The floor between the bottom chords of the two upstream trusses is known as the working floor and contains the machinery for handling the curtain frames and tracks and trucks for carrying the curtains from one point to another as well as tracks for the operating machines themselves. The roof or floor between the upper chords of the same trusses, is of solid reinforced concrete construction, so designed, with the idea in view that at some future date it may be used as a highway bridge should the roads be extended up to this point. No transverse bracing is used between these trusses, thus allowing an unobstructed runway for the electric cranes, hoists and tracks used for manipulating the curtains, frames, etc., suspended below.

The space between the two trusses on the downstream side is thoroughly braced in all directions. The bracing between the lower chords consists of a heavy truss taking the horizontal reaction from the upper end of the curtain frames. This reaction is also distributed, by means of horizontal shoes, to a portion of the pier which extends up beyond the level of that upon which the trusses rest. The floor between the bottom chords is known as the main floor and has a track running the whole length, which can be used in the transportation of any part of the mechanism at this point should repairs or the replacing of same be found necessary.

The normal position of the dam during the summer months is shown by the end elevation on plan No. 1. Each truss span supports 46 curtain frames and 15 sets of curtains. The frames are arranged in groups of twos and fours firmly braced together, enabling each group to act as a unit. Their upper end is attached to the main floor of the span by means of a hinge, allowing them to swing in a vertical plane. Their lower end rests against a casting imbedded in the top of the submerged dam. The curtain is unrolled against the upstream face of the frames and is held in place by two chains, one on either side attached to a hook on the frames. The position of these hooks can be adjusted by means of a nut, so that the bottom of the curtain can be made to rest exactly in its proper position.

At the end of the season of navigation, and before the ice forms, both curtains and frames must be removed. The first step is to lower the level of the water, which must be done gradually, since the sudden loosing of a body of water with a head of 15 or 20 feet might have disastrous results. The lowering of the water may be accomplished in either of two ways. First, by entirely rolling up an occasional curtain and allowing the water to escape through these openings, or, second, by rolling up all the curtains a short distance, making the flow uniform for the whole width of the dam. This latter method is preferable, as an extremely swift overflow is prevented at any one point, thus minimizing the chances of scour.

After the water has been lowered to the required elevation, the work of rolling the curtains can be proceeded with. This work is done by means of the machine working on the platform attached to the downstream face of the curtain frames. There are three of these machines, each doing the work for two spans.

In the act of rolling there is an upward motion of the chain marked "A" and a downward motion of chain marked "B," the speed of chain "B" being one-quarter that of "A." In some of the first designs experimented with in France an upward motion only was given to the chain, but it was found that the curtain could not be trusted to roll regularly, very often "bunching," thus causing considerable trouble and loss of time. By giving the chains this relative speed, however, it is found that all trouble of this nature is eliminated.

When the curtain has been entirely rolled, a short lever on the face of the frame is lowered. A lug on this lever passes through one of the links of the chain and engages the pulley wheel. The lever is then held in this position by a stay bolt, securely fixing the chain in the position desired. The chains passing over both pulleys are caught in this manner, thereby permitting the strain from the hoisting machine to be relieved and chains to be disengaged therefrom. The loose end of the chains is then led into a chain box built in between two of the frames and directly under the pulleys. The machine is then moved ahead on the tracks on which it rests, the section of this track and floor is folded up against and attached to the frame by means of a hook and link, and one section of the frames are ready to hoist.

The first step in lifting the frames is to lower chain "C" straight down some 15 or 20 feet. The chain passes through a looped strap containing a block and terminating in a hook at the end of chain "D." The other end of "D" after passing through a pulley block "P" is fastened to the floor. After chain "C" has been lowered, chain "D" is unhooked and allowed to drop, thus causing the block on the end of the chain "D" to engage chain "C," and by its own weight draw it over towards the curtain frames. Block "P," and with it chain "D," is then lifted vertically by means of the overhead travelling crane, thus giving chain "C" an upward and lateral motion until finally it is suspended directly below block "P" and in a position to be hooked to chain "E" attached to the frames. Experiment will determine the proper initial length that chain "C" should be lowered, in order that its end shall finally be in the correct position for making this connection. The frame can now be swung by means of the hoisting machine on the working floor until it finally reaches the horizontal position indicated by the dotted lines. The chain "E" is allowed to pass through a forked forging attached to the framework of the floor, and by means of a safety clutch is held securely in place. Chain "C" can then be disconnected and the machine moved ahead to the next group of frames. As the chain "C" is raised, chain "D" is slackened, and when the curtain frame reaches its final position, the chain is again hooked up in the position in which it was originally, as shown on plan No. 1. The front elevation on plan No. 1 shows various stages of the operation of lifting the curtain and the frames. If it is desired to inspect and repair the curtains, as will probably be necessary at the end of every season, it is picked up by an overhead hand crane, lifted through an opening in the floor and placed on a truck at the side and carried to another opening in the floor of span No. 7, through which it is lowered to a tramway on the ground, communicating with the repair shops.

The operation is repeated for the entire length of the span. When the curtain on the last set of frames next the pier has been rolled up, the curtain crane is run ahead through a tunnel in the pier to the next span. In the centre of the pier and at right angles to the tunnel is another short tunnel into which, by means of a turntable on the runway, the curtain cranes can be housed when not in commission. The runway can then be used as a foot bridge by the employees, giving them free and unobstructed passage at this lower level to all parts of the dam, and for its entire length.

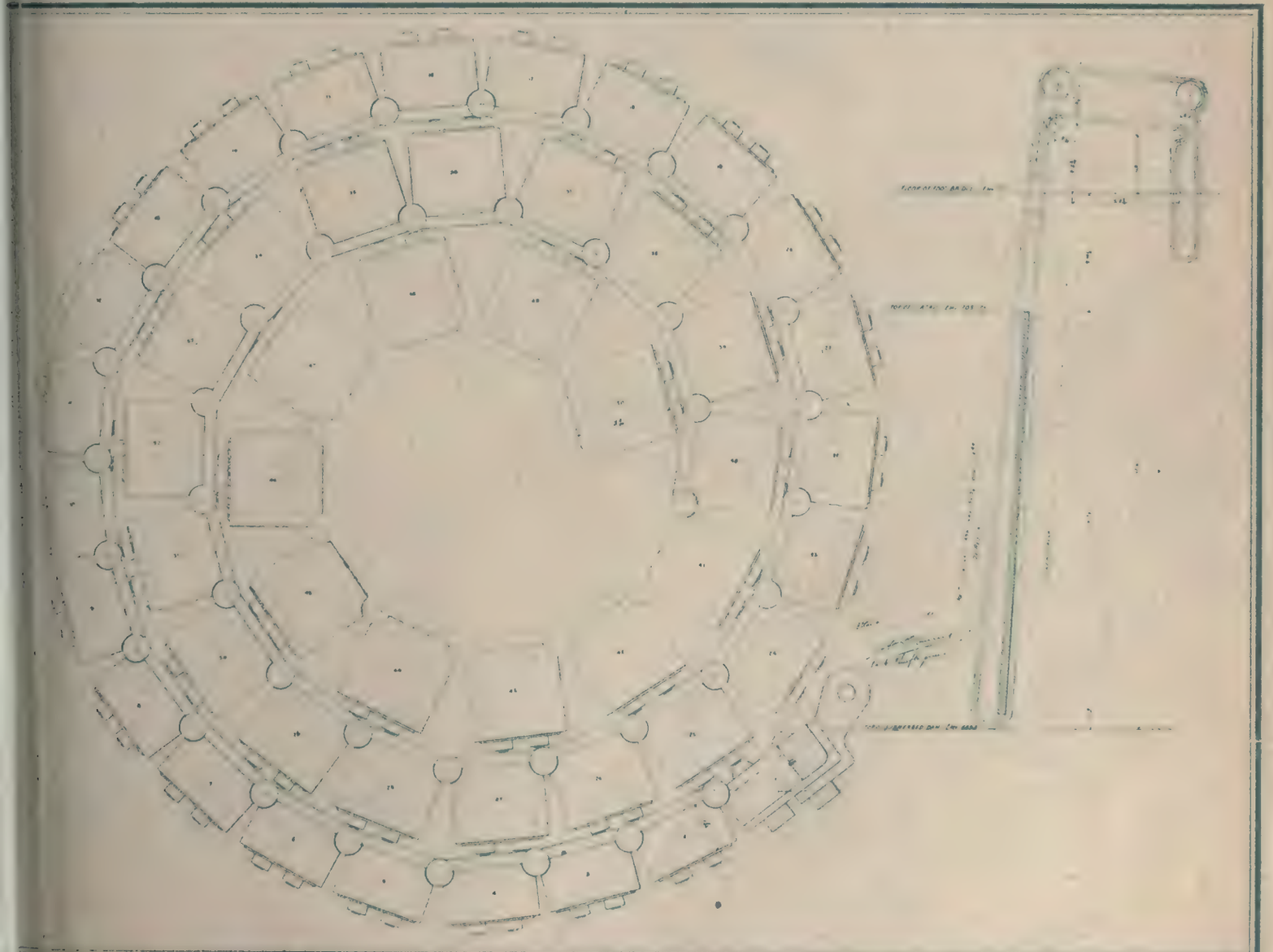
The operation of lowering the frames and curtains in place in the spring is very simple and is quickly performed; being simply the reverse of the operation for raising them.

One might naturally suppose that the loss of water with such a dam would be of a very considerable amount. No difficulty has been found in this respect, however, in actual practice. When the curtains are first lowered there is more or less leakage through the joints, but as these joints are very small, they are soon filled with silt, etc., so that in a short time there is no appreciable waste in this way.

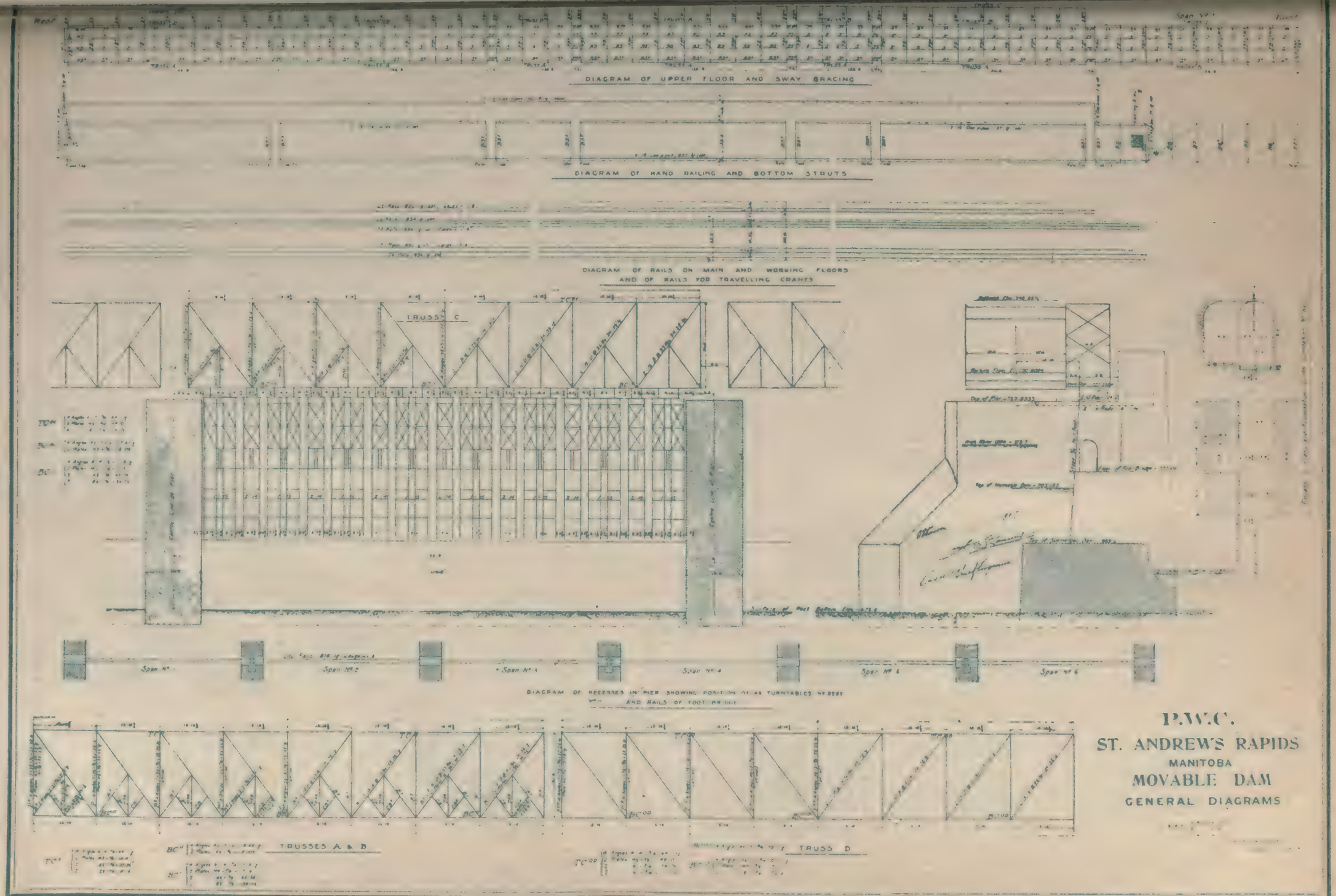
St. Andrew's Rapids Dam. View showing methods of erection, the trusses being assembled on narrow falsework, and then moved laterally into proper position on the piers. H. E. Vautelet, Consulting Engineer.

View of St. Andrew's Rapids Dam, showing the steel superstructure with curtain frames raised, as they will appear during the Winter and early Spring. The lock gates around the west end are shown in the foreground. H. E. Vautelet, Consulting Engineer.

an No. 1. Movable Dam erected at St. Andrew's Rapids, Manitoba, by the Dominion Department of Public Works. H. E. Vautelet, Consulting Engineer.



agram showing curtain rolled up and curtain chain, Movable Dam, St. Andrew's Rapids, Manitoba. H. E. Vautelet, Consulting Engineer.



Plan No. 2. General diagram of St. Andrew's Rapids Movable Dam, erected by the Dominion Department of Public Works. H. E. Vautelet, Consulting Engineer.

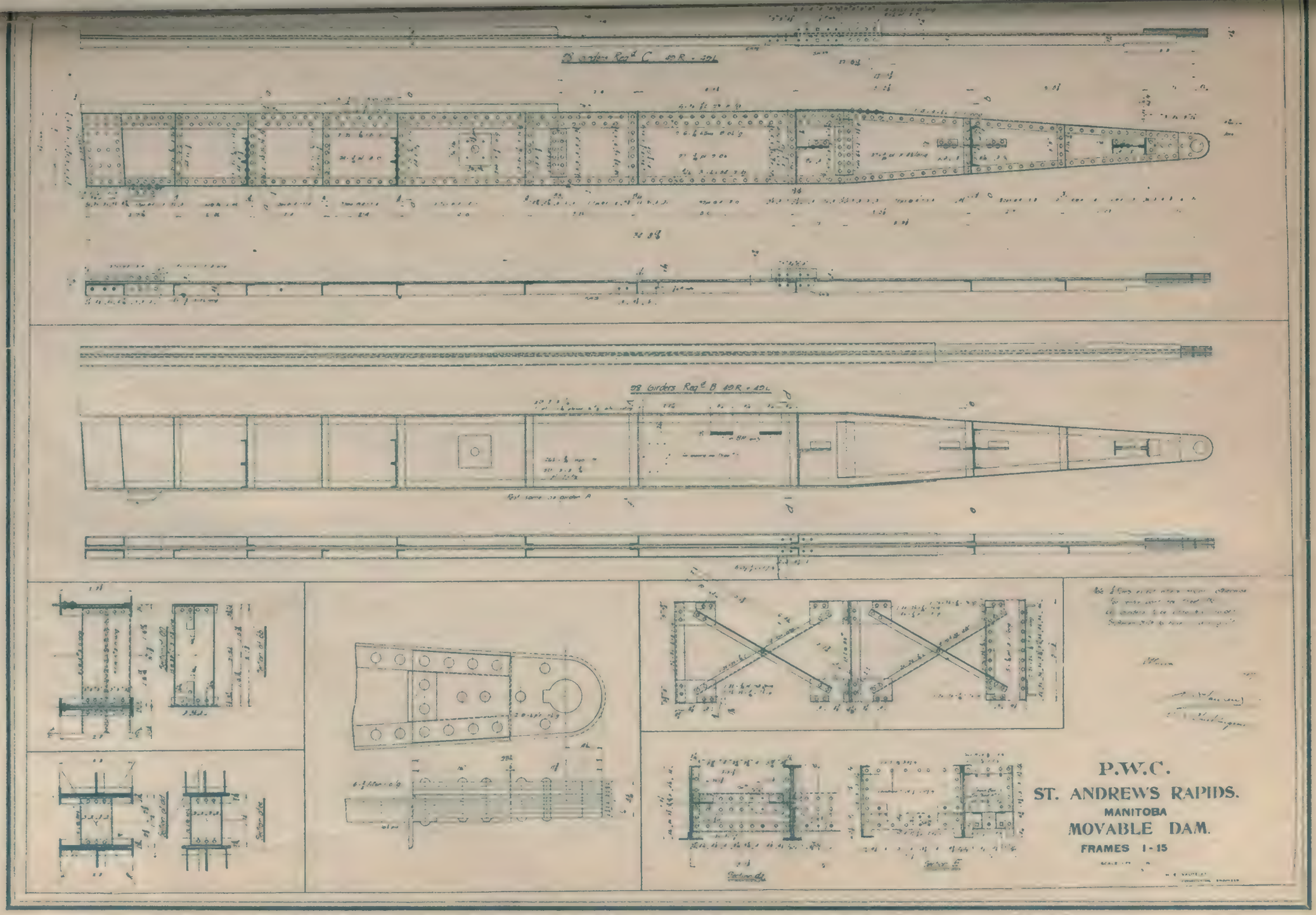


Diagram of Frames 1-15, St. Andrew's Rapids Movable Dam, erected by the Dominion Department of Public Works. H. E. Vautelet, Consulting Engineer.

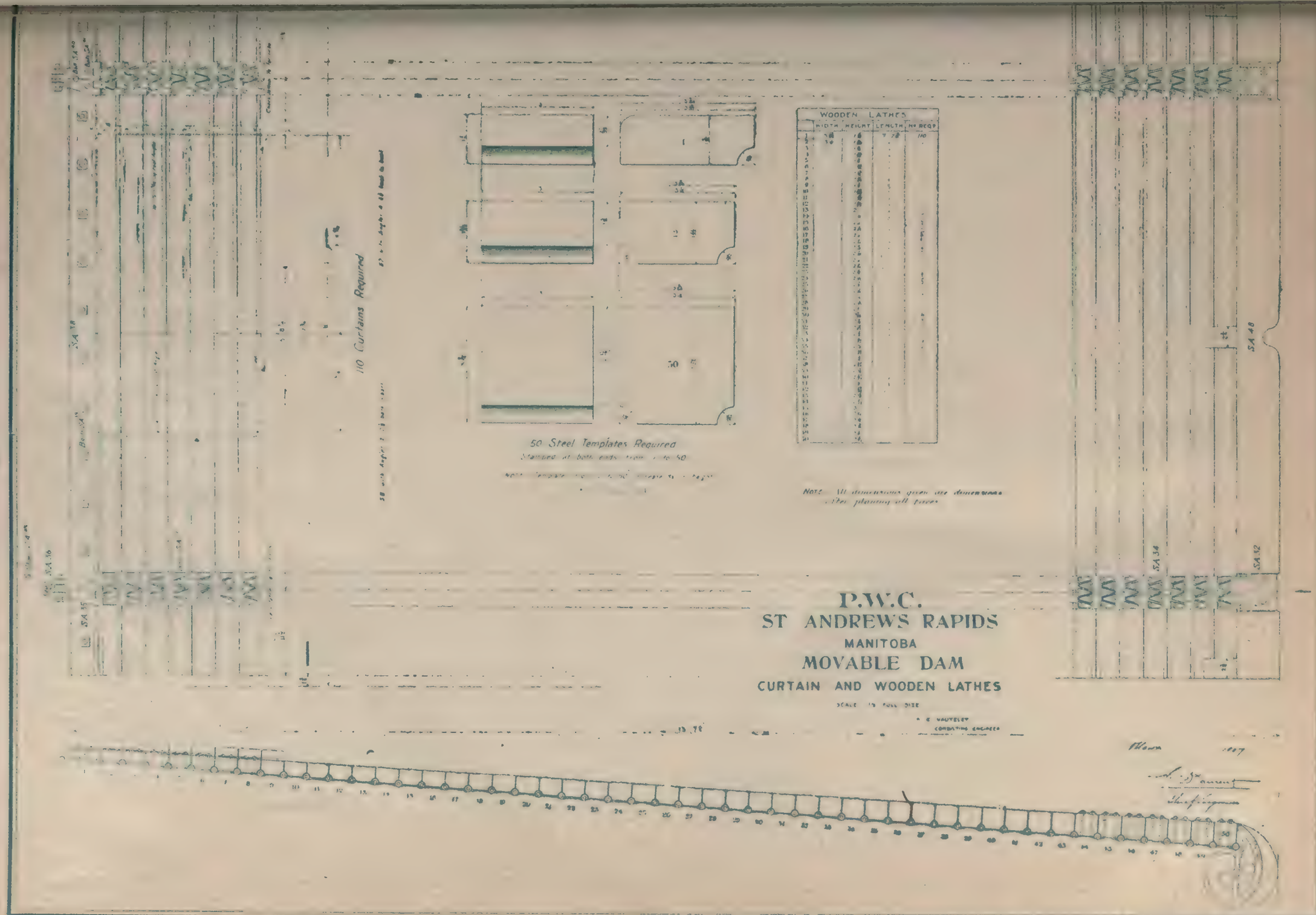
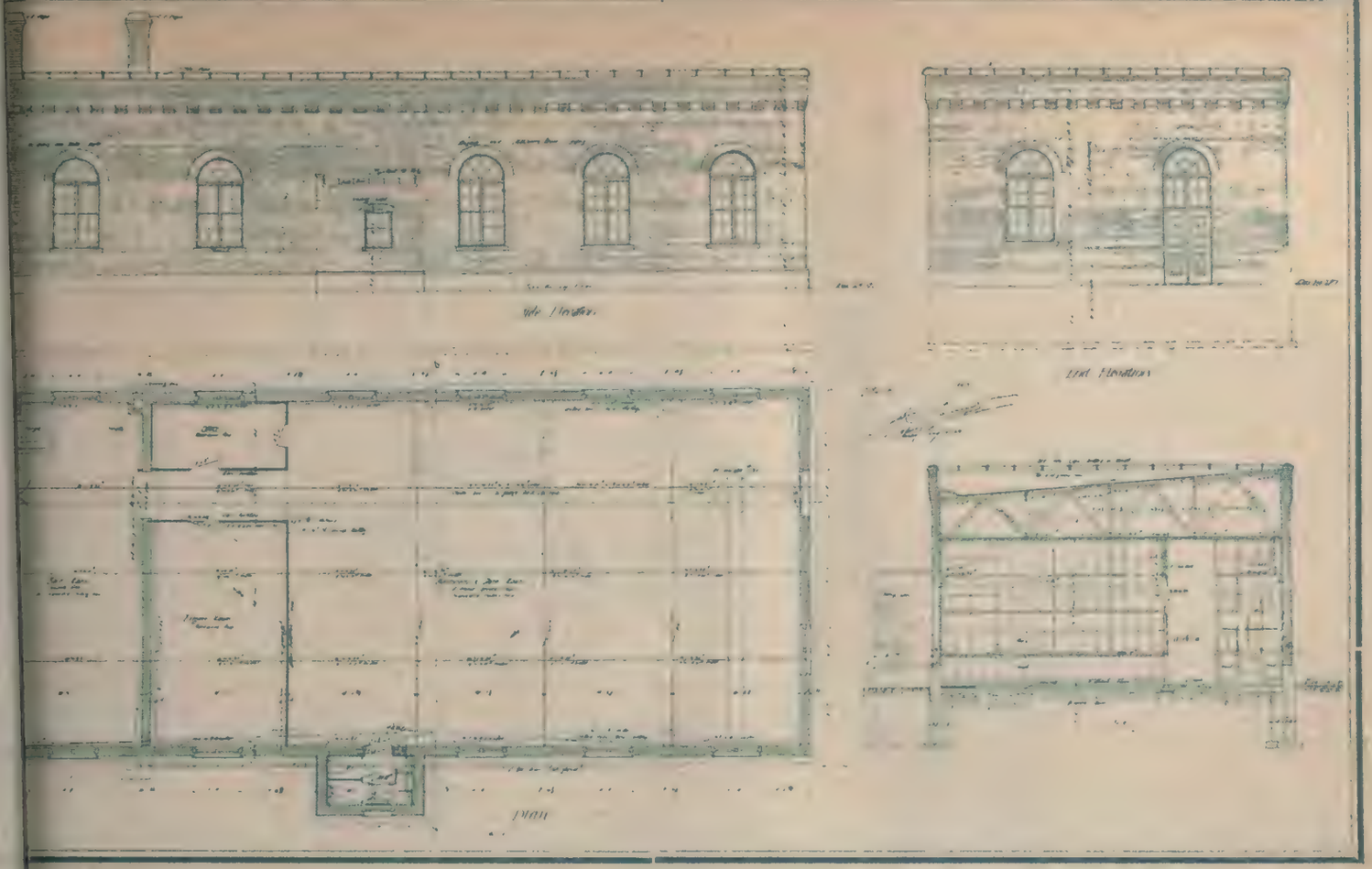


Diagram of Curtain and Wooden Lathes, Movable Dam, St. Andrew's Rapids, Manitoba. H. E. Vautelet, Consulting Engineer.



Elevations and floor plan, Workshop and Storehouse, St. Andrew's Rapids Movable Dam. H. E. Vautelet, Consulting Engineer.

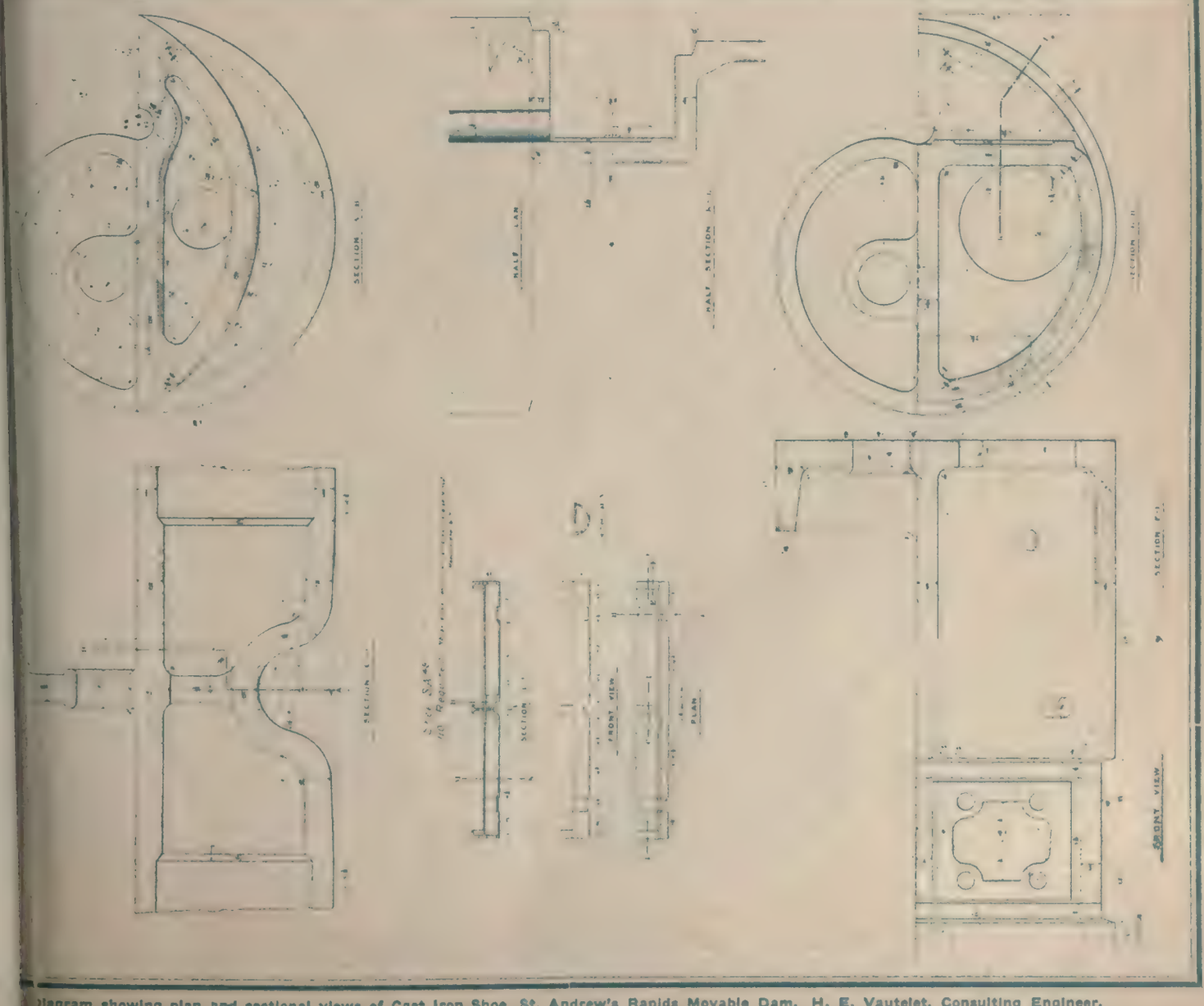
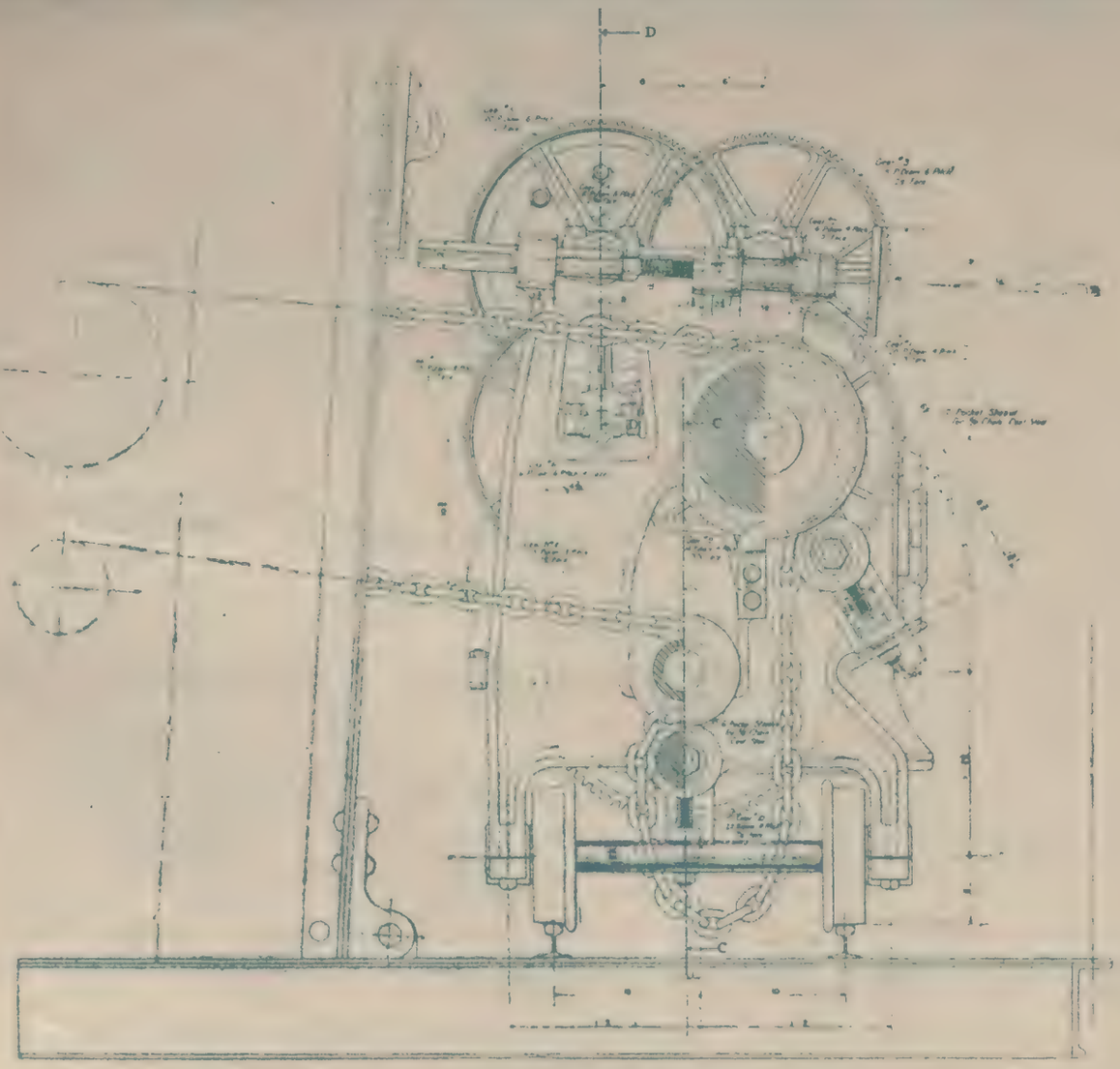


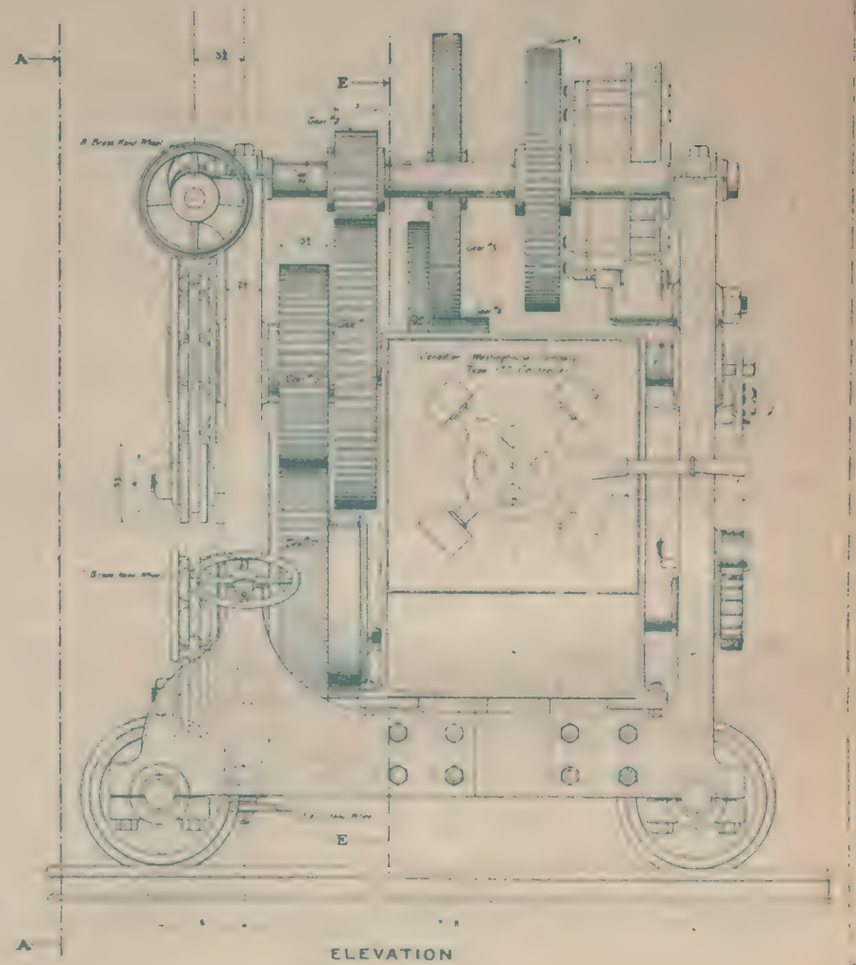
Diagram showing plan and sectional views of Cast Iron Shoe, St. Andrew's Rapids Movable Dam. H. E. Vautelet, Consulting Engineer.



END ELEVATION A · A

Showing Half of Chain Sheaves in Section

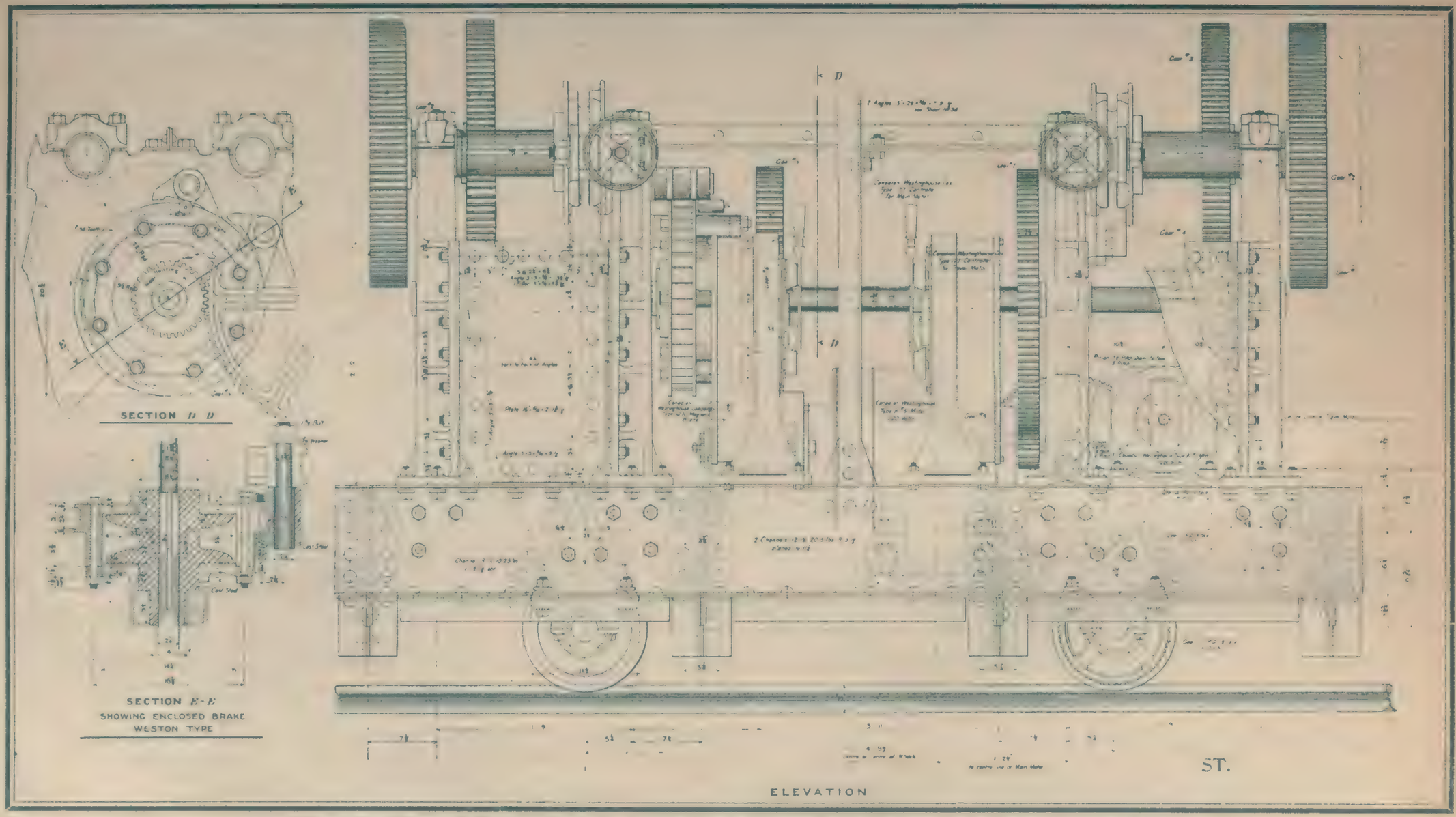
(3 Cranes Required)



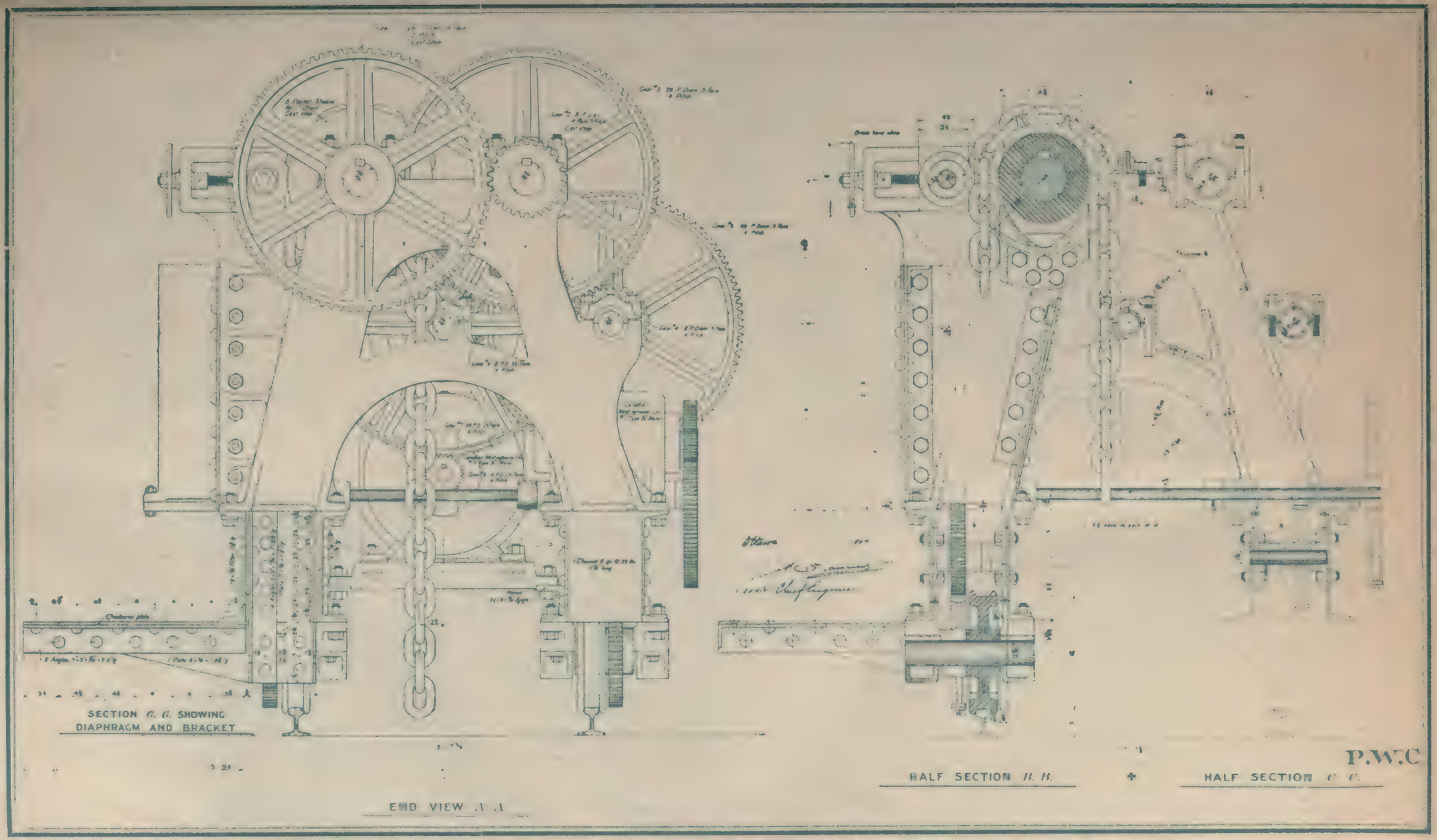
ELEVATION

Looking Upstream

Elevation and East End View of Crane for Curtains, Movable Dam, St. Andrew's Rapids, Manitoba. H. E. Vautelet, Consulting Engineer.



Downstream Elevation of Crane for Frames 1-15, Movable Dam, St. Andrew's Rapids, Manitoba. H. E. Vautelet, Consulting Engineer.



End View and Half Section, Crane for Frames 1-15, Movable Dam, St. Andrew's Rapids, Manitoba. H. E. Vautelet, Consulting Engineer.

DETAILS OF CONSTRUCTION.

Excavation.—The excavation for all masonry work, except foundations of workshop, was continued down to rock. This was encountered practically in the bed of the river. For the submerged dam, however, the rock bottom was trenched for a further depth of 3 feet 6 inches in order to provide against any horizontal movement of the masonry. The work of excavation did not present any

St. Andrew's Rapids Dam. View showing method of erecting girder frames. H. E. Vautelet, Consulting Engineer.

serious difficulties being performed during the summer months when the water was at its lowest stage.

Masonry.—The main piers are 14 feet wide and 55 feet long at the top, and 14 feet by 76 feet at the base, and are generally 50 feet in height. A section of the pier on the down stream side, some 11 feet 6 inches in length, extends up to a further height of 12 feet. This extension, as pointed out above, is intended to take up the horizontal reaction of the upper end of the curtain frames by the trusses. To guard against possible shearing of the concrete wall by the horizontal reaction, steel reinforcing is imbedded in the pier at this point. The reinforcing consists of seven 1½-in. round rods, 15 feet 8 inches long, attached at each end to two 15-in. channels 12 feet long. The upstream face of the pier is provided with an ice-breaker extending some 21 feet beyond the face of the pier proper. For 21 feet the nose has an inclination of 45 deg., its face being curved to a semi-circle with a radius of 7 feet.

The downstream face of the pier is also curved to a radius of 7 feet, and has a vertical batter of 1 in 24.

A tunnel 9 feet high and 4 feet 6 inches wide passes through each pier at an elevation corresponding to that of the platform carrying the curtain cranes. As described above, this crane can be housed in an alcove in the side of this tunnel when the machine is not in use.

The sides of the pier within the working radius of the curtains and frames are so finished that they shall be absolutely plumb and smooth and the pier exactly 14 feet in thickness. This is important in order to prevent either binding of the curtains or leakage around them. The submerged dam is constructed between the main piers, its foot, however, being some 3 feet 6 inches below that of the piers and the general surface of the rock bottom, thus guarding against any possibility of a horizontal movement. The submerged dam is 38 feet wide and 20 feet in extreme height. Castings are imbedded in the top, against which the curtain frames rest, especial care being taken to have them placed so that their alignment will exactly coincide with that of the trusses overhead. It was the original intention to have the top of the dam and one course on the side of the pier faced with granite blocks. In construction, however, the granite was omitted, all faces being finished in concrete. In order to better distribute the shear from the reaction of the lower ends of the curtain frames acting against the castings, 2-in. rods, spaced 4 feet 6 inches centre to centre, are imbedded in the concrete, 2 feet from the top of the dam, with large cast iron washers at either end.

Both the piers and the submerged dam are of concrete masonry throughout. The concrete used was divided into two classes:

First class concrete was composed of one part of cement, two and one-half parts of sand, and five parts of good clean gravel.

Second class concrete was composed of one part of cement, two and one-half parts of sand, and five parts of broken stone. The broken stone was simply specified to be hard and durable and to pass through a ring two inches in diameter. "Displacers" or boulders containing over one

St. Andrew's Rapids Dam, showing the unobstructed working floor between trusses "A" and "B" and the highway floor beams overhead. H. E. Vautelet, Consulting Engineer.

cubic foot could be used in second class concrete, no stone to be closer than six inches to any other stone or any face.

First class concrete was used for the faces of all masonry and extending inward for a depth varying from 1 foot 6 inches to 3 feet, as indicated on the plans. Second class concrete was used in the interior of all piers, walls,

St. Andrew's Rapids Dam. View showing the superstructure completed with one section of the girder frames practically in place. H. E. Vautelet, Consulting Engineer.

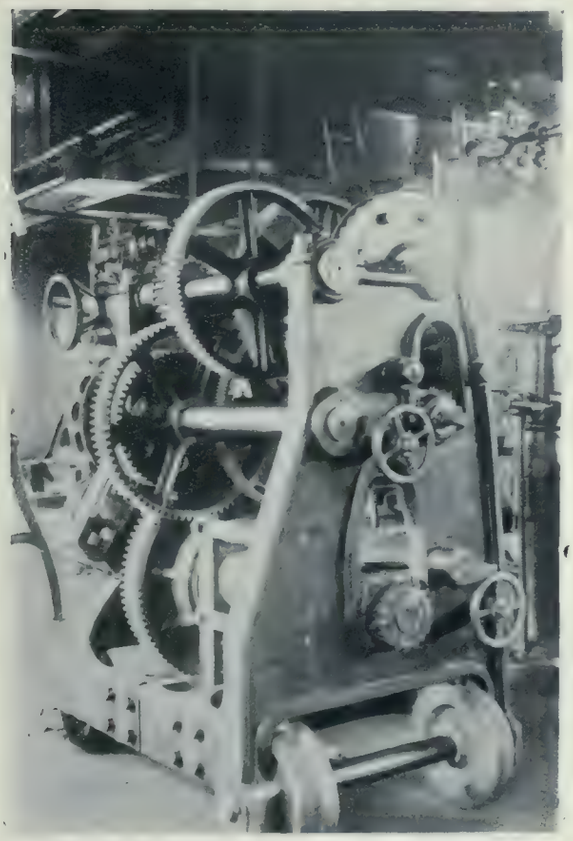
View of Power House, St. Andrew's Rapids Dam, in whi ch the power used for operating the dam is generated. H. E. Vautelet, Consulting Engineer.

etc., or in all places where first class concrete was not specified.

Lock.—The lock and approach channel is situated at the west side of the dam. The lock chamber itself is 215 feet long between hollow quoins 45 feet wide and with walls 34 feet in height above the lower sill. The walls have a total length of 290 feet, including wing walls.

At the upper end the lock is fitted with a pair of gates 28 feet long and 37 feet high from bottom of gate to floor of foot bridge. The lower gates are 28 feet long and 23 feet high from bottom of gate to floor of foot bridge. An extra set of each pair of gates were included in the contract in order to replace those in use at short notice in case of accident.

The lock itself is similar to all other works of this kind and provided with the usual culverts for filling and emptying the chamber, etc., and does not require further discussion. It is constructed entirely of concrete; the bottom being imbedded on solid rock.



St. Andrew's Rapids Dam. Small crane for rolling curtains. H. E. Vautelet, Consulting Engineer.

On the side of the lock provision has been made for a pier upon which a swing bridge can be supported should the dam be used as a highway at a later date.

Trusses.—Spans 1 to 6 inclusive are composed of three trusses 126 feet 8 inches long, and 21 feet deep, centre to centre. The upstream and centre trusses are designed to carry equal loads, and have their main members alike. The downstream trusses for these spans, while of a similar type, are considerably lighter in construction, having much less work to do. Span No. 7 is composed of two trusses of equal length and height to the other spans, but of still lighter construction. The material and layout of these trusses are clearly shown on plan No. 2, rendering it unnecessary to go more fully into details. The steel used is ordinary commercial O.H. medium steel, having an ultimate strength of not less than 58,000 lbs. per square inch and an elastic limit of not less than 33,000 lbs. per square inch.

All brackets and other details of these trusses, to which the working members of the bridge are attached, are put in place with the utmost care, the most rigid inspection being required to prevent any mistakes or careless shop work which might tend to prevent the easy and accurate movement of the parts so necessary for the success of the work.

Highway Floor.—The highway floor is carried on four rows of stringers spaced 7 feet 5 inches centre to centre, these in turn being carried on plate girder floor beams, attached to each post of the truss. The stringers are composed of one 15 inch I-beam at 42 lbs. per foot, and rest on a cast iron shoe attached to the top flange of the floor beam. The floor beam is 36 inches deep, back to back of angles, having each of its flanges composed of two angles 6 inches by 4 inches by ½-in. and a web plate 35½ inches by 5/16 inch. The web is stiffened by vertical angles 3 inches by 3 inches by 5/16 inch, every other one being directly under a stringer. Cross struts consisting of a 12-in. channel at 20½ lbs. separates the stringers over the floor beam and are connected to the ends of both stringers.

The floor itself consists of a series of arches of cinder concrete springing from the bottom flange of the stringers having a thickness of 2½ inches at the crown, the top surface being 3 inches above the top of the stringers. Over this is laid a layer of granite concrete 2 inches thick at the centre of the roadway tapering to nothing at the sides. Over this again is laid the wearing surface consisting of 1½ inches of asphalt. The cinder concrete has a proportion of 1:2½:6, the granite concrete being 1:2½:5.

The steel reinforcing consists of No. 22 four-warp wire cloth, stiffened with 9/16-in. steel rods woven into the cloth at intervals of 9 inches, and the whole placed between the stringers so as to take the form of the arch and act as centreing. The underpart of the arches are plastered with cement mortar so that all parts of the wire and rods are completely covered.

It was required that the floor of the roadway be able to stand the following tests:

1. A distributed load of 600 lbs. per square foot on the whole of a panel between two stringers.

2. A concentrated load of 3,000 lbs. per square foot over any 10 square feet.

3. A concentrated load of 10,000 lbs. on any square foot.

Working Floor.—The working floor is supported on floor beams composed of 24 inches at 80 lbs. I-beams spaced 7 feet 11 inches centre to centre. Two rows of longitudinal struts, composed of 12 channels at 20½ lbs. extend between these floor beams, forming a series of square openings down the centre through which the curtains can be hoisted. The remaining space between these longitudinal struts and the chords is filled with a horizontal cross bracing composed of two angles 3 inches by 3 inches by 5/16 inch to each panel. The floor, with the exception of the centre open space, is covered with steel checkered plate.

Main Floor.—This floor is supported by floor beams composed of 15 inches at 42 lbs. I-beams spaced 7 feet 11 inches centre to centre, alternating with those of the working floor. Two rows of stringers, each composed of one 15-in. channel at 33 lbs. spaced 2 feet 6 inches face to face, extend between the floor beams and carry castings carrying the hinged end of the curtain frames. Stiff horizontal bracing of the Warren type, composed of two angles 3 inches by 3 inches by 7/16 inches, latticed, connect with alternate ends of the floor beams and also the stringers, and transmit to the pier the horizontal reaction of the upper end of the curtain frame as explained above. This floor, unlike the working floor, has no covering.

Curtain Frames.—In studying the layout of the curtain frames it was found that the best results were obtained by arranging these girders in groups of two and four. By this means the ends of two adjacent sets of curtains rest against the outside girders of the larger group, by this means reducing the chance for leakage to a greater

St. Andrew's Rapids Dam. View showing method of assembling and reaming trusses in shop before shipment. H. E. Vautelet, Consulting Engineer.

St. Andrew's Rapids Dam. View showing method of assembling and operating curtains in the shops before shipment. H. E. Vautelet, Consulting Engineer.

extent than if the ends rested on two independent frames. There are, therefore, three different designs of girders, viz., the two in the smaller group of frames, marked "A," the two centre girders in the larger group, marked "B," and the two outside girders in the same group, marked "C."

The girders are 34 ft. 8 3/16 in. long from centre of pin hole at the upper end to the extreme lower end. They are of built-up girder construction, being 2 ft. 3 in. deep, back to back of angles at the lower end; the upper 11 ft. 0 in. tapering to 9 in. The flanges of girder "A" are each composed of 2 angles 3 in. x 3 in. x 3/8 in. for the full length, and one cover plate 7 in. x 7/16 in. x 8½ in. long, starting from the lower end. The web is a solid plate 26½ in. x 5/16 in. (tapering at the top as indicated above). The web is supported by stiffening angles 3½ in. x 3 in. x 3/8 in. with filler plates, spaced at irregular intervals to suit conditions.

Girder "B" is the same as girder "A," with the exception that the flanges are each of 2 angles 3 in. x 3 in. x 5/16 in. and cover plates 7 in. x 7/16 in.

Girder "C" has a somewhat different construction. The downstream flange is composed of one angle only, 4½ in. x 3 in. x ½ in, for the entire length. The flange of the upstream edge is one angle 6 in. x 3½ in. x 3/8 in. with the short leg outstanding, for the parallel portions of the girder, one angle 4 in. x 3 in. x ½ in. being used for the tapered end. For the lower 15 ft. 0 in., however, an extra flange angle 6 in. x 3½ in. x 3/8 in. is used and the web plate allowed to run through 3 in. between these angles. This 15 feet 0 in. length of flange angle is not required, however, as working material, but as a shelf against which the curtain may rest. When the curtains have been rolled up to their proper height this frame can swing to its horizontal position and clear with a comfortable margin the ends of the adjacent curtain.

The girders composing each group of frames are rigidly braced together, with two panels of cross bracing at the top, as well as with six rows of horizontal struts between them.

Curtains.—The curtains are composed of fifty wooden laths 7 ft. 7¾ in. long, 3 in. deep and varying from 1 21/32 in. in thickness for No. 2 to 3 5/32 in. for No. 50, each lath increasing 1/32 in. Lath No. 1 is 1 15-16 in. in thickness, being specially designed to accommodate the casting carrying the links and attachments for the supporting chains. The laths are made of long leaf Southern pine, classified as "clear timber," thoroughly seasoned and the best quality obtainable.

The links connecting the laths are of copper and are designed, cast and machined with the greatest possible care. The copper itself is composed of 88 parts of copper, 10 parts of tin and 2 parts of zinc. A finished link, tested to destruction is required to resist an ultimate strain of 20,000 lbs. per square inch at the point of rupture. The pins used to connect the links are phosphor bronze with an ultimate tensile strength of 140,000 lbs. per square inch. A series of assembled links are required to resist without deformation or alteration a tensile strain of 13,000 lbs. per square inch.

The spiral casting at the foot of the curtain is of cast iron and is cast and machined with great care in order to give the correct initial impulse to the curtain when it first starts to roll.

Before leaving the shop every curtain was required to be completely assembled and rolled a number of times to insure its perfect working condition. When suspended at its full length it was required that the upper edge of lath No. 1 and the lower edge of the spherical casting at the foot shall be exactly parallel and when entirely rolled up the ends of the laths at both edges of the curtain shall form an exact plane, shall be parallel to each other and at right angles to the upper edge of the lath No. 1. Unless a curtain could fulfill these requirements it was rejected. Such absolute requirements were necessary, to guarantee that when operated they would work exactly as intended and that there would be no danger of binding with the adjacent curtains.

One hundred and ten complete curtains in all are required for the dam, but to provide for contingencies the contractor was required to furnish twenty extra curtains with fittings complete, over and above the actual number required.

Travelling Cranes.—Four cranes are employed for hoisting the curtain frames. Two large ones with two sets of chain sprocket wheels for lifting the larger frames marked 1-15, and two smaller ones with one sprocket wheel for lifting the frames marked 2-14.

The large crane has the following electric equipment:

One Canadian General Electric type C.Q. 15, 20 H.P., 230 volt motor for operating the lifting machinery.

One C.G.E. type C.O. 2503, 2 H.P. motor, 220 volts, attached to the trucks.

Two C.G.E. controllers, conveniently placed to allow the operator to control the hoisting or travel of the crane with the greatest ease.

The crane is also fitted with a C.G.E. magnetic brake, attached to the hoisting motor.

Power for the motors is delivered by means of an overhead trolley bar and feed wires, leading from the power house.

The smaller girder frame is of the same general design, except that it is capable of lifting one chain only. It is equipped with a C.G.E. type C.O. 2505, 10 H.P. motor, 220 volts for hoisting, and has exactly similar controller and magnetic brake. This crane, however, has no driving motor, since it is comparatively light and can be readily moved by hand.

There are three cranes for handling the curtains, all exactly alike; each crane, as stated above, working two spans.

These cranes are equipped with a C.G.E. type C.O. 2503, 2 H.P. motor, 220 volts, and a C.G.E. controller. Provision is also made so that the lifting can be done by hand by means of a crank which, on account of the comparatively light load, renders it easy of operation. No propelling motors are used, the cranes being light enough to be readily moved by hand.

There are also six travelling overhead cranes; four 4-ton cranes over the working floor of the dam; one 2-ton crane in the repair shops; and one 2-ton crane in the dynamo room.

These cranes are of the ordinary type with I-beam bridge, hand chain drive and spur-geared sprocket chain hoist.

Repair Shop and Engine House.—This building embraces, properly, boiler room, engine room, machinery and store room, and office. It is a one-story brick building 90 feet x 40 feet, and thoroughly equipped for the purposes for which it is intended.

The mechanical equipment called for in the specifications is as follows:

Boiler Room.—One C.G.E. boiler, having 735 square feet of heating surface. One "Champion" forge, with half hood.

Engine Room.—One "Robb-Armstrong" engine, 10 in. side crank, left hand, direct connection with C.G.E. 40 K.W. direct current generator, 250 volts.

One C.G.E. motor generator set; motor 60 H.P. direct current generator 40 K.W. 2,080 volts.

One switchboard with three panels.

One 2-ton I-beam overhead crane as mentioned above.

Repair Shop.—One 2-ton overhead crane, as mentioned above.

One double cross-cut saw and counter shaft, especially designed to cut laths 7 feet 7¾ inches long and at the same operation cut two notches to fit links ⅛-in. deep, 4 11/32 inches wide, and 5 feet 8¾ inches centre to centre.

One No. 3 self feed rip-saw and counter shaft.

One 12-in. four-sided moulder, capable of planing in one operation the four sides and the quarter rounds of the laths of the curtains.

One wood-boring machine for 5/16-in. and ½-in. holes, 3½ inches deep.

One direct current C.G.E. motor of sufficient power to run the above machinery, with magnetic brake.

The machinery in the repair shop is so arranged that there is room left on side track off turntable for three curtain cranes and for skids to carry twenty spare curtains rolled up, one high, and for two curtains laid flat for repairs, allowing room also for working the overhead cranes.

Wire cupboards are also provided for the lath templates, spare tools, etc.

The building is lighted throughout by electricity.

Other than the works called for on the plans, the contractor was required to furnish the following material and equipment:

(1) Six sets of Manilla rope blocks, complete, to lift foot bridge.

(2) Six 15-ton Norton jacks, 9¾ inches high.

(3) All the electric wires and cables, their attachments and connections.

(4) Twelve round poles about 20 feet long to stop water between end curtains and piers.

(5) A telephone system, with seven boxes located as directed.

(6) Seven hundred lineal feet of track, 2½-in. rails, 20-in. gauge, with three switches and one turntable in the shop.

(7) Four platform cars and one coal car.

The work is being constructed by the Department of Public Works, Canada, of which Mr. Eugene D. Lafleur is Chief Engineer, the work, however, being under the direct supervision of Mr. A. St. Laurent, Assistant Deputy Minister of the Department. Mr. H. E. Vautelet was Consulting Engineer for the whole work, and designed all the special machinery, as well as prepared all plans and specifications in connection with the movable part of the dam and service bridge. The field work was in charge of Mr. A. R. Dufresne, Resident Engineer of the Department, who also prepared all the plans for the lock and masonry work, under the direction of Mr. A. St. Laurent. The plans for the lock gates and filling and emptying valves were executed by Mr. S. J. Chapleau. The mill, shop and field inspection was performed by the Canadian Inspection Company of Montreal.

POLYCHROME ARCHITECTURE.—As Viewed from the Standpoint of the Clayworker.—By H. C. Mueller.

POLYCHROME OR "many colored" architecture, should furnish a very interesting topic for the clayworker, for the simple reason that burned clay combines in itself all the necessary requirements for it. Burned clay is, in fact, the only known building material which will under all circumstances and conditions, retain its original color.

While the clayworker can only play a comparatively passive part in the selection of his product for building purposes, being subject to the directions and pleasures of the designer and architect, he may, nevertheless, take an active part by assisting the work in an experimental way, by suggesting color combinations, texture, etc., and by giving information about the limitations and possibilities of his materials.

Architects will, as a rule, be glad to co-operate with craftsmen who take an intelligent interest in their work, as the best results have always been obtained through the co-operation of the designer and conceiver of things and the man who had to do the work.

Polychrome architecture is almost "as old as the hills," and burned clay has played a most conspicuous part in it from the very beginning. The oriental nations with their love of color have given us the grandest examples in this direction, and it is owing to their wonderful material that we are so well acquainted with the classical examples of polychrome architecture.

While the claim has been made that the Greeks used to color and stain their marbles in rich colors, we must be satisfied with the written records, as nearly all traces of such coloring have disappeared, but we can study the original enameled terra cottas, bricks and tile of the Assyrian and Babylonian period without making any allowance for their age, as they look to-day as fresh and brilliant as when they left the potter's kiln, thousands of years ago. Some of these classical examples of the potter's art have been buried in the ground for centuries, some have been exposed to the rays of the sun and the weather, but no attack of the elements has dimmed or marred their beauty.

The Persians, the Arabs, the Moors have all attained a high degree of perfection in their polychrome architecture. The beautiful mosques, tombs and palaces of these nations are admirable in every respect. The detail of the clay work is marvelous and fascinating, and many a traveler who stood before such a building, or walked through its halls, has exclaimed: "Why do we not create something of this character?"

Our period has not been very productive in an artistic sense. We thought, perhaps, a little too much of labor-saving machinery, trying to gain our goal by producing a great quantity of certain staple articles at the minimum of cost. The engineer has held the stage for a long time and the artist was pushed aside.

It is hardly conceivable that this condition will continue very much longer. We find already a strong current in the direction of polychrome architecture, which may also be called the architecture of the painter, while monochrome architecture may be styled the architecture of the sculptor.

Europe, especially Germany, is making great strides in the application of color in buildings, constructed of terra cotta and brick, and lately great government buildings have been built of these materials. In the United States the government and most of the states have erected but few public buildings of other materials than granite and marble, and it seems that the idea prevails that the brick building lacks a certain monumental character. This is folly, as an examination of the wonderful brickwork of the Netherlands especially show.

Some experiments with colored bricks of terra cottas have not been successful, but the failure was, in every case, owing to the ignorance of the builder, who very frequently did not take into consideration that the porosity of some products would largely interfere with the stability of the color. It is positively necessary that the surface of burned clay be made impervious to moisture, especially if used in city houses, where the atmosphere is pregnant with smoke and soot, if colors are to be retained. The glazed or enameled surface will give the desired protection.

It is true that the bright glittering glaze does not produce a desirable effect, but the so-called matt or faience glazes should be acceptable in every respect. They are strong, deep and yet mellow and soft in appearance; they have a most desirable texture and the palette is practically without limits.—CLAY WORKER.

CONSTRUCTION

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Ivan S. Macdonald, Editor and Manager

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Vol. 3 Toronto, April, 1910 No. 5

Current Items

A NEW CITY HALL is being considered in certain official quarters in Victoria. A statement recently made by Mayor Morley, tacitly put the necessity of the erection of such a building before the council. The city has outgrown the accommodations of the present structure, and the matter of erecting a modern municipal building will probably be submitted to the ratepayers within the present year.

* * *

ONE OF THE NOVEL FEATURES included in the splendid array of Japanese exhibits that will be seen this year at the White City, London (Eng.) famous exposition centre, will be an immense model of the entire city of Osaka, the Venice of Japan, which will contain the tiny reproductions of some 300,000 houses and hundreds of bridges, and a model of the beautiful temple in Shiba Park, Tokio.

* * *

A NEW GOVERNMENT HOUSE for the province of Ontario will be built on a site on East Bloor Street, Toronto, which was purchased for $90,000. The property was secured from the Board of Education, which bought the site two yeasr ago for the proposed technical school, but later decided the location to be unsuitable. The old Government House property on King Street will be sold to the Grand Trunk Railway, which it is understood, is buying up considerable land in the neighborhood with a view to carrying out some extensive improvements.

ONE OF THE FAMOUS 3,000 LB. BELLS of the farfamed chimes of Trinity church in New York is being recast for the purpose of improving its tonal quality. The whole apparatus, in fact, s beng overhauled, and a somewhat novel feature s being introduced in the installation of loud and soft pedals. This will admit of a modification in volume that will produce a melody in chime that is exceptionally rare and beautiful.

* * *

AT THE ANNUAL MEETING of the Alberta Association of Architects, recently held, the following were selected as officers for 1910: President, E. C. Hopkins, Edmonton; 1st vice-president, J. A. MacDonald, Lethbridge; 2nd vice-president, F. J. Lawson, Calgary; secretary, H. M. Whiddington, Strathcona; treasurer, C. L. Gibbs, Edmonton; councillors, R. Percy Barnes, James Henderson, H. D. Johnson, R. W. Lines, J. E. Wize, all of Edmonton, and G. Fordyce of Calgary.

* * *

A ONE HUNDRED AND FIFTY TON revolving shipbuilding crane, built in England a short time back, has a foundation conststing of four steel cylinders, one under each leg of the crane tower. In placing the sub-structure the cylinders were sunk by the pneumatic process to depths of 58 and 73 ft., and were then filled with concrete in which plates and long rods were embedded for anchoring the tower legs. Each cylinder was 10½ ft. in diameter, enlarged to 13½ ft. at the base.

* * *

MILL CONSTRUCTION OR BETTER, is now demanded by the city of Vancouver in the erection of all apartment houses over two stories high that have three or more suites on each floor. Although the new regulation has not been fully enacted, Building Inspector Jarrett has decided to enforce it on the ground that the building committee's recommendation in this respect is of such a character as to make its endorsement by the council only a matter of form.

* * *

A NEW BUILDING PRODUCT known as "Kellastone," the invention of Edward F. Kellie of Terra Hante, Indiana, displayed a crushing strength of over 6,000 lbs. to the square inch in a test recently made at the physical laboratory of Purdue University in that State. The material is being used to a considerable extent in Indiana in the construction of houses. It is of plastic composition, milk white in color, and is said to be cheap, durable, sanitary and fireproof.

* * *

THREE ENORMOUS GENERATORS are being built by the Canadian General Electric Company for the Electrical Development Company of Ontario, who are doubling the capacity of their plant at Niagara Falls. These will establish a new world's record as regards size of individual units, being 15,000 horsepower each. Other mammoth generators contracted for are three 12,500 horsepower units for the Ontario Power Company, and two of 10,000 horsepower each for the Western Canada Power Company of Vancouver.

* * *

OZOKERITE IS THE NAME of a waxy substance of different colors, mined in Germany, which is said to possess a peculiar virtue for the treatment of concrete surfaces. Spread on the surface to be coated, it is ironed in with hot irons,, and gives a smooth and durable surface that can be easily cleaned. Ink spilt on concrete floors can be wiped up with a rag and leaves no stain. The polish is to be tried on the hospitals in Manila, the surface being so smooth that it affords no holding for dust or germs.

WITH A VIEW TO BEAUTIFYING MONTREAL and environs, the Board of Control of that place has endorsed the proposal of the City Improvement League to apply to the Quebec Legislature for power to appoint an independent Commission of five members to formulate and carry out certain schemes tending to improve the appearance of the city. The new board, if constituted, will be known as the Metropolitan Park Commission and its duties will be to provide better means of street communication and transit, together with suitable park and recreaton grounds, under a concerted system of development.

* * *

A CONSPICUOUS FEATURE in proposed building work throughout the Dominion is the large number of important hotel structures projected. Particularly noteworthy is a fourteen story hostelry which will adjoin the Walker Theatre at Winnipeg, and also a fifteen story hotel to be built at Quebec City. The former structure will be erected by a company capitalized for the purposes at $1,250,000, while plans for the later, are now being prepared by Lorenzo Angiers, a Quebec architect. The Quebec hotel will cost a million dollars, and it is said, that it will be identified with the interests of the Grand Trunk Pacific, similar to the manner in which the Chateau Frontenac is to the C.P.R.

* * *

FOUR NATURAL BRIDGES, which were heretofore practically unknown, have recently been brought to light in the southwestern portion of the United States. The largest one of the four is between the Colorado river and the Navajo mountains, but a few miles north of the boundary line separating Utah and Arizona. It is of a hard sandstone formation. One end of the bridge juts out from the wall of the canyon floor, while on the other side the springing line is at the base of the cliff, so that the arch is not particularly symmetrical, though the curve is smooth and has scarcely a break, having a clear span of 274 feet, with its crown 301 feet above the bed of the small stream which flows beneath it.

* * *

IT IS THE UNANIMOUS OPINION of contractors, material men, and labor unions connected with the building trades in Winnipeg, that the city is just entering upon the greatest period of activity it has ever experienced. The estimate of the secretary of the Builders' Exchange, given out at the annual banquet of that organization recently held, places the total amount of work projected for the year considerable in excess of fifteen million dollars. Prominent builders and labor leaders are a unit in declaring that there will be no shortage in either skilled or unskilled mechanics and that the relationship between the employers and employees will be marked by a greater degree of harmony than has ever existd at any prvious period.

* * *

THE BIGGEST REAL ESTATE DEAL in the history of Toronto was recently consummated in the sale of the Janes Building at the northeast corner of Yonge and King streets, to parties whose names have not as yet been disclosed. The consideration named was $740,000. It is understood the property will form the site of a modern sixteen story office building. The corner, together with the abuting property on King st., was purchased for £400 in 1814 by John Dennis who erected a home upon it, which has long since disappeared. A comparison of the house and its trees and plum orchard, so interestingly described in "Robertson's Landmarks of Toronto," with the buildings in the vicinity that are seen to-day, show the wonderful transformation that has taken place, and the great strides which Toronto has made both commercially and industrially.

STEEL TIES are gaining in popularity in several of the European counties, and any new form or device to be used in connection therewith, is thoroughly examined and given a trial. In Germany, especially, this kind of fastener is taking a firm hold. Aside from the northern portion of the country where wooden ties are preferred on account of the soft moist condition of the ground on which the wooden ties are claimed to rest more firmly, particularly when the soil is frozen, steel ties have come pretty much in general use. It is reported that within the next few years this manner of sleeper will be quite universally adopted.

* * *

THE OLDEST TEMPLE IN THE WORLD, so far discovered, says the Slate Trade Gazette (Hull, Eng.) has been unearthed by excavators at Bisya, in central Babylonia. The walls of the tower were first uncovered and the summit cleared. The first inscription on the surface was on a brick stamped with the name Dungi, which goes back to 2750 B.C. A little lower appeared a crumbled piece of gold with the name Param Sim, who lived in 3770 B.C. Just below were large square bricks peculiar to the reign of Sargon, 3800 B.C., who was probably the first Semitic king of Babylon. A large platform was discovered 2½ yd. below the surface, which was constructed of peculiar convex bricks such as were used in building 4500 B.C.

* * *

THE OLD-WORLD EXCLUSIVENESS of Richmond, a spot close to London, is being disturbed by a party of American capitalists, who have had plans prepared for the erection of what Englishmen describe as a "towering pile of flats in one single edifice." The site selected is that of Ancaster House, a Georgian mansion of historic interest and an old-time hunting box of the Duke of Ancaster. The place was given to Sir Lionel Darell by George III., who was accustomed to make a stay there every week. The projected flat building is to be several stories high, fitted with the most modern appliances for luxury and domestic economy, including the somewhat novel feature of a steam heating plant to contend against the damp of the English fogs.

* * *

AMONG THE LARGE NUMBER OF BILLS up for consideration during the present session of the Ontario Legislature, was a measure introduced by Mr. Hoyle (North Ontario) to amend the Municipal Act regarding the construction and control of bridges. The chief feature of the bill was that county councils should have control of all bridges more than 50 feet in length, should undertake their construction, and that the Provincial Public Works Department supply specifications and inspect the work. The township council was too small a unit to undertake the building of an important bridge. The bill also substituted the Ontario Railway and Muncipal Board instead of the courts in case of disputes between municipalities regarding bridges. The reduction in the minimum length from 300 ft. to 50 ft. was regarded by some of the other members as a somewhat radcal departure, and opposition developed in the shape of a protest against the centralization of control, entailed by the supervision of work by the Public Works Department. There was a question also, as to whether provincial inspection would not leave the province open to responsibility for accident. Dr. Reaume, Minister of Public Works said the bill had both merits and disadvantages, while Hon. Mr. Hanna expressed the opinion that while its passage would relieve rural municipalities of considerably outlay, it would greatly increase the contribution of county finances from urban centres, in addition to fixing on the Public Works Department a responsibility that was not desirable. The bill finally went to the Municipal Committee, which decided to let it stand for a year in order that county councils should consider it.

NEW YORK'S NEW THEATRE.—Beautifully Appointed Playhouse Erected Solely in the Interests of Dramatic Art.—Design and Plan of Building Depart from Usual American Idea.—Its Arrangement and Scheme of Decoration.

PRONOUNCED by some to be the most complete and beautifully appointed theatre in the English-speaking world, and conceded in general to be the finest play-house in America, the New Theatre, Central Park West and Sixty-second street, which was but recently opened to the public, has at least much in its design and construction to interest students of architecture.

As is already well known to the reading public, this magnificent structure was erected by thirty representative citizens wholly in the interests of dramatic art, and is intended to take the place of a National Theatre, such as the Comedie Francaise of Paris and the Hof-burg of Vienna.

In that the theatre is in no sense a commercial venture, considerable latitude was allowed Carrere & Hastings, the architects, in its construction, and it has therefore not been designed according to the usual interpretation of the American idea. Before drawing the plans, the architects visited and closely studied the representative theatres abroad, with a view of obtaining the best ideas available; and not only was beauty and the convenience of patrons fully considered, together with the acoustics, but particular attention was paid to sight lines, with the result that every seat in the house commands an excellent view of the stage.

The entire building is not, as is usually the case, given over to the auditorium and the stage, thereby sacrificing the possibility of architectural effect, but instead, conforms more nearly to the Continental type in which the stage and audience room occupy but a moderate portion of the whole. Thus it has been possible to provide for a commodious foyer, two grand stair cases, retiring and smoking rooms, a tea room, restaurant, buffet, offices for the directorate and staff, scores of entrances and exits, numerous circulations and vestibules together with a Founders' room, green room and library.

Viewed from the approaches along Central Park West, the structure is both dignified and imposing. It is of clear gray Indiana limestone, occupying an entire block frontage between 62nd and 63rd streets, and architecturally, as well as in its location, suggests a civic, even a national institution. Although the theatre is modern in character, the treatment in general is somewhat in the spirit of the Italian Reniassance of the late sixteenth century, and reminds one in a degree of the Sansovino Library in the Piazza di San Marco, Venice. Every detail has been carefully considered, and every appointment has been designed and selected to be *enrapport* with the entire scheme.

The front entrances are on the park side while the carriage entrances are on 62nd and 63rd streets. This arrangement obviated crowding and confusion either before or after the play. Once within, the effect is simple, majestic and artistic, rather than gaudy and sumptuous. A trip through the building. taken for the first time, might lead the visitor to believe he was delving in the hidden recesses of some mystic labyrinth, but in reality the house is exceedingly simple and so planned that the auditorium and countless rooms can be emptied in three minutes. Fifty odd stairways lead to the streets or lobbies; exit doors without number can be opened by the pressure of a woman's hand, and the stage and dressing rooms above can be instantly flooded with water from automatic sprinklers should the necessity arise. In fact, no stone has been left unturned to make this structure of solid concrete absolutely safe as well as comfortable and artistic.

Main Foyer, New Theatre, Central Park West, New York, showing famous Baudry paintings on ceiling. Messrs. Carrere and Hastings, Architects.

The ground floor, as in all latter-day playhouses, embodies the orchestra, or main auditorium, but here the similarity ceases. Not only have the sight-lines been studied with the idea of obtaining an exquisite, harmonious effect without imparing the conditions for seeing and hearing, but the orchestra and balconies have been surrounded with circulations calculated to contribute to the enjoyment and comfort of the playgoer. Standing on the stage the auditorium stretches away in an ellipse, the long axis of which is parallel to the proscenium arch. Under this arrangement, which follows the precedent of the Wagner Theatre at Bayreuth, the centre box is no further from the stage than the last seat in the orchestra in the usual theatre In other words the auditorium is the

Copyright, 1909, by the New Theatre.

The New Theatre, Central Park West and 62nd street, New York City, a playhouse built solely in the interest of the dramatic art and the most magnificently appointed theatre building in America. Messrs. Carrere and Hastings, Architects.

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Main Entrance Lobby, New Theatre, Central Park West, New York. Messrs. Carrere and Hastings, Architects.

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Famous Baudry Painting and detailed view of ceiling decoration in Main Foyer, New Theatre, Central Park West, New York city. Messrs. Carrere and Hastings, Architects.

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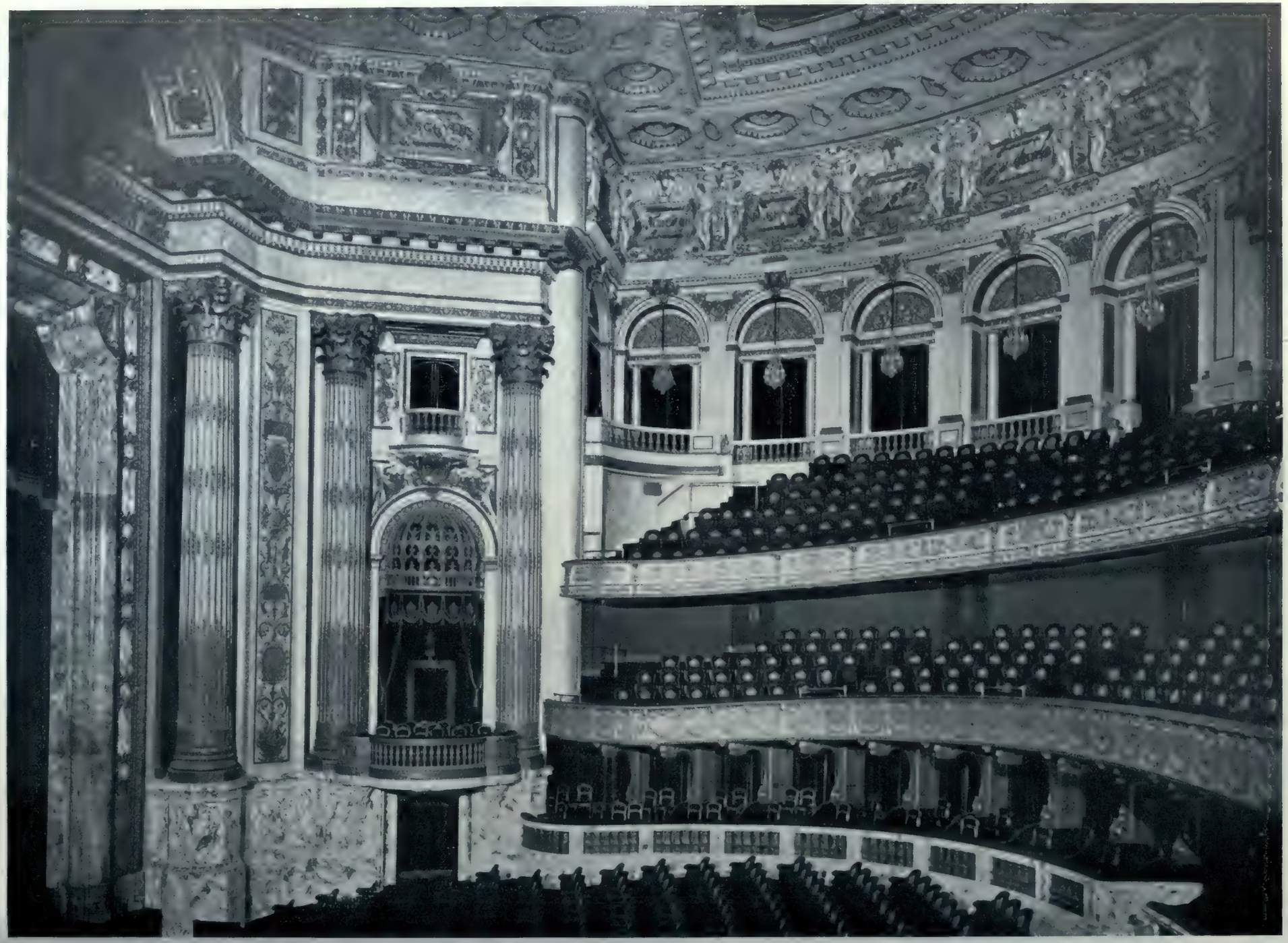
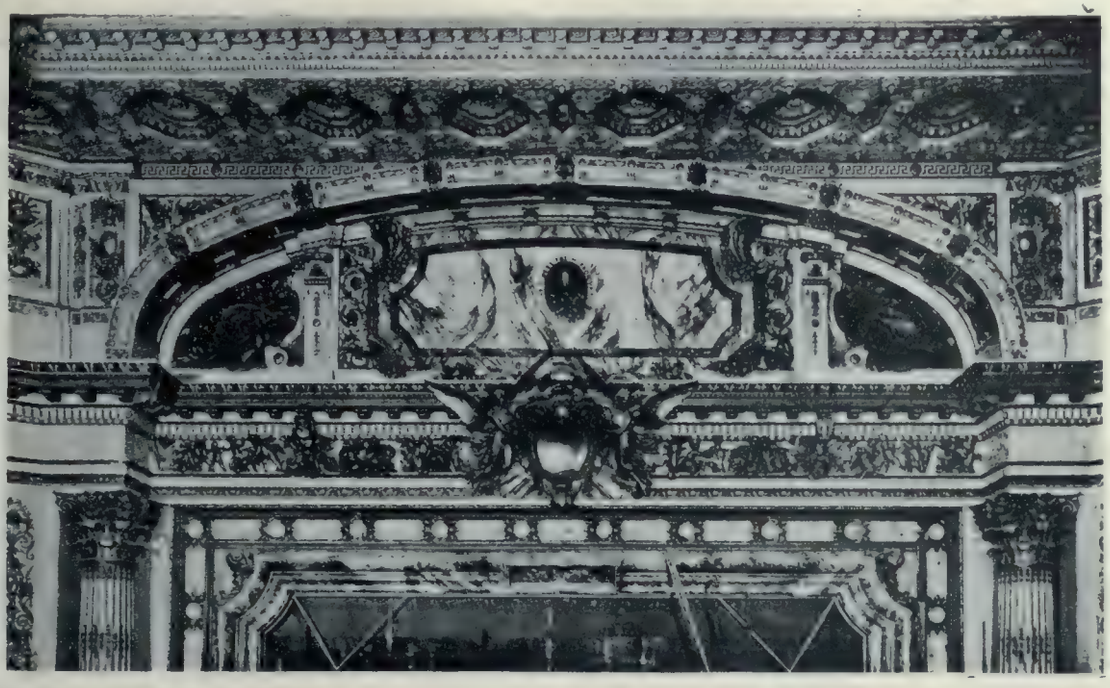
An Owner's Box.
The New Theatre, Central Park West, New York.

Door in Foyer.
Messrs. Carrere and Hastings, Architects.



shape of half an egg with the proscenium arch in the centre of the straight line. Along the curved line rise the Founders' boxes, the foyer stalls and first and second balconies in a receding field of driftwood gray and dull



Copyright, 1909, by the New Theatre.

Detail of Proscenium Arch, New Theatre, Central Park West, New York. Messrs. Carrere and Hastings, Architects.

Roman gold, the predominating color notes in the decorations.

The floor pitches at a moderate angle toward the stage, so it has not been necessary to raise the boxes greatly. They are, in fact, but four feet above the level of the orchestra floor, making it quite possible for one to chat with the occupants from the floor during intermission. The boxes are twenty-three in number and cor-

stalls. The boxes accommodate six persons each and are divided by tapestries from the tiny parlors in the rear. These parlors, in turn, open into a private hall from which short flights of stone steps lead either to the main foyer and circulation on the mezzanine floor, or to the corridor on the ground floor. The hangings of boxes and parlors are in a rich cerise and the balustrades of a royal gold bronze elevated on a Broche violette marble base with marble dies. The foyer stalls are also done in cerise. Above the stalls are the first balcony seats and over them the chairs of the second balcony. In the arrangement of all the seats, whether in the orchestra

Copyright, 1909, by the New Theatre.

Roof Garden, New Theatre, Central Park West, New York. Messrs. Carrere and Hastings, Architects.

respond to the "Golden Horseshoe" at the Metropolitan Opera House, but instead of a second tier above them as was originally planned, there are six rows of foyer or in the balconies, great care has been taken to provide ample space for comfort. The aisles are of unusual width and the chairs are placed on enough of a pitch to

insure every playgoer seeing the entire stage without interference from the person occupying the seat immediate in front.

As regards the decorations, the tonal effects of the interior are most pleasing no matter from which point of the house they may be viewed.

The color scheme of driftwood gray and gold is quiet in the extreme and not only suggests dignified simplicity but a due regard for tradition. Moreover, the relief has been studied to interpret the architectural design, so that the gray is sometimes seen on a heavy gold background, and again the gold predominates on a background of gray. To further the effect the carpets are in cerise and the proscenium arch is framed in greenish-tinged Conemara marble. Over the arch is the theatre's crest, two masks with a looking glass in the centre bearing the motto, "To Hold as 'twere the Mirror up to Nature." Conemara tablets along the walls and under the dome are inscribed with the names of fourteen great dramatists.

The auditorium is surrounded on each floor by a broad corridor, which forms a circulation to be used between acts as well as in entering and leaving the play house. On the ground floor access is obtained to this through a number of vestibules and entrances, some of which lead directly to the corridor and others to the boxes, stairways and balconies, or to other parts of the house. At the corners are two monumental, spiral staircases of great beauty. Each is double, one flight being directly over the other and makes the ascent without meeting.

As the boxes are raised four feet from the orchestra floor they are reached from the main corridor by ascending a half flight of stone steps. This brings one to the private hall, which in turn, leads to the small parlor in the rear of the box. From the top of this half flight of steps the main foyer is reached by ascending another flight of equal length. It is this foyer, by the way, which will contain the majority of the art works to be exhibited from time to time; and it is here where the three famous Baudry paintings from the ceiling of W. K. Vanderbilt's ball-room, form a conspicuous feature of an elaborate decorative scheme, in which rich Sienna marble and gold are the principle elements of composition. At either end of the foyer, cut off by arches, is an orchestra platform which will be used by the orchestra during intermissions whenever dramatic performances are given.

At one end of the circulation on the same floor as the foyer is a tea room daintily done in wedgwood effect, the predominant colors being pale green and white. Here tea will be served to those who so desire during the *entr'actes*. At the other end of the circulation is the women's retiring room pleasantly decorated in a similar manner. The windows upon this floor front on Central Part West and as the park is but a few feet away plenty of fresh air may be had without recourse to the enormous plant which automatically supplies the theatre with fresh hot and cooled air as occasion requires.

The circulations in the rear of the first and second balconies are commodious and intended to be used as promenades during intermissions. On one floor is the Founders' room splendidly equipped, and on the other, the library. The library for the players, which adjoins the dressing rooms, is a model of its kind and has oak book cases rising from the floor to the ceiling. The books will include standard works on drama, books of reference and volumes devoted to art.

The top floor of the building in part is devoted to a picturesque roof garden, which at the present time is used for rehearsals. This garden, designed to delight the eye of all lovers of the beautiful, sets back a bit from the terrace overlooking Central Park and is partly roofed with glass. The doors, all of glass, lead to the walled terrace which will be decorated with potted plants and vari-colored lanterns when the garden is opened to the public. In all probability a stage will be erected here for concerts or performances of one kind and another.

Back of the gardens are smaller rehearsal rooms, two circular in shape; comfortably furnished rooms for chorusmen and women and model make-up rooms for supernumeraries, etc. They are all airy and illuminated during the daytime by skylights. In reality they have every appearance of modern studios and could be used as such. This floor, like others, is reached by large elevators so that neither the actors nor the public visiting the garden will be forced to climb lengthy flights of stairs.

The green room, in disuse since the days of the late Augustine Daly, has been revived. It is located on the ground floor just off the stage on the 63rd street side and is adjacent to two extra dressing rooms to be occupied only when quick changes are necessary. The room will be handsomely furnished, hung with pictures in keeping with tradition and, as of old, will be used exclusively by the players for social intercourse. The dressing rooms rise tier upon tier from the stage floor up on this side of the theatre. Each is fitted with a double wardrobe containing interior electric lights, a marble-topped make-up table with vari-colored lights that the effects of paint, powder and wigs may be determined; comfortable lounging and other chairs and hot and cold water. On each floor are tub and shower baths and many other luxuries and conveniences for the use of the players which other theatres have failed to provide. The offices of the directorate and executive staff are on the third, fourth and fifth floors. Of course the house is fitted with the latest appliances for quick communication, fire apparatus, etc.

A description of the stage requires an article by itself, so complete is its equipment. Suffice it to say, therefore, that as regards mechanism and equipment it embodies features that will attract the attention of mechanical engineers the world over. It is 100 feet wide and has a proscenium opening of 42 feet wide by 40 feet high. The height from the stage floor to the gridiron is 112 feet and the depth from the stage to the bottom of the pit beneath, 42 feet.

A SCHEME DESIGNATED "Roadtown," which is unique in theory at least, has been devised by a New York inventor, to be adopted in connection with the development of suburban property. It is a combination of connected dwellings, with a system of rapid transit and forming in a way a projection of the city into the country. The idea of the inventor is to have the continuous house two or thre stories in height and extending over a considerable area in one direction. On the top is to be a promenade and at the sides, gardens or grass plots, while at stated intervals streets and thoroughfares will pass through the first story. The continuous house will provide its tenants with water, heat, light, power and transportation, but for the latter a noiseless railroad will take the place of an elevator. The idea is to make use of the monorail as well as a moving sidewalk, and to provide for mechanical deliveries of all packages and parcels as well as for the transportation of passengers and food. The inventor, with the architects and engineers associated with him, in working out the estimates of cost state that the saving in construction and maintenance will make it possible for a man to live in the country at the rent now paid for second-rate city apartments and at the same time enjoy all the advantages and conveniences to be found in connection with high-priced elevator apartment houses.

IN THE CONSTRUCTION of the Christian Science church at Pasendena, Cal., which is of monolithic type, the concrete was deposited almost entirely through an 8 in. pipe leading from the bottom of a hopper erected on a high tower. The pipe was hung from a trussed boom and had a swivel joint in it so as to allow the discharge end to be manipulated easily.

SGRAFFITO WORK.—A Method of External and Internal Plastic Decoration Much in Favor in 16th and 17th Centuries.—Modern Examples of Its Use in England.—A Recent Application of Sgraffito in Toronto.

By W. J. HYNES

THE ILLUSTRATION of this small store front shows the upper wall surface between the half-timbered work executed in Sgraffito or colored plaster work. In this instance a frame building was metal lathed, scratch-coated with cement mortar, straightened with cement mortar mixed with black mortar color and surfaced with white Portland (Blanc) cement. The half-timbered work was left from the saw and stained a dark brown. The background is black, the facing white with some bright red used in the Coat of Arms in the centre panel.

George P. Bankhart, in his recent work, "The Art of the Plasterer," gives some interesting data, historical and technical, on Italian Sgraffito. Sgraffito, the Italian for "scratch," is a fitting name for this work, results being obtained by scratching away the outer coating and thus exposing the undercoating of another color.

This system of plastic decoration was re-discovered at the exhumations of the Baths of Titus and was much in favor for external and internal decorations in the 16th and 17th centuries. With the contemporary art of modelling in Stucco Duro, or white stucco, its use spread throughout Europe and reached England in the reign of Henry VIII, much of it being used in the King's palace, "Nonesuch," at Hampton Court executed in the common parge of the native workman.

The Dutch Studio, Yonge Street, Toronto, showing the interesting use of Sgraffito.

The method of execution is to prepare a carefully studied and colored detail, deciding upon the base or background color or colors, and the facing or highlight color. Upon a suitable base or scratch-coating the first color is applied using a carefully prepared mortar, free from large stones or coarse gravel which would impede the free use of the graving iron. Upon this the finish coat of another color is applied as thinly as possible and before the undercoating has become hard or set. Only as much surface must be covered as can be completed while work is soft. The cartoon or design is now stamped or sketched upon the finish coat and the facing coat is scratched or etched away, exposing the undercoating and giving the design.

Most modern work is executed in two colors, generally a black ground and a white surface, and many very good effects are obtained by using simple outlines like the Greek fret; plain lines of different widths and shaded drawings of the astragal, egg and dart, dentil, shields, cartouches, etc. In England, Heywood Sumner, G. T. Robinson, Geo. P. Bankhart and other English architects

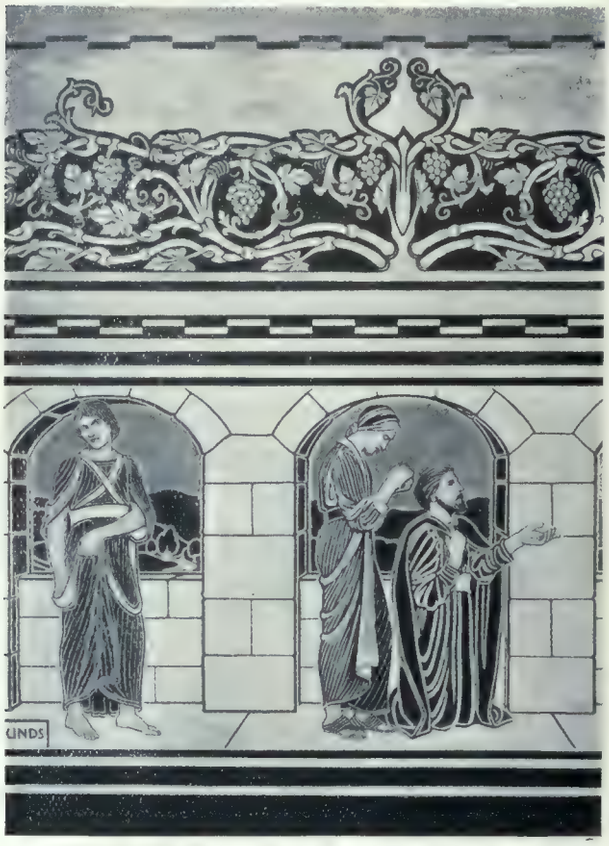
An Example of Sgraffito in Via S. Matteo in Merulana, Rome.

have executed some remarkably successful work by this method.

The earlier sgraffito work of the 16th and 17th centuries, executed in the days when the artists worked for fame and the dollars were not so much in evidence, is a different type. While the methods were the same, the work shows in line and color that the artist was on the job using his graving iron in much the same manner as he would his colored crayons. Occasionally the thumb or forefinger would be used to blend colors or to emphasize the design. Six or eight colors were employed in many instances; figures, animals, scrolls—there seemed to be no limitations and while the results are somewhat florid there is a wonderful ability displayed in their execution.

The present condition of the old, as well as more recent sgraffito, is such as to leave no doubt of its lasting qualities. Modern methods and materials can assure successful results and the possibilities should be most interesting to the architect who will readily appreciate the immense decorative value of color in design.

In monolithic concrete structures, color can be made to emphasize the structural lines and the heavy masses



Sgraffito Work in north wall of Chancel of St. Paul's Church, Winchester.

of walling lightened and embellished with sgraffito. Old painted or tuck pointed brickwork, always an eyesore

Beautiful decorations in Sgraffito, as seen in the Apse of St. Agatha's Church, Portsmouth.

but more objectionable when new work is added, can be covered by this method and will give pleasing and truthful effects successful in proportion to the care and study devoted to the design.

Heywood Sumner's work gives an idea of its possibilities in church interior decoration. A study of his work in St. Paul's church, Winchester; All Saints, Ennismore Gardens, London; St. Agatha's, Portsmouth and especially St. John's, Miles Platting, Manchester, shows a masterly handling of surface in color which can be secured only by means of sgraffito. The careful student who goes into this subject will see that strong effects for auditoriums and dainty results for house or studio are all within the compass of this material and method.

In half-timbered work, cartouches, borders, diapers and other forms of decoration in color will present themselves to the mind of the designer.

Further enlargements on the uses of this work could be made, but sufficient has been noted to enable the architect to investigate and follow the opportunity for color in design, a matter too much neglected at present.

South Wall of All Saints' Church, Ennismore Gardens, London, showing the further possibilities of Sgraffito.

THE PEOPLE OF the United States waste in the course of a year $33,000,000 worth of gas, says the AMERICAN CARPENTER AND BUILDER. Gas is wasted by having wall coverings that absorb the light. Colors differ immensely in their power of reflection. The reflective power of yellow paper, for instance, is 40 per cent., while that of emerald green is only 18 per cent. Dark brown paper reflects 13 per cent., and orange as much as 50 per cent. Having the chandelier too high throws the gas where it isn't needed, and so wastes it. Some people try to secure what they call a cheerful effect by having bright spots of gilding, polished bric-a-brac and inconsequent mirrors to catch the light. This is a mistake; it smply wearies the eyes. Light should be thrown where it is needed, and reflected from broad surfaces.

ECCLESIASTICAL WOOD CARVING.*—Ancient and Modern Examples.—Significance of Work in the Mediaeval Church.—Splendid Carvings of Modern Craftsmen. ∴ ∴

By HENRY WALKER

IT IS A REMARKABLE FACT that in a large proportion of the cathedrals and churches in England there are many grotesque and other curious carvings, some of which are profane, some obscene, and others that have apparently little or no connection with sacred art. The majority of these carvings date back to mediæval times, when the art of carving received more attention than it has subsequently done. In those days the workers in wood and stone were allowed greater latitude in the choice and execution of their subjects than is the case nowadays. Many of the examples of grotesque birds and beasts were undoubtedly copied from the ancient "Bestiaries," or Books of Beasts, whilst others were obtained from the decorations to be found in ancient illuminated service books and Bibles. In some cases the carvings have a symbolical meaning, and often beneath a crude and rugged exterior bore a wealth of significance to the unlettered mind of the period. One of the best examples of this character is the carving of the pelican feeding its young. At the time this symbol was first used it was erroneously believed that the pelican succoured its young with its own blood; the error arising from the fact that this bird has a red mark upon its bill, and as it preened the feathers upon its breast it was thought that it was drawing its blood in order to feed its young: "The Pelicane, whose sons are nursed with Bloude, stabbeth deep her breast, self murtheresse through fondnesse to her broode."

Tideswell Church, Derbyshire.

It is a remarkable fact that Shakespeare fell into the same error, and in "Hamlet" he says:

"To his good friends thus wide I'll ope my arms,
And like the kind life-rending pelican,
Refresh them with my blood."

Tideswell Church, Derbyshire.

In later times this theory has been exploded, but the symbol of the loving sacrifice of Christ is none the less beautiful.

In the parish church at Ufford in Northamptonshire, the bench ends are carved with a variety of grotesque faces. Four of these appear as illustrations to this note. One of them is two-faced, an admirable representation of hypocrisy, and a perennial warning to the villagers to be honest and straightforward in all their dealings. Another represents the horrible disfigurement consequent upon the indulgence in hatred and malice.

Manchester Cathedral.

Of the other illustrations attention must be drawn to the excellent examples of modern carving from the Choir Stalls in Tideswell church in Derbyshire. These are the work of Mr. Tooley of Bury St. Edmunds, and date back to the year 1878. The whole of the carved work at Tideswell will repay careful study. On the south side the figures are connected with St. John the Baptist, the patron Saint of the Church, and on the north they are mostly symbolical and denote purity, victory over sin, etc. A close examination of the illustrations will reveal a charming little "annunciation" and a bird feeding its young.

In the Nave of the same church,

Parish Church, Rochdale.

there are some remarkable carvings by Mr. Advent Hunstone, a local man, whose work is in great repute in Derbyshire.

Rochdale Parish Church is also rich in ancient ecclesiastical carvings, and they are of great interest to the student. The example illustrated shows a knight in full armour, holding a shield upon which appear heraldic devices.

Manchester Cathedral also contains some excellent carvings of the fifteenth century, many of which are mutilated. The example shown reveals a notable piece of heraldic treatment which has happily escaped the rough treatment extended to many other carvings in this cathedral. The arms are those of De la Warre, and special attention is drawn to the excellent way in which the dragon and the poppy head have been carved.

The study and search for these old carvings is intensely interesting, and the quest may be heartily commended to architectural students. Many of them have unfortunately been

*From the Journal of the Society of Architects, London.

mutilated, and, as is too often the case, the damage has been attributed to Cromwell and his Ironsides. This, however, is far from being true, for many of them are known to have been in a damaged condition long before the Protector's time. In modern times the destruction is too frequently completed by the "restorer," but, happily we are waking up to the fact that these relics of a past age are worthy of the most careful preservation.

Economic Advantage of Well-Built Structures.

THE ECONOMIC advantages, both to individual owners and municipalities, of well built structures, is interestingly pointed out in the recent issue of a contemporary journal, which comments on the desirability of better building regulations, especially in the large cities on the Continent.

Hundreds of cities are now revising their building regulations, or

Ufford Church, Northants.

writing new ones, or have just put amended ones into force. It shows that the great fires of the past few years have not been wholly unfruitful lessons. People are awakened to a realization that something must be done. They are tired of having their lives and property constantly in peril, the while paying out nearly $300,000,000 a year for fire protection and $200,000,000 a year to the insurance companies in premiums, while over $215,000,000 of property goes up in smoke every year.

Perfect building is absolute economy, good building is sensible, and shoddy construction is positive extravagance. A city full of good buildings means lessened maintenance cost for each owner, fewer repairs, a longer life for the buildings (and in consequence lower rents would obtain), much less expense for fire departments and water protection, and the very minimum of insurance rates and premiums, safety of life and property. It would mean millions upon millions of dollars saved and a great municipal problem solved.

A first-class city can only be an aggregation of first-class buildings. Therefore in at least the congested districts only perfect construction can

Ufford Church, Northants.

be tolerated, the complete and total elimination of the combustible in building materials.

All buildings, new and old, of a public or semi-public nature should be conspicuously and officially labeled. just what classes they belong to, "First Class," "Second Class," "Dangerous," etc. That will keep the building department alert in properly classifying the buildings and will keep owners from falsely claiming that their inferior and dangerous buildings are "fireproof."

Then the department should make every effort to have the tax system so amended that there will be a scale of

Ufford Church, Northants.

rates rather than a flat rate. The owner of a first-class building requiring the minimum of fire protection and expense on the part of the city should pay a lower rate of taxes than the owner of the fire trap for whose benefit and protection and the protection of the neighboring property he endangers, the expensive fire departments have to be maintained. That man should pay the minimum rate of tax. Further, the building departments should try to influence the insurance companies to create the "neighboring risk" that exists in most European cities, whereby the individual becomes amenable for the damage done to other than his property through his neglect or carelessness.

In other words, if fire extends beyond a man's own premises, he would get but part of his insurance. In Europe this works a charm, people become most careful where they deposit ashes and waste paper and cotton waste, and all these fire-breeding things are kept in fireproof receptacles. Many people clamor for as few restricted fire limits as possible; the building departments should clamor for as wide limits as possible. It is only a question of a few years when the existing fire limits of any city have to be extended. Then they

Ufford Church, Northants.

take in all the second class buildings permitted under the old regulations, these old ones endanger the new buildings and the latter have to be superlatively well built to withstand the adjacent fires that are sure to rage in the old buildings. We must all realize that with as rapidly growing a population the town of to-day is the city of to-morrow. Every one of our cities is now suffering from an inheritance of fire traps handed down by previous generations. The city that would make its fire limits comprehend all of its corporate extent would indeed be a sensible city, a really first-class city.

MR. J. T. FORIN has been appointed to the office of Building Inspector of Cobalt to fill the vacancy caused by the resignation of his precedecessor. Mr. Forin was formerly Inspector of Public Works at Hull, Que., and goes to Cobalt well recommended for his new position.

GERMANY'S POWER PLANTS.—Manner in Which the Exploitation of Hydraulic Energy is Conducted and Governed.—Provisions and Charges for Use of Power.—Compulsory Membership in Associations of Persons Whose Property is Benefitted by Water Supply

GERMANY as an industrial nation, from the standpoint of organization and the efficient, economical utilization of her national resources, stands at the head of the nations of the world. At this time, therefore, while the several provinces of the Dominion are battling with the problem of determining the best course to pursue to get the most out of the water power value in their streams and rivers, a review of the development, control and use of water power in Germany will prove of interest to Canadian municipal officials and engineers.

We have gone a trifle further than the staid, thrifty German, in the establishment of provincial power plants for the development of energy for commercial purposes, for we find that, although some municipalities have their own electric development plants, none of the several states have as yet gone as far in this direction as have the Provinces of Ontario and Manitoba.

THE LAWS RELATING TO THE DEVELOPMENT AND USE OF WATER POWER.

Water rights in Germany are not regulated by Imperial legislation; neither do the use and development of water power come within the scope of the Imperial Government. At the formation of the German Empire the right of eminent domain over the public water was reserved exclusively to the sovereign States joining the Empire and now composing the same.

The laws governing water rights enacted by the several States and the various governmental decrees, rules and ordinances which were the law of the land at the time the Empire was founded remained in full force and effect and subject only to changes and amendments by the several States themselves.

In the contemplation of the German law, from time immemorial the public waters—that is, the rivers navigable by nature, the seashores, and the sea ports—are the property of the State, as a part of its sovereignty for common use. The right of usage of these waters may be acquired by private persons, communities, or municipalities from the State government for certain purposes, subject to governmental supervision and control.

The uniform policy of the German States heretofore has been not to exercise governmental control or ownership by reason of eminent domain over the public waters, so as to make them a source of fiscal revenue, as, for instance, by the erection and management of water works for the supply of water, or by the construction of works for the development and use of the water power, etc.

On the adoption of the new civil code for Germany in 1900, establishing a uniform private law in all the German States, the existing laws relating to the water rights in the various States were left unchanged, and legislation regarding water rights and the use of public waters was again specifically reserved to the several States.

Articles 65 and 66 of the Introduction Law (Einfuhrungs-Gesetz) to the Civil Code provide that: "The provisions of the several State laws governing the water rights, inclusive of the mill rights, accesses to the banks of rivers, rafting, the promotion of irrigation and drainage of real property, right of landing places, the formation of islands in the rivers, the river beds, dams, and embankments shall remain unaffected."

OWNERSHIP AND CONTROL.

Up to the present time, with a few exceptions, the governments of the several German States do not develop the water power under government ownership, nor do they control and rent and sell the power for the use of manufacturers, millers, etc., neither is the power all developed by private capital and the power rented and sold exclusively for the benefit of private owners.

Only during the past twenty years has the utilization of the water power of Germany by the several States under government ownership been taken into consideration. The question is also being agitated by private parties so as to bring about a co-operation between them and the public authorities.

In Prussia at the present time, government ownership of waterworks for power and other purposes is being seriously considered. An exhaustive report presenting the ways of utilizing the public waters as a means of fiscal revenue has been prepared by the ministry of public works, the department of the government which has supervision over all matters pertaining to the public and private waters, and recommending that proper legislation to that end be enacted by the Prussian Parliament. Action, however, on this project is being deferred.

The Bavarian Government proposes to take up the matter of governmental ownership of the waters in the province of Upper Bavaria. A bill for the purpose has been drafted and it is thought that legislation to that effect will soon be enacted. The purpose in view is to establish water power for the generation of electricity from which to furnish the energy to run the railroads in South Bavaria.

Baden has taken the lead in exercising governmental ownership of water power by the erection and management under governmental control of the small electric water-power works at the port of Kehl, on the Rhine, to supply the railroad stations and the navigation works of the said port with electricity.

The waterworks of the city of Nordhausen, in the Harz Mountains, are an illustration of municipal ownership of water-power works.

PROVISIONS FOR THE USE OF WATER.

The system hitherto universally prevailing in the German States for the use of the water is that the erection and management of waterworks are carried out by the water associations known by the German name of "Wasser-Genossenschaften." These are quasi public corporations, organized under the special laws mentioned above, under the enumeration of the laws of Prussia relating to water rights and water power.

These semi-official corporations are organized either entirely by private owners of land who are being directly or remotely benefitted by the use of the waters, or municipalities, or by a combination of both municipality and private individuals.

It is a special feature of the laws governing water associations that the membership of all persons is legally made compulsory whose real property is held to be benefitted by the purposes and the object of the associations, whether it be by the reason of a supply of drinking water or of furnishing power or of drainage or irrigation or of other ameliorations.

The right of appropriation of private property on the assessment of damages is also an essential feature of the said laws.

These associations being corporations for profit, are also being organized under the general German law of the "Code of Commerce" governing companies with a limited liability.

A leading illustration of these latter corporations is one in which the city of Aix la Chapelle is the principal stockholder. This company is called the "Ruhrthal Sper-

rengesellschaft G. m. b. H."—a limited liability company. It is named after the river Ruhr, near which the city is situated. It was organized on March 20, 1890, with seven incorporators, composed of the mayor of the city of Aix la Chapelle as the representative of the city by virtue of a resolution passed by the city council, a commissioner (landrat) of the county of Aix la Chapelle (landkreis of Aachen), empowered by resolution of the county commissioners and of five commissioners representing and empowered by five other adjoining counties or "landkreise."

This company, the title of which, "Ruhrthal Sperrengesellschaft," means company for the storage of the waters of the river Ruhr, was organized with a capital of 5,000,000 marks ($1,190,000), to which the city of Aix la Chapelle, the county of Aix la Chapelle, and two other counties subscribed 1,000,000 marks ($238,000) each, two counties subscribed 320,000 marks ($76,160) each, and one county 360,000 marks ($85,680).

The object of the company, as stated in the article of corporation, is as follows: The erection and maintenance of reservoirs (sammelbecken) for the river Ruhr and its tributaries for the purpose of improving the condition of the said river courses, and to better utilize the water and the water power by the erection of aqueducts, by drainage and irrigation, and also by the construction of electricity works, water motors, pumping works, and the transmission of power for farming, for the industries and for small trades, in a manner so as to be of common benefit.

It is one of the duties of the said company to offer the power produced to the parties in interest, especially to the city of Aix la Chapelle, at rates in proportion to the amount of the capital invested by fixing the prices upon an equitable basis.

CHARGES FOR USE OF POWER.

The above-mentioned Ruhrthal Sperrengesellschaft charges its four membership customers: (1) City of Aix la Chapelle; (2) County of Aix la Chapelle; (3) County of Duren, for electric light 4.1 pfennig (0.976 cents), and (4) the County of Schleide 3.7 pfennig (0.88 cents) for the kilowatt hour, and a further reduction of 10 per cent. if the dividend of the company exceeds 5 per cent.; but it is a condition that an annual consumption of between 2.3 and 8.5 million kilowatt hours must be guaranteed and paid for.

These membership customers are restricted in their sales to others to a tariff, imposed by the management of the company, by which a charge of between 25 and 40 pfennig (5.95 to 9.52 cents) for the kilowatt hour is made.

Electricity for power purposes is sold: (1) At low pressure from 8 to 35 pfennig (1.9 to 8.33 cents); (2) at high pressure (5,000 volts) at 4½ to 25 pfennig (1.07 to 5.95 cents) according to annual consumption.

A more uniform consumption is given a better rate; for instance, a consumer using 10 horse power in twenty-four hours is given a better rate than one using 24 horse power in ten hours.

The Valley Storage Waterpower Works of the city of Solingen, built in 1903, charges for light 45 pfennig (10.71 cents) per kilowatt hour, on a consumption up to 350 hours a year; above that, 25 pfennig (5.95 cents) a kilowatt hour; for power, 18 pfennig (4.28 cents) per kilowatt hour, on a consumption of 750 hours a year; exceeding 750 hours, 8 pfennig (1.9 cents) per kilowatt hour.

These works have a capacity of 450 kilowatt hours. In the spring of 1900 one year after construction, they were connected with 140 motors with a consumption of 209 kilowatts and had a lighting capacity of about 6,550 incandescent lamps of 16 candle light each. During the year 1904 the total output for light and power amounted to 278,000 kilowatt hours and in 1905 to 388,800 kilowatt hours, an increase in one year equal to 40 per cent.

In the spring of 1906 they were connected with more than 500 small motors.

The charge of the Ennepethalsperre for electrical energy is 20 pfennig (4.76 cents) for the kilowatt hour for power, and 35 pfennig (8.33 cents) for light, much lower than the rates of the largest cities of the neighborhood. This plant was put into operation in 1905 and has a yearly capacity of 1.9 millions of horse-power hours.

According to the statutes of the company the proportion of the general expenses which each member using the power has to bear is determined in the following manner: For each horse-power of the motor a rate of 30 marks ($7.14) is charged yearly for the daily use of the motor,in addition to which a gross sum is paid yearly, according to the size of the motors, as follows:

Horse-power.	Marks.	Dollars.
Up to 5	30	7.14
From 5 to 10	40	9.52
From 10 to 15	50	11.90
From 15 to 20	60	14.28
From 20 to 30	80	19.04
From 30 to 50	100	23.80
Above 50	120	28.56

HORSE AND STEAM POWER COMPARED.

On April 1, 1905, Germany had 375 public electricity works with an aggregate capacity of about 107,800 horse-power, the greater part of which was generated by water power.

According to the industrial census of 1895, the aggregate capacity of all motors in use in the industries was 3,428,000 horse-power. Of this, 79.4 per cent was furnished by steam power and 18.4 per cent. or 629,000 horse-power, by water; both together were 97.8 per cent. of all the power used by the factories in Germany.

In Prussia in the year 1898 there were in operation 19,567 water-power works with a total capacity of 219,500 horse-power, the average capacity being 11.2 horse-power.

According to the statistics, the capacity of all steam engines in use in Prussia April 1, 1905, with the exception of railway locomotives and engines used by the army and navy, was 5,440,000 horse-power.

USES TO WHICH THE WATER POWER IS APPLIED.

Water power in Germany is mostly applied to the generation of electricity for lighting and industrial purposes. It is also used for pumping water into reservoirs for supplying cities with water and for irrigation and for drainage. As an illustration of the uses of water power for the generation of electricity for industrial purposes, the following statement relating to the waterworks of the Wupperthal Sperren Genossenschaft, erected in the region of the source of the river Wupper, emptying into the Rhine, may be of interest:

Electric power is furnished by the company to the following plants, viz., 5 powder mills with 16 motors, 1 bone mill with 1 motor, 9 grain mills with 10 motors, 15 cloth factories with 14 motors, 7 spinning works with 5 motors, 3 hammer works with 13 motors, 6 electricity plants with 7 motors, 64 printing works, dyeing works, bleaching works, weaving works, etc., with 9 motors, 4 wire-thread works with 2 motors, 1 flat-iron factory with 1 motor, 4 paper factories with 6 motors, 19 grinding works with 27 motors, 1 felt factory with 2 motors, 1 woodenware factory with 2 motors, 1 waterworks and electric works with 3 motors, 2 hinge and metal screw factories with 6 motors.

THE ART OF BUILDING.*—Possibilities and Limitations as Regards Factors of Composition.—Knowledge of Character and Quality of Materials Necessary to Best Results.—Simple and Earnest Forms of Expression the Most Beautiful. ∴ ∴

By M. H. BAILLIE SCOTT

WHENEVER one sees an artist sketching in some old world village, one realizes afresh how modern art is divorced from the realities of life. No artist in the old days ever contented himself with producing merely shadows of reality. He was busy creating the very stuff of the world, weaving a garment of the gods to adorn the earth. His canvas was flung wide over the country side, and all his pictures were painted in the real. When he had done his work in the valley, the valley was a more beautiful valley than before. He adorned the hills with castles, and set the plains with many a jewel—in moated grange, manor, and farmhouse. In the walled town, too, he was still a creator of beauty in the real The mother art was the essential thing—nothing was or ever could be so important.

Stonework.

Let us now briefly consider then the materials we may use in building: and first let us take stone.

We have in many districts stone of various kinds for building; and in most of these districts we have object lessons in old buildings, showing how stone may be beautifully used. It is unfortunate, however, that the modern mason seems quite unable to profit by such examples: he always wants to improve on them. The art of masonry may often be made a kind of rude mosaic, in which stones of various shapes and sizes and tints can be combined and arranged. In old cottages in Surrey you may find the irregular spaces between the stones adorned with scraps of flint, iron stone, and broken red pottery, with excellent effect. Another instance of the same mosaic in masonry may be found in the old castle at Peel, in the Isle of Man, where the wide scale of tints in the local stone from various shades of red to grey and yellow is taken full advantage of. Is it necessary to add that in the local modern buildings of the same stone, the material has been reduced to an absolute regularity of tint and surface? When the modern mason does descend to rough walling he lets us know it, and can only give us an exaggerated excrescence in the centre of each stone—a confection known as rock-faced. And he seldom knows how to deal with the mortar joint, which in good old work makes such a beautiful reticulated pattern of varying shades of grey.

If only, instead of ignoring the qualities of materials and forcing them into these meaningless forms, we were to begin at the other end, what a new world of art would be disclosed to us. A visit to the site of our building may disclose, perhaps, the fact that flints are the essential local materials for walling. What a palette is there for the artist, of tones of pearly grey; what a variety of textures can be obtained too. ere the soft rounded outlines of the uncut stones, and here, to mark some special feature, the cut flints. The surfaces of the walling enriched, perhaps, with the shivers of the broken flints set in the joints, or notes of red brick or brown stone. And all this you won't find anything about in books, or learn anything about in offices, or art schools. It is a kind of rude natural mosaic, and if rightly done implies the use of materials in the right way, inasmuch as it develops to the utmost their possibilities, instead of obliterating their character by forcing them into preconceived academic formulas. It seems that we are too apt to put the cart before the horse in these matters, and instead of letting the materials influence us and suggest the design, we let them have no voice in the matter at all, but simply shape them into the arbitrary forms we have learnt at school.

Brickwork.

Passing on to consider bricks and brickwork, I suppose every architect has in his office one of those perfect bricks that is the manufacturer's pride and joy, absolutely regular in form and uniform in tint, and which is just everything that a brick should not be—from the point of view of the artist in building. A brick is after all a piece of baked clay, and its beauty consists of its character. It should have the characteristic surface and texture of mother earth. It should be of the earth earthy. In this connection, I remember a great collector of Japanese pottery once showing me a little rude earthen pot. It had no elegance of shape, and would have been scorned by the average buyer of vases. And yet in Japan it was held a perfect thing; and its chief claim to beauty rested in the fact that its form implied the expression of the character of its material. The object of the artist in making it had been to express its inherent clayeyness: subordinating all his own personal aspirations about form, he had sympathetically divined the character of his material. And a nation of artists understood his aims, and appreciated his efforts. And so our bricks first of all express the true inwardness of the stuff they are made of.

Then as to their color, a tint which is subtly varied must necessarily be more beautiful than a uniform shade, and more in harmony with natural surroundings. The mortar joint should not be a succession of mechanically ruled lines, and should be neither too light nor too dark in tone, but introduce into the color scheme a tone of neutral grey, which is always so useful in the general effect of the work—helping to give it that kind of bloom, that indescribable quality of tone, which we find in old brickwork, such as that at Cambridge, for instance.

Roofing Materials..

Then in the matter of roofing materials: the most important quality here is texture, and so tiles should be thick, and if their new color, as is generally the case, is too even in tint to be good, they must have such a texture as will weather and vegetate quickly. It is most important also that the tiles should have those slight irregularities of form and surface which give such interest and charm to old roofs. Nothing is so fatal to the beauty of a roof as tiles which are absolutely regular—giving the effect of a surface ruled with absolutely rigid horizontal lines. You might just as well cover your building with galvanized iron at once. There are at present perhaps no entirely satisfactory tiles made from the point of view of the building artist. The best of them will strike a jarring note of red in the country, and the darker ones are too even in tone to be good. If it is impossible to get old tiles, one is bound to accept a tile which is very crude in its effect for the first few years. Perhaps some day tile makers will weather and mature our tiles for us.

Probably you will agree with me that the finest kind of roof is one of stone—such as the Colley Weston. It is one of the few materials for roofs which is beautiful when new and grows in grace with age.

Slates have the defect that they do not readily yield to nature's inimitable coloring. The rougher and thicker they are, the better the artist in building will like them; and except in their own special locality he will, perhaps, prefer a good grey tone to the more fashionable green.

*Full text of lecture delivered at Carpenter's Hall, London, England.

There is a kind of harshness about slates which makes them specially at home in bleak and barren uplands, or in windswept open spaces by the sea; while the kindly warmth of tiles makes them more adapted in wooded and sheltered places.

It is unfortunate that thatch is not more widely used for small buildings. If it is treated with some preparation to make it fireproof, the main objection to it is removed. It affords far the best protection against outside conditions either of heat or cold, and so is well adapted for small buildings where the bedrooms are in the roof.

The Treatment of Timber.

In the use of timber for building many opportunities and possibilities are lost in the initial preparation of the material, as well as in its subsequent treatment in the workshop. In dealing with materials generally, and perhaps timber in particular, there are two main ideals which may be followed. In the case of timber which has no great hidden beauties to bring to light by high finish, it is wise to aim at securing some suggestion of those natural graces which belong to its living existence as a tree. In the case of other special timbers we may give up this natural beauty for those qualities which can only be educed by a high degree of finish. The great thing to avoid is to halt between these two ideals, and so spoil our horn without achieving a spoon.

I cannot help but note here how strangely these general principles apply to all departments of life. You may remember how this was illustrated in one of those charming early novels by Bernard Shaw, where the hero, merely from being a master of the art of prize-fighting, gained in a degree an insight into the principles which should govern all arts. That is perhaps an extreme case. But the point I specially want to note here is, that in writing an essay on the treatment of material and in showing how they may be educated, I find the same remarks apply exactly to the whole question of education; and the same defects occur in educating human beings as in educating planks of wood. In both cases we so often spoil our horns without making spoons, and so often try to make silk purses out of sow's ears. But while the human problem is an immensely difficult one, involving a sympathetic insight into the nature of the pupil and his possibilities, in the education of materials in the workshop it is relatively simple; and by the use of hand tools, at any rate for finishing the work, we cannot go very far wrong.

It is better in most cases to finish such timber as oak with the adze instead of the plane. Let me add a few words as to the higher education of such materials as mahogany, rosewood, and the like.

Even here I don't want an absolute level surface or straightness of line; but just such subtle undulations as a sculptor might make in highly finished marble. The surface must just so far be alive as that. And then not glassy French polish with its disconcerting stare that is like that excess in glossiness and shininess in boots and hat which we associate with a certain type of city gentleman. Instead of that, let us have the quiet, unobtrusive sheen which a wax polish gives.

In the development of design from the suggestions of the material, a very good instance is that kind of inlay work which consists of a landscape in which the markings of the timber, which so often suggest landscapes, are taken as the basis of a design. Another example is in the use of cross sections of laburnum wood. This material, as you are probably aware, has the annular rings extremely well marked, and these cross sections were often used in old work in hexagons, or in what I think is called the oyster-shell pattern, with very fine effect. The grain of wood, as well as its natural color, will give the best basis of design for inlay; and unless the designer is in close touch with his material here as elsewhere, he will lose all his opportunities. In this mosaic of wood, which we call inlay, I believe that the best results may be gained by slight variations of plane in the surface.

In wood carving what suggestions has the material to offer? We must respect its limitations and possibilities, and our wood carving must be primarily just another means of educing the woodenness of the wood. That is the main characteristic which strikes us in old work. The woodwork is essentially wooden; there is a kind of blunt knobbiness about it. The material has been educated, and its hidden characteristics brought to the surface. When the Renaissance came that ideal was lost, and the material was used merely as an unregarded medium for expressing the conceptions of the designer.

Let us take the case of that famous carver Grinling Gibbons, and let us begin by paying a proper tribute to that almost miraculous skill which places his work almost beyond criticism. He is such a master of his tools that we find he has fallen into the too common fault of ignoring and overriding all the true inwardness of his timber. He is not interested in it at all, but only in his own designs, and merely wants a nice obedient and accommodating material, and so he carves in soft wood. He will then give us a lobster, perhaps, or a bunch of pheasants, rendered with marvellous imitative exactitude. We may wonder, as we do wonder, at these Renaissance triumphs, just as we wonder at fireworks. But art should move us to something more than that. If we want to look at lobsters we can see them in any fishmonger's shop. This imitative rivalry with Nature is the stupidest kind of ideal. And so the work of Grinling Gibbons, wonderful as it is, seldom becomes more than a kind of curiosity of art—a triumph of mechanical skill.

Tiles.

It is a difficult matter for the building artist to find a modern glazed tile which he can use. The manufacturers have all aimed at a mechanical regularity of shape, uniformity of pattern and staring glassiness of glaze, which make practically all modern tiles impossible. There are, of course, or rather there were, the de Morgan tiles, which, excellent in color and design, were still somewhat glassy in their effect; and certain modern makers have produced dull tiles which err on the other side, and have a dead lack lustre aspect. Where then is the perfect glazed tile to be found? Probably only nowadays in the old Dutch tiles. In these the glaze has a thick and creamy quality of subtly varied tones, and in form, texture, and patterning they are full of individual character. It is the same story over again, and beauty has been achieved by sympathetic treatment of material and expression of its qualities. The drawings on these tiles would probably be a matter of scorn to any modern draughtsman, and yet they are perfect in their way, because they speak eloquently of material and process of manufacture. Is it too much to hope that some of our modern makers can learn this simple art, and give us tiles which do not fix us with a glassy stare? In the meantime, the building artist must do without tiles altogether, or use the old Dutch tiles.

Plasterwork.

No one has done more than Mr. Bankart to revive the possibilities of the use of plasterwork, and in his work you cannot find a better example of design in close association with workmanship—design which evolves and emphasizes the qualities of the material. There are two points in regard to plasterwork which I should like to bring before you. One is texture. Mechanical ideals in this, as in other materials, have led to absolutely smooth rigidity of finish, which obliterates all the character of the material, and those suggestions of methods of workmanship which lend such interest to the work. Do not then necessarily finish your plaster with fine stuff, but preserve the texture which the sand gives, and finish from the float with subtile variations in plane. In the arrises, such as those which occur at the sides of a dormer window, do

not work to a rigid line such as is given by a cement or wooden bead, but let the line of the arris take the characteristic line which results from deviations in plane of the surface of the plaster, and let this slight waviness of line occur in your plaster cornices as vague and soft in its outlines as waves of the sea. Let the finished plaster still retain some hint that it was soft and yielding when used; let it flow round the woodwork perhaps engulphing it partially, as if it had risen like a flood which had been frozen. You will find many examples of these qualities of plaster in old work, and but few in modern times. Then as to color, the natural tint given by the sand will often be found to be a good one, and in such cases the plaster may be left untinted. If, however, the plastering is tinted, let it be for choice some tint which is germane to the material—an earthy color, such as ochre, and not Nile green, peacock blue, or any of those shades dear to the art decorator.

Glass.

The use of glass in building is generally wisely confined to the windows. Here, again, we building artists want it to be made and used in the old way—in comparatively small planes, with those slight variations of surface which give our windows a friendly twinkle, instead of a glassy stare. Glass is a material to be used with caution in a building. The less we have of it the better, unless its surface is very much broken up, as in glass mosaic, for instance. Glass tiles are harsh and glaring in their effect. Glass shades so much in vogue in the Victorian era have now been happily banished to the garden.

Metals.

In considering the metals used in building, I have to weary you with the same demand for the evolution of character. In wrought iron, for instance, the particular form you may fancy for the hinges or latches of your doors gains its chief value as design, according to the extent to which it expresses the qualities of the material. In wrought iron we have a substance which, rigid when cold, becomes in the heat of the fire a soft and ductile thing, and the expression of that gentler mood of the iron is the most charming thing we can express about it. It can be shown by outlines which seem to be the resultant of surface pressure—by the swelling of the soft metal round the stamp of the die, as in old coins and in many other ways. In simple ironwork the filing of the cold iron may be combined with the hammering of the hot metal. In finishing such work do not obliterate all the varied tints of the surface with black paint, but finish with linseed oil instead, so that you retain the brighter notes of the file work with the grey tones of the forged iron. In cast-iron work we have plenty of fine examples in the old firebacks that used to be made in Sussex, and many more examples in modern work of inferior work which has made the very name of cast-iron a reproach. The same suggestion and somewhat vague modelling that expresses the qualities of plaster is equally right here, and these qualities in the mould will save the work from that forbidding precision and rigidity which we associate with the term cast-iron.

Reinforced Concrete.

In this brief review of materials, considered from the standpoint of the building artist, a word may be said as to that extremely revolutionary and radical material, ferro-concrete. There is something necessarily illogical in the use of this in connection with those architectural forms which have been evolved as vital and essentially structural features in the buildings of the past. If we are going to use ferro-concrete let us be logical about it, and recognizing its revolutionary character, let us have here, if nowhere else, a new style. Let the adornment of the structure within and without be admittedly superficial in character, with no sham features about it.

In Venice the greatest painters of the time used to adorn the external walls of their buildings with paintings. That would hardly serve in London to-day; but nothing could be better than mosaic and tiles, and such like washable materials used in decorative ways. And in the country this surface mosaic may take a local flavor, which, by the use of pebbles in the form of rough-cast or flints, as already referred to, may bring the building into harmony with nature. If we consider our function as adorners of the earth's crust, we must make our adornments out of the same materials as that crust—just as a pastrycook adorns his pies with pie-crust. Stone, brick and timber are all sound materials to expose to view in the building, but not iron.

Now I daresay there are some of you here who may think that all this talk about art in connection with building, is not very practical. But what does art mean to the worker? It means pleasure in his work. It means the gilding of dull necessary tasks with delight. More and more in the modern world it has become to be the custom to consider work as merely a means of making money to buy our pleasures with; and we lose sight of the fact that the best of all the pleasures that the world has to offer is in the production of work which we believe to be good. If we are going to spend the greater part of our lives in some pursuit, is it not well to see that we get all the delight out of it we can? That would seem a selfish kind of argument were it not happily true that pleasure in the worker begets pleasure in the beholder too. Is there no room in the modern world for the craftsman? Kipling pictures—

> Who lest all thought of Eden fade
> Brings Eden to the craftsman's brain,
> To Godlike muse o'er his own trade,
> And manlike stand with God again.

Let us hope that the artist of the future will find both his work and his pleasure in the creation of the world in which we live—the world of building. Instead of arranging colors on a canvas, let him arrange brick, stone, and wood on hill and dale, in such simple and noble forms that the very spirit of the country will be explained and rendered articulate by his work. Instead of communities of little artistic villas, smugly conscious of their prettiness, let us try to achieve in our smallest buildings those qualities of realities and earnestness which will alone make them seem at home with the creations of nature. And in conjunction with the house builder let us have the garden maker confirming his efforts, not merely in the grooming of suburban villa plots, but in making the wilderness to blossom as the rose. We do not want the dilletante pedantries of architectural art. Let Roman art be for the Romans, and Grecian for the Greek. Here in our Northern clime let us evolve our own art as our fathers did, from our natural conditions of climate and of race.

C.C.C.A. CONVENTION AND EXHIBITION.—Final Arrangement Completed for Gathering of Cement Interests at London. ∴ ∴ ∴

FINAL ARRANGEMENTS for the second annual Convention and Exhibition of the Canadian Cement and Concrete Association held at London, Ont., March 29, 30, 31, and April 1st, have practically been completed and every indication points to an event that will far surpass in every way the initial meeting held in Toronto last year. An unusually attractive programme has been prepared, covering as it does a wide and varied range of subject matter of vital interest to the industry, and introducing some of the most prominent authorities on cement and concrete in Canada and the United States. Many of the papers and lectures present will be illustrated with stereoptican views, and among those who will address the Convention will be Richard L. Hum-

phreys, president of the National Ass'n of Cement Users in the United States, and Director of the Government Structural Material Laboratory at Pittsburg; Phillip L. Wormely, of the Department of Agriculture, Washington, D.C.; Percy H. Wilson, Secretary of the Association of American Portland Cement Manufacturers, Philadelphia, Pa.; and F. S. Baker, President of the Royal Architectural Institute of Canada.

The official programme is as follows:—

PROGRAMME

Tuesday, March 29th

2.30 O'CLOCK P.M.

Annual Address by the President—Peter Gillespie, Lecurer in Theory of Construction, University of Toronto.

Concrete Construction—Cecil B. Smith, of Smith, Kerry & Chace, Consulting Engineers, Toronto, Winnipeg and Calgary.

The Use of Concrete in Dwelling-House Architecture—Ernest Wilby, Architect, Detroit, Mich. (Paper to be read by Secretary.)

Waterproofing of Concrete—R. A. Plumb,, Chemist, Detroit, Mich.

8.00 O'CLOCK P.M.

The Use of Cement in Architecture—F. S. Baker, President Royal Architectural Institute of Canada.

What Concrete Means to the Farmer—Percy H. Wilson, Secretary of the Association of American Portland Cement Manufacturers, Philadelphia, Pa.

Inexpensive Homes of Concrete—Milton Dana Morrill, Architect, Washington, D.C. (Paper to be read by the Secretary.)

Wednesday, March 30th

10.30 O'CLOCK A..M

Discussion of Proposed Standard Specifications.

2.30 O'CLOCK P.M.

Concrete Bridges—A. W. Connor, of Bowman & Connor, Consulting Engineers, Toronto.

An Analysis of Concrete Bridge Failures—C. R. Young, of Barber & Young, Bridge and Structural Engineers, Toronto.

Concrete Roadway Construction—C. W. Boynton, Chief Inspecting Engineer, Universal Portland Cement Co., Chicago, Ill.

Concrete—James Bell, of Bell & McCubbin, Civil Engineers, St. Thomas, Ont.

8.00 O'CLOCK P.M.

The Engineer and the Finished Work—A. W. Campbell, Deputy Minister of Railways and Canals, Ottawa.

The Construction of Concrete Highway Bridges—Chas. Talbot, County Engineer for County of Middlesex, London, Ont.

Concrete Pavements—James Pearson, President The Constructing and Paving Co., Toronto.

Thursday, March 31st

10.30 O'CLOCK A..M

Election of Officers.

2.30 O'CLOCK P.M.

Concrete in Europe—Richard L. Humphrey, President National Association of Cement Users and Director of United States Structural Materials Testing Laboratories, Pittsburg, Pa.

Some Experiments with Cement Tile—W. H. Day, Professor of Physics, Ontario Agricultural College, Guelph.

The Uses of Concrete on the Farm—Philip L. Wormeley, Testing Engineer, Office of Public Roads, United States Department of Agriculture, Washington, D.C.

The Hardening of Portland Cement—A. G. Larson, Chemist, The Grey and Bruce Portland Cement Co., Owen Sound, Ont.

8.00 O'CLOCK P.M.

The Annual Dinner of the Association, at the Tecumseh House.

Friday, April 1st

2.30 O'CLOCK P.M.

Government Testing Laboratories—Richard L. Humphrey, President National Association of Cement Users and Director of United States Structural Materials Testing Laboratories, Pittsburg, Pa.

The Commercial Aspect of Reinforced Concrete in Canada—Gustave Kahn, General Sales Manager, Trussed Concrete Steel Company of Canada, Toronto, Ont.

What the Concrete Block Means to Canada—J. Augustine Smith, Secretary and Sales Manager, Ideal Concrete Machinery Co., South Bend, Indiana, U.S.A.

Concrete from the Contractor's Standpoint—D. C. Raymond, Vice-President, Bishop Construction Co., Montreal and Toronto.

The exhibit feature of the Convention will be held in the Princess Rink, which offers excellent accommodations for display purposes; and the array of concrete machinery and appliances will be complete in every respect. Included in the list of exhibitors are a number of firms from the United States, and several of the splendid exhibits seen at the Chicago show will be in evidence. The Eastern Passenger Association has granted reduced fares ond the certificate plan to delegates attending the Convention. Delegates will purchase, at their home station one-way tickets to London, obtaining at the same time from their local agents, receipts on a standard form for the money so paid. These receipts, when validated by the secretary of the Canadian Cemen tand Concrete Association, will entitle the holders thereof to return tickets free of charge.

SEVERE TEST FOR TERRA COTTA.

A MOST EXTRAORDINARY TEST of the structural possibilities of flat arch terra cotta construction, was conducted by Prof. Peter Gillespie, lecturer on the "Theory of Construction," of Toronto University, recently at the works of the Don Valley Brick Company. The result of the test proved beyond question the feasibility of floor construction in panels much larger than are usually used.

The panel constructed for the test was 7 ft., 9 in. by 8 ft. in dimensions, and was built entirely on the end construction plan, between two 18 inch steel eye-beams weighing 55 lbs. per foot. It will thus be noted that this panel is of much larger dimensions than the ordinary terra cotta floor panel, and for this reason the test was considered a most severe one. The panel was designed to carry a load of 200 lbs. per square foot. The loading consisted of sacks of cement and clay piled in tiers of 28 bags in such a way as to approximate as nearly as possible a uniformily distributed load.

After fourteen tiers of sacks had been placed on the panel, producing a load of 546 lbs. per square foot, without giving the least evidence of failure, it was found impossible to load the panel to destruction, for the reason that the roof of the building did not permit of adding any additional tiers without great inconvenience. It might be stated, further, that the load remained on the panel for several days, without producing a deflection in excess of that which occurred at the time the load was originally placed on the panel, which was 11-32 of an inch.

The Don Valley Company has every reason to feel highly gratified over the result of this exceedingly severe test to which their product was subjected.

ATTRACTIVE EXTERIOR OF JACOB'S BUILDING.

ONE OF THE MOST ATTRACTIVE features of the new Jacob's Building, now under course of erection in Montreal, and described in the March number of CONSTRUCTION, will be its exceptionally handsome appearance, produced by the use of Burmontofts semi-glazed, cream Marmora terra cotta, for the entire exterior of the building. This material is being extensively used in all parts of Canada, for the exterior finish of some of the largest and most attractive business and bank buildings.

Teranno flooring as well as stair treads, well known to Canadian architects, is being used in the St. Regis Cafe which is to be located in the Jacob's Building. Both of these materials are supplied in Canada by Messrs. Eadie-Douglas, Ltd., of Montreal.

CONCRETE BLOCKS.

IN MANY SECTIONS throughout the country, the lack of suitable materials and facilities for the manufacture of clay building products, makes concrete blocks a most desirable and economic material for the construction of practically every type of building. Good sand and gravel are to be found in large qpantities in almost every community, and as these are basic elements in the manufacture of concrete blocks, their production, therefore, is brought within a moderate cost. From a sanitary standpoint, there is much to commend this character of

product while as regards its artistic possibilities, sufficient has been done to demonstrate satisfactorily that very excellent results can be obtained.

The residence of Mr. F. A. Fraser, Bowmanville, Ont., constructed entirely of concrete blocks, is seen in the accompanying illustration. This structure is built

Residence of F. A. Fraser, Bowmanville, Ont., built entirely of concrete blocks.

of 12 inch blocks for the foundations and 10 inch and 8 inch blocks for the second and third storey, respectively the core opening of the blocks varying from 3½ inches in the basement walls to 2½ inches in the superstructure. It will be noted that the size of the core openings are smaller than is generally the case. This reduction in size is due to the fact that the owner is of the same opinion as a large number of contractors who have come to believe that too much in the past has been expected from concrete blocks in the way of crushing strength. It is contended in many cases that walls of this character are too light, owing to large openings ,and that this is invariably the cause of the unsightly cracks that develope in a wall. A greater bedding surface and a smaller opening, if generally adopted, it is maintained, would do much to advance the interests of the industry. The blocks used in the walls of this particular house were made on the London Concrete Machinery Company's "Face-down Adjustable Block Machine," while the sills, steps, window heads, porch columns, etc., were made on moulds manufactured by the same company.

This company will have a large exhibit at the C. C. C. A. Cement Show to be held in London the last of this month, where those in attendance will find much interest.

CORRECTION.—We beg to call our readers' attention to an error in our Western Number, which we herewith desire to correct. Through some manner or other, the new Edmonton High School, designed by Architect Roland W. Lines, was included in the ilustrations and text relating to Calgary and hence designated as a structure of that city. This building, which is one in which the School Board of Edmonton has evinced a liberal spirit, is now under course of construction. It will have thirteen class rooms, chemical and physical laboratories, lecture rooms, a large library and a manual training and domestic science departments. Further than this, it will be provided with a two story auditorium having a gallery, and also a large gymnasium equipped with shower baths, dressing rooms, locker room, etc. The building will be ventilated by the "Forced draft system," and in plan and character will be one of the most complete school structures in the Canadian West.

STEEL EXPOSED to the action of sea-water and the weather is said to corrode at the rate of an inch in 82 years and that an inch of iron under the same conditions corrodes in 200 years. For the combined action of fresh water and weather the respective periods are 170 years for steel and 630 for iron.

AN ENGLISH trade journal states that oil stains on concrete floors may be removed by using a mixture of one ponud of oxalic acid in thre gallons of water, with enough wheat flour added to make a paste that can be applied with a brush. Allow this to remain on the stains for two days and then remove with clear water and a scrubbing brush. A second application will be found to remove the most stubborn case.

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

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TERMS OF SUBSCRIPTION

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Saturday Night Building

TORONTO - - - - - CANADA

BRANCH OFFICES

MONTREAL—Board of Trade Building, LONDON, ENG.—Byron House, 85 Fleet St. E.C.

Avenue of Approach, Residence of Wallace H. Rowe, Cobourg, Ont., showing detail of entrance gate to grounds. Rutan & Russell, Architects.

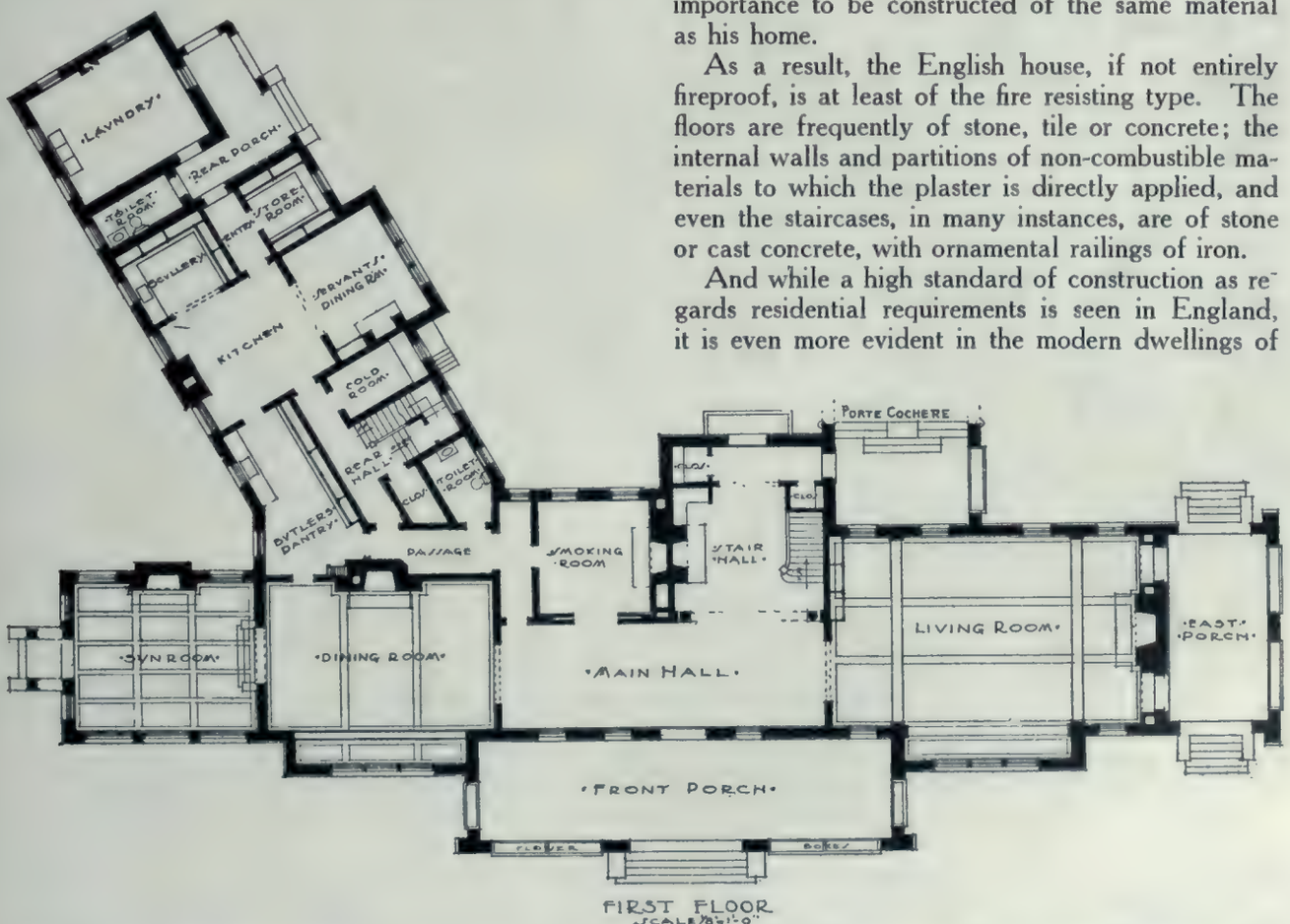
TERRA COTTA IN RESIDENTIAL WORK.—A New and Interesting Application of an Old and Well Tried Material.—Architectural and Constructive Possibilities in Fireproof Dwellings.

THE FIREPROOF or fire resisting residence, while not entirely unknown in Canada, is still as yet somewhat of a novelty. Homes of this type are in fact almost as scarce as the proverbial hen's teeth. As a country just awakening to its commercial and industrial possibilities, we have not been slow to recognize the value of fireproof structures to serve our business and governmental needs, and each succeeding year is witnessing a greater use of non-combustible materials in the erection of our office buildings, warehouses, factories, banks, hospitals and kindred institutions. Stricter building regulations and the economic foresight of a large number of prospective owners, have helped to make progress in this direction; but as regards residential structures, we still, as it were, "temporize" and do little or nothing to render our homes being other than a constant drain on the country's material resources.

As with the United States, where the fire loss amounts to a weekly average of over sixteen hundred residential buildings alone, we squander needlessly each year, a sum that runs away up into the round figures. Each day the press brings its fresh list of fire destroyed and damaged dwelling structures. Permanency of material, both attributive and essential to the home, is something we too often fail to consider. At least, we do not consider the question of permanency and durability in this particular, as it is considered in England and European countries. Inconspicuous and modest as the English home may be, its walls, nevertheless, are built of brick or stone, or other equally substantial forms of masonry construction. The English house, again, when plastered, is plastered on the same permanent walls, and not over cheaply built wood frames, as is invariably the case in this country. Moreover, the roof is always of slate, tile or stone, and shingle for this purpose is never thought of for the moment. Wood, such as clapboards or shingles, is not employed on walls, in a dozen localities throughout the country, and then only for such structures as bath houses and sheds, and even these are generally considered by the owner, of sufficient importance to be constructed of the same material as his home.

As a result, the English house, if not entirely fireproof, is at least of the fire resisting type. The floors are frequently of stone, tile or concrete; the internal walls and partitions of non-combustible materials to which the plaster is directly applied, and even the staircases, in many instances, are of stone or cast concrete, with ornamental railings of iron.

And while a high standard of construction as regards residential requirements is seen in England, it is even more evident in the modern dwellings of



First floor plan, Residence of Wallace H. Rowe, Cobourg, Ont. Note the spacious dimensions and position of rooms. Rutan & Russell, Architects.

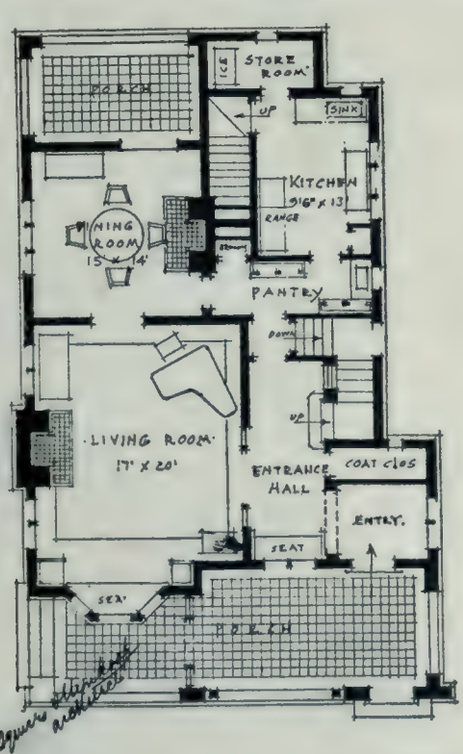
Residence of Wallace H. Rowe, Cobourg, Ont. This house is of fireproof construction throughout, the exterior and interior walls being of brick and tile, and the floors of combination hollow tile and reinforced concrete construction in long spans. The exterior is finished in concrete stucco with a pebble dash surface, cream white in color, and the roof is of tile. Rutan & Russell, Architects.

France, Germany and Italy. What is viewed as a serious fire in any of these countries, would be considered of infinitesimal proportions in Canada, so thoroughly indeed are the homes in Europe built. Germany, in particular, has made remarkable strides in the construction of economical, durable, fireproof dwellings, and the inexpensive, simple and sanitary class of workingmen's cottages produced in that country, like those of England, could be studied

Residence of Charles A. O'Malley, Newark, New Jersey, showing an interesting architectural treatment in terra cotta construction. Squires and Wynkoop, Architects.

to advantage by any government engaged with the solution of a similar economic problem.

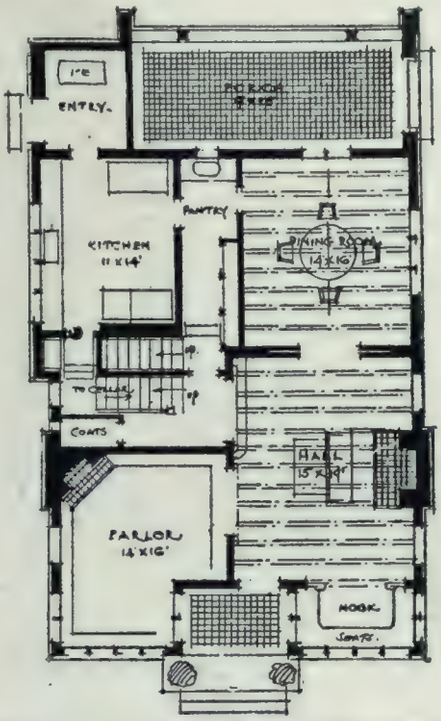
There are certain influences at work, however, that indicate an approach to a material betterment in the construction of domestic work in Canada. One of these is the interest the Government is manifesting to conserve the natural resources we possess,



Ground floor plan, Residence of Charles A. O'Malley, Newark, N.J. Squires and Wynkoop, Architects.

and the steps which are being taken to prevent the destruction of our forests, such as that which divested the United States of its great wealth in this respect.

Another influence is the enactment of more rigid building by-laws and the extension of fire limits; and, although as yet these admit of a broad latitude for the use of wood in the construction of dwellings, wood itself has gradually increased in value until the cost has reached a figure which makes the



Ground floor plan of house owned by J. William Clark, Newark, N.J. Squires and Wynkoop, Architects.

substitution of a more enduring material advisable.

This has led, or is leading rather, to a greater use of non-combustible materials. The careful builder is beginning to consider the question of cost in relation to the permanency of his investment, instead of in the initial outlay only. Brick is more in demand than formerly, and substantial strides are

Terra cotta construction as seen in house built at Newark, N.J., for J. William Clark. Squires and Wynkoop, Architects.

being made with concrete as a material; while another substance, quite new in this application, which is engaging the interest of a large number of architects and contractors, is terra cotta.

Although the use of this material for residential work on this continent antedates the present by but a couple of years, already a large number of terra cotta houses have been built in New York and

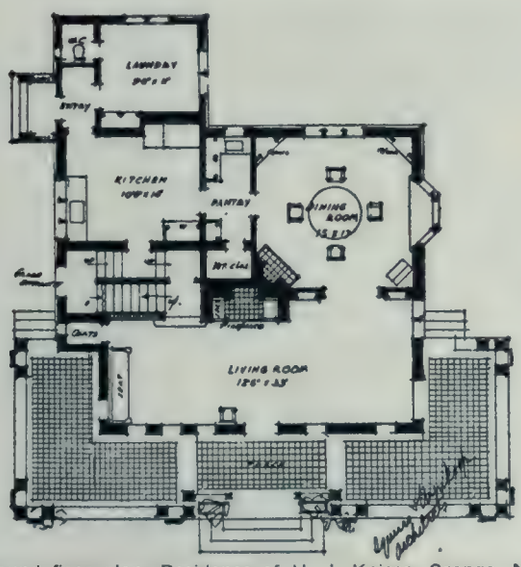
Residence of Wallace H. Rowe, Cobourg, Ont. View showing porte cochere and garden front on north side of house. Rutan & Russell, Architects.

several of the more eastern States. When plans for the first dwelling of this kind in New York were filed with the Building Department, the authorities were somewhat at a loss to know as to whether the structure would meet the requirements of building

Home of H. J. Keiser, Orange, N.J. A fireproof house with an attractive tile roof.

regulations or not. Upon investigation, however, the officials found that this clay material was perfectly safe. The owner of the proposed house was Amos Schaeffer, an engineer attached to the Public Service Commission, who has studied the unfamiliar style of construction thoroughly and found that terra cotta houses would serve all demands, both structurally and otherwise.

As it goes into the walls and floors, the terra cotta is in the form of hollow blocks, such as has



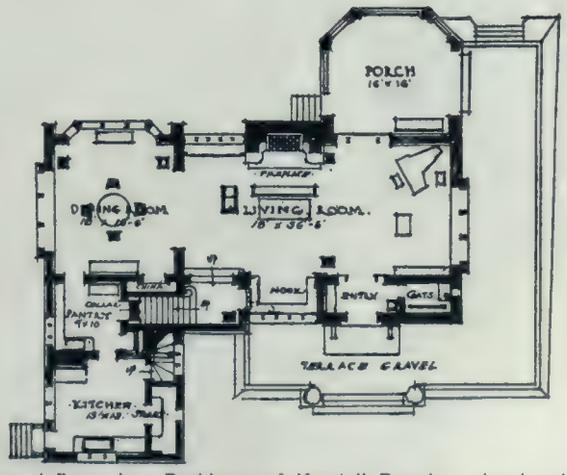
Ground floor plan, Residence of H. J. Keiser, Orange, N.J.

been used for years in the fireproofing of large commercial structures. Only, in residential structures the heavy structural steel which forms a great item in the cost of large standard fireproof buildings is entirely eliminated. The only steel used in fact, is small tension members for reinforcing purposes. This effects a big reduction in cost, and makes it possible to build an enduring fireproof home, within the amount usually expended on brick and other masonry dwellings in which wood form the basis of internal construction. But aside from its fireproofing qualities, another advantage of this form of construction—and by no means an unimportant one—is the fact that the blocks are so laid end to end that they form continuous air spaces. These air spaces render the walls impervious to heat and moisture, with the result that the house of this character is warmer than the average building in winter and cooler in summer. Hindrance in the transmission of sound is also likewise effected, and the danger of vermin is entirely precluded by the nature and density of the material itself.

The most common and economical floor of its

Residence of Kendall Banning, a house of terra cotta with unusually interesting roof lines and effective window grouping. Squires and Wynkoop, Architects.

kind, is one that contains both terra cotta and concrete in its construction, the concrete being used in place of beams. In carrying out the work a false floor of wood is set up with spaces between the planks at regular intervals. Over the open spaces are laid the terra cotta blocks in parallel lines in the position they are to occupy permanently, and the concrete is poured in between them. When the concrete has hardened the blocks are held immovable, and the floor is solid as any floor can be. Quite often the floor is reinforced in both directions, in



Ground floor plan, Residence of Kendall Banning, showing the general scheme of rooms. Squires and Wynkoop, Architects.

which case the transverse strain is taken up by a metal fabric running lengthwise of the arch, through which rods are interwoven at space four inches apart. A variation of this plan in the construction of the

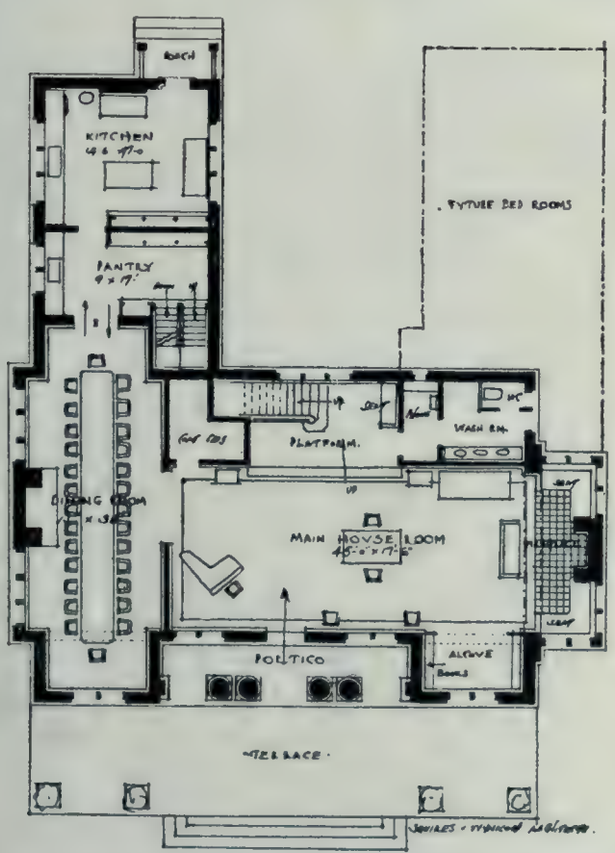
Main Hall, Residence of Wallace H. Rowe, Cobourg, Ont. A beautifully proportioned interior, with simple lines and a restful wall scheme. Note the absence of large or numerous wall hangings and the few well placed pieces of furniture. Rutan & Russell, Architects.

Dining Room, Residence of Wallace H. Rowe, Cobourg, Ont. A spacious room with good lines and simple decorations. Rutan & Russell, Architects.

upper floors is to extend the concrete, beams downward below the surface of the terra cotta. This creates the effect of a beam ceiling which can be treated with a coating of cement and tinted in any color desired. This method, of course, requires a

Terra Cotta House of the Phi Delta Theta Fraternity at Union College, Schenectady, N.Y. Squires and Wynkoop, Architects.

more complicated centering for the concrete than when the floor has both the upper and lower surface even. As regards the partitions, these are constructed in a similar manner to the exterior wall, only it is not required as a rule that they should be as great in thickness. A house carried out entirely in



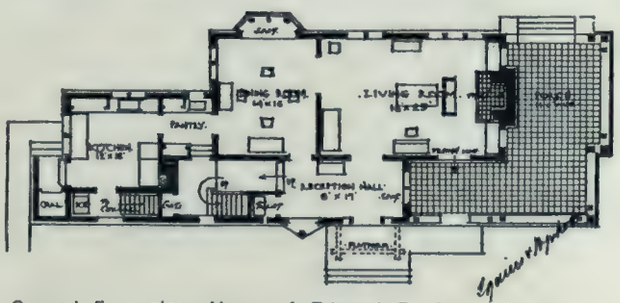
Ground floor plan, Phi Delta Theta Fraternity House, Union College, Schenectady, N.Y. Squires and Wynkoop, Architects.

terra cotta is both fireproof from within and without, and in event of a fire starting on the interior it can be confined to the room in which it originated until extinguished.

Forming the illustrated features of this article are a number of interestingly designed houses in which terra cotta is the principal element of composition, in most instances the structure, with the exception of the roof, being wholly of this material. Notable among these is the fireproof residence of Mr. Wallace H. Rowe at Cobourg, Ont., designed by Messrs. Rutan and Russell. This is not a terra cotta house in its entirety, but one with exterior and interior walls of brick and tile, and floors of combination hollow tile and reinforced concrete in

Home of Edward D. Page, one of a little fireproof village on the outskirts of Orange, N.J. Squires and Wynkoop, Architects.

long spans. There is absolutely nothing in any part of the body of this structure to invite destruction by fire. The roof is of tile and the exterior is finished with concrete stucco, cream white in color and having a pebble dash surface. On the interior, where a most restful homelike effect has been obtained with large rooms having simple lines and harmonious color scheme, the house is finished principally in cream white painted woodwork, with mahogany base board and window sills. The scheme of design throughout, with two exceptions, is of a very simple form of old Colonial. These two exceptions are the sun room and den. The former has a beam ceiling of quaint design in Southern Georgia



Ground floor plan, Home of Edward D. Page, Orange, N.J. Squires and Wynkoop, Architects.

pine, and a large stone fireplace, both in keeping with the exterior character of the room. The den is carried out in a quaint treatment in Tyrolean design, with wainscotted walls and ceiling formed at angles, and marked with decorative carved beams and panels, while the surface of the woodwork has a rough hewn effect.

In the other houses, the exterior and interior walls and floors systems are wholly of terra cotta, with

Residence of Wallace H. Rowe, Cobourg, Ont. View showing Sun Room projection and west grounds. Rutan & Russell, Architects.

Stable and Garage of Wallace H. Rowe, Cobourg, Ont. Like the residence, this structure is built throughout of incombustible materials. Rutan & Russell, Architects.

the exception of the residence of Professor James E. Lough, of the New York University, which was the first terra cotta house built within the confines of New York City. In this house the third floor has wood joist instead of fireproof beams, like those of the first and second floor. These illustrations

Residence of A. B. Steen, Oil City, Pa. Note the architectural possibilities of terra cotta, as shown in the general treatment of this exterior. Squires and Wynkoop, Architects.

serve to demonstrate the opportunity for architectural variation and adornment which this material offers. In this connection it may be mentioned that some of the handsomest country homes in the Eastern States are of this form of construction.

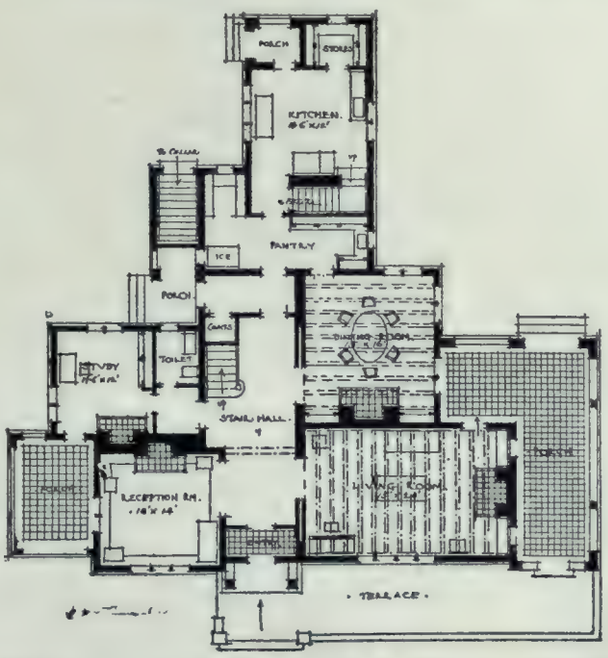
Of interesting design is the house of Mr. Edward D. Page, which is one of a little terra cotta village on the outskirts of Orange, New Jersey, built by the heirs to the Henry A. Page Estate. Each of these houses has from eight to ten rooms, and in one is a floor span of eighteen feet, the longest yet built in this type of construction. A similar undertaking has just been begun in Newark, New Jersey, on a

Home of Prof. James E. Lough, University Heights, New York, the first terra cotta house built within the corporate limits of that city. Squires and Wynkoop, Architects.

tract of land owned by J. William Clark, overlooking Brank Brook Park. One of the two houses already erected is shown in the illustrations. The floors, bearing walls and outside walls are of eight-inch tiles, the non-bearing walls of three-inch tiles, the roofs are covered with slate and the interior finish and superfloors are of wood. The cost of the two houses is about nineteen thousand dollars.

The house designed for Mr. Banning is built on a concrete foundation, and is a long rambling structure, suggesting a modified farm house construction. The tiled roof is in four shades, running from orange to deep orange-brown near the eaves, and forms a very pretty contrast with the cement stucco wall surface. Equally as attractive is the house designed for Mr. Keiser, which is both picturesque and original in color and proportions. The long roofs are of convex tiles, dull red in color, and the walls are a rich cream. The house of Mr. A. B. Steen apparently has nothing about it structurally that can rot or depreciate; it is absolutely fireproof. This house demonstrates the freedom with which terra cotta adapts itself to design and plan.

The other two structures shown also possess a strong element of interest, particularly the home of the Phi Delta Theta Fraternity at the Union College, Schenectady, N.Y. The exterior in both in-



Ground floor plan, Residence of A. B. Steen, Oil City, Pa. Squires and Wynkoop, Architects.

stances is finished with a cement stucco; although in this respect, it may be said, that several attractive houses have recently been erected in the United States where the terra cotta walls are left exposed.

As to the question of cost, the extension of the use of terra cotta to the field of domestic work establishes an exceptional opportunity for economic investment. A structure built, both within and without, entirely of this material, varies but little, if at all, in cost with that of any other type of masonry residence in which wood is specified for internal construction. Compared with frame construction alone, the cost is from 10 to 25 per cent. greater, but this difference is gradually being lessened by the constantly increasing cost of lumber and a broadening experience in the use of this more permanent substitute. Again, any disadvantage occasioned in the initial outlay is more than offset by certain definite economies which terra cotta make possible, such as a saving in painting and repair work, which the yearly deterioration of a frame house entails; also a saving in the cost of fuel, and last, but not least, the item of insurance, which is reduced to a minimum, and in most cases is required only for the furnishings and household effects.

Facade of the Maggiore Hospital, Milan, which accommodates more than 4,000 patients and was founded by Duke Francesco Sforza and his wife Bianca Marie in 1456, on the site of an old palace of Bernabo Visconti. It is one of the most magnificent examples of the brick and terra cotta work of the middle ages and was designed by Antonio Filerete.

THE HOSPITAL MAGGIORE, MILAN.—Beautiful 15th Century Structure Which is Regarded as One of the Most Magnificent Examples of Brick and Terra Cotta Work Produced in the Middle Ages.

IN THE "OSPEDALE MAGGIORE" Milan not only rightfully lays claim to the largest hospital in the world but has, in this building, one of the most perfect examples of the elegant brick and terra cotta work of the middle ages. Italy was pre-eminently the home of brick construction between the Eleventh and Sixteenth centuries. The Lombard school solved the problem of combining it with details in marble and terra cotta as well as by inventing a wonderful variety of moulded bricks. Milan is one of the many cities in Northern Italy that are full of churches and town halls built in this style and the Great Hospital is Milan's largest and most beautiful example.

The Maggiore Hospital, which accommodates more than 4,000 patients was founded by Duke Francesco Sforza and his wife Bianca Maria in 1456 on the site of an old palace of Bernabo Visconti. It is a magnificent building of brick with terra cotta ornaments and is part Gothic and part Renaissance in style. The southern portion is the work of Antonio Filarete, the original architect. The rest was added in 1621.

In plan it is interesting and has served as a model for many other like buildings of an early date. The men are placed to one side in a central cloistered court which is 210 feet wide and 243 feet long in the clear, in a quadrangle 263 feet wide and 279 feet long, the cells being placed in the form of a cross of that size and 30 feet wide. In the intervals of the cross are four court yards on whose remaining sides are rooms for the assistants. On the opposite side of the cloistered court are placed the women. In the middle of the narrow side of the great cloister opposite the entrance is a church which serves for the whole establishment. The cloisters of the large court and main body of the building are in two stories so that they form galleries of communication. Possibly one of the features considered most noteworthy in this building by present-day designers is the series of pleasant promenades supplied by the corridors.

Lubke, in his "History of Sculpture," gives a very excellent description of the details of the exterior of this hospital. He says in part:—

"The immense facade owes its effect not merely to its unsurpassed wealth of ornament, but still more to its beautiful distribution and gradations; the brick style has never produced a more splendid and at the same time, a nobler creation. Briefly to recapitulate its principal features: Two rows of pointed windows, bisected by small columns. The common framework with its elegant decorations, above all with an arabesque of vine and grapes, interspersed with exquisite birds. In the upper arched compartment vigorously-treated half-length figures of male and female saints. The lower row of windows, enclosed by circular sham-arcades, resting on semi-columns. In the pendatives, half-length figures of saints, standing out in strong relief. Then the broad frieze, separating the two stories, decorated alternately with roses and branch work, eagles and angels' heads.

"Above, the windows of the lower storey are repeated with the same rich ornament, but in rectangular frames, and the compartments thus obtained are again adorned with heads in relief, so that four rows are presented of these heads and half-length figures. All this is executed with incomparable freshness and sharpness in the purest forms, and is a perfect wonder in clay sculpture. The twenty-nine arcades to the right of the principal portal are less richly executed than the seventeen of the left side. The heads in the upper windows are able and somewhat more realistic in style than those of the upper parts, and here and there appear with a flowing and tolerably detailed beard. On the left side, the utmost abundance of ornament is displayed.

"Its terra cottas are perhaps the freest, most lifelike and most important works which Upper Italy has produced in burnt clay. They bear the perfect stamp of the Sixteenth century. The male heads exhibit the utmost power; at the same time the treatment of the forms throughout is grand and bold. The female half-length figures are full and soft, beautiful, even voluptuous in the flow of the lines and in the mass of the falling hair; the Putti in the framework of the windows are full of life, freshness and grace. In addition to all this, there is the equally rich ornament of the large central court, executed a little later by Richini.

"In the upper and lower rows of columns, medallions fill the compartments above the arches, forming altogether no less than one hundred and fifty-two heads. The style here is feeble, and somewhat more conventional than even in the later parts of the facade, although a few very able works appear among them."

CONCRETE AND STUCCO IN MEXICO.—Recent Excavations Show Early Use of Materials.

THE USE OF CONCRETE AND STUCCO was common thousands of years ago, and recent excavations in Mexico have brought to light interesting instances of the utilization of concrete in houses and elaborate tombs. South-west, a few miles distant from the town of Oaxaca, is a range of hills on which are the remains of the great fortified city known as Monte Alban, which was probably the ancient capital of the Zapotecan empire. The entire region is filled with groups of mounds, showing it to have been a thickly-populated locality in former times. For centuries these mounds remained unexplored, until uncovered by the spade of Prof. Saville.

At Cullapa, seven miles south-east of Oazaca, a series of large mounds and many stone graves were explored and excavated. The mounds varied in height from 10 to 75 feet, and some were 160 feet square. Some were in the form of a pyramid, others rectangular.

The rectangular mounds were found to be purely burial mounds and to contain the most important tombs, while the pyramidal ones were temple structures. Many had been ploughed over, which had destroyed their original shape, and trees were found growing over several of the tombs. In one instance a ploughed field under cultivation was above a tomb.

Excavations showed that nearly all the mounds contained tombs beneath. The front wall of each tomb was in the form of a frame of stone in which were found on several occasions, as many as five terra cotta funeral urns painted red and having a death's head mask made of stucco. The urns were fastened against the wall with cement.

The tombs were built of huge masses of stone, nicely dressed and covered with cement and stucco, painted red. The lintel over the entrances consisted of a long block of stone painted red, and the doors of the tomb were sealed by large stone slabs.

A peculiar feature found in excavating was the cement floors, which were covered with votive offerings in the shape of food vessels, incense burners and the remains of human bones and skulls. These were painted red.

That these were the burial places of persons of rank and wealth was indicated by the mural paintings which once covered the entire walls, together with the great number of rich padite ornaments and other votive offerings. Other interesting objects in these great Zapotecan tombs were the series of strange funeral urns.

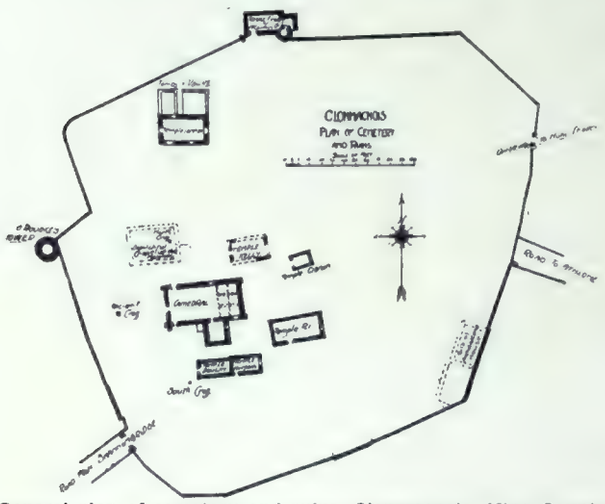
Detail of the Facade of the Maggiore Hospital, Milan, showing its unsurpassed wealth of terra cotta ornament which is a perfect wonder in clay sculpture. These decorations in terra cotta are declared by critics to be the freest and the most lifelike and important work which upper Italy has produced in burnt clay. In the entire facade there is no less than 152 heads.

Detail of one of the lower pointed windows of the Maggiore Hospital, Milan, showing bi-secting columns supporting the sham arches. The common frame work with its elegant decorations above all with the narrow space of fine leaves interspersed with exquisite birds. The head in the window shown here gives some idea of the freshness and sharpness of the work, which is most realistic in style, as is demonstrated in the flowing and detailed beard in the medallion.

THE SEVEN CHURCHES OF CLONMACNOIS.—Famous Ruins of Early Ecclesiastical Edifices in King County, Ireland.—Interesting Notes on the Various Structures, Together with Dates of Erection, and Names of Builders.

A RECENT ANNUAL REPORT of the Government Board of Works for Ireland, illustrates and throws much additional and interesting light on the famous "Seven Churches of Clonmacnois," the ruins of which are described as being situated on the Shannon, in King County, near the centre of Ireland. A monastery or religious city, says the report, was founded here A.D., 545-548, which rose to great importance though its foundation was also accidental and its founder gave it no fostering care. St. Kieran, "Mac an t Saor," "Son of the Carpenter," as he was named from his father's occupation, had settled as recluse on Inis Ainghin (or Hare Island in Lough Ree), and conceived the idea of founding a little wooden church and cell lower down the Shannon, at a lonely spot called Cluan Maccunios, Clonmacnois, Ard Tibra, or Drom Tipraid. While engaged on the work he was found by a fugitive, Prince Dermot, who aided him to set the first posts of the church, thereby earning his blessing and a prophesy of coming honor. Soon afterwards Dermot was elected King of Ireland, and endowed the establishment. The place grew in fame and learning, and many churches and villages of huts were crowded round Kieran's cell. It suffered often from plunderers and destroyers, both Norse and Irish, having been ravaged six times between 834 and 1012, and burned at least ten times between 719 and 1082 and twenty-six times from 814 to 1204. The Norse King, Turgesis, in his attempt to break up the Irish Church in 845, enthroned his wife, Ota, on the altar in the chief church at Clonmacnois, whence she gave her oracles. It was plundered by the subjects of Donough O'Brien in 1042, but he punished the culprits, and made amends to the monks. The Normans did violence to it several times about the year 1200.

Omitting mere sites and foundations, there remain two round towers, three crosses of large size and elaborate sculpture, eight churches, a castle, and two holy



General plan of cemetery and ruins, Clonmacnois, King County, Ireland, showing the location of the various buildings.

wells, and some 200 inscribed tombstones and fragments. The churches are:—(1) The Cathedral, (2) and (3) the conjoined churches of Temple Hurpain and Temple Doolin, (4) Temple Ri or Melaghlin's Church, (5) Aglishbeg or Temple Kieran, (6) Temple Conor, (7) Temple Finghin or Finian, and (8) the Nun's Church. The sites of former churches are (9) "Temple Killen," (10) "Temple Kelly," (11) "Temple Ganly," and (12) "The Bishop's Chapel." There was also (13) another church near the castle named after "Moreig O'Duffy."

The ruins, with the exception of the Nun's Church, are grouped together, the Castle lying near the river, the others included within the graveyard, in which so many princes, prelates, and sages lie buried.

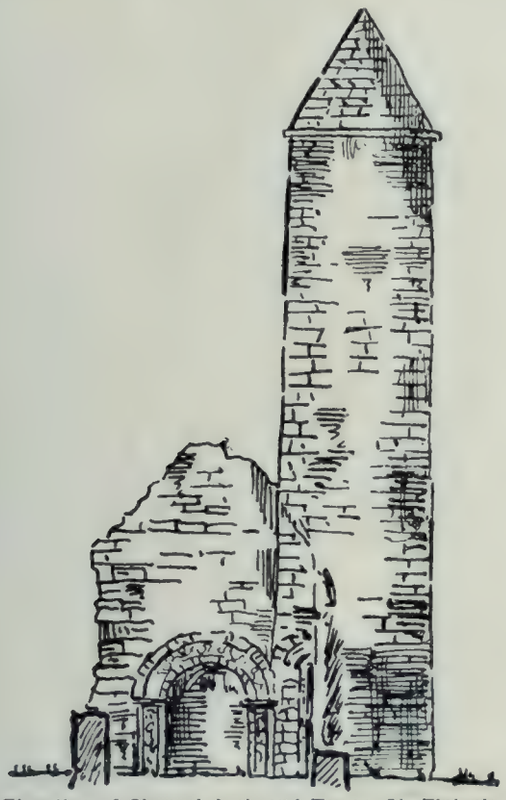
To turn to the records of the buildings, the Aglish Beg or Temple Kieran was reputed to be on the site of that church founded by the patron about 545, and covered

Elevation and plan of North Doorway of Cathedral.

his tomb. It is a very small early cell. In it were found the two beautiful bronze and silver Irish croziers now in the collection of the Royal Irish Academy. It was an oblong oratory, not rectangular, over twelve feet long and eight feet wide inside the walls, which are about two feet thick. It had an antæ at each corner, but the south-western one and part of the rude west door have been rebuilt.

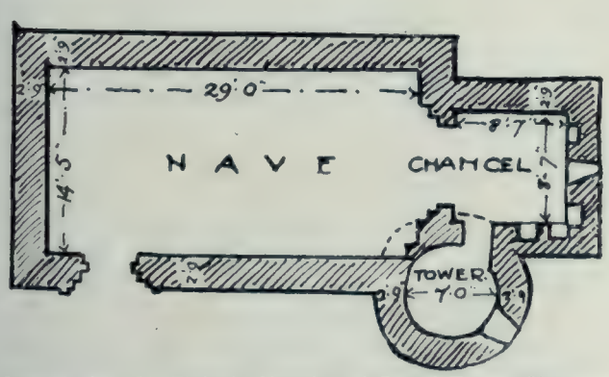
The great Church or Cathedral was restored about 910 by the Abbot Colman MacAillel and the High King Flan, son of Melachin. They also erected the High Cross near it, still inscribed with their names. This church was again restored by Cormac, son of Conn m bocht and Flaherty O'Lynch, between 1080 and 1104; by Tomaltagh MacDermot in 1330, and by the Dean Odo, whose name appears above the elaborate north door, about 1460. It was destroyed by the English in 1552 and again restored by the Vicar-General, Charles Coghlan, in 1647.

The Cathedral, also called Temple Dermot, Temple Coghlan, and in older times "Damhliag" or stone church, hardly retains any suggestion of its early date save in the projecting antæ. Here was buried Roderick, the last native King of Ireland (died 1198), and his father, King Turlough. It is an oblong structure, measuring 62 feet by 28 feet 8 inches inside. It had a curious arrangement in the chancel, which divided by pillars into three vaulted chapels. The attached piers and groinings at the sides alone remain. The other internal details are plain, but the west and north doors were elaborate on the outside; the northern is richly moulded with figures of St. Francis, St. Patrick, and St. Dominick, and a commemorative



Elevation of Chancel Arch and Tower, St. Finian's Church.

inscription overhead to Dean Odo. There is some delicate carving on both doors, with foliage and small dragons. The east gable has fallen, and also most of the west gable, with the arch of its door. At the south is the vaulted sacristy, with an apartment over it having a curious octagonal chimney and window-like slits for the smoke.



Ground plan, St. Finian's Church and Round Tower, Clonmacnois.

Temple Conor was probably built in 1010, when it was endowed with lands by Cathal O'Connor. The west door and south window, still existing, belong to that time. It measures 42 feet 8 inches by 26 feet 6 inches wide, and has a burial enclosure to the north. The church has been modernized, and is still used as a Protestant place of worship.

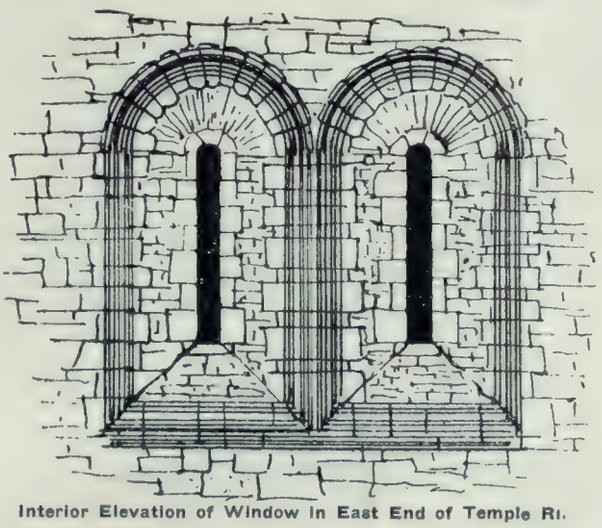
Temple Killen, a levelled church barely traceable to the east of Temple Finghin, was built before 968. The causeway from it to the Nuns' Church was made at two

Detail of Chancel Arch, St. Finian's Church.

periods—the first, the eastern portion, from the Nuns' Garden to the Cairn of the Three Crosses, in 1026; the second, westward "to Cros Chomgaill at the entrance to the street," in 1070.

St. Finian's or Finghin's Church, or Regees Finghin or Finian, is mentioned in 1015, when the great storm overthrew its oak tree, but the neighboring walk of Tober Finghin and a cell near it have records from 610 which probably refer to the church site.

This church embodies at the intersection of its nave and choir the unique and finely built Round Tower called "Clogas Beg" and "MacCarthy's Tower." The church consists of a nearly levelled nave and a well preserved early chancel, 8 feet square. The choir arch has three orders, two probably of the late eleventh century, the innermost much later. The tower has been deeply cut into in order to square the angle of the nave. It is a disputed question whether it is not earlier than the church in



Interior Elevation of Window in East End of Temple Ri.

which it is embedded. It is certainly not an afterthought, and seems (despite assertion to the contrary) to be contemporaneous.

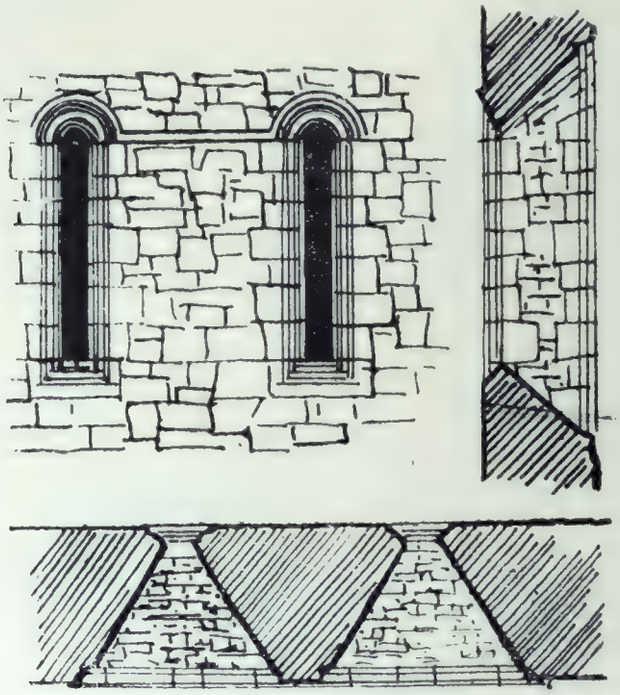
Temple Kelly, now also levelled, was probably the church built in 1167 by Conor NaCeallaigh, Chief of Hy Many, on the site of the older Hospital of Isill Kieran.

The Great Round Tower is attributed to Fergal O'Rourke, who was slain in 946. The Register of Clonmacnois says "he built a small steep castle or steeple called the Irish Claicthough," at least he repaired it, and it was further restored after its partial destruction by lightning in 1134.

The Round Tower called "Clogasmore" and "the Steeple," is, for the most part, of finely fitted ashlar. It

is over 60 feet high and 58 feet 8 inches in girth; the roundheaded doorway is 11 feet above the ground. The upper storey has been rebuilt roughly; four of the older storeys remain, so probably three were destroyed. Its base is slightly out of plumb, and overhangs a few inches.

Temple Hurpain and Temple Doolin, or MacLaffy's Church, lie to the south, the latter having been attached



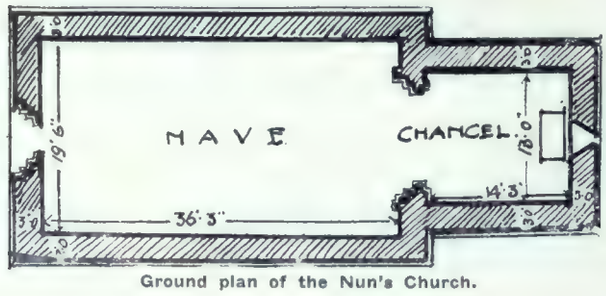
Exterior elevation, section and plan of window in east end of Temple RI.

to the east end of the former. The older church measures 31½ feet by 16 feet inside; it retains the antæ side walls and simple round-headed east windows, with the gable of a very early Celtic oratory. A late pointed door was inserted in place of the original western entrance in 1689, about which time was built Temple Doolin, a plain building, measuring 22 feet 10 inches by 12 feet 9 inches inside; the whole is 57 feet 3 inches long.

Temple Melaghlin, or Temple Ri, lies to the north-east of the last, and south-east from the Cathedral. It is a plain oblong 12th century building, 41 feet by 17 feet 8 inches inside, the walls being about 3 feet thick. The double east window has round heads with shallow mouldings round the arches and piers, and wide splays.

The church has a gallery at the west end; the south window is pointed.

To the west of this group of churches stand two high crosses. "The Cross of the Scriptures," as appears by a



Ground plan of the Nun's Church.

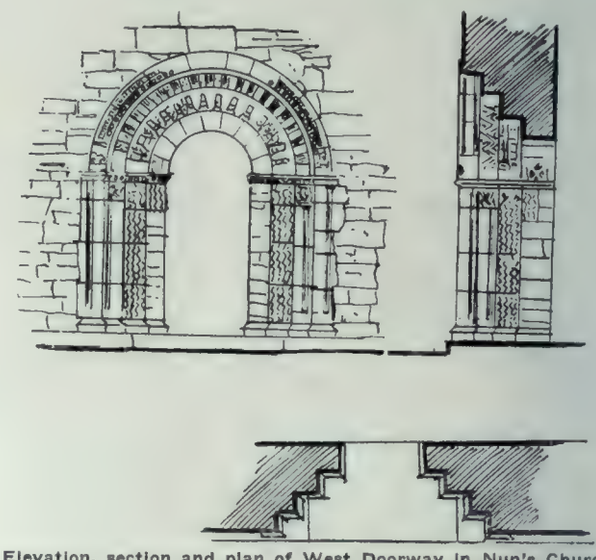
defaced inscription, was put up by Flann, son of Melachlin, and King of Ireland, and the Abbot Colman, about 908. It has the unusual feature of the ring being an entire circle on each face, and shown as held by two plaques. The faces and sides are decorated with carvings of the Crucifixion, the Last Judgment, and scenes from the Passion. One panel probably represents St. Kieran and King Dermot setting the first post of the church. A procession of chariots appears on the base. The second High Cross, near Temple Hurpain, is mainly covered with interlacings and other decorations. It has also a carving of the Crucifixion. A worn shaft of a third cross stands to the north of the Cathedral.

The Normans in 1212 built a castle at Clonmacnois, probably the site of an earthwork called Lis-an-Abbaid, the residence of the Abbot, which had been burned on Easter Day 1135. The King ordered compensation to be paid to the Bishop in 1216 for damage done to his lands and gardens by the construction of the fortress. The castle stands to the west of the cemetery in a square entrenchment. It consists of a rudely built keep, courtyard, and gateway. One of the turrets has fallen against the main building, evidently from the result of an explosion.

The ancient causeway leading to the Nuns' Church is still fairly complete. Near is was discovered evident trace of the "Cairn of the Three Crosses," in which was found a slab inscribed, "Oriot, an Thurcain las andernad in Chrossa," a prayer for Thurcan who made this cross.

The nuns' Church stood before 1026, and was repaired by the ill-starred Dervorgilla, wife of Tierman O'Rourke. After 1170 she retired to it a penitent, and there died and was buried. The architecture, however, seems to belong to the period about 1100.

The Nuns' Church consists of a nave and chancel—nave 36 feet 3 inches by 19 feet 6 inches, and chancel 14



Elevation, section and plan of West Doorway in Nun's Church.

feet 3 inches by 13 feet 3 inches. It retains its richly carved west door and chancel arch, dating from about 1100, with chevrons and beading, enclosing fantastic heads and a small sheelanagig or lock-bringing grotesque. The chancel arch was on the point of falling in 1738; it afterwards fell, and was restored by the Kilkenny Archæological Society (now Royal Society of Antiquaries) in 1866.

The final blow fell on Clonmacnois (after a long period of obscurity as a Bishop's See and Abbey) in 1552, when the English blundered and dismantled the churches and carried off the bells out of the Cloictheach.

Slight attempts to repair the Cathedral and Temple Hurpain were made respectively in 1647 and 1689, and some of the most judicious restoration was carried out by Reverend James Greaves, Hon. Secretary of the Kilkenny Archæological Society (now the Royal Society of Antiquaries of Ireland), in 1865.

Clonmacnois was vested in the Board of Works in 1880, since when several small works of conservation have been carried out.

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

Ivan S. Macdonald, Editor and Manager

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

Vol. 3 Toronto, May, 1910 No. 6

Building Statistics for March.

THE AVALANCHE of building work prophesied for 1910 is giving strong signs of materialization. Returns for March indicate that the country in general is in the swirl of increasing activities, and that operations in all sections are being carried out on a stupendous scale, both in point of investment and in the volume of work undertaken. Permits issued in twenty representative cities reporting to CONSTRUCTION total $8,887,787, as against $4,730,710 in the corresponding period of last year. This is an advance over the preceding month of $5,812,260, and an average gain over the month of March, 1909, of 87 per cent. By far the outstanding feature of the situation is the decided "upturn" in evidence on every hand, and the unusually high totals attained in almost every instance. Only three cities in the list, in fact, met with reversals, viz., Toronto, Windsor and Halifax, the loss in each case being 5 per cent., 32 per cent., and 59 per cent. respectively.

Again the honors for the month fell to the West, where the strides taken in every particular were most gratifying indeed. Calgary, with a gain of 887 per cent., registers the biggest increase noted; Saskatoon, the second highest increase (751 per cent.); while Winnipeg over-reached the field both far and wide as regards the volume of work undertaken, having issued permits aggregating in value $2,526,350, as against $861,200 for the corresponding month of last year. This remarkable total is not only the highest amount recorded in the Dominion, but practically double that noted for the month in any other city, and it is extremely doubtful if any place on the Continent of similar size has ever displayed more marked activity.

Extraordinary advances were also made in all other centres. Vancouver netted a gain of 126 per cent., representing over a million dollars more in new buildings than was undertaken in the same month of last year. Regina piled up an increase of 353 per cent.; Edmonton gained 47 per cent.; Victoria advanced 101 per cent.; and Lethbridge topped her figures for the corresponding month to the extent of 46 per cent.

In Ontario, aside from the two setbacks previously noted, the uptrend movement was both widespread and substantial. London made a most excellent showing, registering a gain of 69 per cent., as did also Hamilton, where the total was 67 per cent. in excess of that recorded last year. Again, Fort William came to the front with an increase of 63 per cent., while Berlin, whose figures were received too late to be included in the following table, reports building operations amounting to approximately $90,000. Other gains noted are those of Peterboro and Port Arthur, which registered increases of 81 per cent. and 346 per cent. respectively, although the amounts in both cases are considerably less than those noted in the other part of the province.

Operations were also decidedly brisk farther east, as is indicated in Montreal's increase of 79 per cent., and the gains of 426 per cent. and 406 per cent. made in the case of St. John and Sydney, respectively. Montreal's total of $676,804 exceeds the amount recorded in March, 1909, by $300,529; while St. John's splendid advance gives that city the third highest increase registered for the month.

In the case of Toronto, it might be mentioned that the loss noted is not due to a less favorable condition than obtained a year ago, but rather to the fact that a large amount of work scheduled has been a trifle slow in materializing. Within the next few weeks this city will see things veritably humming and any deficit of the past month or two will be offset many times over. Equally as much can also be said in the case of Windsor, which will witness a number of important developments in the near future; while as regards Halifax, both the importance of its geographical location and the prevailing activities in the Maritime Provinces is possibly the best assurance that operations there will shortly assume far more substantial proportions.

	Permits for March, 1910.	Permits for March, 1909.	Increase, per cent.	Decrease, per cent.
Calgary, Alta.	$415,800	$42,100	887.64	.....
Edmonton, Alta. ...	264,435	179,395	47.40	.....
Fort William, Ont..	91,575	56,000	63.52	.....
Halifax, N.S.	43,800	109,490	.....	59.99
Hamilton, Ont.	289,390	172,350	67.90	.....
Lethbridge, Alta. ..	113,220	77,035	46.97	.....
London, Ont.	139,700	69,095	102.18	.....
Montreal, P.Q.	676,804	376,275	79.86	.....
Peterboro', Ont. ...	10,327	5,695	81.33	.....
Port Arthur, Ont. ..	5,360	1,200	346.66	.....
Regina, Sask	329,650	72,730	353.25	.....
St. John, N.B.	49,250	9,350	426.73	.....
Saskatoon, Sask. ..	250,275	29,400	751.27	.....
Sydney, N.S.	17,935	3,540	406.63	.....
Toronto, Ont.	1,583,165	1,703,840	.....	7.08
Vancouver, B.C. ...	1,808,766	800,250	126.02	.....
Victoria, B.C.	244,760	121,640	101.21	.....
Windsor, Ont.	27,225	40,125	.....	32.14
Winnipeg, Man. ...	2,526,350	861,200	193.35	.....
	$8,887,787	$4,730,710	87.87	.....

A Canadian Architecture?

RUSKIN SAYS: "Architecture is the art which so disposes and adorns the edifices raised by man, for whatever uses, that the sight of them may contribute to his mental health, power and pleasure."

It is needless to say that Ruskin had a very much stronger feeling for the true worth of architectural design, than we have in Canada. It seems that Canadians—we will not say generally, but in some conspicuous instances—have regarded, or seem to regard, architecture

rather as a necessary evil, than a component part of our national development.

The Bank of Montreal has an American architect to design their two and a half million dollar bank building in Winnipeg. The Bank of Toronto has commissioned Messrs. Carrere & Hastings, of New York, to design their architectural masterpiece in Toronto. On the other hand, a $500,000 technical school is to be designed and erected under the supervision of a carpenter in Toronto, and, worst of all, a five or six million dollar Government building is to be erected at our official home in Ottawa, after the designs of a man who has declared before the courts of our country, that he is not an architect, and knows little or nothing about architecture. It almost seems that architecture in Canada—if we are ever to have one—is at the present time (a time when we are undergoing a development that has never been equalled by any country in the world) experiencing a most retrograde movement. We know that every nation's social, commercial and religious development has been marked and been stamped on the country by its architecture; yet are we to have none; are our greatest works to be designed by men who neither know our country or our people. On the other hand, are our greatest works to be designed by men who neither have studied nor have shown an appreciation for architectural design; men, in other words, who may be called builders, not architects.

In this issue of CONSTRUCTION we publish a letter from two of the representative architectural bodies in the Province of Ontario, deprecating the employment of foreign architects on Canadian work. Their reasons are plain; they not only speak for themselves, but for our business and social interests as well. American architects do not pretend to know Canadian materials, and we, as Canadians, are not supposed to know or to appreciate and admire as ours, American architectural design.

We also publish a set of illustrations; one showing the design of a trained architect for one of the most important Government buildings Canada has erected since Confederation; another the design of a man assisted in his department by underpaid draftsmen, but the design that has evidently been accepted by our cultured and esteemed Minister of the Department of Public Works, Mr. Pugsley.

It occurs to us that there is something distinctly wrong with the people of Canada in their knowledge or conception of the importance of architectural design. In order to have an architecture we might be proud of, that we should have reason to lay claim to, the designers of our buildings must be men who know our country, who know our history, who know our people; men who know our religious, social and business proclivities. Therefore, Canadians must design our buildings, and it is only fair to ourselves to believe that those Canadians that must design our structures—structures that are to stand to the credit of our good taste as a people, structures that are to live longer than we shall, and structures that shall be Canadian—must be men who know us, men who live with us, men who are Canadians. More than this, the designers of our buildings must be trained men; they must be men who are in full sympathy with the importance of architectural design, as well as utility in plan and construction. They must be well trained, and while the facilities that the Dominion and Provincial Governments have offered in the shape of architectural education have been far inferior, in comparison with the importance of this branch of education, to that provided in other countries of the world, we still have architects who, through their own ability, their own inclinations and determinations, have excelled. They have excelled in their training through the fact that they have taken advantage of the educational facilities offered by other countries which have done that for architectural design that Canada has failed to do, and through their knowledge and appreciation of things that are Canadian, and it is these men who are best qualified to design our buildings.

A Timely Step.

MUCH HAS BEEN SAID in these columns with regard to the employment of American architects on Canadian buildings. A list is being compiled by the Joint Committee of the Ontario Association of Architects and the Toronto Society of Architects, of the buildings designed by American architects in the various cities and towns in Canada, showing as well the cost of these structures together with the names and addresses of the successful contractors. The information gathered thus far shows most conclusively that the evil of having our buildings designed by foreign architects is considerably greater than most Canadians would suppose. As has been said in these columns, very often the commissioning of a foreign architect for the designing of a building in Canada, does not only operate against the welfare of the architectural profession in Canada and the establishment of a Canadian architecture, but it takes from the country large sums of money that should be spent in the promotion of Canadian enterprise and in the development of Canadian industry.

In other words, the employment of an American architect who does not know Canadian contractors—an architect who does not know Canadian materials—implies in itself that the proposed structure will be erected by contractors, and of materials, best known to the foreign architect

To sum up, the employment of a foreign architect means, in nine cases out of ten, the employment of foreign contractors, the use of imported materials, and consequently the loss of 90 per cent. of the money expended in the erection of the building to Canada.

For a time Canadian architects have been loath to employ methods necessary to relieve this unfortunate situation or to make plain to Canadian business men the real consequence of this unwholesome practice on the part of many of our large corporations and business institutions; but the situation has developed to such an extent that they feel it their duty to the Canadian public and to the Canadian business man, as well as the architectural profession in Canada, to bring about a movement that will serve to discourage this injurious condition. As a result, CONSTRUCTION has been asked to get together figures and data showing the number of buildings that have been designed in Canada within the last four years by American architects, together with a statement of the names and business addresses of the contractors who erected the buildings, with an approximate value of Canadian materials that were specified or used in these structures. In this manner it is our purpose to show conclusively what it means in a business way to have Canadian buildings designed by foreign architects.

The following letter to CONSTRUCTION from the Joint Committee of the Ontario Association and the Toronto Society of Architects, states specifically just what it is proposed to do.

April 26th, 1910.

Editor, CONSTRUCTION.

Dear Sir,—

A joint committee of local architects, composed of members of the Ontario Association of Architects and the Toronto Society of Architects, has been formed to deal with the question of American architects practising in Canada.

In the opinion of this Committee the situation existing at present is a most serious one, and if immediate steps are not taken to counteract the influence of this "American invasion," the resulting condition of things will be-

come intolerable. The only successful way to combat this influence is to arouse public opinion, both through the press; through the co-operation of the Builders' Exchanges, the Manufacturers' Associations, and through the Dominion and local Houses of Parliament, to the great hurt that is being done both to architecture in Canada, to the architects, and to the contractors and general business of the community.

This Committee would be grateful if CONSTRUCTION would publish a special notice, asking the architects throughout the country, from Halifax to Vancouver, to co-operate in this movement. The first step will be to acquire accurate data of the buildings that have been erected throughout Canada by American architects. The cost of these buildings, the name of the contractor, and if the said contractor or contractors were Americans.

The Committee is of the opinion that the apathy of the architects themselves is largely the cause for existing conditions. Let us suppose for a minute that conditions were reversed and that all the big jobs in United States were being done by Canadians, and that the American architects were only getting the "pickings." What would the American architects do? Suppose that in France all the big work was being done by English architects, or again, suppose that all the big work in England was being done by German architects; the comparisons may seem ridiculous, but the fact remains that to-day in Canada we have exactly this condition existing.

We cannot suppose that those outside of our profession are going to fight our battles, if we ourselves are not keen enough for the fray. We are certainly unworthy of our race if we sit idly by and let all the plums be gobbled up by our neighbors.

Our big commercial buildings—such as our large banking buildings, our stations and hotels—are all being designed by American architects. Are the architects of Canada going to be content to sit idly by and see their patrimony dissipated without making a fight for it? We trust not.

Contrast the attitude of the Canadian Government towards their own architects and that of the American Government towards the American architects. One of the most important competitions that has been lately held was that for the new Government buildings for the Province of Saskatchewan. Six architects altogether were invited for this competition. Among the six was an English firm and an American firm—the latter being Cass Gilbert, of New York. What about the other Canadian architects, who would have been quite competent to enter this competition? There would have been, in addition to the Canadian architects invited, probably five or six other men quite able to give the Province of Saskatchewan a building worthy of their needs. These architects did not even have an opportunity to submit drawings. It was a source of great gratification to the Canadian architects that the above mentioned competition was won by a Canadian firm.

In all Government work in the United States it is a fixed requirement that the architect sending in plans must be a citizen and resident of the United States.

In discussing this question with the average layman, the argument is often brought forward that the American having had more practice in these larger building operations is more proficient. Even granting such is the case —which, however, we do not admit—it surely stands to reason that if the Canadian architects are never given an opportunity to solve the more important problems, we are not going to develop Canadian architecture nor Canadian art. It is surely time to call a halt.

Again, consider the question of the American architect in Canada. He is naturally familiar with American building practice and with American materials. It is impossible for him to be aware of local conditions, and it is quite natural that he should specify American materials; it is also quite natural that he should bring in American contractors to do his work. It can readily be seen that this condition of affairs means a direct loss in money to the community.

Your Committee have been acquiring some data in this regard, and the facts are simply staggering—the figures run up in the millions.

The railroads—such as the Canadian Pacific, the Grand Trunk, and the Canadian Northern, who have their bonds guaranteed by the different provinces, and who are directly supported by the community; our banks, such as the Bank of Toronto, Bank of Montreal, the Royal Bank, Traders Bank, Canadian Bank of Commerce, are employing American architects and American contractors to do their work. These banks get their business in Canada and from Canadians, and get their charters through the will of the Canadian people. We feel that if conditions were reversed, and that if the bank directors were in the place of the local architects, they certainly would not feel kindly towards any of the powerful American banking institutions coming into this country to do business. In fact, they would not tolerate it for a minute.

While this country is of great extent, the population is comparatively small, and the large moneyed interests are practically in the hands of a very few men, and controlled largely from Montreal and Toronto. Once the American architects get a footing with these large corporations, it will be almost impossible to shake them off.

This Committee hopes, therefore, that the architects throughout Canada will respond to the above mentioned appeal, and send all available data in, care of Mr. I S. Macdonald, editor, CONSTRUCTION, Saturday Night Building, Toronto.

THE ONTARIO ASSOCIATION OF ARCHITECTS.
THE TORONTO SOCIETY OF ARCHITECTS.

What is the Reason?

THE POSITION of the Minister of Public Works in assuming the responsibility of rejecting the plans selected and approved of by a competent body of assessors appointed and selected by the Government, for plans prepared by a man who is neither an architect nor one who has a competent staff of draughtsmen, is one that seems inexplainable.

It is true that Mr. Pugsley may be one of our best authorities in Canada on the *arts and crafts* of political *economy*. It is true that Mr. Pugsley may know how to award contracts in the interests of the Government. It is also true that he may know where docks are required or how much a barge is worth, or many other like things, that according to press reports have come under his attention recently. It is also true that the Hon. Mr. Pugsley may know and be in a position to appreciate all the advantages of Napean Stone which it appears the Government Architect has a very peculiar, and we might say, inexplainable weakness for.

Mr. Pugsley, we are free to say, knows absolutely nothing about architectural design. He should not assume the position of being a judge in such matters, and yet, he has declared himself in favor of building a six million dollar Government building under conditions that no other civilized country, with officials that are either cultured or sane in charge of their affairs, would tolerate.

In casting about for Mr. Pugsley's reason for this unpardonable attitude, many suggestions arise in the mind of a man who is familiar with the political news of newspapers representing both the Government and the Opposition. Can it be that expert architectural advice from outside, would not permit the Department of Public Works to follow its usual course in awarding contracts or superintending work? Is it that the probability, that any architect of repute with the least taste for the æsthetic in architectural design would find it impossible to use in a structure of such great proportions Napean Stone? Is it in protection of Nepean Stone that the Department of Public Works finds it expedient to have this building

designed by their own architectural staff? If these can be any reasons, we would pray our Honorable Minister, if necessary, to build more docks on the St. Lawrence River, let some contracts for dredging, buy some new barges or dredges, alter the bookkeeping methods of his Department or do anything to satisfy political conditions, that may arise, wherein money must be expended with the Government's friends, but for the sake of common decency save our Official Home at Ottawa. Don't let such unfortunate conditions be engraved upon our Government Buildings. The museums and our post offices are bad enough, the former design would be complete if it had a draw-bridge in front of the main tower. It may stand up long enough to be an everlasting disgrace to our country and yet it may not. It might, for all we know, some day be so thoroughly ashamed of its face that it would shake and tremble to the extent that it would effect its own destruction. The postoffices designed by this Department for the past twenty years give evidence of being the products of a plan factory.

We contend that there is no reason for such a precedure as is proposed by the Honorable Mr. Pugsley. The London County Council (Eng.) wanted to erect a County building, they called for competitive plans and the work was awarded to a young designer of twenty-eight years of age and he will build the building. John Knox Taylor is looked upon in the United States, and in fact, in the Dominion, as being one of the brightest designers on this continent and one of the shrewdest superintendants at work. He has in his employ many draughtsmen who get salaries much larger than that paid to our own Government architect and yet Carrere & Hastings designed the recent Government buildings erected at Washington and Cass Gilbert designed the new Customs House in New York. In fact John Knox Taylor has never assumed the responsibility either on his own behalf or on behalf of his department, of planning an important structure, and from the standpoint of ability there is no more comparison between the architectural staff of John Knox Taylor and that of the Department of Public Works at Ottawa, than there is between a competent and prominent architect and a village carpenter.

We hope, however, that some influence from some portion of the Government will be brought to bear upon Mr. Pugsley to dissaude him from his proposed procedure. If not, and if we must be direct, we would say to the Honorable Mr. Pugsley that he is a servant of the people and is not running the Department of Public Works at Ottawa for his own gratification, his own profit, or according to his own pleasure. The architectural profession of Canada, the only body of men in this country who may be termed authorities on the matter of architectural design, demands that this unheard of, this most extraordinary procedure proposed, cannot and will not be imposed upon the Canadian people. Every man in Canada who has any respect for decency, or for the æsthetic, or for square dealing cannot but be opposed to the Department on this particular matter. We cannot understand how a cultured, refined and educated man like Sir Wilfrid Laurier, as Prime Minister of Canada, can endorse the procedure of this, one of his Ministers.

CURRENT TOPICS

A BRICK 3,000 YEARS OLD was recently received by the museum of the Dutch Reformed Theological Seminary at New Brunswick, N.J. It is a sun-baked brick about 11 inches square and was excavated in Nippur by the Babylonian expedition of the University of Pennsylvania. It was presented to Dr. Thomas of the Arabian Mission of the Reformed Church by Dr. H. V. Hilprecht, and its age is estimated at 3,000 years. It contains ten lines of inscription in cuneiform writing of Sumerian origin. The brick formed part of the Temple of Bel on the eastern side of the Strait-en-Nil, the biblical Chebar of Ezekiel. Nippur was a suburb of Babylon.

A GROUP OF NAVAL COTTAGES on the Royal Military College grounds at Kingston were recently auctioned off by the Public Works Department for $110. The terms of the sale provides that the structures are to be demolished by June 1st. The cottages have a historical significance, having been built in 1822 as residential quarters for British naval officers.

* * *

A BILL HAS BEEN INTRODUCED in the Quebec Legislature asking that the town of Three Rivers be authorized to borrow an additional sum of $20,000 without the provincial guarantee as to interest. The money is to be used to complete the work of restoration which has been so vigorously carried on since the task of rebuilding the burnt district was undertaken. It is estimated that this amount, together with the sums which are being expended in a private way, will be sufficient to bring about a complete rehabilitation. The increasing values in realty, it is said, will enable the town to take care of this extra liability without any difficulty.

* * *

LONDON'S (ENG.) NEW POSTOFFICE, now in course of construction on Newgate street, will be the most perfectly appointed institution of its kind in the world. It will house departments employing more than 3,000 men, including clerks, sorters, porters, etc., and will be so equipped as to make possible the handling of mail in the most simple and expeditious manner. One of the interesting features in this connection will be a series of endless bands or conveyors, that will transport the bags and packages to the points where the mail is to be delivered, sorted and distributed, thus reducing the work to almost an automatic principle. These conveyors, it is said, are a great improvement over any similar device now in use in any other country. The building will be officially opened the first of August.

* * *

WORK HAS BEEN STARTED on extensive improvements to be carried out on the large iron pier at Port Wade, Nova Scotia, which the Canada Iron Corporation and other interests are enlarging to facilitate the handling of iron ore from the mines now being developed in that region. The pier is to be widened, a wing added, a tower 50 feet high to hold 300 tons of ore erected on the outer end of the pier, and at its head loading pockets with a capacity of 2,000 tons, these to be connected with the tower by endless chain carrying buckets. Excavations have been made for the installation of heavy machinery at the head of the wharf, which will be capable of loading 1,000 tons of ore per hour. Protective walls are also being built, and an elevated track will be constructed to enable cars of ore to reach a position above the loading pockets and discharge ore rapidly.

* * *

THE DOMINION DRY-DOCK COMPANY, LTD., is the name of a new million dollar concern, which, it is stated, will establish large graving docks at Levis, Que., and St. John, N. B. This company is expected to materially advance the ship building interests of Canada, at least the list of incorporators would justify such an assumption. The personnel of the company is as follows: Sir Thomas Shaughnessy, K. C. V. O., representing the Canadian Pacific Railway and Hugh Andrew Allan, ship owner, both of Montreal; George Duncan Davie, ship repairer, and William Molson Dobell, merchant, both of Quebec; Walter Edward Foster, of St. John, N. B., merchant; the Right Hon. William James, Baron Pirrie, of Belfast, Ireland, representing the British shipbuilding firm of Harland & Wolff; Sir Robert William Perks, baronet, and Arthur Morten Grenfell, capitalists, both of London, England.

HARBOR IMPROVEMENT to cost six million dollars is provided for in a resolution of which Hon. Mr. Fielding has given notice. The money is to be used mainly for terminal facilities, docks and sheds. While not so stated, this appropriation is regarded as the initial outlay towards an expenditure involving $18,000,000 contemplated in the elaborate report and plan for improvements at this port, prepared by the commission of engineers, and submitted last summer.

* * *

IT NOW APPEARS that Mr. Edison is not the only one who has been engaged with the problem of producing poured concrete houses. In a recent report, United States Consul L. J. Keene, of Chihuahua, writes than an architect of that Mexican city has also patented "a method for making cement houses all in one piece, cheaply, durably, and with ease of construction." The inventor, the report says, has ordered apparatus from Germany, with which he will make a practical demonstration.

* * *

A NEW METHOD OF TREATING WOOD, known as the "Powell process," has been invented and tried with much success in Australia. The essential part of the treatment consists in boiling the wood and allowing it to cool and absorb a saccharine solution, after which it is dried, rendering the wood thoroughly seasoned within a few days after cutting, increasing its strength, and stopping all warping and shrinking. The sap in the wood is driven out and replaced by an antiseptic, owing to the saccharine solution boiling at a higher temperature than water, thus making the wood impervious to dry rot and to the attacks of white ants and other parasites which prey on ordinary lumber.

* * *

ELECTRICITY FOR ILLUMINATING PURPOSES, heretofore regarded as a luxury, is now brought within reach of the English laboring class, as a result of a new and inexpensive system of wiring recently perfected. A six-room cottage, according to Trade Commissioner MacNamara, Manchester, has been fitted up at Rotherhite by the Fixed Price Light Company, in connection with Messrs. Siemen Brothers, the inventors of the new system. The charge will be a fixed weekly rental of 2½d. per light from April to September 30, and 3½d. per light from October 1 to March 31. Thus for a three-roomed workman's dwelling the charge would amount to 7d. or 10½d. a week, or decidedly less than that generally paid for gas on the slot system. This charge includes the fitting up and wiring and the first lamp. New lamps must be paid for by the consumer, but the payment can be made by instalments.

* * *

A SKYSCRAPED CHURCH is New York's latest architectural exploitation. Such a structure has been designed to replace the present Fifth avenue Baptist church or "Rockefeller church," as it is generally known, which occupies a site, 100 feet square, on the south side of Forty-sixth street, west of Fifth avenue. The auditorium, which will take up practically all of the ground space available, will be seventy-five feet in height. Above this will be three floors, while the roof will be utilized as a summer garden and playgrounds. Rooms for Sunday school and Bible class work will occupy the first two upper floors, and modern offices and assembly rooms that of the top story, Notwithstanding the unusual plan of the building the design will be ecclesiastical. The Forty-sixth street front will be carried out in a light stone with two shades of marble. The feature of the facade will be a large gable with rows of arches resting on a series of slender columns. Three large arched windows will light the main auditorium. The slender columns carry the eye from base to the decorations at the upper roof line and deceive one as to the actual height of the building. The structure will cost $500,000.

BOTH ELEVATED AND UNDERGROUND railways to all external appearances, are public service possibilities which the citizens of Montreal may shortly realize. At least, a company with a capitalization of $20,000,000, known as the Montreal Elevated and Underground Railway Company has been organized with this object in view. Those behind the scheme are said to be well known Canadian and American capitalists, although as yet no names have been disclosed. It is understood that the new company is in no way identified with the traction interests operating in the city at the present time.

* * *

THERE IS MUCH TALK of a great Thames dam, and it appears that this project is really on the point of accomplishment. Its purpose is to put a stop to the decadence of London as a seaport, due to the fact that in its upper part, even in the neighborhood of the London docks, its depth is not sufficient for the needs of modern navigation with its huge ships. Essentially the project consists in the establishment of a great transverse dam at Gravesend, which will raise the water of the river permanently to the level that it attains at present only at high tide. Evidently raising the water-level will have the same result as deepening the channel, and it will be much easier than the dredging on a high scale recommended by the Port-of-London commission in 1902. Besides, in actually lowering the river bed, many precautions would have to be taken to avoid undermining the walls of the piers. The dam would be provided with locks; six of these are planned, large enough to admit the largest ships capable of ascending the river to London. They will operate independently of the state of the tide, and traffic will be continuous at all hours of day and night. It is estimated that the execution of this project will involve an expense of more than $25,000,000. This does not take into consideration the dredging, etc., necessitated by the work.

* * *

A VERY LIGHT, TOUGH BRICK of peculiar fire resisting properties is now made in Denmark from what is locally called "moler," a foliated diatomaceous deposit found in Jutland. Until recently no use had been found for the material, but Prof. Joseph W. Richards in writing in the Electrochemical and Metalurgical Industry states that after a series of experiments the Clay Laboratory of the Danish States Testing Laboratory has been successful in producing bricks from mixtures of clay and moler in various proportions, and from moler alone, with very interesting results, particularly as concerns the properties of these bricks. In the first ten tests, moler was mixed with 25, 50 and 75 per cent. of marl, and with 25 and 50 per cent. of red clay; afterwards bricks were burned from moler alone. Contrary to expectations, moler alone burned to a fine red brick, very firm and light, and of such toughness that a nail could be driven through without cracking it. The specific gravity of these bricks was about 1, and their strength about that of common bricks. The particular properties claimed for this character of brick are their great strength in proportion to their lightness and the heat insulating quality. They are suitable for partitions, floor constructions, arches of every form, although they are not adapted for outside use, because of their porosity and absorption of water. Much is promised for this material, however, as a refactory, as the porosity of the brick makes their heat conductivity very low. Assuming the reliability of statements made as regards tests made in this respect, says the writer, such bricks form an excellent material for intermediate use, as a heat insulator, in the walls of furnaces, as courses between the refractory lining brick and the ordinary outside brick. The low heat conductivity should reduce greatly the heat losses through such composite walls. Its use for electric furnaces, outside of the carbon or magnesite lining, and inside the iron shell, should be highly advantageous.


THE TORONTO GENERAL HOSPITAL
DARLING & PEARSON
ARCHITECTS

TORONTO GENERAL HOSPITAL.—Noteworthy Group of Buildings to be Erected at a Cost of $2,500,000.—General Scheme Far Exceeds in Magnitude Any Similar Project Ever Undertaken in Canada.—Structures to be Built of Brick and Stone.

ONE of the most laudable undertakings of the Queen City during the past decade is the building of the new General Hospital, which will comprise seven or eight large buildings on a magnificently-located site in the centre of one of Torontos finest residential districts. It is something more than a year since the officials started to raze this property and the architects, Darling & Pearson now have their working plans ready and indications point to the buildings being figured by contractors at a very early date.

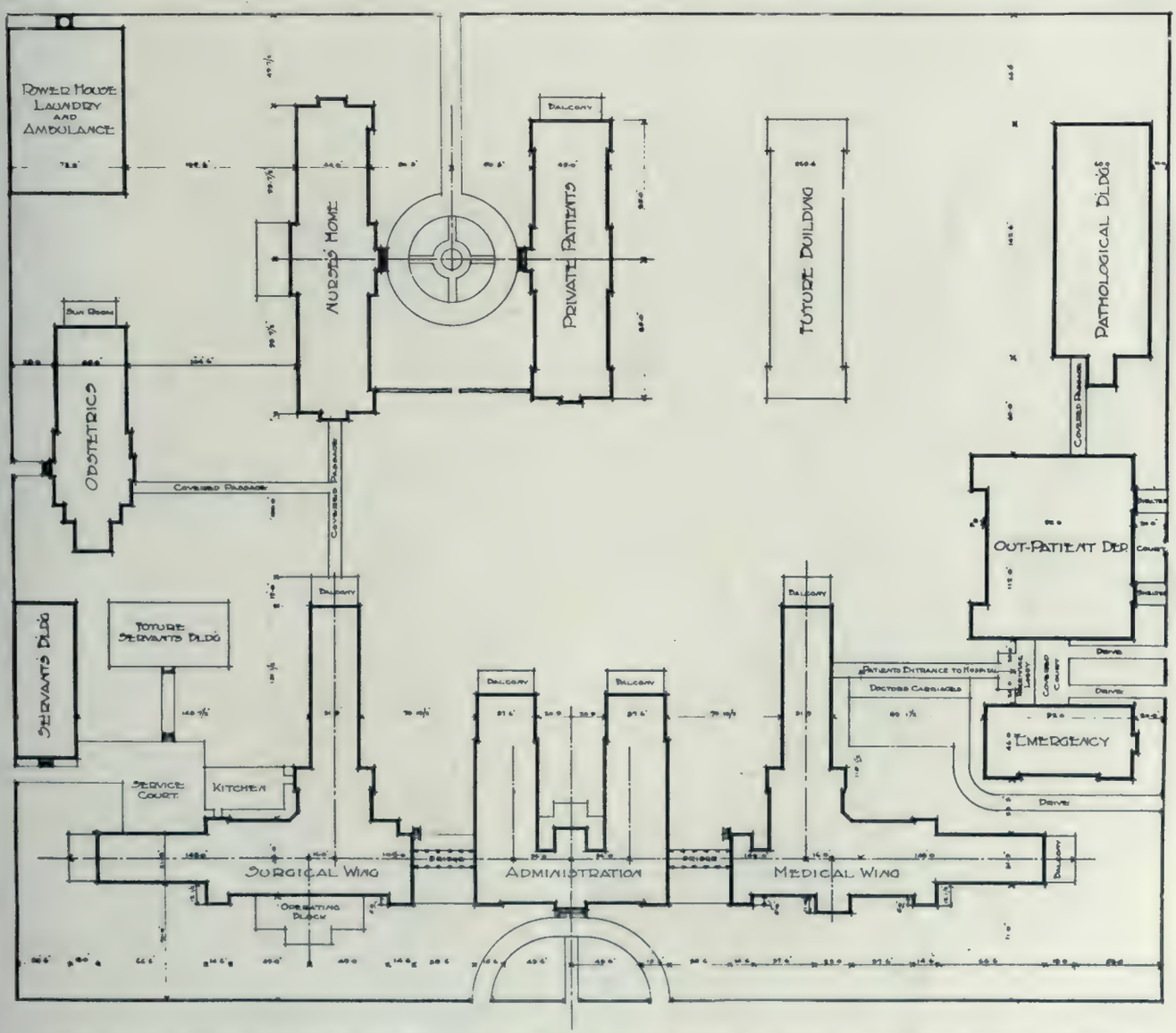
It is estimated that the several buildings that will comprise this the largest institution of its kind in Canada, will cost something over $2,500,000. The City of Toronto, the Province of Ontario, and private individuals have all contributed liberally towards the funds necessary for the carrying out of the project.

The Toronto General Hospital will be primarily and principally a public institution in which the chief object of the promoters has been to provide first-class accomodation in the public wards.

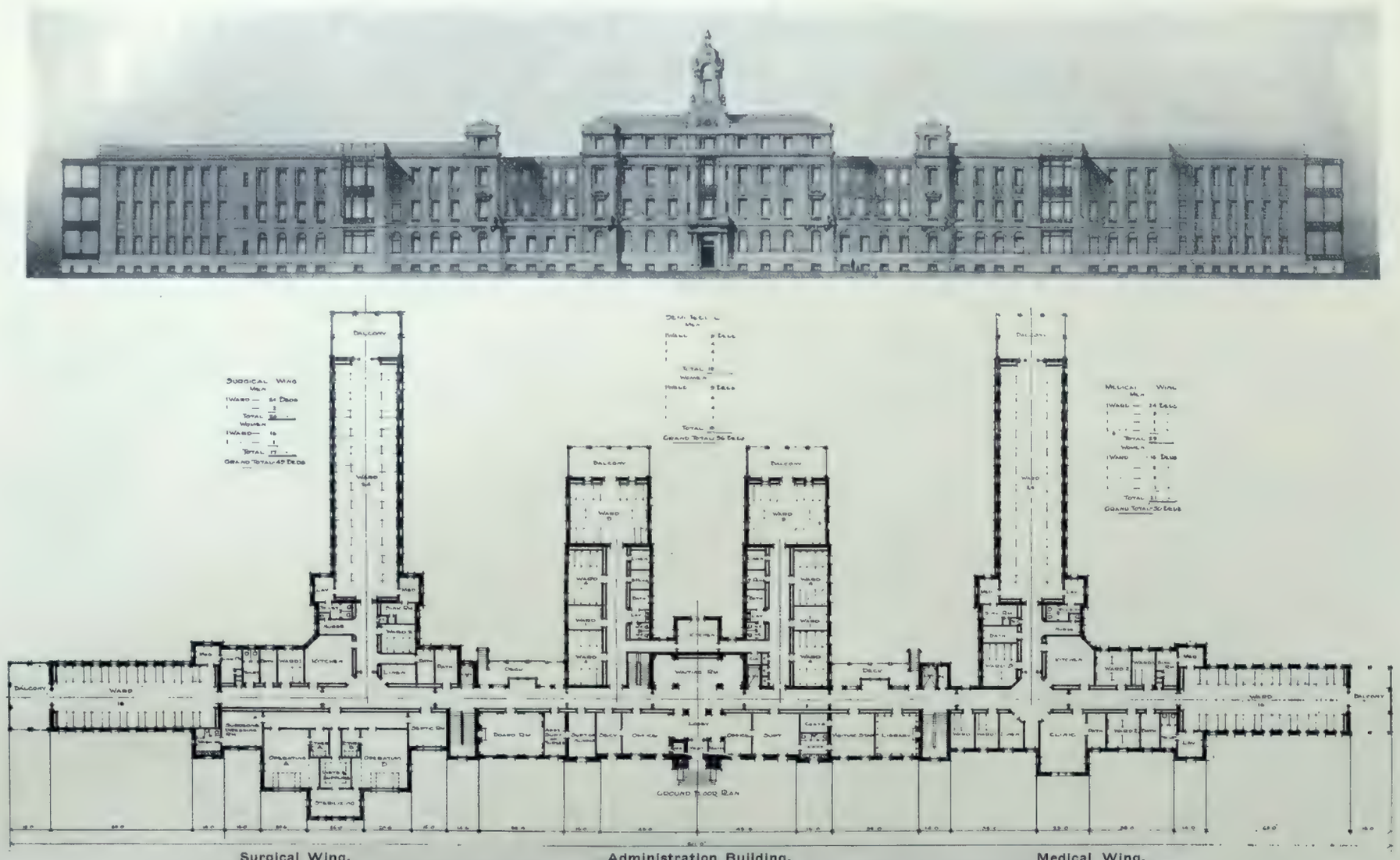
While the exact details of construction have not yet been decided upon, it will be the object of the designers to employ solid masonary construction to the greatest possible extent. It is at present their idea, we understand, to have the walls of solid brick or stone construction, thus not only lending a character of permanency to the buildings, but to give them the appearance of stability and dignity.

The planning of such an institution, in order to provide for all the modern conveniences and equipments, has been by no means a small task, and the accompanying plans and elevations will give our readers some idea of the manner in which the problem has been handled by the architects, Messrs. Darling & Pearson.

The site for the new Hospital, which is 600 by 700 feet in dimensions, is located at the corner of College street and University Avenue. The general scheme, as shown in the block plan, consists of an Administration building, with entrance on College street, flanked on one side by the surgical wing, and on the other by the medical wing. The out patient department and emergency Building are approached from University ave., and between them is the ambulance entrance into a covered court, providing for the delivery of patients without



Block plan, proposed Toronto General Hospital, showing the location of the various buildings. Darling and Pearson, Architects.



Surgical Wing. Administration Building. Medical Wing.

College Street elevation and ground floor plan, Central Block, proposed Toronto General Hospital. Darling and Pearson, Architects.

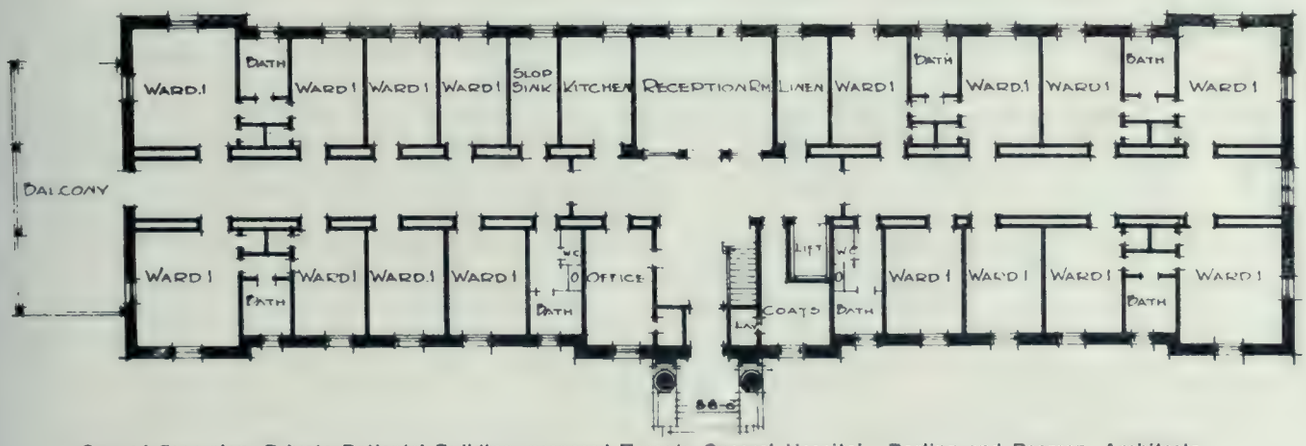
Building for Private Patients, proposed Toronto General Hospital. Darling and Pearson, Architects.

being seen from the street. To the south of the out patient department is the pathological or university building. At the south of the property along Christopher street, are the nurses' home and private patients' building, and to the east, on Elizabeth street are the obstetrics' and servants' buildings. The power plant and laundry are located at the southeast corner of the property. The ambulance house will also be placed at this point.

The administration building is four stories in height, and forms the main entrance to the hospital. On the ground floor are the administrative offices facing College street, and accomodation for 36 semi-public patients to the south of the main corridor. The first floor is given up to the eye and ear, nose and throat departments, has 34 beds in small wards with the usual ward dependencies, and an operating suite. The gynacological department is located on the second floor, and has 39 beds with ward kitchen, both, toilets, etc., and an operating suite and clinic room. On the third floor are the quarters for the internes'; provision being made for 22 resident doctors, with their common room, dinning-room, etc.

The surgical wing, (three floors and basement), is to the east o fthe administrative building, and is connected with same by bridges. There is accommodation for 145 beds, for both sexes. On each floor are two large wards and several smaller wards for special cases, together with ward kitchen, linen room, sink room, pathological room, and ample provision for toilets and baths. At the end of each ward is a large balcony. The operating block is situated on the ground floor and consists of two large operating rooms, a smaller septic room, anaesthetizing rooms, sterilizing and instrument rooms, and dressing rooms for the surgeons and nurses. In the basement of this wing are the kitchen dependencies and store rooms, as well as the servants' dining rooms. The kitchen itself is located outside the building on the basement level. All the public wards and nurses' home are served from this kitchen.

The medical wing, (three doors and basement), is to

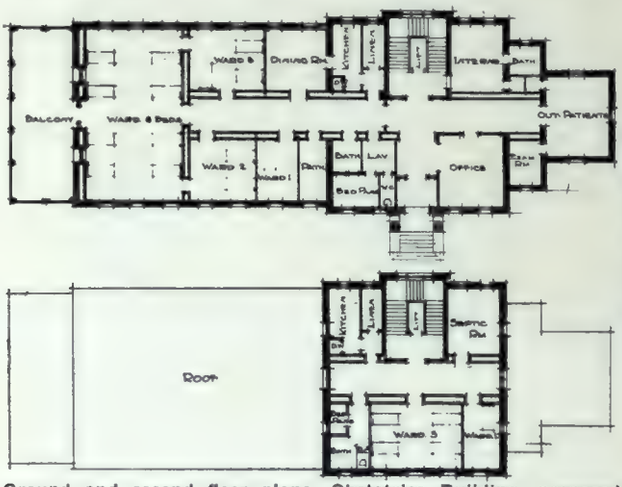


Ground floor plan, Private Patients' Building, proposed Toronto General Hospital. Darling and Pearson, Architects.

Emergency and Out-Patient Buildings, proposed Toronto General Hospital. Darling and Pearson, Architects.

Obstetrics Building, proposed Toronto General Hospital. Darling and Pearson, Architects.

the right of the administration building, and is similar in plan to the surgical wing; there is provision for 150 beds for both sexes, and a clinic room on each floor. In the basement are the receiving department and deten-



Ground and second floor plans, Obstetrics Building, proposed Toronto General Hospital. Darling and Pearson, Architects.

tion wards, also the electrical department and X-ray and hydro-theraueutic rooms.

The emergency building, (one floor), for the reception of accident cases, includes wards for 9 beds, with the usual dependencies, preparation rooms, and an operating suite.

The out-patient department, (two floors and basement), facing University Ave., is for the daily treatment of poor patients, in medicine, surgery, gynecology, and the eye, ear, nose and throat departments. It consists of a large central waiting-room, lighted from the top, with the consulting and examining rooms grouped

Ground floor plan, Servants' Building, proposed Toronto General Hospital. Darling and Pearson, Architects.

around it. There is an operating suite for minor operations. The department will have a capacity of some 350 patients per day.

The pathological building, three floors and basement,) is for the use of the medical school of Toronto University, and consisted mainly of laboratories for students and special research work. The pathological

Nurses' Home, proposed Toronto General Hospital. Darling and Pearson, Architects.

work of the hospital will be done here. The autopsical room sand morgue are located in the basement.

The private patients building, (four floors and basement,) has accomodation for 98 private patients, in single rooms and rooms of two, three, four and five beds. Each floor has a small kitchen, linen room, sink room and the usual toilet arrangements. There are ten rooms with private baths. On the top floor is an operating suite of two operating rooms, ether room, sterilizing room, etc.

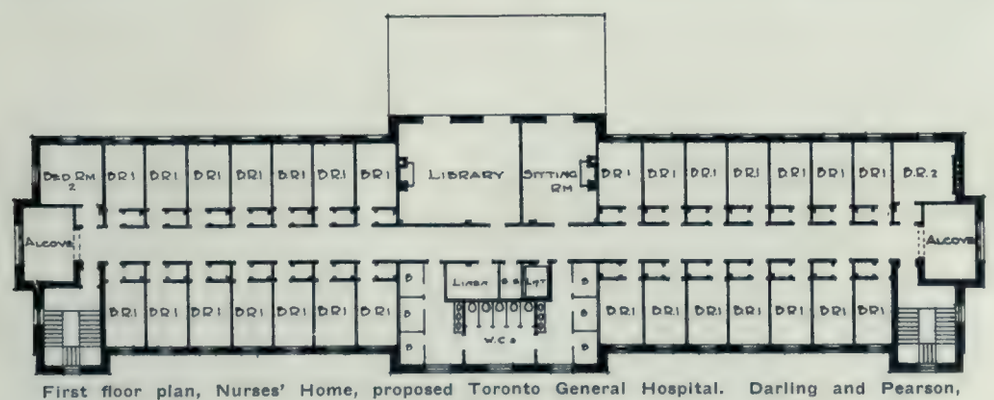
Ground floor plan, Nurses' Home, proposed Toronto General Hospital. Darling and Pearson, Architects.

The building is served by a private kitchen, of its own, in the basement.

The nurses home (five floors and basement), provides accommodation for about 170 nurses. On the ground floor is a large parlor, a small reception room, dining and service rooms, and rooms for the superintendent of nurses, her assistants, and for the graduating nurses. The library is on the first floor, and on each floor is a good-sized sitting room and a sitting alcove at each end of the hall. In the basement is the gymnasium, lecture rooms, etc. In the rear of the building will be the nurses' garden, with tennis courts and other arrangements for recreation.

The obstetrics' building, (two and a half floors and basement), provides for the reception of 36 public lying-in cases in small wards with the necessary dependencies, and labor room and nursery. On the ground floor is an out-patients' department for daily consultation and treatment. Sun parlors are provided on each floor at the south end of the building, overlooking the nurses' garden.

In the servants' building are rooms for about 70 men servants, with baths, toilet rooms, and a large common room on the ground floor.



First floor plan, Nurses' Home, proposed Toronto General Hospital. Darling and Pearson, Architects.

The power house will provide light, heat and power for the whole group of buildings, delivering the steam and electric current through tunnels. The laundry is placed over the power house, and will be equipped with the latest laundry machinery.

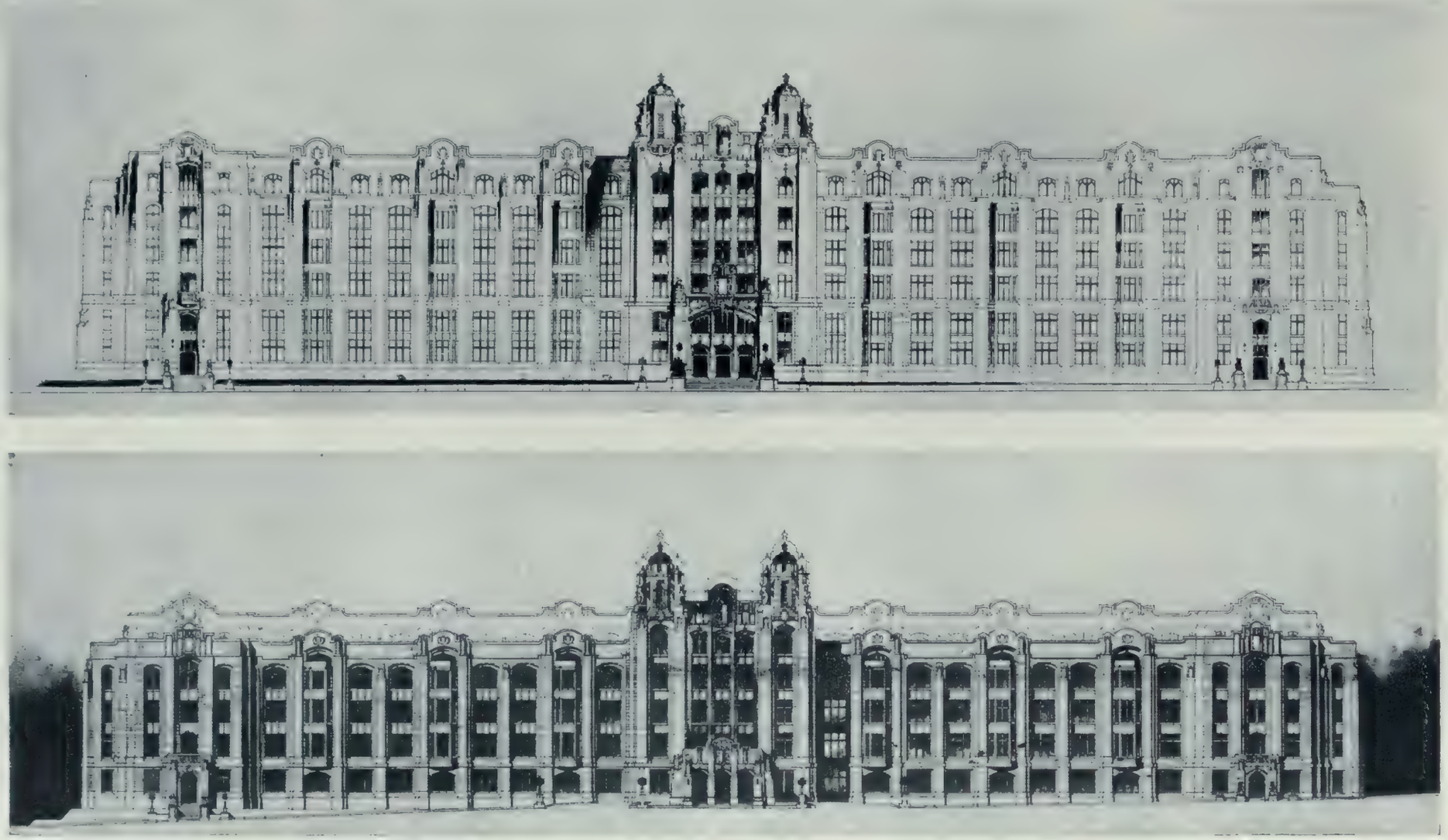
ROAD MAKING IN GERMANY.

THE CONSTRUCTION AND MAINTENANCE of streets and roads is a matter of great public interest in Germany. From every standpoint—military, agricultural, commercial, hygienic, economic—the question of good roads is deemed of the utmost importance. One of the matters now receiving the special attention of German scientists, highway authorities, and engineers is the treatment of streets and roads for the purpose of obviating dust and mud.

In the past, various combinations of oil and salt have been used for this purpose, but as the effect was only transitory, this method was not considered a solution of the problem of maintaining hard, clean, and sanitary highways. Experiments have also been made with coal tar, and some of these preparations applied to the surface of roads have kept the dust settled for longer periods of time than by former methods. Although recognized as an improvement, the expense connected with the employment of these preparations has stood as an objection to their general use and experiments were continued for the purpose of producing a more ideal and cheaper composition for treating roads.

One of the results of these recent experiments is the preparation of the substance called "apokonin," which has been pronounced by some technical observers as the best and most lasting road covering yet brought out. The merits of this process were discussed at the recent Convention of Scientists and Physicians held in Salzburg, Germany. The process is secret, but it is known that coal-tar oils are the main ingredients. The heavy, penetrating qualities of the oils give great binding power to the composition. This, together with the pressure applied, produces a formation iron-like in its consistency, making the surface of the road, it is claimed, so smooth and hard that snow and rain water can not penetrate.

Perspective of the design executed by the architectural staff of the Department of Public Works and the one which the Honorable Mr. Pugsley has declared it is the intention of the Government to carry out. The utter lack of character in this design has brought down upon it a storm of severe criticism in Canada and was criticized by a prominent member of the profession as "looking like a cross between a fancy jail and a chocolate factory with a dash of high school thrown in."



Street and Park elevations of the prize design of Messrs. E. & W. S. Maxwell, Montreal, for the proposed Departmental building to be erected by the Canadian Government at Ottawa. This design has been commented upon favorably by the most eminent critics on this continent. It is an excellent adaptation of Gothic to modern conditions and would provide a structure that would harmonize well with the dignified old piles on Parliament Hill. It has, however, been set aside by the Department of Public Works and declared by the Honorable Mr. Pugsley to be unsuitable.

PROPOSED DEPARTMENT BUILDING, OTTAWA.—A Gross Breach of Faith with Architectural Profession.—A Beautifully Symmetrical and Monumental Modern Adaptation of Gothic Set Aside for a Design Characterized by Critic as a "Glorified Packing Box." ∴

IT NOW APPEARS that Mr. Pugsley, Minister of Public Works, has decided to carry out his determination to set aside the prize design of Messrs. E. & W. S. Maxwell, of Montreal, for the proposed Departmental Building at Ottawa and erecting this, one of Canada's largest Government buildings, after plans prepared by Chief Architect, David Ewart, of the Department of Public Works, and his staff.

A large delegation of architects recently waited upon the Government protesting strongly against such a procedure, pointing out that the design of so important a structure was essentially work for the best architectural talent in Canada, and that the competition conducted more than two years ago by the Department was at that time calculated to give the country the benefit of the best architectural services obtainable in Canada. The petitioners further pointed out that the conditions of the competition implied that the successful competitor should be asked to prepare the final drawings and superintend the construction of the building. They pointed out that the adoption of plans prepared by the Government's chief architect would not only constitute a breach of faith with the architectural profession in Canada but would give, the country a structure far inferior to that which might be obtained through following out their original programme.

The publication in the daily press of Mr. Ewart's design justifies every contention made by the architects. Mr. Pugsley's statement as recently made on the floor of the House that not one of the prize designs was considered suitable, does, by no means, justify the stand taken by the Government. Several designs were prepared in accordance with a definite programme laid down by the Government, and the assessors that awarded the prizes were among the most competent architectural critics in Canada, one of whom was the Government's chief architect, Mr. Ewart. In all architectural competitions, it is invariably the case that the successful design has to be changed in some few minor particulars before a working plan can be decided upon. This would be also true with regard to the design of Messrs. E & W. S. Maxwell. This design was prepared in strict accordance with the programme as laid down by the Government, and the general conception was considered good. The fact that it possibly is not suitable in every minor detail, does not justify its being thrown out by the Government, and substituted by an essentially inferior design prepared by an over-worked department.

We publish herewith Mr. Ewart's design, together with the prize design of Messrs. E. & W. S. Maxwell. A glance at them is sufficient to enable even the untrained eye to perceive the utter lack of character in the former as compared with the beautiful symmetrical lines of the latter. The designs of Messrs. Maxwell, when first published, some two years ago, received favorable comment from critics all over the continent. It is a beautiful adaption of Modern Gothic and would harmonize well with the old dignified Gothic piles on Parliament Hill. The utter lack of character in Mr. Ewart's design, on the other hand, renders practically impossible a detailed criticism. The criticism of a prominent Toronto architect of this latter design is fairly representative of just how the trained eye looks upon this unfortunate design. To CONSTRUCTION he said:

"I have had the pleasure—or I might rather term it the pain—of examining critically the perspective drawing showing the proposed new Departmental Building to be erected at Ottawa by the Dominion Government.

"At first sight, one is struck with the utter lack of character—A Departmental Building for the Dominion Government.—It looks more like a cross between a fancy jail and a chocolate factory, with a dash of "high school thrown in. No consideration has been given to the study of the building in mass; the central motive is too wide in proportion to the connecting wings, nor is this central motive properly tied to the connecting wings or to the end pavillions. The fenestration of the connecting wings is monotonous and uninteresting in the extreme. No attempt has been made to relieve by grouping, or by the handling of the piers the studied monotony of row after row of windows.

"The building is too high for its length. The treatment of the basement gives an appearance of weakness to the whole structure—it looks like a sham building, and such it really is. It pretends to be Gothic—but heaven deliver us from such a bastard Gothic.

"The old buildings, while open to criticism, are, on the whole, a picturesque and interesting group—at least the work of a scholar; but what shall we say of this "glorified packing box?" It has really nothing to commend it. It is bad in character, bad in mass, bad in detail, commonplace in conception.

"If the proposed new Government Buildings at Ottawa are to be Gothic in design, and this is a sample of Government Gothic, then I am sure all intelligent men will join with us in saying, 'God forbid!'"

If we were to make any comment upon this criticism we would say that it is not sufficiently severe.

Letter to the Prime Minister from Mr. Baker.

The following letter was addressed to Sir Wilfrid Laurier by Mr. F. S. Baker, President of the R. A. I. C., and it quite fairly represents the views of the architectural profession, together with those of intelligent Canadians generally upon the proposed procedure of Mr. Pugsley:

April 15th, 1910.

My Dear Sir Wilfrid:

In January of this year a very representative deputation of the architects of the whole Dominion, numbering about fifteen, visited Ottawa and saw the Minister of Public Works by appointment. The object of this visit was to present a petition from all of the official provincial architectural bodies, and also from the Royal Architectural Institute of Canada, the representative Canadian body, requesting the Government to adopt the principle, long since adopted in the principal countries of the world, of employing eminent architects in private practice to design and supervise the erection of the more important public buildings to be undertaken by the Government, including those for which a competition amongst the architects of Canada had already been held, namely the $5,000,000 Departmental Building in Major's Hill Park, Ottawa. By holding that competition the Dominion Government had in fact adopted the principle in question and the Public was led to believe that the same principle would be followed in future.

At the interview above referred to with the Hon. Dr. Pugsley, the usual assurance of consideration was given

by the Minister, to whom the matter was made as clear as possible by the architects, in the time available.

My attention has now been called to page 6325 of Hansard, dated April 4th, 1910, in which the Honourable Minister has stated, in answer to qeustions, that the planning and carrying out of the work is now to be done by the "architectural staff of the Department of Public Works."

An illustration has also appeared in the Ottawa and Toronto papers indicating the design which the Department proposes to carry out.

Now, sir, on behalf of the architects of Canada and taking the broadest possible view of the matter, not being embarrassed by any question of friendship or politics, I feel it my duty to draw your attention to the very serious effect which this policy may have upon the future of Canada, regarding the welfare of which we are, of course, all fully equally concerned.

The Honorable Minister has stated that "not one of the designs submitted was considered suitable." In this he refers to the designs submitted in the competition for these buildings instituted and conducted by the Government some time ago. I take issue with this statement as the Board of Assessors appointed by the Government, which included its Chief Architect who acted as its agent, selected one design as complying with the conditions of the competition, and thus suitable for the requirements of the various departments. It must be obvious to every one that the object of a competition is to ascertain which design is the most suitable and while in this case the planning of these buildings was the test, the plan might reasonably require some alterations in different parts, as happens in the case of almost every building that is erected for public or private purposes.

The design produced by the architectural staff of the Department of Public Works has now been published, and I submit that for its purpose it is a travesty on good architecture. If it were intended for a "Salvation Army Barrack," or a "Tobacco Factory," this criticism might not be reasonable, but for a building to house the official departments of the Government of an advanced country, I submit the design is absolutely unsuitable and calculated to increase in the minds of cultured persons the inferiority of Canada in Art.

The question is, are we in Canada to be continually made a laughing stock for the people of all civilized countries, by expending vast sums of money upon buildings of puerile design and questionable construction?

A commission passed upon the collapse of the West Block Tower, and I ask if its findings were creditable to this department? If a Royal Commission was appointed to investigate the conditions existing to-day in the new Museum, what would its findings be? Has there been a large number of failures costing large sums of money to rectify in buildings designed and erected by this same department? Our Government is elected to execute the will of the country, and I do not think there can be found one Canadian who will agree that a retrograde step is a wise one.

Canada wants progress, her money spent wisely, her Government to benefit by mistakes of other countries and avoid them, a future Canada which will be a joy to the visitor, a country whose objects of Art and Architecture may be heralded abroad as sound and good. May I be permitted to say that these hopes and expectations will be completely defeated if the policy of having an overworked department attempt the erection of the large public buildings of Canada, is continued. I am,

Yours very truly,

F. S. Baker
President R.A.I.C.

Rt. Hon. Sir Wilfrid Laurier,
Prime Minister,
Ottawa, Ont.

It is our sincere hope that some influence prompted by a slight regard for the architecture of our National Buildings in Ottawa may be brought to bear upon Mr. Pugsley, to dissuade him from following out his present proposed course and thus prevent the erection of a structure that for all time would be a blot on the good taste of the Canadian people.

ARCHITECTURAL REGISTRATION AND THE CONTRACTOR.

THE CHAIRMAN of the National Federation of Building Trade Employers in South Africa (Mr. M. C. A. Meischke), in speaking before the Select Committee on the Architects' Bill last June, gave evidence to the effect that builders were in favor of Registration of architects in that they were more assured that they would get fair treatment from the architects. Mr. Reid had mentioned the question of the final certificates being withheld sometimes by unscrupulous architects, either with the object of pressing the builder when he was wanting money to get money out of him, or for some other purpose. When the Bill passed as he hoped it would, it would mean that the Council of Architects had a hold upon its members, and when there was any unprofessional conduct they could bring it before the Institute, as provided for under Clause 13 and strike them from the roll. Sometimes architects would do anything in order to get work, and would offer their services at a very low rate. Of course, they had to make up their loss in some way by getting money from the builder. There were also unscrupulous builders who lent themselves to that, giving architects an extra commission which would come out of the work, for which, as in the case of the Dutch Reformed Church, the proprietors had to pay, because the architect gave certificates for extra work which had not been done, or if they could not increase the bill they decreased the amount of work. Without Registration they could not do anything, because the architects were powerless, but if the Bill passed, a case like that could be brought to the notice of the Council and they could take steps. They considered that through the passing of this Bill, builders and the public were more protected as a class. Another point was that if it were secured that architects acted fairly there was less risk for the builders, so that they could take work at a cheaper rate than he had to do sometimes at present. Architects at present were always allowed a margin, especially where it was a question of lump sums provided for in the contract. If an architect was unscrupulous he spent the money and shared it with the builder or proprietor or otherwise. That was an abuse which would be done away with when the Bill passed.

The issue of certificates was one of the greatest things they had to protect. Even the builder suffered as well as the proprietor. The architect, being the agent of the proprietor, dealt with his client's money. If there was any collusion between the two the proprietor suffered, if not, the builder suffered. When the Bill passes, the Council of Architects will be enabled to see that the members of the profession run straight and the builders will have redress by going to the Council and reporting dishonest practices. Therefore, they were in favor of the Bill. As Mr. Tindall had said, it was also in the public interest to get architects of standing to put up decent buildings, with architectural features. It was for the benefit of the country. Then, of course, they would have in future a stricter supervision of the work. To-day, builders worked in the interests of their trade; but under the Act, architects and builders would work together and the public at large will benefit by it. Mr. Jacobsz had said something about builders and architects. Of course, in the country districts a builder can design and plan a building. But he is not an architect; he could only style himself a builder. He does not come under the Act because he is not an architect; he is a builder.—THE JOURNAL OF THE SOCIETY OF ARCHITECTS, LONDON.

THE NECESSITY OF FIREPROOF CONSTRUCTION.—Enormous Destruction of Property in Canada Demands the Adoption of Safe and Economical Methods of Construction.—By Prof. Peter Gillespie, President C.C.C.A.

THE CANADIAN CEMENT and Concrete Association has completed the second year of its history with an outlook for usefulness which is undoubtedly brighter than it was a year ago. Its membership is larger; its name and aims are more widely known; its financial status is more comfortable, and in a few particulars it has learned wisdom through mistakes of the past. As anticipated in my opening remarks to you last March, a permanent secretary has been appointed, to whom has been delegated the clerical work connected with the association. The new regime is proving very satisfactory, and I think that this will be a means to extending its influence and work. A committee on standard specifications has been at work, and will report to you during the week on the results of its labors. It is felt that by issuing standard specifications which are up to date, but also sufficiently conservative to meet the approval of moderate people, the association will be doing something to endorse safe and economical construction in concrete.

Regarding the attitude of the Canadian Cement and Concrete Association toward other building materials, I have only a word to say. While it stands for the dissemination of authentic information regarding the uses of a comparatively new material—for the encouragement of whatever in cement construction is safe, economical and artistic, and for the elimination of whatever is unsafe, wasteful and unsightly—it does not decry nor condemn any other legitimate building material. It recognizes that others have claims and advantages of their own, and does not advocate cement construction where another material is manifestly superior for the special situation under consideration. It recognizes also that steel and concrete and clay products and wood make, on occasions, most excellent structural combinations, and feels no enmity nor jealousy towards any of them.

It has been pointed out that human progress from pioneer conditions always divides itself into three noteworthy stages. These are, first, the period of individual enterprise involving the conquest of the wilderness and making for the benefit of the man; second, the period of collective enterprise making for the benefit of communities, or of the individuals constituting them; third, the period of co-operative enterprise, largely altruistic, for the advantage of the nation, and for succeeding generations as well as those of the present. This last is the era upon which we are now entering, an era when an endeavor to use wisely, to avoid unnecessary waste and to look to the requirements of the future is being made. As a sign of the times, we have commissions on the Conservation of Natural Resources. It is to a recognition by the present generation of its responsibility to posterity, that these important commissions of inquiry in the United States and Canada owe their beginning. "The duty of man to man, on which the integrity of nations must rest, is no higher than the duty of each generation to the next; and the obligation of the nation to each actual citizen is no more sacred than the obligation to the citizen to be, who, in turn, must bear the nation's duties and responsibilities." It is only of recent years that the attention of people in the New World has been drawn to the fact that the natural resources of this continent are not inexhaustible, and that if the duty of the present to succeeding generations is to be faithfully discharged, some methods of conserving these assets must be devised. The most reprehensible of all waste is destruction, and the most destructive of all agencies is fire, and to the extent of its ravages in this country at the present time, to a comparison of our own country's fire loss with that of other lands, and to means for minimizing this appalling waste, I invite your attention for a few minutes to-day.

A report of the United States Geological Survey, recently to hand, affirms that during the year 1907, the per capita loss in the United States due to the destruction of buildings and their contents by fire was $2.51, while the average corresponding per capita loss in Austria, Denmark, France, Germany, Italy and Switzerland during various periods from 1898 to 1904 was only 33c., an amount only one-eighth that quoted for the United States of America. It must also be remembered that to the actual per capita loss as given above, viz., $2.51, must be added a number of items indirectly, if not directly, chargeable to the fire fiend. Premiums are paid to fire insurance companies obviously very much in excess of the compensation for fire losses returned to the insured; fire fighting equipment and a water distributing system must be installed and maintained at an expense very much in excess of what would be required for purely industrial and domestic necessities. These the statistician has estimated as follows: Excess of premiums paid over amount of losses returned, per capita, $1.71; maintenance of waterworks, chargeable to fire service, exclusively, per capita, 33c.; maintenance of public fire departments, per capita, 57c.; maintenance of private fire protection, per capita, 21c.. This makes a total annual per capita tax of $5.33, and represents an aggregate cost to the public of the United States of 456 millions of dollars, an amount the magnitude of which it is exceedingly difficult to comprehend. If through any cause, it were possible to reduce the actual fire loss in the United States to a figure comparable with what prevails in the countries of continental Europe, there would be a proportionate reduction in related and accessory items as well, which, it is estimated, would reduce the aggregate loss through fire to ninety millions of dollars, which would mean a saving to the republic of 366 millions. In consequence, it would appear that the United States is paying annually a preventable tax sufficient to construct a Panama Canal. For the year 1907, the total value of buildings erected in the Republic was conservatively estimated at $1,000,000,000, and from what has been said above, it is seen that a loss by fire equal to practically half the value of the buildings constructed, was suffered by the American people. This is a loss that no system of account keeping or no method of clever logic can conceal. Destruction by fire is absolute and irreparable, and insurance when paid to the owner, serves only to distribute the loss among the whole body of the insured. This state of affairs is truly appalling, and it is a striking wonder that economists have given so little attention to the evil and its remedy.

The Monetary Times of January 6, 1910, reports the aggregate loss in Canada due to fire during the year 1909 as $18,905,000, with a total loss of life of 219. The daily press report of a fire was first accepted by this journal, and then inquiries were addressed personally to the owner and occupant of the property destroyed. In this way fairly authentic information regarding the magnitude of the loss was obtained. An actual fire loss of one and three-quarters millions of dollars per month in Canada must give us pause. This is equivalent to a per capita loss of $2.70, seven per cent. greater than that reported by the United States, twenty-three times as large as that reported for Italy, six times as large as that reported for Germany, and nine times as large as that reported for France. Assuming that for Canada, the accessory and related losses due to insurance, fire protection, etc., are of the same order as in the neighbor reporting, Canada's sacrifice to the fire monster, directly and indirectly will approximate the enormous total of $40,000,000 per year. This amount is four times the yearly interest on Canada's national debt, is nearly equal

*Paper read before the second annual Convention of the Canadian Cement and Concrete Association at London, Canada.

to the total annual revenue from duties on imports into Canada, is seven times as large as the entire annual expenditure for postal facilities in this country, is twice as great as the entire expenditure by the people of the country for the maintenance of churches and clergy of all denominations, and is sufficient to construct four Dreadnoughts annually. In addition to this, there were sacrificed last year, four lives per week for every week of the year, a number almost large enough to place a victim's skull on every milepost between Buffalo and Detroit. On this side of the water we view with alarm the manner in which the European Powers are breaking the backs of their taxpayers in order to render their armaments on land and sea more and more formidable, and we are, sometimes, in consequence, lead to doubt the real progress of civilization, not thinking perhaps that our own prodigality in the matter of destruction by fire must arouse them in a feeling of wonderment at the folly of the so-called progressive American people.

The cause of such destruction is not far to seek. Our buildings, many of them, are constructed of most inflammable materials, and although they may be protected by the most perfect fire-fighting appliances that ingenuity can devise, conflagrations are inevitable. The disastrous Toronto and Baltimore fires of 1904, the San Francisco calamity of 1906, and the Collinwood School House tragedy and the conflagration in Chelsea, Mass., in 1908, are still fresh in the people's minds, and it is safe to say that had fire-proof construction as to-day understood prevailed generally, these unfortunate disasters would either have never occurred or the evils attending them would have been very much less than they actually were. The alarming feature of the entire situation is that similar calamities may occur any day in any city of Canada or the United States.

In America combustible building materials are employed to an extent that would not be tolerated in Europe. Older in the world's history than America, these nations have developed a wisdom in construction, in comparison with which America suffers greatly. In many European cities the erection of wooden buildings is prohibited, and the use of inflammable material in construction is so rigidly regulated and overseen that fires are practically confined in every instance to the building in which they originated. It is manifest from the results that the consequences of European paternal government are not at all disadvantageous.

A report from a branch of the Government service at Washington, D. C., has this to say: "The timber supply of the United States is rapidly approaching exhaustion, and unless means are taken to limit the waste (a great deal of it through fires) and replenish the supply through reforestation, the timber resources of the country will be exhausted within the next quarter of a century. The known supplies of high-grade iron in this country, estimated at more than 4,788,000,000 tons cannot be expected to last beyond the middle of this century unless the present increasing rate of consumption is curtailed. There are in addition about 75,000,000,000 tons of low-grade iron ore, which will undoubtedly be used to some extent as the price of iron advances. The supplies of stone, sand, gravel, clay, cement, lime and slate are practically inexhaustible, and as the supplies of timber and iron are depleted and the prices of these are increased, it is evident that the United States must turn to concrete-making materials, clay products, and building stone as substitutes for wood and iron." Continuing, the same report asserts that "the mineral materials available for structural purposes may be divided into two classes: (1) iron, steel, copper, nickel, and their manufacture, the supplies of which are limited and which are themselves subject to destruction through weathering, fire and other causes; (2) stone, clay products, and cement and concrete manufactures, which are less subject to destructive agencies and the supplies of which are practically inexhaustible.

"In building and construction work the substitution of the materials of the second group for the more commonly used wood and metal manufactures should be encouraged as having an important influence on the preservation of the supplies of the more perishable and scarcer materials. The use of building stone and clay and cement products in this country had been restricted by competition with the much cheaper wood products and the more easily fabricated and more available metal products. Improved methods of preparing the raw materials for use in building construction are, however, rapidly diminishing the difference in cost, and careful investigation as to their structural qualities and the more suitable structural forms would have an important influence in further reducing this difference in cost and in enlarging the use of the more permanent materials." It is manifest from the above that those materials which occur in almost inexhaustible quantities and which, when fabricated into structural forms, are least susceptible to destructive agencies, must be looked to to save the situation. They constitute the really fireproof building materials as has been attested by numerous severe trials. Building regulations on this continent, however, have been very much to blame in their failure to compel, or at least encourage their use. They have permitted the erection of structures either of inflammable materials or of combustible materials in such a way that when a fire occurs in the contents of a building it is not usually confined to that building. Our fire protection appliances are probably as modern on this continent as elsewhere, so that it seems conclusive that to insist on the use of fireproof building materials in the first place, and in the second to scrutinize carefully the method of using them so that fires when they do occur will be properly confined, will be the remedy. It is exceedingly poor economy to sacrifice tomorrow the accumulated wealth of years of labor for the immediate convenience and needs of to-day.

THE USE OF CEMENT IN ARCHITECTURE.—By F. S. Baker, President R.A.I.C. .·.

I RISE TO SPEAK on the subject "The Use of Cement in Architecture" with considerable diffidence as I see before me so many people who are much better informed on this subject than I am. Will you allow me, sir, to congratulate you and your association upon the splendid exhibition which you have arranged and upon the excellent attendance, which indicates the great progress which your association is making. I want also to say to this gathering of Canadians, mostly no doubt interested in the manufacture of cement, on behalf of the architects of Canada, how very much the successful efforts of those engaged in the manufacture of cement have been appreciated, and to express their pleasure that cement, particularly "Portland," made of Canadian material by Canadian workmen, is now obtainable in satisfactory quantities, of a quality equal if not superior to any made in any country in the world.

I easily recall the days when the only Portland cement came from England in very small quantities and at a prohibitive price. The production of the Canadian article saw the emancipation of the architects from the anxieties of masonry work in lime mortar, and to-day I doubt if there is a building material which the architects regard with more affection than Portland cement.

With your kind permission I will speak on this subject from the architect's as distinguished from the engineer's point of view. Your excellent programme in-

(*Concluded on page* 80.)

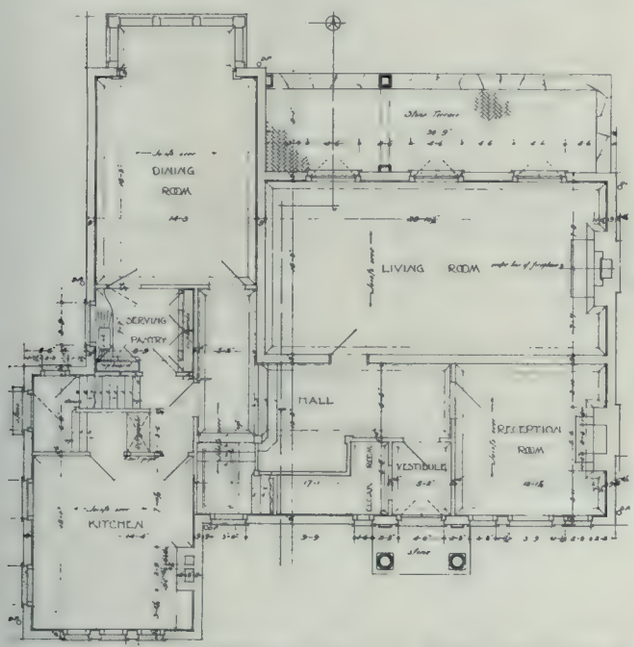
*Paper read before the Second Annual Convention of the Canadian Cement and Concrete Association at London, Canada.

Residence of E. R. Rolph, of the firm of Sproat & Rolph, Architects, on Jackes avenue, Toronto. An interesting Georgian house with walls of ordinary red brick laid in a double stretcher bond, so jointed with false vertical joints of the same colors as to take on the appearance of Roman brick.

Rear view of residence of Architect E. R. Rolph, Jackes avenue, Toronto, showing the casement windows, which open on to the pergola-like porch facing the direct south. Preparatory work on the garden fountain, which, together with the proposed landscape features, will make this portion of the lot an ideal one, is seen in the basin and tiles in the foreground.

RESIDENCE OF MR. E. R. ROLPH, TORONTO.—Splendidly Situated Georgian Home in Which Beauty of Design and Plan is Achieved by Simple Lines and Good Proportions.—Floor Depression in Hall and Living Room Feature of an Unusually Interesting Scheme.

THERE IS POSSIBLY NO STYLE of architectural treatment, which admits of more latitude for practical and consistent house-planning than that of the Georgian Period, and yet it may be said in the same breath that there is perhaps no style with narrower or more restrictive limitations. To glance about at various



Ground floor plan, Residence of Mr. E. R. Rolph, of the firm of Sproatt and Rolph, Architects, on Jackes avenue, Toronto.

examples both good and bad, and commonplace and attractive, is to be fully convinced of the truth of this contradiction. This latitude, it may be said, lies in the flexibility of the design itself, and the limitations in the failure to discern the possibilities in this respect. Thus one finds Georgian houses which slavishly ape one another, and again others in which the lines of compositions have been beautifully moulded to produce a distinct feeling of frank simplicity without destroying or belaboring the characteristic features of the design.

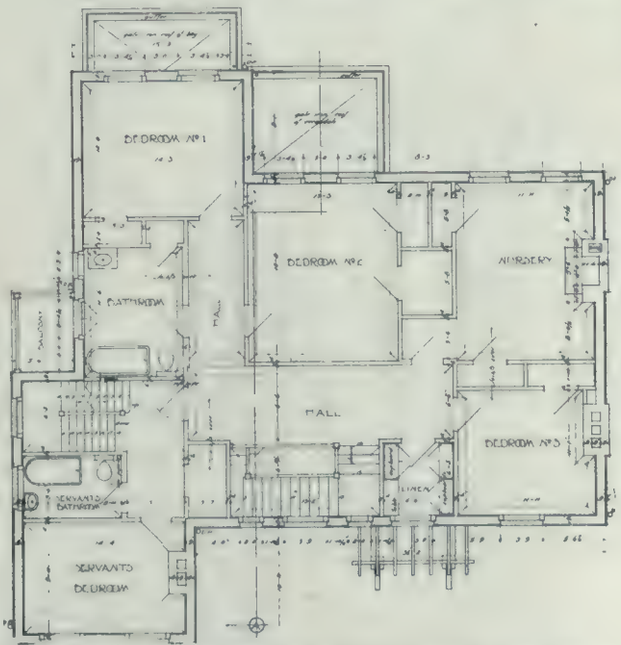
One of the more successful residences of this type is the recently erected home of Mr. E. R. Rolph, of the firm of Sproatt & Rolph, architects, Toronto. This home stands well back on spacious grounds on the south side of Jackes ave., in one of the most delightful sections of the Rosedale district. Originally the site formed a part of a large apple orchard, and at the front of the lot is a beautiful old apple tree spreading its robust boughs in a most paternal manner. Other trees of this variety are interspersed along the sides, while at the juncture of the street line are two stalwart young maples which further add to make the environments ideal as regards natural advantages.

The approach is by a vitrified brick walk to an interesting small entrance porch placed slightly to the right of the centre, and having a delightfully private yet inviting feeling, which is further accentuated by the projection from the service portion at the northeast corner. The walls are of ordinary red brick with 1¼ inch white mortar joints, and double stretchers so laid and merged with false vertical joints of the same color, as to take on the appearance of Roman brick. This results in a most pleasing composition, and with the white woodwork and green painted shutters of the upper storey forms an unusually simple yet attractive exterior.

As the exterior suggests, the interior of the house is extremely homelike in its appointments, and the entrance hall, which is transversely situated, reveals a general plan which departs from the usual arrangement found in residences of this style. Here the floor is tiled with red English quarries and the walls are covered with a green velvet paper, while adding effectively to this combination is the woodwork, which is painted white, with the exception of the doors and hand rail and newels of the staircase, which are a rich mahogany. By accident, and by the result of no forethought, the scheme of decorations is worked out in Oriental style, with Chinese lanterns, furniture, and wall pieces, but these happily are quite in sympathy with their surroundings.

The living room is done in a soft green velvet paper, similar to that in the hall, and has casement windows opening onto a pergola-like porch, overlooking a south garden. The curtains are of old green silk rep hung from gilded cornices, the mantel of Indian limestone, and the floor of polished oak covered with rich, soft rugs. In order to allow additional height for the cove ceiling, without raising the level of the entire upper floor, the floor of this room, together with that of the main hall and reception room, is depressed twenty-one inches. This is worked out in the staircase, to have it continuous, by an arrangement of three short steps to a landing on a floor level with the service portion of the house.

Off this landing is a short passage to the dining-room, which has a south-facing bay, affording the same delightful view as is obtained from the living room. In this room the furniture is of mahogany, the carpet a soft green, and the wall paper of a russet brown design on a deep blue background. Passage to and from the kitchen



Second floor plan, Residence of Mr. E. R. Rolph, of the firm of Sproatt and Rolph, Architects, on Jackes avenue, Toronto.

is by a small serving pantry, which is also adjoined by a service staircase giving access to the basement and upper floors.

In the upper floor the woodwork throughout, as on the first floor, is finished in white enamel, and the wall

Entrance Hall and Main Staircase, residence of Architect E. R. Rolph, Jackes avenue, Toronto. Note the floor of red English tile quarries, and the delightful harmony between the Oriental decorations and general wall scheme.

Living Room, residence of Architect E. R. Rolph, Jackes avenue, Toronto, showing the cove ceiling and Indiana limestone mantel.

Dining Room, residence of Architect E. R. Rolph, Jackes Avenue, Toronto, as it appears looking from the bay window towards the hallway. On the right is seen the doorway connecting with the servery and kitchen.

Upper Hallway, residence of Architect E. R. Rolph, Jacke - avenue, Toronto, in which the wall treatment and woodwork of the lower hall scheme is repeated.

scheme and decorations of the hallway is similar to the hall below. There are three bedrooms, a nursery and a large tiled bathroom, exclusive of the servants' bedroom and accommodations, which are situated above the kitchen.

THE USE OF CEMENT IN ARCHITECTURE.

—Continued from Page 75.

dictates that the engineer's view will be well taken care of.

It is very gratifying to know that no matter how enormous the quantity of Portland cement required in the operations incideral to the development of this vast country of ours, the raw material is available to insure the use of the Canadian product and protect us against the necessity of importing foreign material.

I think that so delicate a material as Portland cement should be shipped in better packages than jute sacks, and claiming an architect's prerogative, I would ask your consideration of the possibility of improvement in this direction.

There is a source of considerable anxiety and annoyance to the architects which I think your chemical experts might overcome with great benefit to every one concerned. I refer to that ingredient in Portland cement, and all seem to be alike in this respect, which so badly stains any limestone or sandstone with which it comes in contact.

Owing to the kindness of the management of the International Cement Company at Hull, Que., I was given an opportunity with several other architects to visit their works and see the whole process of manufacture from the quarry from which the shale was mixed to the jute sacks already referred to.

Part of the process was, of course, this crushed shale and clay in the large cylinders at a very high temperature, and it occurred to me that the qualities which caused the stainings of the stone might be some form of carbon which might be eliminated by a furtil burning or by some chemical process which would not injure the usefulness of the product. Of course we use various methods of overcoming this staining, such as painting the back of the stone and using some non-staining cement in making the mortar used next the stone, etc., but even with these precautions the stains sometimes get through. I have in my mind a very fine public building now being erected of Bedford stone and large areas of the external walls of the building are ruined by this staining.

The subject of concrete will be well covered by various speakers at this meeting, but there is one feature which occurs to me, I refer to the injury which concrete in course of setting receives from any sudden jar. To obviate this where concrete is used for floors in steel frame buildings, I think the architect should provide additional steel sufficient to insure a stiffness in the frames, which would prevent injury to the concrete by the vibration incidental to the erection of any steel frame building. I have observed that concrete placed in moderate freezing weather, say twenty degrees and above, which is allowed to set fully without any vibration, seems to be as good as that set in non-freezing weather.

Portland cement has proved very useful in forming surfaces to resist water or tanks to contain fluid, such as cisterns, swimming baths, egg tanks, etc., but the success of this depends largely on the mixture. In a case like egg tanks it is exceedingly important that the walls should be absolutely tight as the slightest subsidence of the fluid causes the eggs at the bottom of the tank to be crushed.

For this reason concrete seems to be the ideal thing for floors which lie upon the earth, such as basement floors or veranda floors, or sidewalks. As a finished floor for a building, however, I do not think a cement and sand or marble dust composition is satisfactory, and the same applies to staircases. I refer, of course, to places where there is heavy traffic, as the floors or treads at once begin to wear, and the consequent deposit is carried into adjoining rooms.

Portland cement shows its greatest usefulness to the architect in the mortar which is now almost universally used in the laying up of brick walls. I mean cement mortar, one to three. A brick wall laid in such mortar and grouted with liquid with cement grout in a very few courses becomes as hard as solid stone, and as compared with concrete the builder has the assurance of strength, from his knowledge of the soundness of the bricks and of their resistance to crushing. I have watched men cutting an opening through such a brick wall, and the hard bricks generally yield before the mortar. Such masonry is a great comfort to the architect. In it there is no danger of a weak spot, such as might occur in a concrete wall through the carelessness of the workmen. No matter what precautions he takes, the architect of a reinforced concrete building must have some anxiety on this score until the building has been thoroughly tested, and while I say this I am a great admirer of the wonderful feats which have been performed in the erection of immense reinforced concrete structures, and I am satisfied that it is a practical building process. The use of cement mortar in the building of rubble stone walls is also a great boon to the architect. No rubble stone work should be attempted in anything but cement mortar, where cement is obtainable. The failure which I have seen in rubble stone work would in every case have been avoided if cement mortar had been used.

While the concrete block is a desirable article for a certain class of building, I have not yet seen any which would be satisfactorily used in a building which was to stand as an architectural effort in a conspicuous place. In saying this I do not include so-called artificial stone which is a very admirable building material, and thanks to cement in its construction, is now obtainable of the highest quality, in any quantity. And you get it without delay. In this material anything which the architect can design of a masonry character can be rapidly constructed and reproduced to an endless number. He is hypercritical who condemns this material because it is an imitation. I contend that it is a sound building material, which can be quite properly used where it is obviously artificial stone.

Of the several kinds of artificial stone, I prefer that which is formed of the same material all through, and not formed in the main of one kind of concrete and faced with another. There is apt to be a difference in the expansion and contraction of two materials and a difference in the retention of moisture, which might reduce the strength of the latter article, as compared with that which is formed of the same material all through. It is clear, however, that an architect must be drawn into the reproduction of a feature so easily obtained in artificial stone in an effort to economize. On the whole I like artificial stone very much and wish it every success.

A delightful material for use on the interior wall surfaces of buildings has developed recently, in plaster formed of white cement mixed with ground stones of different colors.

Of these the most used is perhaps that which is known as Caen stone cement. This is now used to finish the interior of the public parts of hotels, hospitals, theatres, banks, stores, and even churches. It is applied much as plaster would be and is laid of tects in courses jointed horizontally and vertically, just as real stone work would be. The result is almost a perfect imitation of real Caen stone work and is, as I said before, a delightful interior finish. On account of its plastic nature the most difficult ornamental work can easily be produced cast from a carved model, which, of course, can be reproduced as often as desired. The color obtained is splendid, and while it is undoubtedly an imitation and more to be condemned on that score than artificial stone, an architect

obtains in its use a most satisfactory result for his client. All the large cities in Canada, and I think I may safely say all the large cities in the United States have prominent examples of the use of this material for interior finish. In most of these cases all of the interior trimmings, including the mouldings and ornaments, are also formed in the Caen stone cement.

The use of cement has also made possible many embellishments for the exterior of the building which could otherwise only be obtained at great expense. A whole wall surface may now be safely covered with cement plaster, either on masonry work or metal lath, and the craftsman feels assured that it will stay in position, while at the same time it may be enriched with scrafito ornament by the skillful carver. On the other hand friezes protected by roofs or other protections can be modelled in relief on the building, quite as successfully (and at much less expense) as a frieze carved in stone.

I cannot stop without urging upon this association of influential men the desirability of doing everything possible to encourage good architecture throughout the Dominion of Canada. You have done in the manufacture of Portland cement more than any other body of men has done in what makes for sound construction in building, and if you will as a body take a firm stand in favor of the employment by the public of architects, known to be skilled in their profession, you will be able to do much to improve Canadian architecture.

GEORGIAN BAY CANAL.—Project Now Reported a Certainty.—Noted British Engineer Acting in Concert with Dominion Government.—Monumental Engineering Feat to Cost $150,000,000.

WITH the arrival of Sir Robert W. Perks, the noted British engineer in Canada, comes the first tangible move toward the actual construction of the Georgian Bay Ship Canal, that monumental engineering work of the British Empire which has been projected with a view to providing the shortest and cheapest grain carriage route from far Western Canada to the parts for ocean going steamers on the St. Lawrence. Sir Robert, whose engineering skill has been written from the Manchester Ship Canal down to the Rio Janeiro quays and the construction of the Argentine and Chito Transandine Railway, will assume constructive supervision of this proposed new monster among inland waterways.

The Georgian Bay Canal, which may revolutionize traffic conditions with regard to the great grain reaches of Western Canada as well as of the Northwest of the United States, will entail an estimated expenditure of between $100,000,000 and $150,000,000.

Though, as now planned, this money will be furnished in the first instance by an English syndicate, the cost of the undertaking probably will be guaranteed by the Canadian government, as steps are to be taken soon for the passage of a bill through the Dominion Parliament authorizing the construction of the canal as a government undertaking.

Government Ready to Aid.

Held to be rendered necessary by the fact that the St. Lawrence is not navigable for its entire length, the idea of constructing an all Canadian shipping waterway connecting the Ottawa River by way of Lake Nipissing and so with the St. Lawrence at Montreal was first proposed thirty years ago by Mr. McLeod Stuart, of Toronto, who inherited the scheme from his father. Many memorials on the project have been addressed to the Dominion Parliament, but up to the present nothing has been done toward formal governmental sanction of the plan. Sir Robert's arrival, his preparations prior to his leaving England, having been marked by his withdrawal from many activities with which he has been associated, so that his stay may be extensive, was determined upon only, so it is authoritatively affirmed, after assurances had been received in London that the present Canadian government would lend every effort to expedite the passing of a measure making the project a government undertaking.

According to the latest designs, as learned from authoritative sources, the proposed 440 miles of canal between Georgian Bay and Montreal will be twenty-two feet deep and will link up the deep and navigable stretches of intervening lakes and rivers by means of thirty-three locks. The summit level, at about six thousand feet, will occur on the section between Lake Nipissing and the Ottawa River. The projectors count upon plenty of water not only for the canal, but for an electric plant of large dimensions, the latter idea being supported by the large watershed draining into the canal zone. It is estimated that the undertaking will require five years for completion.

Strategic Advantage.

Though the English press lays stress on the commercial aspects of the canal, another object that will be attained is the strategic advantage that the waterway will provide for the British Empire. There is no doubt that in the minds of the patriotic projectors of the undertaking the importance of this feature is not underestimated. The question of imperial defence, in fact, coordinates with that of commercial advantage. A glance at the Canadian map makes this assertion self-evident. For, surveying the map from the imperial standpoint, it is contended by Englishmen that the 3,260 miles of frontier dividing Canada from the United States is from a military standpoint a big item in the list of future contingencies.

A waterway which will enable the ships of the royal navy to draw up to the wharves of the upper lake ports, as they now draw up to the wharves of Montreal and Quebec, it is contended, will mean that the eastern portion of the Dominion's boundary will depend for its defence on naval, instead of military, power. Also, from a political point of view, the Georgian Bay Canal promises to place a trump card in the hands of a fully developed Canada.

As to the commercial possibilities of the undertaking, a London newspaper said:—

"These are infinite. Duluth, Chicago and Port Arthur are the grain centres of half the area of North America, Manitoba and the Northwest, in Canada, and, in the Republic, the States of Dakota, Minnesota, Missouri, Michigan, Illinois, Indiana, Colorado, Kansas and Nebraska. The trade in wheat, agricultural products generally and raw materials is enormous, for it must be remembered that the region is nearly as large as Europe. Some idea as to its magnitude may be gained from the fact that the freight received and shipped from Buffalo, the eastern terminus of deep water navigation, exceeds 70,000,000 tons. On the upper lakes the aggregate tonnage is at least half as much, the traffic of the canals at Sault Ste. Marie in a season of 230 days about twice the traffic of the Suez Canal in one year, while the traffic which passes up and down the Detroit River is said to exceed the foreign and coastwise traffic of London and Liverpool combined."

Route for Grain.

Boats bringing grain from the interior that at present pass eastward through Lake Superior or Lake Michigan and turn southward through Lake Huron, proceeding round the southern boundary of the Province of Ontario by the canal route, would continue eastward across Lake Huron into Georgian Bay, whence they enter the French River, and, continuing eastward, pass upward through Lake Nipissing to the highest point in the route, after which they descend the Ottawa River to Montreal.

It is purposed to construct the canal on the "dam and lock system," with slack water reaches between the structures. The locks along the route will be constructed of concrete and will have a length of 650 feet, a width of

65 feet, and a depth of 22 feet. It will permit the passage of ships of six hundred feet in length, sixty feet in beam and with a twenty foot draught. Of the 440 miles distance between Montreal and French River Village, on Georgian Bay, all save some twenty or thirty miles follow the course of some river or lake. Consequently the actual canal cutting that will be necessary to complete the undertaking will vary from twenty-eight to thirty-four miles. In addition about sixty miles of submerged channels will have to be removed at shoals, sharp bends and at other difficult points in order to form wider channels. This would leave about 332 miles of natural waterway that would not require any improvement save the raising of the water surface.

THE ARTISTIC SIDE OF CONCRETE CONSTRUCTION IN THE COUNTRY.—By Ernest Willby, Architect.

JUST NOW ALL KINDS of movements are on foot for the beautifying of our cities. I should like to see a similar movement for the beautifying of our rural districts; the first is a work of great difficulty, the latter, with the aid of concrete, becomes, I believe, very simple.

Usually in obtaining an artistic result, as for example in cement houses, that result depends on the quality of the design; the designer must be an artist, that is to say, an architect with artistic knowledge and training.

In the field for cement work to which I shall direct your attention, the architect is not essential, a slight knowledge of what constitutes good design would help, but even an entire lack of this knowledge would not destroy though it might lessen, the beauty of the finished work. Given certain requirements met in the simplest and most practical way by use of concrete, a good result would be obtained as naturally and almost as inevitably as night follows day.

Canada and the United States, being newly settled countries, have had to meet the problem of opening up the land for occupation by rough and ready methods; little thought had been given to so immaterial a thing as beauty. This is especially noticeable in our bridge work; first came the wooden bridge, not altogether without merit, and then in the search for something more durable, that triumph of ingenuity, the modern steel trussed bridge, a tall attenuated arrangement of struts and wires beautifully scientific, but not by any means scientifically beautiful.

Now, I have no quarrel with the steel bridge for railway work and spans of magnitude, for it is often the only solution, but on our highways for crossing small rivers and streams it is but a poor substitute for the beauty of the arch bridge, and the pity of it is, that it is usually placed in a spot where nature with green foliage, sloping banks and running water has prepared the setting for a charming picture.

The small steel bridge is an eyesore, and endurable only so long as we cannot replace it with some other form of construction more beautiful, while being practicable and inexpensive; concrete seems to offer us these three advantages.

It is not my purpose, however, to dilate on the practical and economical advantages of concrete construction for bridge work but on the artistic results which follow its use; concrete as a material is in harmony with almost any natural setting as soon as it is in place, large surfaces of cement are never monotonous, the texture of the surface gives endless play of light and shade, it also forms a satisfactory background for trees and shrubs, the solidity of the material gives a satisfying appearance of permanence and stability, the absence of which is fatal to all beauty in the steel or wooden bridge.

Ever since the arch was discovered some 2,000 odd years ago, no other form of bridge construction has been invented which, in beauty of form and durability, can compete with it; to appreciate fully how much we lose by not having adopted, hitherto, this form of bridge construction, we have only to visit England, France, Germany, Italy or Spain. In each of these countries we find the arch bridge of every size and kind used since time immemorial, each one beautiful, a harmonious note in the landscape.

Now, at least three parts of this beauty is not the result of design, it comes from using the arch form; the arch is in itself so beautiful that other things matter little. The bridge may be of hewn stone or the most rustic of masonry, may be designed by some talented architect, or by some country mason; it may be embellished with sculptured work, mouldings, every kind of enrichment, or it may be severely plain, but in no case is it ugly.

We cannot hope to reproduce these bridges in stone, the expense makes that impracticable. In most localities concrete offers the one and only other material. It is a good substitute if used frankly for what it is and not in imitation of stone. While the arch form is applicable to concrete construction, I regard it as essential that the use and shape of the arch be such that no steel reinforcement be needed to give it stability, it must not only be strong, but it must look strong. For this reason the eliptical arch is not to be commended; the arch needs only to be semi-circular or segmental, in some cases it may be pointed. Any of these forms will look well.

It would be preferable to use monolithic construction throughout the bridge. Cement blocks could, however, be used for the arch, when they would be more practicable, provided the rock-faced variety were not used. In country districts a high finish is not necessary, a degree of rusticity being more harmonious with the natural surroundings. In this case there would be no objection to simplicity, which is a safe path to follow; any attempt at decoration is dangerous unless done by a trained designer.

A word about steel reinforcement. There would be no objection to its use for the purpose of giving strength and homogeneity, provided no attempt be made to alter the structural line of the arch. As I said before, the beauty of the bridge depends on the line of the arch, which should be similar to a masonry arch, so that it will have the appearance of being self-supporting and of having ample strength to support the weight resting upon it. In a number of cases when the arch has been used in the United States the mistake has been made of giving an excessive rise to the crown of the bridge; a few inches of rise sufficient to overcome the optical effect of sagging is desirable, but should be so slight as to be barely perceptible.

To sum up results, we find that the arch bridge is beautiful, that this beauty is not the result of skill in design, but comes from the use of the arch. Consequently the road engineer can, without any special knowledge of design, construct a bridge possessing artistic merit. Concrete is the only material at present which can be used for an arch bridge without prohibitive cost. It is satisfactory in texture and color, is easily obtained, gives the required stability of appearance, is permanent, and, provided a capable engineer or superintendent is in charge, local labor can be used in carrying out the work.

That other blot on our landscape, those flimsy, restless constructions of wood we call farm buildings, are much in need of a more permanent and sightly building material. Stone is again out of the question on account of cost, brick also is expensive, and unless a good quality is used, properly laid in cement mortar, and resting on good foundations, it is not permanent; it is also difficult to handle in an artistic way by any but a trained

architect, and the usual farmer is not likely to employ one.

Occasionally the ambitious farmer, with good intentions but mistaken zeal, has transplanted to the country that type of brick house beloved of our cheap builders, found in the suburbs of all our large cities, a conglomeration of brick, scroll sawn-wood ornaments, so-called art glass, with a few fussy verandas thrown in for good measure; in the city it is bad enough, but in the country its innate ugliness is made even more apparent by its surroundings.

Now, a farm house and the adjoining buildings should not only serve the purpose for which they are built, but should look the part, should belong to the country, be as much a part of it as the trees, a growth of the soil, not merely resting upon it but a part of it. To accomplish this a solid building material is essential, the structures must have stability, be permanent and look so; added to this the material must harmonize in color and texture with its environment. Concrete will do all this if used with a little judgment.

It is not likely that the artistic value of concrete construction will appeal to the farmer. If he uses it, it will be on account of the low cost, permanence and ease of handling. However, if he be persuaded to use it for its practical advantages and not be led astray by a mistaken desire to imitate stone or to reproduce the features of a town house; if he will only use concrete for what it is, build simply, without any effort to add architectural details, in all likelihood the result will be good.

Farm buildings, from their shape and size, fall naturally into good lines; generally they are long and low, with much unbroken wall and roof surface. The windows, doors, and other openings are few in number. If to these conditions we add stability, a pleasing wall and roof texture, we then have all the essentials of a good building. This, again, is more than proved by what we find across the ocean. There the farm buildings are good to look at, adding a human touch to the landscape without marring in any way its beauty. This is not because they are elaborate, for they are simple in the extreme, nor is it due to intention or design, for their builders had no thought beyond meeting their practical needs; but these buildings have a dignity which comes from honest workmanship and the use of permanent materials. It is to be noted that this material, usually stone, was always a natural product of the vicinity, and hence harmonizes perfectly with the face of nature in that district in which it was placed.

One valuable characteristic of concrete is its neutral color which, in the majority of cases, blends perfectly with nature's color scheme. In concrete for farm buildings I believe the best effect will be obtained by using monolithic construction, not cement blocks, for while the latter is much better than wood, and capable of rendering good service, the necessary joints destroy the repose of surface so desirable from an artistic point of view.

All the buildings should be simple in the extreme; let the walls and roof be continuous, and, as long as possible, avoiding all unnecessary breaks, keeping all openings some distance from the corners of the building in order to preserve the appearance of stability; the roof-eaves should project some distance, as this not only sheds the rain, protects the walls from dampness, but gives a shadow of great value in an artistic sense.

If these simple rules are followed, and concrete is used for the walls, and the usual wood shingles for roofs, the combination would result in buildings which fit naturally into the landscape. A few trees would add greatly to the effect; creepers also could be allowed to grow without fear of injury to the walls, thus adding additional beauty.

You will note that the basis of this desirable result is the concrete wall, possessing as it does, the vital characteristics of stability, texture and color. Possibly one point is open to question, that of color. In most localities the natural color of cement will be sufficiently pleasing; when this is not the case, an increased interest and effect may be obtained by coloring the walls. Whitewash is not costly and, if made from a good formula, will last a considerable time; when weather-worn it can easily be renewed. It is also possible by additions of the earth colors, to obtain the most delicate tints of pink, greys and yellows. Whitewash on wood is cheap and nasty; on cement it is economical and good; its soft, velvety color is pleasing in itself and harmonizes perfectly with trees and shrubbery. Abroad it is held in great esteem.

In concluding my paper, I can only add that to all people who love the beauty of the country-side, the advent of concrete promises much for the future. If, with its aid, our bridges and farm houses are made beautiful, then something well worth while will have been accomplished. It is for you manufacturers and users of cement to advocate the use of cement not alone for the economical and practical advantages, but also for its artistic value as a building material in the country, and if you can persuade your road engineers to adopt the arch form for bridge construction, and the farmer to use concrete for his buildings, you will have done a good work, for, in addition to the practical, useful results achieved by the use of cement, you will also have added a note of beauty to our landscape, a thing devoutly to be wished for by all lovers of nature.

BUILDING MATERIALS IN CHINA.

IN ANSWER TO AN INQUIRY Charge d'Affaires Henry P. Fletcher, of Peking, furnishes the following information concerning the letting of contracts and the furnishing of supplies to contractors for the Chinese government, which applies fully to North China, and, to a great degree, to building construction throughout the empire:

The Chinese government has no rules, printed or otherwise, for letting contracts or buying materials. The man on the spot with the lowest price and the quickest delivery gets the work. Ninety per cent. of all the building done in China is done by Chinese contractors. When foreign material is specified, such as heating plants, plumbing, electric light plants, light fixtures, constructional steel, etc., tenders for these materials, either delivered on the ground, or put in place, are asked for from the many foreign firms in Tientsin or Shanghai. These firms hold agencies for the materials required and all arrangements are made with them.

Neither the native engineer nor the foreign contractor deal directly with the home houses, as it saves much trouble to deal with large houses well established in China. Their prices include freight, duties, and the numberless other small items, and a price is quoted which lands the goods where wanted, and, if desired, puts them in place. The contractors has notihng to do beyond paying the foreign firm in China and making sure that he gets what he ordered.

Unless connections are made with a well-established firm or a permanent agency for a special line of goods created, there is no chance of introducing foreign goods into China. As all the large firms have their own expert engineers, the contractor can have fair prices quoted at short notice on anything. All these firms make it their business to be very much in touch with all proposed work, both government and private. The terms usually offered by the government are one-thind on arrival of papers of shipment, one-third on delivery, and one-third on acceptance. These government terms varied considerably during the last year; in order to help the foreign firms, as money was tight, and exchange bad, the government paid on several occasions one-half on signature of contract and one-half on completion of work.

Second floor plan, "Deer Lodge" Hotel, at Silver Heights, Winnipeg. Pratt & Ross, Architects.

Ground floor plan, "Deer Lodge" Hotel, at Silver Heights, Winnipeg, Pratt & Ross, Architects.

NEW HOTELS IN THE CANADIAN WEST.—English Domestic and Modern Design as Seen in Two Recently Erected Hostelries Which Provide Comfortable Accommodations for Tourist and Traveller in a New and Rapidly Growing Country.

WITH THE TRAVELLER and with those who by preference or force of circumstances spend a large portion of their lives in hotels, the extent of a country's civilization is measured to a large degree by the accommodations which are offered for their convenience and comfort. It matters not what a community may offer in the way of commercial inducements or natural surroundings, the wayfarer or sojourner is more or less influenced by the character and advantages of his *pied a terre*. In the mining camp or the embryonic town in the industrial or agricultural zone, one looks for nothing more than the hastily fashioned abode with its primitive and somewhat meagre accommodations, but as these places attain more substantial proportions, greater advantages in the way of domestic comfort and hygiene are expected than those originally provided. Good hotels —not necessarily luxurious, but in keeping with the size and importance of a community—are essential to the welfare of any town or city of progressive tendencies, just as much as is a transient class itself necessary to give an added stir to the town or city's commercial, industrial and social activities.

As a country still in the adolescent state, the Canadian West has been decidedly wide awake to the necessity of providing adequate and comfortable hotel accommodations, and its strides in this respect have been compatible with its marked expansion in other directions. Two of its more recent structures in this particular, which while not possible as pretentious in size or appointments as some of the larger Western hostelries, nevertheless possess an element of interest, are the new hotel at Silver Heights, a suburb of Winnipeg, and the Flanagan Hotel at Saskatoon. The former structure, which was designed by Messrs. Pratt and Ross, is situated on the outskirts of the Western Metropolis, contiguous to a beautiful stretch of natural country. It was built to replace the historic hostelry at Deer Lodge, as the section in which it is located is known, and with its half-timbered walls, gabled roof, and deep covered verandahs, presents a more domestic aspect than is usually found in buildings of this type. In plan the building assumes the shape of a rambling "T," with the central projection towards the front and the end wings of similar size and design. The accompanying illustration shows the structure, which has a frontage of 160 feet, from a south-east view-point on its spacious grounds extending along Portage avenue.

The main entrance to the hotel is through the central projection where a vestibule with reception rooms on either side, leads into a spacious rotunda finished in early English oak with panelled walls and beamed ceiling. This interior is 30 by 40 feet in dimensions. The furniture is

"Deer Lodge"—a recent Western hotel in English domestic design, which is situated on the outskirts of Winnipeg. Pratt and Ross, Architects.

Office and Rotunda, Hotel at Silver Heights, Winnipeg. Note the large rustic fireplace and the simple yet comfortable character of the furnishings. Pratt & Ross, Architects.

Dining Room, Hotel at Silver Heights, Winnipeg, showing the beamed ceiling and the pleasing scheme of decorations in general. Pratt & Ross, Architects.

Flanagan Hotel, Saskatoon, a recent completed hostelry which offers the advantages of modern appointments to travellers in the Prairie West. W. W. LaChance, Architect.

Dining Room, Flanagan Hotel, Saskatoon, showing the high panelled wainscotting and decorative detail of plastic relief work. W. W. LaChance, Architect.

of heavy post construction, simple in design and luxuriously upholstered in leather. Opposite the hotel office, which is located on the left, is a massive rustic fireplace in perfect harmony with the homelike simplicity of its surroundings. At the rear is the main staircase, together with a commodious ladies' cloak room and modern tiled lavatories. To the left of the rotunda is the entrance to the dining room, and to the right a corridor leading into the bar. This latter room, together with the buffet, occupies the ground floor of the east wing, and is finished in tavern oak in a style somewhat similar to the rotunda, and like it, has a mosaic floor. The buffet is equipped with a sideboard and small tables in keeping with the decorative scheme of the walls, and is separated from the bar room by three large archways.

The main dining room, capable of seating seventy-five guests is situated in the west wing, and is adjoined by two small dining rooms for private parties. All of these rooms repeat, in a measure, the wall and ceiling treatment and finish of the rotunda. The kitchen pantries and cold storage compartment are in a wing adjoining the dining room on the north, thus keeping the service department well together.

The entire space above the dining room is taken up by a large assembly hall to be used for music and dancing or receptions as the occasion demands, and the remainder of the building is laid out in good sized bedrooms, both single and *en suite,* with ample bath room accommodations. Special attention has been given to the general sanitary arrangements, and the bathrooms, toilets the lavatories are finished in tile and equipped with approved means of ventilation. The hotel has its own private water supply and sewerage systems, both of which have been installed under the supervision of competent engineers in work of this character. The water is drawn from an artesian well by an automatic electric pump which is capable of serving the hotel, fountain and stables and also the needs for fire protection. The structure throughout is lighted by electricity and no detail has been overlooked that would contribute to the comfort and convenience of the guests.

The Flannigan Hotel at Saskatoon departs somewhat in design from the building just described, and follows a more conventional style and plan. It is a three story and basement structure, designed by Architect W. W. La Chance of that place, and enclosed with walls of a light colored cream brick. The central feature is an octagonal tower at the intersection of the two facades, which terminates in a dome capped observatory that rises an additional storey above the balance of the structure. The main access is through an entrance sheltered by a projecting balcony which is supported by two huge corner pillars at the outer extreme. On the interior everything is so arranged as to facilitate the service and provide every reasonable means for the comfort and convenience of the guests. Aside from a spacious rotunda and office, there is a number of sample rooms, together with reception rooms, buffet, barber shop, etc., all of which are placed according to their degree of accommodation, and relative importance to each other. The dining room which is seen in the accompanying illustration reflects the care that has been taken in the selection of the decorations and furnishings throughout. The two upper floors are taken up principally by guest rooms and bathing and toilet accommodations. The building is lighted by electricity, heated by steam, and the sanitary appointments in general leave nothing to be desired. The contract for the various work connected with the erection of the structure was carried out by local contractors, with the exception of the plastic relief work in the dining room which was done by W. J. Hynes, of Toronto.

Among the new buildings of this kind which are at the present time projected in the West, is a fourteen storey fireproof structure to be erected adjoining the Walker Theatre at Winnipeg, by a company, capitalized at $1,250,000, which has recently been formed for this purpose. A large addition, it is also understood, will be built in connection with the Empress Hotel at Victoria, while, in all probability, the Carlton-Ritz Hotel Syndicate, which contemplates establishing a system of hostelries in Canada and the United States, will within a reasonable time undertake the erection of several hotels at various points between Winnipeg and the coast.

ARTIFICIAL STONE.—Its Use on Public Buildings as Specified by the State of New York.

IN VIEW of the great extent to which cast or manufactured stones has come to be employed in this country. we herewith publish the section of the New York State Building Code, dealing with this particular product, believing that as specifications for artificial stone as used on public buildings, it will prove to be of considerable interest to our readers. The section referred to is as follows:

The contractor shall furnish and set all cut stone shown by the drawings or herein specified. He is to submit a price based on buff Indiana limestone, also on cast concrete stone, the cast concrete stone to match Indiana limestone in color and texture, and is to have the same finish.

All cast stone shall be made of Portland cement of uniform color and texture, and free from iron or other foreign material liable to discoloration.

Aggregates shall be of crushed granite or marble.

The cement and aggregates shall be thoroughly mixed in the proportion of one part of cement to not over six, or less than four parts of aggregate, all measured by weight. The aggregate shall be made by crushing selected pieces of stone to insure uniformity of color and texture, and shall be screened into three sizes, the largest of which shall not exceed that which passes a ring of ¾ in. in diameter, and the various sizes shall be proportioned for maximum density. There shall be at least 50 per cent. of such a size of aggregate that will pass a ¾ in. ring and will not pass a 1-16 in. ring.

The concrete for making the cast stone shall be mixed with not less than 15 per cent. of water by weight and shall be mixed by a machine, preferably of the rotary type. If cast in semi-liquid condition, it shall be continually agitated up to the time it is deposited in the mold.

All casts shall be properly seasoned by being kept moist and away from the sun's rays and draughts for at least ten (10) days after being made.

After having been seasoned for at least ten (10) days, all exposed plain surfaces of the stone shall be tooled with a drove finish or rubbed as herein specified for Indiana limestone. This tooling shall preferably be done by grinding the grooves by the use of an abrasive material so that the larger aggregate will not be disturbed or in any way shattered.

All surfaces of cast stone to be true, no hollows, and all to conform to specifications for Indiana limestone.

Capitals to be cast true to model, sufficient over-pieces shall be furnished. Surfaces of all stone, including caps, to be retooled as necessary to leave perfect.

All cast stone shall be of such quality that it will pass a test at the age of twenty-eight (28) days of at least 1,200 pounds compression per square inch, and shall not have an absorption to exceed five per cent. when thoroughly dried and immersed in water for forty-eight (48) hours.

All lintels, bearing stones and others subject to cross bending shall be reinforced by means of steel rods placed about two inches from their tension surface, and the total sectional area of the steel shall be equal to one-half of one

(*Continued on next page.*)

ST. ANDREW'S CHURCH, FORT WILLIAM.
—Brief Description of Its Design and Construction

GOTHIC IN SPIRIT, though modified to meet the modern requirements of a Non-conformist place of worship, bearing all the details of the style in pointed window and arch, characteristic label, battlement, and geometrical tracery, St. Andrew's church well

St. Andrew's Presbyterian Church, Fort William, Ont. Hood and Scott, Architects.

presents the quasi-Gothic which is becoming the predominating style of ecclesiastical architecture in Canada.

The church is located on a corner lot and has a frontage of 80 feet on Brodie street and 100 feet on Donald street.

The most striking external feature of the building is the massive tower which rises to a height of 100 feet, culminating gracefully in a fashion that reminds one of many historic towers in Scotland, and is a suggestion of the fact that the church has a history behind her, stretching back to Reformation times, and beyond them to the far off antiquity of the land of Wallace and Bruce as well as of Melville and Knox.

The entrances are five i nnumber, the principal one being approached by a broad flight of steps from Brodie street, leads through right and left vestibules into the auditorium. The other four entrances give access to vestibules in the angle towers which contain stairways leading to a semi-circular gallery, and are also connected with the auditorium.

The exterior of the building is of stone. The rock faced work being of local Simpson Island white sandstone and the tooled work of No. 1 Bedford limestone. The roof is supported by special reinforced steel work and covered with black slates.

The whole of the interior woodwork is of quartered oak with dark Old English finish.

The semi-barrel ceiling, which has been adopted, is elaborately panelled in keeping with the general design, and this work is all carried out in white plaster and Keene's cement, and left plain for future mural decoration.

The organ, with its 180 polished zinc pipes, rears majestically above the dark oak tracery of the choir screen, giving the whole church that appearance of solemn religious grandeur so seldom seen in the modern Non-conformist place of worship.

The building, which has a seating capacity of 1,200, was designed by and carried out under the supervision of Messrs. Hood & Scott, architects, Fort William.

ARTIFICIAL STONE.—Continued from Page 88

per cent. of the area of cross section of the concrete in the member reinforced. When any casts exceed in any dimension twelve times its least dimension, it shall be reinforced to insure safety in handling.

Samples of cast stone on which bids are based shall be submitted for approval, said samples to be retained by the architects.

Preference shall be given to stone cast in an established factory, and contractor must be able to show work of similar character that he has executed, and same must meet the approval of architects.

All casts shall be provided with steel bonds for the purpose of tying into the backing and with hooks for handling and lifting which shall be placed in the stone while being cast.

Cast stone need not be plastered on back with La Fage cement, nor need it be painted as specified for Indiana limestone.

A NEW COMPANY IN THE WEST is the Western Clays, Limited, which has been formed to manufacture brick and sewer tile. The company has secured an 18-acre tract of excellent building and pottery clay at Strathcona, where a modernly equipped plant will be established. Connected with the enterprise are a number of prominent Edmonton men, including John A. McDougal, D. H. Smith, of the Western Realty Company; H. H. Richards, of the Northern Bank, and A. Driscoll and R. H. Knight, of the firm of Driscoll and Knight.

Detail of Main Entrance, St. Andrew's Presbyterian Church, Fort William, Ont. Hood and Scott, Architects.

MACHINERY AND TRADE

"PARIPAN." ∴ ∴ ∴ ∴

WE DESIRE to bring to the notice of our readers, and especially to the attention of the architects, decorators and builders, the advertisement in this issue of Randall Bros., London, Eng., one of the largest and best known paint houses in the British Empire. This firm manufactures and makes a specialty of "Paripan," a lacquer-enamel of unusually high merit, which is being broadly specified and used by architects and decorators in England and the Colonies, for every conceivable kind of painting—both inside and out—especially were superior finish, durability and merit of investment are essential requisites.

This preparation is about to be introduced in Canada, and in view of the splendid endorsation which it has received abroad, it is quite likely that it will not be long in universally establishing itself with those in this country who are interested in architectural decorations and finishes.

"Paripan" lays claim to a number of advantages over all other enamels and paints, in that it is made with the same base as the famous and almost imperishable Japanese lacquer, and is, therefore, possessed of great elasticity, brilliancy, covering capacity, and ability to resist climatic and other detrimental influences. It is supplied either for gloss or flat (dull) finishes, and can be used equally as advantageously for surfacing walls and ceilings, as it can for woodwork and other purposes. Possibly in this connection it might be well to mention that Messrs. Randall Bros. have prepared a very attractive booklet in which photographic plates appear showing several English residential interiors of stately dimensions, in which the entire wall scheme, woodwork and ceiling, are carried out entirely in Paripan. These views serve to convey a more adequate idea of the beauty of effect, and richness of texture to be produced by this material, than mere words can describe.

However, the use of "Paripan" is not by any means confined to high class residential work. In fact its application is practically illimitable. It is used for every conceivable purpose for which painting is required—from the lowly cottage to the palatial home, the commercial building to the large public or private institutions, and even for radiators, railway coaches, locomotives, tram cars, steamers and yachts.

One of the great advantages claimed for "Paripan," is that owing to its durability, it costs far less than ordinary paint. Surfaces of this enamel are still in perfect condition after weathering the elements for eight or ten years. Another particular feature is that either "Paripan Glossy," which gives a surface like glass, or "Paripan Flat," which produces a delicate dull silklike effect, is perfectly washable, and can be readily cleaned with soap and water, without in any way injuring the richness of the texture or the lustre of the surface. Because of this reason, and also because of the fact that it produces a hard impervious surface, "Paripan" possesses a sanitary virtue which has led to its adoption in a large number of public and private hospitals and sanitariums; and the manufacturers have numerous testimonials from eminent doctors and bacteriologists regarding its splendid advantages in this respect.

As regards color, "Paripan" can be obtained in white, cream, ivory, and in almost any color or shade imaginable. The "glossy," and the "flat" preparations can also be mixed to obtain different tonal effects, or either one or the other may be tinted by the addition of artist tube colors, if special shades are desired.

"British made and British owned," and "the more it is washed the better it looks," are phrases which have become inseparably connected with "Paripan" in England, and other countries where it is used, and in view of the high manner in which it is spoken of, it seems to us from knowledge to hand that, altogether "Paripan" is a preparation which "once tried, cannot be denied."

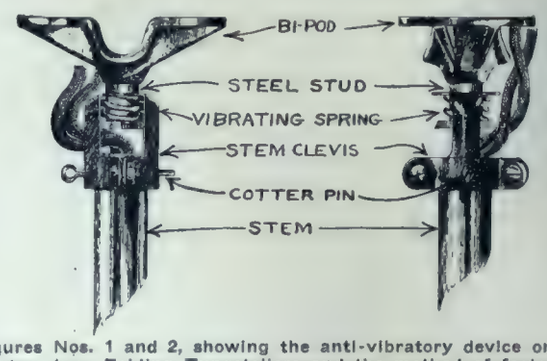
Among some of the important structures in England and elsewhere, in which "Paripan" is used, are the following: Windsor Castle, Royal Apartments; Government House, Calcutta; The Imperial Palace, Constantinople; Belvoir Castle; Wheathampstead House; King Edward's School, Witley; The L. C. C. Model Dwellings; London and County Bank; North British Insurance Company; Capital and Counties Bank; Mill Hill Barracks; Royal Naval Barracks, Portsmouth; Senior United Service Club; Victoria Barracks, Belfast; Bankers' Clearing House; St. Bee's School Laboratories; Gaiety Restaurant; St. Stephen's Club; Constitutional Club; King Edward VII.'s Sanatorium, Midhurst; Brompton Hospital; St. Bartholomew's Hospital; Westminster Hospital; Middlesex Hospital.

"Paripan" is also used in many general and military hospitals, sanatoria, asylums, workhouses, infirmaries, etc., as well as by H. M. Navy municipal authorities, and railway, shipping, and industrial companies, both in the British Isles and abroad.

Messrs. Randall Bros. have prepared an attractive, illustrated book with color chart, which, together with prices and testimonials, will be sent to architects, decorators, surveyors, engineers, railway companies, or other interested parties, upon request. The address of this firm is Palmerston House, Old Broad St., London E.C.

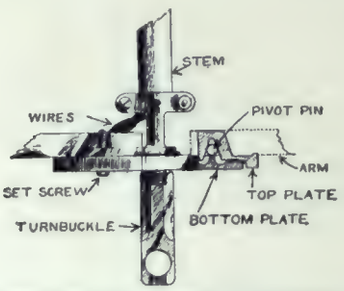
ARTIFICIAL ILLUMINATION. ∴ ∴

ARTIFICIAL ILLUMINATION is quite as much within the sphere of the architect's activity as is the designing and arrangement of windows for the admission of outside light itself. In this age of spacious buildings, together with the increasing night work in commercial and industrial institutions, and again the fact that quite often adjacent structures greatly lessen the advantages that the day provides in the way of natural light—the problem of artificial illumination is one that demands a broad and most careful consideration. Within



Figures Nos. 1 and 2, showing the anti-vibratory device on all stem type Folding Tungstoliers and the method of fastening them to ceilings. This construction permits the Tungstoliers to plumb themselves.

the past few years, electricity, without question the safest, most efficient and hygenic form of lighting—has been brought within easy reach of the general public by the invention of the Tungsten Lamp, which not only increases the degree of luminosity, but reduces the cost for current by over one-half of the charges usually made. A great many architects, however, have condemned the Tungsten Lamp owing to the frailness of the filament, but this, investigation has proved, is not the cause of any dissatisfaction, as where properly installed, this lamp is giving better satisfaction than any other illuminate upon the



Figl No. 3, illustrating the method of fastening arms in both stem and close ceiling types, by the use of two iron plates which clamp the arms in such a manner that they cannot possibly turn or sag.

market to-day. Where the trouble lies is in the fact that the installation has been made without due consideration being given as regards proper protection for the lamp to offset any vibratory movement. When the Welsbach burner was put on the market, the first step of the manufacturer of this ingenious light, was to instruct the general public that a jar or vibratory action was injurious to the mantle, and that any heavy movement would be disastrous to such a light. The Tungsten Lamp is in a measure likewise affected, although it is not to be inferred from this that it is as frail as the Welsbach Burner in this respect. It is maintained, however, that if the Tungsten Lamp is properly protected from vibration and jar, the results will be far better than where they are simply used at an angle or in a rigid fixture. Realizing this, certain manufacturers have made a thorough study of Tungsten (Madza) method of lighting, and have designed special anti-vibratory features to be used with lamps of this especial character. The accompanying cuts demonstrating the principle and illustrating the parts of an ingenious fixture designed for this purpose, will give architects an excellent idea of what constitutes a proper installation where the Tungsten Lamp is considered. These illustrations are reproduced from Bulletin No. 20, of the

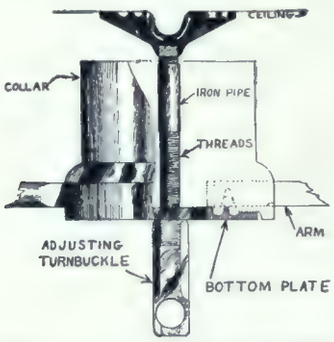


Fig. No. 4, showing the close ceiling type adjustment. After connection is made it is only necessary to turn adjusting turnbuckle and the Tungstolier adjusts itself into position against the ceiling.

Tungstolier Company, of Canada, Limited, Toronto, and they reflect in no little measure, the accomplishment of this firm in reducing this effective system of lighting to a most substantial and economical basis.

It is not claimed, nor is it to be understood, that the Tungsten Lamp will not burn on an angle or in a rigid fixture, but it is quite plain that such a lamp when protected from jar and vibration, will last much longer, give better service and hence reduce cost of renewal to the consumer, than one which has not been properly considered in this respect. The Tungsten Company is pre-

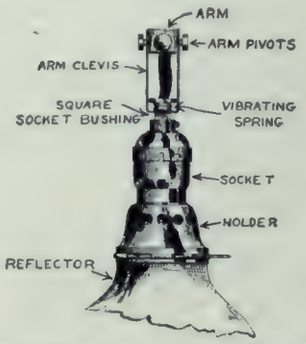


Fig. No. 5, illustrating the method of providing an anti-vibratory device in close ceiling types, protecting each lamp individually.

pared to co-operate with the architects in the solving of their lighting problems, and Bulletin No. 20, together with other valuable data on this subject, which this firm publishes, will be sent to any interested party upon request.

TO BUILD NEW PLANT.

ARRANGEMENTS ARE NOW being made by the London Concrete Machinery Company, Ltd., London, Ont., for the erection of a new plant to be about eight times the size of their present one. The business of this firm has been marked by a steady expansion, and every year since its organization the company has found it necessary to build additions to its premises in order to meet the growing demand for their products. Within the past year several heavy lines of concrete machinery, such as mixers, crushers, etc., have been added to extensive line of equipment and supplies which they manufacture, and business, it is said, has increased four-fold over the preceding year, which was one of the best in this concern's history. Owing to the fact that within the past few months, the volume of trade has grown to such an extent that the company has found it necessary to have a large portion of their work done in other shops by contract, the directors have decided to secure about a two-acres site and immediately proceed with the erection of a new plant. Their present building, although new and quite large and commodious, will no doubt be used for other manufacturing purposes.

VERY EXTENSIVE HARBOR WORKS, says the ILLUSTRATED CARPENTER AND BUILDER, London, are about to be carried out at Glasgow. A scheme for the construction of the largest graving dock in the world is now before the Clyde Navigation Trustees. The dock will have an inside length of 1,020 feet, an entrance width of 100 feet, and a depth on the sill at average high water of spring tides of 36 feet. It will be (according to the sketch plans) in two divisions—one of 420 feet in the inner end and one of 600 feet nearest the entrance. It will be parallel to the river and will be entered from a large canting basin adjacent to the harbor workshops. The basin will have a wharf 1,150 feet in length, running at right angles to the river, available for ordinary harbor traffic purposes. Such a dock should meet all naval and mercantile requirements for many years to come. It is also proposed that powers should be obtained for the construction of a commercial tidal dock or docks. The construction of the graving dock will extend over five or six years, while the tidal basin will be gradually formed according to the requirements of the port.

SANITARY AND HYGIENIC PRINCIPLES IN BUILDING CONSTRUCTION.

IT IS VERY IMPORTANT, in order to have a building erected upon proper sanitary and hygienic principles, that the arrangements in connection with the plumber's work be extended in a thorough and efficient manner. The cost entailed necessarily enters into the consideration of what kind of material should be adopted, but if a satisfactory job has to be done there should be no scruple in the amount of expense requisite for the proper execution of the work. This department cannot afford to be done in a slipshod and inefficient manner, as the results otherwise may be either very injurious to the health of the occupants, or ultimately disastrous to the durability of the building. In the first place we would consider the outside plumbing work. This consists of the roof work and conductors leading therefrom, and waste pipes from closets, bathrooms and sinks. The ridges, hip rafters, valley gutters, and platform roofs are frequently laid with zinc or galvanized iron, but a more substantial job can be done with lead, although it is more costly. It is necessary that care be exercised in making proper junctions at the overlaps of either zinc, iron or lead, for upon this depends the prevention of water getting into the roof sarking, and causing its ultimate decay. Frequently certain parts of the roof are greatly exposed to the stormy winds, and are liable to be stripped by their violence. For this reason, straps about 12 inches long are fixed to the lead, iron or zinc ridges and hip rafters with galvanized iron nails. Or if solder joints are required to be done at the overlaps of the lead, care must be taken that they are finished smoothly and thoroughly watertight.

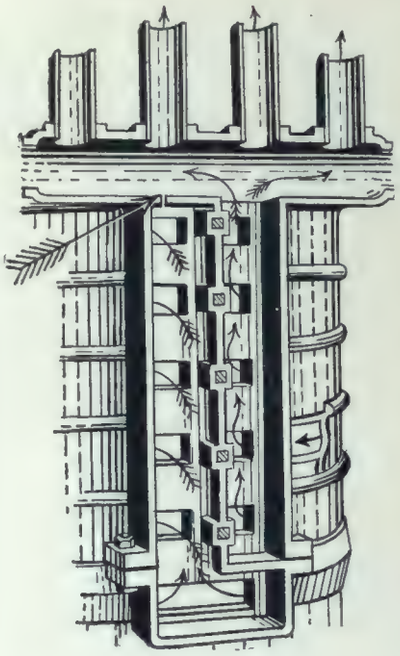
The eave gutters and down pipes, made of cast iron, should have the requisite "slips" at the joints, and be properly secured and supported. It is preferable from a sanitary point of view, that all soil and waste pipes be erected outside the walls of the building. The water closets may be so arranged that they be next the back wall, or either of the side walls of the house, and the branch soil pipe carried through the thickness of the wall and inserted into a "branch horn" cast on the upright soil pipe, and jointed thoroughly with red lead and rope yarn. The lower part of the soil pipe should be of "heavy" material below the junction at the branch, while the upper part of the soil pipe may be of "light" material, and carried up about 2 feet above the level of the eave, for ventilation. On the top of this pipe a "rose" grating may be fixed, which prevents anything from entering that would prove an obstruction to ventilation, while at the bottom there may be a bend or heel rest at the drain. The iron conductors and waste pipes outside of the walls should be secured by iron holdfasts batted into the walls.

The internal arrangement of the plumber work is also of the utmost importance, for upon them depends the healthy and comfortable condition of the building. The bathroom and water-closet should be so placed apart from any bedroom or sitting room, not only for a sanitary reason, but also because it is being less objectionable in other respects. The pipes to and from the bathroom fittings, when exposed, should be of gun metal, electroplated or galvanized metal, for the sake of appearance. This makes a clean, though somewhat more costly job, but if the common lead or iron pipes are exposed, they should be painted. It is necessary to observe that all lead pipes laid under the flooring be properly jointed, and that they be notched down into the joints slightly below the level of the flooring, care being taken when nailing that no nails be driven into the pipes, otherwise the results may be disastrous. It is a good thing to have thin narrow boards laid along between the joists upon which the "supply" or "feed" pipes may rest.

It is also preferable that these pipes above the flooring be exposed, and not covered or boxed in, for the reasons that any leakage may be discerned at once, or the place of exit discovered from which may proceed any obnoxious gas or injurious element. The collars at junction of all soil and air pipes should be made thoroughly tight, and the couplings at all pipes properly adjusted. Upon the lead or iron bends of soil or waste pipes there should be "cleansing screws" attached, so that examination may be made when any congestion takes place that hinders the proper discharge. The arrangements of the plumber's pipes for the purposes intended should have them so placed in certain positions that will be most conducive to the proper fulfilment of their several requirements. And it is very essential that the law of gravitation, and those laws of chemical and mechanical action be studied and observed, in order to have the efficiency that is so desirable in this department of building operations. This is very necessary when we come to consider the adoption of a hot water system throughout a house. The position of the hot water tank, the various pipes in connection therewith, and the leading of the latter to the several fittings in the bathrooms and other places, all call for the most recent scientific information on these points, in order to obtain the most satisfactory results. The exigencies of the present time demand the most serious consideration of each several detail in connection with the department of plumber's work, and it is by strict building by-laws being framed, based upon scientific and practical experience, that an efficient system can be adopted in our large cities and towns, which would not only prove of great value to the general populace, but also be a guide to the proper discharge of all the arrangements connected with this kind of work in the erection of flat dwellings.—W. M. BROWN, C.E., IN BUILDING MANAGEMENT.

TAPERING CONCRETE CHIMNEYS.

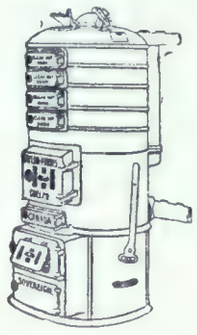
THE MAJORITY of the numerous reinforced concrete chimneys that have been built are cylindrical in shape, due to limitation in the design of the forms, and where a variation in diameter is made this has been effected by an offset. Recently, however, says Engineering News, some special designs of form construction have been devised which permit the building of tapering stacks without excessive cost for this feature of the work. The forms, which are 5 feet high, consist of sets of rings, steel plate forming the surfaces, and long bolts by means of which the adjustments of diameter and wall thickness are made. The rings are of sufficient diameter to enclose the base of the chimney, and are made of heavy angles bent to varying radii and spliced into complete circles. The radial bolts must be long enough to permit of their extending into the chimney surface when the diameter is smallest (at the top of the chimney). The diameter of the rings remains constant, standard sets of form rings being carried in stock for various sizes of chimneys. The steel sheets are of standard size, and are filled out with split sheets, made interchangeable. The sheets are secured by flat-head stove bolts to vertical stiffeners on the outer surfaces of the forms, except at one rib, where the adjustment is taken up. The varying diameter is obtained by means of the long radial bolts which turn through small angles attached to the steel rings, and end in malleable clips which grip steel bands on the outside of kerfed wood strips which press the sheets in to the desired radius. Permanent centres are kept at the base of the chimney and on the scaffold above, and each section of the chimney is plumbed. Thus perfect alignment is secured throughout the construction.



The "SOVEREIGN" Bolted on Water Post with Interior Air Circuit

The AIR CIRCUIT is a simple provision made in the "Sovereign" to allow of the ready escape of air from any of the compartments of the boiler into the Expansion Tank, or into the Radiators, where it may be released through the Air Valves. It is a small channel, drilled through the heavy wall of the Water Post, making a direct connection with the Flow Pipe. It establishes a short circuit for the air.

In all other boilers the air that remains in a boiler after it is first filled, or re-filled, has to follow the circulation of the water and pass through the Boiler Sections before finding an outlet. The tendency of these air bubbles is to cling to the surface of the metal, particularly to the upper flat sides of the Sections, so that its presence is liable to hamper the operation of such a boiler for weeks after installation. Not the slightest delay ever occurs in getting a "Sovereign" into perfect working order.



The Sovereign short circuit air channel will be copied in the future—but this season it is an improvement exclusive with the "Sovereign"

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CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

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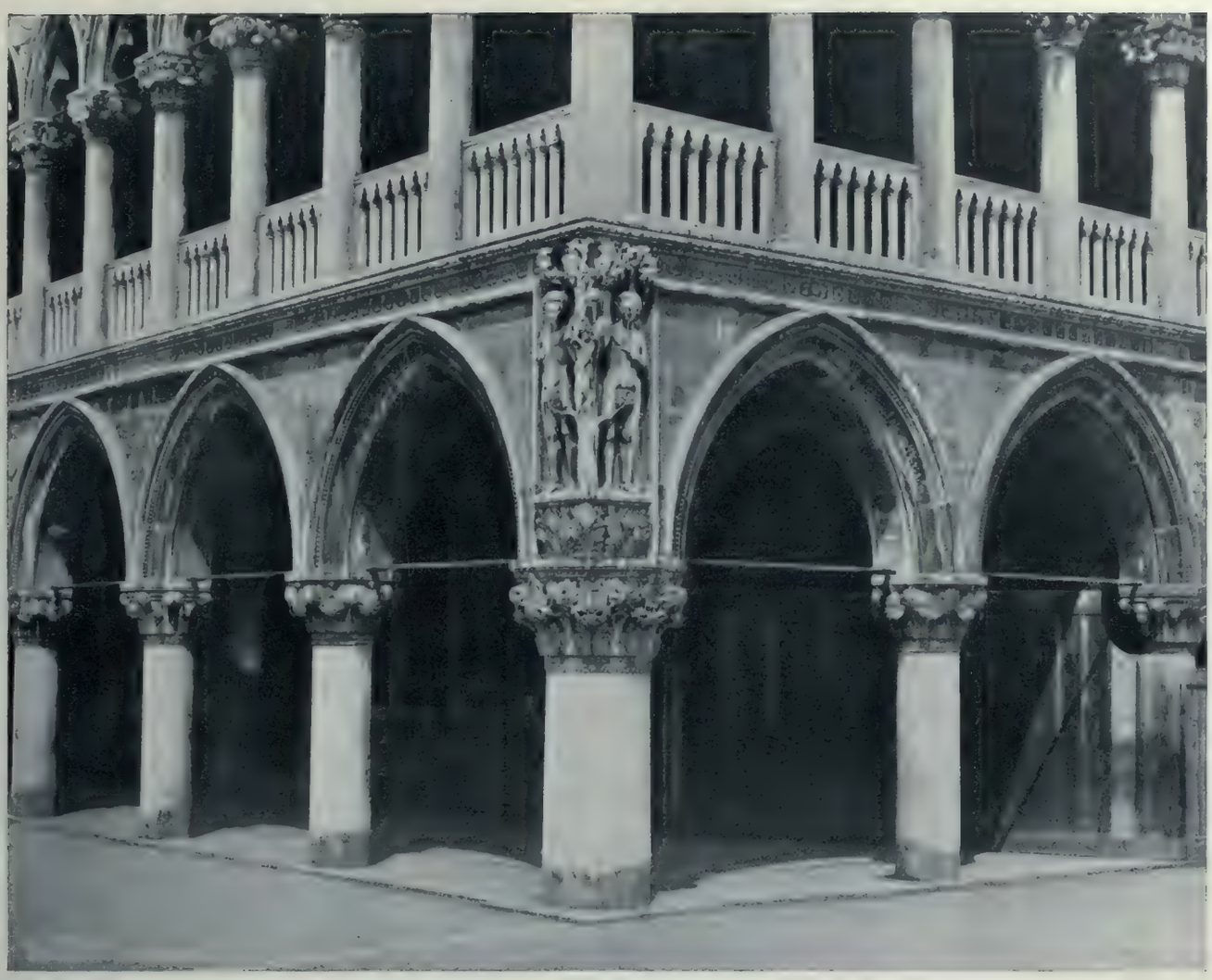
BRANCH OFFICES

MONTREAL—Board of Trade Building. LONDON, ENG.—Byron House, 85 Fleet St. E.C.

Panoramic View of Venice, showing the Ducal Palace with its Open Colonnades, together with the Campanile towering on the Left, and the Domes of St. Mark which appear above the Palace in the Background.

Ducal Palace, Venice. View showing Inner Colonnade and General Architectural Treatment of Court-yard Elevations.



Detail of Colonnade, Ducal Palace, Venice, showing the Sculpture Work at the Angle of the Walls and the Varied Treatment of the Capitals. The Lower Columns have a More Stumpy Appearance than was Intended owing to the Raising of the Pavement in the Piazza. They have no Bases, but are Supported by a Continuous Stylobate.

DUCAL PALACE, VENICE.—Notable Structure of Fifteenth Century Italian Gothic Which Has For Years Been a Subject of Interest to Students of Design.—Comments on Its History and Architectural Features.

WHEN CONSIDERING Venetian Gothic architecture, it is impossible to overlook the Doge's Palace. For centuries this building has been visited by the world's greatest architectural critics, and although on some few occasions the criticism has been rather of an adverse nature in some few details, it nevertheless has, more than any other building of its type in Venice, risen triumphantly over centuries of critical inspection.

The first Ducal palace was built in 820 by Doge Angelo, a Byzantine palace, and we know that from contemporary writers, it was of great magnificence, but it received great additions during the twelfth century, especially from the Doge Sebastiano Ziani, who enlarged it in every direction. In the fourteenth century the great Saloon was built with many other important additions, but the palace of Ziani still remains, contrasting with the splendours of the later buildings. So strong was the feeling that it ought to be re-built that to save the vast expense and fearing their own weakness, the Senate passed a decree forbidding anyone speaking of rebuilding the old palace, under a penalty of one thousand ducats, but in 1419 a fire occurred, which destroyed part of the old building. A decree for rebuilding the old palace was issued under Doge Moncenigo in 1422 and the work was carried out under his successor, Doge Foscari. In 1684 another fire destroyed the upper rooms of the east facade and almost all of the whole of the interior of the palace, and the completion of the repairs necessitated at this time brought the edifice into its present form. The architects employed were members of the family of Bon or Buoni, and to two of them the two principal colonades are due.

In this description of the Ducal palace we have drawn upon the best known authorities in existence, and a large amount of the comment and criticism has been extracted from Street's description of this old palace in "The Brick and Marble Architecture of the Middle Ages in Northern Italy." This is considered one of the best treatises on this especial phase of Italian architecture, and is now out of print. We believe that with the illustrations and descriptions herewith given the student of architecture may be enabled to get a pretty fair idea of the beauties of this old Ducal palace.

The whole building forms three sides of a hollow square; one side rises out of the deep recesses of the Rio del Palazzo, spanned near its outlet by the famous Bridge of Sighs and is entirely of Renaissance work, the next side rising from the River dei Schiavoni, faces the Guid-

Scala dei Giganti (Giant's Staircase), Ducal Palace, Venice, built by Antonia Rizzi. It derives its name from the Colossal Statues of Mars and Neptune, wrought by Jacopo Sansovino in 1554, which Stand at Either Side of the Entrance.

Porta della Carta, Ducal Palace, Venice. The Beautiful Entrance-way, giving Access to the Court from the Piazzetto, which is Inscribed with the name of its Architect, Bartolome Bon (1440-1443).

Section of Elevation in Court, Ducal Palace, Venice, showing the Decorative Enrichment of the Walls, and the General Arrangement of the Windows in the Upper Stages.

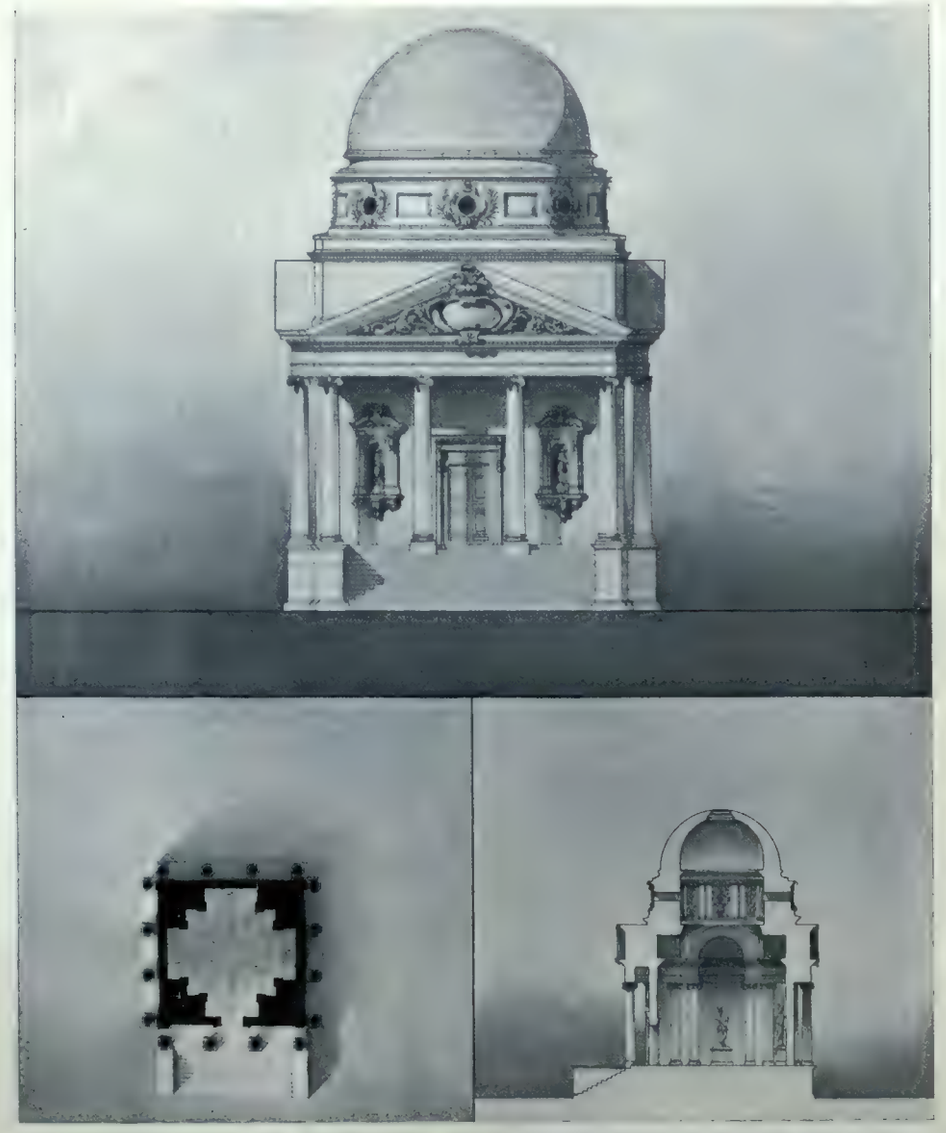
Palazzo Cavalli, Erected in the 15th Century. One of the Striking Examples of Venetian Go thic along the Grand Canal.

ecca, and is of the purest Gothic, and the third, facing the Piazetta de San Marco—the small square which opens St. Marks to the water—is also Gothic, and of the same type. In height the whole design is divided into three stages, the upper nearly equal to the united height of the two lower stages, and faced entirely with a delicate diaper of marble cut in small oblong pieces, and looking, save in their texture and color much like bricks. In this marble faced wall are pierced a number of windows with pointed arches, the tracery of which has been taken out, and in or near the centre of each facade a much larger window and balcony which looks rather as though it had been subsequently inserted. The lowest stage consists of a long and uniform arcade of very simple and noble pointed arches resting upon circular columns with elaborately carved caps. The intermediate stage is a magnificent arcade supporting very glorious tracery too well-known to everybody to require much description, and divided from the stages above and below it by large and pronounced lines of carved and moulded string-courses. It is important to observe that up to the top of the second string-course, the whole of the architecture is of the noblest type of Venetian pointed, the arches of the lowest stage are well proportioned, and though very simple, still well moulded, and the detail of the work of the second stage is, to say the least, not at all inferior. They form altogether, many writers maintain, without exception the very noblest and truest specimen of Christian architecture south of the Alps. Above this noble work the third stage comes with patent marks in every stone of which it is composed, and it was designed by some other hand than that which had been so successful below. There is something chilling in the waste of plain unbroken wall coming above the wonderful richness of the arcades which support it. Moreover, this placing of the richer work below and the plainer above is so contrary, not only to all ordinary canons of architecture, but just as much to the ordinary practice of the Venetians, that it creates an impression that is substantially correct, viz., that the line at which alterations and additions have been made is to be looked for in a horizontal and not in a vertical direction; that in all probability, consequently the builders of A.D. 1301 commenced with some portion of the sea facade and gradually carried on the building to (at any rate) the height of the two stages as we now see them and that then, when in A.D. 1341 the Council Chamber was found to be too small and larger rooms were required, another architect suggested the advantage of obtaining this by raising an immense storey above the others, and without destroying much of his predecessors work, providing rooms on the most magnificent scale for the Doge and his Council. There is no mark of diversity of style between the two fronts beyond some slight differences in the treatment of the sculptors, but it is quite impossible to argue with any certainty from this, because it is plain that this difference might arise from the employment of two sculptors at the same time, whose minds were as different in tone as their hands were in power, or from the completion of a portion only of the carving at first and the delay for some reason which might easily arise to that in the Piazzetta front until a later period, The shafts at the angles of the building, which in the earliest Venetian work were simply the rounding off of the sharp angles, afterwards three-quarter shafts formed by rounding the angle and then sinking a line on each side a few inches from it, becoming in time detached shafts projecting from the face of the wall, and apparently independent of it, and held in their places by occasional bands bedded into the wall. In short these latter expedients were just as unreal, unnatural and ugly expedients for marking the angle of the wall as the others were lovely and simple modes of delicately softening its contour. The shafts at the upper angles of the upper stage of the Ducal palace are of the late type, both ugly and weak and never devised by the original architect of the work below. Besides these, the windows which are indeed arched, are poor in their detail, small, and entirely wanting in a bold spirit, and where tracery remains, as it still does in two windows at the extreme end of the sea front, it is of much later and poorer character than the traceries below. Finally, the parapet is not at all equal in its conception to any of the lower work, and crowns with an insignificant grotesqueness the noble symmetry of the two lower arcades.

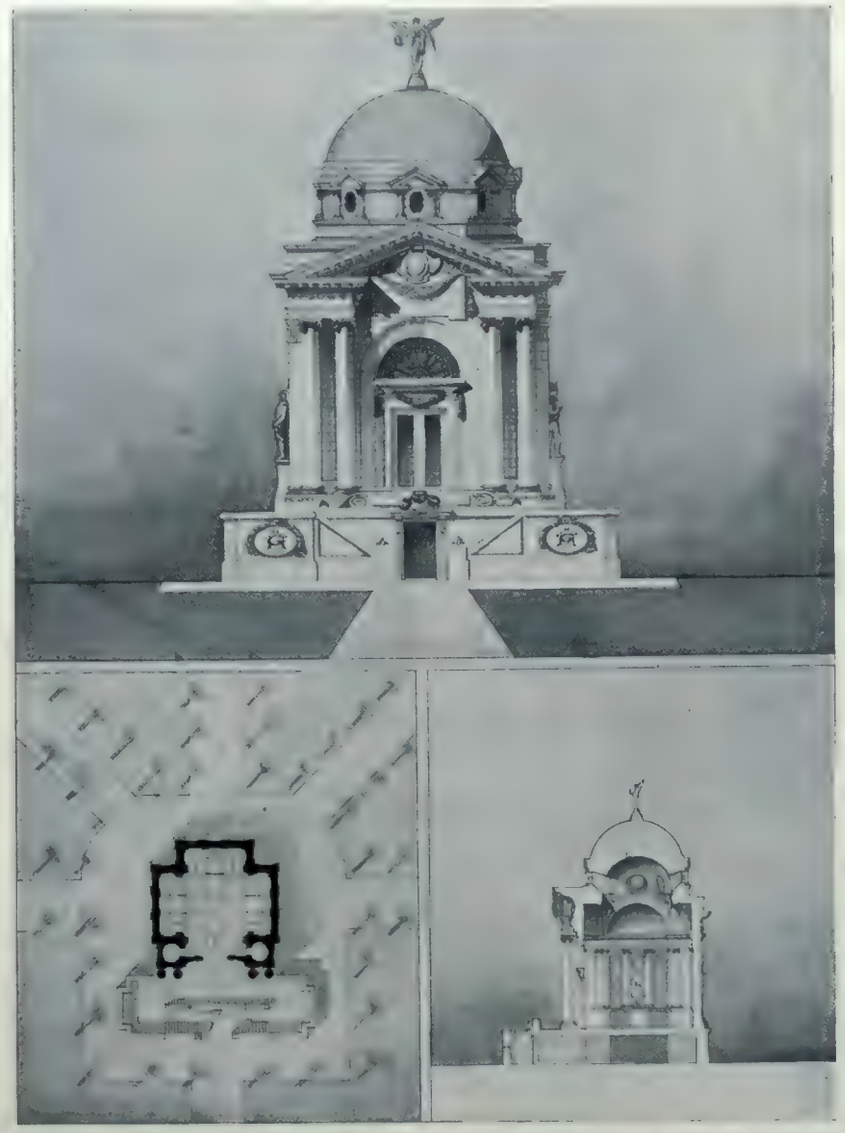
The new Council Chamber was not completed entirely until A.D. 1423, and in A.D. 1429 the Doge Foscari built a gate called the Porta della Carte at the S. Mark's end of the Piazzetta facade. In constructive art the palace appears to be very much of the Byzantine type in its early stage. The weight is supported by a succession of shafts placed at very short intervals from each other, and in neither is there any approach to the system of pier, and arch and buttress, so distinct of pointed art in the north. The pointed arch is used, it is true, in the palace, but after all the mere use of the pointed arch does not make thorough pointed architecture, and therefore all glorious as it is as a variety of pointed architecture, the Ducal palace is scarcely to be placed in the first class of pointed buildings. Indeed, the second stage, whose exquisite beauty is the charm of the whole building, does not exhibit the pointed arch at all in a properly developed form, but is strong enough to support the great weight of wall above, only by reason of the massy character of its tracery, and not by the proper application of constructional arches. There is no approach to buttressing, but the angles required some help, and this is given partly by iron ties at the springing of the arches running for some distance in each direction. All the mouldings are very simple, generally composed of three-quarter beads, small fillets and large flat hollows, and constantly arranged in the same order. The label of the main arcade is a plain bead. In the spring-course boldly carved figures are repeated with a slight interval between each, and the upper string-course has a row of nail-heads in one of its members. The cusping of the tracery is quite square in this section, and the cusps finished with a square end, to which is attached—with good effect—a small circular ball of red marble. The parapet is of the somewhat peculiar kind, and one cannot but admire its extreme peculiarity of both outline and design.

Such then is the Ducal palace; a building certainly in some respects of almost unequalled beauty, and at the same time of unequalled merit. Its first and second stages, quite perfect in their bold, nervous character, and in the almost everlasting-looking succession of the same beautiful features in shaft, and arch and tracery, form perhaps one of the very grandest proofs in the world of the existing beauty of perfect regularity in architecture, which it is possible to obtain it a very large scale. It is, however, in spite of, not in conjunction with the treatment of the upper stage, that this facade is so eminently beautiful, and without it the remainder of the palace would find at least as many admirers as it does now, whilst by itself the world with one consent would pass by this upper stage as a very worthless and inferior piece of architecture.

CONCRETE FLOOR TILES are quite extensively used in Palestine where concrete was first introduced twenty years ago. Other products of this particular material also in evidence are railings, cornices, steps and sewer and water pipes. Reinforced concrete construction, however, is still something new and it is only recently that the first building of this kind—a sanitarium—was built near Jerusalem. It is extremely doubtful though, whether this form of construction in Jerusalem, will be adopted to any great extent owing to the large supply of building stone available, and the low cost of labor in quarrying and dressing it. In Jaffa, however, where the reverse condition exists, both reinforced concrete and concrete block construction should become popular.



Design for Memorial, to be placed at a Focal Point in a Public Park and to contain the Statues of Three Great Artists—T. L. Rowe, Second Year Student, Department of Architecture, Toronto University.



Design for Memorial, to be placed at a Focal Point in a Public Park and contain the Statues of Three Great Artists—H. H. Madill, Second Year Student, Department of Architecture, Toronto University.

STUDENT'S WORK IN ARCHITECTURAL DESIGN.—Productions of Second and Third Year Men at Toronto University.—The Course of Study and Facilities and Equipment Provided.—Department Should be Encouraged by Co-operation of the Profession.

THERE HAS BEEN much discussion in architectural circles with regard to the efficiency of the Architectural Department of the Toronto University conducted under the direction of Professor Wright, and we are under the impression that much of the adverse comment was prompted by the fact that the architectural profession generally is not conversant with just what Professor Wright is really accomplishing in his department. It is true that the Toronto University does not offer as good facilities in its architectural department for the education of the student in the matter of design, as do some of the larger universities in the United States, but it is also true that the university authorities must have the co-operation of the architectural profession to enable them to give more to the architectural student.

The curriculum adopted by the University for architectural education, consists mainly of course in mathmetics and the science of construction, although in the past few years considerable attention has been given to the study of design and the aesthetic side of architecture. At the present time, two studios of ample size, which are well lighted from the East and North, are devoted to this particular branch of the work and the efforts of the students, under the direction of Mr. A. W. McConnell, who has charge of the classes in design, shows considerable proficiency and promise. Mr. McConnell, who is himself a graduate of the Department of Architecture at the University, is well qualified for the duties of his position, having had, in addition to his university course, the benefit of a summer course at Harvard, and a year's study in Paris, where he has just returned to do further supplemental work during the summer months. Furthermore, he has had considerable good office experience both in Toronto and the West, and is, therefore, in a position to instruct the students as to what is required of them in this respect.

The Department at the present time provides for a three year's course of which the first year is chiefly devoted to studying the various Orders and Architectural History. Practical work in design is taken up in the subsequent terms, when the students are given a wide diversity of subject matter on which to work. The full programme of study, showing the nature and variety of problems set for second and third year men during the past session, appended hereto, give a splendid idea of just what the University is doing in this respect.

Second Year Students

A Porch for a City House.—The building is situated on a residential street in a large city. The porch is to be a small, open vestibule placed over the main entrance, which leads through an interior vestibule into a large reception hall. Drawing required: Elevation, ¼ in. scale. Plan and section, ⅛ in. scale.

A Memorial to Three Great Artists.—This monument is to be placed at a focal point in a public park and is to hold the statues of three great artists. The base shall not exceed 40 feet over all. Drawings required: Plan, 1-16 in. scale; section, 1-16 in. scale; front elevation, ⅛ in. scale.

Suburban Residence.—To be situated on a northeast corner lot 120 feet by 120 feet. The ground floor is to contain a vestibule, reception hall, drawing-room, library, dining-room and kitchen; the first floor, sitting-room, bathroom and bedrooms; and the second floor, bathroom and bedrooms. Drawings required: Plan, front elevation, cross section. Scale, 1-16 in. to 1 ft.

Row of Six Workingmen's Cottages.—Ground floor to contain living room and kitchen; and first floor two bedrooms and bathroom. Total area of ground floor, 360 square feet. Drawings required: Plans of one of the cottages; front elevation of row, and a cross-section. Scale, 1-16 in. to 1 ft.

Garage.—Ground floor to contain room 16 feet by 20 feet (space for two cars), workroom, and stall for a team of horses. First floor to be occupied by caretaker's apartments. Drawings required: Plan, front elevation, and cross-section. Scale, 1-16 in. to 1 ft.

Colonial House.—A business man having purchased a lot sufficiently large to give him space on all sides, wishes to build a nine-roomed Colonial house. First floor to have a central hall, 15 feet wide, with vestibule and porch in front and doorway in rear; a large living-room about 14 feet by 25 feet, and a parlor and dining-room about 12 feet by 14 feet each. The kitchen, pantry, china closet are to be located in a separate wing. The second floor to be occupied by five bedrooms, bath, closets, and an alcove if possible; and the attic to be arranged for sleeping rooms.

A Summer Residence.—To be erected for a well-to-do city family who spend six months of the year in the country. This house is to have a spacious verandah and a large living-room (24 feet by 36 feet, about), with fireplaces, seats, etc., to occupy the whole of ground floor of main portion of house. The dining-room is to be 13 feet by 16 feet, with kitchen. The client wishes to have dining-room and kitchen in a wing. The first floor is to contain a bath and bedrooms of medium size.

Third Year Students

Loggia.—The drawing will show the loggia before the elevation of a museum. The loggia will be itself the principal entrance to the building, which will include a large hall (a) lighted from the roof, and side galleries (b and c) lighted by windows and disposed for the exhibition of small works of art, metals, etc. In the hall will be exposed the sculptures, ancient and modern. The loggia will be of the nature of an open vestibule, in the spirit, perhaps, of the Loggia del Lanza at Florence. A number of groups of vases, statues, etc., will be placed under its vaults. The elevation will not exceed 80 feet. Plan with part of building, scale 1-16 in. Elevation and section, ⅛ in..

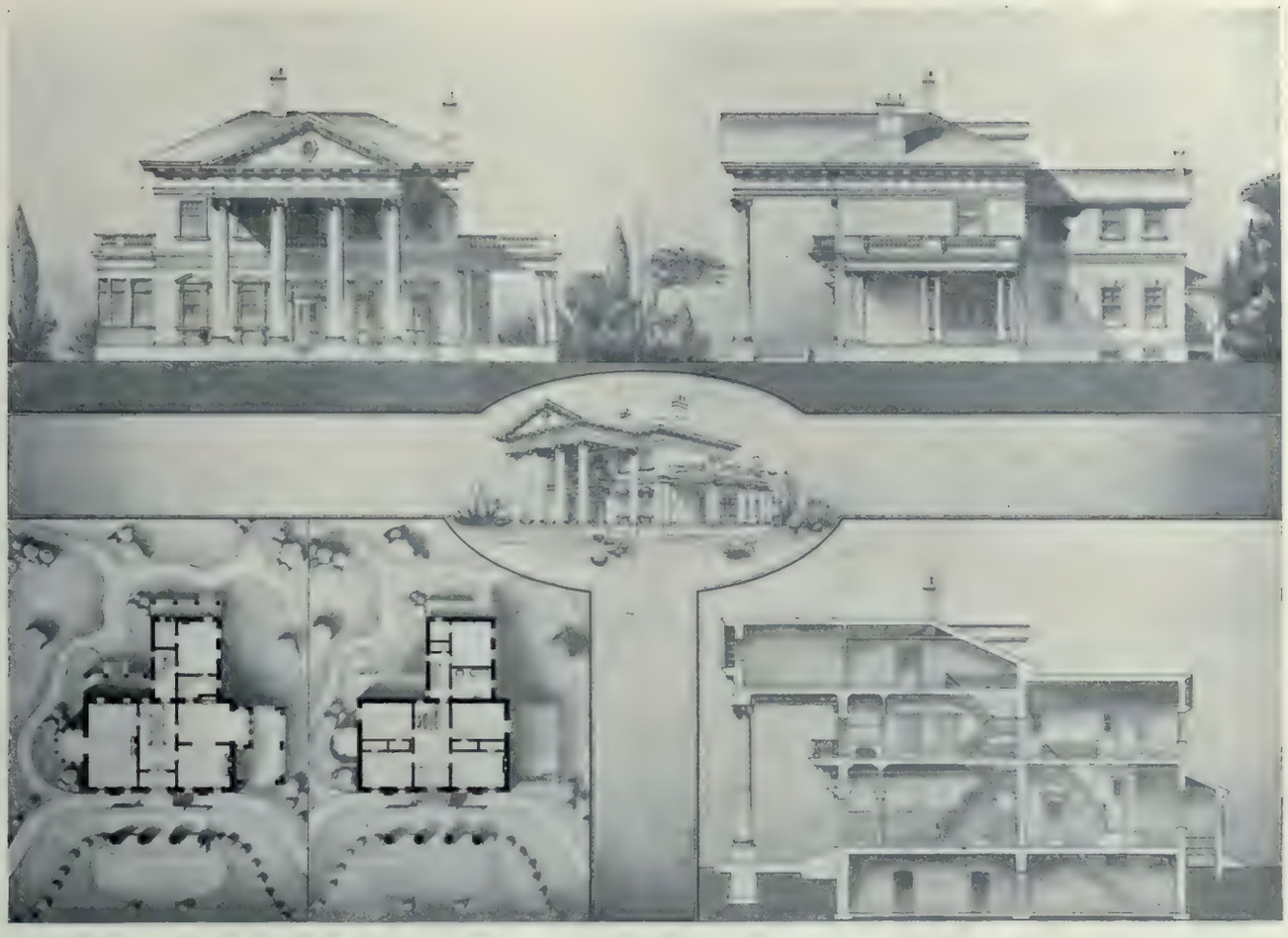
Chapel.—Situated on the southern coast of a large lake and visited by a great number of travellers, a small chapel is to be erected to take the place of one well known as the centre of local pilgrimage. The mountain falls here almost directly into the lake. It is supposed, however, that the road for carriages passes between the chapel and the lake and that an open space of 100 feet is here left behind the road, which is 17 feet higher than the lake. A disposition of steps and landings will give access to the visitors arriving by boats. The width of the chapel shall not exceed 40 feet. It will include a small sacristy and will be decorated as richly as possible. Plan, 1-16 in. to 1 foot. Section and elevation, ⅛ in. to 1 foot.

A Tomb.—To be built in a private cemetery by a rich gentleman to hold the remains of himself and family. A composition showing the surrounding walks and grounds is to be suggested. The greatest dimension shall not exceed 30 feet. Drawings required: Front elevation, ¼ in. scale. Plan and section, ⅛ in. scale. Time, 10 hours.

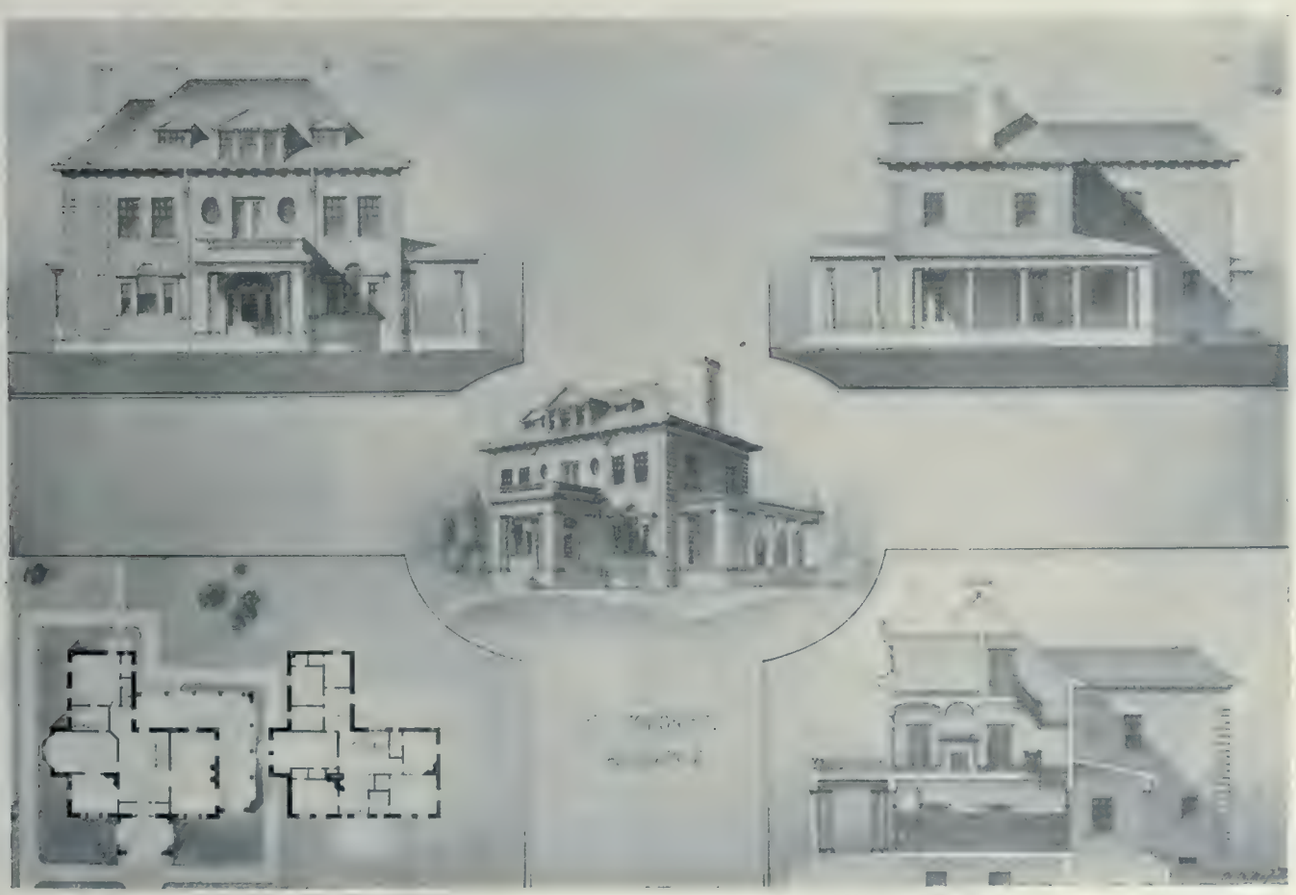
A Billiard Room.—To be situated at the end of a large villa. The billiard room will be placed, as in the sketch, at the end of an open gallery. The width of this gallery is 35 feet over all. In elevation, the billiard room will not

"Fragments," a Study in Detail and Perspective—H. H. Madill, Second Year Student, Department of Architecture, Toronto University.

Design for "Niche for Antiques," to be Situated at the End of an Alley on a Large Private Estate—J. B. Fisken, Third Year Student, Department of Architecture, Toronto University.



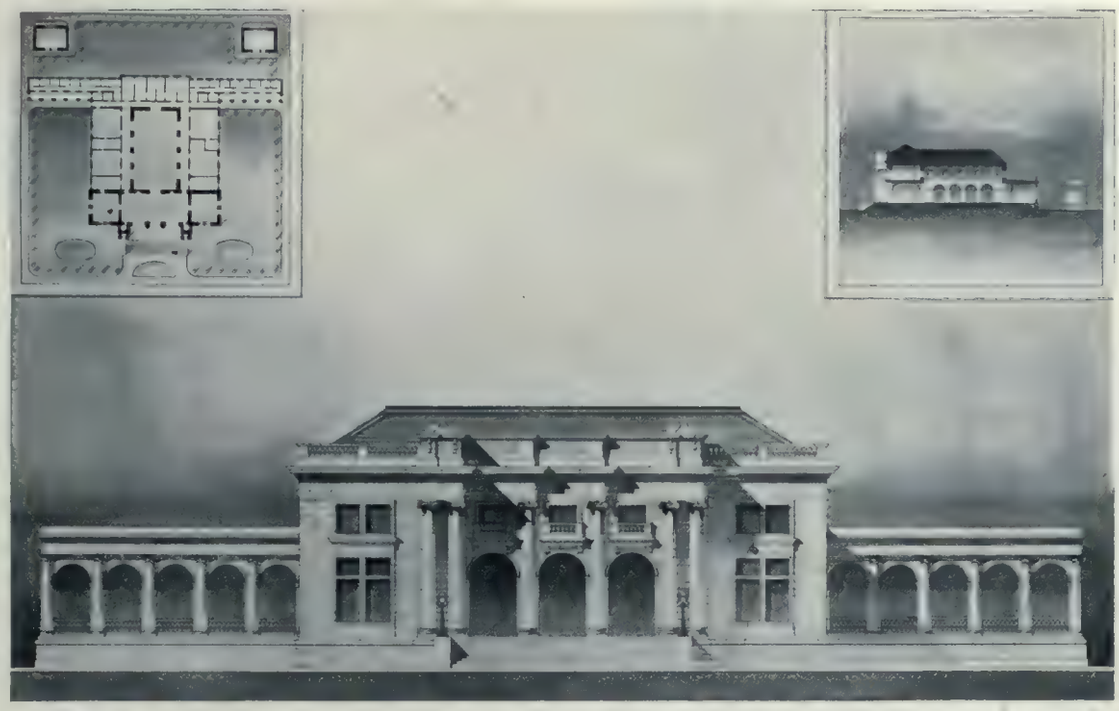
Design for Colonial Residence—T. L. Rowe, Second Year Student, Department of Architecture, Toronto University.



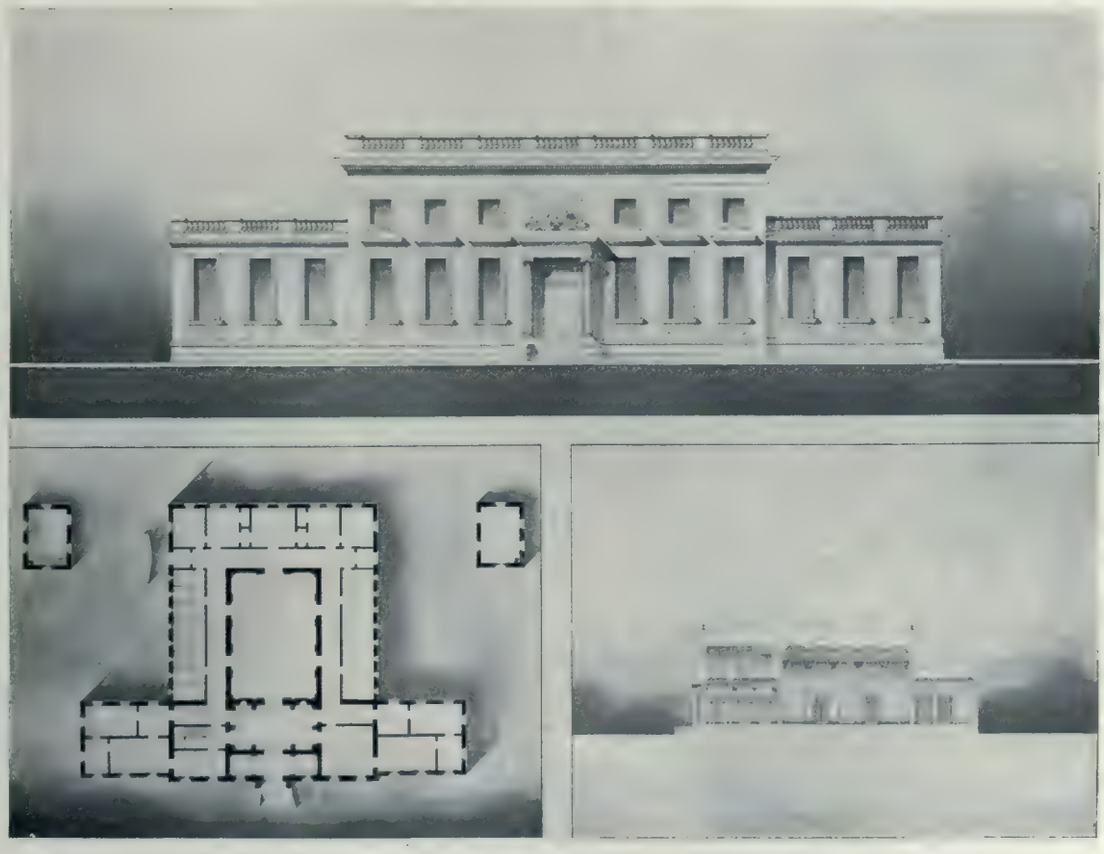
Design for Colonial Residence—H. H. Madill, Second Year Student, Department of Architecture, Toronto University.

Design for Chapel to be Situated on the Southern Coast of a Large Lake—J. B. K. Fisken, Third Year Student, Department of Architecture, Toronto University.

Design for Chapel to be Situated on the Southern Coast of a Large Lake—J. H. Craig, Third Year Student, Department of Architecture, Toronto University.



Dispensary for Children—T. C. McBride, Third Year Student, Department of Architecture, Toronto University.



Dispensary for Children—J. H. Craig, Third Year Student, Department of Architecture, Toronto University.

exceed 33 feet. The end of the composition will be accentuated by an exedra (b) covered by a roof or half cupola. The exedra can be part of billiard room or can be considered like an ordinary balcony. Plan with end of gallery, 1-16 in. Elevation and section, ⅛ in.

A *Band Stand.*—To be erected in a public park in a place where it is possible to have the audience on only one side. Over all dimension must not exceed 45 feet. Elevation, plan and section.

Niche for Antiques.—To be situated at the end of an alley in the private grounds of a rich man's estate, which is walled. This is built for the purpose of holding an antique statue and to form a background for certain antique figures which will be on the ground, wall, etc.

THE COMMERCIAL ASPECT OF CONCRETE IN CANADA.*—By Gustave Kahn.

THAT CONCRETE as a building material has passed the experimental stage in modern conion is evidenced by the rapidly increasing number of structures to be found in the civilized world. Writers of history tell us that concrete, either plain or reinforced, is not a new material, and in support of this statement point to structures of ancient as well as medieval days. Be that as it may, our own immediate knowledge of the material is comparatively new, but new or old, the data to be had relative to the material and its value as a structural material, is to-day just as complete and just as reliable as the data to be had on any other material.

The history of mankind divides all epochs pertaining to civilization into different ages, and so we may safely conclude that the history of construction should be divided into ages. We have had the age in which stone was used; we have had the age in which wood was used, and we have had the steel age, and we are now passing through what in time will come to be known as the concrete age. That the concrete age will occupy just as prominent a place in future building history as any other is only reasonable to expect, even though the conditions making this possible have changed.

As Victor Hugo said in his writings: In early history structures of all classes were intended to record the happenings of the day; in other words, to record history. Therefore in order for a material to be adopted for structural purposes its main requisite was quality to withstand the ravages of time. To-day, however, we look for more. In order that a structural material satisfy the required demands, it must have the enduring qualities required in earlier days, and also must have the virtue of being easily handled in order that it may be commercially economical in its application. This then is the primary reason why concrete will naturally come to be known as the building material of the age. There is no known material that will better withstand the ravages of time. and, furthermore, there is no known material that can be handled more economically.

That Canada is keeping pace with other countries in concrete construction is evidenced by the growth of the entire industry in Canada. Unquestionably the best indication of the industry's growth is recorded by the cement manufactured in, and imported into Canada. Looking into this record, we find that during the year 1900 there were manufactured here 292,124 barrels of cement During the same year there was imported 374,966 barrels of cement. This shows that the total consumption for the year in Canada was 667,090 barrels, of which only 44 per cent. was manufactured here.

During 1909 there was manufactured in Canada 4,089,191 barrels; there was imported 156,456 barrels; the total consumption for the year being 4,245,647 barrels. with the splendid showing that a total of over 95 per cent. was of home manufacture.

The fact that concrete work in Canada compares favorably with concrete work done in other countries indicates that the cement manufactured here compares favorably with that manufactured in other countries. Assuming that on an average there is used one and a quarter barrels of cement to each cubic yard of concrete, we have for the year's work, 3,396,500 cubic yards, representing an approximate expenditure of $30,500,000.

There is cause for congratulation among Canadians that more than eighty per cent. of all the materials entering into this work were produced in Canada. And I believe that the growth of the industry is such that we are justified in demanding Government recognition of the industry. I believe that it will be of special interest to this convention to hear that practically all of the important structural work in Canada during the last year was either entirely or partially carried out in concrete, plain or reinforced. This statement may be rather broad, but it can be easily proven.

A hasty review of the situation may not be out of place at this time. To make the review systematic, we would begin at the Pacific Coast. The largest building in Victoria for the year, known as the Pemberton Building, is reinforced concrete throughout, and all of the larger buildings in Vancouver for the year are either entirely reinforced concrete or are steel skeletons with concrete floors.

Coming on to Calgary, there were erected last year in this city two large reinforced concrete buildings, in addition to steel frame buildings with concrete floors. Edmonton, however, has been somewhat backward in this respect, the use of concrete there having been limited to pavements, foundations and concrete floors.

Regina showed most excellent progress indeed, and was one of the leaders in this class of construction. The most notable examples there are the Saskatchewan Parliament Buildings, which are built almost entirely of reinforced concrete.

Winnipeg witnessed a great development in the use of concrete, as is instanced in such buildings as the Transcontinental Railway shops, the Fort Garry Terminal station, the Maltese Cross Rubber Company's warehouse, the Government Examining Warehouse, and other important structures. We learn that Winnipeg alone was responsible last year for about thirty large concrete buildings, not counting the smaller work to be found everywhere, or the large Power Plant for the City of Winnipeg, at Lac Du Bonnet, built almost entirely of concrete. Again, Port Arthur and Fort William have made big advances in this direction as is seen in the large reinforced concrete grain elevators which were erected in these towns during the last year.

Coming still further East, for the year right here, in and around London, may be found any number of good examples of concrete buildings and bridges. Among these may be noted a building finished for the Murray Shoe Company, also the Water Works and Power Plant, now in course of construction. In Hamilton nearly every building of importance erected during the past year is either entirely or partially of reinforced concrete. Toronto, while a little behind the others, also shows its quota of good work for the year. The fight in Toronto last year in connection with the large trunk sewer there. now in course of construction, should be of especial interest to this convention. The engineers for the work designed it originally in concrete. The brick industry made a very strenuous fight, and succeeded in delaying the awarding of the contract. Through them the City Engineering Department was compelled to investigate concrete for sewer construction in general, and only after a very thorough investigation were they permitted to adopt concrete.

Peterborough shows the use of this material in the erection of a large Water Works Dam and Power House.

*Paper read before the Second Annual Convention of the Canadian Cement and Concrete Association, at London, Ont.

and also in the most important concrete arch bridge yet attempted in Canada, which was started last fall. Belleville and Kingston, too, were well represented in this year's work, while Ottawa shows five new reinforced concrete buildings as well as a large concrete grand stand built on the fair grounds.

Note here, that in giving the number of reinforced concrete buildings, the numerous smaller buildings, such as concrete block houses, erected in this material have not been included.

In Montreal was erected the largest reinforced concrete building in Canada during 1909. The structure to which I refer is known as Jacobs Building. It has a frontage of 237 feet; a depth of 133 ft.; at present it is seven stories high, and is planned to eventually be increased to ten stories. Another example is the Wilder Building, a ten-storey warehouse. Another, the Ogilvie Building, a large steel skeleton frame with concrete floors. In addition to these, Montreal has a number of smaller buildings erected in concrete during the past year.

And so we may pass on to the Atlantic Coast, and find evidence to substantiate the claims made earlier in this paper.

The commercial success or failure of the contractor in concrete work is entirely a matter of ability in handling the work efficiently. No greater mistake can be made by the contractor than to attempt to make money on concrete work by slighting or skimping the job. Only the best materials obtainable should be used. It is true you may place a certain amount of stone, sand and cement into a mixer, mix it and place it in position to harden or solidify, and a satisfactory piece of concrete may be the result; but if it is, it is merely a matter of chance. On the other hand, if proper precautions are taken, if the stone is clean and of proper quality and size, the sand clean and of consistent quality, the cement sound and of recognized quality, the proper proportions of materials carefully mixed together, the total just as carefully placed in position, there can be no question as to the result. It is a foregone conclusion, not a matter of chance. The contractor undertaking reinforced concrete work will find it greatly to his advantage and the advantage of the industry to exercise every precaution, in fact, it is absolutely necessary. It is not sufficient to place steel into a bed of concrete and then run chances of the amount, the quality or shape of the steel being right. There is only one proper way, and that is to analyze or diagnose the case. Be sure that all possible conditions have been considered, such as the known load that the structure is to sustain, the greatest possible load that it may be called upon to sustain. Analyze the stresses these loads will produce on the concrete as well as on the steel, make sure that the quality and quantity of the concrete as well as the steel is sufficient to take care of this load. Make sure that the concrete will be called upon to take care of only the stress it is known it can resist. (Compression). Be sure that the distribution of the steel throughout the mass is in accordance with the stresses distributed throughout the mass. In other words, be sure that all compression, all tensile, as well as all shearing stress are provided for. Then exercise the proper precautions in combining the proper materials, and the final result is again a foregone conclusion; not chance; it spells success.

No contractor can become a permanently successful business man unless he does good work, and at the same time make money. It therefore only follows that a successful concrete contractor must do good concrete work, and must make money.

According to my former statements, if all necessary precautions are taken in designing, planning, inspecting and performing the work, the final result, regarding quality of work, cannot be questioned. The only thing that remains to be considered from a business point of view, is how to make money. To this there is only one answer. Learn to figure costs. Do not undertake a contract, unless you can see that the price to be obtained will provide a profit. It may seem strange, but it is true that the difference of opinions among contractors regarding cost are just as great as the differences of opinions among lawyers, regarding matters of law, or doctors pertaining to matters of medicine. Only careful study and long experience will perfect the contractor's judgment in this regard. There always are, however, or should be, certain positively known facts. These are, the cost of the required material, the cost of transporting these materials to the site, and overhead charges, or cost of looking after the routine business in connection with any contract. Then comes the cost, or probable cost, of equipment required, and last, but by no means least—(rather the greatest) is the cost, or probable cost of the required labor. If the plans are properly prepared, the cost of the materials is usually only a matter of plain addition and multiplication. Right here, I would ask you to observe that this statement is modified. The plans must be properly prepared, and that means a lot; for plans that are properly prepared must show the most economical way known to accomplish certain results. By this it means that every particle of material shown on the plan must when incorporated in the work, perform a certain needed function in such a manner that the full strength of the material used is developed; and further, that only materials especially suited for certain functions be employed for said duties. The statement has often and truly been made that every dollar judiciously spent in planning work will save two dollars in performing same. This principle also holds true in the careful selection of materials to be used. As a rule, the low unit cost of raw material is not a criterion for careful planning, for, should all materials required in the structure cost the contractor $10.00 and the labor required to place this material cost an additional $10.00, the resultant total cost thus being $20.00; then differently prepared materials which cost $12.00 and the labor required in placing same $6.00, are unquestionably more economical. The overhead charges in any business are usually controlled by business system; the better the system employed, the lower the overhead cost. The cost of labor is usually reduced in direct ratio to the care exercised in planning the work, selecting the materials and the equipment for handling same.

To sum up, to be successful as a contractor in concrete work, plan the work in a careful manner, select carefully the materials to be employed in the work, (employing not the materials whose first cost is lowest, but materials that are most economical "in place," and which when properly prepared reduce the chance of error to a minimum). Simplify as much as possible field labor and above all things, refrain from taking contracts so low, that when the work is finished and the bills are paid, nothing remains to recompense you for the energies expended in carrying the work to completion.

We are all working, or should be working, for a common cause, the success of the cement and concrete industry. Remember that every bad piece of concrete work done injures not only the contractor who performed this work, but the entire industry, so for his selfish reason, if for no other, it is up to us to assist one another in successfully handling all our contracts. In our own interests we can not afford to knock; we must boost our fellow concrete contractor.

COFFERDAMS CONSTRUCTED BY FREEZING have been used in Germany. The plant consists of an air compressor and suitable receivers mounted on a vessel. A shallow closed box of steel is built the shape of the cofferdam and weldless steel tubes are inserted in it at short intervals. These tubes are closed at the bottom, pointed, and of such length that when driven into the river or lake bottom the closed box is just at the surface. Compressed air is pumped into the box and tubes and on expanding freezes the surrounding water and forms a wall of ice.

ART, ARCHITECTURE AND THE ASSISTANT.*—By E. J. Dixon, A.R.I.B.A. ∴ ∴

THE FIRST GLIMMER in the official mind of the existence of the architect's assistant, as we know him, was exhibited in the address of Mr. Walter Cave at the Architectural Association nearly two years ago, and the measures taken by that body in reference to the state of unemployment, as exhibited by their register, indicates the desire for protection so widespread in the profession at the present time, and of which the measures taken by the Royal Institute cannot be too generously praised. But, previous to Mr. Cave's address, and since, the official view of the assistant as a person of private resource apart from the salary he receives for his work, has been the predominant one. In listening to presidential addresses one after another, one wonders whether presidents live in another world, whether their productions in this direction are intended as an impertinence, a gross piece of sarcasm by tacit inference to their audiences, who principally consist of the struggling assistant who often finds it a matter of difficulty to pay his annual subscription, or, thirdly, whether the assistant is considered so unimportant as to deserve no recognition from the presidential point of view, except as a student.

From the position of the assistant as student there is much to be done, and the existence of a large class, much larger than one would suspect, wretchedly paid, quite unrepresented in any society, and having no means whereby their position may be bettered, the existence of this class, I say, is a standing menace to the profession as it concerns the assistant, for it means the lowering of salary and status of the better men and more casual employment. The existence of many offices where men of this class are employed at insignificant salaries, with a paid assistant brought in at intervals to perform any thoughtful work, tutor the pupils and backward assistants, and then politely dismissed when the term of his usefulness is past, is no uncommon experience, and one which has been politely waived aside by official opinion. As a student, the assistant has always been interested in matters of art, and especially in relationship to his profession. From the point of view of individual development, the study of art is essential; but art in relation to the assistant and to our profession as matters stand at present is besmirched with cant and hypocrisy. One cannot but regard the manner in which the cant of art has grown up in our profession as one of the most important signs of the times, whereby the selfish business man talks insincerely of art in order to dupe his sincerely artistic confreres to achieve his real aims; those aims, of course, being those of any other profession or business devoid of any factor appealing directly to the emotions, as art appeals to any architect who sincerely believes and practises the Mistress Art.

The assistant, of course, has only the full opportunity of showing his knowledge of the art of architecture when either the cunning, carelessness, laziness, or lack of ability of his principal will allow—a condition of things which often prevails, and very largely in public offices where an engineer often reaps a harvest of praise and prestige from the work of an unheard-of architectural assistant. Art itself appears to have reached a precarious stage in the profession of architecture. The disciples are busy imitating and collecting from the masters, and the masters are busy in an ostensible game of bluff—that of imitating themselves; so that the final result of the latter's work is little above the average of their disciples.

To describe the present position of the profession of architecture towards art as that of a mere superficial relationship will probably honestly astonish a few, disgust many, and be looked upon as the idle prattle of an imbecile by many more. To describe that relationship as suspiciously dishonest is probably much nearer the truth, and to frankly describe it as dishonest is more probably the expression of outspoken sincerity. The many points of view as to the relationship of architecture to art agree in those well-known aphorisms so dear to some of us, architecture "The Mistress Art," "The Mother of all the Arts," "Architecture not a Profession but an Art." Most of us have heard these well-worn words so many times that, had we no genuine basis for our belief in them, the mere repetition would have engendered it. The purely artistic phases of the profession, Grand Manner or no Grand Manner, Decorated Construction or Constructed Decoration, are gradually being narrowed to the position the question of religion popularly occupies. If we are Methodists we buy our bread from a Methodist baker, and if we are Calvinists we feel intense remorse on purchasing goods sold by a grocer who contemns the Five Points. Likewise the Grand Manner disciples gaze with silent disgust on the followers of Mr. Baillie Scott. All this is very pleasing and amusing, but its economic aspect as affecting the assistant is scarcely worth any further reference except in a very few exceptional cases. The most noticeable feature of many of the ardent and talkative adherents of any of the schools of architecture is, that if their principles differ, their work has much in common, and usually finds an ample shelter under the title "early Victorian."

As all true camp followers of the art of architecture, the members of this Guild of Assistants duly subscribe to the common declaration of faith which we continue to recite with all due solemnity as our professional fathers have taught us. We do not desire to drag the art of architecture from the high place it occupies, or to trail even the hem of the garments of the Mistress Art in the dust. One would have thought that the position of the art of architecture was sufficiently well-established to resist the breath of scandal from any quarter, but it has ever been a commonplace that the gods should be strictly respected and protected in their implied sufficience from blasphemous influence. We are not deeply concerned in this table talk of architecture, and as a Guild of Assistants we desire to study the profession of architecture as it really is, and to discover the sources of the evils we know and feel the effects of. Let us leave for a moment the attractive thesis of the art of architecture and examine the less attractive but more engrossing one of the profession of architecture. The principal and the assistant of fifty years ago might be described as standing on the same plane as regards rank and social position, and in a relationship somewhat of tutor and pupil, the latter being practically certain, if he persevered, of reaching the same, or perhaps a higher, position in the profession than his tutor. It is not implied that the service of architecture was entirely the object, for many of the older practitioners have left some goodly sums of money, as we all know, penuriously amassed in the service of architecture. The advent of the modern assistant, a man with little or no financial backing and depending solely on his salary to live, was gradual; but eventually he numerically swamped the older class, and often proved himself more capable. He immediately endeavored to imitate the older men—he adopted their superstitions, their habits, and their prejudices. This kind of thing is not, of course, unknown in other walks of life, it is a common social phenomenon. The difficulties of any new movement on behalf of any section have, as their initial difficulty, their first obstacle, the prejudices borrowed from the social strata immediately above, and the question of their removal. The architect's assistant of the present day quickly found himself in the same position as the wage-earners in any other business, and due to precisely the same causes. He has hitherto found his prejudices too strong to permit him to combine in his own interests, to recognize, in short, that his position as assistant is rapidly becoming a permanent one, that the possibilities of becoming a principal grow less as he grows older, that signs are not wanting that the principal means of outlet for the energies of the assistant, the opportunity that this profession possesses above all others, the open competi-

*Paper read before the Guild of Architect's Assistants, at London, Eng.

tion, is gradually becoming limited, either to districts and more often to architects in practice. I do not think that in thus rapidly sketching the latter history of the architect's assistant I have in any way overdrawn the real state of affairs in the profession as it concerns him. Once granting the truth of this account of the present position of the architect's assistant, it would appear that the only common-sense course to adopt, if no escape from the profession is available, would be to render it as congenial as possible; to recognize the probable limitations of one's genius without attempting to render null and void any ambition one may possess. The first point to be noticed in assuming this view of the architect's assistant's place in the profession is the fact that nothing definite can be achieved without organization of some kind or other, and the painful fact that the existing societies are composed of principals or those who are in full possession of the illusion that they will be principals, and, secondly, that a deplorable reception awaits the man who would take up cudgels on behalf of the assistant in such a foreign atmosphere. The question then for all assistants to decide is the kind of organization they will select, the work they propose to commit to its care, and the manner of its execution.

The Guild of Architects' Assistants proposes to unite all those who have any title whatever to its designation; it proposes to primarily unite them socially as a matter of course, and, secondly, it has proposed a programme whereby the many grievances under which the assistant struggles; and which before recognizing his position as practically that of a mere casual laborer with practically the same wage, it regarded as the necessary struggle of the architectural pilgrim on his way to achieve the crown of glory of a future practice; this programme has now been before the public in the architectural press for the past eighteen months. It proposes to endeavor to do something in the matter of (1) salaries, (2) office hours, (3) office conditions, (4) recognition of an assistant's work where possible, (5) legal assistance, (6) unemployment bureaux and insurance, (7) education. The Guild will endeavor to carry out the proposals by means of combination, necessitating strength of numbers, and conference with existing societies and principals, necessitating tact and toleration. There are many other advantages a keen, solid combination such as this will immediately suggest, such as parliamentary and municipal action, it being usually found an easier matter to effect changes in the domestic affairs of public bodies by means of correspondence and deputations than in the case of private employers.

The act of bringing forward matters which immediately affect the well-being of the assistant to the notice of existing bodies would have the effect of stimulating the interest of assistants who are members of those bodies.

The inclusion of principals who are interested in this, which the Guild trusts will become the important phase of architectural politics, will provide the necessary element of experience and breadth which such a movement as ours demands. The principal finds it necessary to take some measure of protection for his own interests against the guerilla warfare carried on against him by the unruly members of his class, by taking refuge within the folds of a Registration Bill; but the assistant feels doubtful as to whether he should combine in like manner, and for exactly similar reasons. You see "We don't intend to remain assistants—we shall one day be principals," and then "the idea of combination is so like trade unionism, which, of course, is a thing we must not dream of." There are some of us, however, an increasing number, who, after noticing the gradual removal of the elderly assistant who has failed to arrive, muttering continually, as he shakes his iron-grey head, the dear old excuses and shibboleths, and gradually sinking into that dismal limbo from which no architect's assistant returns, who, I say, desire to bring all assistants together within a bond of union of their own interests, for their own progress and betterment. Whatever is bad in combination let us exhibit enough sense to reject, and whatever is good let us hold fast to whatever borrowed prejudices may be wrecked in the struggle.

To begin with, this Guild of Architects' Assistants welcomes the advice, help and assistance of all principals who are really interested in the welfare and fate of the assistant. They are able to see the assistant from the business point of view, to appreciate the value of a good assistant, and to condemn the incompetence of a poor one. All principals interested in the better organization of the profession generally will welcome the advent of any well-considered scheme which redounds to their benefit, which will select, classify, and secure to them the best assistant available on the market, instead of continuing the present method, if it can be so called, of trial and error in the engagement of assistants. Principals will recognize that the assistants are even more interested in any sound scheme for the protection of the profession than they are themselves, that they form a potent numerical factor in all societies, and consequently represent an interest which, if well organized, would unquestionably prove of great value in any movement in the direction of the real reform of the business organization of the profession or the improvement of the status of its units.

We make no attempt to strictly define the term "Architects' Assistant," regarding as such all who are engaged in the practice of the construction of building and who may be likely to compete with us in business life for any class of work, building or architecture. We want to make the term "Architects' Assistant" as broad as possible, leaving it to the common sense of those who desire to join us as to their reasons for inclusion.

Apart from all these reasons for the development of the Guild of Architcts' Assistants, which we may term "economic," another, and perhaps more powerful one, may be brought forward to justify our existence, and that is the "social" reason. We are the only "Society of Architects' Assistants," the only architectural society having for its primary object the maintenance of the status of assistants. As all other existing societies place the principals' interests first and the assistants' last, so we fill a place in the profession by providing for and maintaining the assistants' interests, and those not without deference to the principal, whom we ask to join and assist us. We have continually reiterated that we have no desire to compete in any way with other societies, but to collaborate and work with and within them. Unfortunately the fact that we must receive subscriptions if we want to live constitutes in some way a challenge to other societies; but we have endeavored to minimize this possible source of irritation to as low a figure as possible (1) in order to allow our members to remain in existing societies and to work within them, (2) to avoid as much as possible any appearance of competition with other societies. Any similarity that may be apparent in the aims of the Guild in comparison with those of other societies demonstrates firstly, that no radical difference exists; secondly, that the proposals of other societies in relation primarily to the principal are exactly similar to ours in relation to the assistant; and thirdly, the social aspect, that of providing an assistants' society, is exactly similar to that of other societies.

In conclusion, therefore, it is our hope that the Guild of Architects' Assistants, by presenting the assistants' case in an organized fashion to existing bodies, besides carrying out that section of the work which is peculiarly its own, will form a useful cement to existing professional opinion, even if it may not eventually aspire to the position of an important feature in the professional structure itself.

THE GOVERNMENT BUILDINGS AT KHARTOUM.

THE SUDAN possesses practically no ancient architecture; true, a few remains exist of churches erected probably in the fourteenth century by Coptic Christians, but, unlike the neighboring land of Egypt—the seat of the earliest civilization—there are no wondrous temples

or tombs such as bear witness for all time to the magic skill of the Egyptians of remote antiquity.

Thus, after the conquest of the Sudan, when it became necessary to erect buildings for administrative purposes, there was no indigenous architecture to reproduce or to work upon as the basis of a style for modern buildings suited to the exacting climatic conditions.

The Governor-General's palace, built on the site of Gordon's old residence, was the first important building of the new regime. It was commenced by Lord Kitchener almost immediately after the battle of Omdurman and is designed in the Florentine manner. Situated amid a wealth of tropical foliage, the effect of the white palace on the bank of the Blue Nile is certainly pleasing, though it is perhaps chiefly interesting for the rapidity of its construction and from the fact that it was built entirely by native soldiers quite untrained in the building crafts. The Gordon College, another of Lord Kitchener's achievements, is also Gothic in treatment. This building, as its name implies, was erected in memory of the heroic General who was killed in 1885 while defending Khartoum.

When the question of the new Government buildings was mooted the first consideration was as to style. After much thought a form of Saracenic architecture was adopted, this style being, of course, the product of the Mohammedan faith, and therefore eminently suitable for a country where the English have never sought to impose their religion or customs on the natives. Further, it has a certain likeness to the style of the buildings previously mentioned, and as it has ever been a style for Eastern lands it lends itself readily to a treatment designed to obviate the discomforts of a very trying climate.

The building is being erected on the peninsula formed by the junction of the White and Blue Niles. The part to be proceeded with at present contains the entrance hall (a room of noble proportions), the economic museums, and a masonic temple, the interior of the latter being modelled on one of the ancient temples of Egypt. The whole scheme, which it is hoped to carry out eventually, will comprise a large hall in the centre of the building adjoining the entrance hall, which will be used for official receptions, levees, etc.

The frontage of the building is 352 feet, the depth 230 feet, and the tower when completed will be 150 feet high.

The walls are of hard sandstone on a plinth of granite, and will be finished externally in white plaster, the ornate details being specially executed by skilled workers.

Internally a considerable amount of marble and mosaic will be used, and a feature is to be made of the great staircase in the entrance hall.

The work is being carried out by the Sudan Public Works Department, Captain M. Ralston Kennedy, R.E., D.S.O., Director of Public Works.—THE ARCHITECT, LONDON.

CEMENT STUCCO.—Its Adaptability to Modern Residential Construction.—By W. E. Ramsay.

THE STUCCO HOUSE MARKS the completion of an evolution destined in the near future to completely revolutionize building methods in Canada. The stucco house is no longer a speculation but a definite quantity; for aside entirely from its architectural possibilities and the plastic way in which it lends itself to the building of the home beautiful, it possesses the added advantages of being proof against fire, wind, cold and dampness

To fully appreciate the marvellous possibilities of this wonderful building material, try a simple little experiment for yourself.

Take a small piece of plank, nail a small piece of metal lath to it, then cover the lath half an inch thick with mortar composed of Portland cement and sand in about the proportions used in making sidewalks.

Keep this in a damp place for a few weeks and you will find that to cut the mortar from the plank you will have to use a cold chisel.

The cement application has become an artificial stone—but much tougher and much more durable than any stone that nature has even turned out.

Could anything be more simple? And the necessary materials in this evolution were merely cheap cement and cheap metal lath—two commodities both here and both so inexpensive that a few years will bring about a marvellous change in the appearance of town and country.

With some exceptions, the new houses will be made of wood or steel frames covered with metal lath and finished in the manner described.

While the covering will not be thick, it can be given the appearance of massiveness and stability according to the character of the house; the process lends itself to any architectural design.

Not only is the initial cost low, but the cost of frequent repainting and repairs is obliterated entirely. A stucco house properly built will be warm in winter and cool in summer—so long as a tight roof is maintained—will be indestructible by the elements as lapse of time only serves to make the cement harder and better.

An Interesting Residential Structure, Showing the Artistic Possibilities of Cement Stucco.

The greatest benefits to come from this system will be in the covering of old frame houses and outbuildings which now, in every condition of dilapidation, offend the sight.

A few days' work of the plasterer marks the disappearance of the old house, and means, in effect, the creation of a new cut structure, up-to-date in appearance, strong and durable, and in many cases readily saleable at at double the previous market value. If the work is done with a light-colored cement and a white sand, with a smooth finish which will not catch the dust and soot, the result will be most attractive. Much of the charm of European cities comes from the white stucco or cement covering so universally used. This is not a new idea in Europe; it was introduced into England in the Elizabethan period and is to-day considered the most efficacious and substantial form for the outside coating of residences. In fact, in England, as in France and Italy, stucco is commonly applied to new bricks in order to get more artistic results. Motor through the suburban districts of New York and New Jersey and you will see a continuity of handsome homes built by the wealthy, which are in many cases merely of frame constructions covered with stucco on expanded metal.

In order to get the best results it is absolutely imperative that this lath should be thoroughly painted or galvanized and, above all, the architects should select a lath that will be bedded in the stucco, as the longevity of these light fabrics depend upon this.

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

Ivan S. Macdonald, Editor and Manager

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

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Building Operations in April.

AN AVERAGE GAIN of 43 per cent., representing a total investment of $12,294,780, as against $8,552,375 in the corresponding period last year, or an amount approximately $4,000,000 in excess of that recorded in the preceding month, is the story of Canada's wonderful building progress, as briefly told by the comparative figures for April submitted to CONSTRUCTION from twenty-eight representative cities scattered broadcast throughout the Dominion. Halley's comet on its trip past the earth this time found much that it failed to observe when it came this way before, and Canadian builders in all sections, it seems, exerted every effort by the erection of new structures, to make it difficult for this celestial wonder to whisk its tail by without, as it were, causing it to sit up and take notice. So marked has the development been, in fact, that several sections of the West are on the verge of a building material famine, such as was never experienced before. In Winnipeg and Calgary, prices are said to have steadily increased, and that despite any willingness to accept the advance, materials cannot be obtained in sufficient quantities to in any way adequately meet the unusually heavy demand.

Possibly the most pronounced feature of the month was not so much the universal activity that prevailed in general, as much as it was the heavy proportionate gains made in all parts. Four cities totaled $1,500,000 or better, and fourteen others registered amounts ranging from $100,000 upwards. While five more losses are noted than in the preceding month, it must be remembered that the number of cities reporting is practically one-third again as great. Some of the declines are due to labor trouble, as in the case of Lethbridge, where the falling off (55 per cent.) can be ascribed wholly to the strike in the building trades during the first two weeks of the month.

The largest amount of the month is noted in the case of Toronto, which issued permits for improvements, amounting to $2,522,055, although Winnipeg, with a total of $2,305,450, was a most worthy competitor for honors in this respect. Considering the huge volume of work undertaken in the same month last year, the progress made in either instance is most gratifying indeed, and especially so, in view of the fact that both of these cities report a large number of important projects in immediate prospect.

The highest increase for the month, however, goes to Stratford, which climbed to the apex with a gain of 1741 per cent., representing an investment of over half a million, as compared with $30,100 in the month of April, 1909. Ontario, in fact, turned to account six increases, besides the two mentioned, viz:—Brantford, 109 per cent.; Hamilton, 69; Berlin, 16; Peterboro, 48; Port Arthur, 22; and Kingston 12 per cent. The losses noted in this province occurred at Ottawa and London, which receded 5 and 40 per cent. respectively; and at Fort William and Windsor, which fell short of their corresponding figures, to the extent of 76 and 70 per cent. in order named. Windsor promises a big improvement in the near future, as a by-law has just been passed regarding the granting of sites for factories and manufacturing plants, which will in all probability bring a large number of important industrial concerns to that city and stimulate building development in all lines; while as for Fort William, it might be explained that the permits in April 1909 included the mammoth elevator erected there last year, and that omitting this one item, the city is ahead for the month on all other work, by over 50 per cent.

As regards the Eastern section of the country, Montreal crowded well to the front by netting a gain of 62 per cent., her total for the month of $1,822,082 being the third highest amount recorded; while Sydney's tremendous uplift (602 per cent.) gives that place the second highest standing as regards percentage increase. Halifax and St. John, however, fell to the rear by a decline of 47 per cent. and 48 per cent. respectively, although the corresponding figures in the latter case are of such meagre proportions as to afford no reliable means for accurately judging the situation. Last month and the month before, this city was substantially ahead, and there is no reason to assume other than that the healthy condition which heretofore obtained will shortly reassert itself.

In the West, operations in general were veritably

	Permits for April, 1910.	Permits for April, 1909.	Increase, per cent.	Decrease, per cent.
Berlin, Ont.	$87,881	$75,200	16.86	.....
Brandon, Man.	52,150	33,875	53.94	.....
Brantford, Ont.	79,830	38,015	109.99	.....
Calgary, Alta.	603,930	174,150	246.78	.....
Edmonton, Alta.	252,196	210,890	19.58	.....
Fort William, Ont.	261,625	1,116,000	.....	76.55
Halifax, N.S.	29,650	57,000	.....	47.98
Hamilton, Ont.	382,175	225,380	69.56	.....
Kingston, Ont.	48,188	43,000	12.06	.....
Lethbridge, Alta.	100,425	224,440	.....	55.25
London, Ont.	104,883	177,250	.....	40.82
Montreal, Que.	1,822,082	1,111,891	63.87	.....
Moose Jaw, Sask.	153,250	161,250	.....	4.95
Ottawa, Ont.	340,675	359,600	.....	5.26
Peterboro', Ont.	121,201	81,721	48.31	.....
Port Arthur, Ont.	107,650	87,600	22.88	.....
Regina, Sask.	307,205	71,875	327.41	.....
St. John, N.B.	5,200	10,000	.....	48.00
Saskatoon, Sask.	292,956	147,090	99.16	.....
Stratford, Ont.	554,300	30,100	1,741.52	.....
Sydney, N.S.	88,025	12,550	601.39	.....
Toronto, Ont.	2,522,055	2,003,398	2.58	.....
Vancouver, B.C.	1,460,508	783,490	86.41	.....
Victoria, B.C.	192,440	188,060	2.32	.....
Windsor, Ont.	18,250	64,350	.....	70.70
Winnipeg, Man.	2,305,450	1,064,200	116.63	.....
	$12,294,780	$8,552,375	43.75	.....

rampant. Aside from Lethbridge's decrease, and a loss of 5 per cent. experienced at Moose Jaw, all places prospered to an unusual degree. Vancouver's big upturn of $1,460,508 practically doubles the amount of work undertaken in the month of April, 1909, and is a most remarkable total, considering the phenomenal advances made by this city since the first of the year. Victoria overlapped her previous mark by a gain of 2 per cent. Calgary made a most excellent showing, registering an increase of 109 per cent., as did also Edmonton, where the total was 19 per cent. in excess of that recorded last year. Again, Regina came mightily to the fore with a striking gain of 327 per cent., while Saskatoon and Brandon with their increases of 99 per cent. and 53 per cent. respectively, give evidence of a growth which, to say the least, is both gratifying and substantial.

While these figures truthfully reflect the wholesome conditions as regards building operations which exist in all sections of the country, they fail materially to measure the full force of activity in general. There are hundreds of secondary towns and villages throughout the length and breadth of the land that are going ahead at equally as stupendous strides, and it is only necessary to glance at the daily or weekly press in almost any locality to be impressed with the truly wonderful development that is taking place. As regards the outlook immediate indications are that the present pace will be maintained indefinitely, as practically all architectural offices are well laden with work, and a large number of important projects as well as much small work will be carried out during the summer months.

City Building in Germany.

CITY BUILDING, that is, the planning and laying out of cities so that they may be beautiful and an uplifting influence, is something which is being earnestly carried out in the more progressive European countries. Germany, who has always made a keen study of her sociological and economic problems, is making splendid progress in this direction. In England one is greatly impressed with the improvements being wrought by garden-city schemes, and town-planning. Edinburgh and Paris reveal in beautiful streets and buildings what is possible of attainment by governmental and architectural co-operation. But here in Canada, the seed of progress in this respect has not begun to germinate.

How utterly behind we are in this connection is fairly demonstrated in the ineptitude of the Dominion Department of Public Works in its proposed programme as regards the Departmental Building at Ottawa, and the inanity of the Board of Education in Toronto in its procedure in connection with the designing of the proposed $500,000 Technical School.

Germany, as a nation which has given most careful attention to sociological and economic problems, affords an object lesson that we can profitably study. In an article entitled, "City Building in Germany," appearing in Scribner's Magazine, Mr. Frederick C. Howe, says: "The paramountcy of private property does not exist. Humanity is first. The city enjoys some of the sovereignty of the Empire. It can promote the beautiful. It can destroy the ugly. It can protect its poor. It can educate as it wills. It can plan for the future. It can have city dreams. And the German city has dreams, dreams which are fast being visualized. The German burgomeisters are laying the foundations of the city of to-morrow as an architect lays the foundations of a forty-story skyscraper or the designer of a world's fair plans his play city far in advance of its excavation.

German architects saw the obvious. They saw that the city would grow as it had in the past. So they enlarged the boundaries. They annexed suburban land. The present area of Dusseldorf, with its 300,000 people, is 29,000 acres; of Cologne, with a population of 428,700, is 28,000; of Frankfort, with a population of 335,000, is 23,203. Having enlarged its area, the city was in a position to control its development, to plan for its building. *It called in its architects and its engineers* or it sent to a neighboring university for an expert. A plan is made of the surrounding territory, of the topography of the land, the natural advantages, the proximity to the railways, and the probable uses to which the region will be put. The prevailing winds are studied, and factories are only permitted to locate in certain prescribed areas. In some cities they are excluded from the business and residence sections altogether. If the neighborhood is suited for manufacturing it is dedicated to industrial uses. If it is a working-class quarter, the streets and parking are adjusted to workingmen's homes. If it is suited to homes of a more expensive sort, the plan is upon a more elaborate scale.

The foresight of the city does not end here. Streets, boulevards, parks, open spaces and sites for public buildings and school-houses are laid out far in advance of the city's growth."

Of course, we appreciate that there are self-centred government and school board officials in Canada, who will say: "Who cares what Germany is doing?" Aye! there's the rub. We also appreciate the fact that there are self-centered government and school officials, who say: "What do we care for the Canadian people?" Aye! ditto. "The public be damned." These gentlemen may have a multiplicity of talents as regards their respective vocations, but the designing and erecting of buildings is not one of them. It is work for the architects and them alone and just so soon as the *representatives of the people* (*?*) realize this old and long established fact, just so soon will architecture in Canada represent fairly the intelligence and culture of our people.

An Unheeded Lesson.

AT NEARLY THE CLOSE of last season's sports in Toronto, the sheds and shacks that had been erected for the purpose of housing schemes and apparatus for the entertainment of the people of the city of Toronto, at Hanlan's Point, were destroyed by fire. A young lady lost her life. She was *merely* a cashier in one of the tinder boxes in which people had been accustomed to be entertained; and the manner of construction adopted in the rebuilding of this well known resort, is but another evidence of how cheaply human life is held.

All Toronto watched the fire. People who have their summer homes on the Island were very anxious about how far the blaze might spread. The city of Toronto was accused of not having sufficient fire protection at the Island. The owners of the Island were accused of not having sufficient protection against fire. The former promised better fire protection, which has been provided. The latter promised a fireproof class of buildings, which has not been provided. The buildings at Hanlan's Point, across from the city of Toronto, to-day are entitled to be termed tinder boxes just as much as those which were destroyed by fire last August. The city of Toronto, which provides police to patrol it for the protection of its citizen, and firemen to protect it against fire, was promised cement buildings, concrete buildings, promised everything of a fire resisting nature, for its greatest amusement place. Instead, the Building Inspection Department, which has jurisdiction over this amusement place, has issued permits for a class of buildings that are wholly unfit in construction to safely house the people whom they are built to accommodate.

It is not our desire in this manner to give a lecture to either the authorities of the city of Toronto, or the owners of Hanlan's Point, but we do propose placing ourselves on record as being not only opposed to the action of the city authorities who granted permits for such buildings as have been erected for amusement purposes at Hanlan's Point, but we are surprised that the men who

are financially interested in this, the greatest amusement place of the second largest city of Canada, have not deemed it more expedient to erect buildings that are incombustible, rather, than ones which would serve as ever dangerous fire traps.

Yankee Control Again.

IT OCCURS THAT the regulations of our Board of Fire Underwriters in Canada are controlled from the United States. A short time ago an instance was brought to our notice, where a Canadian manufacturer of fireproof windows had to submit his invention to a board of underwriters in Chicago. It occurs to us that this procedure is very much akin to that of having our laboring men controlled from what are ostensibly termed international headquarters (in the United States).

Bearing upon this subject, we have recently a dispatch from London stating that the Birmingham Chamber of Commerce has decided to approach the Board of Trade on a matter affecting British trade relations with Canada. A local firm recently made an effort to open trade with Canada. Samples of their goods were sent to an agent, who reported that they had been submitted to the inspection of the Fire Underwriters' Association and that he had stated a test would have to be made at the underwriters' laboratories in Chicago. It goes on to state that in accordance with the rules of the National Board of Fire Underwriters, manufacturers would have to bear the cost for testing and labelling and the charges for carriage to and from the laboratories. This meant that the supply of all kinds of materials for use in buildings would be practically controlled by a corporate body established in and under the laws of the United States. It is maintained by the chamber that this is a serious state of affairs and might readily be considered a menace to the extension of British trade with Canada of a great range of articles. The effect of such conditions in relation to our trade with Great Britain is small as compared with the effect that it may have, or will have, upon our own Canadian trade. When we consider that it is necessary for a British manufacturer in Birmingham, England, to have his goods sent to the city of Chicago, in the Republic of the United States, to be tested before it can be used in Canada, a portion of the British Empire, it occurs to us that a condition exists that must be remedied.

Again, why should the Underwriters' Association demand that all tests, all decisions with regard to fireproofing qualities, and all points of criticism either of approval or disapproval, be made in Chicago, a city foreign to our country? This is just another instance in which our Canadian people have not shown their national stamina.

The Philosophy of the Scrap Heap.

IN THESE DAYS of rapid construction on all kinds of work we are sometimes struck with the rapidity with which one change follows another, as well as with the expedition with which the work is rushed to completion. The destruction of an almost modern New York building to make way for one that will be more economical for its owners in "upkeep" as well as more profitable from a standpoint of investment, has caused the SCIENTIFIC AMERICAN to deal with what it very aptly terms the "philosophy of the scrap heap." Although the building referred to is almost comparatively new, still the sound business judgment of the owners has found that their interests may be better served by its demolition. Speaking of the adverse tendency which still prevails in many countries regarding this seemingly extravagant waste, it says:

"Your old-world engineer or architect, with perhaps a stronger flavor of sentimentalism, hesitates to sweep a faithful servant so remorselessly out of the way. He will point with pride to his forty-year-old locomotive with its million-mile record of service; and he will add wing to wing and another storey or two to a building, if this be possible, rather than raze to the foundations and build from the ground up. It is a case of each to his choice; though there are not wanting many indications that British engineers are beginning to realize the value of the scrap heap, and apply the principles which it implies in the development of their industrial enterprises."

No one can in this instance lay the charge that this building was faulty, or to any extent behind the times in the construction of any of its sixteen storeys, but the fact that it is moderately satisfactory will not suffice for its salvation. The reign of "good" has given place to that of "best," and everywhere we see in our industrial operations one machine being thrown away, although it has only been in use perhaps a year, because another has been found that with the expenditure of equal labor or power will give double the manufactured product. It is a recognized fact that the pecuniary loss from inefficiency of operation is often twice as great as the increased cost of new installation. And the same low holds in the construction of our buildings. This principle is well stated in the following paragraph from the same source:

"Under modern industrial conditions, things are done in a big way with a strong dash of the spectacular. But the city dweller, albeit he is daily confronted with the unusual and the unexpected, must confess to some measure of surprise on learning that a modern skyscraper 300 feet in height, and but a dozen years old, is to be torn down to make way for a new structure which is to be several storeys higher, and—"more up-to-date," if you please. To the conservative European, the ruthless demolition of a building that must have cost over a million dollars, and is still entitled to be called new, will appear, no doubt, as another instance of our national vice of extravagance. But it is not so. The Gillender building is being razed in accordance with a certain industrial doctrine, which has been found to give most excellent economical results, namely, the doctrine of the "scrap heap," according to which, we believe, and have proven in a thousand ways, that so soon as the march of improvement or development renders it certain that there is more profit in "scrapping" an existing machine, plant, or building, and replacing it by another more efficient or of greater capacity, it is a matter of sound business policy to send that machine to the "junk heap" or turn the "wrecking gang" loose upon that building."

The United States is perhaps the greatest exemplification of this doctrine. No man in that country is a greater apostle of the same creed than Andrew Carnegie, and his different manufacturing enterprises, be they furnace or mill, are eternal monuments of his carrying into practice this very doctrine.

Condemn it as some may by saying that the policy is purely utilitarian—a mere question of dollars and cents, still they cannot get away from the argument so aptly stated in our contemporary that it "is a good business policy nevertheless, and, in reality, has been one of the most powerful factors in bringing about the present phenomenal industrial development of the United States."

Is there not here a lesson worth while? May not the Canadian architect and engineer learn points of value from these very instances that will be to the material advantage of himself and client. Neither of these professions need to view it with glances cast askance. It is the gospel of men who have proved its worth in practice; and in many cases is the very essence of wisdom, economy and good business judgment, and an impetus to commercial and industrial development.

Canada and Conservation.

THE SUBJECT OF CONSERVATION is now being given greater prominence by the people of Canada, due no doubt, to the great progress made during the last few years in her different industrial enterprises. The recent events in the United States, especially in the matters of forest preservation and water franchises, and the information gleaned from those in touch with the actual conditions in our own land, have done much to hasten the present movement. Of especial importance are the efforts of the Conservation Commission at Ottawa, and they cannot fail to arouse the necessary enthusiasm of the Canadian people, as well as bringing about the most thorough husbanding of our native resources.

The latest step in their propaganda is the issue of a series of bulletins which will deal with specific instances showing wherein the young nation must be awake to the proper development of her wonderful natural wealth.

If the work of this department is to be of the immense benefit that the people of Canada anticipate, the administration must be done with a fearless hand.

So far this has been the case, and no better indication of the national attitude could be found than in the opposition offered to the project of damming the St. Lawrence at the Long Sault Rapids near Cornwall. These rapids represent one of the greatest heritages belonging to Eastern Ontario and without a doubt will some day be to this part of the province what Niagara Falls is at the present time to Western Ontario.

The Canadian people may well feel satisfied with the careful safeguarding of their rights in this instance. American capitalists were trying by every means to obtain a concession whose benefits to themselves would make the proverbial lion's share seem but a mere flea bite.

The interests seeking these privilege wished to develop more power at this point than the Waterways Treaty will permit being taken at Niagara. At the same time the major part of this power was for the consumption of our neighbors to the south.

For similar privileges the Niagara companies are now paying the Ontario Government nearly $300,000 annually while the power rights of the St. Lawrence were to be given without the least remuneration. Canadians who in the near future will have this power available for their own use have here a strong object lesson, and it will aid the Commission by the additional interest and support it brings to this important cause. The Canadians of the future who will lead the young nation in its march of industry will review with appreciation the efforts of to-day for the preservation of what are at present simply dormant assets.

The question of forest and mineral preservation are also among the topics receiving attention, and here as well present and future generations will see the beneficial results.

The Commission may rest assured that its best efforts will only be opposed by those interested in grabbing for a privileged few that which should be the property of the entire nation. It may also be assured that it has the undivided support of the right thinking people of the land.

An Ideal House Show.

EXHIBITIONS of many characters have been held in Madison Square Garden, New York, but the most unique that has yet been established is that of the "Ideal House Show." Every nook and corner of the Garden contain some exhibit of a house in miniature. There are to be found there, colonial dwellings of concrete; Edison houses poured from moulds in double quick time; bungalows erected while you wait; cottages surrounded by pretty gardens; and extensive mansions overlooking an expansive sea and sound. All these have been erected in the most ideal form, under the supervision of the best architects and the direction of the most expert contractors, and have been furnished by the most skilful interior decorators.

We make note of this extraordinary exposition, not because it is the result of the effort of real estate dealers, but because we do believe that efforts of this nature tend to promote the better taste of the general public in the matter of residential design and home furnishing. It is something which could be advantageously duplicated in Canada, for instance at the National Exhibition held annually at Toronto, where it could be viewed by hundreds of thousands of visitors, and prove an attraction both profitable and instructive.

CURRENT TOPICS

IT IS EXPECTED THAT THE SITE for the British Columbia University will be selected sometime during the coming summer. Five of the foremost educationalists in Canada have been asked by the Minister of Education to act as the commission authorized by statute to decide on a suitable location. The names of the commissioners will be made known as soon as those invited have signified their acceptance.

* * *

ARCHITECTS ARE INVITED by the Ontario Government to prepare competitive plans for the new Government House to be erected at Toronto on Bloor street east. Two prizes of $1,000 and $500 respectively are offered for the most acceptable designs submitted. The time set for the close of the competition is July 15, and all designs and plans must be in the hands of Hon. Dr. Reaume, Minister of Public Works, by noon on that date.

* * *

TENDERS FOR THE CONSTRUCTION of the Quebec Bridge, according to an Ottawa despatch, will be called for shortly. Specifications for the structure are now practically completed, and several of the most prominent bridge building concerns in the world, whose representatives have been familiarizing themselves with the plans and details of construction during the past two months, will bid on the work.

* * *

WHILE THE MERITS of hollow cement blocks were practically unknown in Scotland two years ago, this material gives promise of being extensively adopted. Since that time, it is estimated that the amount invested in buildings of this type in or near Glasgow, is over $150,000. These structures are principally residential buildings such as tenement houses, cottages and villas, and some of them are most interesting in design and architectural treatment.

* * *

AUSTRALIAN HARDWOODS will in all probability be introduced in Canada before long for street paving, wharf and bridge building. At least Canadian Trade Commissioner D. H. Ross, at Melbourne, in a recent report, states that several inquiries have been received from interests in the Dominion regarding hardwoods suitable for such purposes. The principal hardwoods of that ability. Only recently 2,000 tons were purchased for country are said to be unequalled for strength and durshipment to Rotterdam, while specifications have but lately been received in Melbourne for supplies of hardwood required for the Bremerton, U.S.A. dry docks.

* * *

THE ARCHITECTURAL FIRM of Michie and Dowler, Calgary, has been dissolved, and Mr. Dowler has engaged in partnership with Mr. G. M. Lang, C.E. The new firm will be known as Lang and Dowler, with offices in suite 6, Alexander corner, over Molsons Bank. Mr. Lang is an associated member of the Canadian Society of Civil Engineers, and was for several years in the engineering department of the C. P. R. Mr. Dowler is a registered member of the Alberta Association of Architects, and together with his former business associate, has been connected with the erection of a large number of the more important business buildings in Calgary.

THE ST. ANDREW'S RAPIDS DAM described in the April CONSTRUCTION was opened for traffic early in May, when the steamer "Alberta" made the trip from Winnipeg to Selkirk. The benefits that this work will bring to Winnipeg were made apparent by the fact that the first steamer to use the locks was on its way to Lake Winnipeg for a cargo of wood. The fuel problem is a vital one to all western cities and especially so to a rapidly-growing city such as Winnipeg. Now that the tremendous wood supplies in the Northern part of the province of Manitoba are accessible by an all-water route to the provincial capital, the fuel problem should be greatly relieved.

* * *

A VIADUCT SCHEME whereby it is proposed to abolish the numerous grade crossings on the Grand Trunk line between Montreal and St. Henri stations, was one of the important matters which recently came up before the Board of Railway Commissioners for consideration. According to the outline of the project only such grade levels as are absolutely necessary for switching purposes will be retained. The viaduct, which will be approximately four miles in length, is estimated to cost $8.000,000, of which amount $2,000,000 will be contributed by the city of Montreal. Plans for the structures are now being prepared by the engineering staff of the Grand Trunk Company, under the supervision of Chief Engineer Kelly, and it is expected that working drawings will be ready the first of August.

* * *

THE THIRD ANNUAL GENERAL ASSEMBLY of the Royal Architectural Institute of Canada will be held at Winnipeg from 24th to 27th of August inclusive. At the present time a very interesting programme is in course of preparation, and a complete list of the subject matter and business to be dealt with will be sent to members of the profession early in July. In that it is the desire to make this meeting as representative as possible in every way, every Canadian architect, whether a member of the Royal Institute or not, is cordially invited to attend and participate in the daily sessions and enjoy the entertainments to be provided. Arrangements are being made with the railway companies for reduced transportation rates for those who wish to take advantage of the trip. This will offer members of the profession and their friends an exceptional opportunity to visit the Western Metropolis, and the Winnipeg architects have promised to make the occasion one long to be remembered.

* * *

IT IS CLAIMED FOR AUCKLAND, New Zealand, that it enjoys the remarkable distinction of having the largest reinforced concrete bridge in the world, known as the Grafton Bridge, spanning a canyon in the environs of that city The bridge consists of one central span with two approaches, of which the western is of two spans of 35 feet, and four of 75 feet, and the eastern is of three spans, two being of 83 feet and one of 42 feet. The bearing plates for the girders are fixed on the piers, with ample room for expansion. The two main piers completing the approaches stand 100 feet, and are cylindrical, the walls being from 12 inches to 8 inches in thickness. On the top, or head of the pier, curved cantilever brackets carry the footpaths over the piers, and serve to embellish the pier heads. The piers are really built on three walls, and between the walls sit abutments, being entirely independent of the piers. Into the abutments is fixed a thrust plate or steel grillage set to an angle normal through the line of thrust, and upon this plate rests a hinge supporting the whole arch. The arch span is 350 feet and is three-hinged. It consists of two ribs ranging from 6 feet at the abutment to 9 feet, 6 inches, graduating to 5 feet at the crown. These huge ribs are tied together by beams, which act also as wind braces.

MANAGER OF CITY is the unique appointment made by the city of Port Arthur, where J. A. Antonisen has been promoted from the position of city engineer to the full charge of all the city's utilities. Under his control will be the lighting, telephone, waterworks and steel railways of the city. In these departments he will have charge of both construction and maintenance, with as complete authority as the general manager of any large corporation. In this position he will act in a legislative capacity only, and his previous duties, which have been of an executive nature, will be attended to by a special department. The experiment will be keenly watched by all interested in municipal government.

* * *

THE FIRST PLAIN CONCRETE ARCH, says ROCK PRODUCTS, was built at Fontainebleu Forest, France. This bridge is known as the Grand Maitre bridge and was completed in 1869. It is of the one-span type, being 115 feet in length, and is not reinforced. The first attempt in plain concrete arch construction in the United States was the 31-foot span built in Prospect Park, Brooklyn, completed in 1871. The earliest knowledge of reinforcement being used was in France, sometime in 1885; however, the first concrete bridge reinforced with iron, built in the United States, was constructed in Golden Gate Park, San Francisco, completed in August, 1889. This form of construction has developed past the experimental stage and is now the representative of the highest art of modern bridge construction. It is adapted to railway bridges, owing to the fact that its solidity and entire lack of joints render it free from the excessive vibration often experienced in steel structures. In riding over a structure built of concrete it is pleasing to the passengers to note the absence of the familiar roar which is always to be endured in passing over a steel bridge. One of the longest spans in concrete bridge construction is the 280-foot span of the new Rock River bridge in Cleveland. The proposed New York City bridge is designed for a span of 724 feet. The large spans show the rapid development in the use of reinforced concrete as a bridge-building material.

* * *

A FAMINE IN BUILDING MATERIALS is now being experienced at Winnipeg, where the scarcity of structural products is far more pronounced than at any other time within the past six years. Common brick has gone up four dollars a thousand, timber and dimension lumber is quoted at two dollars higher, and shingles are also away up in price. Good common brick at any price is almost absent from the market. The total supply manufactured by local yards has been exhausted, and it is only from outside sources that brick may be obtained. Freight rates and added handling expense are responsible for the increase from $11 to $15 a thousand in cost. In season, common brick sells for ten dollars a thousand, but during the spring months the regular price is $11. The brick imported from several western points is of an inferior quality, and not suitable for heavy structures. A number of contractors are now holding up work on apartment blocks to secure satisfactory materials and prices. All tenders submitted for work are now based on the high cost of material, with a rider that if the architect will wait until after the first of the month the work will be done much cheaper.

The advance in the cost of lumber is said to be due to the difficulty in getting shipments from the coast, where a goodly percentage of material used in Winnipeg is hewn and dressed. Lumber prices on the Coast are also going up in the same proportion that they have advanced here. Cement is seventy-five cents per barrel higher than last year. Even this necessity is not over-plentiful, and by the time deliveries are made for all the orders in hand, there may be a shortage in it also. Contractors are estimating a hold-up of three weeks on big jobs as a result of the increase in the prices of materials.

Senator Clark's $7,000,000 Mansion on Fifth Avenue, New York.

OF ALL RECENT WORK in residential design, none perhaps has excited more attention among members of the profession, or has brought forth more adverse criticism, from an architectural standpoint, than the $7,000,000 home erected by Senator Clark, of Montana, on Fifth avenue, New York. This costly mansion, so purely classic in parts, and so decidedly hybrid in its general treatment, is universally condemned by students of design as a rank architectural perversion. Governmental, ecclesiastical and residential in appearance at one and the same time, this striking domicile suggests nothing in its outline as to purpose for which it is intended to serve. To the uninitiated, it is an "enigma," and to those who know, a "mistaken conception of grandeur." As regards its interior appointments, complete information is lacking. Suffice it to say that the house contains one hundred and twenty rooms; thirty baths (one Turkish); three elevators; an extensive telephone system; one of the biggest organs in the world; a Chinese lounging room for Oriental guests; a mammoth reception hall and ball room; seven pianos; a million dollars' worth of rugs; pictures and paintings valued at $2,000,000; twenty-two bedrooms; six sun rooms; two roof gardens; one six-ton ice plant, and three 275 h.p. steam boilers. In this connection, the following poem entit'ed "Senator Copper of Tonopah Ditch," penned by Will. Irwin for COLLIER'S WEEKLY, is appropriately humorous:

"Senator Copper of Tonopah Ditch
Made a clean billion in minin' and sich,
Hiked for Noo York, where his money he blew,
Buildin' a palace on Fift' Avenoo.
'How,' sez the Senator, 'can I look proudest?
Build me a house that'll holler the loudest—
None o' yer slab-sided, plain mausoleums—
Give me the treasures of art and museums;
Build it new fangled,
Scalloped and angled,
Fine, like a weddin' cake garnished with pills;
Gents, do your dooty—
Trot out yer beauty,
Give me my money's worth—I'll pay the bills.'

"Forty-eight architects came to consult,
Drawin' up plans for a splendid result;
If the old Senator wanted to pay,
They'd give 'im art with a capital A.
Every style from the Greeks to the Hindoos,
Dago front porches and Siamese windows,
Japanese cupolas fightin' with Russian,
Walls Senegambian, Turkish and Prussian;
Pillars Ionic,
Eaves Babylonic,
Doors cut in scallops, resemblin' a shell;
Roof wuz Egyptian,
Gables caniptian,
Whole grand effect, when completed, wuz—hell!

"When them there architects finished in style,
Forty-nine sculptors waltzed into the pile,
Swingin' their chisels in circles and lines,
Carvin' the stonework in fancy designs;
Some favored animals—tigers and snakes;
Some favored cookery—doughnuts and cakes,
Till the whole mansion wuz crusted with ornaments.
Cellar to garret with hammam adornments—
Lettuce and onions,
Cupids and bunions,
Fowls o' the air and the fish o' the deep,
Mermaids and dragons,
Horses and wagons—
Isn't no wonder the neighbors can't sleep!

"Senator Copper, with pard'nable pride,
Showed the grand house where he planned to abide;
Full of emotion, he scarcely could speak;
'Can't find its like in Noo York—it's uneek;
See the variety, size and alignment,
Showin' the owner has wealth and refinement,
Showin' he's one o' the tonier classes—
Who can help seein' my house when he passes?
Windows that stare at you,
Statoos that swear at you,
Steeples and weather-vanes pointin' aloof;
Nuthin' can beat it—
Just to complete it
Guess I'll stick gold-leaf all over the roof.'"

THE MAGNIFICENT NEW MARBLE PALACE of the International Union of American Republics—within a stone's throw of the White House, Washington, was recently dedicated in the name of universal peace. With its splendid location at the edge of Potomac Park and the White House, its imposing marble facade, its quaint Spanish patio, and elaborately furnished hall of the republics, the new building, the gift of Mr. Carnegie, won the admiration of all the distinguished company that passed within the bronze-grilled portals, at the dedication exercises, at which President Taft and Mr Carnegie headed the receiving party. The ceremonies were attended by special and diplomatic representatives of the various nations forming the union.

ARGENTINA IS ANNUALLY BUILDING more miles of railway than any other South American Country. The Rosario-Puerto Belgrano Railway, which crosses the province of Buenos Aires and connects two growing trade centres, will undoubtedly be a profitable and an important line, and its success will entail the investment of much additional capital. Various rumors of German lines have been circulated, and it is not at all improbable that some of them will be built within the next five years, while the prospective opening of the Transcontinental Railway, connecting Valparaiso and Buenos Aires, will undoubtedly stimulate competition to the extent of building a rival line within the next five years, which will result in greater annual increases in the mileage of Argentine railways.

The new Winch Building, Corner Hastings and Howe Streets, Vancouver, B.C. A Handsome and Substantial Commercial Structure Recently Erected in the Centre of the City's Business District. It is Designed to Carry Two Additional Storys and is of Fireproof Construction Throughout. On the Other Corners of this Intersection are to be Built Three Ten Story Office Buildings, One of Which is Now Well Under Way. Hooper and Watkins, Architects.

VANCOUVER AND VICTORIA BUILDINGS.—Representative Work of British Columbia Architect, Showing Some of the More Important Public, Commercial and Ecclesiastical Structures Erected in the Pacific Coast Cities.

BRITISH COLUMBIA, to the many Easterners who have not as yet had an opportunity to visit the Pacific Coast, is still a country of many distances. They view it only through a mental perspective, formed by vague impressions regarding its fertile soil, delightful climate, rich resources and wonderful growth—and yet without any definite knowledge as to its real progress and development. Perhaps the best and most positive proof of the remarkable advance made by this province within the past few years, is found in the many splendid buildings erected in its more important towns and cities. In this connection we are illustrating a number of Vancouver and Victoria buildings, representing some of the more recent work of Architect Thos. Hooper, who has an extensive practice in both cities, believing that these structures in a way will enable our readers, as far as British Columbia is concerned, to fairly judge the whole by the abstract, and thus obtain a reliable idea of the substantial strides, commercial and otherwise, which that section of the country is making. Mr. Hooper is well known on the Pacific Coast as a designer of public and commercial buildings, and he has to his credit several of the largest and more important structures of either type erected within the past few years in these two cities.

Prominent among his more recent work is the new Winch Building, a handsome seven-story office structure situated in Vancouver, at the corner of Hastings and Howe streets. The exterior of the building is carried out entirely in British Columbia granite, and the architectural treatment is a free adaptation of the Renaissance style, with the general lines as far as consistent, conforming to those of the new Federal Post Office, which adjoins it on Hastings street. In construction, the building is of a most modern and substantial character, the frame being of steel encased in concrete, the partitions of hollow tile, and the floors of reinforced concrete—thus bringing its physical features well within the meaning of the term "fireproof," as it is understood.

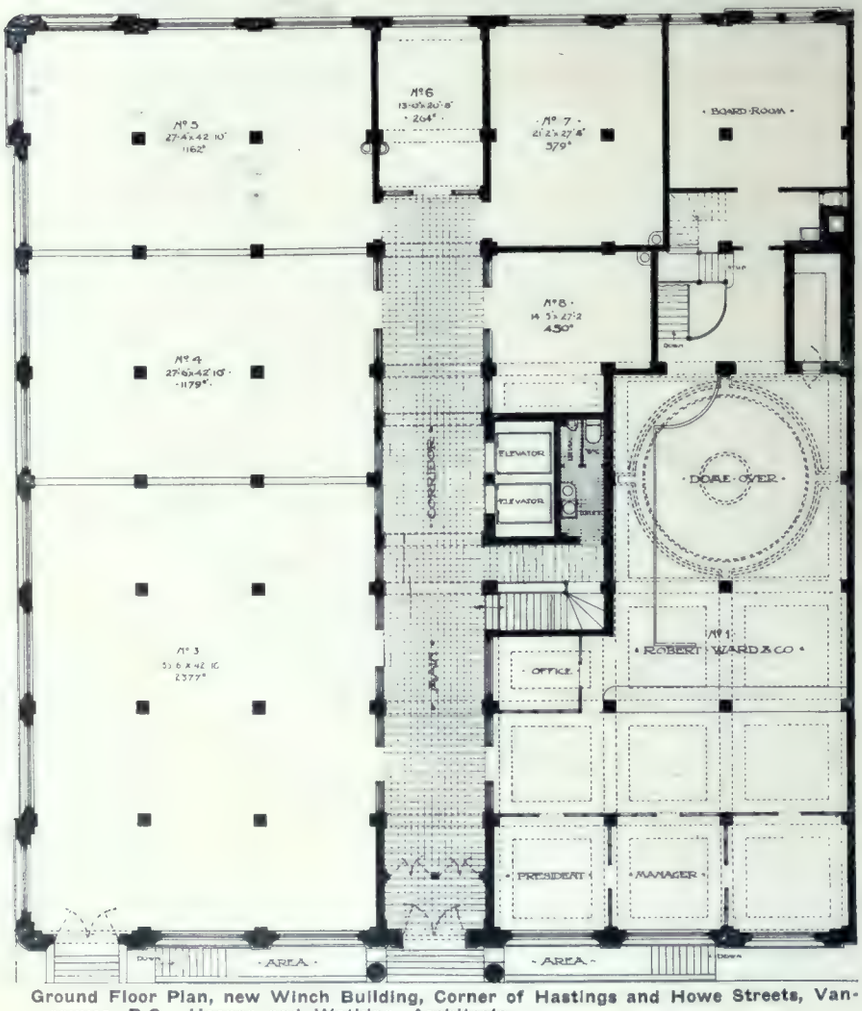
The main entrance, flanked by two large monolith columns, leads into a barrel vaulted corridor, thirteen feet wide, which extends practically the entire depth of the building. This is finished in stucco relief work, and marble dado and pilasters, the floor being of tile. There are two large and six smaller offices on the main floor, the principal one of which, situated to the right of the entrance, being occupied by the owner of the premises. It is a handsomely finished interior, with

mahogany panelled walls, and a deep plastered beamed ceiling, containing a large dome of stained glass, allegorically depicting the life and resources of British Columbia. At the rear is a board room and vaults, and a staircase leading to the mezzanine floor, which provides toilet and storage accommodations, and to the safe deposit vaults in the basement.

The upper floors are served by two centrally located high speed elevators, and the stairs throughout are of concrete with marble treads and rises. There are twenty-eight offices on each floor, all of which are arranged so as to have an abundance of outside light. The finish throughout is of oak. Every room is provided with enamelled basin and running water, and over half of the offices have modern fireproof vaults. The general lavatory and toilet rooms are designed along approved lines, the floor being tile, the fittings porcelain, and the partitions of marble. The upper corridors are also tiled, both on the floor and the walls, which are dadoed to the height of four feet.

A large vacuum cleaner with two outlets is installed on each floor, and the heating is done by low pressure steam system. In the basement are large offices and a wide corridor, besides a safe deposit vault, elevator machinery rooms, toilets and boiler room, where are two boilers.

Typical Office Floor Plan, new Winch Building, Corner of Hastings and Howe Streets, Vancouver, B.C. Hooper and Watkins, Architects.

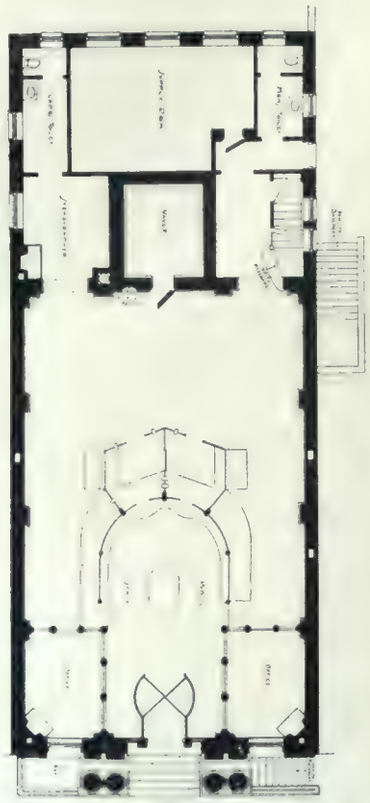


Ground Floor Plan, new Winch Building, Corner of Hastings and Howe Streets, Vancouver, B.C. Hooper and Watkins, Architects.

Eventually the height of the structure is to be increased by two additional stories, the steel work and walls being designed with this object in view. The cost of the building complete was $383,000.

Another imposing structure designed by Mr. Hooper, is the Dominion Stock and Bond Company's new building (see illustration on page 73) now in process of erection on the corner opposite the Winch Building. This is to be a ten-story structure, covering a ground area of 104 by 120 feet, and it is to be used entirely for office purposes. In construction it will be similar to the building just mentioned, being of steel, concrete and hollow tile, with granite exterior walls. A colonnade formed by huge monolith pillars, will extend along the lower portion of the building on both streets, and this treatment will be repeated in a measure in the upper part of the structure where twinned semi-circular pilasters will rise between the windows from the ninth floor line to a richly-detailed cornice. Entrance to the interior will be by spacious corridors carried out in stucco relief-work, marble and tile, and leading to a central hall giving access to four high speed elevators and fireproof staircase communicating with the upper floors. The heating of the building will be done by a low pressure steam system and the appointments throughout will be of a most modern type. In this connec-

Exterior and Interior Views, Head Office of the B. C. Permanent Loan and Savings Company on Pender Street. An Interesting Small Structure of Ionic Design, Situated on the Principal Thoroughfare of Vancouver's Financial District. The Manager's Office and Board Room are Located on the Mezzanine Floor over the Vault and the Supply Room at the Rear of the Banking Floor. (See Floor Plan on next page.) Thos. Hooper, Architect.



Floor Plan, B. C. Permanent Loan and Saving Company, Pender Street, Vancouver, B.C. Thos. Hooper, Architect.

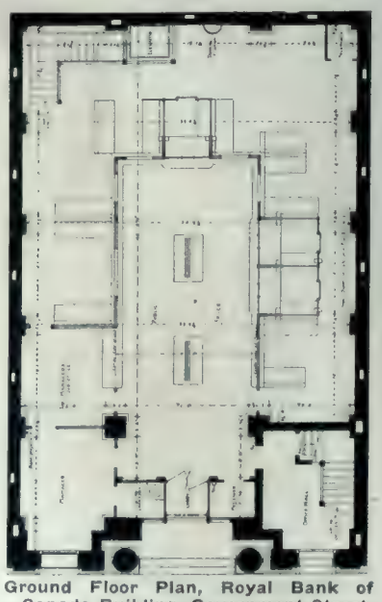
tion, it might be mentioned that two other structures of similar height and for similar purposes, are at present projected to be built this year on the two other corners of this intersection—a fact which gives an excellent idea of the growing importance and rapid development of Vancouver as a commercial centre, and the prominence it is assuming as one of the most progressive cities in the Dominion.

Noteworthy among Vancouver's banking houses is the head office of the British Columbia Permanent Loan and Saving Company—an interesting Ionic structure located on Pender street in the heart of the financial district. In the construction of this building, a delicately veined sand stone is used for the exterior walls, the frame work is of steel, and the appointments in general of a fireproof nature. Most of the ground floor space is occupied by a large banking room, having a tile floor and rich mahogany fixtures with bronze metal teller's cage. The high wainscotting and the pilasters are of marble, and the ceiling, which is deeply coffered with enriched plastic beams, contains an elliptical dome of stained glass situated over the public space. The manager's office and board room are situated on the mezzanine floor at the rear. These rooms are handsomely finished in hardwood, and have stained glass domes and fireplace. The space directly beneath them is taken up by the vault, supply room and lavatory facilities; and the basement, which is the full size of the building, is occupied by the agents' office space, and a hot water heating plant. The cost of the building complete was $43,000.

The two other business structures illustrated are the Loo Building and the new Bower Block. The former is located at the corner of Hastings and Abbott Streets. It is of mill construction with solid masonry wall, faced with pressed brick, and was erected at a cost of $93,000. There are seven spacious stores on the ground floor and twenty-three offices on each of the four upper floors, besides ample vault and lavatory accommodations. In addition there is a large basement with street entrances well suited to business purposes. The upper floors are served by two high speed elevators, and the offices are arranged so as to obtain the maximum degree of outside light. The building is heated by hot water, the lighting is by electricity, and the appointments in general have been most carefully considered.

The Bower Block is a large store and office building at the present time in course of construction on Granville Street, one of the busy trade arteries of the city. The facade is faced with a blue Bedford limestone, carried on steel framework, and the architectural treatment is such as to impart to the structure a feeling of dignity and solidity. There are fifteen offices, finished with oak trim, on each floor, to which access is obtained by a modern elevator service. The partitions dividing the various rooms are of the metal lath and metal stud type, plastered with cement to a thickness of two inches; and all parts of the structural steel work throughout the building, are protected by concrete casing. Concrete is also used for the curtain walls and floor system; the latter, with the exception of the corridors and toilets which are tiled, being surfaced with battle-ship linoleum on a cement base. In order that all offices may have plenty of outside light, a light area with windows of metal sash and wire glass, is provided on either side. Steam for heating pur-

Front Elevation, Recently Erected Premises of the Royal Bank of Canada on Government Street, Victoria, B.C. This Front is Executed Entirely in a Rich Native Granite, Even Unto the Latticed Windows, Which are Cut Through Three-Inch Stone Slabs. Thos. Hooper, Architect.



Ground Floor Plan, Royal Bank of Canada Building, Government Street, Victoria, B.C. Thos. Hooper, Architect.

Public Library Building, Victoria, B.C. A Substantially Built Structure, Having British Columbia Granite Exterior Walls. Thos. Hooper, Architect.

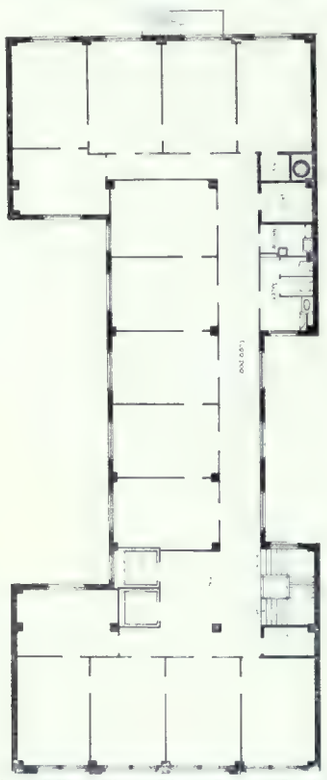
Loo Building, Corner Hastings and Abbott Streets, Vancouver, B.C. The Ground Floor Contains Seven Spacious Stoors, and the Upper Floors Twenty-Three Offices Each, with Ample Lavatory and Vault Accommodations. All Rooms are Exceptionally Well Lighted and the Upper Floors are Served by Two High Speed Elevators. Thos. Hooper, Architect.

poses will be supplied by a low pressure system; the electric wiring will

Ground Floor Plan, Public Library Building, Victoria, B.C., Showing General Lay-Out of the Interior and Arrangement of Stack Room. Thos. Hooper, Architect.

be installed in a conduit; and among other features of the equipment, there will be a modern vacuum system for cleaning purposes, installed on each floor.

The three Victoria buildings, designed by Mr. Hooper, which are shown in the accompanying illustrations,



Typical Office Floor Plan, Bower Building, Now Being Built on Granville Street, Vancouver, B.C. Thos. Hooper, Architect.

fittingly bespeak the splendid progress of this rapidly-growing city, and give an excellent idea of the substantial character of buildings which are being erected in the capital of British Columbia. The Public Library building, which is a substantial, two-story and basement, granite structure, is both dignified in design and practical in plan. The interior is exceptionally well arranged, being such as to enable the librarian and his assistants to command a full view of the entire first floor. The vestibule and entrance lobby is flanked on either side by spacious reading rooms. Back of the lobby is the delivery space, with staircase, vault and librarian's office on one side, and a catalogue room and reference room on the other. A novel feature of the plan is the stack room, which is semi-circular in shape, and has book-cases arranged to conform accordingly. On the upper floor are several good sized rooms, equally as well arranged. and in the basement there is ample storage space and a modern heating plant.

The Royal Bank of Canada's new building is the most recent addition to the banking houses of Victoria, and when its completion is eventually carried out, which will be in the near future, the institution it will house can feel justly proud. The front is of cut granite, and the entrance, which is recessed, has two large columns on either side. Over the doorway is a bronze cast of the Royal Coat of Arms and above this, spanning the width of the entrance, is a wrought iron arched window which rises to the base of the lower cornice. A feature of the stone work is two high placed latticed windows, which were cut through three-inch stone slabs. The side and back walls of the building are of brick supporting large box girders which carry the upper floor. The banking room

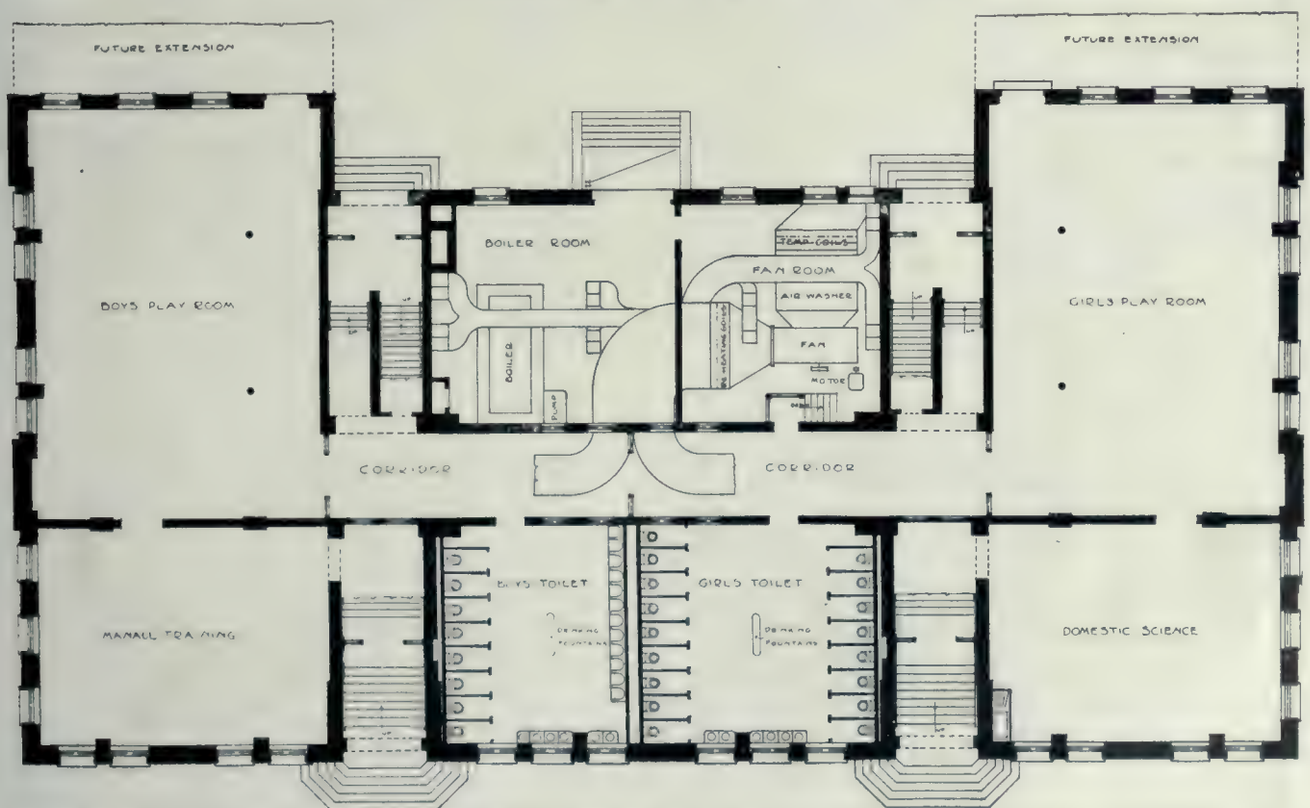
The Bower Building, an Eight Story Fireproof Store and Office Structure now in Course of Erection on Granville Street, Vancouver, B.C. The Frame Work of the Building is of Steel Encased in Concrete—this Latter Material Also Being Used for the Curtain Walls—While the Front is Faced with Bedford Indiana Limestone of a Blue Tone. Thos. Hooper, Architect.

rises twenty-five feet in height, and has a large stained glass elliptical dome set in a richly plastered ceiling. The walls are pilastered and panelled to a height of ten feet in mahogany to match the bank fixtures, and the floor throughout is surfaced with terrazo. To the left of the entrance is the manager's suite, and at the rear of the floor is a small book elevator which runs to the basement, where two large vaults, lavatories, locker rooms and boiler compartments are located. The upper floor, which has

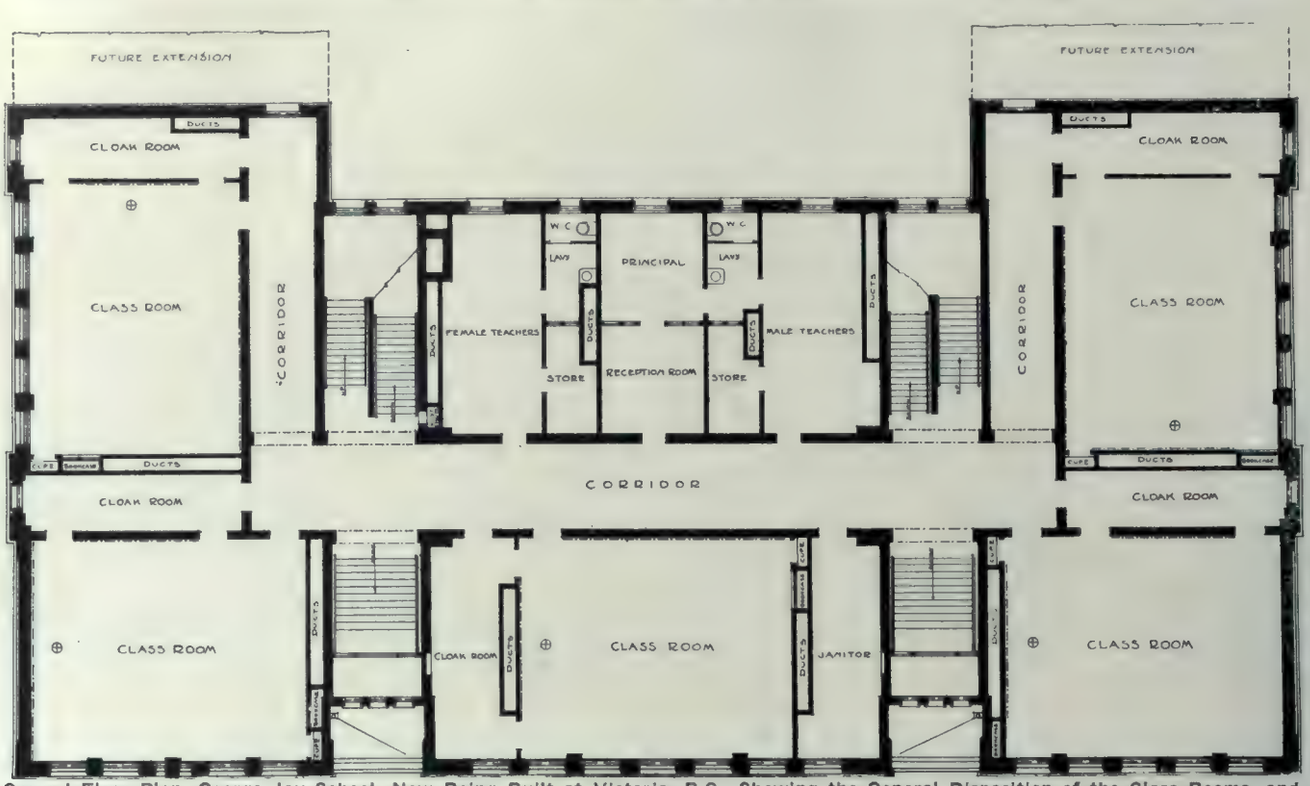
The George Jay School, Now Being Built by the Board of Education at Victoria, B.C. In the Plan and Construction of This Building the Essentials of School Hygiene and the Safety of the Scholars Have Been Thoroughly Considered. The Exterior Walls are of Concrete and Pressed Brick, the Interior Dividing Walls and Partitions of Brick and Hollow Tile; and the Beams, Floors, Roof and Stairs of Reinforced Concrete. Thos. Hooper, Architect.

a separate street entrance, contains seven offices, each equipped with separate lavatories, and two general toilet rooms. The estimated cost of the building is $44,000.

In the George Jay School, which the Board of Education has well under way at the present time, Victoria will have a building which is eminently superior in more ways than one, to a large number of similar structures that have been erected within recent date, in many of the more congested parts of the eastern section of the Dominion. This building shows a proper appreciation on the part of the School Trustees, as regards "merit of investment," and both in plan and construction it has many features that can be advantageously studied by other municipalities which have like problems confronting them. Not only has the element of fireproofing been fully taken into account, but the essentials of school hygiene have been broadly considered as well. The design of the building itself is especially worthy of note, as is also the arrangement of the entrances, which depart somewhat from the plan generally adopted. The foundations, floor system and stairs are of reinforced concrete, the partitions of brick and hollow tile, and the exterior walls are of clayburn pressed brick. On the ground floor are five



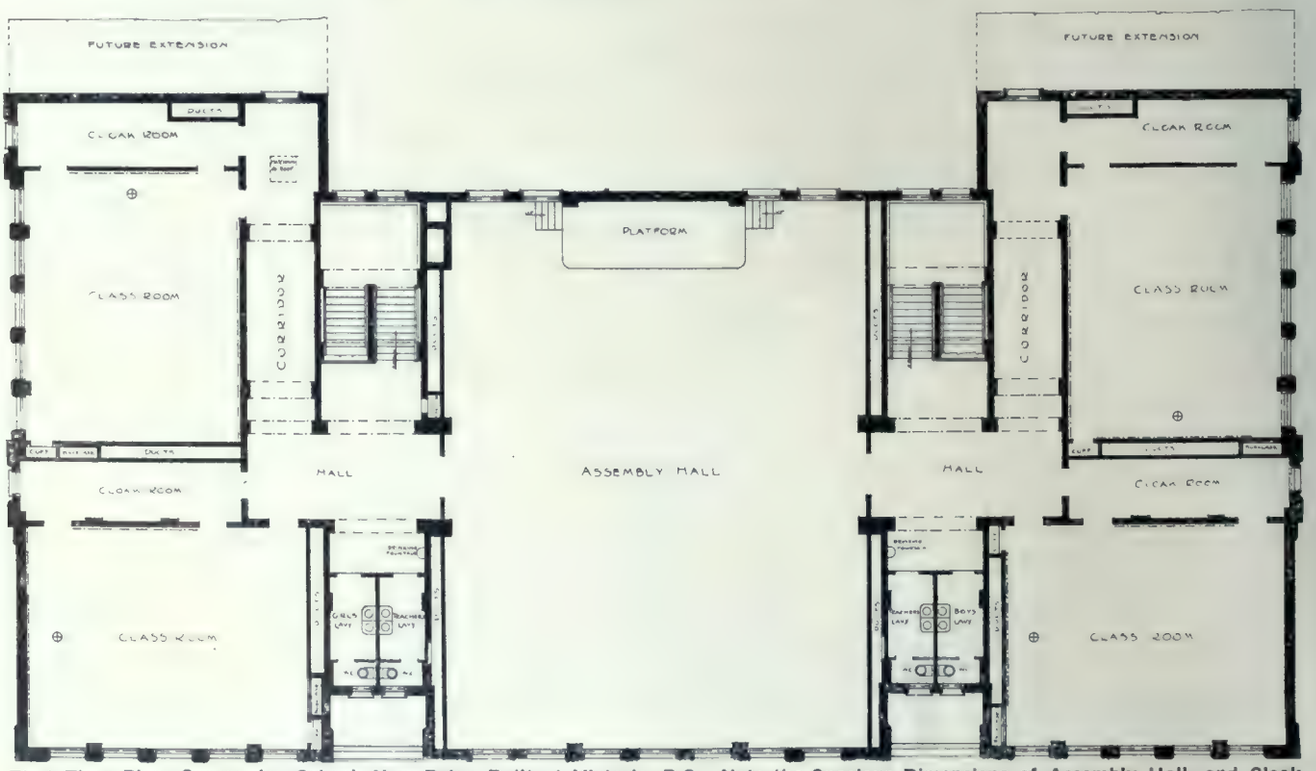
Basement Plan, George Jay School, Now Being Built at Victoria, B.C. Note the Large Play Rooms and the Direct Staircase Arrangement Giving Access to the Upper Floors and the Outside. Thos. Hooper, Architect.



Ground Floor Plan, George Jay School, Now Being Built at Victoria, B.C., Showing the General Disposition of the Class Rooms, and Location of Principal's Office and Accommodations for the Teaching Staff. Thos. Hooper, Architect.

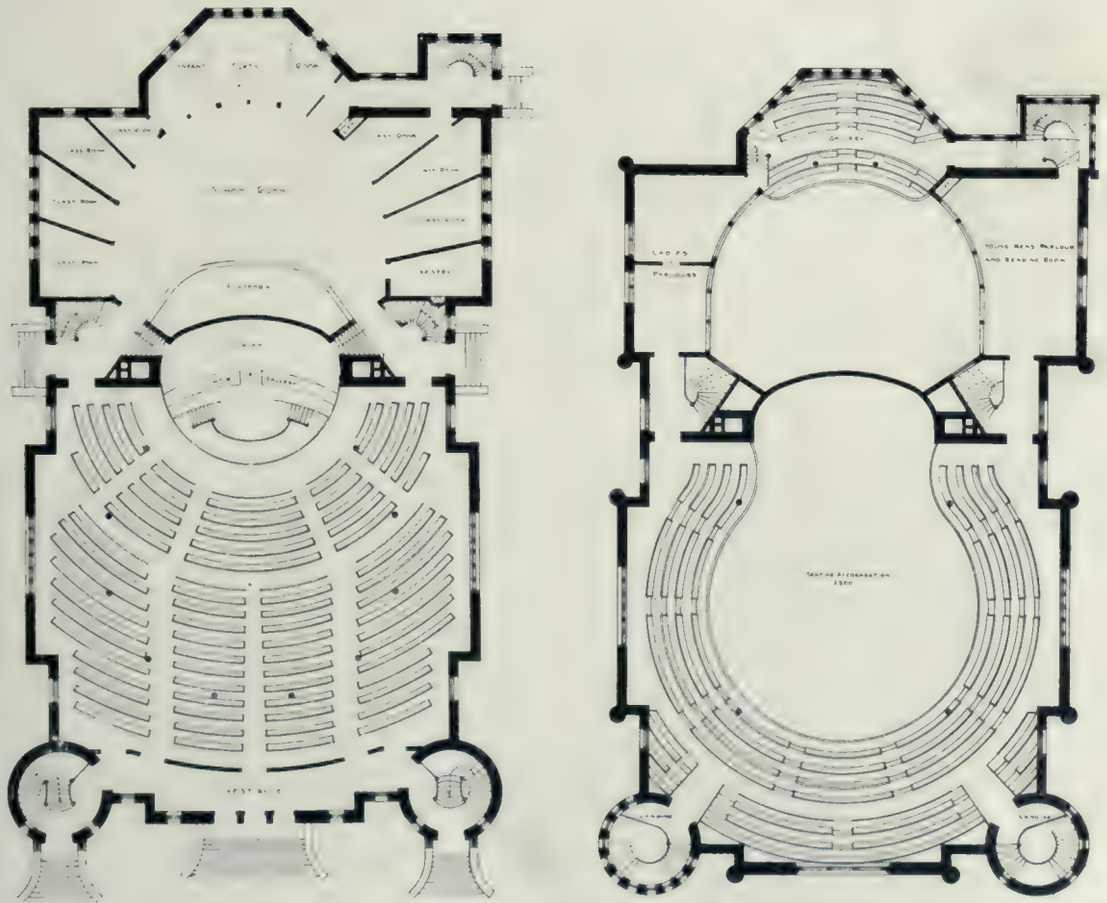
large class rooms with ample wardrobe accommodation, the principal's offices, and two rooms for the teaching staff. The second floor contains four additional class rooms, four modernly equipped lavatories, and a spacious assembly hall which takes up the entire central portion of the floor. This auditorium opens onto hallways on either side, giving access to the staircases which are most direct in their arrangement, thus making it possible for this portion of the building to be quickly emptied. The Manual Training and Domestic Science departments are located in the basement, where large separate play rooms and splendidly equipped toilets for either sex are also to be found. The boiler-room and fan system are located in the rear, and the heating is done by humified air, warmed over steam coils, the temperature being regulated by thermostats in each room.

Although Mr. Hooper's work relates principally to commercial and public buildings, he has designed several of the more important ecclesiastical edifices erected recently in the Pacific Coast district. One of his most notable efforts in this respect is the Metropolitan Methodist Church on Pandora Avenue, Vancouver—an imposing structure which provides seating accommodation for 2,500 worshippers. The walls are of granite rubblework and at the intersection of the two main facades, the main tower rises to a considerable height



First Floor Plan, George Jay School, Now Being Built at Victoria, B.C. Note the Spacious Dimensions of Assembly Hall, and Cloak Room and Lavatory Arrangements. Thos. Hooper, Architect.

Metropolitan Methodist Church, Pandora Avenue, Vancouver, B.C. An Imposing Ecclesiastical Edifice Capable of Seating 2,500 Worshippers. Thos. Hooper, Architect.



Ground and Upper Floor Plans, Metropolitan Methodist Church, Vancouver, B.C. Note the Unusual Arrangement of the Sunday School Rooms, and the Arrangement of the Side Entrances, which Serves both This Portion of the Building and the Large Auditorium. Thos. Hooper, Architect.

above the roof of the structure. Entrance to the vestibule is obtained through a triple arched doorway, and through two entrances, at either corner, which also gives access to the staircase leading to the balcony floor. The auditorium, which has large traceried windows, is exceptionally well lighted and an unobstructed view of the pulpit and choir can be obtained from any part of the building. A feature of the plan is the unusual arrangement of the Sunday School room, which is situated at the rear of the auditorium. This can be entered from the two doors giving access to the auditorium at either side of the building, or through an entrance at the rear. The second floor provides two ladies' parlors and a young men's reading-room, while the basement contains several additional rooms for church and social purposes.

View of Auditorium, Metropolitan Methodist Church, Vancouver, B.C., Showing the General Architectural Treatment of the Interior. Thos. Hooper, Architect.

A smaller building of this character, by the same author, is the Trinity Methodist Church, Nelson, B. C. This structure costs $25,000, and it is built of a white marble, which is found in abundance in that locality. The auditorium, which is splendidly lighted by large stained-glass windows, has a low vaulted ceiling, traced with plastic moulds; and the walls are panelled with British Columbia fir, beautifully grained and finished. There is a good-sized gallery, and additional seating accommodation, if necessary, can be provided by utilizing the Sunday School, which is divided from the auditorium by rolling partitions. In the basement of the structure are several large class rooms, banquet hall, kitchen, etc. Heating is supplied by a fan system, and the appointments throughout are modern in character.

The residence of Mr. George Snyder, is one of Victoria's many interesting stone and shingle homes, a mode of construction, in fact, which is quite prevalent in domestic work in the extreme West. Two interior views of this residence, are illustrated, one showing the entrance hall, and the other the dining-room. The hallway, with its fireplace, wall panelling and wood ceiling, is especially interesting, while the dining-room shows a most pleasing consideration both in its decorative scheme and character of the furnishings.

Trinity Methodist Church, Nelson, B.C., Built of Local White Marble and Erected at a cost of $25,000. Thos. Hooper, Architect.

REGISTRATION OF ENGINEERS.

LICENSING CIVIL ENGINEERS is contemplated in a bill introduced in the New York Assembly by Mr. Edward J. L. Raldiris, an engineer member of that body. The bill was referred to the committee on public education, which has already held two hearings on it. If passed, says ENGINEERING RECORD, it will require all engineers who practice engineering in the State after January 1st, 1911, to be licensed; which will be done by examination or by presenting satisfactory proof of ability, under which latter method engineers now engaged in practice will be licensed, as it is not the aim of the author of the bill to affect those engaged in engineering work when it goes into effect. "Mr. Raldiris states that the purpose of his measure is to give the engineer the same standing in the community as the physician and the lawyer, by raising the standard of those licensed to practice civil engineering, and making it a misdemeanor to practice without a license. An examination of the bill shows that it probably has not had the benefit of adverse criticism before being presented, as it can be very much improved in some places where the exact purpose of the requirements is not at all apparent. For example, an engineer is defined as a "practitioner of engineering," and the practice of engineering is defined as follows: 'A

Perspective View of Ten Story Fireproof Office Building now in Process of Erection at the Corner of Hastings and Howe Streets, Vancouver, for the Dominion Stock and Bond Company. It will be of Steel Frame Construction Encased in Concrete, with Granite Exterior Walls. Thos. Hooper, Architect.

person practices engineering within the meaning of this article, except as herinafter stated, who holds himself out as being able to design, construct, and care for public works, such as roads, bridges, canals, railways, aqueducts, drainage works, waterworks, river and harbor improvements, military engineering work, foundations, irrigation works, structural steel works, triangulation and topographical layouts or plans of cities, street improvements, and the engineering inspection thereof.'. The meaning of 'except as hereinafter stated,' is not evident from anything in a subsequent section of the bill, and the definition quoted gives everything stated in the bill regarding the character of the work it is proposed to control. But it is self-evident that the language of the bill will not prevent engineering work from being intrusted to anybody who does not 'hold himself out as being able to design, construct and care for public works.' This objection can be overcome by a change in language so that there shall be no uncertainty as to what is meant. Another grave objection to the bill is its partial uncertainty as to what shall be the status of subordinates occupying places without legal responsibility. This point caused considerable discussion some two years ago when the licensing of architects in Illinois was under consideration, and there was a strong feeling that all assistants above the grade of junior draftsmen should be licensed. It was finally decided, however, that the objects desired would be fully attained by making the law apply only to those who occupied positions of legal responsibility, and the operation of the law for more than ten years has confirmed the wisdom of this view. It might be added that the presentation of this bill without any prior discussion of it by the American Society of Civil Engineers robs it of authority as a professional measure."

REINFORCED CONCRETE has just made its appearance in Palestine, and is calling forth much interest and curiosity from natives, especially masons. When the German Emperor and Empress visited Jerusalem in 1898 a carriage road from the northern suburbs up and along the ridge of Mount Scopus to the summit of the Mount of Olives was built for them by the Turkish Government. From the top of Mount Scopus there is an extensive view. Jerusalem lies near by, below to the west, and to the east the Dead Sea appears only a few miles off, while it is over 20 miles, and beyond it and the Jordan valley extends the range of Moab. It was this sight that impressed the Empress, and on her return to Germany a large sum was collected for building the sanitorium at this place, which has just been opened. In this building concrete has been used in a different manner from that in general use. The sanitorium proper is two stories high, with a basement under a part, and is built around a large open court. The living rooms, etc., form two sides and the north end, while the south end is occupied by the church and the lofty bell tower. The apses are toward the south, it being the first Lutherian church in which the apses do not face east.

Residence of Mr. George Snyder, Victoria, B.C. An attractive Dwelling House of Frame and Stone Construction—a Combination of Materials Which is Quite Common in Residential Work Throughout the Extreme Western Section. Thos. Hooper, Architect.

Hallway, Residence of Mr. George Snyder, Victoria, B.C. Showing Detail of Staircase, Wall Panelling and Beamed Ceiling. Thos. Hooper, Architect.

Dining Room, Residence of Mr. George Snyder, Victoria, B.C., Showing Decorative Treatment of Ceiling and General Character of the Furnishings and Hangings. Thos. Hooper, Architect.

An attractive reinforced concrete residence with a red tile roof and a picturesque setting. Milton Dana Morrill, Architect.

INEXPENSIVE HOMES OF REINFORCED CONCRETE.—Substantially and Hygienically Planned Small Dwelling Structures in Which the Artistic and Economic Use of Concrete is Fully Demonstrated.—Sections Cast in Steel Moulds of Standard Dimensions.

By MILTON DANA MORRILL

WHAT ARCHITECTURAL STYLE are we developing to day?

The Greeks developed the lintel type of architecture, following the natural shapes and sizes of available stone. The Romans built mostly in brick, and developed the arch as a natural form for their material. What new type and style will be developed through the use of reinforced concrete? There must be a concrete style. We have already worked out the structural forms which seem best suited to the material, and possibly the best concrete buildings have been designed by engineers, as they have followed the simplest and most logical shapes, and have not been hampered by architectural precedent.

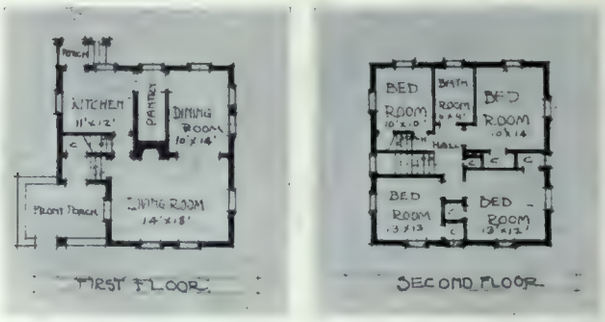
We architects are so wedded to traditional forms such as cornices, columns and arches, that we are likely to employ these in positions where they serve a decorative rather than a constructive function. Is there any reason why structures cannot be designed in the simplest and most natural forms for concrete, and still be beautiful in proportion, line, and color? Cannot honest construction be made decorative and beautiful without requiring a masque of false architectural detail or an imitation in material? It has seemed to me that in cement work we have been designing in styles suited for wood or brick, and constructing in concrete with shapes unsuited and unnatural to the material in hand. This has, of course, made work difficult and expensive.

In my work on inexpensive homes, economy compelled me to put out of mind all architectural development, and to go back to first principles and to primitive habitations. Houses as well as other structures need not be expensive to be beautiful. Good taste, proportion, and a good selection of materials and color are only necessary. The most costly buildings in this country are often the worst from an architectural and esthetic standpoint. Our early Colonial homes are beautiful, why? (They are built of inexpensive material). Their simplicity and good taste are the open secrets of their beauty.

While the design of the small house would not seem such a great problem, it presents more difficulty than larger plans, for economy is of the first importance, although, conveniences, beauty and stability cannot be sacrificed.

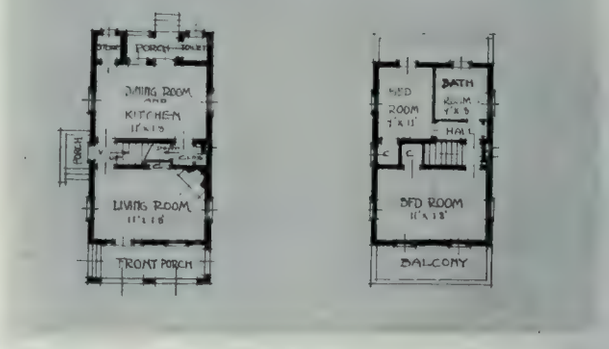
In literature the statement of a fact in the shortest, most concise, and simple form takes careful study of elimination; and so, to reduce expense without losing modern convenience and comfort, is the essence of scientific planning. It has been endeavored to combine in the following designs the convenience of the apartment with the light, air, privacy, and consequent health of the country. Passages and halls have been eliminated, leaving all space available for occupation. All rooms have light on two sides. One chimney must serve, and convenience and economy in house work is of first importance. The science of living has been given but little study, and many of us consider carefully in our work how we can economize in labor. But in our homes there is a great waste of effort and energy through unstudied plan. Upon reviewing the problem of housing, I found that a box house was by far the most economic form, which could be constructed enclosing a given space, as this form requires the least wall area. The box is also the most rigid and substantial, as is illustrated, by those of paste board in daily use, while of a fragile and flimsy material, these become firm and substantial when reinforced at the corners.

The idea of a boxed-shaped house is not attractive to us, but why cannot this form be made beautiful? We see carved and decorated jewelry cabinets, which are exquisite. Why can we not design attractive homes within



Design for a Seven Room Concrete House. This special type of house was awarded first prize at the last International Congress on Prevention of Tuberculosis. An attractive feature is the roof-garden, which can be divided off into out-door bedrooms by movable screens. Milton Dana Morrill, Architect.

STUDY FOR FIVE-ROOM HOUSE



Study for a Five-Room House, showing an extremely simple yet attractive design and interior arrangement. Milton Dana Morrill, Designer.

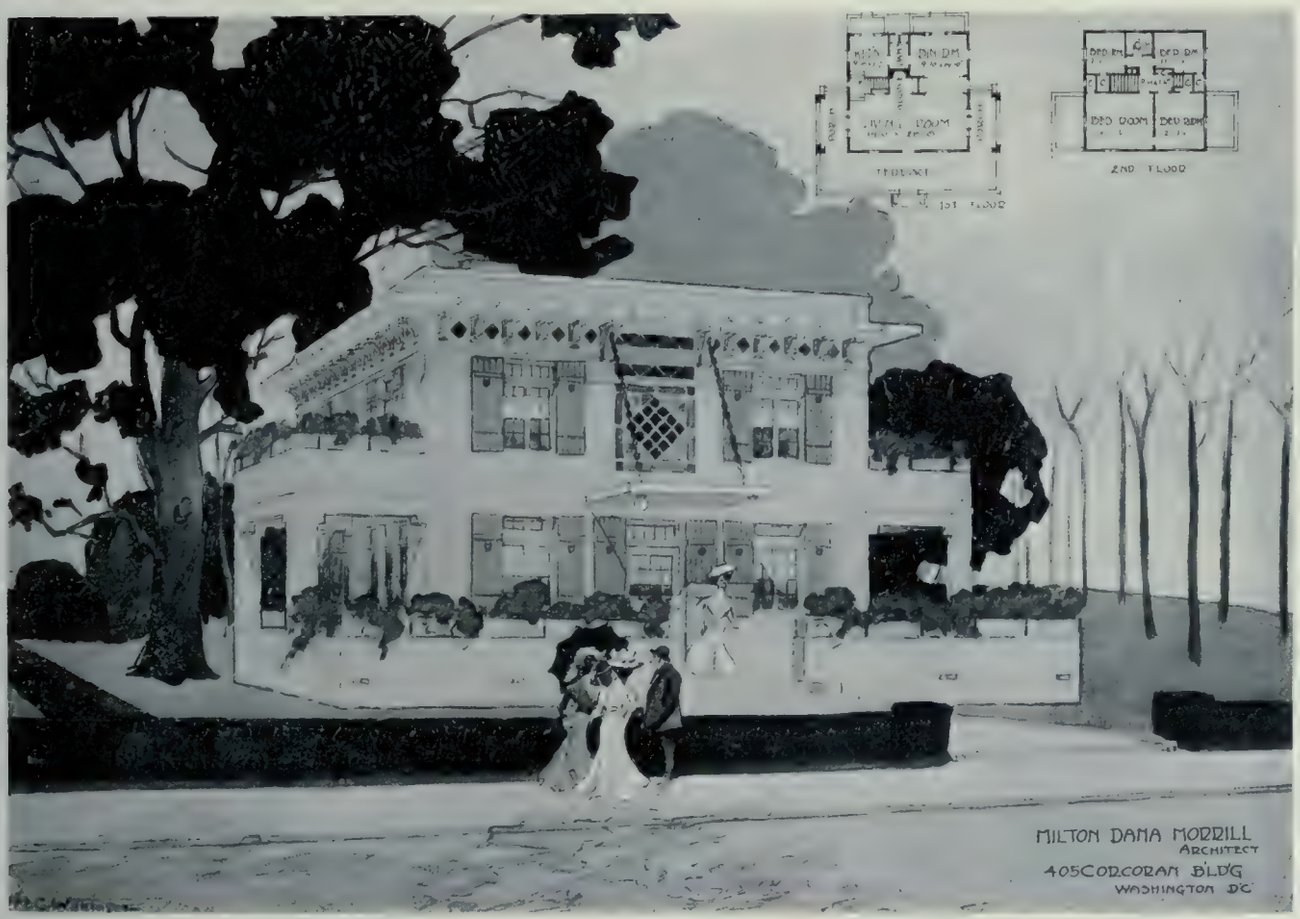
A Two-Storey Two-Family Concrete House, which is one of a group of ninety houses to be built by the Octavia Hill Association of Philadelphia. The contractors estimate the cost of these houses at $300 per room. Milton Dana Morrill, Architect.

Perspective Sketch and Floor Plan for a Three-Room Workman's Cottage. Note the large living room with alcoves at each end fitted with couches. These can be transformed into bedrooms by sliding curtains. The chimney of the fireplace also serves the kitchen, and a shower bath can be installed in one of the closet spaces if so desired. Milton Dana Morrill, Designer.

similar lines, being guided more by the law of common sense, fitness and beauty, rather than by precedent, in following an architectural style, which at best cannot be suited in structural forms so changed? Everything in daily use has been standardized, books are of uniform size, bookcases are arranged in unit sections and the same has been done with thousands of articles about us, and the principle of standard forms has reduced cost and labor to a tremendous degree, and improved quality. Why cannot this same principle be applied to houses and homes.

If standard homes can be built to advantage at wholesale, how important it is that these should be perfect in architecture and in plans. In all our cities contractors are building rows upon rows of houses, and in the majority of cases plans are not furnished by leading architects but are bought from the man who will make them at the cheapest price. Contractors will employ the best doctor they can find for their families, but in these building operations the best architects are cut out because we have the design, and if we follow our diagrams in setting up our steel moulds, the building is bound to come out right. One of the plans is so arranged that it can be built in sections almost as a bookcase is put up, being complete in four, five, six and seven room houses and arranged so that any number of rooms up to twelve can be made or added with no alteration. For a group of these houses the fire places, stairway, sinks, ice-boxes, etc., are of a standard type and steel moulds are made for these. To make an attractive mantel it is only necessary to lock together the standard moulds and pour the material, the whole being made at a quarter the cost of our less substantial wood fixtures.

In the preparation of these plans the designer has endeavored to invent homes where the habitant of the tenement can afford to live, and where he and his family can enjoy two of the greatest gifts of God—good health and sun shine. It is now realized that our hospitals can only relieve and prevent the communication of disease. They cannot stamp it out, and if future generations are



Design for a six room all-concrete house to be constructed by the Mount Hope Finishing Company near Fall River, Mass. Note the general architectural effect produced by simple lines and good proportions. The inlaid work over the entrance is of marble, and this together with simple window shutters and flower boxes serves to effect a most pleasing contrast with the white wall. Milton Dana Morrill, Architect.

they cannot compete with unstudied and inferior work, and the public must see and live in these buildings which are not beautiful, and sometimes even offending to the eye. I believe that all our cities should have art commissions who would pass upon designs for fitness of appearance just as our health department demand sanitary plans.

There are certain limitations to the economic use of concrete and we might as well recognize these and design our work accordingly. When we come to intricate detail and curved surfaces, concrete work becomes difficult, on account of the necessary moulds. Simple straight lines are ideal for this work and after all they make the simplest and most attractive buildings.

I have adopted in all plans standard unit dimensions, so that drawings are reduced to mould diagrams, after

to improve mentally, morally and physically, our people must live in healthy homes, and the city tenement cannot furnish these.

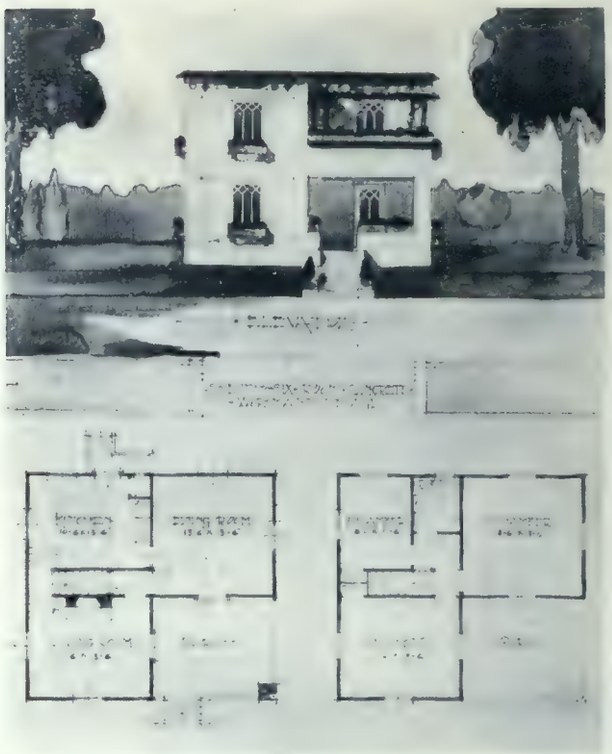
A few years ago the expense of travel and time consumed made it imperative that the laboring classes should live near their work, but improved transportation and low fare have now increased the residence zone to many miles around our larger cities and high land values and consequent high rents have reversed conditions so that it is imperative that only inexpensive land shall be occoccupied for habitation.

The accompanying designs are almost primitive in their simplicity but would not this simplicity add, rather than detract from their appearance, and would not a group of these buildings with their white walls, flowerboxes, and inlaid marble block ornaments make a striking

contrast to the usual inexpensive homes. There is a great mental and physical improvement brought about through clean and beautiful homes and a pride awakened which enters the entire life of the tenement. In the dark, unwholesome tenement there is little incentive for cleanliness in habits or in life and a marked advance has been noted by a change to sanitary and attractive surroundings.

Plans have been prepared for a group of two story, three-room apartment buildings, for the Octavia Hill Association of Philadelphia, Pa. The kitchen fixtures, sinks, ice-box and closets, which are to be of cement cast in steel moulds, occupying one end of the living room, so that by light washable curtains these can be screened when not in use. The bath rooms are interlocking in plan, so that no space is lost. The contractor's estimate in concrete was $900.00 per apartment, or $300.00 per room, fire-proof, and sanitary. In brick $1,100.00. These can rent for $8.00 or $10.00 per month. The group will comprise ninety buildings.

One design presents a three-room house. The large living room extending across the front with alcoves at



Design for a Six-Room Workman's Cottage. An Attractive Small Dwelling House With a Well Disposed Interior Arrangement. Note the Direct Surfacing of the Exterior and the Interesting Window Treatment. The Porch and Balcony Arrangement is also Worthy of Note. Milton Dana Morrill, Architect.

each end fitted with couches and arranged by sliding curtains so that these may be transformed into bedrooms, an attractive open fire place is directly opposite the entrance, the chimney also serving for kitchen range. A shower bath can be placed in one of the closet spaces. Another plan is for a four-room one-story house, without bath. This plan, as well as the former, is intended to accommodate the family who now inhabits a two or three room tenement. This house could rent for four or five dollars per month.

Still another presents a plan for a two family house, the four-room apartment on the first floor opens on an attractive side porch. The upstairs apartments open on a front porch and separate entrance, each apartment has a bath.

Plans have also been prepared for quite a group of the five and seven-room type, to be constructed by the Mount Hope Finishing Company near Fall River, Mass, In these houses every room has windows on at least two sides and all are arranged in such a way that they can be built as double houses or in block where land value prohibits the detached home.

While single homes can be constructed along the lines of these designs, the great economy obtained by wholesale building makes it desirable to construct in groups so that they can be almost entirely machine made. Just as in our clothing, tailor-made suits can only be afforded by those whose salaries warrant it, so in our homes, the especially designed and built house, is only within the reach of a comparative few.

A competition for sanitary inexpensive workman's homes was held at the late International Congress on Prevention of Tuberculosis when this especial type of house was awarded the first gold medal. The following are a few of the special, and for the most part, new features which have been incorporated in the design: The coal is hoisted by a simple chain block, attached to a swinging davit and is dumped through a hole in the roof to a large pocket, from which it feeds by gravity into the fire box of stove, the ashes falling into a pit and being removed from an outside door. This is simply the application of the equipment of large plants to the home. This stove combines in one compact fixture, cooking range, house and hot water heater, and gas stove. The garbage is placed in a cast-iron chamber in smoke flue, and after drying is dumped into a fire-box by damper. Fire places in each room have flues about the smokestack forming a natural ventilation. The ice-box, which is filled from the outside, is arranged for use as a fresh-air closet, doing away with use of ice except in hot weather. This is also arranged to be flushed. The roof is of open cellular construction, and cool in summer.

An attractive feature of the house is the roof garden and sunroom, forming out-of-door bedrooms, divided by use of movable screens. Window boxes form an inexpensive and at the same time artistic decoration. We cast our walls for two-story buildings 6 inches in thickness, and you can realize how far a cubic yard goes in this thickness. With the steel moulds we expect to place this for $5.00 per yard, so that a wall (the side of a room) 9 feet by 12 feet, will cost but $10.00.

When the "Model House" was first shown there were many skeptics as to the practicability of the scheme, and I thought that the best plan was to construct a house along these lines, as an ocular demonstration is the only way to definitely prove a project of this kind. This house, which is in Brantwood, Maryland, near Washington, has very little wood except the window sash and doors. The walls are 8 inches in thickness, the floors are 4-1-2 inch slabs, reinforced in both directions.

The moulds were of wood made in standard sections, and one carload of Portland cement sufficed for construction. To thoroughly clean a room, a hose is used, the cement floors being graded to plugged tile spouts, discharging on the lawn. An enclosure for the garbage pail is left under the wash tub which has an outside screen door for ventilation and removal. This is arranged also to be flushed out. A small wood strip is laid in the border so that rugs or carpet can be tacked in place, if desired. All corners are coved, and all fixtures are bracketed from the wall, which leaves no places for the shelter of dust or vermin and facilitates in cleaning.

The possible omission in insurance and repairs, and their general indestructible character, would make this type of building especially suitable for rented houses. The waste heat from the kitchen range warms the house through circulation of hot water, the heating system being built to be cut off by an inside fire box in the summer months. All fixtures such as kitchen sinks and washtubs, lavatory and bath tubs are cast in concrete, and given a very smooth cement finish. For the water supply a concrete tank is built in the top of the bath room, which is filled from a small force pump at the kitchen sink. In some of my plans I have graded the roof to a sand box filter connecting with the tank, so that rain water may

also be stored and used. The windows are of a casement type, swinging out, with no trim, but with a stencil

Two-Storey Concrete House erected at Brantwood, Maryland. The walls are 8 inches in thickness and the floors are 4½ inch slabs reinforced in both directions. This was the first house constructed with standard section moulds, and it was built to demonstrate the possibilities of reinforced concrete in low priced, sanitary, fireproof residences. Milton Dana Morrill, Architect.

border, sash being hinged to simple metal strips, which form a weather-tight joint. In some buildings my plan contemplates a window sliding sideways into a wall pocket, the screen being locked to the sash so when the sash is moved the screen follows, closing the opening.

Detail of Porch, Concrete Residence at Brantwood, Maryland. Milton Dana Morrill, Architect.

The building has no exterior ornamentation, as the flowers, and vines in the window boxes give the best of decoration and color. Why do we have flowers and ornaments of stone when we can have genuine flowers and ornaments which are much more beautiful and decorative. These flower boxes, (of course they are of concrete), now contain small cedar trees which we gathered near the site, and the vines are the wild honeysuckle, which grows in such fragrant tangles all about.

It is difficult to base an estimate of cost on construction of this first house, since the moulds and the superintendent's time have been charged against it, but it is safe to estimate that these houses can be built at between two hundred and three hundred dollars per room. In the construction of concrete houses, I have found that in some light work, the cost of lumber and carpentry labor for moulds, was three-fourth the total cost. It was necessary that this expense should be reduced or eliminated, if we were to build in this material.

Side Entrance, Concrete Residence at Brantwood, Maryland. Milton Dana Morrill, Architect.

I searched the market in this connection, for a standard sectional steel mould equipment and found several good types, but none exactly suiting my requirements. The simple equipment involved many months' experimental work, and should, I believe, do much to reduce the cost of concrete construction, since it practically eliminates carpentry and lumber waste.

The mould plates are pressed from 12-gauge sheet steel into flanged sections 24 inches square. Upon the completion of the footing course the plates are locked to the cement spacing blocks, furnishing a trough, into which the mix is poured. The cement spacing blocks are of course left in the wall and the plates are locked to these by a key, which is afterwards removed. Whereever four corners join a cuff engages, wedges the plates

together, and draws them to perfect alignment on the inside. The whole stands very rigid and firm when erected, and in experimental work I have not found it difficult to keep the work plumb, as the corners join evenly and render the alignment true.

The plates are two tiers in height, each tier being clamped together in series, and attached by a hinged rod so that the lower tier is unlocked and swung to its new position on top and locked, there being few loose parts to fall. The whole equipment for house construction has only ten different parts, and as it costs about

Side entrance, concrete residence at Brantwood, Maryland. Milton Dana Morrill, Architect.

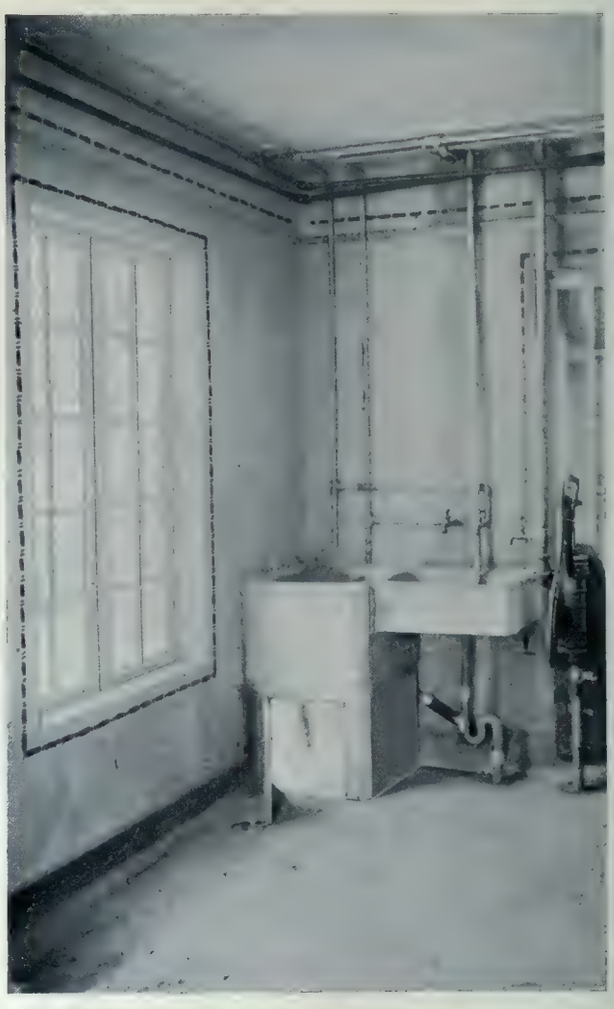
$800.00, and can be used indefinitely, the cost per house is not great. Wood fillers are arranged to take up odd dimensions.

Several small sections of walls have been built with this equipment, patents for which are now pending and within two weeks I expect to start on the first work, for which a full equipment is now being finished.

These plates are locked together in the same way for the floors, the spacing blocks here give the exact thickness of slab, and reinforcement rods are placed and accurately secured to these blocks by bending a heavy wire, which is cast in each block with end protruding for this purpose. To give a smooth and even surface floor, a wet mix is poured in, and the plates are slid in place on top and locked to spacing blocks, and wedged down until the surplus mix is squeezed out in front. This should do away largely with expensive labor in cement finishing. For the floors, cement spacing blocks are cast with projecting flanges so that they will give considerable support to the slab and reinforcement, and permit the lower plates to be removed after three days. A post is wedged and blocked up under each spacer giving supports only 24 inches apart.

Upon experiment I found that a slight ridge or pattern at the joining of the mould plates and spacing blocks was found to appear slightly different in color. I have treated this as wall decoration, and with the rosette cast on the spacing blocks, an extremely interesting pattern is formed, and it is possible to leave the wall without further finish inside or out, unless a brush coating is applied to give a more uniform color, and as a safeguard against dampness. As the plates are cleaned and greased each time they are raised, and as the concrete is a very wet mix, an extremely smooth surface is obtainable, requiring no plaster, the economy is, I believe, apparent.

At Virginia Highlands, twelve minutes out of Washington, we are just starting a group of houses, a few will be of brick, but the majority will be of cement. We have



View of Kitchen, Concrete House at Brentwood, Maryland. This interior can be cleaned with a hose, the cement floor being graded to Tile Spouts, discharging on the Lawn. The Enclosure for Garbage Pail under Concrete Sink has an Outside Screen Door for Ventilation and the Removal of Garbage. This is also Arranged to be Flushed Out. Milton Dana Morrill, Architect.

purchased this beautiful tract on the heights just south of Arlington, overlooking Washington, and we are forming a stock company to develop and sell land and in connection with this, will erect a number of these houses.

Good cinder concrete gives ample strength for walls of these houses, and we are using the waste from manufacturing plants nearby. It is possible in this work to take the material which has been thrown away as useless, and make something useful and beautiful with it.

CONCRETE BLOCK CONSTRUCTION.*—What It Means to Canada in the Erection of Safe and Permanent Buildings.—Dominion Should Profit by Mistakes Made in Neighboring Country.—Proper Way to Reduce Fire Loss is by Preventing It.

By J. AUGUSTINE SMITH

THE DEVELOPMENT OF CANADA carries with it tremendous potential possibilities in every direction. In this development, I know of no one factor that will be of greater real benefit to you than concrete block. When I speak of the "concrete block," I do not mean the poor, cheap, porous cement block you see frequently, but rather the well-made, dense, sound, impervious stone, that is of first-class quality, and meets every requirement; the product that secures the unqualified approval of the architect and builder.

The statement that the concrete block is destined to play so important a part in your affairs may be questioned by those who have given this subject but casual thought or observation. Let us, therefore, give some consideration to this subject.

In the first place, I take it, your history of development will very closely resemble the methods, means, and characteristics of the development and growth of the United States, when our great West was being peopled. Great colonies poured in, habitations were rudely and hastily erected, with all the waste and destruction consequent upon the necessity of providing living quarters quickly. In such a rush, the great desire was to build as cheaply as possible, without regard to economy, or the real necessity for the promotion of safety. The result was, a wooden building era, which has cost us millions upon tens of millions of dollars, hundreds upon thousands of lives, and has given us a character of building which has proven extraordinarily costly, and has threatened in a serious way the prosperity of our country. Indeed, it is this phase of the question that I want to bring strongly before you, and upon which I want you to give serious consideration.

In our history, the greatest drain we have had upon our resources is our constant and extraordinary loss by fire. This is due to our loose and insecure methods of building construction. We have built of wood, sufficient for to-day only, and without regard to permanence. Our experience in this respect should be preventive of your making the same mistake.

Most people who are unaware of the extraordinary loss suffer each year by fire. This matter is now receiving the careful and earnest thought of our people. The United States Government have lately established, under the Department of the Interior, Structural Materials Testing Laboratories at St. Louis, for the purpose of determining the character of all structural materials, as well as their fire resistive properties.

As illustrating the importance of this investigation, I may call your attention to the fact that the fire loss in the United States, including not only property destroyed, but the maintenance of fire departments, payments of insurance premiums, so-called preventive agencies and other incidentals, amounted to over five hundred million dollars in 1906, or over 80 per cent. of the value of the total new building construction. This is equivalent to an annual tax of over six dollars per capita. By comparison, in six of the large European countries, the fire loss averaged only thirty-three cents per capita, and this in spite of the fact that the appliances and facilities for fighting fires in the United States are greatly superior to those in European countries.

The advantage shown in the fire losses of other countries is due to the more extended use of building materials which are more or less fireproof.

The laboratories above referred to have carried on a series of tests to prove the relative value of structural materials in resisting fire, and the report of these series of tests carried on has just been issued by the Government, and it shows conclusively the extraordinary value of concrete blocks in this regard.

A short time ago, I saw a very able article in one of the magazines, which went on to say that the proper way to reduce the loss by fire was to prevent it. A wiser statement never was made. Canada, therefore, has it within her own province to recommend and devise methods for the prevention of the tremendous drain caused by fire losses such as we have experienced on our side.

Let me show you a little more clearly just what the United States suffers annually from this one cause of waste. The annual fire expense in our country, as I have said, has reached, in some years, the enormous sum of five hundred million dollars, with a death list of seven thousand persons. This property loss represents a loss that does not include the loss of profits to the business man who has been burned out for the time he is out of business.

In foreign countries, there is an average loss of less than one fire per year to every thousand of population, while in the United States, we have four and a half fires per year for each thousand population. Natural conditions are, however, conspiring to bring about a change in this regard. The increased cost of combustible building materials has made us look for something else, and this has called public attention to the extraordinary fire resistive qualities of concrete.

An active movement has been started to secure fireproof construction, especially in our public buildings. To-day there is scarcely a city of any size where there is not a strong sentiment in favor of fireproof construction for all public or semi-public buildings. How little has been accomplished, however, is shown from the fact that with some twelve million buildings in the United States, there are only eight thousand which are even so-called fireproof, while, in all probability, two thousand will cover the number which are actually fireproof.

While the largest proportion of our fires occur in dwellings, yet there is an average weekly destruction of three theatres, three public halls, twelve churches, two hospitals, two asylums, two colleges, twenty-six hotels, three department stores, six apartment houses, two jails, and sixteen hundred dwellings.

The press, usually alert and active in all our great reforms, has taken up this question of loss and waste by fire, and is doing effective work in calling the attention of the public to the necessity for better construction. This agitation has, in a measure, accelerated the manufacture of building materials that are best calculated to form the greatest resistance to fire. This is most noticeable in the case of Portland cement and cement products, and particularly in the rapid development and use of concrete blocks and reinforced concrete.

This subject of fire loss means much to Canada. Your country is growing, and growing fast. It is incumbent upon you to develop the means by which you will prevent making such economic mistakes as we have made.

The first requisite is to see that a proper, fair building by-law, of an intelligent character, is passed in each of your cities and towns. Do not attempt, however, to build your by-laws on some of the silly ordinances which have been passed in the United States. In passing some of these ordinances which I refer to, influences were at

*Paper read before the Second Annual Convention of the Canadian Cement and Concrete Association at London, Ont.

Residence of A. H. Brown, Leesburg, Indiana. Built of Bevel and Plain Cement Blocks. Note the arched Window over the Verandah, and the Perfect Adjustment of the Material at all Wall Openings. Cosmo C. Elwood, Architect.

Residence of Dr. Dickerson, McComb, Mississippi. An attractive Dwelling Structure in which the Walls are Constructed of Plain Concrete Blocks with Bevel Block Trimmings.

work to favor certain forms of building materials, to the exclusion of others. Indeed, in a certain notorious case, the mayor of a great city was hastily summoned from his vacation in the mountains to veto a city ordinance that had incorporated in it a provision which would effectually prevent the use of certain building materials to the exclusive benefit of certain other materials. The mayor vetoed this ordinance, demanded that fair provision be incorporated in the measure that would make for the safety and protection of the people in their right, and at the same time secure equity and fairness for all.

Then, too, it sometimes happens that the ignorance of the extraordinary character of concrete in strength, has led the makers of some of these ordinances to require an excessive width of wall for ordinary building purposes.

It is clearly recognized on our side that an 8-inch concrete wall, whether it be of monolithic or hollow block construction, is sufficient for all buildings up to two storevs in height. Indeed, the common practice is to permit the substitution of an 8-inch block or monolithic wall, where 10-inch or 12-inch brick walls are specified.

The extraordinary, inherent, compressive strength of the material makes this good practice. There is reason in all things, and I sincerely hope Canadians will see to it that they do not go to the opposite extreme, in seeking to secure permanence of construction. It is easy to waste money in excessive requirements, just as it is to err in not taking sufficient precaution to secure the best results. When due regard to the common factors of safety necessary to produce permanence is taken, anything more than that is an extravagance.

I, therefore, hope that in drawing your by-laws, and in seeking to secure what I strongly recommend, i.e., safetv and permanence of construction, due consideration will be given to provisions that will protect the builder as well as the public.

The peculiarly fitting character of concrete to Canadian resources is well known. It is a fact, I believe, that while you have extraordinarily fine forests and splendid deposits of stone in certain sections, there is a wide section of your country that is devoid of structural materials, but which is blessed with gravel and sand of a splendid character. Moreover, that you have deposits of limestone and marl that make it possible for you to produce cement in unlimited quantities.

This means you have at hand everything necessary for the production of concrete of the highest grade, that will enable you to build with great saving to yourselves, and at the same time secure absolutely fireproof structures at low ratios of cost.

Moreover, I believe Canada is to be congratulated because of the fact that, in the development of the concrete business, the manufacture of concrete blocks has not been productive of the extraordinary amount of poor work so frequently seen in the United States; in other words, you have been a little slower to take hold, but your disposition is to produce good work. With us, a lot of small people engaged in this industry in the beginning, without proper financial means to carry the business on, and without the proper business training to make it a success.

This condition is being rapidly changed, however, and now people of large means, thorough business training, and with qualifications fitting them to carry on this industry in the best possible way, are now engaging in the manufacture of concrete stone, with the result we see evidences on every side of the adoption of concrete in this form in the building of large structures, and in its use in combination with reinforced concrete and steel building operations.

What has happened on our side will happen with you. You have this distinct advantage, however, your patent laws are a little better enforced than ours, which has prevented the influx of cheap, crude machinery for the production of concrete blocks, and I have no hesitation in saying to you that the cement block, properly made, will be one of the greatest economic assets you will have in your building operations in Canada.

I take it, also, in Canada, fewer mistakes have been made than with us, for it has been remarked to me many times that the business is in a position to develop naturally, along the most approved lines, with machinery and appliances convenient to do the very best work possible.

I therefore say with confidence, that the development of the concrete block business in your country should be coincident with your prosperity and development. Good concrete blocks cannot be produced without proper methods of manufacture, and it is essentially necessary that careful supervision and scrutiny be exercised by your public officials to see that this material is made worthy to be used in all kinds of construction.

The saving to be made, by reason of the use of cement blocks, is extraordinary. Without any hesitation whatever, therefor, I say you will not only save millions and millions of dollars in the first cost of construction, but you will add to this constantly, by reason of the permanence of your buildings, and their fire-resisting quality.

Of all the drains and wastes you may be threatened with, there is none that is so vital, so useless, and so easily preventable as that of fire. An ounce of prevention, in this regard, is easily worth ten pounds of cure.

Concrete blocks are now being produced of the most artistic and beautiful kinds. The development of this industry has gone forward until architects and builders have come to realize that concrete in unit form is destined to play a very important part in all future construction

Grain Bin Erected at Marion City, Michigan. Type of Building in which Concrete Block Construction, Owing to its Durable and Fireproof Qualities, is Being Extensively Employed.

work. Under a process lately developed, blocks are now made that are absolutely impermeable to moisture, dense, sound, and durable as time itself. Blocks are made with faces of granite, marble, limestone, and other effects, as well as being produced in a variety of colors that lend themselves easily to any scheme of color decoration.

Indeed, the development of the concrete block has reached that point that one of our great millionaires in the United States is building a country residence constructed entirely of blocks, that will be one of the finest and most palatial country seats in the United States. To give you some idea of what he is doing, I may say he has already built a massive residence for himself, a large cow-barn, piggery, dairy and power house, and purposes building in all sixteen residences, twelve large barns, four 50-foot silos, a power house, chicken houses, and other buildings, as well as four miles of concrete fence, which will take in all more than one million concrete blocks. In this work alone more than twenty million bricks will

(*Concluded on page* 86.)

Entrance Hall, Residence of G. E. Bryant, Castle Frank Crescent, Toronto, Showing the Lower and Upper Staircase and the open Arrangement of the Interior. Messrs. Chadwick and Beckett, Architects.

Dining Room, Residence of G. E. Bryant, Castle Frank Crescent, Toronto. Note the Proportions and General Treatment of this Interior, together with the Built-in Buffet and Large Comfortable Seats in the Bay-Window projection. Messrs. Chadwick and Beckett, Architects.

Interesting Stone and Half-Timbered Resi dence of Mr. G. E. Bryant, Castle Frank C rescent, Toronto. Messrs. Chadwick and Beckett, Architects.

RESIDENCE OF MR. G. E. BRYANT, TORONTO.—An Attractive "Rosedale" Dwelling Structure with an Interesting Natural Setting.—Built of Stone and Half-Timbered Construction.—Description of Its Plan, Color Scheme and Interior Features. ∴ ∴

FROM A RESIDENTIAL STANDPOINT, Toronto is essentially brick. Journey in what direction one will, houses of this construction are greatly in the preponderance. It is only within the past few years that stone work as the principal material in domestic wall construction has to any extent put in its appearance, and even with the more pronounced development that has recently taken place in this direction, the scarcity of homes of this type still renders them more of an abstract quantity than otherwise.

What is lacking in number, however, is perhaps more than offset in quality, as most of these houses are both noteworthy in design and carefully considered in construction, the workmanship in fact comparing most favorably with the beautiful and substantial character of masonry found in other parts where this latter material is more extensively employed.

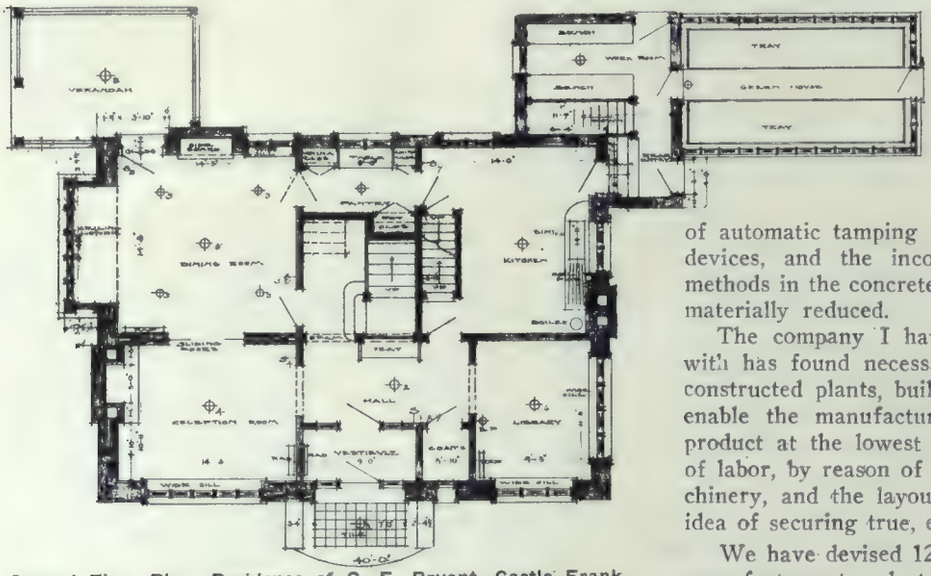
Several attractive residential structures in which the use of stone work is seen to advantage, have lately been erected in Castle Frank Crescent in the east-end of Rosedale. Notable among these is the interesting home of Mr. G. E. Bryant, illustrated in this instance. This dwelling is a south fronting house situated on large terrace grounds, which give the owner a delightful view of the ravine and the natural scenery with which this suburb abounds.

The walls of the house are of Credit Valley rubble masonry for the lower storey with half timber work and stucco plaster above, and the color scheme of cream, greys, browns and terra cotta, together with the rough surface of the stone and the red tile stain of the shingle roof, forms a combination which blends exquisitely with the dense foliage of the trees and other like advantages that the site provides. The buttresses at the corners of the lower walls emphasize their sturdiness of construction, while interesting small windows and modest dormers gives the house that charm of simplicity so greatly to be admired in structures of residential design.

Passing through the entrance, with its direct projecting hood, one enters the vestibule and the hallway, which is rather open in its arrangement. There are two open doorways connecting with the reception room and dining room, and an interestingly designed staircase, leading to the second floor. This interior is finished in Georgia Pine stained in Flemish Oak, with strapped dado walls and a heavy beamed ceiling. Adjoining the vestibule is a coat room, while to the right of the hall is the library which is well lighted by east and south windows.

The reception room, which is finished in hard wall plaster and has a large open fireplace; is connected by sliding doors with the dining room, which is situated at the rear. This latter room is especially well proportioned, and intensely homelike in its architectural treatment, a feature of the general scheme being the built-in sideboard, and the large seats which are placed at either side of the bay window projection. The woodwork here is

similar in finish to that of the hall and library; the ceiling is beamed and the walls are dadoed with broad straps extending up to the plate rail, which is placed at a height of seven feet. A richly pannelled door opens into the pantry having built-in china closets and serving table) which

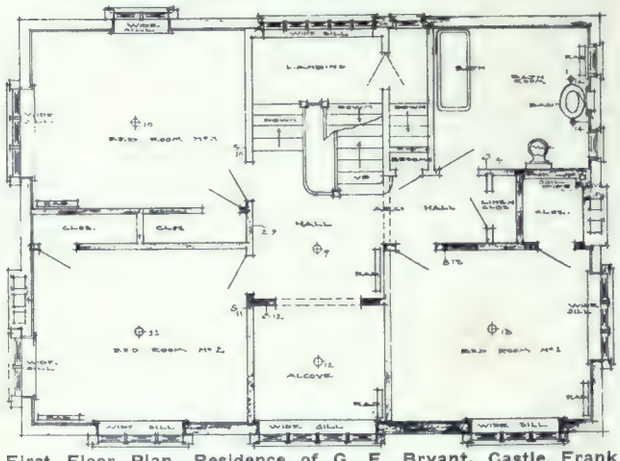


Ground Floor Plan, Residence of G. E. Bryant, Castle Frank Crescent, Toronto. Messrs. Chadwick and Beckett, Architects.

occupies the space at the rear of the staircase. This brings the dining room and kitchen consequently together, and at the same time, keeps the latter well apart from the rest of the house. Off the kitchen is an entry for tradesmen, and a passage to the workshop and large green house, which is carried out in the shape of a projecting wing at the northwest corner.

The second floor provides three large bed rooms, an alcove and a modernly-equipped bathroom of spacious dimension. All bedrooms have roomy clothes closets, and a cheerful scheme of decoration. In addition to these are two unfinished attic rooms which are adapted to storage purposes.

A special feature in connection with the house is a



First Floor Plan, Residence of G. E. Bryant, Castle Frank Crescent, Toronto. Messrs. Chadwick and Beckett, Architects.

formal Dutch garden which the architects, Messrs. Chadwick and Beckitt, have planned as part of the general scheme. This garden is situated at the rear and can be reached from either the green house or the spacious verandah off the dining room.

RECENT ADVICES FROM EDMONTON state that two companies with heavy financial backing have been organized to exploit the sandstone deposits in Entwhistle, situated in that electoral district. The stone is said to be of an excellent quality for building purposes, and it is understood that quarries will be established in the near future to operate the property.

CONCRETE BLOCK CONSTRUCTION.—By J. Augustine Smith.—Continued from Page 83.

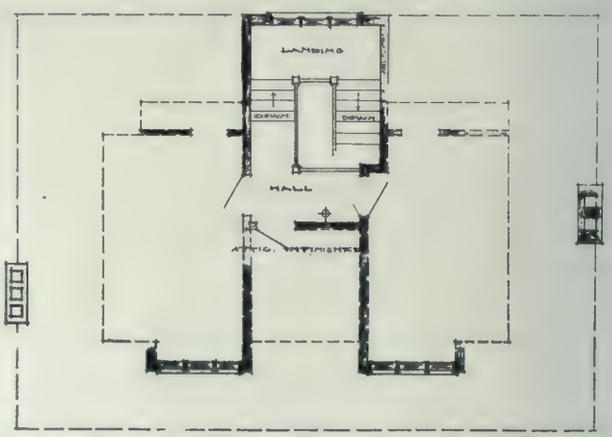
be displaced. This will give you an idea of the manner in which concrete blocks are now being used on our side.

Now, as to the comparative cost of good concrete block construction as against other forms, I stated to you in a paper I read before your convention last year, some of the costs which this form of construction made possible. Since that time, in the development of automatic tamping machinery, loading and trowelling devices, and the incorporation of modern, up-to-date methods in the concrete block plant, these costs have been materially reduced.

The company I have the honor of being connected with has found necessary the development of modernly constructed plants, built upon economical lines, that will enable the manufacturer to produce his manufactured product at the lowest possible cost of manufacture and of labor, by reason of the perfect installation of his machinery, and the layout of the plant, designed with the idea of securing true, economic results.

We have devised 120 different types of plants for the manufacturer to select from, ranging from the automatically equipped plant, in which everything is done by machinery, down to the one-machine, one-man plant, in which everything is done by hand.

Moreover, we have carried along a series of tests to demonstrate the necessity for a proper grading and selec-



Attic Plan, Residence of G. E. Bryant, Castle Frank Crescent, Toronto. Messrs. Chadwick and Beckett, Architects.

tion of the aggregate used. This is a very important item, so important, indeed, that we strongly urge the assaying and rectification of the aggregate used in manufacturing blocks, so as to secure the greatest possible saving in the cement necessary to bind the whole into a concrete mass.

Furthermore, we have found it necessary to go into a series of tests that will demonstrate the exact amount of water necessary to use to produce the best results, and we have found some astonishing features in the tests so far carried on. It will require about eighteen months to complete this investigation, and I feel I can say we will be prepared at the end of that time to give to the concrete world results that will prove of great benefit to the manufacturer of concrete blocks.

In closing, I wish to say that the development of this industry in Canada is a very vital subject with you, particularly in the development of the business on proper and rational lines. If this is done, I believe you will agree with me, in the course of the next few years, it will represent a material advantage to you in the saving and economies it will secure in the use of the concrete block as a building material.

RURAL SCHOOL BUILDINGS IN ENGLAND.—Paper Giving Detailed Statement of Investigation Recently Conducted by Several English County Councils, Read Before the British Society of Architects.

THERE IS NO TYPE of building that is more grossly neglected in both design and construction than the average Canadian rural school building. The agriculturalist, even in our so-called premier province, Ontario, looks upon the country school as a necessary evil. He, as a rule, believes that he has made a great sacrifice for the benefit of the community and his posterity by depriving himself of the help of his sons and daughters on the farm by sending them to school during the winter season. He cannot see why a school teacher should get a greater salary than his hired man. In fact in his mind the school "marm" does not earn as much as a good hired man, in that the school teacher only works nine months in the year, five days in the week and only six hours in the day. So much so has this underestimation of the importance of the services of the country school teacher become imbedded in the mind of the farmer that the Provincial Department of Education of Ontario found it necessary to enact a law placing a minimum upon the salary that should be paid to teachers of rural schools.

The same lack of appreciation of the importance of public school training, this same parsimonious attitude of the farmer toward the employment of competent teachers is shamefully apparent in the character of buildings provided for rural school accommodation.

The impecunious conditions imposed upon rural school boards, together with the penurious manner in which they have been accustomed to conduct the affairs pertaining to public school education in their several individual school sections has resulted in the erection of school buildings notable for their lack of every essential in design, equipment and sanitation. The rural school officials as a rule know little or nothing about school design, and the country carpenter usually employed to plan and erect such buildings in most cases knows less.

The school, when completed, is not one which the members of the community hope to look upon with pride, but is viewed as an expensive luxury forced upon them by conditions with which they are not in sympathy and it may be said that our schools do not fail to show plainly the conditions under which they were erected.

These unfortunate conditions will never be changed until the rural school boards are awakened to the fullness of their responsibilities, by the pressure of public opinion, or until the Government undertakes to enact strict regulations governing the design, construction and equipment of rural schools. It is only when some such movement occurs that the necessity for the employment of competent school architects will be established in the untrained mind of the rural school officials. It is, however, gratifying to note that some of the larger towns and villages are commencing to realize the necessity for the employment of trained men to design their schools. Now and again we find towns advertising for architectural services, and although the conditions named in the programme are often such as to preclude all possibility of the employment of any self-respecting architect, it, nevertheless, marks a step in the proper direction.

That designing of a rural school building requires more than ordinary experience gained in the general practice of architecture, is shown conclusively in a paper recently read before the Society of Architects, London, Eng., by G. Topham Forrest, architect to the Northumberland Education Committee.

After the passing of the Education Act of 1902, most of the County Councils throughout England had exhaustive surveys made of all the school buildings within their administrative area, including all the non-provided schools of every denomination, so as to form some idea as to how the buildings stood with regard to sanitation, water supply, heating, lighting, ventilation, planning, and state of repair generally.

This work was of a very large order, and one which entailed a very considerable amount of labor. Very exhaustive reports were drawn up by county architects and others, and as Mr. Forrest assisted at that time in the compilation of reports, embodying detailed inspections of nearly 1,000 of these buildings, his views on this particular subject are of considerable interest to all those concerned with school design and equipment. The conditions prevalent in many of the rural schools in England in regard to sanitation, heating and ventilation, plan and equipment, as outlined by Mr. Forrest are common to most of our Canadian rural schools.

His suggestions as offered in the following excerpts from his paper will be of value to school architects and will further prove beyond all possibility of doubt that the successful designing of rural schools is not the work of the village carpenter but rather a study for the thoroughly trained and experienced architect.

Sanitation. System of Closets in Schools.

In fifty per cent. of rural schools the form of closet in most use is either an open or closed midden privy. These are usually situated in localities having no water supply, or public drainage system. Some of these middens are cleaned out monthly, others half yearly, and many are not cleaned out for periods extending over twelve months. The result of this is that in many schools the effluvia penetrate the school according to the direction of the wind; these privies consequently become abominations.

The tub, pan or pail closet is an improvement on the very insanitary and unwholesome midden privy. Covered midden privies, and open midden privies ought to be condemned as utterly unfit for the purpose. I have always considered these middens abominations, although they are still looked upon with favor by many rural authorities, probably because they require less looking after.

For all practical purposes, and especially for the sake of cleanliness, the pail or tub is the best type of closet, if it can be cleaned out every few days. In urban districts this can be managed; but in rural districts someone ought to be made responsible, otherwise the nuisance is not mitigated.

Dealing with schools situated in districts having a public water supply, but no main drainage, where water closets were used, the problem of disposal is generally solved by the use of the cesspool. Into this cesspool is taken the crude sewage and the effluvia from the urinals. Cesspools have still to be resorted to under certain conditions, but they are at all times a nuisance, and as lavatory waste has to be treated as soil drainage, they soon become filled and the contents have to be continually pumped out. The more perfect systems of sewage disposal are difficult to apply on a small scale, but the modern bacterial method of purification by septic or sewage disposal tanks is advisable for larger schools erected under adverse conditions of public sewage disposal, and if the initial outlay is a little greater the cleanliness of the system will amply compensate for the expenditure. I would strongly advise the use of septic tanks.

In coming to the last class of closets, viz., those on the water carriage system, what are known as trough closets have their disadvantages. Forms of connected

closets are, however, trapped from each other by water standing in the pipe between. These are technically known as latrines, and are emptied by a syphon discharge. This is a great improvement upon the trough closet, but this system also has its disadvantages, in so far as many children can use the closet before the automatic flusher goes off. I have been the means of introducing into the schools throughout the County of Northumberland a type of closet very similar to those used for lunatic asylums. This closet is especially adapted for children, being narrow and elongated in shape. The elongation of the basin means less soiling of the back , and giving a very satisfactory flush with two gallons of water. The inspection cap is large enough to admit of easy access in case of chokage, but there is less temptation to put articles into this form of closet. The cistern is easy to pull, and the smallest child can set up the flush. I must admit that I dreaded somewhat the introduction of this variety, on account of the children forgetting to pull the handle after use; but the result was entirely satisfactory, and has been most encouraging.

School House built at Westerhope, Eng., by the Northumberland County Council. Note the general architectural treatment, so decidedly in contrast with the average rural school building in Canada.

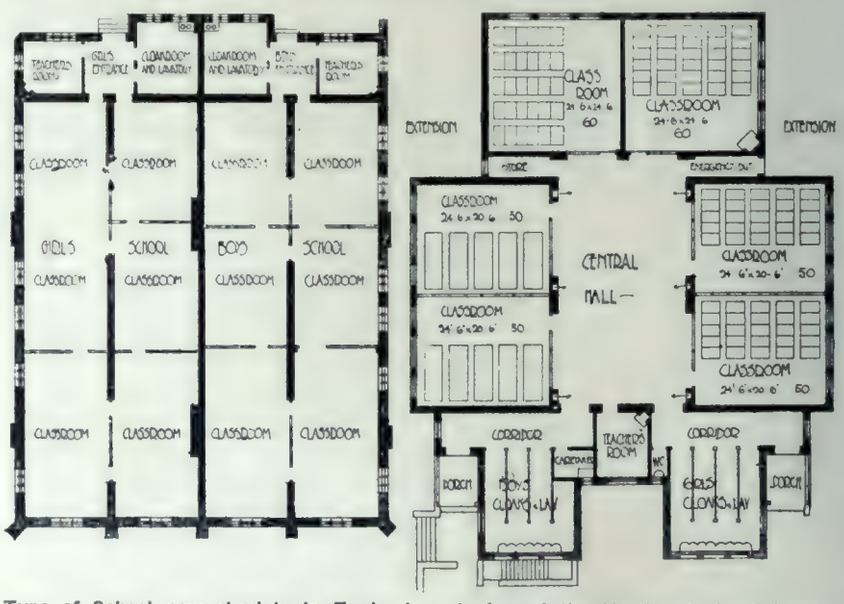
Far too little attention is given as a rule to the construction of urinals. Speaking generally, they consist of either an open channel, or a primitive sort of trough, without any proper lining or divisions. Some are flushed by rain water conducted usually in an iron pipe from the rain eaves, others are flushed in a perfunctory sort of way by hand, but by far the greatest number has no arrangement whatever for cleaning purposes, nor have they any system of flushing.

School urinals should be properly divided and made of some impervious material, non-absorbent, with a lining of cement, or better still, enamelled fireclay, with an adequate supply of water for flushing purposes. Slate should never be used unless treated with coal tar to prevent absorbtion and scribbling by the children.

With regard to soil drainage and drainage work generally, experience has taught that the system of entrusting the construction of drains to odd labourers with intermittent supervision is fraught with evil consequences. There can be no doubt that in most of the rural districts unprofessional labour, is largely employed, chiefly for the sake of economy. The village carpenter has been responsible for all sorts of alterations and additions to buildings; and the construction of drains has been left to the agricultural labourer. The laying down of a proper and efficient drainage system to all our schools in need of such is a large undertaking.

I have always favored a large hall to schools of 300 and upwards. My argument in favor of its use being that it materially helps the ventilation of the classrooms during the winter months, on account of the comparatively small area architects are limited to at the present time in the designing of these rooms.

The hall can always be freshly ventilated and the glass screens between it and the classrooms should be made with opening sashes so that the air can be drawn into the classrooms. Assembly halls act as large air wells to the various classrooms, more especially if one side has an external wall well supplied with large windows, which should be made to open. The exact shaft in the ceiling should also be under control. The temperature can be kept lower than that of the classrooms by having a separate circuit from the boiler. The argument in favor of ventilating classrooms through the central hall is that fresh warmed air is admitted through both sides of the room over the radiators in the outside walls of the classroom, and through the screen dividing the room from the hall. If the ventilation and temperature of the hall such as above described were properly regulated, the ventilation of the classroom would be materially helped, especially in the winter months when it is impossible to open the windows, and when the fresh air openings behind the radiators are entirely deficient for the needs of the full class.



Type of School now obsolete in England, and plan of the Northumberland County Council School at Westerhope. A comparison of these plans gives an excellent idea of the vast improvement both in arrangement and hygienic advantages that has been made in the construction of English rural school buildings.

Another advantage of the central hall are that the glazed screens between it and the classrooms help considerably in the lighting of these rooms. The light from this side is shaded, leaving the chief source of illumination from the left. By doing away with the central hall and substituting a low corridor, as is done in some

School House, built by the Northumberland County Council at Newbiggin-by-Sea. An attractively designed small structure with interesting gables, effective window grouping, and well-placed entrances.

schools, so as to get the opposite walls of classrooms external walls with windows in each wall, there is always considerable risk of the lighting from the right being too strong for the scholars.

Cloakrooms.

All cloakrooms should be near entrances and have cross ventilation. 12 in. apart for cloakhooks is allowed in secondary schools, and 6 in. in elementary schools. If 12 in. is reasonable distance for the garments of the well-fed, surely 6 in. is too little for the poorer and less-cared-for children. Reform here again is necessary. Mats and scrapers should always be placed immediately inside cloakrooms, so as to prevent as much dust as possible getting into the school. Mosiac floors, if properly laid, are the best, but ordinary cement concrete is quite satisfactory and much cheaper.

Classrooms

In planning a school, attention should be concentrated first and foremost upon the arrangements of the classrooms. As regards size of classrooms, the tendency now is to reduce these as much as possible. It is very common to find schools with all the classrooms the same size, say to accommodate 60, and I venture to think this is a mistake. Rooms should be graded. Every school must be plannel so that the children can be seated in the best manner for being taught. The rooms must be grouped compactly and conveniently so as to secure proper organization and supervision. It is very important to remember that the accommodation of every room depends not merely on its area, but also on the lighting, the shape of the room and the position of the doors. Rooms should be planned as nearly approximating a square as possible. In England glazed bricks or tiles have up to the present time been the most suitable material for dados on account of the small upkeep in the way of maintenance, but now some authorities on school work have stepped forward and protested very strongly against the use of glazed surfaces for classroom walls. The reflected light on their surfaces may have something to do with it, and being non-porous may not be considered hygienic for crowded rooms; but this is a matter of opinion, and personally I favor glazed bricks or tiles.

Warming and Ventilation.

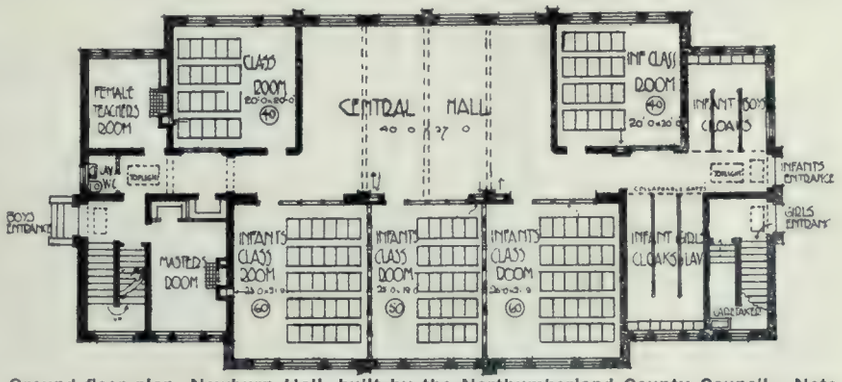
In most of the old familiar schools in England of the L shape type, the ordinary fireplace is still one of the most common means of heating. It is of course cheerful and healthy, on account of the ventilation insured by it, and it is surprising what a number of schools are solely dependent upon these open fires for getting rid of the foul air. This form of heating, however, cannot be regarded as sufficient. Uniform warmth can never be obtained in a room heated by fires only. A great evil of the open fire is the current of cold air continually passing along the floor level causing cold feet to the children. If open fires have to be put in, the following points should be attended to:—

(1) Firebrick should be used instead of iron.

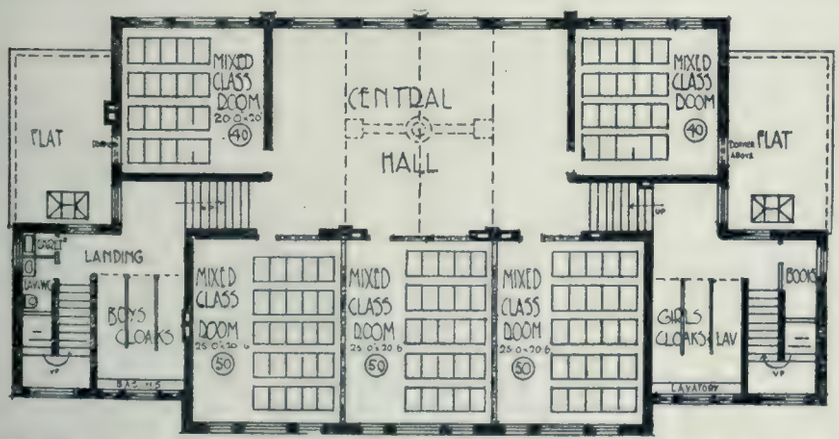
(2) The fireplace should be narrower with the back leaning forward.

(3) The space beneath the fire should be closed.

Ventilating grates are useful if no provision has been made for warming the cold air, as they have great warming power and good control of combustion.



Ground floor plan, Newburn Hall, built by the Northumberland County Council. Note the large central hall and position of the entrances.



First floor plan, Newburn Hall, which follows out the arrangement worked out in the lower hall, thus providing adequate corridor space and a convenient staircase arrangement.

Stoves.

If stoves are not properly constructed, they are a very dangerous form of heating. Stove flue pipes are very often constructed in the worst possible way, the flue stack running up inside the room, instead of being taken horizontally through the wall at the level of the stove and then carried up the outside of the wall. The joints of the flue pipes

are often very slack, the metal itself pervious with time and wear, emitting into the room products of combustion that must be and are detrimental to the health of the scholars and teachers. Ventilating stoves give very satisfactory results, but here again care in fixing is necessary.

High and Low Pressure Hot Water.

Heating by hot water constitutes one of the best and simplest means of warming schools. The low pressure system is more prevalent, which has one great feature in its favor, namely, its adaptability to any method of ventilation. The practice of arranging hot water pipes in channels below the floor with perforated iron gratings at the floor line, was commonly met with, but should be condemned. It is dangerous, tends to uncleanliness, and there is always a great loss of heating power.

In laying down low pressure installation care must be taken to see that the basement heating cellar is properly drained, and that the same is not flooded after a heavy rain. Where the sewer is too shallow to take away the water, a system of low pressure heating has been adopted, having the boiler on the ground floor level.

In most rural schools the elementary principles of ventilation were entirely absent. Take for example a school where the only means of ventilation is the open fireplace and window, in some instances, and the windows only in others. The supply of fresh air has been found to be deficient. The exhaled organic matter has made the badly ventilated rooms very offensive. The fresh air to a classroom should never be admitted through a single inlet, but should be relatively distributed to ensure proper diffusion. Fresh air inlets should not be used, the whole area of the classroom window should be made to open. The window openings should be large and regulated by means of rod gearing. At the end of every hour or at every change of class, the whole window should be thrown open and the air in the room will be rendered quite fresh in less than five minutes. Never open windows by means of fasteners, attached to cords, if it can possibly be avoided, for in less than a month from the time they are fixed they will get out of repair, so much so that the teacher will cease to struggle with them, and consequently the windows will remain shut during the various changes of lessons. Rod gearing properly controlled and attached to the whole of the opening sashes, even although it is a little disfiguring and a trifle costly, is an admirable arrangement and one in which the teacher never forgets to carry out his duty of ventilating his room at the proper times.

Outlet Ventilation.

It is an undoubted fact that in many schools the smoke flues from the fireplaces formed the only means of outlet ventilation, the windows in most cases acting as inlets. In addition to the fireplaces, there are two methods usually adopted to carry away the foul air. The first method consists of perforated openings into a false roof without any proper ridge exhaust ventilation to carry the foul emanations away (a deadly practice but exceedingly common). The second method consists of outlet openings in the ceiling of similar description as the first method, but with a communicating shaft from these openings to the external air, and provided at the ridge level with some form of exhaust ventilator or revolving cowl. For the first method of getting rid of the foul air, no condemnation is too severe. The space between the false roof and the ceiling becomes an air chamber, and is usually allowed to become exceedingly dirty. Air drawn into these, therefore, can scarcely escape contamination, and this air is very often breathed over and over again. The second method is satisfactory, provided of course, that sufficient air is given to the outlets. Twenty square feet should be the total area for inlets and outlets to an ordinary classroom.

Artificial Ventilation.

As there is such a great difference of opinion on this form of ventilation, and so much has been written for and against it, each school should be treated on its merits. Country schools usually of one storey only have been referred to, and if it were attempted to mechanically ventilate such schools serious trouble would be encountered on the score of expense. It is well, however, to know how much air is needed in a school and how to furnish this by exact mechanical means.

In dealing with the ventilation of a school, the three main points to consider are:—

(1) Area of floor to be provided for every scholar.

(2) Cubic capacity of the room.

(3) Number of cubic feet per minute which must be brought in and then exhausted for each scholar.

Lighting.

The principal causes of darkness in the schools revealed by investigation are: insufficient size of windows; windows wrongly placed, *i. e.*, in a corner; lighting area insufficient; classrooms too narrow to give a sufficient angle of light; further extensions built regardless of position; trees obstructing the light; mullions too heavy, so that shadows were cast; panes of glass too small.

The following questions, if attended to might be beneficial in remedying defective lighting, especially in schools already built:—

(1) Can children get direct light from the sky by means of windows?

(2) Is the ratio of window glass to floor surface sufficient?

(3) Are the windows on the left hand of the scholars?

(4) Is the color of the walls or the ceilings too dark?

(5) Have the desks been arranged in accordance with the best possible lighting?

In selecting a site for a school, high ground should be chosen, as it affords more light on account of the height of obstructions being reduced, and it also gives freer play to the sunlight. In building a school, it must always be assumed that the building is to be lighted on all four sides and enough land secured so that the distance from obstructions is sufficient. Windows should always be as large as possible, and the sashes should be glazed with clear glass.

The best light for a classroom comes from the upper part of the windows, windows should therefore extend as far towards the ceiling as possible. In the older schools it is not unusual to find two or three feet of wall space between the window head and ceiling.

With regard to the internal coloring of schools, the plastering of a building should diffuse the light, and should, therefore, be tinted some very light color, almost white. Walls should be colored with very light tints of buff and green.

Artificial Lighting.

In all rural schools, where no supply of gas is obtainable, some form or other of oil lamps must be used. Great care should be taken that a tight-fitting wick is used. Many of the oil lamps, especially the more expensive kinds have their reservoir placed in cup-shaped sconces fitting very loosely to allow of their ready removal. This constitutes a source of danger. Gas lighting by common burners has been practically superseded by the introduction of incandescent mantles, with good results. As regards hygiene, electric light possesses many advantages over gas, but the cost of maintaining is about 50 per cent. higher.. There is now, however, on the market a new metallic film lamp in place of the ordinary incandescent, which is claimed will effect a very great saving in the consumption of current.

Folding Partitions.

In supervising the fixing of folding partitions, there should be no large objectional trough or channel or any unsightly iron straps, and where a trough or channel is used, such a channel must on no account be cut out of

(*Concluded on page 94.*)

MACHINERY AND TRADE

NEW PREMISES OF MUSSENS, LIMITED.

THE WELL KNOWN FIRM of Mussen, Limited, Montreal, have moved from their old offices at the corner of Victoria Square to a large five-storey building on the opposite side of St. James street. Within the past few years the business of this concern has experienced such a marked expansion as to render the old premises entirely inadequate, and make it imperative for the company to secure larger quarters. In their new building they not only have splendid office accommodation for their constantly increasing staff, but two unusually well appointed floors, arranged solely for display purposes, which gives prospective purchasers a most excellent opportunity to examine their vast line of machinery, equipment and supplies. A cut of the company's new building is illustrated herewith, as is also their warehouse, which is exceptionally well equipped for the handling of heavy machinery. The warehouse, which has a capacity for one hundred carloads of stock, has a wide driveway running clear through the building with street openings at either end This building is most desirably located, being near the railway and navigation lines, thus enabling the company to make shipment in a prompt and ready manner. Mussen, Limited, now have branch offices and warehouses in Cobalt, Winnipeg and Vancouver, and also offices in Toronto and Calgary. From a small beginning this firm has become the largest concern of its kind in the Dominion. Their principal lines are machinery and supplies for railways, mines, contractors, municipalities and machine shops; and they maintain a well equipped engineering department which looks after the designing, supplying and erecting of complete plants for various purposes, such as quarrying, mining, etc. The company's latest move is but another indication of this firm's rapid and steady growth —a growth which has resulted from reliable and efficient business methods which have characterized this company's business dealings from its inception, and has won for it a most enviable reputation.

New Home of Mussens Limited, St. James Street, Montreal.

Warehouses of Mussens Limited, Montreal.

FIRE PROTECTION.

FIRE IS ACKNOWLEDGED to be the most destructive of all agencies, and the protection of buildings against its destroying power is a very vital issue to-day. During the year 1909, Canada suffered a loss due to fire of $18,905,000, and a total loss of life of 219. A loss due to fire of over $51,000 per day, or, looking at it in another way, a loss of $2.70 each for every man, woman and child in Canada, must make one pause and consider whether he is doing his utmost to obtain the most efficient fire protection available.

Modern fireproof buildings of steel, brick and cement are practically perfect inasmuch as they are immune from destruction by fire, but the contents certainly do not enjoy that advantage. If the buildings are not fireproof, there is the double danger of fire and the double loss in case the worst happens. It is very evident, on consideration, that there is something lacking in the safeguarding of property and lives. Fireproof buildings and civic fire protection do not satisfy.

The unit which is necessary to complete protection, and which is missing in the great majority of cases, is known as the Sprinkler System. This system of Sprinklers, consists of a graduated series of pipes running through all parts of the building, with outlets spaced in such a way that each covers an area 10 feet square. The pipes are supplied with water from the city mains or from large tanks placed at an elevation at least as high as the roof of the building. In some cases they are supplied by both main and tank. To the outlets are attached the sprinklers. A temperature of about 165 Fahrenheit, melts

the nipple, releasing the water. The pressure of the stream acts on the sprinkler head, causing it to throw a heavy shower of water in all directions through a radius of five feet. The volume of water is sufficient to extinguish any incipient fire and effectually prevent conflagration. Each sprinkler acts independently of the others, so that unnecessary damage, due to the water, is avoided. Valves are conveniently situated so that the stream may be closed off when the fire is overcome. It must not be omitted that, at the same moment in which the sprinkler is released and the stream starts to play, by means of an electrically operated system, an alarm is given to the nearest fire-hall, and the fire department is at once on hand to lend assistance if it be necessary. The system is at once practical, effectual and thorough.

An objection often made to the use of sprinklers is that, situated as they are on the ceilings of the rooms, they are unsightly. There are no grounds for this objection whatever. In the case of new buildings, the pipes may be totally concealed, and the small outlet heads arranged so as to fit in with the architect's decorative scheme. As an instance of successful installation in a building which had been completed, take the case of Ryrie Bros.' "Diamond Hall," at the corner of Yonge and Adelaide streets, Toronto. Here the only parts visible are the sprinkler heads, and they do not at all disfigure the ornamental ceiling. Just now the Holt Renfrew Company's building, corner of Yonge and Adelaide streets, which is being remodelled, is being equipped with sprinklers. Both of these installations are the work of the General Fire Equipment Company, who have been most successful in protecting buildings against fire in this way.

There is another phase of the situation to be viewed. Besides the immunity from fire loss, which the system affords, there is a decreased insurance rate. This item is one of no mean account. The insurance underwriters make great reductions in rates in cases of buildings containing the system. An average reduction of at least 50 per cent. and reaching as high as 70 per cent. gives an idea of the advantage. It is in fact an investment. Consider a specific case. An owner has been paying 2½ per cent. on a risk of $400,000, and he has the sprinkler system installed. The rate is dropped to 1 per cent. and he effects a saving of $6,000 yearly on an investment of, say, $15,000 to $20,000, which is a very profitable rate of interest on the cost of installation. The rate is determined, of course, by the occupancy and the value of the stock carried in the building.

When one reasons that the system of automatic fire protection which has just been outlined, is a practically perfect safeguard, is an excellent investment from the insurance rate standpoint, and in no manner detracts from the decorative effect of the building, he realizes that he requires the Sprinkler System.

The General Fire Equipment Company has given thorough satisfaction in all their work. They cause no inconvenience or annoyance when putting the system in a building which has been erected some time. A copy of letters attesting to the efficiency of their sprinklers will be gladly sent to anvone interested, upon application to the company's offices at 72 Queen street east, Toronto.

EADIE-DOUGLAS, LIMITED, prominent among dealers in building materials and specialties in Canada, have just removed to their new premises at 12-14 University street, Montreal. The building has been entirely remodelled throughout, and is ideal in arrangement to meet this firm's rapidly growing requirements. The ground floor front is finished in Burmantofts Marma Terra Cotta, giving a striking exterior effect. The ground floor, which is spacious and handsomely decorated, contains a large show room and offices for the salesmen. The show room is well adapted to exhibit the superior products handled by the firm. The two upper stories contain roomy, well fitted, and well lighted offices, part of which will be occupied by the concern themselves. Other firms having offices in the building are The Terrano Flooring Company of Canada, Limited, the Insulyte Company, Limited, and the Dominion Fireproofing Company, Limited.

REMOVES TO NEW QUARTERS.

THE STANDARD IDEAL Company, manufacturers of "Alexandra ware" and other high grade porcelain enameled plumbing products, have moved their Montreal office and sale department from 128 Craig street west to 155 Notre Dame street west. The new premises afford splendid advantages for display purposes, and the accommodations in general are admirably adapted to the company's rapidly growing requirements. Montreal architects and other customers on telephoning this firm will avoid delays by asking for Main 7499.

RURAL SCHOOL BUILDINGS IN ENGLAND.

—Continued from Page 90.

the wood floor of the school room, but a straight board must be put down in direct line of partition with blocks, through which the maker of the screen must cut his own groove.

Essentials of Design.

There are many other discrepancies in rural school design and construction not mentioned above, but progress must be made step by step, and while more thought should be given the real essentials of school design, it must be admitted that any aspirations which architects have in this direction would be very much aided, if the public who are their clients, could be got to think and see more justly about the essential qualities of the design of schools. Why should the expenditure on school buildings be cut down to a minimum of cost per head, and why should the cry always be for bare utilitarianism?

At the age of six, when the average child first goes to school, practically everything he sees is new and interesting and worthy of deep consideration. His brain gets no rest from the time he wakes to the time he goes to sleep at night, surely then, schools ought to be things of beauty. Educational buildings must always furnish a most imposing factor in the social structure of a community. In England one sixth of the entire population is enrolled as pupils in elementary schools. It is obvious, therefore, that the institutions designed for the training of these to whom the destiny of the nation is to be trusted, should be safeguarded at every possible point.

THE SHIPYARDS AT ESQUIMALT, B. C., owned by Bullen Bros., are reported to have been sold to an English Syndicate, which will greatly enlarge the present facilities, and increase the size of the dry docks to accommodate naval and merchantmen vessels of the largest type. It is understood that the purchase was made following the decision of the Government to establish a Canadian navy, and that the company anticipated tendering on the construction of vessels of this character.

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

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Second Annual House Number

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H. GAGNIER, Limited, Publishers

Saturday Night Building

TORONTO - - - - - CANADA

BRANCH OFFICES

MONTREAL—Board of Trade Building, LONDON, ENG.—Byron House, 85 Fleet St. E.C.

Parsonage of Metropolitan Church, Bond and Shuter Streets, Toronto. View from North-west Corner, Showing the Metropolitan Church in the Background. Sproatt and Rolph, Architects.

South Wall of Parsonage, Metropolitan Church, Showing St. Michael's Cathedral in the Background. This Residence was Designed in the Elizabethan Style to Harmonize with the two Gothic Churches, Between Which it Stands. Sproatt and Rolph, Architects.

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E WISH ARCHITECTS and owners to understand that we are not a mere *Bar selling concern*, but are fundamentally a corps of competent Concrete Engineers ready to serve the architect and the owner. In this capacity we do not advocate any one type of reinforcement for all purposes, but we do have different types of products to meet all requirements. The Kahn System, therefore, stands for an economical system of steel products to satisfy every need in a fireproof structure.

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¶ American Architects in Canada.—A gross breach of professional ethics by representative of American Architectural firm.—States in public press that Architecture in Canada is undeveloped.—An insidious attack upon Canadian Architects.—Says that his principals are conceded to be the leading Architects on North American Continent. . . .

MANY PHASES of the several evils arising from the practice of employing American architects to design Canadian structures have been discussed from time to time in these columns. It has been pointed out that, beyond the question of all doubt, we have architects in Canada well qualified to design and erect any structure, without regard to size or the purpose for which it is to be used, that our social or commercial growth may demand or make possible. As proof that this is a statement of fact rather than an opinion, we would point out that the general standard of architectural design in residential, ecclesiastical and commercial work in our larger Canadian cities, is eminently superior to that in cities of like size in the United States. Who would say that the standard in residential design and construction in Detroit was superior to that of Toronto, with its Rosedale, Queen's Park, Poplar Plains Road, Avenue Road, Palmerston Avenue, Jarvis Street, Bloor Street and North Sherbourne Street? Who would say that the standard of commercial design in Milwaukee was superior to that to be found in Toronto's wholesale district. Who will say that the architectural beauty of Buffalo's ecclesiastical edifices compares favorably with that of Toronto's churches? It is true that Toronto's schools are far below the usual standard in the average American city, but these were never designed by an architect. It is also true that the Provincial Parliament Building is open to severe criticism, but this monstrosity was designed by a Buffalo architect.

What city of like size in the United States can boast of the quiet, dignified and generally massive architectural style prevalent in Montreal? What city of 125,000 population on the American side is there that can point to an architectural style that will compare favorably with that generally prevalent in Winnipeg? These questions all answer themselves in the negative. Yet in the face of these unquestionable facts large American architectural firms continue to dazzle some of our large corporations with boastful representations, tickle their vanity with carefully designed business arguments and thus secure Canadian work which they tack on to the tail end of a big "business."

Up to recently these American architects have been content to secure such work as they could without openly defying the ethics of the profession, as recognized in Canada, but it remained for Eustage G. Bird, the accredited representative of Carrere and Hastings of New York, with offices in Toronto, to openly attack the standing of the architectural profession generally in Canada in an effort to justify the employment of his principals by a Canadian banking corporation, in an interview which appeared recently in the Toronto "Star." The case in point is the commission given to Messrs. Carrere and Hastings, of New York, for the erection of the proposed Bank of Toronto building at the corner of King and Bay Streets, Toronto. The fact that a foreign architect should be employed to erect a Canadian banking building caused much unfavorable comment in many circles and for some reason or other Mr. Bird either requested to be, or permitted himself to be interviewed by a reporter of the Toronto "Star" in which some statements appeared that are the most remarkable that we have ever known an architect to give for publication. The article in question after giving a brief description of the proposed structure said in part:—

"Designs were submitted by three Toronto firms: Sproatt and Rolph, 90 Yonge Street; George Gouinlock, 1108 Temple Building, and J. M. Lyle, 14 Leader Lane.

"Although their plans were considered and were excellent in many ways, those submitted by the New York firm were considered the most satisfactory.

"*'In any new country architecture is necessarily undeveloped.* As in any other branch of Art it is necessary for us in Canada *to rely on established principles which have been perfected in New York or Europe.* In doing this there is no intention of boycotting Canadian industry, but only an attempt to secure a satisfactory design. *Carrere and Hastings are conceded to be the leading architects of North America, and surely Toronto wants the best buildings that can be secured,"* said Mr. Bird to the "Star" this morning. "A bank is owned by its shareholders it is the duty of the directors to get the best they can, whether from inside or outside of their own country. Some people have the impression that Carrere and Hastings and myself want to give the work connected with the erection of Canadian buildings to others than Canadians. This is not so. Practically all the sub-contracts for the erection of the Traders Bank Building and the Royal Bank Building on King Street east, were let in Toronto, and fully 80 per cent. of the work was done by Toronto mechanics and laborers. The same course will be followed in the case of the Bank of Toronto building.'

"The plans for the Toronto Bank building were designed by Mr. Bird in his office in the Traders Bank Building, and were examined and approved by Carrere and Hastings."

It is hard to understand how even a foreign architect who has any regard for the ethics of his profession would allow himself to be made responsible for statements designed to further his own interests by undertaking to belittle the standing of the Canadian architectural profession. Is it that Mr. Bird's client, the Bank of Toronto, annoyed by many protests against the employment of an American architectural firm, insisted that he (Mr. Bird) should justify his employment in the public press? Is it that Mr. Bird was forced to sacrifice professional ethics in deference to the business interests of his clients or is it an open expression of Mr. Bird's usual methods of securing work? Or, again, is it the first open indication that Mr. Bird's firm proposes to introduce into Canada the business methods employed by many American architects in the pursuit of their profession.

Mr. Bird has evidently taken especial care to inform the "Star's" reporter of the names of the Canadian Architects and architectural firms, who submitted plans with him for the structure in question that were "by the way" considered inferior to his. The logical result, therefore, was that, of course, he secured the commission for his firm.

In the mention of his success in the competition, Mr. Bird has shown a desire to be *charitable* with Canadian architectural firms by telling us that nothing else could have been expected, since *"in any new country architecture is undeveloped."*. In other words it could not be expected to secure in Canada sufficiently trained men to create a design equal to that which he is enabled to supply. Apart from this being an insidious misrepresentation of facts it is the most brazen piece of blind egotism that has yet come to our notice.

Why are Messrs. Carrere and Hastings, whom Mr. Bird would have us believe are the Alpha and Omega in architecture on the North American Continent, so solicituous about architectural design in Canada? Why have they not shown more consideration for architecture in such cities as Detroit, Buffalo, Milwaukee, Indianapolis and many other cities of like size in their own country by sending a missionary to save them from architectural anarchy? These cities need their help more than do our Canadian centres. We answer, because these American centres have architects of their own to whom they are loyal. We, in Canada, have architects whose work in many respects is superior to that of the average American architect in these cities, but we are not loyal nor even square with our architects. Therefore, such firms as Carrere and Hastings find this a profitable field in which to operate. We are easy!

Mr. Bird again says that it is necessary for "us in Canada to rely upon established principles which have been developed in New York and Europe." This is quite true, but the relying upon principles developed in New York does not require or even augur for the employment of a New York architect. We know that the United States had to rely upon the "established principles as developed in Europe," but never did Americans assume that this meant that European architects should be employed to design American structures. They sent their architects to Europe to become trained in the proper practice of the established principles that had been developed there and upon their return entrusted the erection of their buildings to them. Canada has not a few architects who are as thoroughly acquainted with the established principles developed in New York and Europe and who received their training from the same source as Messrs. Carrere and Hastings, and the only reason that they have not to their credit, work of the scope and magnitude that these "so-called" *Yankee Architectural Giants* can point to, as their masterpiece, is because of the limitations of the demands made upon them.

More than this, we have not as yet had any work in this country by American architects that could, in the least, justify the assertion that they can give us in architectural design that which we cannot secure in Canada.

In answer to the argument, that the employment of an American architect on a Canadian building simply means that we have made way for the advance agent of the contracting and building material interests of the United States, Mr. Bird says that 80 per cent. of the labor will be Toronto labor. This may be true as far as the ordinary building mechanics and laborers are concerned, but we would point out that the general contract on every building Messrs. Carrere and Hastings have erected in Canada has been awarded to American contractors.

It should not be pleasant for Canadians to learn that our local Canadian sub-contractors are obliged to work under an American contractor, on a building superintended by an American architect, but built by Canadian money.

We, however, find in the same interview in question that, the plans for the Toronto Bank Building were designed by Mr. Bird in his office in the Traders Bank Building, Toronto, and were examined and approved by Messrs. Carrere and Hastings in New York. So entirely inconsistent is this last statement, with the apparent object of the whole article that, if it were not for the serious nature of the question involved, we would have been inclined to look upon the whole affair as a very good joke, unworthy of attention.

Mr. Bird tells us that Messrs. Carrere and Hastings, with whom he is associated, secured the commission in question and pleads for the employment of American architects on Canadian buildings on the strength of his contention that as a new country "our architecture is as yet undeveloped." He then undertakes to justify the Bank of Toronto in the selection of Messrs. Carrere and Hastings by telling us that they are conceded to be the leading architects on the North American continent. (Why not the Western Hemisphere?)

In the face of all this we are told that Mr. Bird and not Messrs. Carrere and Hastings designed the proposed Bank of Toronto and that Carrere and Hastings simply checked over the plans. We possibly have a right to assume that the Building Inspector of Toronto also checked over the plans, but we hardly believe that Mr. Bird would have us believe that this city official had anything to do with the designing of the structure. From these contradictory statements it seems that we have a right to infer one of two things, either that Mr. Bird is practicing under the reputation of Msssrs. Carrere and Hastings, or that he is directly in the employ of this firm and not an associate.

We do not know Mr. Bird's nationality, we do not know where he was born, nor do we know whether he is a naturalized Canadian, but if Mr. Bird is the designer of the buildings Messrs. Carrere and Hastings secure commissions to build in Canada, we cannot understand where or why he has any right to lecture us about the unfitness of our Canadian architects. We know of no work he has done in Canada or elsewhere that would justify his assuming that his architectural training or practice has been such as to place him in a position where he might consistently deprecate the inferiority of Canadian architects, when discussing in the public press a competition with which are connected the names of such men as Sproatt and Rolph, G. W. Gouinlock and J. M. Lyle. These men, all of whom are "sailing under their own colors"; practising under their own responsibility and enjoying a reputation that is all their own have to their credit many structures that have established them as architects of no mean ability. All have had an excellent training which is made apparent in their work. Sproatt and Rolph have to their credit one of the most beautiful gothic structures in Canada in the recently erected Library of Victoria College. Geo. W. Gouinlock was the architect for the Forester's Temple, Toronto. He also designed all the recently erected buildings at Exhibition Park, Toronto, the finest permanent exhibition buildings in the world. Mr. John M. Lyle was the architect of the Royal Alexander Theatre, one of the most beautifully appointed theatres on the

continent, and is now erecting the Provincial Penetentiary for Ontario, which will be the largest and most completely equipped institution of its kind in Canada.

These are the men, with a hundred others in Canada, that Mr. Bird would be charitable with, because little can be expected of them, in so far as architecture is still undeveloped in this new country. Mr. Bird has come to Canada to give us that which we, in our crude state, have not and cannot produce ourselves, namely, an architecture based "on established principles which have been perfected in New York or Europe" and Messrs. Carrere and Hastings, of New York, are going to examine and approve of his plans and United States contractors will build our buildings.

It is not our desire in these columns to bring into any discussion of a subject of general interest to the profession the name of any individual or firm, but the nature of Mr. Bird's interview as published in the Toronto "Star," together with the importance of the principles involved forced us to make an exception to the rule.

It occurs to us that an architect of Mr. Bird's exceptional ability, backed up by the *greatest architectural firm on the continent* should be able to find some more dignified and professionally decent method of establishing himself and his firm with the Canadian building public than that of casting aspersions upon the architectural profession of Canada and belittling our appreciation of the aesthetic in architecture.

¶ Building Statistics for May from 25 centers show the remarkable increase of 50 per cent. over corresponding month of 1909.—Phenomenal increases general.—Winnipeg first.

FROM A CONSIDERATION of the building statistics of twenty-five representative Canadian cities, it is very evident that the Dominion is in no way likely to lose her reputation for structural development. The figures for the month of May, 1910, have attained a situation far above that for the same period last year, thus establishing a new record for that month. Although Canadians have ever been sanguine as to the development of this country, yet the figures presented, serve as a substantiation thereof, and are a source of the greatest satisfaction, especially when, from a closer knowledge of the building operations in progress, it is known that none of these representative towns have been experiencing what is generally understood by the word "boom," but are passing through a period of steady but phenomenal material development.

Fifty per cent. is the remarkable increase of May 1910 over May 1909, in value of buildings for which permits were issued in the twenty-five cities listed. This represents an increase of $3,772,172, a very substantial amount considering that for May last year, permits were issued to the value of $7,545,152; and these statistics have been compiled only for the cities given, so as to represent fairly the condition which prevails throughout the different provinces. Of course, there are scores of smaller towns and cities which would show increases of like or even greater proportions, so that an adequate idea of the aggregate building operations throughout Canada can in no wise be obtained from the list. However, the percentage gain is representative, and accurately expresses the strides which are being made.

As regards the cities of Ontario whose figures are given, a glance shows that six of them have had very material increases. Toronto leads in Ontario, but has had to take second place in the honors of the Dominion, being outclassed by Winnipeg. Toronto shows practically the same total as for May last year, which is highly commendable, when the fact is considered that builders hesitate to apply for permits on account of the comparative scarcity of brick. This latter fact holds in some of the other cities in Ontario and also in many cities in the rest of the provinces, notably in the West. Fort William and Port Arthur show exceptionally creditable increases of 109 per cent. and 173 per cent., as also do Hamilton and Peterborough, with the heavy gains of 140 and 196 per cent. respectively. Ottawa is ahead by three and Stratford by four per cent., while St. Thomas also comes out to the good with a slight increase. Brantford, London and Windsor, show small decreases, owing to the fact that several important structures came under the figures of last May. Montreal, as usual, is prominent with a total of $1,709,200, thereby taking third place; an increase of 54 per cent. in one year is most commendable for a city where building last May amounted to $1,107,790. St. John, N.B., and Sydney, N.S., exhibit a lead of 27 per cent. and 19 per cent. respectively over previous figures, which is most noteworthy, to say the least. Halifax, however, has not yet reasserted itself, the loss there noted being 64 per cent.

Considering the more Western provinces, the extensive operations being carried on in Manitoba, Saskatchewan, Alberta, and British Columbia, present a fair idea of the progress there, and gives one a general conception of the tremendous expansion which the country is undergoing. Winnipeg leads all other Canadian cities, leaving

	Permits for May, 1910.	Permits for May, 1909.	Increase, Per cent.	Decrease, Per cent.
Brandon, Man.	$224,590	$88,225	154.56	.....
Brantford, Ont.....	24,430	58,275	.....	58.07
Calgary, Alta.	525,066	377,650	39.03	.....
Edmonton, Alta. ...	231,055	368,005	.....	37.21
Fort William, Ont..	259,230	123,645	109.65	.....
Halifax, N.S.	36,200	102,430	.....	64.65
Hamilton, Ont.	202,625	84,195	140.66	.....
Lethbridge, Alta. ..	354,535	236,200	50.09	.....
London, Ont.	87,165	88,620	.....	1.64
Montreal, Que.	1,709,200	1,107,790	54.28	.....
Moose Jaw, Sask...	207,000	25,700	705.44	.....
Ottawa, Ont.	651,150	628,075	3.67	.....
Peterboro', Ont. ...	124,845	42,155	196.15	.....
Port Arthur, Ont. .	131,925	48,300	173.13	.....
Regina, Sask.	397,040	90,325	339.56	.....
St. John, N.B.	28,800	22,600	27.43	.....
St. Thomas, Ont. ..	31,500	31,300	0	.....
Saskatoon, Sask. ..	859,350	106,985	703.24	.....
Stratford, Ont.	23,400	22,400	4.46	.....
Sydney, N.S.	25,928	21,775	19.07	.....
Toronto, Ont.	1,870,350	1,887,532	0	.....
Victoria, B.C.	257,290	183,620	36.40	.....
Vancouver, B.C. ...	941,570	477,140	97.33	.....
Windsor, Ont.	21,580	25,410	.....	15.07
Winnipeg, Man. ...	2,091,500	1,291,800	61.90	.....
	11,317,324	7,545,152	50.00	.....

Toronto, its closest competitor, a good lap behind. It exhibits a building list valued at $2,091,500, a gain of 62 per cent. Brandon ably supports Winnipeg in upholding the honor of the province of Manitoba, as permits for buildings were issued aggregating $224,590, as against $88,225, an improvement of 154 per cent. Saskatchewan may well be proud of the astounding figures sent in by Moose Jaw, Saskatoon, and Regina, gains of 705, 703 and 339 per cent. being noted in the order named. Saskatoon, with a list of structures for May worth $859,350, stands out conspicuously and is attracting the attention of all Canada by its remarkable uninterrupted progress. Calgary, presents a most flourishing condition, with a total of $525,066, a very substantial increment over May, 1909, of 39 per cent., while Lethbridge sustains its reputation with a gain of 50 per cent. Edmonton, though making a showing of $231,055, exhibits a slight percentage decrease owing to the fact that the amounts fluctuate from month to month, but on the whole, building in this city is brisk. Vancouver, to establish its title as one of the largest of the Canadian cities, comes to the fore with a list worth $941,570, shattering last May's record by 97 per cent. Victoria also present a heavy gain of 36 per

cent., and a total of $257,290, showing the steady increase in building in the capital city of the province.

That an uncommon condition of building activity prevails throughout the country is truly evidenced by the fact that all architects are increasing their staffs, working over time and still finding themselves overcrowded with work. It is the general belief that this condition of prosperity is not only likely to hold during the next few years, but also to be greatly augmented.

¶ *Evil of soliciting involuntary contributions in form of advertising by professional, fraternal and Church organizations.—An unwholesome practice that is prevalent in Canada.*

UNDER THE TITLE "Comprehensive Plans for Toronto," the ARCHITECTURAL RECORD (New York) makes the following editorial comment:—

"The Report which is issued by the Toronto Guild of Civic Art on the comprehensive improvement of Toronto is a very imposing publication—until one gets to the advertisements at the back. Probably these finance the publication, but, fortunately, it has not often been necessary to finance reports of such character in this way, and the Toronto report was deserving of a better treatment. . . . . An important part of the Guild's membership is made up of architects, and the plans were prepared by its own committee. The report is illustrated with telling photographs and contains comparatively little text. But it adds Toronto to that long list of cities that are considering their development in a big way."

It is truly unfortunate that the provincial habit of collecting involuntary subscriptions from business interests under the guise of advertising is in evidence in almost every undertaking of either a worthy or unworthy nature. In Canada, fraternal, church, labor, social and professional organizations look upon it as their inherent right to solicit contributions, in the form of advertising, with the object of producing a revenue from such publications as they find it either expedient or necessary to issue in connection with the work of their organization or association.

The real evil of such a practice lies in the fact, that the man who is considered a prospective advertiser is placed in a position where he cannot reject or accept the proposition set before him, solely upon its merits or demerits. Often he has been chosen as a victim for purely business reasons, and he cannot afford to ignore or refuse the requests or suggestions—if you will—placed before him. He is forced to "give up" or is placed in the unenviable position of incurring the displeasure of the promoters of the scheme.

In an unworthy cause he is coerced by an unscrupulous high pressure advertising man. In a worthy cause pressure is brought to bear upon him by the fact that the names of esteemed and honorable men are connected with the project.

It is beneath the dignity of those who connect their names with a worthy cause, which deserves public support, to solicit contributions in this manner, and as, in the case of the book issued by the Toronto Guild of Civic Art, many a worthy project is placed in a false light by this unethical procedure.

The Canadian Society of Civic Engineers is an organization that deserves particular credit in this connection. They issue during the year a large number of publications, and, despite the fact that advertising in them would be considered a good investment by a large number of business institutions, the society has reserved its publications for its own private use and neither solicits or accepts advertisements for even their annual report. This is a dignified attitude that does credit to the Society and the Engineering profession, one that is in keeping with the dignity of an organization of professional men. It is to be hoped that we will some day outgrow this remnant of provincialism, and that reputable organizations will find means of supporting themselves without the solicitation of involuntary contributions.

THE LICENSING OF ENGINEERS has attracted so much attention during the last couple of years, says the ENGINEERING RECORD that it is gratifying to notice an indication of a careful consideration of the subject by the American Society of Civil Engineers. In a recent issue of this journal the appointment of a committee to study the matter was announced, and this committee has already issued a circular letter to all members of the society asking for information regarding existing statutes which in any way affect the work of an engineer or bills which have for their purpose the enactment of such statutes. The committee is working under a vote of the Society which was passed as a result of the following resolution by the Board of Direction: "Resolved, that it is the sense of the Board that it is the duty of the American Society of Civil Engineers to use its influence in the proper formulation of all legislation by the general Government or by any States of the Union which affects the practice of engineers; and the Board recommends the appointment by the Society of a committee whose duty it shall be to formulate the general lines on which such legislation should be based, and that such committee be requested to report at the next annual convention." Few engineers who occupy positions of large responsibility probably appreciate how much interest is shown in this subject by those whose positions are not so high. There is an undoubted feeling in many parts of the country, and particularly among engineers engaged in small communities, that legal restrictions should be placed upon the practice of surveying and to some extent the practice of engineering, in order to keep the public from entrusting such work to persons without either adequate training or proper experience. In order that the work of the committee of the American Society of Civil Engineers may carry the greatest weight, it is desirable that all members of the Society who are able to afford it definite information should forward this to the secretary of the Society, who is a member of the committee, as promptly as possible. A frank and complete discussion of the subject in all its aspects at the next convention will do a great deal to secure the passage of proper laws and prevent the enactment of statutes which will cause endless trouble even to those whom they are intended to protect.

CANADIAN TRADE COMMISSIONER H. R. Pousette of Durban, South Africa, writes that new bills have just been introduced into the Transvaal Parliament to provide for the construction of three new lines of railway, viz.: a line from Standerton to Vrede in the Orange River Colony; one from Val's Spruit to Pilgrims Rest; and another from the Gelati Railway to the Messina Copper Mines on the Limpopo River. As indicating the increasing prosperity of the country, nothing of a more substantial nature could possibly be offered than the growing revenue which has accrued to the various systems of this character now operating. In this connection reference is made to the South African Railway, the Government Railway of the Transvaal and Orange River Colony, which showed a total earning for the seven months ending January 31 of over $16,000,000, or $3,000,000 in excess of what was estimated for that period. Attention is also called to the fact that for the two weeks ended April 2, the Natal Government railways showed increased earnings over last year, of $80,000, which is about the average increment maintained for some months; while the Cape Government railways for the seven months ending January 31, last, show an increase in earnings of about $1,250,000 over 1908 and 1909.

CONSTRUCTION

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

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CURRENT TOPICS

ONE OF THE MOST IMPORTANT and beneficial schemes embarked upon by the Belfast corporation is the improvement of a number of unhealthy areas by the removal of existing houses and the construction of new streets and dwellings, in their places. It is estimated that the cost of the new houses will be about $580,000 and will accommodate 4,000 persons.

* * *

THE CANADIAN ARCHIVES BUILDING at Ottawa contains a unique example of wood carving. It is in the form of a model of Quebec City in the year 1800, and is complete to the smallest detail. The model, which was executed by Jean Baptiste Dinberger, was commenced in 1795, and finished ten years later. It is altogether likely that it was made for military purposes, as it was sent to Woolwich Arsenal, England, and was brought back to Canada only recently.

* * *

CEMENT TANKS LINED WITH GLASS are gradually taking the place of wooden tanks in France for wine storage houses. The walls of the tank are lined with squares of glass which are joined together at the edges with cement. When the wine is poured in a salt of tartaric acid forms over the thin cement joint, effectually protecting the cement from further action by the acid. The glass itself is impervious to attack. A comparison of losses by evaporation, due to heat shows that in wooden tanks a loss is sustained of 6 and 7 per cent., while in containers of cement and glass the loss is only about 1 per cent.

A LARGE PIECE OF ROMAN PAVEMENT was recently unearthed in England by some workmen while engaged in repairing the floor and foundation of Winchester Cathedral. The pavement was found to be in an excellent state of preservation, being intact, and presenting very little evidence of disintegration. It was about fourteen square feet in area and was discovered at a depth of nine feet.

* * *

SEVERAL FOREIGN COUNTRIES will shortly make extensive tests with cresol-calcium, a new preparation for treating railway ties. The merits and preservative qualities of this compound is dealt with in an article published by the Swedish Chamber of Commerce. It is the invention of two engineers in the employ of the state railways in that country, and is said to be superior to all other products used for this purpose.

* * *

IN THE CANON DE CHELLY, Arizona, are the remains of what is probably the oldest brick structure in America. It is the ruins of the homes of the cliff-dwellers, a people, like the moundbuilders, whose identity is not known, but who lived centuries ago. A projecting cliff overhangs the remaining walls having, very likely, effectively acted as a roof for the building. The walls which remain exhibit the character of the brick of which they were built, and the soundness of these brick is a matter of surprise to archæologists who have examined them.

* * *

THERE IS EVERY PROBABILITY that an increased importation of concrete machinery and appliances into the Dominican Republic, will follow the action of the Congress of that country in lowering the duty on cement from 78 cents per barrel to 10 cents per 220 pounds, and on structural iron and steel to $1 per 220 pounds. This should offer a good market for interested manufacturers in Canada who are desirous of plying their wares abroad. The Government of the country in question is said to be quite partial to reinforced concrete, and the reduction in the tariff on the commodities mentioned was made with a view to encouraging the adoption of this form of construction as much as possible.

* * *

NEAR CORDOVA, ALASKA, there has just been completed a bridge which is unique of its kind. It spans the Copper River, which has a width of 1,500 feet and a maximum depth of water of 35 feet. When the river is not frozen over, the stream carries a constant burden of icebergs, some containing 50,000 to 70,000 cubic feet of ice and weighing thousands of tons. To withstand this terrific bombardment of ice, three solid concrete piers, armored with steel rails, were built. Each pier measures 86 feet at its greatest diameter, and reaches a depth of 50 feet below the bottom of the river. Up stream from the piers are large concrete ice breakers, also embedded in bed rock and similarly armored with steel rails.

* * *

SINCE TENDERS have been asked for the superstructure of the Quebec bridge, a great deal of speculation has been indulged in by those interested as to the probable cost of the completed bridge. It has been estimated that the total weight of steel in the completed bridge will closely approach 75,000 tons, or 150,000,000 pounds and so at a cost per pound of 6 to 7½ cents, the superstructure alone will cost from $9,000,000 to $11,250,000. This will bring the total cost up to something in the neighborhood of $14,000,000. Tenders are advertised for not only in Canada, the United States and England, but in Germany as well, and the magnitude of the work to be undertaken is well portrayed by the fact that the Government requires a bond of $1,000,000 from each company submitting a tender. Tenders are to be received until September. It is to be hoped that a Canadian firm succeeds in securing the contract.

Residence of Hugh F. Osler, Winnipeg. A most attractive House with Beautifully Assembled Lines, and a Decidedly Interesting Exterior Composition. Note the Perfect Balance of the Design and the Treatment of the Brick Work. Herbert B. Rugh, Architect.

Residence of Hugh F. Osler, Winnipeg. The walls of this Residence are Built of Concrete Blocks, Veneered with Copper Color Vitrified Brick for the Lower Storey and Finished with Cement Plaster above. The Tone of the Woodwork is Brown, save the Window Sashes, which are Painted White. This View Shows the Main Approach, and gives a Fair Idea of the General Character of the Surroundings. Herbert B. Rugh, Architect.

RESIDENTIAL DESIGN IN CANADA.—Some of the more Noteworthy Recent Work of Canadian Architects, Which Reflects the Prosperous Development of the Country, Together with a Greater Appreciation of the Aesthetic in Architecture. ∴ ∴ ∴

IN CONSIDERING ARCHITECTURAL development in Canada, one must, in order to judge the best and most consistent results, turn to the more recent efforts in residential design. Admitting that there is some very excellent work being done in the other departments of architecture, yet the most satisfactory progress by far is to be found in buildings of a domestic character. To better appreciate the decided advancement being made in this direction, it is only necessary to take a glance back at the residential structures of the past, many of which still stand to bear witness to the ruthless manner in which even the most rudimentary principles of architecture were set aside. True, the primitively fashioned homes of the early settlers, had both a simple character and a picturesque quality, and many of the old stone houses which have stood these many years in the Lower Provinces, display at least a constructive consideration that is both admirable and worthy of emulation. The builders of that time made the most of the crude materials and few implements at their command, and in meeting their modest domestic requirements, they gave to their homes and unadorned walls, that simple beauty which is obtained by rugged materials, elemental lines and good proportion.

The good, which characterized the design of the buildings in the early days, however, perished with the generations which followed. There came, as far as Canada was concerned, a period when architecture as an art, was practically lost and its precepts entirely forgotten. It was, especially as regards the character of the homes, a period of striking incompatibility—one in fact, that brought about a condition singularly antithetical, in that the quiet and peaceful life existing within the average interior, gave no indication in the belying and restless lines without. There were, of course, residences of some of the former Governors and a few of the more wealthy and cultured which reflected in a way contemporary architecture abroad; but these were the exceptions. Domestic design in the main, showed evidences of an unrefined and baneful influence. The cottages of the middle class, huddled closely on narrow lots, thrust themselves up with an awkward rigidity, both stoical anl uninviting. Even the better class of homes with their spacious grounds failed to attain a much higher standard, and expressed little either externally or internally which could be dignified by the name of architecture.

It remained for the latter day designers, the architect of the present generation, to establish by carefully considered work, a countervailing influence to curb the unwholesome tendency which prevailed, and to cultivate in the public's mind higher ideals as regards the character and appointment of the home. With their efforts came a truer interpretation of the law of domestic design, a more wholesome appreciation for color scheme and decorations, and a broader consideration as regards aspects and advantages. The change wrought might be termed revolutionary, if one extreme is to be compared with another, but in any event, it made way for a social and economic betterment in our mode of habitation, that was widely at variance with the homely and depressing results of the work which preceded it.

While the "Stylist" may not find to his entire satisfaction an architectural co-ordination in the exterior and interior treatment of the houses designed by the present day architects, yet he cannot deny that there exists a pleasing sense of harmony and a home-like atmosphere that is both appealing and deserving of his unstinted approbation. In this connection it is gratifying to note that a large number of the profession are sufficiently jealous of their reputation, to refuse to carry out work for a client whose interference makes impossible the erection of a dwelling structure consistent with the approved principles of good design. As a consequence, in residential work, an architecture is being achieved that is not only lifting the character of the homes in Canada far above the commonplace, but which is also cultivating in the mind of the lay public a higher appreciation for the aesthetic as regards the character of the home surroundings.

Not that this is to be construed as implying that all is well with our residential work. The reference to the progress made is intended to relate solely to the work which emanates from the architectural offices. A contrast, and admittedly a highly unsatisfactory one, stands out in the productions of the speculative builders, whose houses mimicking one another in extending rows, are abundantly in evidence outside of the more exclusive districts. With these operators, the simple reversal of a general plan usually suffices to establish the required variance or individuality which distinguishes one dwelling structure from another. Thus, if the bay projection is on the right and the verandah on the left in one structure, the opposite is in order with houses that adjoins, and vice versa. Viewed at almost any angle, either architecturally or constructively these houses are sadly out of perspective of the more thoughtfully considered homes. Nothing could possibly more fully point out the necessity of some legalized form of qualification for the men who are entrusted with the designing and erection of our buildings, than this class of work. Architecturally they are bad, and constructively but little better. Commercialism so completely enters into their plan and general make-up, that they barely come within the building regulations and that is all; and the unfortunate owner soon discovers to his sorrow, just how cheaply they have been thrown together.

The greatest hope in this respect lies in the influence which the work of the architects is exerting. Through their efforts the public is being gradually educated up to more lofty ideals, and the people are coming to demand something more conducive to their social and domestic betterment. Perhaps the most encouraging indication to be noted is in the development of certain estates along similar lines to the "Garden Suburb Schemes," that are proving so successful in England. Several of these projects are now being carried out with commendable enterprise by a few progressive real estate firms, but wisely the promoters have placed the laying out of the grounds and the designing of the buildings entirely in the hands of capable architects. As yet these projects have not been sufficiently developed to judge of their ultimate results, but enough has been accomplished to fully demonstrate the advantages of the scheme and more than justify the undertaking. The houses so far erected, have been built with a proper regard to open spaces, vistas, trees and shrubbery. The natural advantages are preserved as much as possible, and where required, formal gardening is employed to add to the attractiveness of the site. In some cases, the prospective owner has the option of selecting a designer other than the one employed, but in all respects the plan must conform to the regulations laid down, and meet with approval of the supervising architect in charge. This is done to avoid the danger of poorly planned and ungainly structures, so that the general scheme may be devoid of any incongruity, by bringing all buildings within proper architectural limitations.

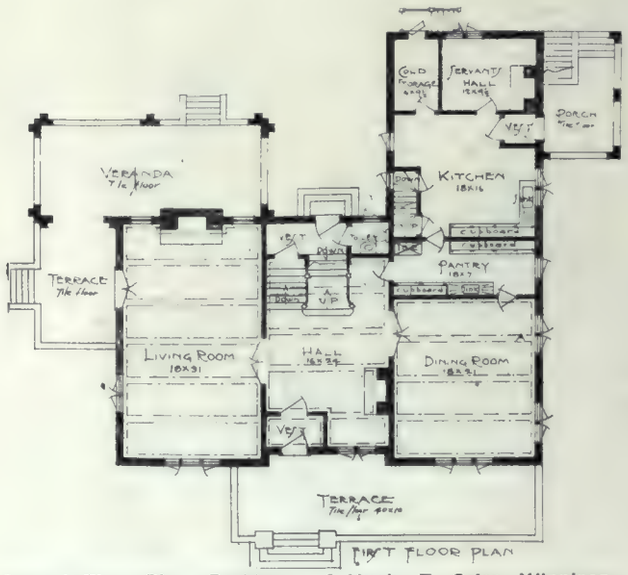
Reception Hall, Residence of Hugh F. Osler, Winnipeg. One of the Distinctive Features of the Interior is the Woodwork—the Species employed Being known as Japanese Sugi. It is a Beautifully Grained Wood finished to Harmonize with the Walls and Ceiling, which are in Stippled Effect of Rusty Brown. Herbert B. Rugh, Architect.

View of Reception Hall, Residence of Hugh F. Osler, as It is Seen from the Living Room. Note the effective Door Panelling, the Large Open Fireplace, and Perfect Consonance of the General Scheme. Herbert B. Rugh, Architect.

Living Room, Residence of Hugh B. Osler, Winnipeg. Low Broad Lines, and Simple Furnishings of Appropriate Design, Combine to make this Room both Restful and Inviting. The Color Scheme is Brown and Gold and the Woodwork is Birch with a Deep Walnut Stain. Herbert B. Rugh, Architect.

Dining Room, Residence of Hugh F. Osler, Winnipeg. Here the Woodwork has a Rich Mahogany Finish, and Blue Predominates the Wall Treatment above the Panelling. In keeping with the Architectural Scheme, Wall Brackets or Sconces are used Instead of Ceiling Fixtures. This Style of Fixture is Also used in the Living Room Illustrated Above. Herbert B. Rugh, Architect.

Altogether there are many signs and material manifestations in the character of recent domestic buildings that are both assuring and promising. Various influences are at work to bring about a more perfect adjustment and make progress possible in this respect. That one of these is the unprecedented commercial and industrial development which is takng place cannot be denied. Gradually the encroachment of modern business houses and manufacturing plants is bringing about the demolition of a large number of commonplace dwellings in the more central districts of the towns and cities. This in itself is giving a strong impetus to the upbuilding of the outlying residential parts and suburbs. But, the principal and most attuning influence by far, which is making itself felt in this direction, lies in the efforts of the architects, who



Ground Floor Plan, Residence of Hugh F. Osler, Winnipeg. Herbert B. Rugh, Architect.

by example of their work, are inculcating in the public a better understanding of the basic principles underlying domestic design.

An idea as to what is being attained in residential work is to be had from the accompanying illustrations, which are described herewith. These houses, represent some of the more recent efforts of a number of prominent designers, and they show both a pleasing consideration in their architectural treatment and an interesting use of various materials. The first subject shown, that of the residences of Hugh F. Osler, Winnipeg, is a most successful home, designed by Architect Herbert B. Rugh, of that city. The construction in this house is particularly interesting in that the walls are built of concrete blocks, veneered with copper color, vitrified brick for the lower portion, and coated with cement plaster above. By adopting this combination and the employment of simple lines, the designer has contrived to obtain both a substantial wall system and a most attractive exterior scheme. The brick work is laid up with 1¼-inch wide raked mortar joints, and the woodwork, with the exception of the window sashes, which are painted white, is finished in brown.

Added interest to the design is given by the terrace across the front with its low brick walls, stone coping, and simple fashioned urns; while a pleasing feature is the modest balcony over the entrance, which is sheltered by the overhang of the central roof, and beautifully balanced by end gables, and the arrangement of the windows. The reception hall, as will be seen by the plans, is an exceptionally large interior with beamed ceiling and dadoed walls. A few well selected pieces of furniture and a large fireplace completes the general scheme. One of the distinctive features of this room, is the woodwork, which is of a species known as Japanese Sugi. It is a beautifully grained wood, finished in a rich brown to harmonize with the upper walls and ceiling, which are stippled in rusty brown. The dining room and living room, also have beamed ceilings. The living room, which takes up the entire space to the right, opens into a larger rear terrace, finished with a tile floor. Here the color scheme is brown and gold, with walnut stained birch wood trimmings. In the dining room the woodwork is finished with a mahogany stain, and above the high panelling is a rich wall paper in which blue is the predominating tone. At the rear is a service pantry, and adjoining this the kitchen and servants' hall. Upstairs there are three large bedrooms, a den, sleeping porch, nursery, dressing room, and bathroom, with ample wardrobe and closet accommodations.

A house, somewhat different in style, which shows a pleasing consideration in its design and internal arrangement, is the residence of H. H. Beck, Clarendon Avenue, Toronto, designed by Architect C. P. Band. It is a red brick and cement stucco house, having direct surfaced walls, and semi-sexagon bay with a half timbered gable above, at the right of the entrance. The roof, which pitches toward the front and back, is constructed of double boarding, having an air space between so as to permit of a free circulation from eaves to outlet at ridge. Entrance to house is by a short flight of stone steps, flanked by low brick walls with stone coping, and sheltered overhead by a simple hood in gable design. A small vestibule gives access to a central hall having a beamed ceiling and high panelled walls with a heavy cap mould running up and over top of door. To the right is the drawing room and dining room, and to the left the library with the main stair-case adjoining; the rear of the floor being entirely occupied by the kitchen and servants' hall. The hall, library and dining room are finished in quarter cut oak. In the dining room, which also has a beamed ceiling, the space between the wall straps is filled with a basket cloth stained a warm crimson tone, the upper portion of the panelling being finished with a simple detailed plate rail with brackets. The woodwork throughout is treated in brown with a wax finish in different shades to suit the decorations of the various rooms. An interesting arrangement is worked out in the upper landing of the stairs, which is extended to form the floor of the con-

First Floor Plan, Residence of Hugh F. Osler, Winnipeg. Herbert B. Rugh, Architect.

servatory and north balcony, situated over the large verandah at the side. The upper floor provides three good sized sleeping chambers, dressing room, sewing room and two spacious bathrooms. There are grouped around the upper hallway and arranged so as to be compact in general plan. A novel feature of the basement plan is a large music and dancing room, which extends across the full width of the house at the front. This is approached by stairs going down off the main hall, the step terminating in a good sized landing, equipped with fixed seat. The woodwork in this room is in Georgia pine, stained brown, with the spaces between the wall straps filled in with a

Residence of H. H. Beck, Clarendon Crescent, Toronto. Both in Design and Situation this house possesses a strong Domestic Interest. The Walls are of Red Brick for the Lower Storey, with Rough Plaster Cement above, the Wood Work and Gable Timbers being painted Brown. Charles P. Band, Architect.

Dining Room. Residence of H. H. Beck, Clarendon Crescent, Toronto. This Interior is Finished in Quarter Cut Oak, with the Panel Spaces Filled in with a Basket Weave Cloth of a Warm Crimson Tone. The Shelve Pieces and Fixtures are in Excellent Taste, and the Treatment in General Results in a Scheme that has Both Individuality and Comfort. Charles P. Band, Architect.

Library, Residence of H. H. Beck, Clarendon Crescent, Toronto. The Ingle Nook with its Small Side Windows and the Built-in Cabinet over the Fireplace are Noteworthy features. Charles P. Band, Architect.

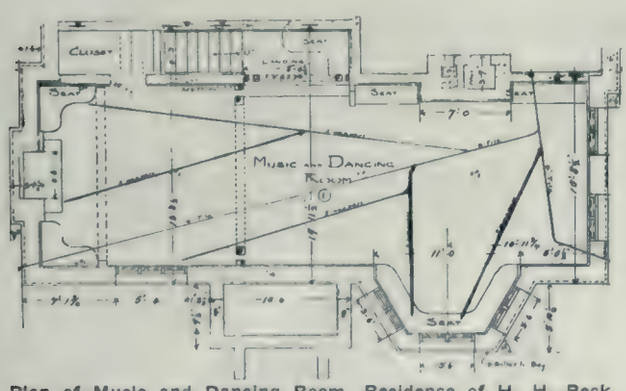
Music and Dancing Room, Residence of H. H. Beck, Clarendon Crescent, Toronto. Extending across the Front of the Basement and Reached by a Staircase off the Entrance Vestibule, this Interior forms a most Novel Feature of the Plan. The Wall Treatment is in Brown Stained Georgia Pine with Burlap Panels of a Golden Shade. An Appropriate Decoration is the Plastic Frieze with Terpsichorean Figures in Low Relief, Depicting the Various Periods and Costumes of the Dance. Chas. P. Band, Architect.

burlap of a golden shade. An appropriate decoration is a plastic wall frieze with Terpsichorean figures in low relief, depicting the various period and costumes of the dance.

"Seven Oaks," the home of Charles H. Fleming, Castle Frank crescent, Toronto, is a delightful residential structure, overlooking one of the prettiest parts of the "Rosedale" Ravine. To borrow the words of its owner, it is essentially a "homey house," and an excellent example of what can be accomplished when the owner, architect, and contractors work in harmony and with pride in their joint production. The treatment in general partakes of the characteristics of the English country house, and nowhere has utility or comfort been sacrificed for the sake of mere appearance. Built of selected rubble stone to the sills of the first floor windows, care was taken by the architects, Messrs. Chadwick and Beckett, to avoid

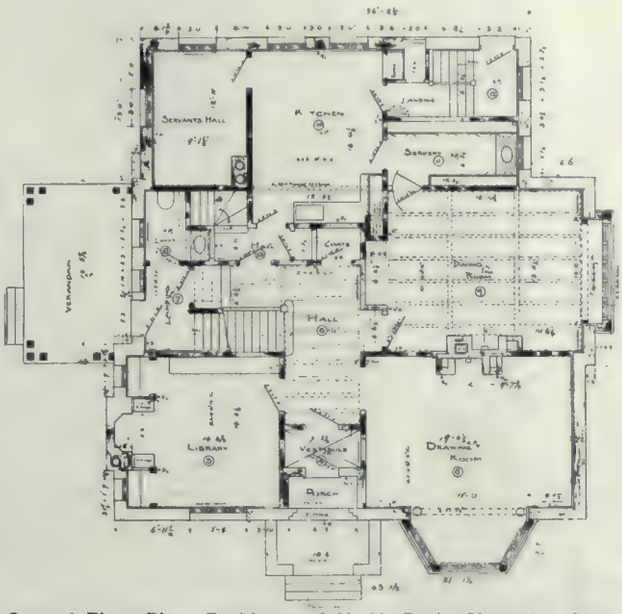
Hall and Staircase, Residence of H. H. Beck, Clarendon Crescent, Toronto. Chas. P. Band, Architect.

the cold grey monotone so often seen in stone houses. A judicious mixture of grey Credit Valley, blue Owen Sound, and water-rusted lake shore stone was employed, and this has produced an effect that is eminently satisfactory in every way. Above the stone work the walls are finished with a warm-grey tinted cement stucco applied directly to a brick background. This results in a most pleasing combination which is effectively set off by the insetting of red tiles in the arches, and a red tile roof



Plan of Music and Dancing Room, Residence of H. H. Beck, Clarendon Crescent, Toronto. Charles P. Band, Architect.

of English shingle pattern. The plan of the house in itself has a number of very excellent features. A roomy porch floored with Welsh quarry tiles is provided at the front entrance, and the terrace has been well carried out



Ground Floor Plan, Residence of H. H. Beck, Clarendon Crescent, Toronto. Charles P. Band, Architect.

so that the steps break at the middle of the red brick walk, instead of being at the porch. The verandah proper, however, is at the south or rear of the house, overlooking the sunken garden and ravine. This is floored with red paving brick, laid on edge in herring-bone pattern, and is reached from the main hall, living or dining room by double French doors, thus making it a familiar part of the house. On the east side is an additional entrance and kitchen yard, together with a garage which it is possible to reach under cover, a convenience in going to the theatre on a wet night. Entering the front door one passes into a roomy vestibule, which has a small hall to the left, from which opens the kitchen, basement and a

First Floor Plan, Residence of H. H. Beck, Clarendon Crescent, Toronto. Charles P. Band, Architect.

two-piece lavatory. Adjoining the main hall is the living room, which is treated in Early English style, with dadoed walls and grey stucco ceilings crossed with heavy beams. A large fireplace built of vitrified crucible brick forms a pleasing feature of this room, while the furniture and general appointments are of a character in keeping with the decorative scheme. The dining room, like-

"Seven Oaks," the Home of Charles H. Flem ng, Castle Frank Crescent, Toronto.—An Exceptionally Noteworthy Residence Which Exhibits a Feeling that is Strongly akin to the Rare Homelike Charm so Characteristic of the English Country House. The Beauties of the Site are Deserving of Especial Note, as are Also the Texture and Treatment of the Walls. The Stone Work, which is Built of Credit Valley, Blue Owen Sound, and Water-Rusted Lake Shore Stone, Lacks the Cold Grey Monotone So Often Seen in Residental Work and Unites with the Red Tile Roof and Verdant Tones of the Ground and Foliage to Make a Most Perfect Domestic Composition. Chadwick and Beckett, Architects.

"Seven Oaks," As It is Seen from the Rear. The View Shows the Sunken Garden and the Arcade Openings and Comfortable Lines of the large South-Fronting Verandah Which Overlooks one of the Prettiest Parts of Rosedale Ravine. The Roof Lines have a Picturesque Quality and the Over-hang of the Eaves a Sheltering Sense that Renders the Whole Both Private and Restful. Chadwick and Beckett, Architects.

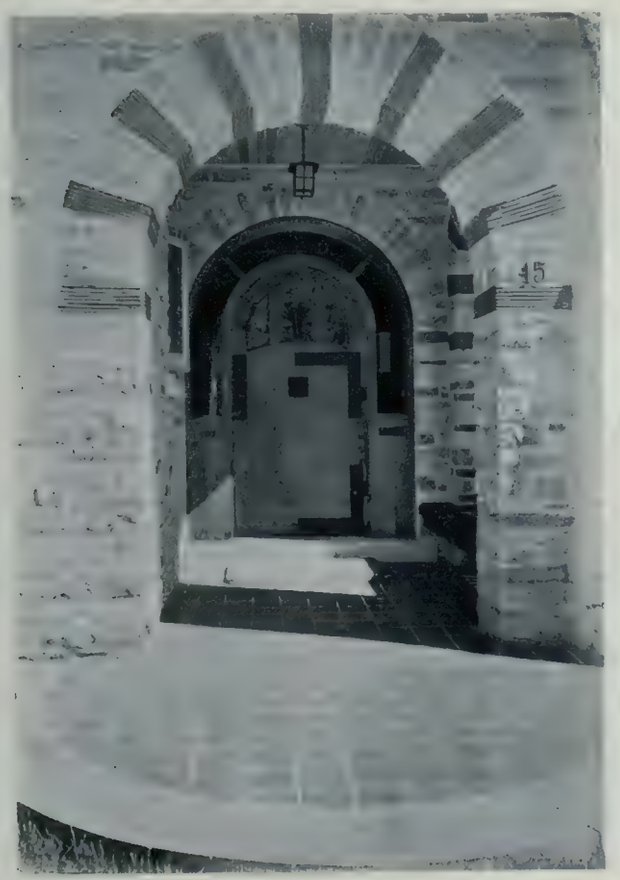
Living Room, Residence of Charles H. Fleming, Castle Frank Crescent, Toronto. Discrimination in the Selection of the Furniture and Decorations, so that every Appointment forms a Component Part of the Architectural Scheme, is Conspicuously Evident in this Interior. The General Treatment is in Early English and the Ceiling is Finished in Grey Stucco. This View Shows the Casement Windows Which Open onto the Large Verandah at the Rear. Chadwick and Beckett, Architects.

View of Same Room, Looking Towards the Front of House. Built-in Conveniences are Found in the Form of Book Shelves and the Fixed Seat which Conforms to the Large Bay Window. The Fireplace is of Vitrified Crucible Brick, and the Lighting Fixtures are Designed to be Consistent with the General Scheme. Chadwick and Beckett, Architects.

Dining Room, Residence of Charles H. Fleming, Castle Frank Crescent, Toronto. The Wall Panels are Done in Silk Paper of a Deep Wine Color, the Woodwork is of Georgia Pine, and the Furniture is Mahogany. The Bay Window Overlooks the Rear Grounds, While to the Right is a Double Door Opening in from the Verandah. Chadwick and Beckett, Architects.

South Bed-Room, Residence of Charles H. Fleming, Castle Frank Crescent, Toronto. Note the Bay Windows with its Old English type Casements. The Draperies and Valance are Old Pompadour Rose and the Wall Decoration a Moss Rose on a Delicately Tinted Background. Chadwick and Beckett, Architects.

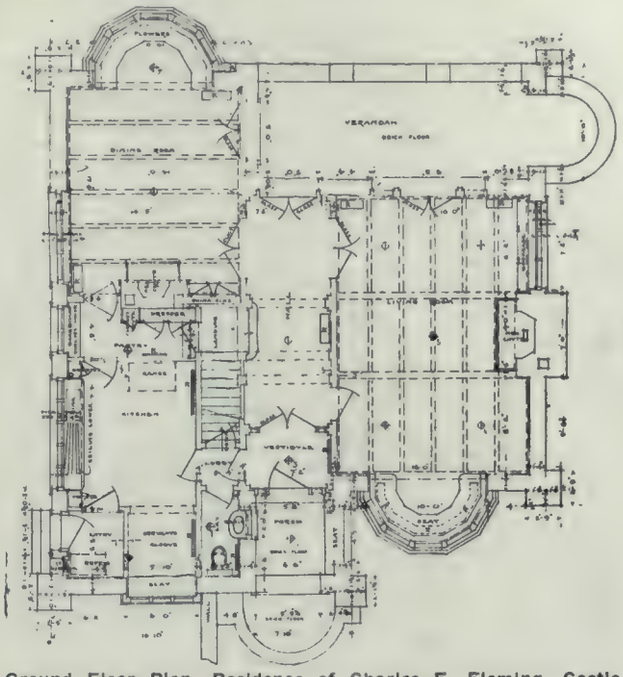
wise beamed and dadoed, opens from the left of the hall, and is furnished with mahogany pieces. Here the woodwork is of Georgia Pine with the spaces between the wall straps filled in with a silk paper of a deep wine color. On the first floor up are four large bedrooms, one of which, a charming south room with moss rose decoration and draperies and valances in old rose pompadour, being particularly attractive. As with the other rooms, this interior is equipped with casement windows of an old English type. Aside from these interiors, there is also a large tiled bathroom equipped with shower, spray and sitz baths in addition to the usual "tub." On the attic floor are two additional bedrooms and a bathroom, and also a good sized storage for trunks. Clothes chutes open from all floors, and there is a telephone from the upper hall to the kitchen. The usual domestic offices are arranged to advantage, and in the basement is a spacious billiard hall which is consistently appointed for the purpose for which it is used. In all, the house contains five fireplaces, window seats are used frequently throughout, and built-in china closets and book-cases are



Entrance Porch, Residence of Charles H. Fleming, Castle Frank Crescent, Toronto. Note the Unusual Design of the Door, and the Unique Insetting of the Red Roof Tiles in the Stone Arches. Chadwick and Beckett, Architects.

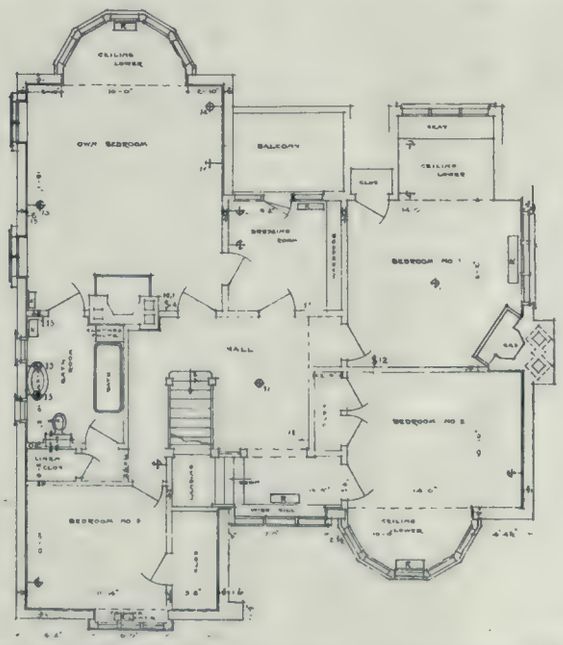
found in the dining and living rooms respectively. The scheme of the grounds in itself is most beautiful. To the west of the lot, there is a large tennis lawn; while to the south, gravel paths winding round the side of the ravine, give access to the beds holding roses and old-fashioned hardy flowers, such as peonies, larkspur, snapdragon, monkshood, Canterbury bells, and foxgloves. One of the paths lead through a pergola, where climbing roses have been planted. This feature may be seen in one of the accompanying illustrations.

The home of Henry Baird, Heath street, Toronto, is a recent adaptation in Colonial design by the same architects. Much of the "sameness" which characterizes so many Colonial homes is strikingly absent in this charmingly considered house. This is due partly to the beautiful poise of its architectural lines, and again to the chasteness of its exterior composition. The walls are built of white brick, on a two foot base of river stone, laid with its natural face and raked at joints; the columns and trimmings are executed in Roman stone, and the shutters are done in a green paint, with roof and dormers



Ground Floor Plan, Residence of Charles F. Fleming, Castle Frank Crescent, Toronto. Chadwick and Beckett, Architects.

stained a corresponding tone. As with most houses of the square type, the plan provides for a roomy arrangement. The entrance porch, which is at the side, opens into a vestibule which in turn gives access to the main hall. The living room and dining, which are separated by the main staircase and a small transverse hall, take up practically the entire space to the right. Both of these in-



First Floor Plan, Residence of Charles H. Fleming, Castle Frank Crescent, Toronto. Chadwick and Beckett, Architects.

teriors, as well as the stair hall, open by French windows on to a large covered verandah, having a brick floor, which overlooks the rear grounds. To the left of the vestibule is the reception room, which has rubbed mahogany woodwork and decorative walls. This is adjoined by a small hall and service entry. The principal rooms and the main hall are finished in white enamel woodwork with wide panelled base, and stucco ceiling and wall

Front View.

Dining Room.

Living Room.

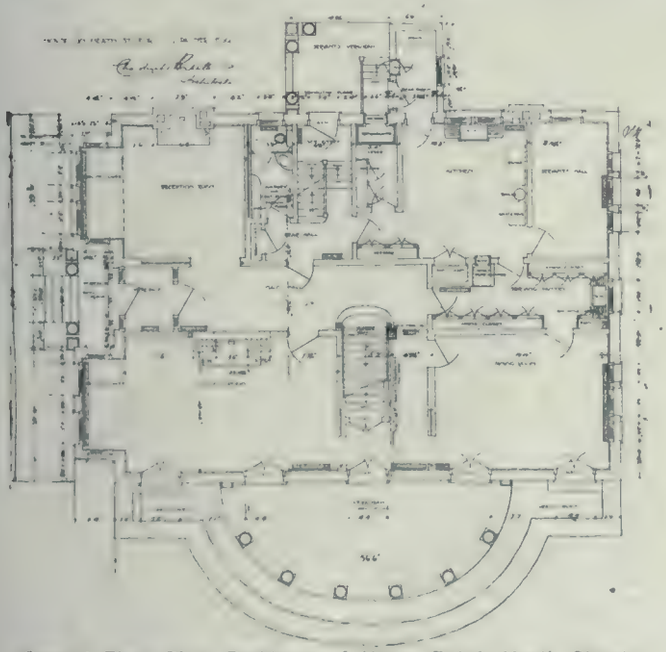
Rear View.

Home of Henry Baird, Heath Street, Toronto. A most Noteworthy Residential Structure in Colonial Design, which both in Architectural Treatment and Exterior Coloring, Admirably Adapts Itself to the Beautiful Grounds which Surrounds it. The Walls are of White Brick, on a Two-Foot Base of River Stone, laid with its Natural Face and Raked Joints; the Shutter and Roof are in Green, [illegible] of Roman Stone. Note the Decorations and Appointment of the Interior as seen in the Views of Living and Dining Rooms. Chadwick & Beckett, Architects.

cornice. The walls of the living room, which has a large buff brick fireplace, are green in tone and those in the dining room treated in crimson. The culinary department and servants' hall occupies the remaining portion of the floor, a large service pantry with built-in cupboards

Staircase, Home of Henry Baird, Heath Street, Toronto. Chadwick & Beckett, Architects.

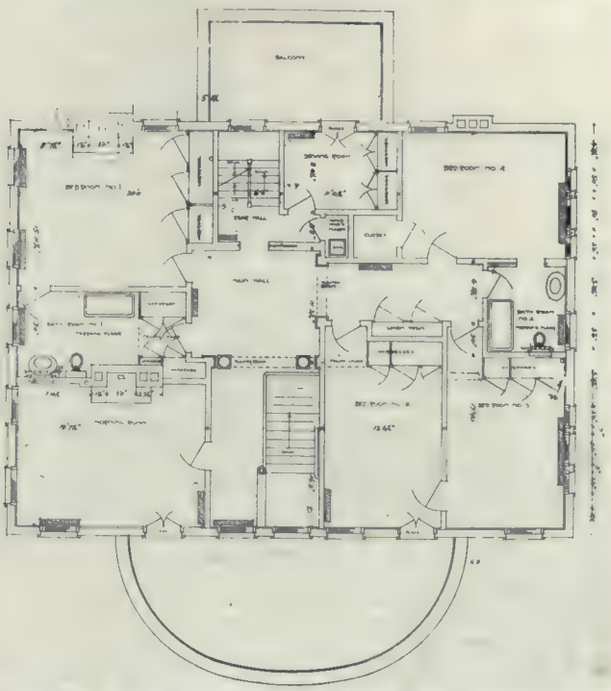
giving convenient service between the kitchen and dining room. The upstairs rooms throughout are finished in white enamelled woodwork with decorated walls and duresco treated ceilings. Large wardrobes are provided



Ground Floor Plan, Residence of Henry Baird, Heath Street, Toronto, Toronto. Chadwick and Beckett, Architects.

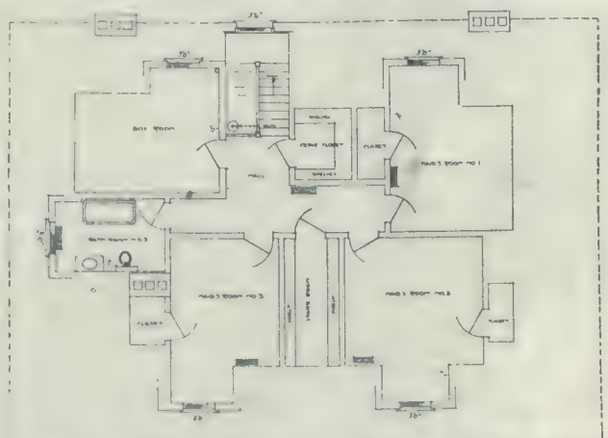
in each bedroom, and these are finished in white enamel to be in keeping with the general scheme.

The residence of Howard Bovell, 50 Western avenue, Toronto, which was also designed by Messrs. Chadwick and Beckett, is an interesting south fronting house in which the main rooms are arranged so as to take advantage of a picturesque ravine, which the site overlooks. As a house located on somewhat exposed grounds, a very appropriate selection is shown in the character of the materials employed. The walls for the lower storey are



First Floor Plan, Residence of Henry Baird, Heath Street, Toronto. Chadwick and Beckett, Architects.

of Fleming Quarry stone, and the upper part and roof are finished in brown stained shingles. The large verandah with its low sheltering roof, making the entrance private in character, is a pleasing feature, as is also the large chimney, which lends a pleasing sense of solidity and comfort to the general scheme. Internally, the house is very compact in plan, all space being utilized to the utmost advantage. The main hall, which forms a continuation of the vestibule, gives direct access to various rooms. The living room, which is situated to the left, is a large interior having a most inviting ingle, built of Ontario paving brick, with hinged seats on either side to



Attic Plan, Residence of Henry Baird, Heath Street, Toronto. Chadwick and Beckett, Architects.

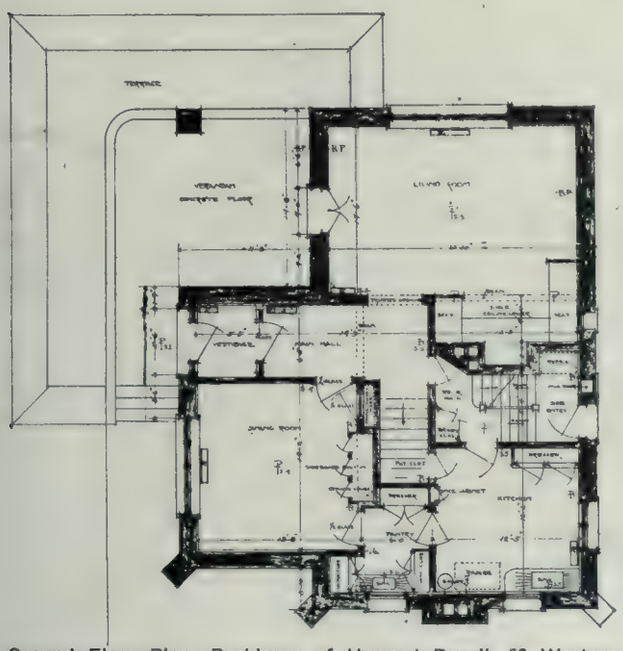
form fuel boxes. Both the living room and the dining room are finished with an orange tinted wall paper and plain stucco freize and ceiling. The latter room has a built-in sideboard, and is conveniently connected by a serving pantry to kitchen, which together with the staircase, takes up the remaining portion of the floor. All the

Residence of Howard Bovell, 50 Western Avenue, Toronto. An Interesting South-Fronting House in Which the Main Rooms are Arranged to Obtain the Advantage of a Picturesque Ravine Which the Site Overlooks. The Lower Walls are of Fleming Quarry Stone, and the Upper Portion and Roof of Brown Stained Shingles. Chadwick and Beckett, Architects.

Living Room Ingle, Residence of Howard Bovell,, Western Avenue, Toronto. Built of Ontario Paving Brick, with Hinged Seats on Either Side to Form Fuel Boxes. Chadwick and Beckett, Architects.

woodwork throughout is of pine with a wax finish in dull brown the treatment being very deceptive and leaving one in doubt as to the exact character of the wood. Upstairs are two large bedrooms, a sewing room, maid's room, and bath room, together with ample wardrobe and closet accommodations.

An attractive small house is seen in the villa residence at 48 Russell Hill road, Toronto, which was designed by Architect F. S. Baker. This house is built on a large piece of wooded ground, sloping rapidly towards the south, to



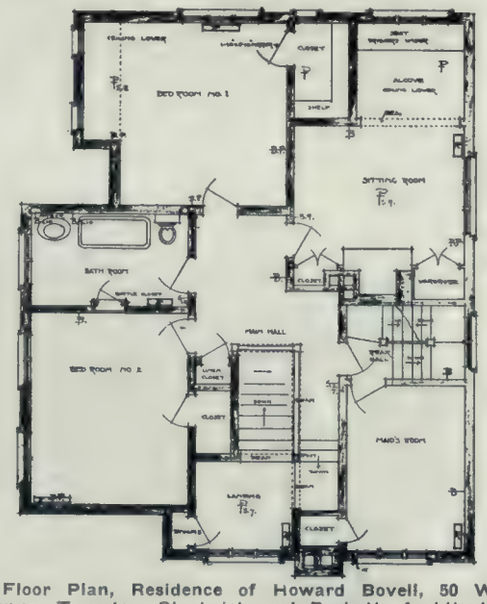
Ground Floor Plan, Residence of Howard Bovell, 50 Western Avenue, Toronto. Chadwick and Beckett, Architects.

which the rustic character of the design particularly adapts itself. The stonework is built 18 inches in thickness, with a promiscuous rubble in mixed grey and brown colors; while the upper portion, in imitation of half timber work, is sheeted on studding, inside and out, the external panels being plastered with a grey cement stucco on metallic lath. In treatment the design is characterized by a pleasing simplicity, the large verandah and balcony suggesting both comfort and hospitality, and the large chimney, which rises to an agreeable height above the green shingled roof, lending dignity and balance to the whole. On the inside is a large hall with the drawing room to the rear, and the dining room and kitchen on the left, both of the latter rooms adjoining each other. An open staircase leads to the upper floor, where two small and one large bedrooms, together with a sitting room and bathroom, are arranged in an interesting manner. The house, which cost $6,000, is heated with hot air, and the woodwork throughout is pine, either stained or plain in finish.

Among the many interesting homes in the Avenue Hill district, Toronto, are several moderate size houses, which also represent the work of Mr. Baker. One of these is the villa residence at No. 52 Poplar Plains road, a grey brick structure which is planned to suit a site with an agreeable outlook both on the east and west. For this reason a good sized verandah has been provided both at the front and rear, the one at the front being enclosed with windows and door of the casement type. In general the design is simple in character, the roof which falls rapidly at the front being broken by a simple dormer and a gable projection having a half-timbered end, which rises at the right. The plan of the house is arranged to provide excellent accommodations. Aside from a vestibule, and a good sized hall adjoined by a coat room and two-piece lavatory, the ground floor has a large living room, dining room and kitchen, all conveniently situated. The dining room has a beamed ceiling, while that of the living room is strapped, the latter interior also having a large open fireplace. On the first floor are four bedrooms, a sewing room, and two bathrooms, all grouped around a central hall. All the floors throughout are in oak and the work is Georgia Pine, the plumbing fixtures, which are of porcelain enamelled iron, being of Canadian manufacture. The cost was about $6,000.

Two other small houses of noteworthy design, by the same author, are the villa residences at 56 and 58 Poplar Plains road, Toronto. The first is a red brick dwelling with a green stained shingle roof and white painted woodwork. In designing this structure an effort has been made to obtain the simplest possible form with the greatest amount of room. The exterior is most direct in its surfacing, the homelike character and individuality of feeling being obtained by a simple bay and window arrangement and a modest, yet interesting entrance. The plan is very compact in its arrangement, the room being disposed so as to reduce as much as possible the household work. The library and dining room, both of which have fireplaces, open on a south verandah overlooking two beautiful parks. On the opposite side of the hall, to the north end of the house, are the dining room and kitchen, connected by a simple devised serving pantry. The upper floor, which is reached by an open staircase opposite the entrance, provides four bedrooms—two of which have fireplaces—together with a dressing room, bathroom and ample closet space. The cost of this house, including the hot air heating, was about $5,500.

The other house (58 Poplar Plains road) forming a neighbor to this structure, is a red brick and cement plas-



First Floor Plan, Residence of Howard Bovell, 50 Western Avenue, Toronto. Chadwick and Beckett, Architects.

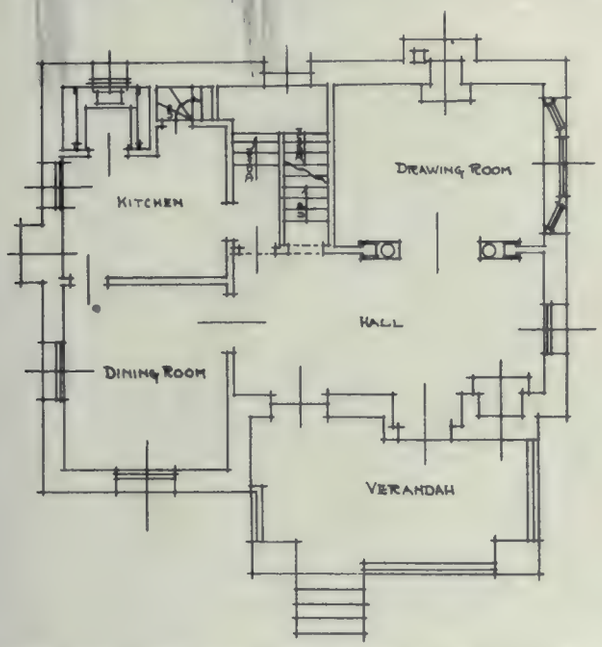
tered residence with a south and east gable and bay arrangement, overhanging eaves, and an interesting roof which sweeps down over a spacious verandah. The stucco panels are of a gray tone, the woodwork painted white, and the shingles left unstained. The plan in general shows a thoughtful consideration both as regards the comfort of the occupants, and convenience in the performance of domestic duties. On the ground floor the vestibule, hall and staircase is arranged to take up the central, with the drawing room at the front and the kitchen and dining room at the rear. Both the drawing room and dining room have large fireplaces. The woodwork is in stained and painted pine, with stained doors throughout. Three bedrooms, two of which have fireplaces, together with a good size hall and bathroom, occupy the upper floor. The heating is done by hot air, and the cost of the house complete is about $5,500.

Another of Mr. Baker's houses is the villa residence at 87 Walmer road, Toronto. This house, which was built at a cost of about $5,000, has been designed in deference to the owner's desire for a residence of simple character,

Villa Residence, 48 Russell Hill Road, Toronto. The Rugged Walls and Half-Timbered Work Brings this House in Full Harmony with the Natural Advantages which the Site Provides. The Stone Terrace with its Series of Short Steps is Noteworthy. F. S. Baker, Architect.

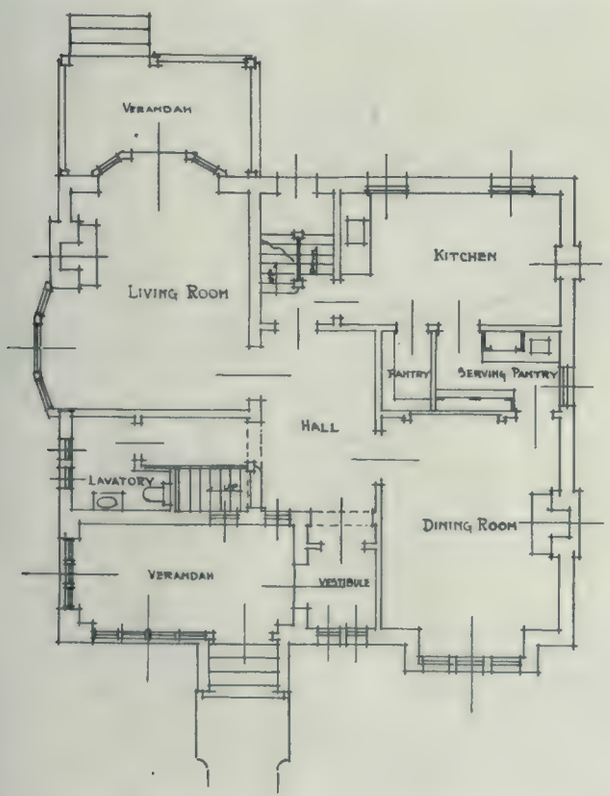
Villa Residence, 52 Popular Plains Road, Toronto. A Moderate Sized Red Brick Dwelling Structure with Interesting Roof Lines, and a Large Glass Enclosed Front Verandah. F. S. Baker, Architect.

providing the necessary conveniences in a space unnecessarily large. The walls are of red brick, the woodwork painted, the panels of the bays plastered with a cement stucco of grey stone, and the shingle of the roof and gable stained in red. On the ground floor are a large drawing room with an open fireplace, a vestibule, hall, dining room and kitchen, the latter two rooms being arranged so as to be in proper relation to each other. All interiors are finished in pine with hardwood floors. On the upper floor



Ground Floor Plan, Villa Residence, 48 Russell Hill Road, Toronto. F. S. Baker, Architect.

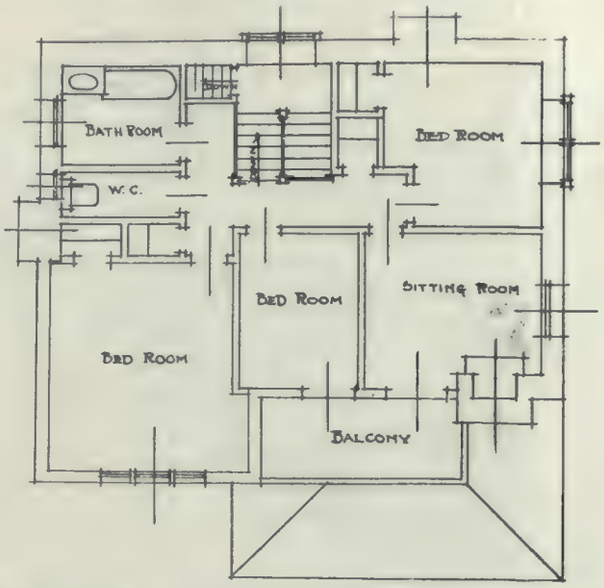
are three large bedrooms, a dressing room and a bathroom, advantageously placed around a good sized hall. As a residence built to come within the limits of a narrow west facing lot, both the design and plan are most commend-



Ground Floor Plan, Villa Residence, 52 Popular Plains Road, Toronto. F. S. Baker, Architect.

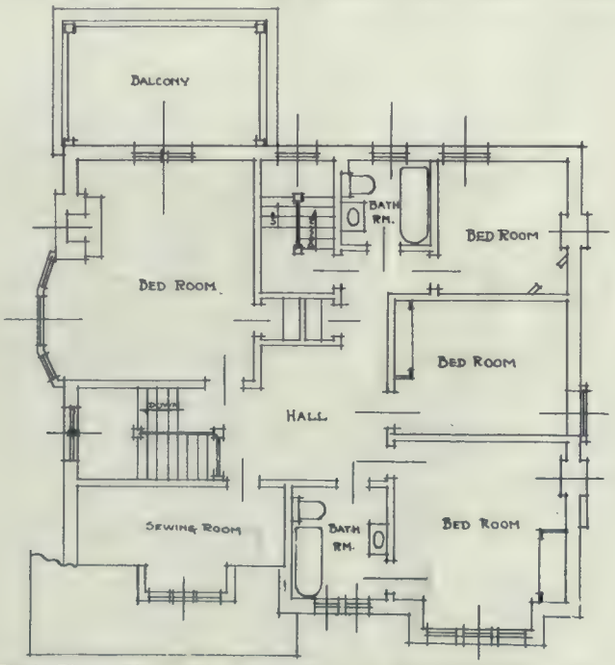
able; the gable projection with its overhanging eaves on the left, and the roof continuing down over the porch giving a highly pleasing effect.

The residence of G. A. Crain, Clenow Avenue, Othomes in and about that city. In this house the square plan has been adopted in that the lot gave no opportuntawa, was designed by Architect C. P. Meredith, who has to his credit a large number of the better designed



First Floor Plan, Villa Residence, 48 Russell Hill Road, Toronto. F. S. Baker, Architect.

ity for an irregular arrangement, and a simple composition and the treatment of the roof and windows have been relied upon to produce an interesting exterior scheme. The walls are of red brick with cut stone trimmings, the wood being painted white and the shut-



First Floor Plan, Villa Residence, 52 Popular Plains Road, Toronto. F. S. Baker, Architect.

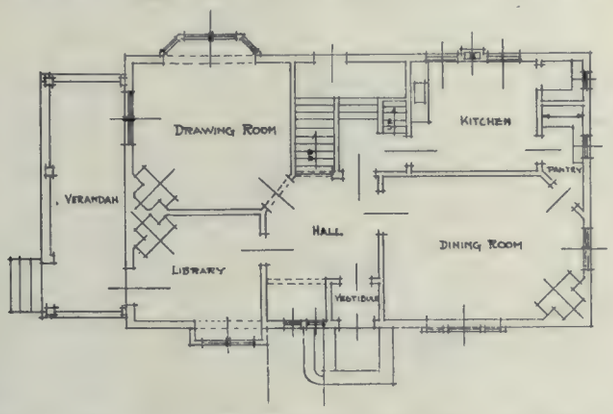
ters green. A most perfect balance is established in the design by the three evenly spaced dormers, and the uniform arrangement of the bay and windows at either side of the entrance. The porch gives access to a good size vestibule, which in turn opens into the hall, taken off transversely to the left, and having an open staircase with a coat room at the rear. To the left on entering is the library, and to the right the drawing room, both of which have large built-in fireplaces, the latter room opening onto a spacious verandah at the side of the house. The rear portion of the floor is taken up by the dining room, having a built-in china closet, and the kitchen, to which it is connected by a large serving pantry. In general the arrangement is compact, the

Villa Residence, 56 Popular Plains Road, Toronto. Note the Direct Lines, the Low Set Roof, and the Treatment of Entrance and Windows, from which this Home-Like Little Structure Derives its Delightful Feeling and Individuality. F. S. Baker, Architect.

Villa Residence, 58 Popular Plains Road, Toronto. This House is Built of Red Brick for the Lower Portion, with Cement Plaster and Shingle Work Above. The Continuation of the Roof Over the Verandah is a Pleasing Feature, while the Picket Fence Across the Front is Exceedingly Appropriate to the Narrow Roadway with its Slow, Gradual Rise, which the House Overlooks. F. S. Baker, Architect.

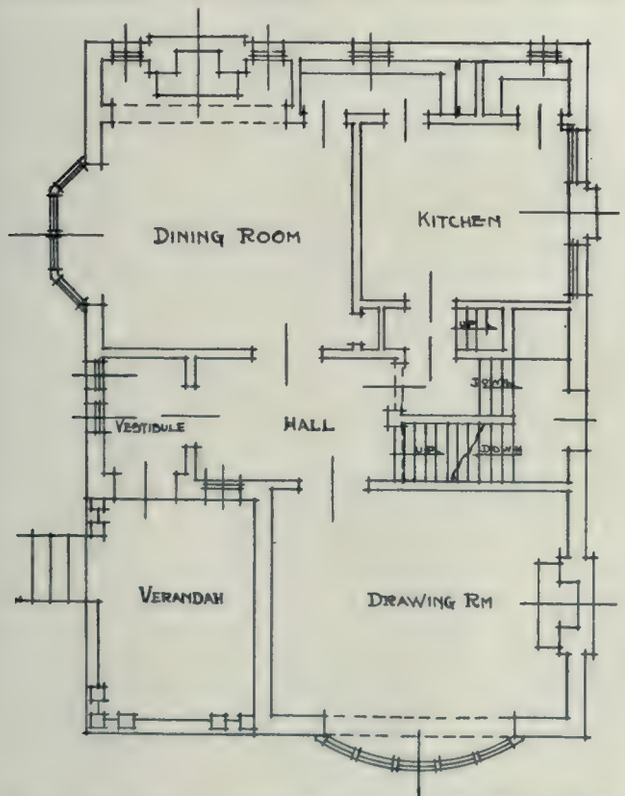
plan providing for roomy interiors, both on this floor and the floors above where there are in all nine well appointed sleeping chambers, together with two bathrooms and excellent closet and wardrobe accommodations.

A considerable contrast in style to the above house is presented in the rectory of the Holy Trinity Church, Pembroke, Ont., which is also an example of Mr. Meredith's work. Here the design is of simple English character, suggesting both solidity and comfort, the



Ground Floor Plan, Villa Residence, 56 Poplar Plains Road, Toronto. F. S. Baker, Architect.

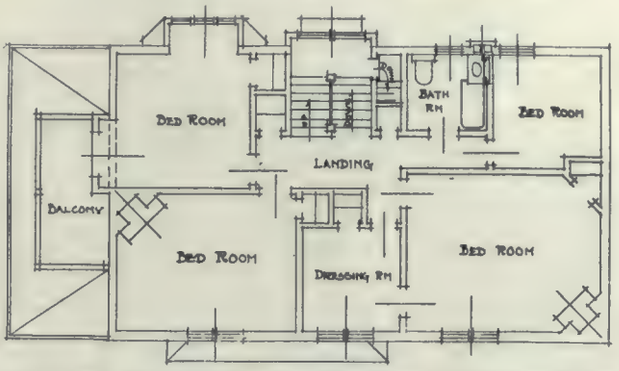
walls being of red brick for the lower story, with half timbered and stucco work above. The arrangement of the interior results in practically a square plan giving very excellent accommodations, and providing on the ground floor a large drawing room, study, dining room and kitchen, the latter two rooms being connected by a convenient servery, which takes up the space back of the staircase. On the upper floors are eight bedrooms



Ground Floor Plan, Villa Residence, 58 Poplar Pla ns Road, Toronto. F. S. Baker, Architect.

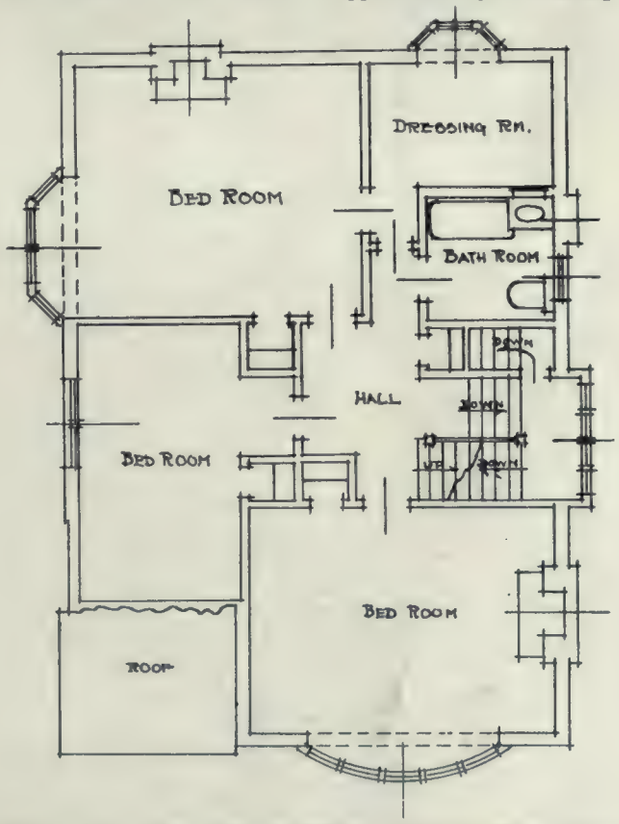
in addition to a dressing room and bath room, all of which are advantageously grouped around large central halls and arranged to have pleasant outside exposures. The study or office is so placed to be convenient to the front entrance, which is very necessary in country rectories to permit the incumbent to attend to his pastoral duties without encroaching upon the privacy of the household. In situation the house is very pleasantly located, the grounds being in an elevated position at the back of the town, affording a splendid view along the Ottawa River.

Another house, although much larger in plan, which shows an interesting use of half timber work and a thoughtful consideration in its general treatment, is the residence of George Robinson, 2 Beaumont Road, To-



First Floor Plan, Villa Residence, 56 Poplar Plains Road, Toronto. F. S. Baker, Architect.

ronto, designed by Architect John M. Lyle. In construction, this house is virtually a brick structure, finished with cement stucco and wall strapping, which renders the exterior particularly attractive. The color scheme of the roof and woodwork is a dark green, with sash and muntin bars in grey white tone, the downpipes being painted in a deep veronese Emerald green. The port cochere at the entrance, approached by a winding



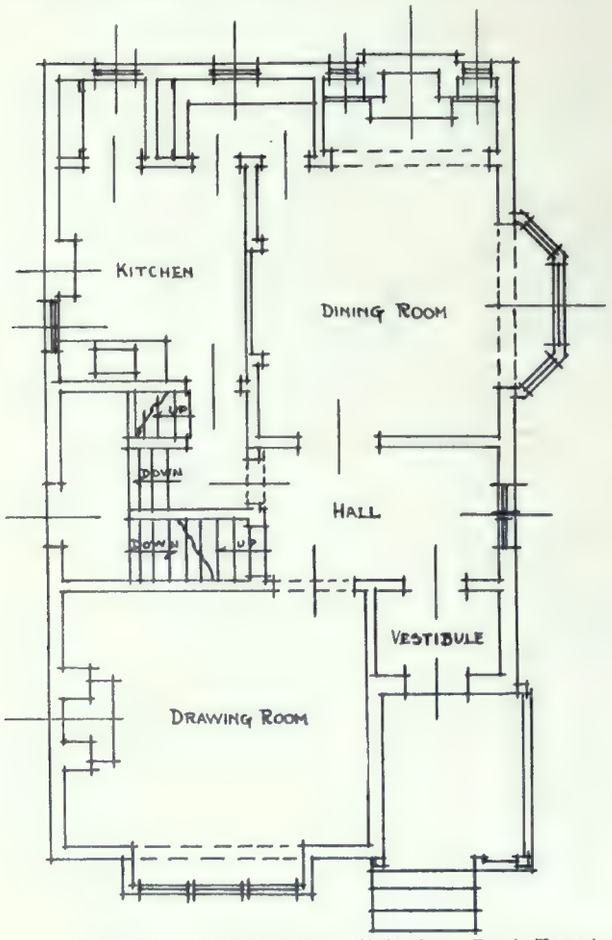
Ground Floor Plan, Villa Residence, 58 Poplar Plains Road, ronto. F. S. Baker, Architect.

driveway, and the two large verandahs, are interesting features, the verandah at the front being arranged so that it can be enclosed in glass during the winter months, and be used as a living room. Inside the entrance is a good size vestibule with a two piece lavatory adjoining, while back of this is a large reception hall having an open staircase with a built-in seat at its side. To the left is the living room, with doors opening onto both verandahs, and to the right the drawing room, which has a bay projection at the front. Another hall taken off to the right and equipped with a modern vault, leads to the kitchen, back staircase, servants' hall, and side entry, where a

large built-in refrigerator is provided. This brings the service department well within itself and removes it

Villa Residence, 87 Walmer Road, Toronto. A Small House of Red Brick Construction With Exceptionally Good Lines and an Effective Bay Window Treatment. F. S. Baker, Architect.

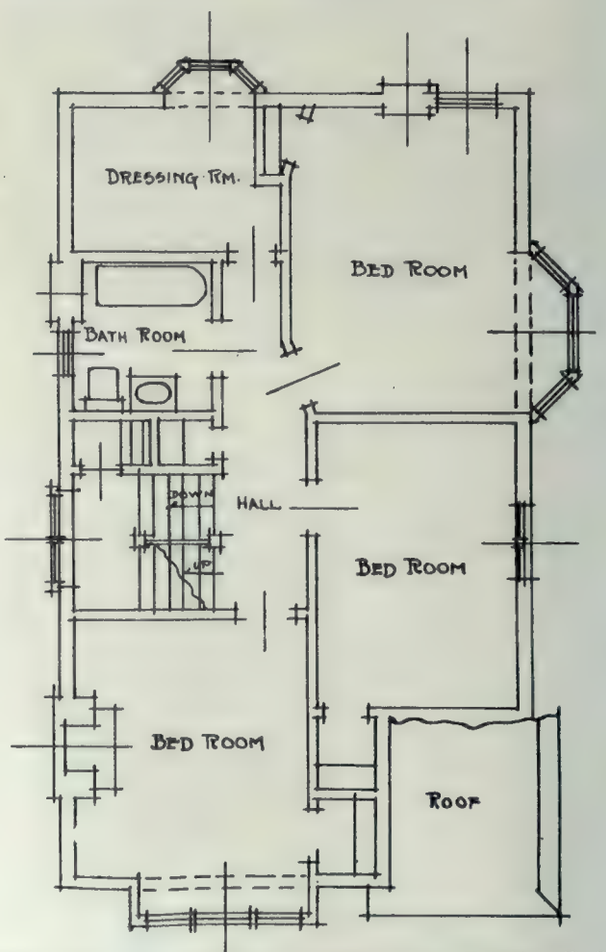
completely from the living rooms. The kitchen, which also has a spacious verandah, is at the rear, with the



Ground Floor Plan, Villa Residence, 87 Walmer Road, Toronto. F. S. Baker, Architect.

dining room to the right at the back of the main hall; the butler's pantry and kitchen pantry being conveniently located behind the two. Both the living room and drawing room have large open fireplaces, and all windows throughout are of casement type. The next floor has six bedrooms, all of which have adjoining bath rooms, in addition to a large central hall, and roomy wardrobes.

That it is possible to obtain domestic charm and individuality of expression in residential design, with direct lines and plain surfaces, is strikingly evident in the home of Hugh S. Stevens, St. Clair Ave., Toronto, designed by the same architect. Though simple in character, the poise of the lines and the color treatment of the walls and the roof makes the exterior scheme extremely attractive. In less skilled hands, than those of Mr. Lyle, the designing of a house so decidedly simple, would invariably prove fatal from an architectural standpoint. Here, however, the perfect symmetry and beautiful balance result in a structure that is both commendable in its scheme and gracing to its site. The walls are of red brick with wide mortar joints for the lower story, while the upper portion is in grayish white stucco on a brick background,



First Floor, Villa Residence, 87 Walmer Road, Toronto. F. S. Baker, Architect.

with a roof of grey-green Vermont slate. The plan of this residence is not shown, but as the exterior indicates, the accommodation provides for a well-arranged and roomy interior.

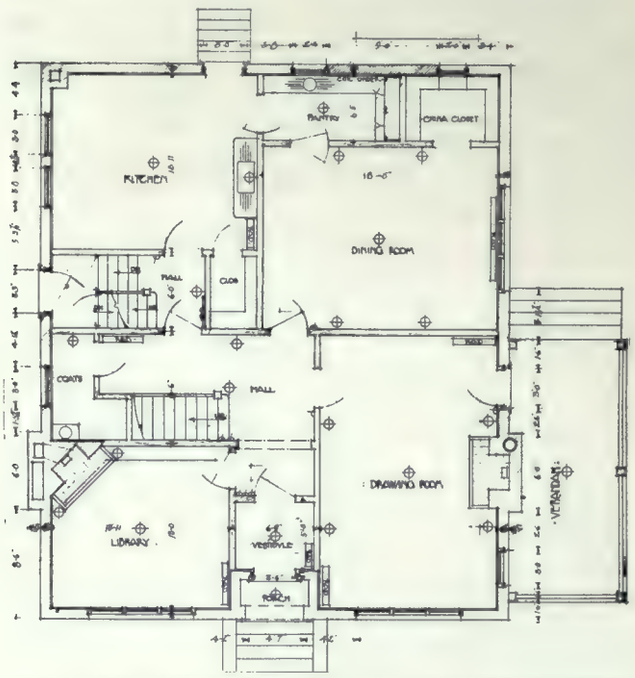
The residence of J. B. McCarter, 56 Chestnut Park Road, Toronto, is a "Rosedale" home with a modern English feeling, commendable lines, and a pleasing dignity. This house, designed by Messrs. Wickson and Gregg, is built of red brick with colored joints and grey stone trimming. A small terrace and hedgerow across the front add interest to the setting, and completes an effect that makes this structure an unusually attractive city residence. The vestibule leads into an interior that is both interesting in its plan and scheme of decoration. Especially can this be said as regards the living room, where

Residence of G. A. Crain, Clemow Avenue, Ottawa. In this House the Square Design has been Adopted as Being Best Suited to Meet the Limitation of a Restricted Lot. The Materials of Composition and the Roof and Window Treatment were Relied Upon to Produce an Interesting Effect. C. P. Meredith, Architect.

Rectory of Holy Trinity Church, Pembroke, Ont. The Red Brick and Half Timbered Treatment give this House a Simple English Feeling. It is very pleasantly situated, being Located on Elevated Grounds, Overlooking the Ottawa River. C. P. Meredith, Architect.

a series of mural paintings depicting landscape scenes, form a panelled freize above a simple detailed plate rail. The walls of this interior are strapped and the woodwork of quarter-cut oak. At the rear is the dining room, and adjoining it on the right, the kitchen. In the reception hall, which is also finished in oak, and has a uniquely panelled wall border, a good sized coat room is provided in the space back of the staircase. The reception room, living room and the dining room which opens onto a large verandah overlooking a rear garden, have bay projections and open fireplaces, as have also three of the floor sleeping chambers on the floor above. In addition to the bedrooms, the latter floor also has a large, modernly appointed bath room, together with roomy closets and a clothes chute connection with the laundry in the basement.

In the home of James Grand, Oriole Road, Toronto, also designed by Messrs. Wickson and Gregg, the plan is devised so as to give all the principal rooms a southern exposure. On this account, the windows at the front are of less importance, and the main chimney is placed at the front, instead of at the side of the house. The exterior composition is in dark red brick with uncolored mortar joints and blue Ohio stone trimmings, the upper portion of the rear wall being finished in a half-timbered and cement stucco effect. Entrance from the main ap-



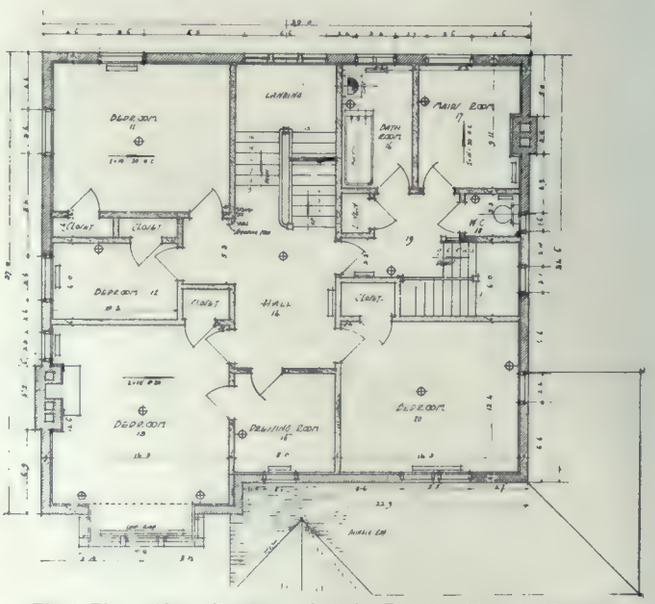
Ground Floor Plan, Residence of G. A. Crain, Clemow Avenue, Ottawa. C. P. Meredith, Architect.

proach is by a simple gabled east porch into a vestibule and a large reception hall having an open fireplace with built-in fixed seats on either side. The living-room is immediately to the left, and adjoining it the dining room, having a beamed ceiling, built-in-buffet, and a south bay. Both of the interior, as well as the large verandah onto which the dining room opens, overlook the rear grounds. A spacious serving pantry forms a convenient passage from the dining-room to the kitchen which together with the rear staircase takes up the remaining portion of the floor. A feature of the upper floor is a large sun room, which occupies the space over the balcony. In addition to this, there are three bedrooms, smoking room and linen closet. Both the east bedroom and smoking room have fireplaces, and a similar feature is also to be found in the living room and dining room on the floor below.

A further example of this firm's work, is the residence of C. F. May, Binscarth Road, Toronto, which was designed particularly to suit a lot with a magnificent view down the Don Valley. In adapting the plan to the site, the windows of the living-room and dining room have been given both the full benefit of the landscape, and the advantages of a southern exposure. The kitchen, under this arrangement, is naturally placed to the front of the house, but being situated in a north-easterly position, it is admirably located without unnecessarily obtruding itself either in the plan or exterior scheme. All the main rooms and the hall on this floor are finished in oak with beamed ceilings, the hall being panelled, and the living

Ground Floor Plan, Rectory of Holy Trinity Church, Pembroke, Ont. C. P. Meredith, Architect.

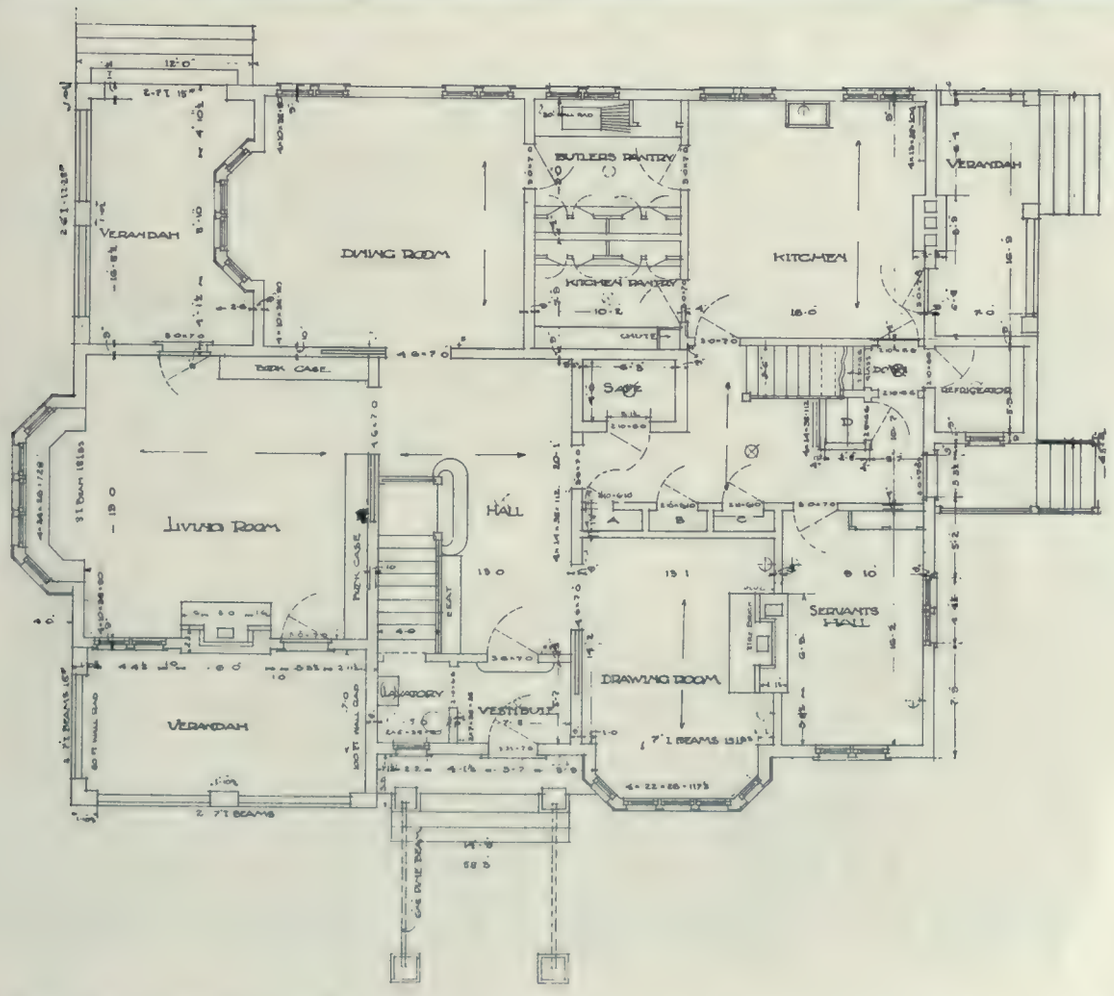
room having heavy timber wall work which is particularly effective. The ingle in the living room is so situated as to afford a pleasing vista of the other interior. Fireplaces are also found in the dining room, and in the reception hall, which is located off the entrance to the right, and has a large deep bay at the front of the house. On the floor above, the general architectural scheme shows a most pleasing consistency throughout. There are four bedrooms, two bathrooms, a sewing room; one of the bedrooms opening into a balcony which forms the upper part



First Floor Plan, Rectory of Holy Trinity Church, Pembroke, Ont. C. P. Meredith, Architect.

of a larger south-west verandah adjoining the living room.

The pair of houses at 6 and 8 Elmsley Place, Toronto, were designed by Mr. Wickson before he and Mr. Gregg entered into partnership. These dwellings were built as



Residence of Mr. George L. Robinson, 2 Beaumont Road, Toronto. In Construction, this Admirable Home is a Half-Timber House with Stucco Finish on Brick. The Roof is Shingled and Stained a Dark Green, which Color Merges to a Deep Grey Green in the Woodwork, with White Painted Sash and Muntin Bars. Splendid Features are the Two Verandahs, the One at the Front of the House Being Arranged so that It Can be Enclosed in Glass and Used as a Living Room During the Winter Months. John M. Lyle, Architect.

Front View, Residence of Hugh S. Stevens, St. Clair Avenue, Deer Park, Toronto. Though Simple in Character, the Poise of the Lines and Color Treatment of Walls and Roof Make the Design of this House Extremely Attractive. The Lower Storey is Built of Deep Red Brick with Wide Mortar Joints, and the Upper Portion is Treated with Greyish White Stucco on Brick, with a Roof of Grey Green Vermont Slate. John M. Lyle, Architect.

Rear View, Residence of Hugh S. Stevens, St. Clair Avenue, Toronto. John M. Lyle, Architect.

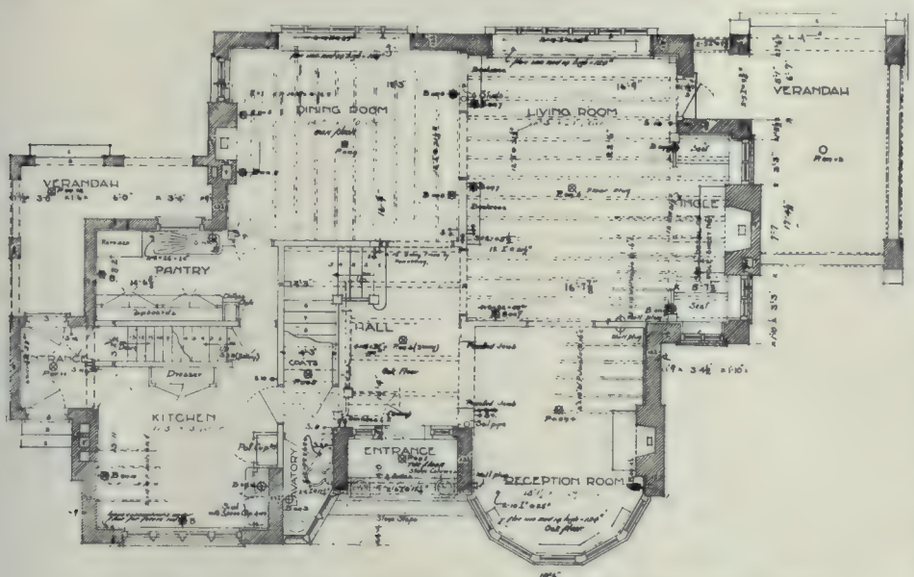
Residence of S. F. May, 81 Binscarth Road, Toronto. Spacious Grounds and a Magnificent View down the Don Valley renders this Attractively designed House Particularly Adapted to the Character of the Site. Wickson and Gregg, Architects.

Hallway, Residence of S. F. May, 81 Binscarth Road, Toronto, Showing the Rich Simplicity of the Oak Panelling and Staircase. Wickson and Gregg, Architect.

Living Room, Residence of S. F. May, 81 Binscarth Road, Toronto. As to What can be Obtained in the Way of a Living Abode by Simple Lines and Good Proportions is Strikingly Demonstrated in the General Treatment of this Interior. Observe the Perfect Consistency which Prevails Throughout. The Timber Work of the Walls is Particularly Effective. Wickson & Gregg, Architects.

Ingle Nook in Living Room, Residence of S. F. May, Toronto. Showing the Brick Fire-place with its Built-in Seats and Atmosphere of Coziness. Wickson & Gregg, Architects.

an investment to suit the better class of tenants, and they are particularly noteworthy as a two family structure, in which varying elevations give each tenant a home that is quite distinct in architectural lines and arrangement from its neighbor, without in any way upsetting the balance of the design. The plan, which is not shown, provides for compact interiors, with good sized rooms, and splendid accommodations in general.

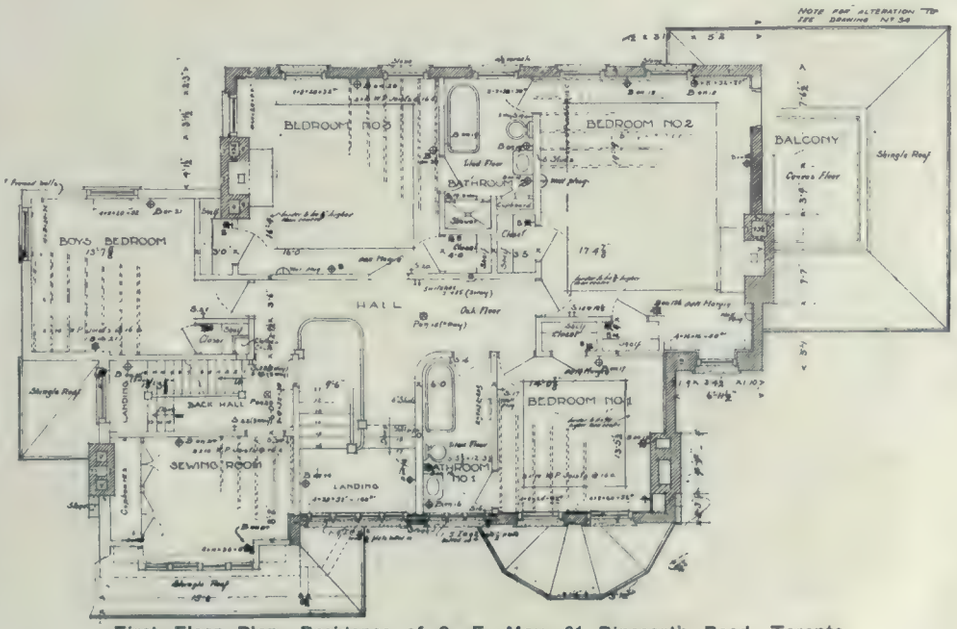


Ground Floor Plan, Residence of S. F. May, 81 Binscarth Road, Toronto. Wickson & Gregg, Architects.

A residence characterized by modern lines is shown in the home of H. Horseman, 185 Crescent Road, Toronto, designed by Architects Ellis and Connery. In this house the walls are of red brick with grey stone trimmings, the roof of slate and the woodwork painted white. The interior in general is very compact in its arrangement, the various rooms being so situated as to obtain the most direct means of communication according to the degree of relationship existing between one interior and the other. The finish throughout is in hardwood; the dining room having a beamed ceiling and dadoed walls, being carried out in oak, and the drawing room in birch with a mahogany stain. Both the drawing room and the library, which is opposite it across the hall, have fireplaces, and another feature of this kind is also to be found at the back of the reception hall. The rear portion of the floor is taken up by the kitchen and a serving pantry, the kitchen opening onto a verandah overlooking a well-kept garden. A convenient feature is a small hoist off the rear passage, which communicates with the basement and the floor above, where there are four sleeping chambers, a sun room and two tiled bath rooms.

Essentially different in its architectural treatment is the residence of George Fensom, of Chestnut Park Road, Toronto, a recent adaptation in domestic design by the same architects, which affords an interesting study in direct lines, plain surfaces and simple detail. The walls are of a dark purplish brown brick, with white mortar joints and white painted woodwork, and the roof is of slate. In plan, this house follows an arrangement similar to that of the early Colonial homes, with a large central hall extending practically to the rear, bringing about a complete separation of the living and service rooms, and yet admitting of ready intercommunication throughout the entire interior. The hallway, dining room and library which has dadoed walls and a beamed ceiling, are finished in oak; and the parlor is carried out in a white enamel treatment. In the dining room, the wall scheme is in stucco with a plate rail decoration, and in the parlor and library, which opens into each, there are appropriately designed fireplaces with fixed seats adjoining. Ample pantry and cupboard acommodations, together with a service staircase are conveniently situated in the space between the dining room and kitchen, the latter room also having a large built-in refrigerator with an ice door at the end of the verandah which adjoins at the rear of the house. On the bed room floor the finish throughout is in white enamel, the plan providing for three sleeping chambers, a sitting room and bath room, together with a good size hall and rear balcony.

A decidedly noteworthy residence, both as regards its architectural lines and general treatment, is the home of F. W. McFarland, 48 Glen road, Toronto, which was built from plans by Architects Bond and Smith. This home was specially designed to fit in with an old elm tree, which stands at the front of its high-terraced site. The walls are built of random coursed ashlar, with cement stucco above, and the shutters and woodwork are painted green. The two short stages of stone steps, overlooked by the bay window, form a most interesting approach, and gives both character and privacy to a delightful, simple setting.



First Floor Plan, Residence of S. F. May, 81 Binscarth Road, Toronto. Wickson & Gregg, Architects.

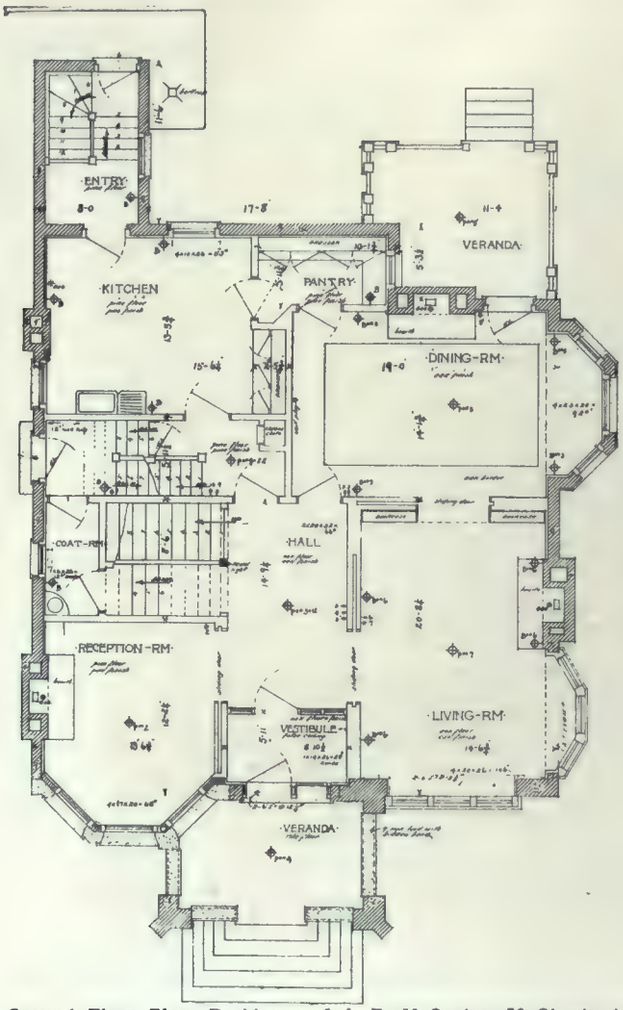
On the interior, both the scheme of rooms and decorations have been very thoroughly considered. A feeling of homelike simplicity pervades throughout. The dining room, which is to the right of the hall, is a quiet and restful interior finished in mahogany, with high panelled walls, brick fireplace, and a plain stucco freize and ceiling.

Residence of J. B. McCarter, 56 Chestnut Park Road, Toronto. A "Rosedale" Home with a Modern English Feeling, Commendable Lines and a Pleasing Dignity. Wickson and Gregg, Architects.

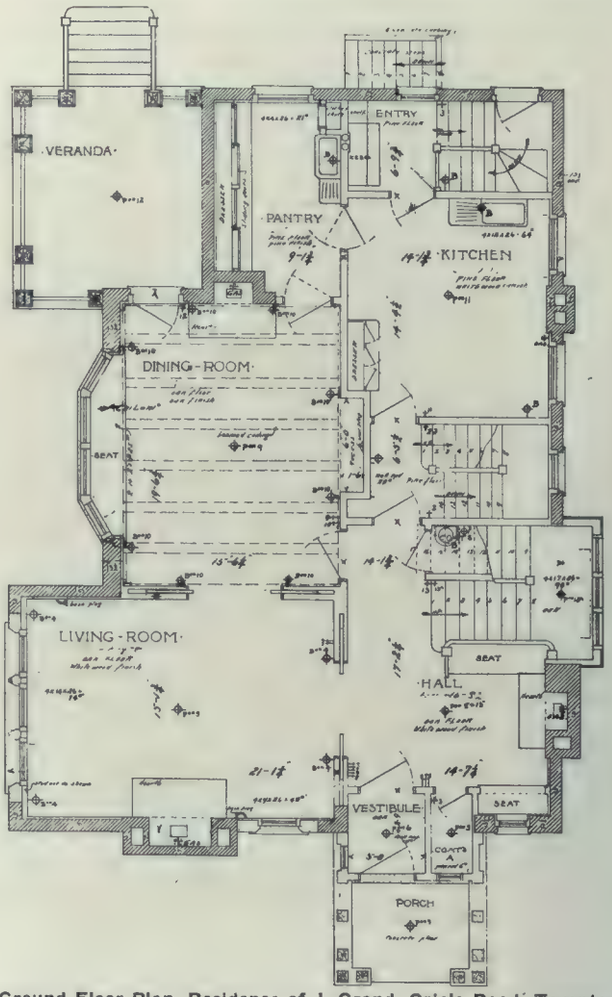
Entrance Hall, Residence of J. B. McCarter, 56 Chestnut Park Road, Toronto, Showing the Uniquely Panelled Wall Border and the Select Character of the Furnishings. Wickson and Gregg, Architects.

Residence of James Grand, 28 Oriole Road, Toron to. This Illustration Shows the Rear or South Elevation, on which Side all Main Rooms Have Been Placed. The Lower Story is of Extra Dark Red Brick, with White Mortar Joints while the Upper Story is of Half Timber and Stucco. Wickson and Gregg, Architects.

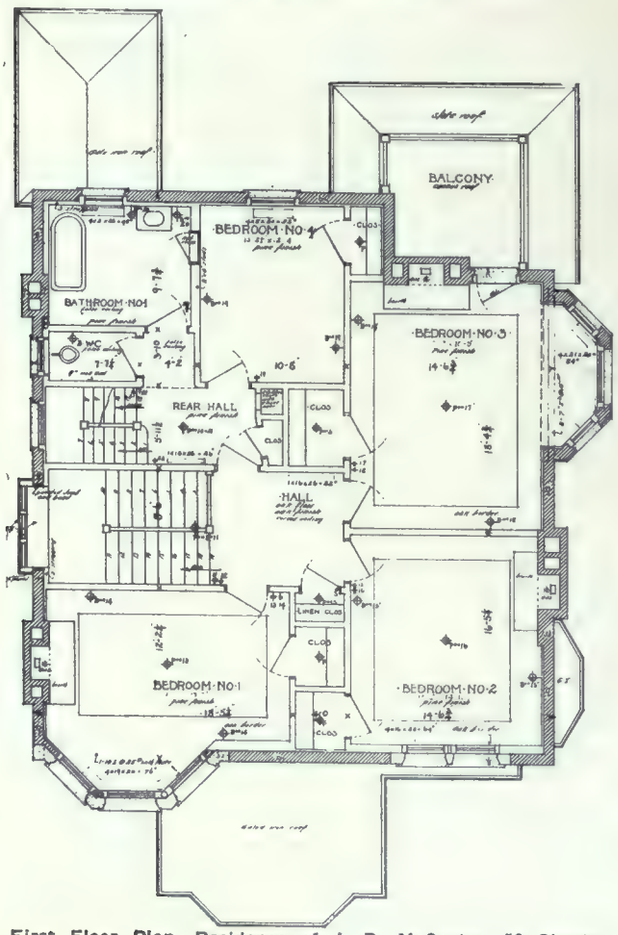
Dining Room, Residence of James Grand, Oriole Road, Toronto, Showing the Treatment of Walls and Ceiling, Together With the Fire Place and Built-in Sideboard. Wickson and Gregg, Architects.



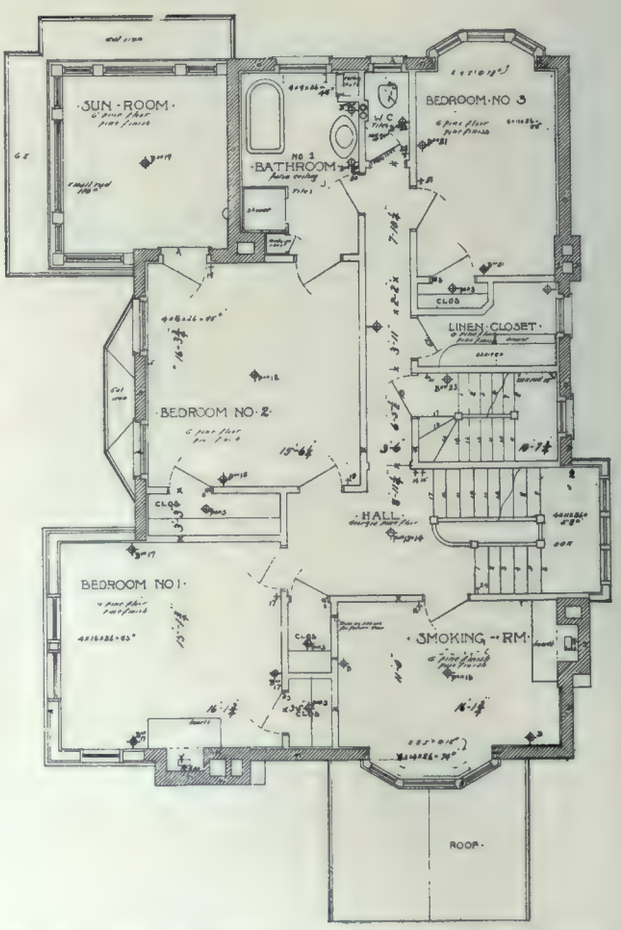
Ground Floor Plan, Residence of J. B. McCarter, 56 Chestnut Park Road, Toronto. Wickson and Gregg, Architects.



Ground Floor Plan, Residence of J. Grand, Oriole Road, Toronto. Wickson and Gregg, Architects.



First Floor Plan, Residence of J. B. McCarter, 56 Chestnut Park Road, Toronto. Wickson and Gregg, Architects.



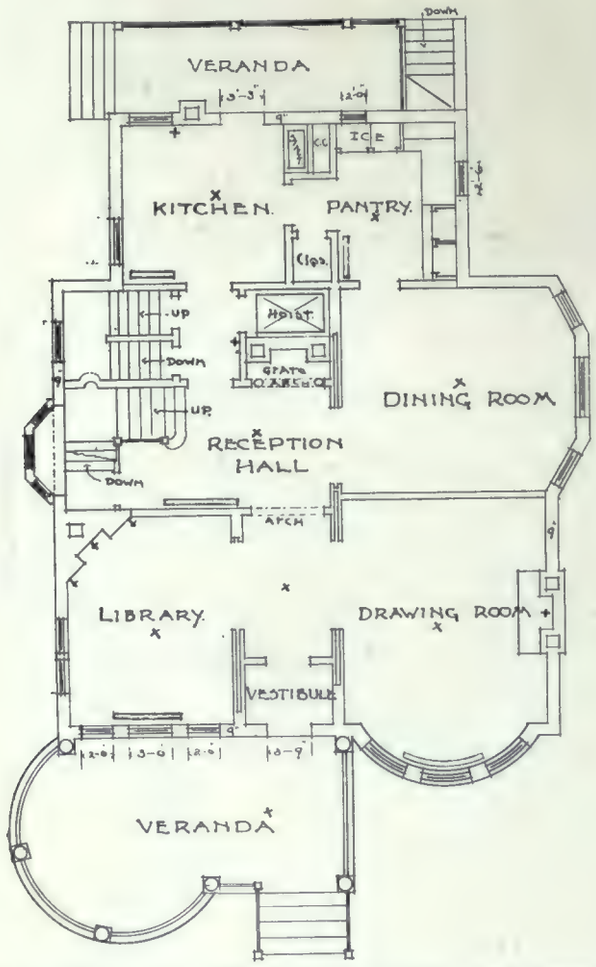
First Floor Plan, Residence of J. Grand, Oriole Road, Toronto. Wickson and Gregg, Architects.

Pair of Houses, 6 and 8 Elmsley Place, Toronto. An Attractively Designed and Well Balanced Two Family Dwelling, in which Varying Elevations give each Tenant a Home that is Quite Distinct in Architectural Lines from its Neighbor. A. Frank Wickson, Architect.

Home of H. Horseman, 185 Crescent Road, Toronto. A Residential Structure Designed along Modern Lines, with Red Brick Walls, Grey Stone Trimmings and White Painted Woodwork. Ellis & Connery, Architects.

Adjoining in a convenient space is a servery, having a built-in table and cupboard, while to the rear is the kitchen with a small entry and basement steps immediately to the back. The arrangement of the main and service staircase effects a considerable saving in floor space in addition to providing a large kitchen pantry and a convenient coat room in the main hall. The living room, which is placed back of the reception room, opens onto a spacious verandah and a rear garden. A feature of this room is a large ingle nook with fixed seats and a Welsh tile floor. The finish here is in oak, with high-panelled walls, plate rail, and beamed ceiling. The upper floor provides for three bedrooms, a dressing room and two bathrooms, together with ample wardrobe and closet space, the rooms being grouped around a central hall and the arrangement in general very compact.

Four other examples of this firm's work which exhibit a pleasing variety, both as regards design and use of materials, are shown in the group of small houses illustrated on page 92. Particularly commendable is the residence of W. B. Brumell, Russell Hill road, Toronto, with its simple but interesting door and patronizing roof line which sweeps gracefully down from a half-timbered gable to the outer extreme of the entrance. In this house the walls

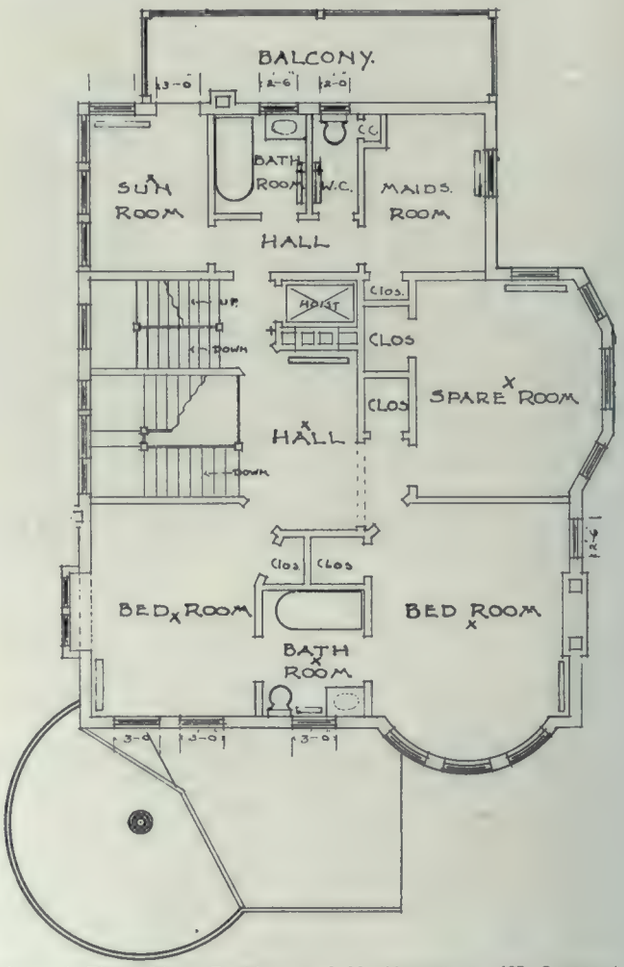


Ground Floor Plan, Residence of H. Horseman, 185 Crescent Road, Toronto. Ellis & Connery, Architects.

are red brick with cement stucco above, and the woodwork is painted white; the direct surfacing and large chimney stack with diagonally placed bays an either side, resulting in a pretty balance and a decidedly effective exterior scheme. Internally the arrangement in general leaves little to be desired, the room being of a good size and the decorative treatment consistent throughout. The hall, which has an open staircase and coat space, is carried out in Flemish oak, while the living room, which is to the right of the vestibule, is finished in wite enamel. Both the latter interior and the den have appropriately treated fireplaces, and in the dining room, which opens into a large back verandah, a built-in cupboard and sideboard forms a convenient feature of the decorative scheme.

The servery connects the dining room and kitchen, the latter being situated in a rear projection and well removed from the other rooms.

The home of W. Carter, Dunvegan road, Toronto, is a small house of what might be termed modern Bungalow design. It is very compact in plan, and the most has been made of the limited floor space available. In order to allow for roomy interior on the ground floor, a combination staircase is employed and very little room is taken



Ground Floor Plan, Residence of H. Horseman, 185 Crescent Road, Toronto. Ellis & Connery, Architects.

up by the hall and vestibule. This arrangement provides for a large living room and dining room, together with a spacious servery, adequate pantry accommodations, and a good-sized kitchen. The living room, which is finished in Flemish oak, is decidedly homelike in its appointments, having a large ingle nook with seats on either side, at one end, and a semi-octagonal bay overlooking the front grounds at the other. On the upper floor, where a similar economy in space has been worked out, there are four bedrooms, each having separate clothes closets, together with a sewing room, den and bathroom. The exterior of the house is of red brick with cement stucco above, and brown stained wood, the simplicity of the design, with its low ridge roof, overhanging eaves, and bay window treatment, producing both individuality and an interesting homelike feeling.

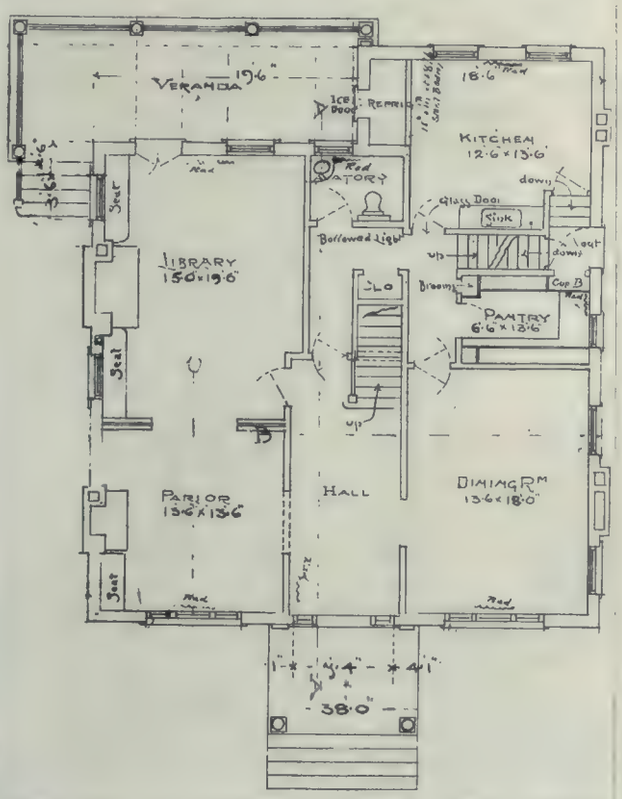
A larger house than the other two is the residence of Mr. J. M. Hedley, 51 Warren road, Toronto. It is an excellently planned house with a direct roof arrangement, and a gable and bay projection breaking the main wall, and giving a simple but interesting character to the exterior. The walls are of red brick, with brown-stained woodwork and half-timbered gables. Opening from the

Home of F. W. McFarland, 48 Glen Road, Toronto. This House with its Random Coursed Ashlar, Cement Stucco Upper Walls and Green Stained Woodwork, was Specially Designed to Fit in with the Old Elm in the Foreground. Bond & Smith, Architects.

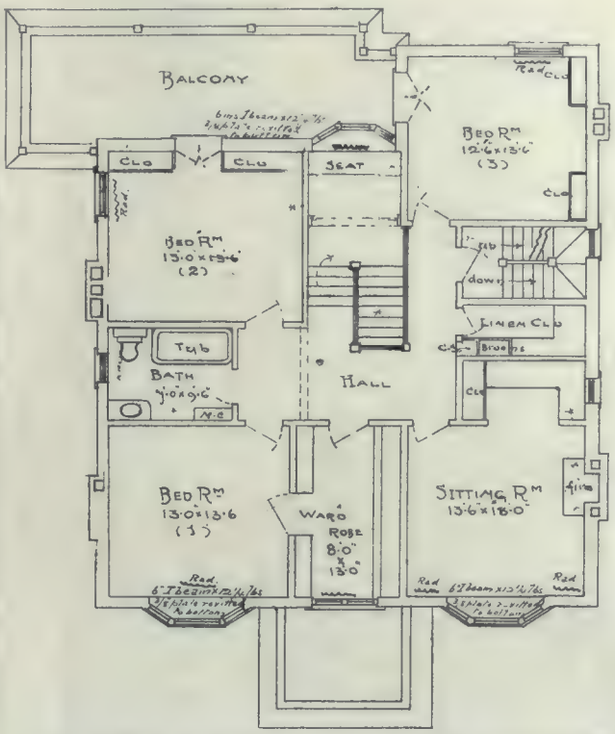
Residence of George Fensom, 84 Chestnut Park Road, Toronto. A House of the Square Type with Dark Purplish Brown Brick Walls, and an Interesting Door and Window Arrangement. Ellis & Connery, Architects.

Library, Residence of George Fensom, 84 Chestnut Park Road, Toronto. Showing the Large Brick Fireplace, Beamed Ceilings and Wall Cornice. Ellis & Connery, Architects.

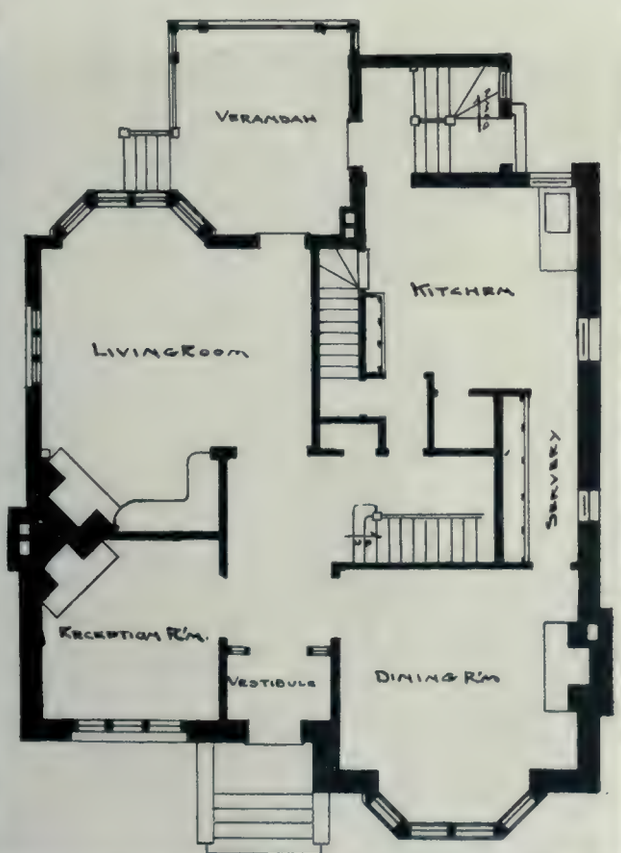
Dining Room, Home of F. W. McFarland, 48 Glen Road, Toronto. A Quiet and Restful Interior, Finished in Mahogany with High Panelled Walls and Stucco Frieze and Ceiling. Bond & Smith, Architects.



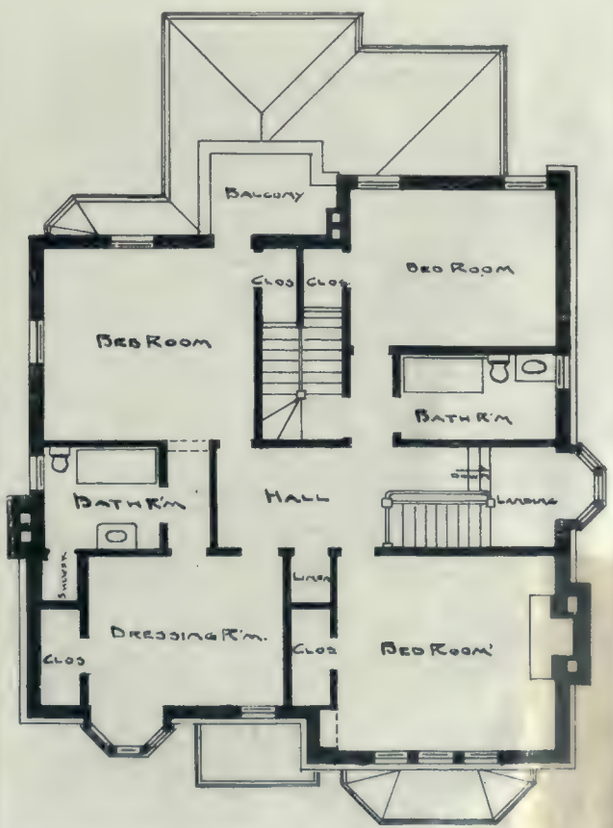
Ground Floor Plan, Residence of George Fensom, Chestnut Park Road, Toronto. Ellis and Connery, Architects.



First Floor Plan, Residence of George Fensom, Chestnut Park Road, Toronto. Ellis and Connery, Architects.



Ground Floor Plan, Home of F. W. McFarland, 48 Glen Road, Toronto. Bond & Smith, Architects.



Ground Floor Plan, Home of F. W. McFarland, 48 Glen Road, Toronto. Bond & Smith, Architects.

Residence of W. B. Brumell, Russell Hill Road.

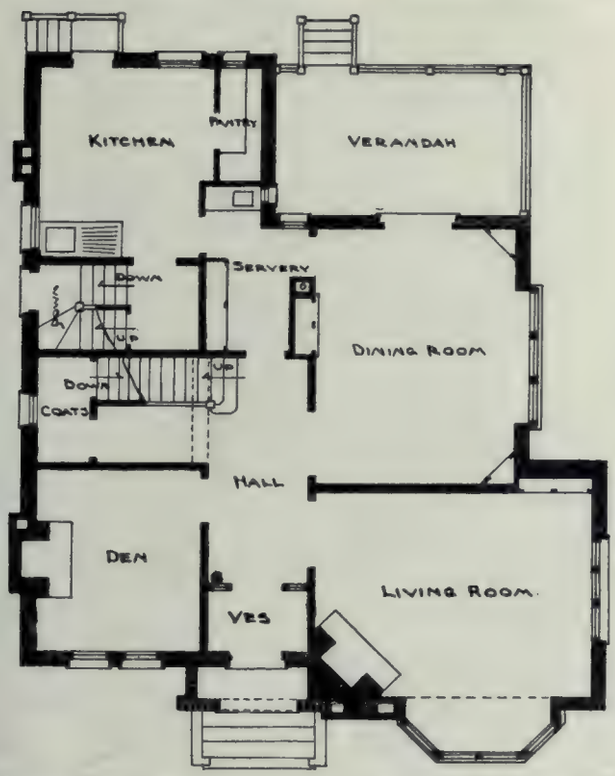
Residence of J. M. Hedley, Warren Road.

Residence of W. Carter, Dunvegan Road.

Residence of J. W. Barry, Balmoral Avenue.

VARIETY IN DOMESTIC DESIGN AND IN THE USE OF CONSTRUCTIVE MATERIALS AS SEEN IN FOUR INTERESTING TORONTO HOMES. BOND AND SMITH, ARCHITECTS.

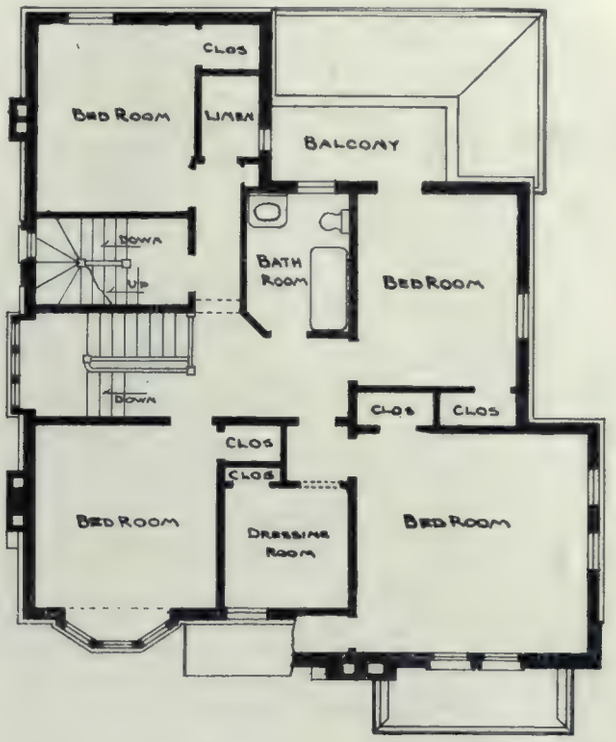
vestibule, the hallway having an open staircase and lavatory at the rear, gives direct access to the various interiors. To the left are living rooms and den, both of which have large open fireplaces and well placed windows.



Ground Floor Plan, Residence of W. B. Brumell, Russell Hill Road, Toronto. Bond and Smith, Architects.

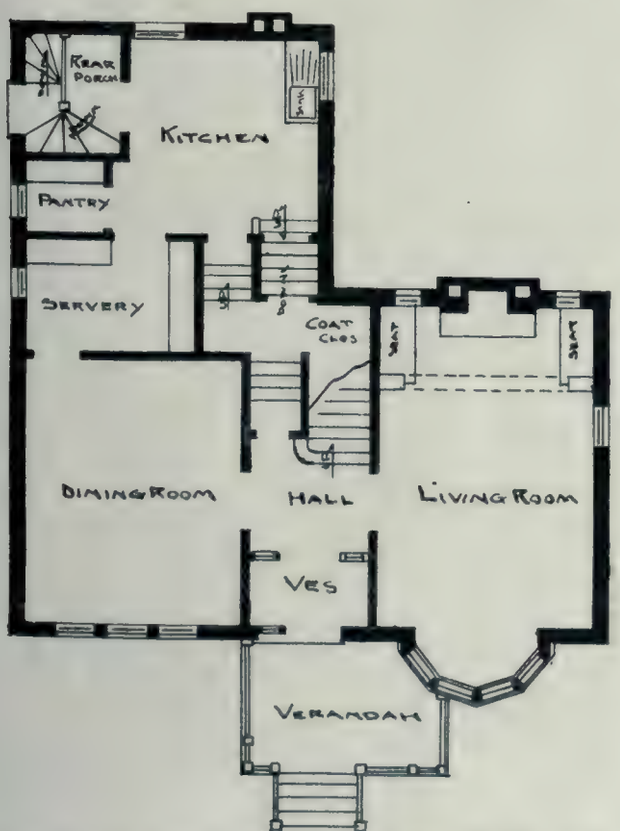
A small passage taken off to the right communicates with the service staircase and kitchen department, the latter being well screened from the road by the large verandah which opens off the side of the dining room at the front of the house. Upstairs, the arrangement provides good sized sleeping chambers, with bathrooms conveniently situated, and all interior having outside exposures.

The residence of J. M. Barry, Balmoral avenue, Toronto, shows an interesting use of red brick, green stained

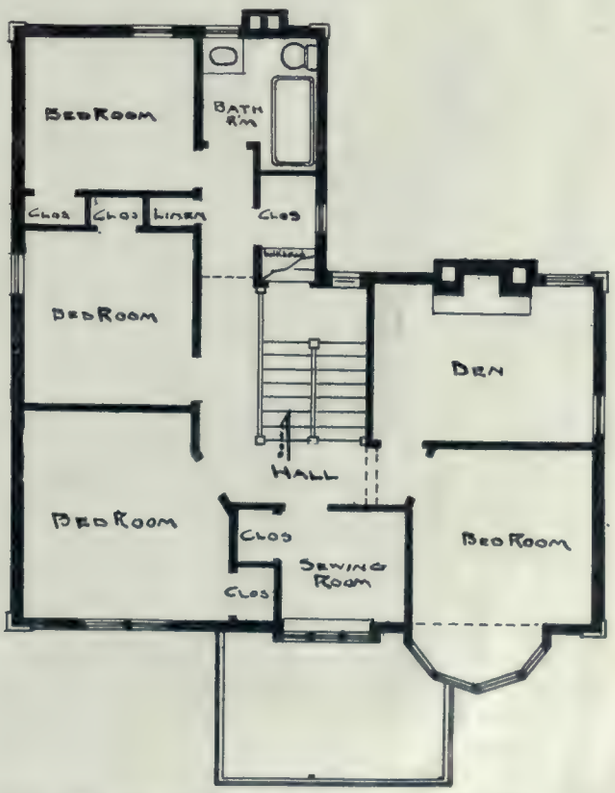


First Floor Plan, Residence of W. B. Brumell, Russell Hill Road, Toronto. Bond and Smith, Architects.

shingles and white painted woodwork. Its many angles, diversified roof lines and over-hanging eaves result in a picturesque quality which gives the exterior an unusually attractive character. A feature of the plan is the spacious hall with its deep ingle having fixed seats in either side. Around this interior the other rooms are conveniently grouped, the dining room and kitchen adjoining

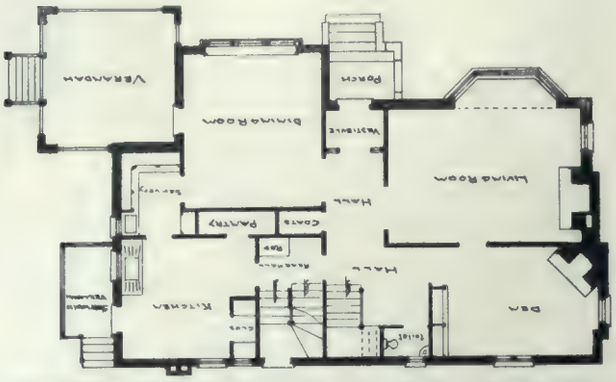


Ground Floor Plan, Residence of W. Carter, Dunvegan Road, Toronto. Bond and Smith, Architects



First Floor Plan, Residence of W. Carter, Dunvegan Road, Toronto. Bond and Smith, Architects.

each other on the right, and the living room taking up the space at the left. An open staircase at the end of the hall communicates with the upper floor, which provides



Ground Floor Plan, Residence of J. M. Hedley, Warren Road, Toronto. Bond and Smith, Architects.

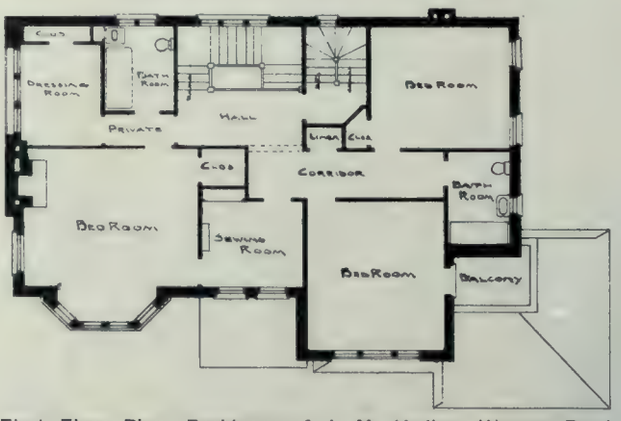
four bedrooms, a large hall, bathroom and closet space. The accommodations in general are most satisfactory, the plan being compact, and the means of communication between one part of the house to another most direct.

In planning a house for a narrow lot, an architect usually finds himself working within limitations which admit of very little latitude as regards design. There are no aspects or natural features to be considered, as a rule, and very often unalterable restrictions which render it difficult to design a residence that is satisfying in its general scheme. However, in the home of C. B. Bounick, 141 Admiral road, Toronto, Messrs. Bond and Smith, have

Ground Floor Plan, Residence of J. W. Barry, Balmoral Avenue, Toronto Bond and Smith, Architects.

produced a very creditable dwelling structure, which nicely adapts itself to a lot having a 40 ft. frontage. Naturally the plan is compact, a noteworthy feature being the fireplaces in the hall and dining room, which are arranged so as to be served by one chimney. The drawing room is finished in white enamel with a cove ceiling, and the dining room, which is beamed, is carried out in Flemish oak. Naturally, the construction is red brick with half-timber gables and bay windows, the roof treatment above the verandah being quite unusual.

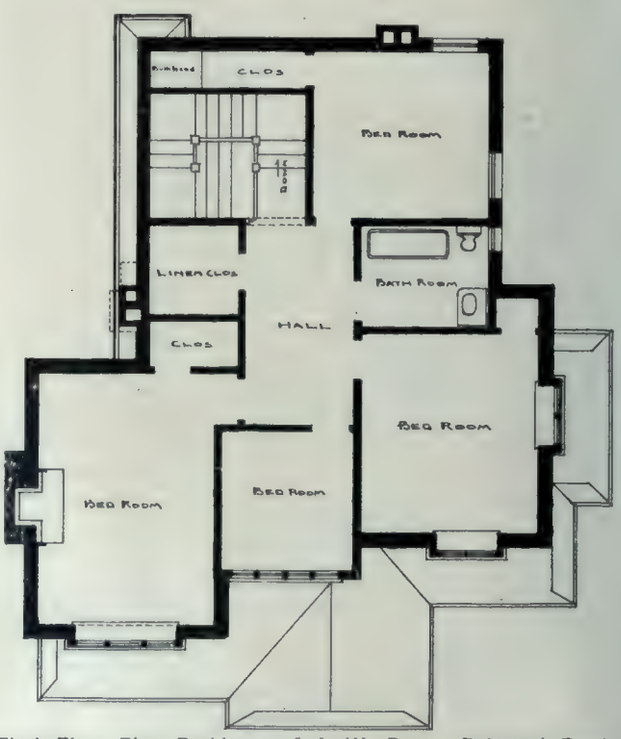
A similarly arranged plan is found in the residence of



First Floor Plan, Residence of J. M. Hedley, Warren Road, Toronto. Bond and Smith, Architects.

C. Charliewood, 83 Dunvegan road, Toronto, which was also designed by these architects; only here the exterior is somewhat different in its lines and construction, the walls being of red brick, with the second story finished in cement stucco.

Much different in situation is the residence of C. Cambie, another Bond and Smith house, located at 34 Poplar Plains road, Toronto. The interest in this house lies in its sheltering eaves and the comfortable verandah which opens off the den and drawing room, at the side. These pleasing features are accentuated by the mass of tree and foliage which the spacious grounds provide. Of special note is the entrance, with its triangular stoop and diagonally placed steps, abutting the dining room bay.

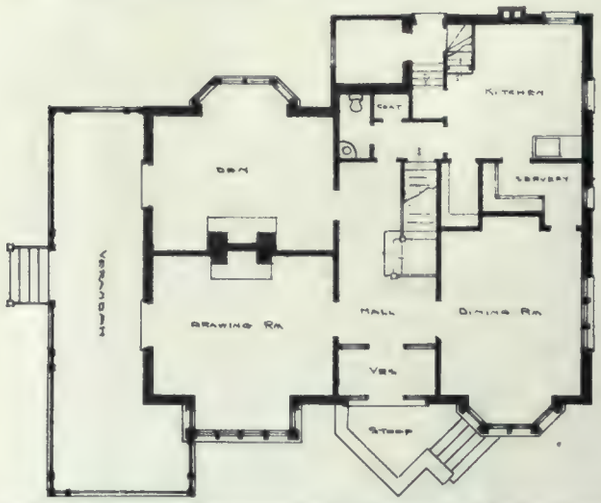


First Floor Plan Residence of J. W. Barry, Balmoral Road, Toronto Bond and Smith, Architects.

The plan in general is most satisfactorily arranged, an economy being worked out in having the fireplaces in den, dining room and main bedroom served by one chimney. The hallway, which is spacious and direct, is finished in hardwood stained a silver grey; the den in Flemish oak, and the drawing room in white enamel. In the dining room the finish is mahogany, with high panelled wall, and a simple stucco freize and ceiling. This gives an

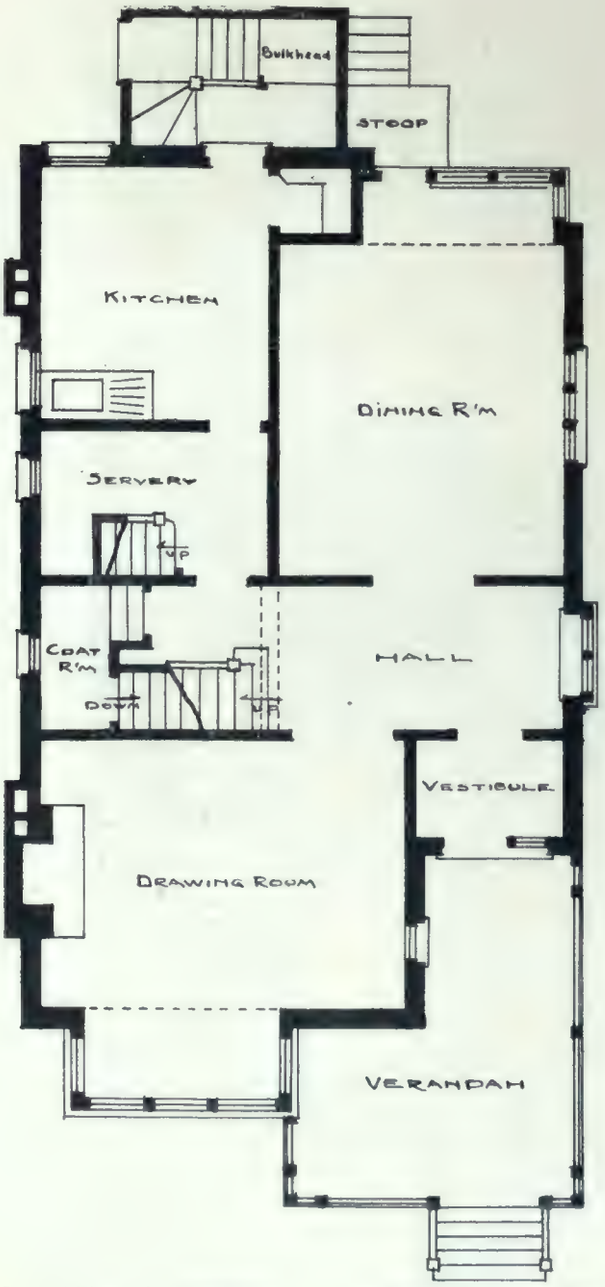
Residence of C. Cambie, 34 Poplar Plains Road, Toro nto. The Interest in this House Lies in the Projecting Eaves, Which Give a Sense of Security, and the Spacious Verandahs, Which Suggest Comfort. These Pleasing Features are Accentuated by the Mass of Trees and Foliage in the Background. Bond and Smith, Architects.

Hallway, Residence of C. Cambie, 34 Poplar Plains Road, Toronto. Finished in Hardwood, Stained a Silver Grey, with harmonizing Wall Treatment. Bond and Smith, Architects.

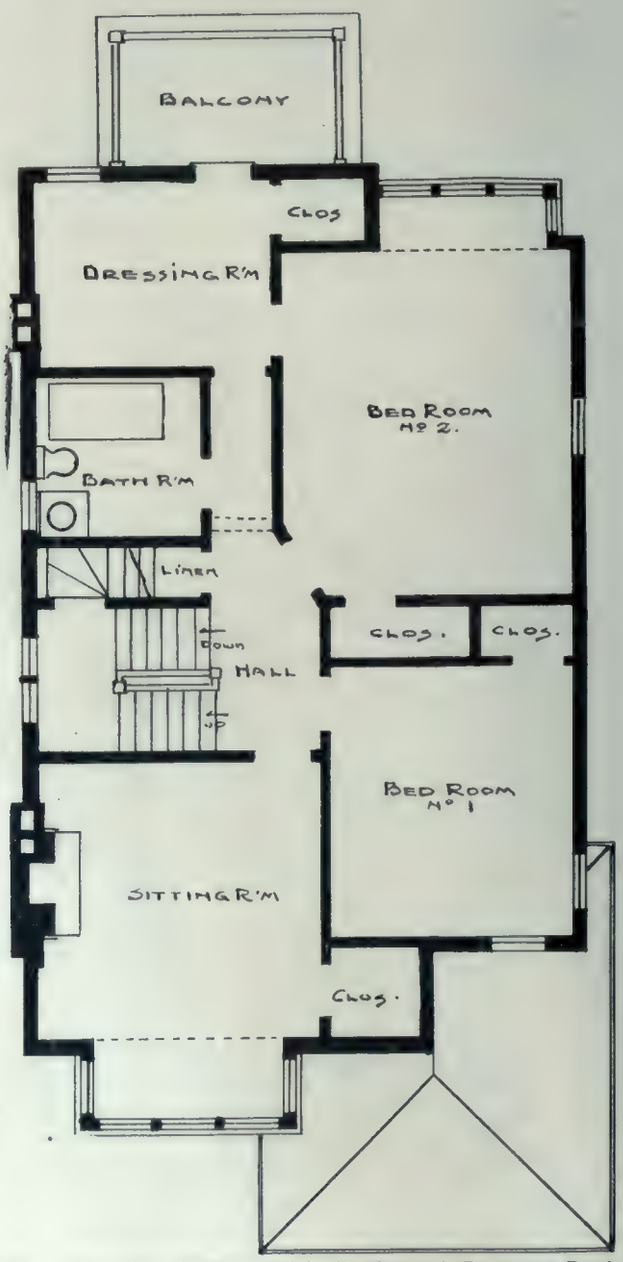


Ground Floor Plan, Residence of C. Cambie, 34 Poplar Plains Road, Toronto. Bond and Smith, Architects.

First Floor Plan. Residence of C. Cambie, 34 Poplar Plains Road, Toronto. Bond and Smith, Architects.



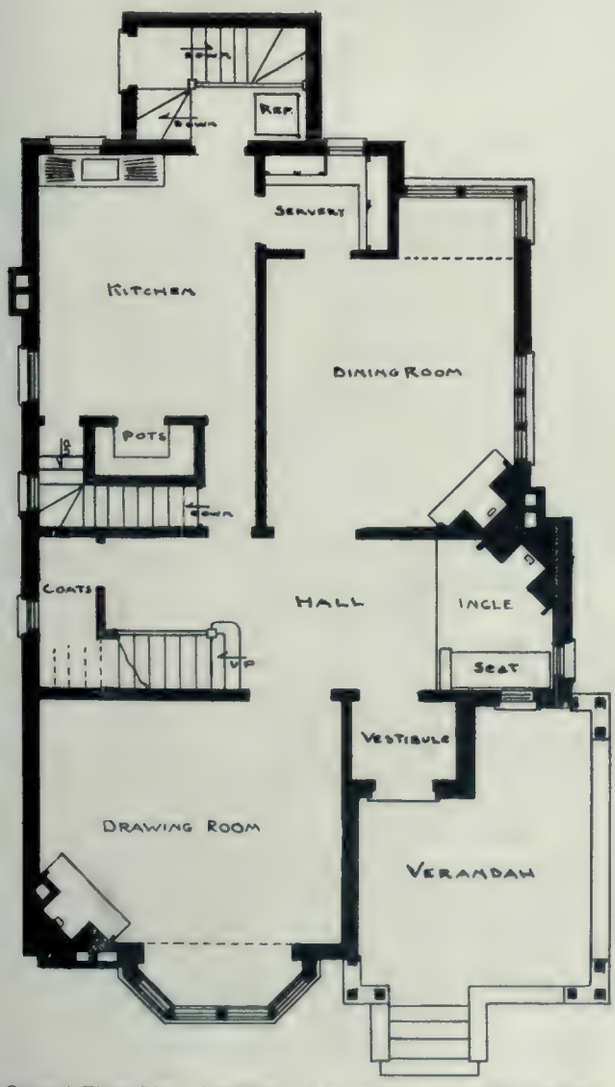
Ground Floor Plan, Residence of C. Charlewood, Dunvegan Road, Toronto. Bond and Smith, Architects.



First Floor Plan, Residence of C. Charlewood, Dunvegan Road, Toronto. Bond and Smith, Architects.

Residence of C. Charlewood, Dunvegan Road, Toronto. Bond and Smith, Architects.

First Floor Plan, Residence of C. Bounick, Admiral Crescent, Toronto. Bond and Smith, Architects



Ground Floor Plan, Residence of C. Bounick, Admiral Crescent, Toronto. Bond and Smith, Architects

Home of C. Bounick, Admiral Crescent, Toronto. Bond and Smith, Architects.

Home of A. W. Taylor, St. Catharines, Ont. Built of Credit Valley Broken Ashlar, with Cement Stucco Above the Second Storey Sills. The Roof is of Slate and the Color of the Woodwork, Brown. Bond and Smith, Architects.

Main Hall, Home of A. W. Taylor, St. Catharines, Ont. This Room is Finished in Hardwood, Stained a Greenish Black, with Golden Yellow Walls and Rich Blue Hangings. Bond and Smith, Architects.

Dining Room, Home of A. W. Taylor, St. Catharines, Ont. Here the Woodwork, Finished in White Enamel, is Effectively Set Off with a Warm Red Frieze Over the High Wall Panelling, and Hangings of a Corresponding Tone. Bond and Smith, Architects.

Billiard Room, Home of A. W. Taylor, St. Catharines, Ont. An Unusual Interior whose Trussed Roof, Stone Fire Place, and Decorations Give it the Appearance of a Hunter's Lodge. Bond and Smith, Architects.

individual decorative scheme to each interior, and yet brings the treatment throughout into perfect harmony.

The residence of A. W. Taylor is an attractive St. Catharines home, which also represents the work of these designers. It is an interesting house both within and without. Here the simple break at the end of the roof, together with the direct gable sweep and rambling line of the verandah shelter, result in an exterior that is particularly effective. The materials used are Credit Valley broken ashlar, with cement stucco above the second storey sills; the roof being of slate and the color of the wood-

Ground Floor Plan, Residence of A. W. Taylor, St. Catnarines, Ont. Bond and Smith, Architects.

work, brown. The plan shows an irregular arrangement that quite removes it from the conventional, and gives the main rooms the benefit of exposures on two or more sides. In the hall is a large ingle with fixed seats and small windows on either side. This interior is finished in hardwood, stained a greenish black, with golden yellow walls and rich blue hangings. In the living room the ceiling is beamed and the walls are panelled in a green stained hardwood with a brown and green frieze above; while in the dining room, the treatment is in white enamel, with high dadoed walls and rich red frieze and hangings. The sun room, which adjoins, is finished to be in accord with the latter room. An unusual interior in its scheme of decoration is the billiard room, which is reached from the main hall. Here the open timber truss of the roof, and the large stone fireplace, together with the Flemish oak woodwork and wall pieces, give an appearance which is strikingly similar to that of a hunter's lodge.

Probably no "period" of architecture has done more for the advancement of domestic design than the Elizabethan era, and possibly no house exhibits a more refining influence, or displays a more pleasing homelike simplicity, than one designed in this style. Successfully adapting this style to modern residential requirements is the firm of Sproatt & Ralph, Toronto, who are conceded by many to be the best authorities on Elizabethan architecture in Canada. An example of their work in this respect is shown in the residence of Eri Whaley, Roxborough street East, Toronto, an admirably designed structure both as regards its exterior character and internal arrangement. The rooms are beautifully proportioned, spacious and well placed; the whole scheme forming an interior that is quiet and restful in its lines and decorative treatment. In that the owner, who is a member of the firm of Whaley and Royce, is closely identified with the musical interests of Canada, the architects have worked out an interesting feature in the plan in the arrangement of the living room and dining room. These rooms open into each other with a two step rise to the latter floor, thus forming one large interior which is eminently suitable for musicales and like entertainments. The walls are panelled in oak, stained a tobacco brown, and the ceiling in the dining room is of beamed type. In the drawing room, the treatment is in white enamel, with the panels filled in with an appropriately designed wall pattern.

One of the most perfect examples of Elizabethan architecture in Canada, if not on the entire Continent, is the Metropolitan parsonage ot the corner of Bond and Shuter streets, Toronto. This building, which was erected by the Massey Estate as a memorial to Anna Vincent Massey, demonstrates the beautiful architectural co-ordination which can be obtained when the carrying out of the general scheme is placed entirely in the hands of the designer. In this particularly instance, every detail of the entire decorative scheme was left solely to the judgement of Messrs. Sproatt and Rolph, the architects, even to the selection of the wall paper, furniture and carpets; and the perfect harmony which exists throughout illustrates fully the advisability of permitting an architect to carry out his scheme in its entirety without being hampered by untrained interference. The exterior walls of the parsonage are built of random course ashlar sandstone with cut Indiana limestone trimmings,

First Floor Plan, Residence of A. W. Taylor, St. Catharines, Ont. Bond and Smith, Architects.

the whole being laid on a solid stone bed. As regard the arrangement of the interior, this is fully explained in the accompanying plan. The entire woodwork of the first floor is in fumed oak, and the furniture throughout is of mahogany, all pieces having beens selected by the architects in the shop of an antiquarian. In the hall, the ceiling is groined and finished with a richly painted linen surface, the wall treatment is in burnt orange, and the carpet is of a special design in a heavy brown Donegal weave. In the study or pastor's office the walls are pan-

Front View.

Drawing Room.

Hall.

Living Room and Dining Room.

Residence of Eri Whaley, Roxborough Street East, Toronto. A Modern House with an Elizabethan Exterior. A Feature of the Plan is the Living Room and Dining Room, Which are Arranged to Open Into Each Other, so as to Form One Large Interior Suitable for Musicales and Like Entertainments. Sproatt and Rolph, Architects.

Front View.

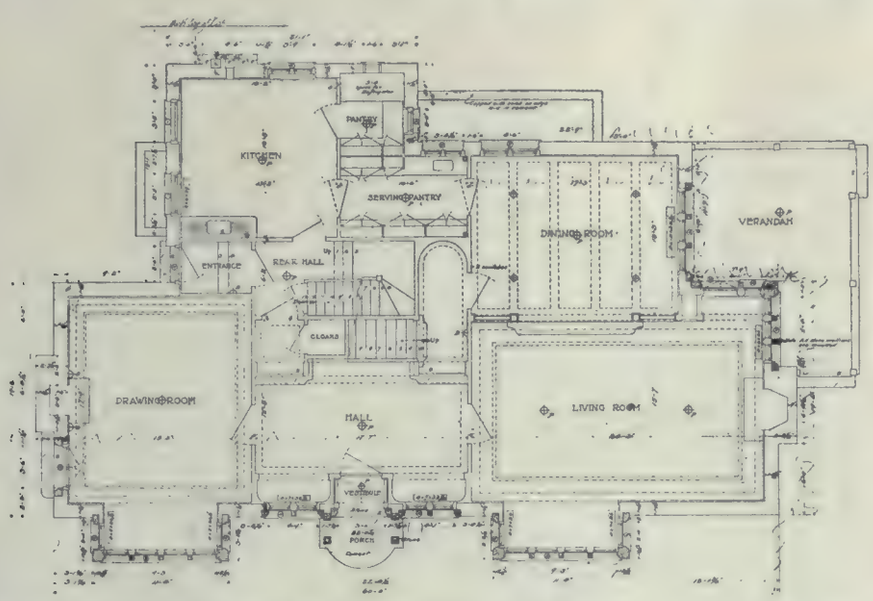
Library.

Hall

Dining Room.

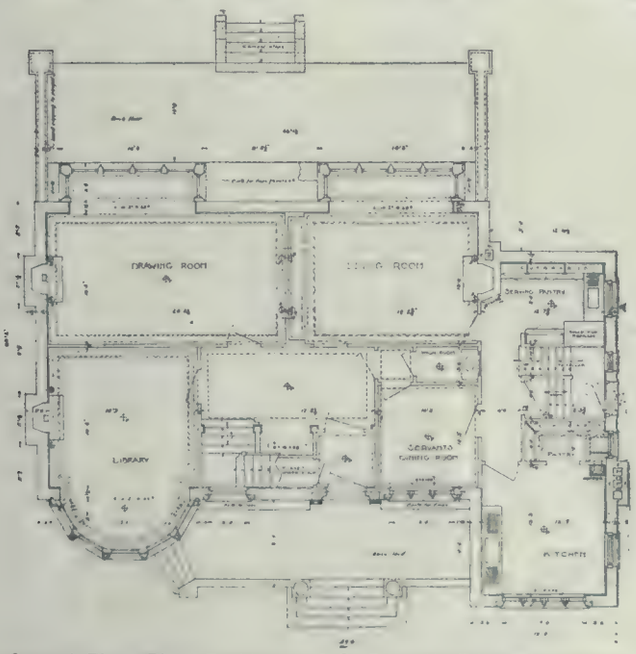
Residence of G. Burnett, Edmund Avenue, Toronto. Built of Red Brick with Stone Trimmings Around Bays and Windows. The Roof is Slate and Other Window Sashes are in White With Green Painted Upper Shutters. Sproatt and Rolph, Architects.

elled in green leather with a gold embossed border, the ceiling being of cream, painted on linen. Here a convenient feature is formed by a large built-in bookcase



Ground Floor Plan, Residence of Eri Whaley, Roxborough Street East, Toronto. Sproatt and Rolph, Architects.

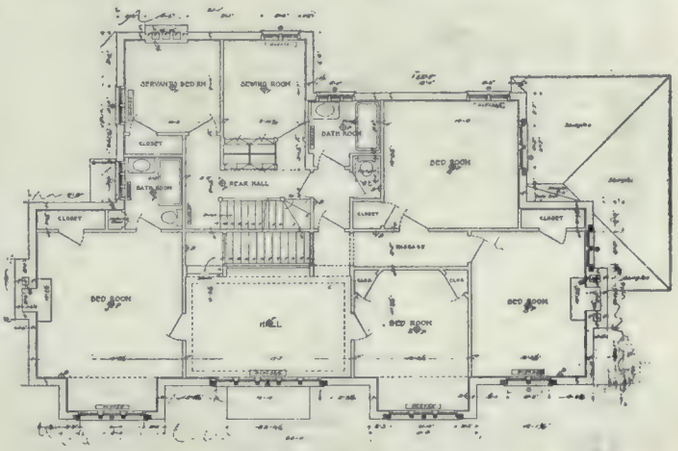
carried out in Flemish oak in keeping with the scheme of woodwork. A similiar ceiling treatment to that in this interior obtains in the living room, where the wall paper is of the old fashioned tapestry design, consisting of a green background marked by deep green ribbons and cream and pink roses. The mantel and hearth are of Indiana limestone, lined with fire brick, the design being in character with the other appointments of the room. Varying in its decorative effect, yet in complete consonance with the general treatment, is the dining room which



Ground Floor Plan, Residence of G. Burnett, Edmund Avenue, Toronto. Sproatt and Rolph, Architects.

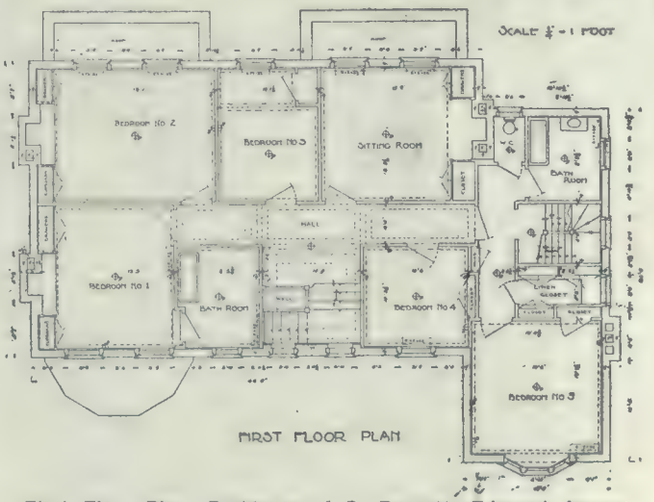
has beamed ceiling with cream panels, and wall of Zuber plum paper, the hanging being of a heavy casement cloth of a champagne color. In the upstair hall the decorative scheme of the lower hall is repeated. The sitting room is finished in white, green and red, with the furniture upholstered in chintz to match the wall paper.

The ground floor is 10 ft. 9 in. in height, and the upper floor 9 ft. high. The building was designed to architecturally harmonize with the two churches of Gothic design, which stand on either side; the grey color of the stone most perfectly blending with the old weather-worn white brick of the two other structures. One of the features of the plan was to provide the required space without an attic, and another to combine in a practical way the two functions of a parson's residence, viz., privacy and office facilities for the conducting of the business of the parish. While everything about the building is rich and dignified, the architects were highly successful in subduing everything that might appear lavish or extravagant, and in giving the whole scheme an atmosphere of restful simplicity. Another feature of the house, is that the architects have been successful in providing ample light in every room in the house, without having spoiled the architecture of the building with too many window openings. The windows have been so arranged that although they apparently take up a small percentage of wall sruface, they give the maximum degree of light for the limited window openings



First Floor Plan, Residence of Eri Whaley, Roxborough Street East, Toronto. Sproatt and Rolph, Architects.

employed. The woodwork throughout was executed by the Globe Furniture Company; the furniture was selected from the shops of B. M. and T. Jenkins, and the carpets were supplied by the John Kay Company, all of Toronto.



First Floor Plan, Residence of G. Burnett, Edmund Avenue, Toronto. Sproatt and Rolph, Architects.

The home of G. Burnett, Edmund avenue, Toronto, is another noteworthy residential structure, designed by the same architects. Here the treatment is most simple, the restful lines and plain surfaces of the exterior giving the

Living Room, Parsonage of Metropolitan Church, Toronto. The Wall Paper in this Room is of Old Fashioned Tapestry Design, with a Green Background and Green Ribbon and Cream and Pink Rose Decoration. All the Woodwork is in Fumed Oak, and the Mantel and Hearth are in Indiana Limestone. Sproatt and Rolph, Architects.

Dining Room, Parsonage of Metropolitan Church, Toronto. Here the Walls are Done in a Zuber Plum Paper, and the Hangings are of a Heavy Casement Cloth of a Champagne Color. Sproatt and Rolph, Architects.

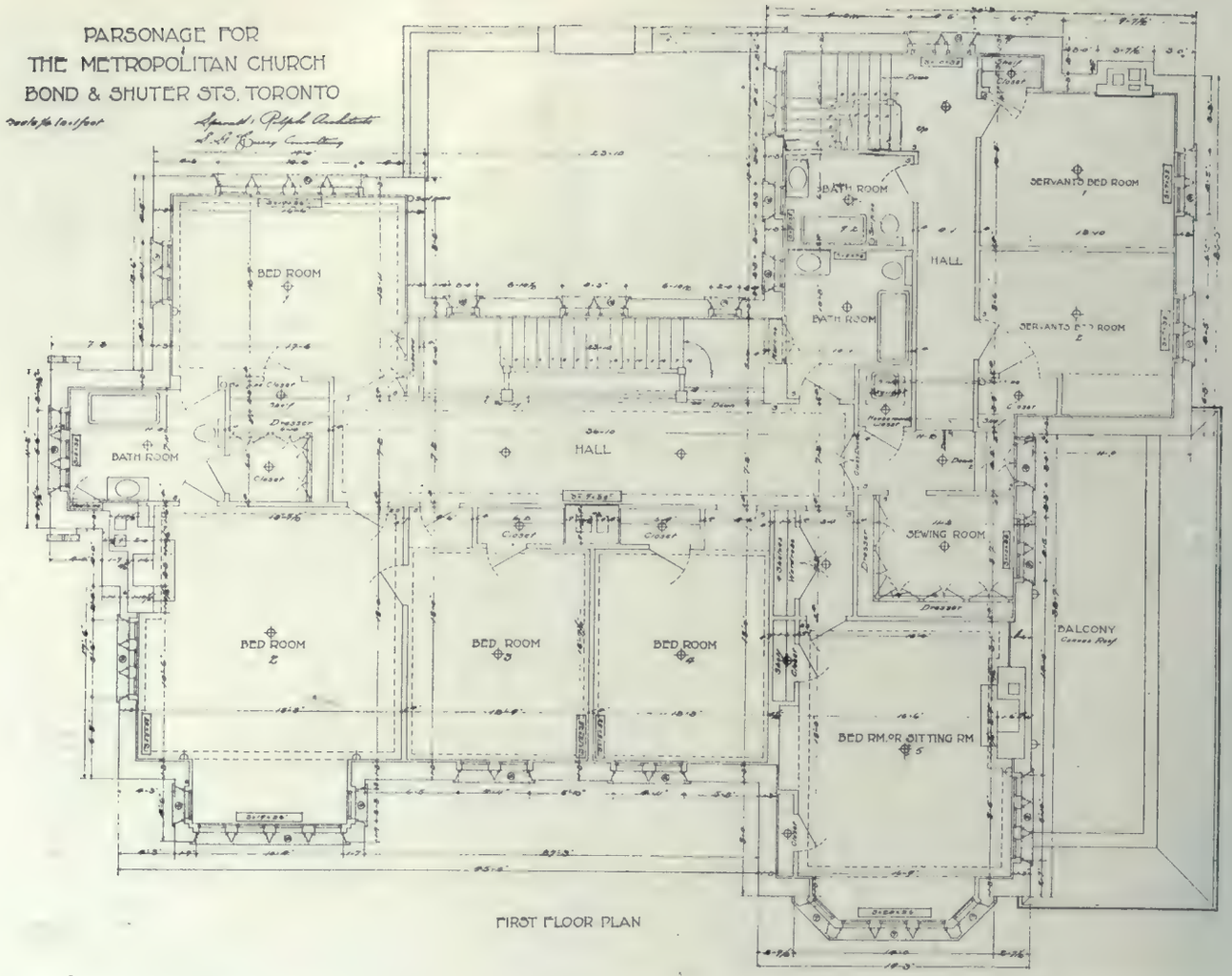
Main Hall, Looking Toward Entrance.

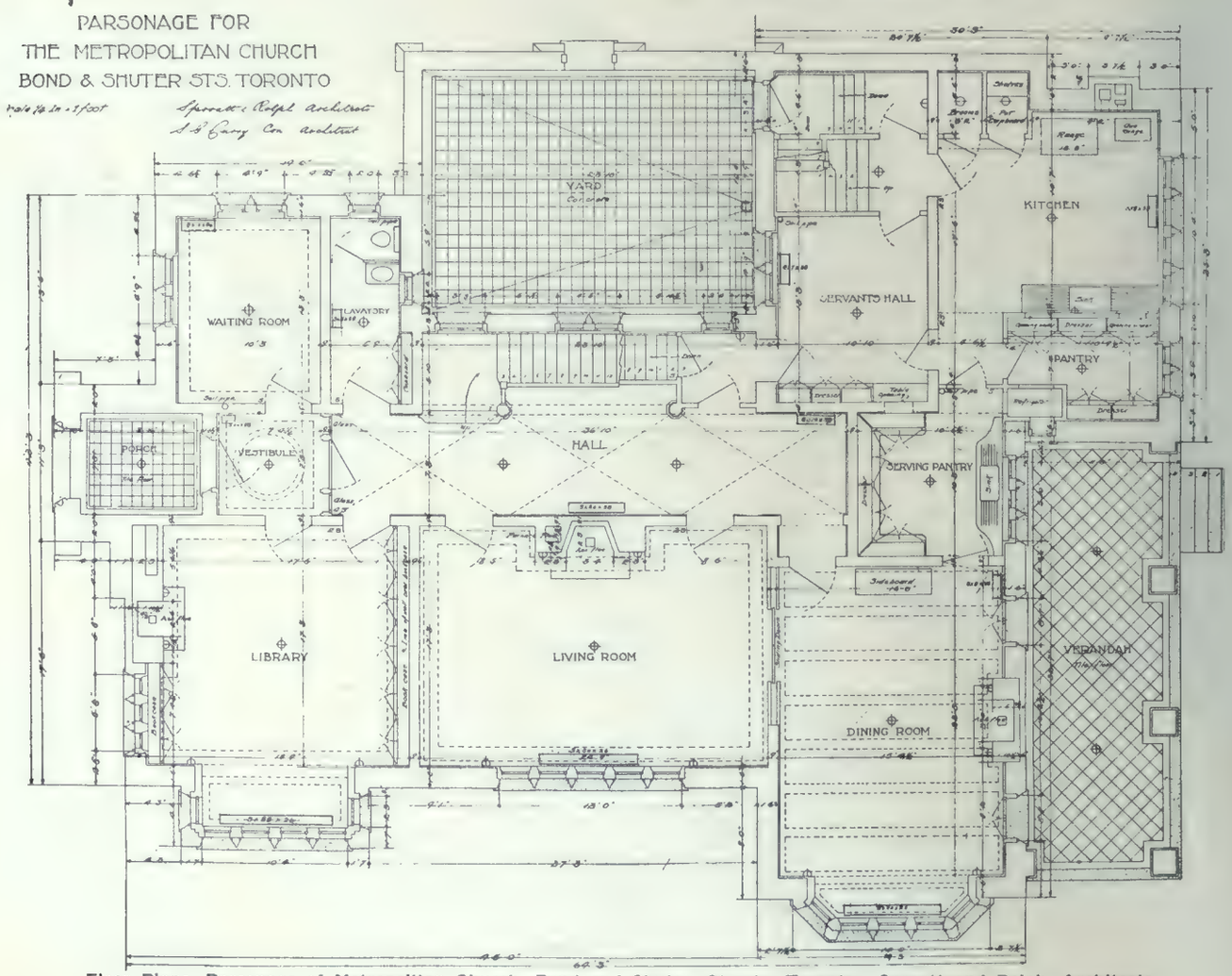
Pastor's Study.

Parsonage of Metropolitan Church, Toronto's Finest Example of Elizabethan Architecture in Domestic Design. Designed to Harmonize with the Two Gothic Churches which Stand on Either Side. Sproatt and Rolph, Architects.

Upper Hall.

Bed Room.





Floor Plans, Parsonage of Metropolitan Church, Bond and Shuter Streets, Toronto. Sproatt and Rolph, Architects.

Front View.

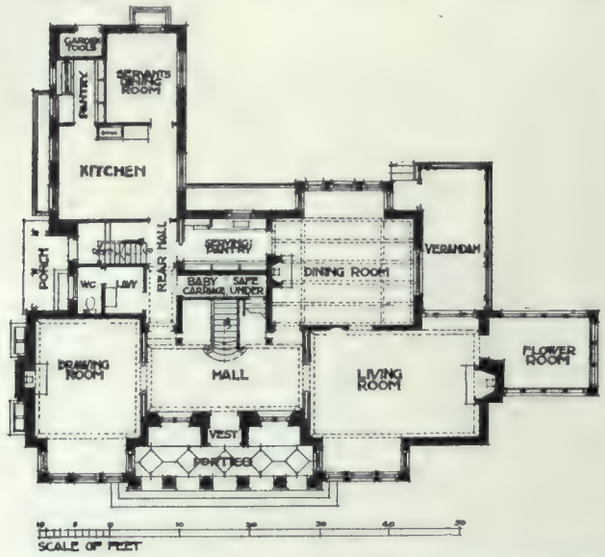
Living Room.

Hall.

Drawing Room.

Residence of E. G. Gooderham, Sherbourne Street North, Toronto. A Modern Adaptation in Georgian Design. Both the Simple Dignity of the Exterior and the Quiet, Restful Treatment of the Rooms Throughout is Strongly Characteristic of the Work of the Designers, Messrs. Sproatt and Rolph.

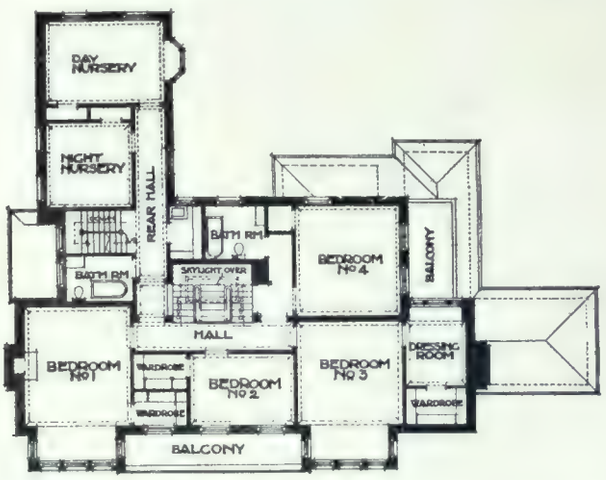
design a distinctive and unpretentious domestic character. The walls are built of red brick with stone trimmings around windows, bays and entrance, the roof being of slate. The simple entrance with its brick paved terrace is an interesting feature, as is also the verandah similiarly paved, which opened off the living and dining-room at the rear, and which overlooks the sloping grounds at that



Ground Floor Plan, Residence of E. D. Gooderham, Sherbourne Street North, Toronto. Sproatt and Rolph, Architects.

side. The accommodations as provided by the plan, are to be seen in the accompanying illustrations; the living rooms and service department being exceptionally well placed, and the arrangement in general such as to provide the greatest degree of convenience and comfort on either the lower or upper floor.

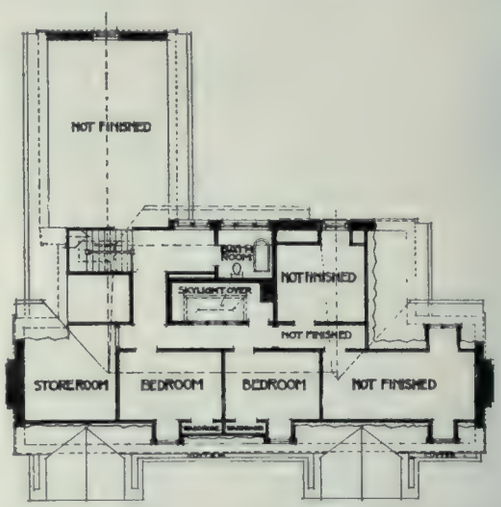
An attractive house having a modern Georgian character, designed by the same architects, is the residence of E. D. Gooderham, North Sherbourne street, Toronto. In this house the walls are of red brick with white mortar joints and grey cut stone trimmings and cornice. The disposition of the various room results in a most admirably arranged interior. Especially is this the case on the ground floor where direct access is obtained from the entrance to all main rooms, the staircase, rear passage and kitchen. Both the drawing room and living room



First Floor Plan, Residence of E. D. Gooderham, Sherbourne Street North, Toronto. Sproatt and Rolph, Architects.

are convenient, located at the left and right of the reception hall, the latter room having an open fireplace, and an adjoining flower room which screens the large side verandah from the street. Entrance to the dining room, which has a beamed ceiling and also a fireplace, can be gained from either the reception hall, living room, or serving pantry, which connect it at the rear of staircase with the kitchen. The kitchen and servant dining room, which are located in the rear wing, are practically isolated from the other portion of the house The various interiors are appropriately appointed in their decorative schemes. The quiet and restful treatment throughout being quite characteristic of this firm's work.

One of the first residences to be erected in what is now the popular Avenue Road district, Toronto, is the home of John H. Eyre on the corner of Heath street, designed by Architect F. H. Herbert. It is a good example of a large and comfortable residence designed to take advantage of a spacious site commanding an excellent view of the country about it. The chief feature of the design is the large semi-circular verandah at the front, which commands a splendid view both up and down the avenue. The exterior walls are built of select buff Don Valley pressed brick with white stone trimmings throughout. From the verandah are two doors leading directly into the hall and library. The hall, living room and dining room are all richly panelled in dark quartercut oak with a color scheme of red and gold. In the lower storey, the floor throughout is quarter-cut oak. The drawing room is finished in enamelled ivory, and in harmony with the scheme is a mantel built of white tile. At the rear is a large verandah with the upper portion forming a balcony off first floor. Domestic conveniences are found in the way of a cold storage room and a modern laundry drying



Attic Plan, Residence of E. D. Gooderham, Sherbourne Street North, Toronto. Sproatt and Rolph, Architects.

apparatus, both of which are situated in the basement.

In the same district, only situated at the head of Avenue Road Hill is the residence of W. R. Wilson, which was also designed by the same architect. The splendid outlook from this point, encompassing an exceptionally fine view of the city, is taken full advantage of in the large roomy verandah and balcony arrangement at the front of the house. In construction, the exterior walls are of Don Valley brick of a buff tone, with white stone trimmings and cream painted woodwork. The plan of the house in general has been very thoroughly considered, the rooms being conveniently placed, and all main interiors having large fireplaces and bay windows. The drawing room and dining room are finished in mahogany with white enamelled doors, while the hall, staircase and living room are carried out in oak, with oak floors throughout. A feature of the upstairs plan is the lounge room which opens onto the balcony.

Two other houses by the same author are the residences of Percival Leadley, and Mrs. R. G. McLean, at 21 and 23 Elm avenue, Toronto, respectively. Both of these structures are modern homes of the square type, having front bays and verandahs designed to take advantage of the pleasant outlook along the street on which they are located. The residence of Mrs. McLean is built of red pressed brick with white stone trimmings, white

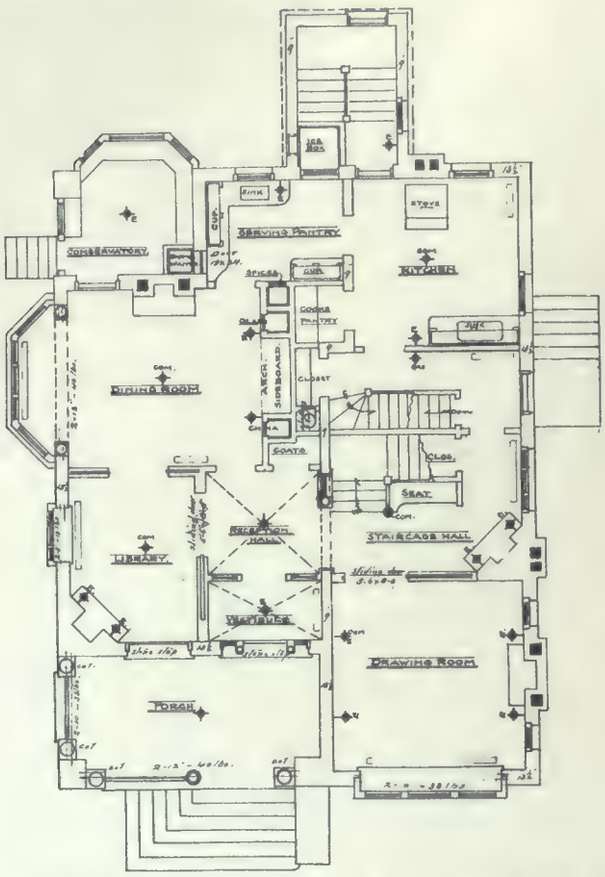
Residence of John H. Eyre, 58 Avenue Road.

Residence of Percival Leadley, 21 Elm Avenue.

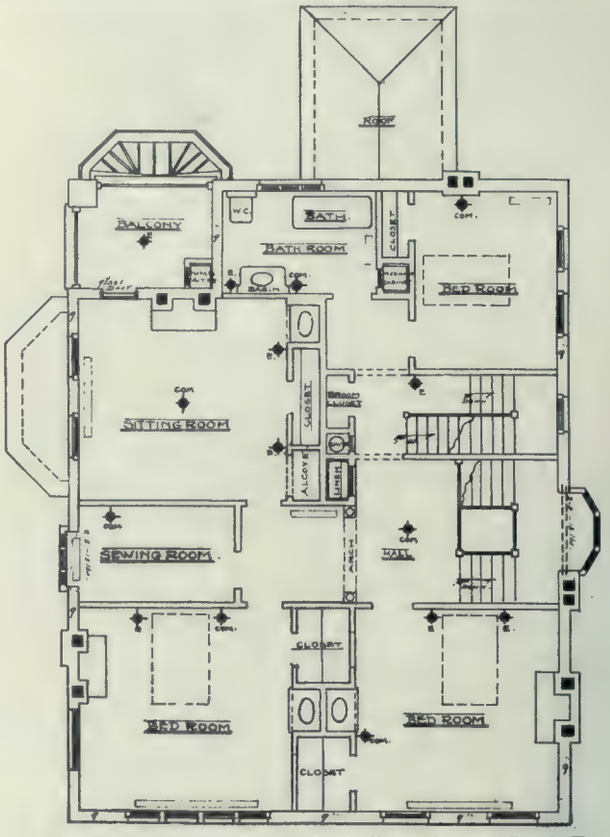
Residence of Mrs. R. G. McLean, 23 Elm Avenue.

Residence of W. R. Wilson, 148 Farnham Avenue.

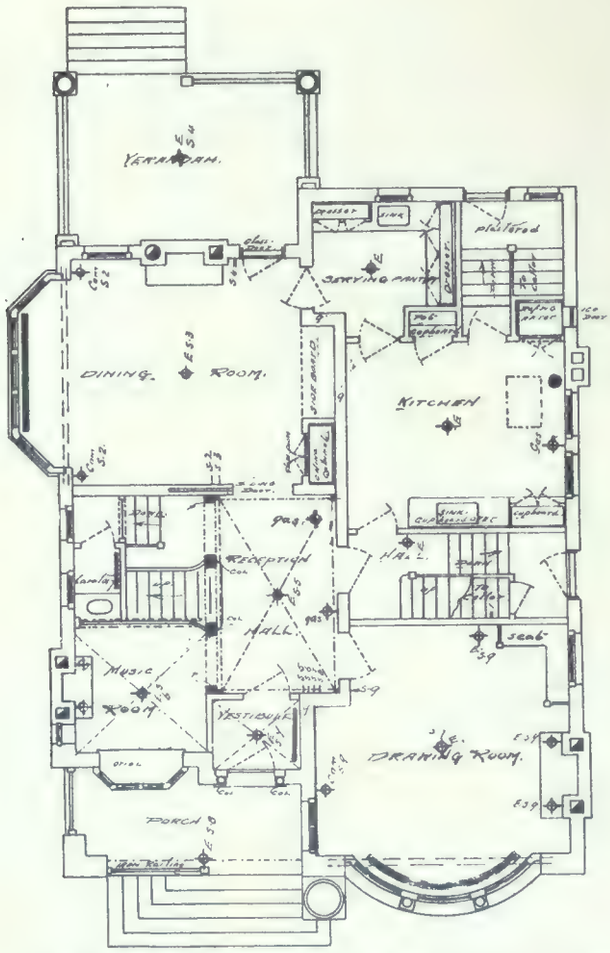
Domestic Design as Seen in Four Recently Erected Toronto Homes. F. H. Herbert, Architect.



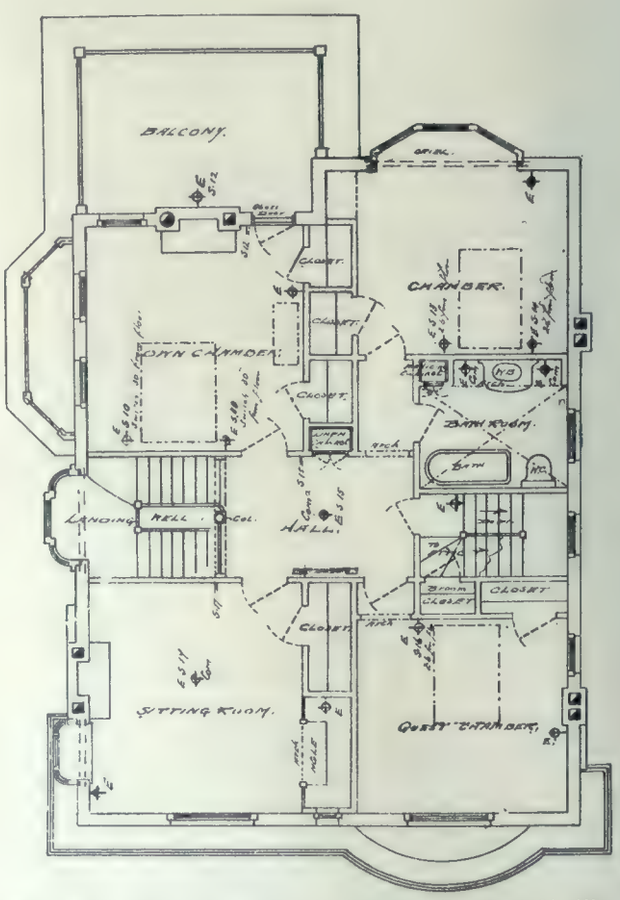
Ground Floor Plan, Residence of J. H. Eyre, Avenue Road, Toronto. F. H. Herbert, Architect.



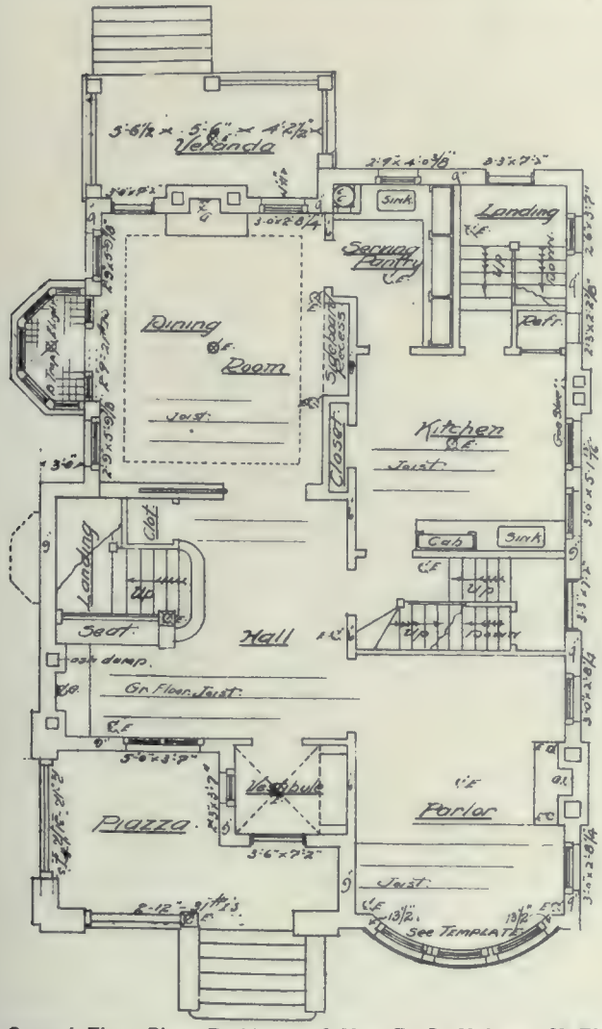
First Floor Plan, Residence of J. H. Eyre, Avenue Road, Toronto. F. H. Herbert, Architect.



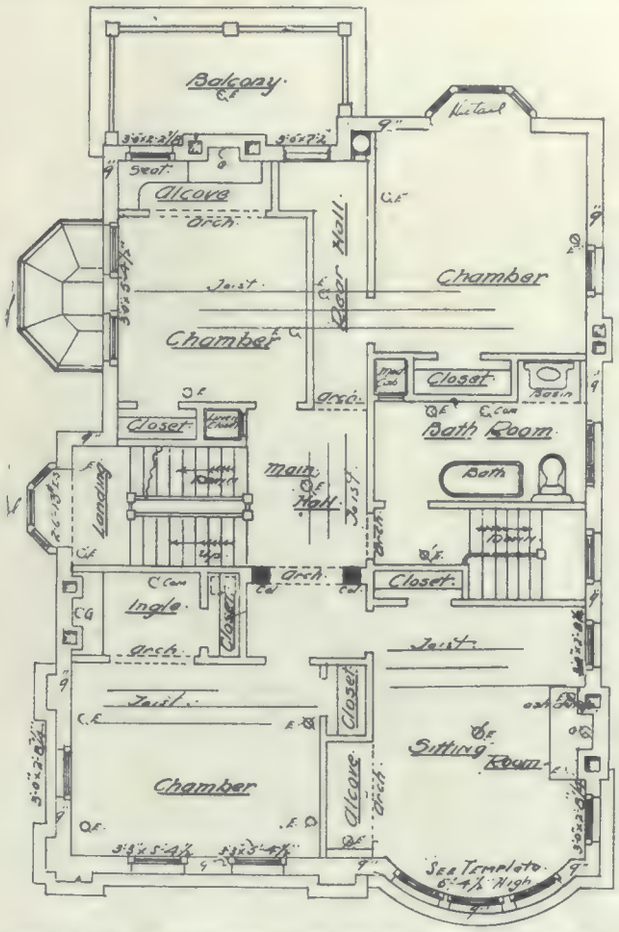
Ground Floor Plan, Residence of Percival Leadley, 21 Elm Avenue, Toronto. F. H. Herbert, Architect.



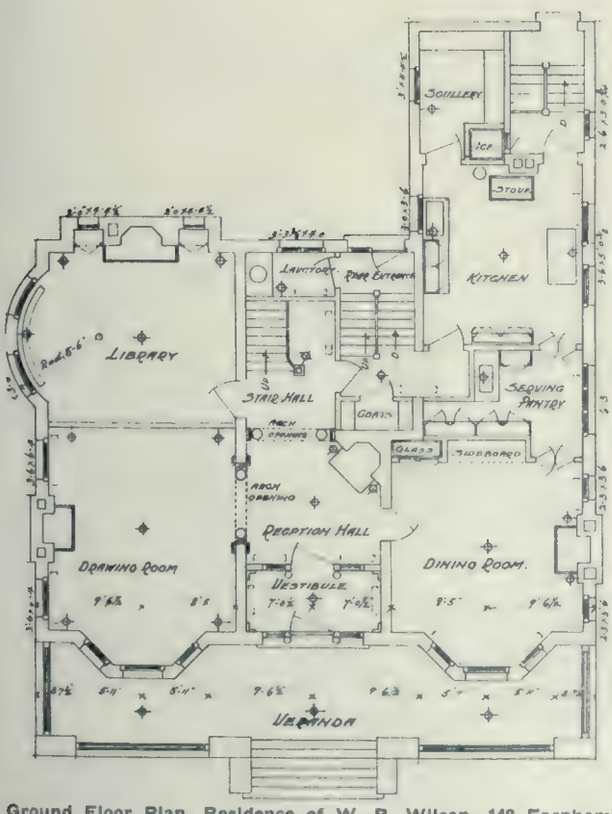
First Floor Plan, Residence of Percival Leadley, 21 Elm Avenue, Toronto. F. H. Herbert, Architect.



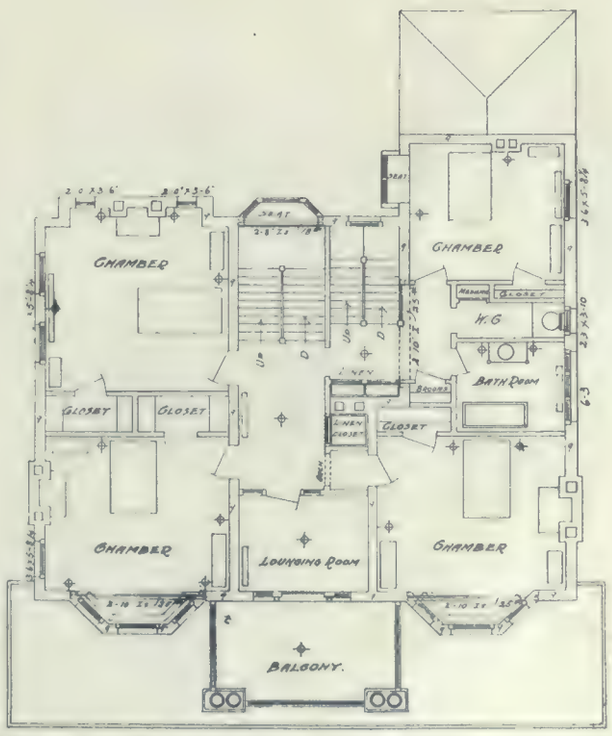
Ground Floor Plan, Residence of Mrs. R. G. McLean, 23 Elm Avenue, Toronto. F. H. Herbert, Architect.



First Floor Plan, Residence of Mrs. R. G. McLean, 23 Elm Avenue, Toronto. F. H. Herbert, Architect.



Ground Floor Plan, Residence of W. R. Wilson, 148 Farnham Avenue, Toronto. F. H. Herbert, Architect.



First Floor Plan, Residence of W. R. Wilson, 148 Farnham Avenue, Toronto. F. H. Herbert, Architect.

Residence of A. B. Ormsby, Situated on the Lake Shore, near Mimico, Ont. One of the More Interesting Homes of Recent Erection. F. H. Herbert, Architect.

View Showing Service Wing, Residence of A. B. Ormsby, Mimico, Ont. The Walls of this House are of White Limestone. with Cement Stucco Gables, the Pillars of the verandah being of Concrete. F. H. Herbert, Architect.

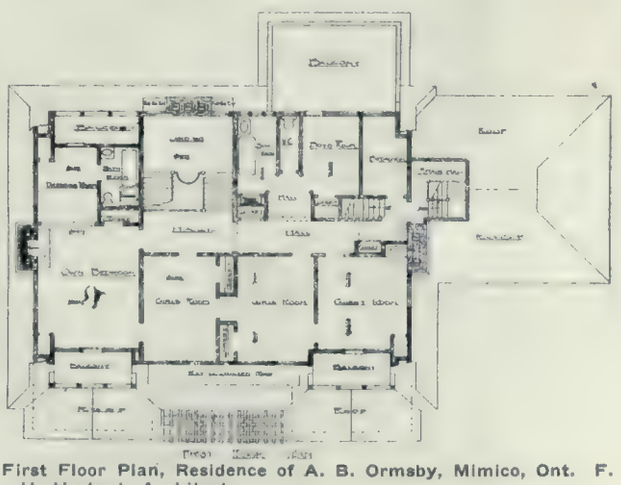
Residence of A. B. Ormsby, near Mimico, Ont. Note the Balance of the Design and the Simple Window Treatment Throughout. F. H. Herbert, Architect.

painted woodwork, and slate roof. The interior throughout is finished in hardwood. In the dining-room which has a built-in sideboard, the walls are panelled in mahogany, and in the hall where a similiar treatment obtains, the finish is in quarter cut oak. Two features in the plan worthy of note are the conservatory which opens off the dining-room, and the cosy ingle nook in the main bedroom on the upper floor In the residence of Mr. Leadley, the external construction is also in red brick, only here a different combination results in that the lower portion is faced with brown and white stone, the woodwork painted cream and white, and the roof covered with green slate. On the ground floor, the reception hall gives ready access to the drawing room and kitchen

Ground Floor Plan, Residence of A. B. Ormsby, Mimico, Ont. F. H. Herbert, Architect.

on the right, and the music room, staircase and dining-room on the left. The latter room is adjoined at the rear by a large verandah having a balcony arrangement above. The treatment in the main hall is in mission oak, with brick mantel, beamed ceiling and hardwood floor. On the first floor the rooms are of spacious dimensions, all interiors being particularly well lighted by large, well placed windows.

Further evidence of Mr. Herbert's work is seen in the attractive country home of A. B. Ormsby, near Mimico, Ont. This house is situated on the lake shore, on a lot which is 1,200 feet deep to the water front. The construction is of white lime-stone with cement stucco gables and a shingle roof. An interesting feature of the design is the large porch spanning the entire front, with its hugh concrete pillars, and pavement of red vetrified English tiles. The entrance hall extends practically the entire depth of the house, with the den and a large fireplace immediately to the rear. The ceiling here has heavy beams and the woodwork, including the staircase, is carried out entirely in mahogany. In the living room, which is finished in mission oak with a beamed ceiling and panelled walls, is a large fireplace of blue Egytian tile. This room opens onto both the front verandah and a spacious porch at the rear. In the dining room the



First Floor Plan, Residence of A. B. Ormsby, Mimico, Ont. F. H. Herbert, Architect.

wall treatment is somewhat similar, only here the woodwork is in quarter-cut oak, and a barrel-shape ceiling and built-in buffet forms a part of the architectural scheme. The reception room and living room, which are placed to the right of entrance, are finished in white enamel and dark oak respectively, with richly panelled walls and ceilings. The service installation of this residence includes its own private pumping plant with soft water equipment, as well as a septic tank system for sewerage disposal.

Library, Residence of F. L Ratcliff, Crescent Road, Toronto. The High Bay Window with its Fixed Shelves Below is an Appropriately Devised Feature. Burke, Horwood and White, Architects.

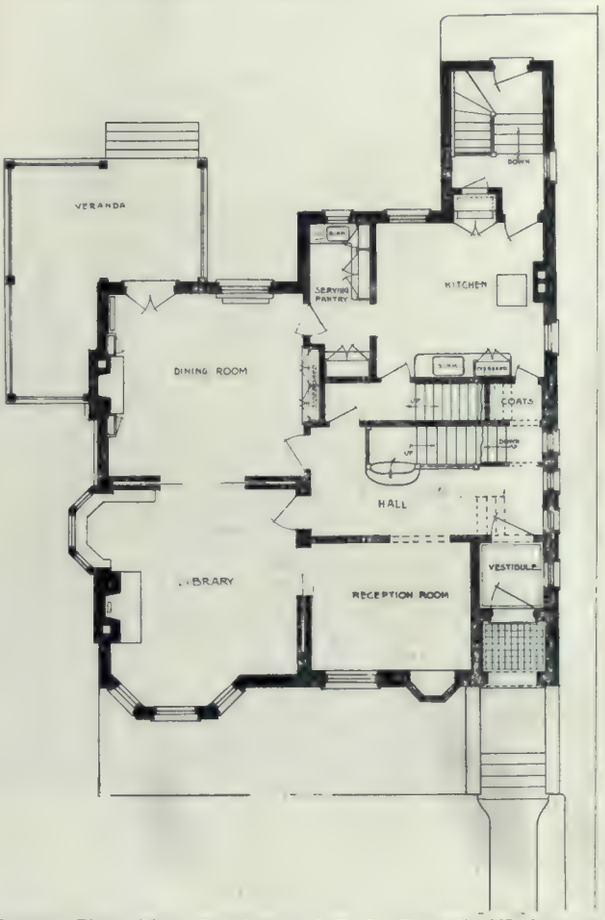
Dining Room, Looking Toward Library, Residence of F. L. Ratcliff, Crescent Road, Toronto, Showing the Fire Place, Built-in Buffet, and Scheme of Decoration. Burke, Horwood and White, Architects.

One of the more noteworthy of the many fine homes on Crescent Road, Toronto, is the residence of T. L. Ratcliff, designed by architects Burke, Horwood and White. It is an exceptionally well considered house, in which the designers, have succeeded in obtaining a dignified homelike character by the use of simple lines and an effective color scheme. The walls are of red brick, the woodwork painted white, and the roof is of slate. Particularly commendable is the entrance and windows of the lower main wall, with their simple stone detail. On the interior, the plan provides a most convenient arrangement with the reception room, library, and dining room, opening directly off the hall. The library which is quite and restful in its treatment, has a brick fireplace with bay windows on either side. An appropriately devised feature in this room are the fixed book shelves below the window of the smaller bay. In the dining room, which also has a fireplace, a built-in sideboard and a simple designed plate rail form an interesting part of the decorative scheme. Conveniently adjoining, is the servery and kitchen with the basement stairs and entry immediately at the rear. A feature of the upstair floor is the den which opens onto a balcony overlooking the rear grounds.

Residence of F. L. Ratcliff, 145 Crescent Road, Toronto. Burke, Horwood and White, Architects.

On Whitney Avenue, Toronto, Mr. White of this architectural firm, has built himself a home, that is not only interesting in its exterior design and treatment, but more particular in its scheme of interior decorations and appointments. Rarely does one find a more refined simplicity or a more homelike feeling, than that which exists in the arrangement and treatment of this residence. An excellent idea as to how thoroughly every detail has been considered can be obtained from the accompanying views of the living room and dining. The former with its beautiful harmony in architectural lines and furnishings, is a most inviting interior, while the latter in its rich grained woodwork and wall decorations present a scheme that is both quiet and restful, and unusual in the character of its treatment. The plan in general is very compact, a noteworthy feature being the arrangement of the hall. In exterior construction, the house is of red brick with white mortar joints, and white painted woodwork, the simple lines and interesting treatment of the windows giving the design a most decided domestic character.

In the residence of James C. Worts, Avenue Road,



Ground Floor Plan, Residence of F. L. Ratcliff, 145 Crescent Road, Toronto. Burke, Horwood and White, Architects.

Toronto, we have an excellent example of a large luxurious home in which nothing in the form of comfort or homeliness in plan or interior arrangement has been sacrificed for outward show.

Mr. George Gouinlock, the architect, whose domestic work is characterized by the study and care given to the

First Floor Plan, Residence of F. L. Ratcliff, 145 Crescent Road, Toronto. Burke, Horwood and White, Architects.

Living Room, Home of M. A. White, Whitney Avenue, Toronto. Note the Beautiful Co-Ordination in the Architectural Lines and Furnishing and the Refined, Home-Like Feeling Which Obtains Throughout. Burke, Horwood and White, Architects.

Dining Room, Home of M. A. White, Whitney Avenue, Toronto. An Interior Which is Exemplary Both in its Design and Decorative Accessories. Burke, Horwood and White, Architects.

arrangement of homelike appointments has in this residence combined most harmoniously, luxury and warmth without having sacrified either.

The exterior is simple and dignified, showing an English domestic feeling. The broken gables and quoins about the windows give it a strong touch of the Elizabethan era, and the verandah on the west front and piazza extending around the south east corner of the house, in addition to the porte cochere, with their fluted columns of classic design lend a touch of the Georgian.

A glance at the plans will give a good idea of the excellence of the general lay out of the house. The central hall, the large well appointed kitchen, and the exceptionally large dining room which looks out on the piazza on the south-east corner are all features worthy of note. The arrangement of the uper floors with their large closet and bath room accommodation are fairly well shown in the plan of the first floor as reproduced herewith.

The halls and staircase are finished in quarter cut oak throughout, the ground floor hall having vaulted ceiling with stencil decoration; this hall and vestibule having a quarter cut oak panelled dado. The drawing room is furnished in grey enamel with fine carved Empire man-

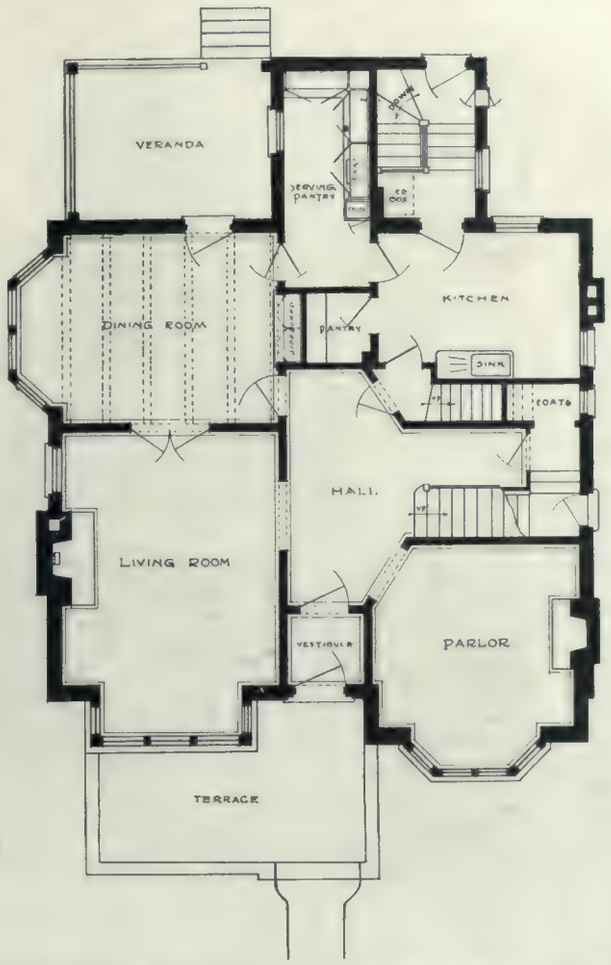
Home of M. A. White of the Architectural Firm of Burke, Horwood and White, on Whitney Avenue, Toronto.

tel and walls are decorated with silver grey paper forming panels with festoons of pink roses. The dining room is finished in mahogany, walls covered in fine muslin with a fine stenciled design on frize. The library is finished in whitewood, stained walnut color, and is fitted up with mantel and built-in bookcases. The sitting room on first floor is furnished in white enamel and opens onto balcony.

The house has two bathrooms on first floor with tile floor and dadoes, one having enclosed shower with tile floor and walls and domed ceiling. There is also another bathroom in attic for servants. All of the sanitary fittings are of the very best quality as supplied by the Standard Ideal Co.

The house is fully equipped with all the most modern conveniences, such as laundry, refrigerator, serving pantry, cupboards, closets, clothes closets, back and carriage entrances, linen and sewing rooms, and is lighted by electricity and heated by hot water.

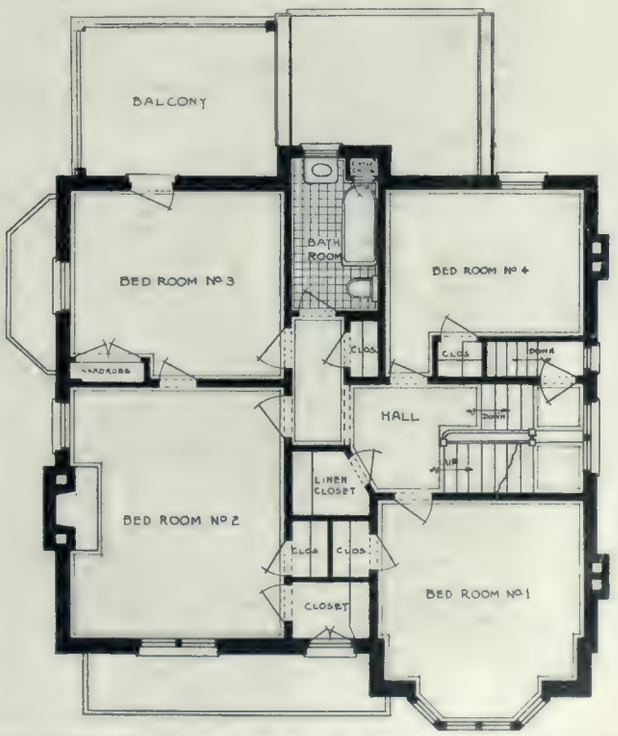
The house is built in best quality Don Valley red



Ground Floor Plan, Home of M. A. White, Whitney Avenue, Toronto. Burke, Horwood and White, Architects.

pressed brick, with stone trimmings and blue slate roof.

Impressing itself upon the observer of domestic design in a large number of the more moderately sized houses, is the extent to which cement stucco is employed as the material of external composition. That this material lends itself to both architectural expression and



First Floor Plan, Home of M. A. White, Whitney Avenue, Toronto. Burke, Horwood and White, Architects.

Residence of James S. Worts, Avenue Road, Toronto. A Large Well Planned, Richly Appointed House, with a Strong English Domestic Feeling, a Feature of Which is the Wide Piazza Extending Around the South-east Corner. Geo. W. Gouinlock, Architect.

Dining Room, James S. Worts' Residence, Toronto. One of the Features of this House is the Complete Harmony Prevalent in the Interior Decorations and Furnishing. This Room is Finished in Mahogany; the Walls are Covered with Fine Muslin, with a Richly Stenciled Frieze. Geo. W. Gouinlock, Architect.

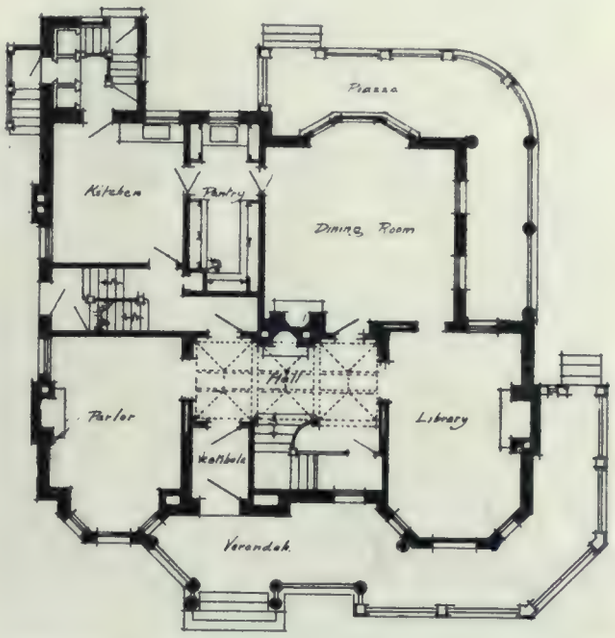
economy in construction, is quite obvious to one who has investigated its merits, and its use when properly considered results in a wall construction, which to say the least is both stable and permanent in character. An excellent example of this type of house is the residence of W. F Temple, 106 Balsam Ave., Toronto, which was designed by Architect E. G. Wilson. In this house a most delightful exterior is obtained by plain walls, small casement windows and a simple color scheme. The woodwork of the exterior is left undressed and treated with "Solignum," the half timber work and porch being stained in brown, and the shingles of the roof stained green. A noteworthy feature is the verandah at the side with its pergola-like roof at one end. The plan in general is most commendable in its lay-out, the room being large and conveniently arranged. Worthy of special note is the large dining room with its open fire place, and the arrangement of the stairs and serving pantry.

A HIGH CONCRETE BUILDING IN ENGLAND.

A REINFORCED CONCRETE building, 295 ft. high from street level to the top of its towers, and 170 ft. high

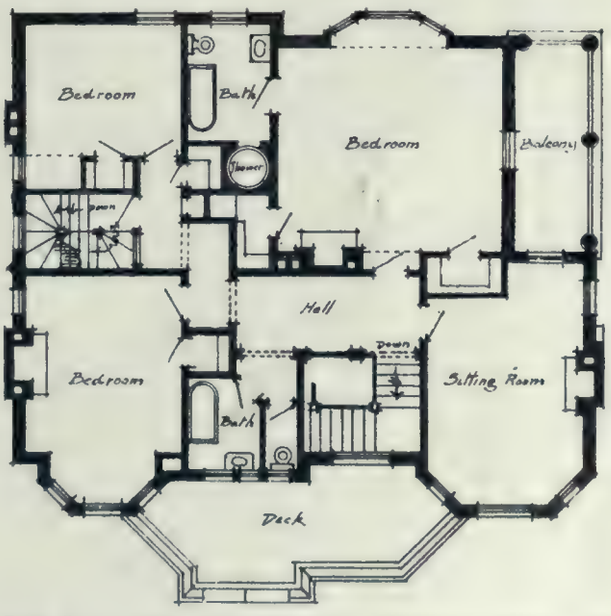
Lower Hall and Staircase, Residence of James S. Worts, Toronto, Finished in Quarter-cut Oak, with Panelled Dado of Same Wood. The Vaulted Ceiling is Embellished with a Stencil Decoration. Geo. W. Gouinlock, Architect.

from street level to the main roof, has been built in Liverpool. It has eleven storeys above street level in the main portion, and six storeys in each of two main towers. A basement, 15 ft. deep, extends under the entire area, which is 177½ wide and 301 ft. long. With the exception of the outer curtain walls, the building is built entirely of reinforced concrete. The building is to be used for office purposes, but on account of its height, the columns, particularly those supporting the main towers, carry very heavy loads. The largest of these columns carry maximum loads of 1,500 tons, are 3 ft. square in the ninth floor where the load is 900 tons per column, and 3 x 8 ft. in plan at basement floor level, where the above stated maximum loads are carried. According to a diagram shown in the BUILDER, London, the reinforcement in these 3 x 8 ft. columns consists of round rods placed 6 in. on centres transversely and 15 in. on centres longitudinally, all tied together by hooping. The size of the rods is not stated. Numerous long beams, up to 40 and 50 ft. spans,



Ground Floor Plan, James G. Worts' Residence, Toronto. Geo. W. Gouinlock, Architect.

are used. Portions of the load of each of the two main towers, which rise 125 ft. above the main roof, are carried by arches of 60-ft. clear span and a rise of 32 ft. Each of the arches extends through two storeys and in addition to supporting numerous floorbeams carries six concentrated column loads ranging from 110 to 345 tons, making up a total of 1,480 tons per arch. In the eighth floor it was desired to secure wide unobstructed areas, and for that reason a number of beams of 41 ft. 3 in. clear span and with cantilever projections of 3 ft. 9 in. at one end have been used. Two concentrated loads of 740 tons each are carried by each beam in addition to a

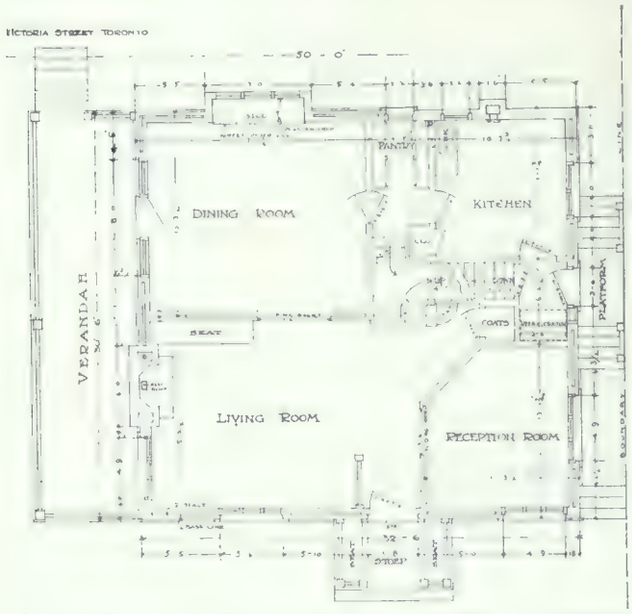


First Floor Plan, James S. Worts' Residence, Toronto. Geo. W. Gouinlock, Architect.

distributed load of 100 tons, making a total upon each member of 1,580 tons.

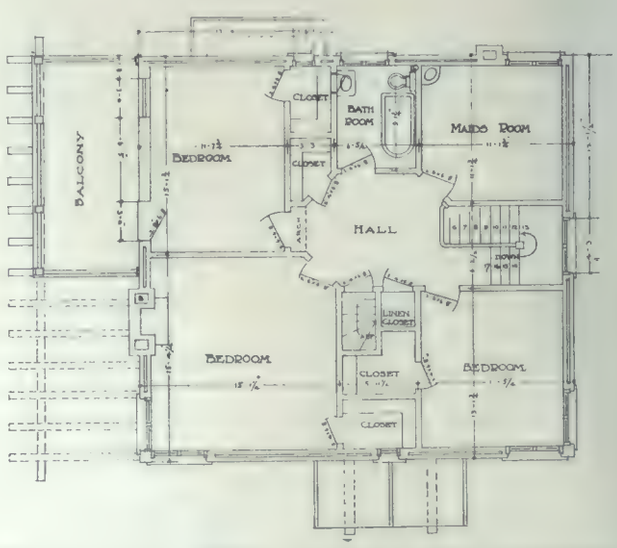
Residence of W. F. Temple, 106 Balsam Avenue, Toronto. An Attractive Small House Which Shows in an Interesting Manner the Use of Cement Stucco in External Construction. E. G. Wilson, Architect.

EXPERIMENTS WITH SAND-BLAST FINISH for concrete, according to CEMENT RECORD, were recently made on specimen blocks to determine the feasibility of substituting this method for bush-hammering in surfacing the Rock River bridge. The structure has an arch span of 280 feet between springing lines, and the number of



Ground Floor Plan, Residence of W. F. Temple, 106 Balsam Avenue, Toronto. E. G. Wilson, Architect.

sired to cut out the cement on the surface and show the granite. The experiment showed that 80 pounds pressure was necessary to accomplish the cutting, while only about 60 pounds are used when cleaning stone or steel. The sand blasting required about the same time as bush-hammering, and the resulting cost was about the same by either method. It was also shown that the sand blast tended to expose all the defects in the surface and where



First Floor Plan, Residence of W. F. Temple, 106 Balsam Avenue, Toronto. E. G. Wilson, Architect.

10,000. The entire exposed surface of the bridge was "faced" during construction with a mixture of 1 to 4 cement and fine blue granite 2 inches thick. It was de- square yards to be surfaced by bush-hammering is about

any rough places in small cracks appeared, the blast cut into them and made them appear worse than before. Bush-hammering on the other hand tends to fill in any small cracks or defects in the surface and cover them up.

MACHINERY AND TRADE

DEPARTMENT OF PHOTOGRAPHY. ∴ ∴

IT HAS BEEN OUR INTENTION for sometime past, in fact, ever since the inception of "CONSTRUCTION," to establish a Department of Photography, from which photographic work of a superior character could be obtained and which would be open to the use of the architects of this country. The difficulty which always confronted us was to obtain the right man for the place, one who understood the underlying principles of architectural photography. In the person of Mr. A. H. O. Freemantle, we believe we have found such a one. Mr. Freemantle is probably the best architectural photographer in Canada; he is a gold medallist in the profession,, besides having obtained numerous prizes and diplomas for his work at different exhibitions here and in the United States. Interior views without distortion of perspective are indeed something new and will be especially appreciated by architects. Our official photographer is an expert of the new school, paying the strictest attention to the artistic side of the subject, by selecting wherever possible the best view-point, the best lighting, and using only orth-chromatic plates. Dry plates being sensitive to blue, violet and ultra violet rays of the spectrum, it is impossible to give a true rendering of color values by photography. Red, green and Yellow, although appearing luminous to the eye, are very non-actinic and affect the plate very little, if any. Hence in photography, an interior with a green or yellow color scheme would appear much darker, and give a false impression, while on the other hand, a room furnished blue would appear almost white. By using an orthochromatic plate, which is made sensitive to the yellow and green, and a suitable ray filter, the blue end of the spectrum is constrained, thereby allowing the greens, yellows and pinks to act on the plate and enabling an expert to give a true rendering of the color values and bring out all the beautiful detail in a soft harmonious manner. Just why the commercial photographer of the present day continues to use the old ordinary plate, producing the "boiler plate" tvpe of pictures, it is difficult to say. The most of the illustrations contained in this journal are the work of Mr. Freemantle, and it is due to him to say that under no conditions does he take views by flash-light, preferring rather to give a longer exposure. Our Photographic Department is placed at the disposal of Canadian Architects, believing that in doing so we are supplying a long felt want in the line of up-to-date satisfactory, and efficient photography. We are in a position to supply Art Prints in Portfolio form of any structure illustrated in this number of "CONSTRUCTION," to the architects or owners. We believe that this new departure will meet with the unstinted approval of the architects of the Dominion, as it makes possible the means of obtaining efficient results in photography.

DAYLIGHT ILLUMINATION. ∴ ∴ ∴

WE ARE IN RECEIPT of an attractive, neatly bound catalogue recently issued by the Hobbs Manufacturing Company, manufacturers of practically all lines of window glass. The book is gotten up with some care, no expense being spared in using the best procurable book-coated paper, so as to exhibit advantageously the various styles and design in ornamental glass. Profuse illustrations in half-tone and three-color work give a fairly adequate idea of the extent of the different kinds of window glass handled by this firm. Thirty-two pages are devoted entirely to color work, which has been very cleverly executed, illustrating glass for domestic purposes, church work, memorial windows, etc., suitable for any design of structure, and of colors to harmonize with any scheme of decoration. Other lines shown are glass signs, plate and bevelled plate, mirrors, and metal store-front bars. One of the specialties is the Maximum Daylight Glass, the principal of which is to refract direct light entering at a window which usually comes from an upward direction, and distribute it evenly over the entire room. The collective and dispersive power of the lens surface added to the refractive power of ordinary prismatic glass gives the "Maximum" daylight illuminating effects, which are very superior. The endorsement of this glass and use of same in such modern commercial structures as the Jacob's Building, Montreal, should be a guarantee that this glass is superior to any other prism in appearance, and for results, in such places as store front transoms. This prism glass is the first ever produced in sheet form with scientifically-shaped projections on both sides of the sheet. The Hobbs Manufacturing Company make a special point of promptly filling orders. The plant of this successful firm is situated at London, Ontario, with branch offices at Toronto, Montreal and Winnipeg.

A BOON FOR CONTRACTORS. ∴ ∴

FOR SOME YEARS PAST the necessity has been realized for an up-to-date method of making estimates and keeping records of cost data, which would combine a high degree of accuracy with a minimum amount of complexity. Firms whose resources permit of a large office staff and an elaborate system of bookkeeping are able to keep fairly accurate account of costs and estimates, but this scheme means a raise in percentage of fixed charges which is unreasonably high with reference to the total volume of business done. The disparity which usually exists between the different tenders on a job shows the lack of uniformity in the method of estimating. A contractor usually finds when he begins work on some contract that he has omitted some item from his estimates. To reduce such mis-chances to a minimum and to provide a medium for a complete record of estimates, costs, men's time and materials, the Builders' Auxiliary Company have brought forward an excellent and simple system. It consists of three different books. A large one measuring 12 x 19 inches, to be used for estimates and costs, is made on the loose leaf system, with provision for every possible item, so that nothing may be missed. The book is divided into different parts providing for all subdivisions relating to excavation, foundations, stone-masonry, etc., etc. The totals from the bottom of each page are carried forward to a summary page by which the total cost is obtained. A "time" book measuring 5 x 10 inches, so that it may be carried conveniently in the pocket, provides a method of keeping account of the number of hours put in each day by each man, giving also what particular work he has been engaged in, so that the time required for each job such as, for example, roofing, may be known at a glance. The "materials" book of same size as the time book, supplies a medium in which to keep track of all materials, when they arrive, and in what quantity. Altogether, the three books, called the Builders' Auxiliary, form an invaluable assistance to the builders. Thev are published by the Builders' Auxiliary Company of Sherbrooke, Que., and Boston, Mass.

NEW DEVICE FOR FURNITURE.

THE RAPIDITY with which some modern improvements or "New Ideas" take hold is truly remarkable, especially in case where the innovation takes the place of some long tolerated nuisance. As an instance—for years people have had to put up helplessly with damage done to floors and carpets by the old-fashioned wheel castor simply for the reason that there was no alternative. Now, however, the appearance of the Onward Sliding Furni-

ture Shoe has sounded the doom of the ordinary castor. Already large quantities of these furniture shoes are used and the factory at Berlin, Ontario, is working to its capacity. The illustration shows one of the many styles and sizes of this article.

They are made with either Mott or Glass Base, as required, and are an inexpensive necessity, for sale at all dealers. The Onward Manufacturing Company, of which Mr. Witzel is manager, is situated at Berlin, Ont.

FIRE-BRICK.

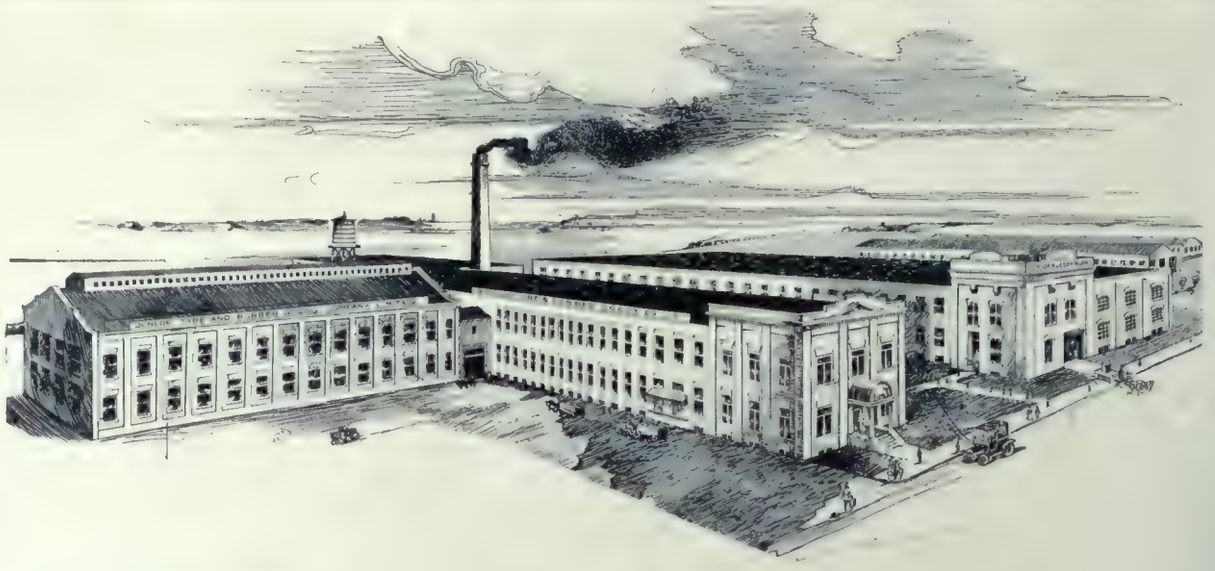
TWO UNDESIRABLE QUALITIES in fire-brick are those of "melting" and "splitting up"; and it is for a brick which does not possess this combination of defects that manufacturers have been striving. The Glenboig Union Fireclay Company with works at Glenboig, Cumbernauld and Gartcosh, Scotland, have attained a broad reputation for their brand of fireproof products. In a recent treatise by King on the manufacture and distribution of coal gas, with reference to fireclay this statement is made: "The Glenboig Bricks are perhaps unequalled for their refractory qualities and they possess the further excellent advantage of neither expanding nor contracting upon being heated and cooled." The demand for this firm's products in Canada has lately shown a steady and marked increase. Their representative in this country, Mr. Alexander Gibb, reports that at the present time business is exceptionally brisk. Mr. Gibb, who has offices at 13 St. John st., Montreal, Que., would be pleased to receive inquiries from those interested in Glenboig products.

MERGER OF RETAIL FIRMS.

ARRANGEMENTS have just been completed by which two prominent Toronto retail firms are materially furthering their interests by forming an amalgamation. These firms are the W. A. Murray Company, the popular King street east departmental store, and the noted house-furnishing firm of John Kay Company of King street west. All the details of the merger have been definitely settled, and the following directors appointed: President, W. Parkyn Murray; vice-president, Major J. A. Murray; directors, J. W. Drynan, J. D. Kay, A. E. Dyment, W. T. Bradshaw, J. Ridout, and W. Finton. The capitalization of the new firm is placed at $3,000,000, and the plans take in the building of a large store structure at the corner of Yonge and College streets in the near future. The high-class goods which have hitherto been handled by both firms, point to the fact that the company will have in their new store one that will be a credit to the city, and one that will be patronized by those who purchase only the best.

BRITISH COLUMBIA will, by this time next year, be the possessor of the finest scenic highway in Western America. The roadway will be 1,200 miles long and uninterrupted except in an unavoidable case, where ferry is taken across the Gulf of Georgia. Half way up Vancouver Island, the roadway starts at a place where the Provincial Government expect shortly to establish a national park and a forest and game preserve; it winds southward through scenery which is unsurpassable, until Victoria is reached. The mainland section begins at either Vancouver city or New Westminster, and extends along old mining trails to the basin of the Hope Mountain; from there a new link will be built connecting ultimately with the Crow's Nest division of the Canadian Pacific Railroad, the general route of which will be followed to the interprovincial boundary at the summit of the Rockies.

GLASS BRICKS, says a contemporary, are coming into use in France owing to their hygienic qualities and facility with which they can be manufactured. Bricks of this nature, it is pointed out, do not crumble or receive the dust found in the worn earth brick of ordinary manufacture. One advantage is that they can be made of refuse glass, old window panes, broken bottles and the like. In the best method the molten glass is run into molds capable of resisting the different heating and cooling degrees. The finished brick presents a smooth and impervious surface. The new brick is supplanting the old one in walls, pavements, the side walls and flooring of bathrooms and hospitals, the waiting rooms of railway stations and places of similar character. In Hamburg they are used in meat markets, where they convey an impression of dazzling purity. In Milan the hospitals have adopted their use and the schools use them because rooms walled with glass bricks reflect more light. In Dresden and other cities of Saxony they are used in the theatres, museums and public buildings.



Dunlop Rubber Goods

In the present month of July the Dunlop Tire and Rubber Goods Company celebrates the Sixteenth Anniversary of its establishment in Canada.

In the beginning the Dunlop Company was exclusively engaged in the manufacture of Bicycle Tires. That these Tires were a success goes without question, and from its first success the Dunlop Company branched out into other articles of manufactured rubber. The first line added was Solid Tires; then came Rubber Heels, Horseshoe Pads, Rubber Mats, etc. With the arrival of the Automobile the Dunlop Tire Company produced the first Automobile Tire ever made in Canada, and this branch of the business has so extended that the Company now supplies 80 per cent. of the Automobile Tires made and sold in Canada.

Five years ago the Dunlop Company took on its first large contract for making mechanical rubber goods, and last January it added to its already large plant on Booth Avenue, an addition to the mechanical rubber goods department, which in itself constitutes a very large factory. This department of the business has grown very rapidly—it has repeated the success of the Bicycle and Automobile Tire Departments.

Rubber Goods for Houses and Buildings

Floor Tiling, Mats, Matting, Stair Treads, Weather Stripling, Insulating Tape, Stand Pipe Hose, Steam and Hydraulic Packing.

Dunlop Tire & Rubber Goods Company Limited

Toronto Montreal Winnipeg London, Ont.

Vancover Victoria Calgary St. John, N.B.

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

Vol. 3 **TORONTO, AUGUST, 1910.** **No. 9**

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H. GAGNIER, Limited, Publishers

Saturday Night Building

TORONTO - - - - - CANADA

BRANCH OFFICES

MONTREAL—Board of Trade Building, LONDON, ENG.—Byron House, 85 Fleet St. E.C.

First Prize Design, Awarded Gold Medal in the R.A.I.C. Competition for a National Memorial Monument to be Erected on the North-West Arm, Halifax, N.S. N. S. Sharp, Toronto, Designer. (See Page 43).

¶ Building Returns for June—Comparative Figures from Twenty-five Centres show the Situation to be Most Satisfactory—Average Gain for Month, 14 per cent. . . . .

ALTHOUGH SOMEWHAT LESS BRISK than the preceding months, building operations in June were carried out to an extent considerably in advance of the progress noted in the corresponding period of 1909. The returns on the whole are, to say the least, highly gratifying, showing as they do, an average increase of 14 per cent. for twenty-three centres reporting to CONSTRUCTION. These centres reflects more or less accurately the building situation in every locality from coast to coast. The ratio of gains to losses is a trifle better than two to one.

The West, in particular, made a most excellent showing, noting a cycle of unbroken gains, and reflecting a condition which is hardly short of remarkable, when one considers the pronounced activity of the immediate past and the settling back which usually accompanies the summer season. Again, Winnipeg, which has a gain of 17 per cent., has the largest total amount for permits issued of any city of the Dominion, having to her credit a total of $2,406,600, as against $2,042,850 in June, 1908. Brandon in the same province, is substantially ahead of her corresponding figures with an increase of 68 per cent., while Regina and Saskatoon, representing the condition in Saskatchewan, top their last year amounts to the extent of 109 per cent. and 26 per cent. respectively.

By far the most marked feature of the month in the Western section was the tremendous upturn in Vancouver, where an aggregate value for permits amounting to $1,162,920 gives that city an advantage of 77 per cent. over the preceding corresponding period. Accompanying Vancouver report is the statement "that there is still every prospect that the remarkable progress of the present will keep up." Possibly as much can also be said for Victoria, whose gain of 152 per cent., although a somewhat smaller amount is noted, shows an even greater proportionate increase. In Alberta, Calgary, Lethbridge and Edmonton, in their respective advances of 183, 12 and 11 per cent., indicate the splendid progress which is being made in that province. Edmonton predicts a heavy total for July, while the past performances of Calgary and Lethbridge is possibly the best assurance of what to expect from those two places.

With Ontario, however, the fortunes of the month were less propitious. Five gains and five losses were noted. Ottawa and London experienced a falling off of 78 and 69 per cent. respectively, while Windsor and Kingston are behind to the extent of 36 per cent. and 71 per cent. in order named. Another city also in the arrear is Fort William, although the loss (16 per cent.) in this case is directly chargeable to a carpenters' strike which greatly retarded operations for the best part of the month, and not to a less favorable condition than has existed heretofore. On the other hand, a substantial upward trend was in evidence elsewhere. Brantford, with a gain of 322 per cent., looms up with the highest percentage increase of any city on the list. Petereboro comes second in this respect by registering an advance of 228 per cent., while Hamilton manifests her rapidly expanding tendency by appending a gain 108 per cent. in excess of the amount tabulated in the same month of last year. Toronto, however, had the largest total by far, her amount of $2,302,550 (15 per cent. gain) being the second largest total recorded in the Dominion. The comparative figures of all the above mentioned places bespeak a most sound and steady condition, as does also the gain noted in the case of Port Arthur, where a larger number of additional improvements give promise of early materialization

As regards the more Eastern section, Montreal more than held her own, while Sydney overreached last June's figures by an advance of 212 per cent., the third highest increase for the month. Montreal's total of $1,585,254, as against $1,103,885, representing a gain of 43 per cent., is a noteworthy one, especially so, in view of that city's uninterrupted progress, and the high amount it has recorded from month to month. St. John and Halifax, however, did not fare so well, the loss in either case being 34 per cent. and 67 per cent. in order named.

	Permits for June, 1910.	Permits for June, 1909.	Increase, Per cent.	Decrease, Per cent.
Brandon, Man.	87,950	52,235	68.3	.....
Brantford, Ont.	109,145	25,805	322.9	.....
Calgary, Alta.	573,846	202,710	183.1	.....
Edmonton, Alta	233.670	201,290	11.1	.....
Fort William, Ont.	256,225	307,125	.....	16.5
Halifax, N.S.	21,630	66,830	.....	67.6
Hamilton, Ont.	301,885	144,945	108.3	.....
Kingston, Ont.	11,545	40,975	.....	71.8
Lethbridge, Alta.	92,005	82,170	12.0	.....
London, Ont.	38,586	127,639	.....	69.7
Montreal, Que.	1,585,254	1,103,855	43.6	.....
Ottawa, Ont.	302,250	1,400,725	.....	78 0
Peterboro, Ont.	145,470	44,322	228.2	.....
Port Arthur, Ont.	65,375	17,600	271.5	.....
Regina, Sask.	255,318	121,650	109.8	.....
St John, N.B.	41,300	64,900	.....	34.8
Saskatoon, Sask.	194,400	153,085	26.9	.....
Sydney, N.S.	69,789	22,360	212.1	.....
Toronto, Ont.	2,302,550	2,001,545	15.0	.....
Victoria, B.C.	227,600	90,120	152.5	.....
Vancouver, B.C.	,162,940	657,020	77.0	.....
Windsor, Ont.	31,075	48,550	.....	36.0
Winnipeg, Man.	2,406,600	2,042,850	17.8	.....
	$10,516,408	$9,220,306	14.0	.....

R.A.I.C. to Hold Third Annual Assembly at Winnipeg, August 25th, 26th and 27th. Big Attendance Expected. General Programme and Announcements. . . . . .

THE THIRD ANNUAL ASSEMBLY of the Royal Architectural Institute of Canada, to be held at Winnipeg on August 25, promises to be, by far, the largest meeting yet held by this growing Dominion organization of architects.

At its inception the promoters of this institution, which will serve as a medium through which many problems confronting Canadian architects may be solved, met with many difficulties, most of which are well known to our readers, and have been discussed in these columns on several occasions. But thanks to level-headed, self-sacrificing, and patient work of its officers, these difficulties have all been overcome, and to-day every provincial association of architects in the Dominion is giving this, the mother organization, its heartiest support, both officially and individually.

A glance over some of the several annoying instances in which the professional rights and integrity of the architectural profession have been subjected to in Canada during the past year is the best evidence that can be set forth as proof of the fact, that to receive just recognition from the Dominion as well as the various Provincial Governments, and the lay public, it is absolutely essential that all the provincial associations should join in one affiliated body—that body is the "Royal Architectural Institute of Canada," and it is only fair to say for the president and its councillors of the past year that they have accomplished much more during 1910 than could have been anticipated at the time of their appointment to office.

The following is a portion of the announcement, together with the programme of the assembly to be held at Winnipeg, and it is to be hoped that each individual architect, who finds it at all possible, will be present at this meeting; they will receive a hearty welcome from the West, and they will find Westerners exceptionally good hosts.

The Annual Meeting of the Royal Architectural Institute of Canada will be held in the Assembly Hall of the University of Manitoba, Winnipeg, Man., on Thursday and Friday, the 25th and 26th of August, 1910.

The Headquarters of the members during the annual meeting will be at the Royal Alexandra Hotel. Club privileges will be arranged for those members desiring same.

GENERAL PROGRAMME.

The general programme as laid out by the Council and the Local Committee of Arrangements comprises the following items:

Thursday, 25th August, 1910.

9.30 a.m.—Meeting of the Council at the Royal Alexandra Hotel.

10.30 a.m.—Inaugural session of the third general annual assembly in the Assembly Hall of the Manitoba University.

(a) Addresses by His Worship the Mayor of Winnipeg, the President of the Manitoba Association of Architects, the President of the Winnipeg Builders' Exchange. Response by Mr. F. S. Baker, F.R.I.B.A., President of the Royal Architectural Institute of Canada.

(b) Reading of the Minutes of the second general assembly, Toronto, 1909.

(c) Business arising out of the minutes.

(d) Nomination of scrutineers for the election of officers and Council.

(e) Report of the Council.

(f) Report of the hon. treasurer and auditors.

(g) Notices of motion.

(h) New business.

(i) Announcements respecting the Assembly.

2.30 p.m.—Business session.

(j) Federation of the various Canadian architectural bodies.

(k) Amendments to the charter.

(l) "The Architecture of the West," by Mr. Joseph Greenfield, M.A.A., F.R.A.I.C.

(m) "Architectural Jurisprudence," by Mr. Isaac Campbell, K.C.

8.00 p.m.—Reception tendered by the President and Council of the Manitoba Association of Architects to the members of the Royal Architectural Institute of Canada.

Friday, 26th August, 1910.

9.30 a.m.—Sight-seeing drive through Winnipeg and suburbs.

2.30 p.m.—Business session.

(n) "Federation of Foreign Architectural Societies," by Mr. Alcide Chausse, Licentiate R.I.B.A., M.R.S.A., F.R.A.I.C.

(o) (Subject of Prof. Nobbs' paper). by Prof. P. E. Nobbs, F.R.I.B.A., of McGill College, Montreal.

(p) Election of honorary and honorary corresponding members.

(q) General business.

(r) Report of scrutineers on election of the officers and Council.

(s) Election of two auditors.

(t) Place of next General Annual Assembly to be chosen.

(u) Unfinished business.

4.30 p.m.—Meeting of the Council.

8.00 p.m.—Annual dinner at the Royal Alexandra Hotel. Price of tickets, $5.00. Tickets can be had from the hon. treasurer.

Saturday, 27th August, 1910.

An invitation has been accepted from the Garson Quarries for a special train to take the assembly to Tyndall to inspect their large quarries and to partake of a luncheon which they will provide.

An invitation has been made by the Winnipeg Builders' Exchange, offering to convey members to St. Andrew's Locks. Both of these excursions will occupy the greater part of the day.

Notice of Motion.—Notice is hereby given that at this meeting a member will move that the Council be given power to obtain amendments to the Charter of the Royal Architectural Institute of Canada, and to take the other steps necessary to alter the Constitution of the Royal Architectural Institute, to comply with the request in the joint resolution of all he Official Provincial Associations throughout Canada, to form the R.A.I.C. into a Federation of official Canadian architectural bodies. Among the principal amendments will be the changing of the name of the "Royal Architectural Institute of Canada" to the "Royal Institute of Canadian Architects," and the providing a class of membership for those members of the Royal Architectural Institute, who are not members of a Provincial Association, such as for instance "non-registered members."

Misconception of the Proper Conduct of Architectural Competitions by Lay Public Causes Much Dissatisfaction in the Profession. . . . . .

MANY DIFFICULTIES seem to have arisen in the several architectural competitions that have recently been conducted in Canada. It seems that the lay public has absolutely no conception of the ethical rules governing programmes in architectural competitions, nor have they any idea of the proper procedure in the awarding of the prizes, nor do they understand that when an architect submits a design in a competition, he does it with a view of securing the commission, and not simply of winning the prize offered. For this reason, the conditions governing such competitions, the appointment of the assessors, and the methods adopted in the awarding of prizes, have caused no little bitterness among competing architects.

It is absolutely impossible to conduct a competition, where each individual competitor will be given, what he may consider an honorable and fair deal, if the conditions governing the competition are not correct, the assessor is not properly appointed and a properly qualified man, or the procedure of the awarding of prizes conducted in a manner consistent with good professional practice. This difficulty is one of the many that has to be straightened out, before the architect is permitted to do justice to his clients, himself and the profession generally.

It is our purpose in the near future to go thoroughly into this matter of architectural competitions, and we hope within the next few months to be able to deal with some of the difficulties that have arisen in the recent competitions we refer to. In the meantime, we shall be glad to hear from members of the profession who have suggestions to offer, as to the best ways and means of impressing upon the building public what an architectural competition really means.

CORRECTION. . . . . .

ON PAGE 36 OF JUNE "CONSTRUCTION," in the advertisement of The Standard Ideal Co., a cut of the La Patrie Building, Montreal was reproduced, in connection with which the name of Mr. Pennault was erroneously mentioned as the architect, instead of Messrs. G. A. Monette and J. O. Turgeon, who were the associate architects for this building. We beg to say that this unfortunate mistake was purely the result of a typographical error, for it is generally known that these architects were responsible for the design of this, the finest newspaper building in Canada.

COMPETITION FOR MEMORIAL TOWER.—Awards Made in R.A.I.C. Competition for National Tower to be Erected on North-west Arm, Halifax.—Assessors' Report Says Designs Submitted Disappointing.

ANNOUNCEMENT of an architectural competition for a National Memorial Tower to commemorate the establishment of self-government in Canada, under the auspices of the Royal Architectural Institute of Canada, was made in the March number of CONSTRUCTION. This proposed tower was to be erected on the North West Arm at Halifax on an elevation of ninety feet above sea level.

Since it is purely a patriotic undertaking, no money prizes were named, but the R.A.I.C. offered a gold medal for the first prize, a silver medal for the second prize, and a bronze medal for the third prize design.

The competition was closed on the 25th of May. Twelve designs from different portions of Canada were submitted, and the prizes were awarded on July 25 by the assessors, Professors P. E. Nobbs, of McGill University, Montreal; F. Spence Baker, president of the R.A.I.C., and Mr. Frank Darling, of the firm of Darling & Pearson, Toronto.

In view of the fact that the season has been an exceedingly busy one for the architects, the number of designs submitted may be considered reasonably large.

We reproduce below the report of the assessors as submitted to the R.A.I.C.

2 LEADER LANE, JULY 25, 1910.

THE ROYAL ARCHITECTURAL INSTITUTE OF CANADA,
5 BEAVER HALL SQUARE,
MONTREAL, CAN.

GENTLEMEN:

RE MEMORIAL TOWER, HALIFAX.

We have carefully examined the twelve sets of drawings submitted in competition for the proposed Memorial Tower at Halifax and cannot refrain from expressing the opinion that the result of the competition as exhibited by the above designs is very disappointing. With the exception of the design we have placed first, none of them seem to have succeeded in arriving at such a solution of the problem as comes anywhere near the idea that the promoters evidently had in mind.

The design placed second, though on the whole excellent, is after all merely an Italian Campanile—a foreign style that has nothing whatever to do with this country.

The design placed third lacks interest and fails in expressing its purpose.

Number one would require much more study before it could be adopted, and though the general idea might very well be kept, certain changes would, in our opinion, be essential before it could be considered satisfactory.

We have placed

1st, the design submitted by Mr. A. Sharp, Toronto.
2nd, that submitted by Mr. W. M. Brown, Halifax.
3rd, that by Mr. Jno. M. Lyle of Toronto.

We are, Gentlemen,
Yours obediently,
(Sgd.) P. E. NOBBS,
F. SPENCE BAKER,
FRANK DARLING.

In order that our readers may thoroughly acquaint themselves with the exact conditions governing the competition, we reproduce same here in full as announced in March CONSTRUCTION.

CONDITIONS OF COMPETITION.

It is proposed to erect a Tower commemorative of the Federation of the various Provinces whereby the Dominion of Canada came into existence, in 1867.

This Tower is to be erected on the North West Arm at Halifax, N.S.

The competition is open to Canadian architects and draughtsmen who are British subjects, and will be conducted as follows, by the Royal Architectural Institute of Canada:

1st. The official Provincial Association in each Province will invite its members to submit competitive designs for the Tower.

2nd. Each Provincial Association will then select the three best designs from those submitted and forward them to the Royal Architectural Institute, which body will make a final selection from the plans so submitted. Members of the Royal Architectural Institute who reside in a Province where there is no organized Provincial Association of Architects, will send their designs direct to the Secretary of the Royal Architectural Institute before the 25th May, 1910. These drawings will be submitted to the Council of the Royal Architectural Institute, who will select three plans to go forward to the final competition as set forth in Condition 6.

3rd. Medals will be awarded by the Royal Architectural Institute suitably inscribed. To the author of the design placed first, a gold medal; author of the design placed second, a silver medal; author of the design placed third, a bronze medal.

4th. The author of the design placed first by the Royal Architectural Institute as the winner of the whole competition will be asked to prepare working drawings and specifications with sufficient details to carry out the work. It is felt that the patriotism of Canadian architects can be counted upon in this respect, the elimination of profit being in the nature of a contribution.

5th. The Tower is to be built of local ironstone rubble laid in cement mortar, cost per cubic foot, 50 cents. All dressed work, such as strings, quoins, etc., to be of granite, cost per cubic foot, $3.

The height of the Tower to be not less than 100 feet. The walls to be solid rubble pointed inside and outside—no plastering. The floors to be fireproof. The stairs also to be of fireproof material.

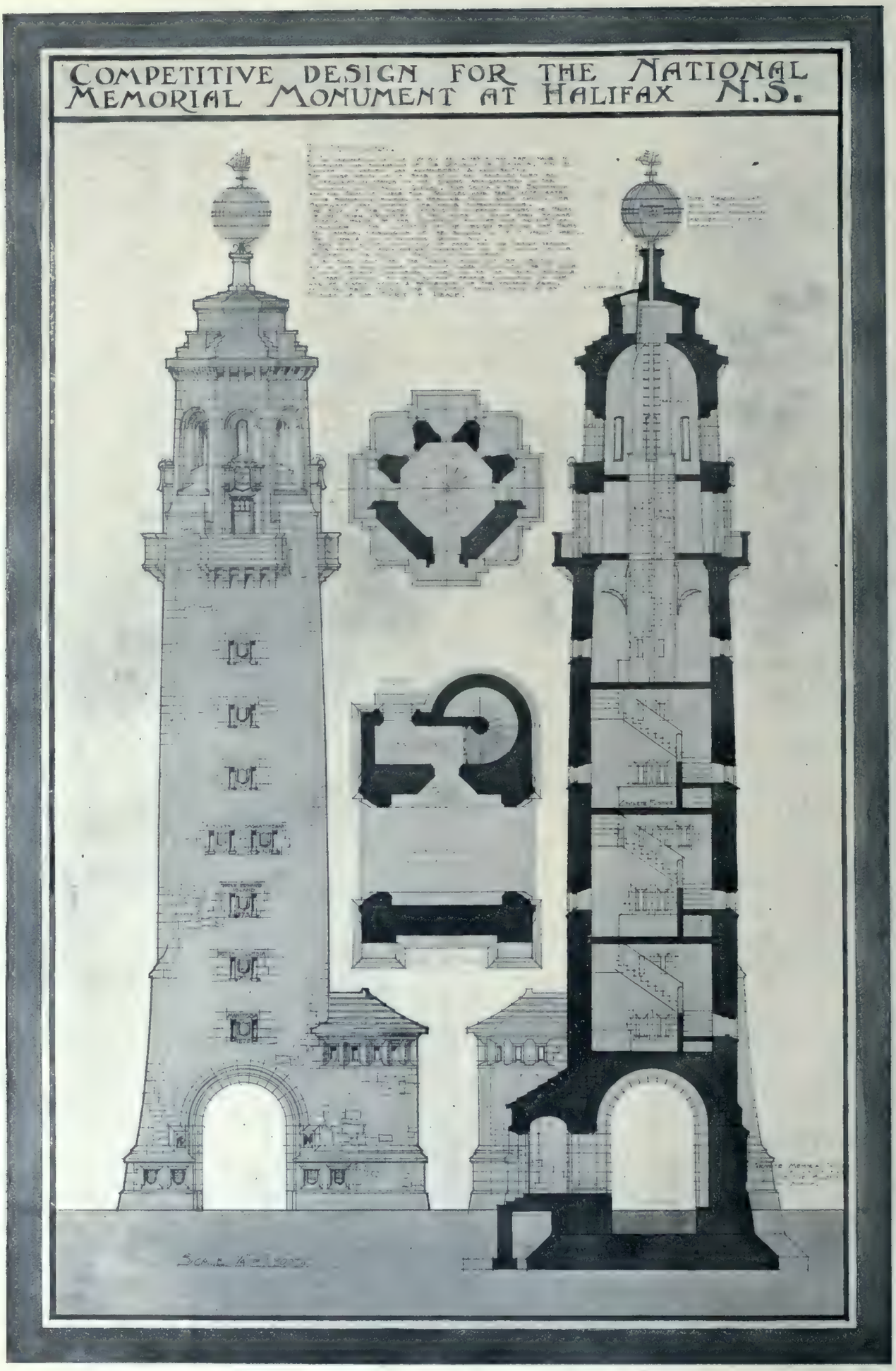
The location is indicated on the panoramic view of the North West Arm at Halifax.

The cost of the building is not to exceed $22,000.

6th. The drawings submitted in each Province will be submitted to a Board of Assessors composed of the President and two members of the Council of the Provincial Associations, who will select the three plans to go forward to the final competition, where the designs will be submitted to the final selection made by the Professor of Architecture at McGill University, Montreal; the Professor of Architecture at the University of Toronto, and the President of the Royal Architectural Institute.

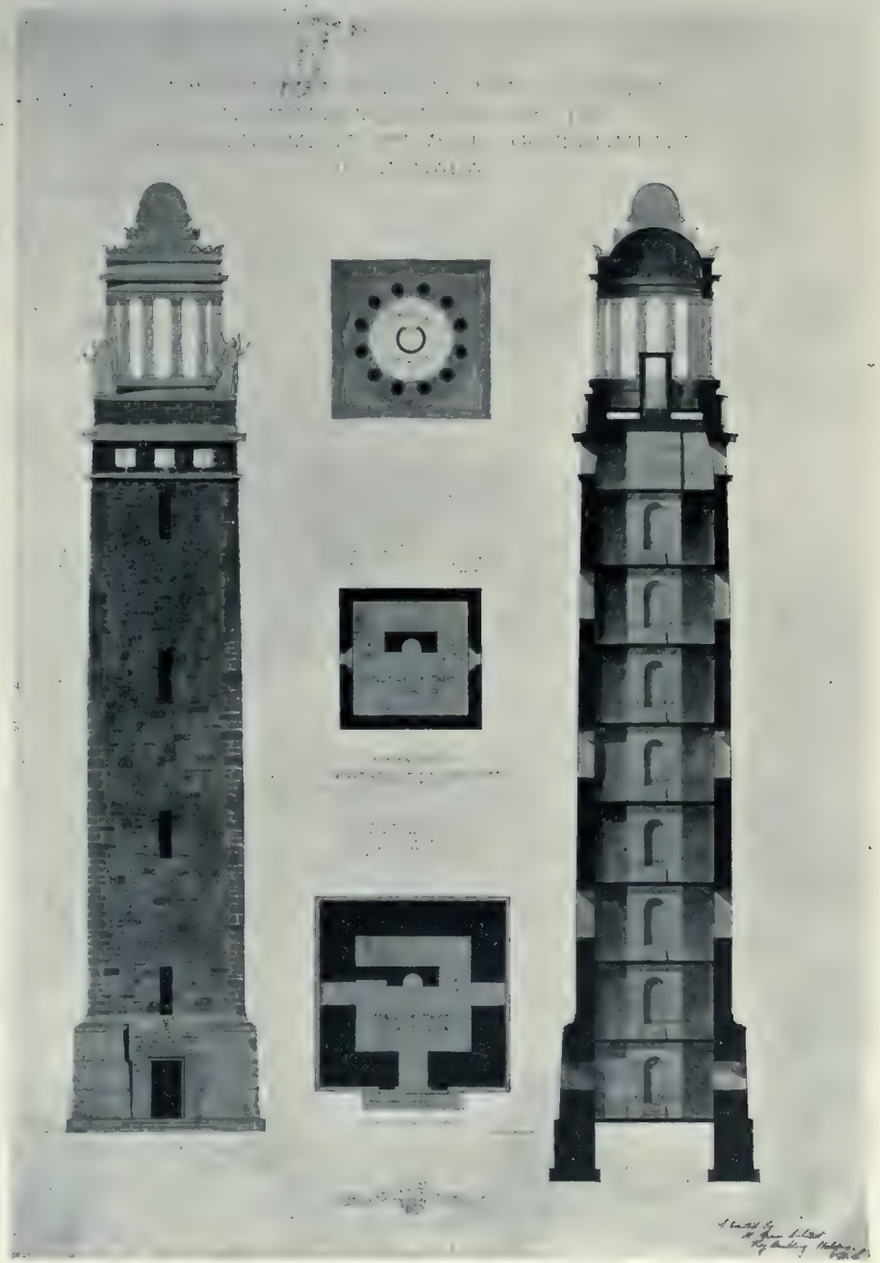
7th. Any intending competitors wishing to ask any questions may do so by writing to the Secretary at any time previous to April 10, 1910. All questions thus received will be answered in one document, which will be sent to the Secretaries of the various Associations to whom Conditions of Competition have been supplied immediately following the date of the 10th April.

8th. The drawings in each Provincial Competition as mentioned in Condition 2 are to be handed to the Registrar or Secretary of the Association before the 25th of May, 1910, and the final award will be made as soon as possible thereafter. The drawings, which are to be made at the scale of ¼ inch to the foot, are to consist of two sheets, one showing the plan, elevations and sections, and the other a perspective view of the exterior of the building. The latter may be rendered in pencil, pen and ink, pastel, wash or water color, as the competitior may decide, but the perspective is not to be drawn at a smaller scale than ¼ inch to the foot.

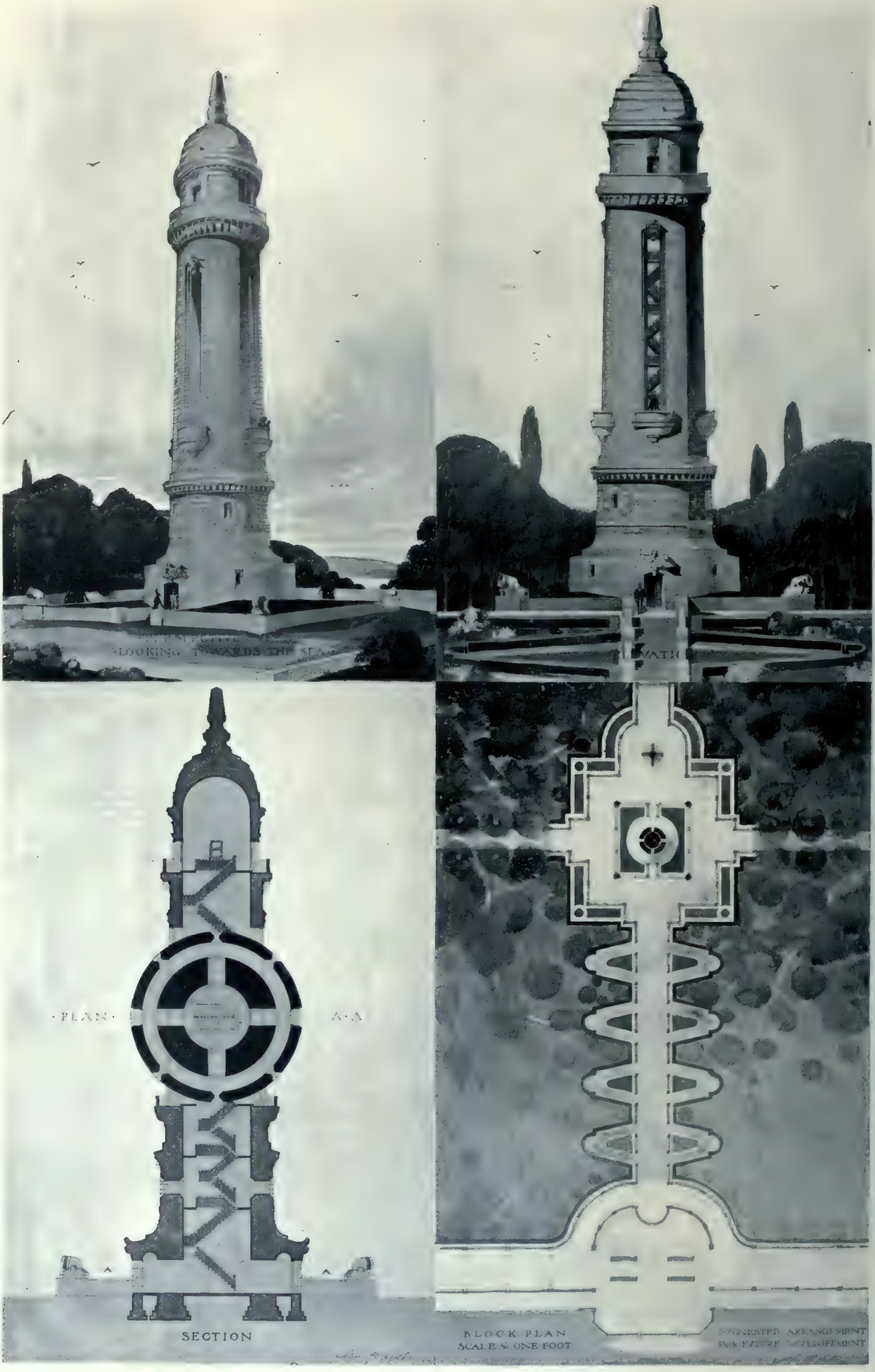


Elevation and Sectional View, Together with Ground Plan and Other Details of the First Prize Design, Awarded the Gold Medal in the R.A.I.C. Competition for the National Memorial Monument to be Erected on the North-West Arm, Halifax. N. S. Sharp, Toronto, Designer.

Second Prize Design, Awarded Silver Medal in the R.A.I.C. Competition for a National Memorial Monument to be Erected on the North-West Arm, Halifax. W. M. Brown, Halifax, Designer.



Elevation and Sectional View, Together with Ground Plan and Other Details of the Second Prize Design, Awarded the Silver Medal in the R.A.I.C. Competition for the National Memorial Monument to be Erected on the North-West Arm, Halifax. W. M. Brown, Halifax, Designer.



Third Prize Design, Awarded Bronze Medal in the R.A.I.C. Competition for a National Memorial Monument to be Erected on the North-West Arm, Halifax. John M. Lyle, Toronto, Designer.

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

Ivan S. Macdonald, Editor and Manager

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

Vol. 3 Toronto, August, 1910 No. 9

CURRENT TOPICS

AN INCREASE IN THE ANNUAL VALUE of the Egyptian cotton crop of between $15,000,000 and $20,000,000 is expected to result from the heightening of the Assouan Dam. The work, it is estimated, will occupy six years in all, and cost a huge sum, but the benefits to be derived from the improvement has a compensatory value, that will repay for the undertaking many times over.

* * *

A REPORT FROM STOCKHOLM says that the water falls of Sweden have been estimated to be able to supply 10,000,000 horse-power for at least nine months of the year. At the present time the Government owns 277 falls, and it is their intention to utilize as many as possible in the near future. The largest state owned electric plant, the energy of which has been calculated to be 80,000 horse power, is at Trohattan. Another situated at Porjis Falls develops 50,000 horse power.

* * *

THE YEAR 1909 SHOWS an increase of 20 per cent. over 1908 in the production of Portland cement in the United States. Returns collected jointly by the Bureau of the Census and the Geological Survey show that between 61,300,000 and 62,000,000 barrels were produced in 1909. The value of this at an average rate of 85 cents per barrel is between $52,105,000 and $52,700,000. Although the price per barrel was very low during part of the summer of 1909, yet the average of 85 cents is the same as for 1908.

THE COMBINED IDEAS of the principal tramway managers of England are embodied in a new electric car brake which is about to be given a trial at Bradford. The new device was designed in pursuant to various suggestions offered to the manager of the street railway system operating at that place, who is also the joint inventor of the extensible axle now in use on the Bradford-Leeds tramway to overcome the sudden change in guage that occurs in that line from 4 feet to 4 feet 8 inches.

* * *

THE ANCIENT CITY OF TARSUS, in Asia Minor, has recently been lighted by electricity, the power being taken from the rapidly flowing Cydnus River. About 1½ miles from the city an 80-horsepower turbine is made to drive a large dynamo, which furnishes sufficient power for 1,000 lamps of 16 candlepower each; 450 are now used to light the streets of the city and the remainder will be furnished to private consumers. It is proposed to extend the electric-lighting system to Adana and Mersine, the power to be likewise furnished by the Cydnus River and transmitted by wire to these places.

* * *

CARDIFF, BRISTOL AND OTHER TOWNS in England, according to Trade Commissioner W. A. McKinnon at Birmingham, have adopted for their electric railway service a device consisting of a patent frog similar to a spring pivot, by which a trolley pole can be automatically reversed at terminals. The car itself simply starts on the return journey, the pole going backwards for a few yards, when it is caught and carried outwards on a "Y," till it is at right angles with the track. From this position the forward movement of the car pulls it along the return arm of the "Y" and through another right angle back again to the straight wire, and the reverse is completed.

* * *

TO MEASURE THE HEAT generated by the hardening of Portland cement tests are being made in the Panama Canal zone by imbedding in the walls of the locks built at Gatun, six resistance thermometers. At different stages in the settling of the cement readings of the temperature are to be taken. The temperature increases rapidly from the time the concrete begins to crystalize until it reaches its final set. From the settling point the increase is slow but usually continues during the hardening process which may last several years. The results of these experiments will be likely to prove of great interest and may throw some light on expansion and contraction which is the bugbear of all cement users.

* * *

A NOTABLE ADDITION to the attractions that Florence holds out to the lover of architecture and others arts, says The ARCHITECT (London) has been made in the opening of the restored Davanzati Palace in the Via Porta Rossa. Built early in the fourteenth century by the Davizzi family, it at the close of the sixteenth century became the property of Bernardo Davanzati, a man of wealth, learning and ancient lineage. Like many other old Italian families, the Davanzati declined in wealth and influence, and came to an end with the suicide of the last representative, Carlo di Giuseppe. The house, already suffering from the poverty of its owners, fell into the abysm of a tenement dwelling. In 1904 Signor Volpi, the well-known art expert and dealer, bought the palace, and has since been steadily carrying out its rescue from desolation and restoration to a close approach to its former beauty. Frescoes and old woodwork have been brought to light, and Signor Volpi has furnished the palace again with unrestored furniture of its own date.

TRADE COMMISSIONER Harrison Watson, in a recent report states that maple flooring is being extensively used in the erection of public institutions, hotels, and similar buildings, and manufacturers who possess the capacity for a large and regular output ought to be able to find a profitable market for the material in the United Kingdom.

* * *

WHAT IS CLAIMED to be an absolute noise-proof room has been perfected by Prof. Zwaardemaker, of the Utrecht (Holland) University. Details of the construction of the chamber which precludes the transmission of either external or internal sound, have been communicated to the Amsterdam Royal Academy of Science. The walls of the room consist of six layers, alternately of wood, cork and sand. There are two spaces, one between the second and the third layer, and one between the fourth and the fifth, from which the air has been extracted. The inner walls are of porous stone covered with a kind of horsehair cloth known as trichopiese, a Belgian invention, which is sound-resisting and is widely used in Belgium in telephone booths. The walls are pierced by acoustically isolated leaden rods. The roof is composed of layers of lead, wood, asphalt, paper, seagrass and cork. The floor is of marble and is covered with a thickly woven Smyrna carpet. A tomb-like silence reigns within the compartment, which will be used for clinical studies only.

* * *

THERE WILL SOON be completed in New York City what is reasonably supposed to be the strongest and safest bank vault that man's ingenuity has yet devised. Bankers and probably safe breakers are manifesting great interest in this burglar proof construction. The huge door, eighteen inches in thickness, is built to withstand dynamite or any other form of high explosives. It is made of steel with a special concrete filling between the outside and inside walls, and imbedded in this concrete are jail rods. The door itself weighs twenty-five tons. Inside this outer door is another made of solid steel of one and a half inches thickness. The combination consists of a set of four time locks which will render it absolutely impossible to open the door at night by working the combination. The foundation of the vault is altogether separate from the foundation of the building containing it, and is so constructed as to positively prevent undertunneling. A system of lamps and mirrors beneath the floor around the four walls gives the watchman a clear view underneath the floor.

* * *

ONE OF THE MOST UNIQUE ABODES in the world is found in the home of S. Mobly, near Prairie Grove, Ark. For years Mobley, who is a member of the Farmer Union, and one of the best-known agriculturalists in his section of the state, has lived in a cave at the top of a mountain 1,700 feet high. Despite the fact that this home is somewhat unusual in location, it lacks little or nothing in the way of comfort and conveniences, its advantages in this respect including hot and cold water, electric fans, electric light and steam heat. It is 78 feet long by 25 feet wide and 32 feet high, and is described as being probably the most palatial cave in the universe. The walls are of beautiful granite, which has been handsomely polished. The ceiling is forty feet thick. The front of the cave is of glass and the floors are of hardwood. The flues of the cooking range pass out through the mouth of the cave and extend outward a distance of nearly forty feet. Moveable screens permit the increase and reduction of rooms at the pleasure of the occupants. A fine spring at the top of the mountain furnishes water through a private system of waterworks. This novel dwelling is reached by a beautiful road ascending the crest of the mountain by easy stages, and the grounds about the cave are kept in perfect condition.

SINCE THE APPLICATION of cement to so many lines of structural work, says a contemporary, there have been numerous designs created in connection with log houses. The development of the cement industry has enabled architects to form designs of modern descriptions of log residences for the country service, the beaches, the city estate, or wherever required. Some of the designs of logs in combination with concrete effects are exceedingly attractive in appearance. Other styles are plain. Some are made up with real rocks or pebbles for the rubble surfaces, while other types are executed with the imitation of rock and pebbles with cement material. Then there are cottages designed with rubble surfaces set off with broken bottle green glass. Some good effects have been secured with hardwood set in blocks, angles, sections, curves, and the like in the cement walls of the log frame cabins. There are many designs possible when wrought iron or steel sections, elbows, cornices, parts of frames, turns, etc., are utilized in conjunction with the rubble work, cement, and log work. Furthermore, models of attractive combination log and cement houses are made by introducing novelties in window sash, frames of heavy doors, metal doors, sheet iron or tile smoke stacks, novel-shaped windows, projecting ends of logs at the corners and kindred work. It is possible for the designer of cement products to make imitation concrete logs so well that you imagine that the artificial log is the genuine article. Some of the concrete workmen prefer to erect the log structure with logs made from moulded concrete. These logs are cast with the ends properly recessed for the jointing at the angle of the walls. The concrete log is often cast with the filling space ready made in such a way that the material forming that space readily interlocks with the material of the adjoining log.

* * *

IN ORDER TO NUMBER DRAWINGS in a convenient manner and make it easy to find any section or detail referred to on an assembled drawing or plan, Mr. I. W. Jones, engineer and designer of water power plants, Milton, N.H., has devised a system which is self-referencing. The various sheets for a given job are designated alphabetically, from A onward. When there are more than 26 sheets on one job, the twenty-seventh is called AA, the twenty-eighth AB, and so on. The different views, sketches and details on a sheet are designated numerically and the sheet letter attached to the number. For example, the third detail on sheet D would have as its title, No. 3—D. When sections are taken they are given titles which show the letter of the sheet on which they are detailed, and a number corresponding to the position on that sheet. If, for example, a certain cross-section line on one of the plans is marked 2—H, it means that the drawing of this section will be found on sheet H, and that it is the second section or detail on that sheet. All section lines are lettered at both ends and have arrows to show in what direction the section is taken. Moreover, if a piece of machinery indicated on a plan is marked "See Detail 9—M," it would mean that the detailed drawing of the object is No. 9 on sheet M. The scheme thus saves considerable time over one that is not self-referencing. Mr. Jones states that it has been found very satisfactory. Each job is given an individual number which consists of a combination of a consecutive job number for the year in which it was taken, and the last two figures of the year. For example, job number 1009, means that the job was the tenth one taken up in 1909, while the twenty-fifth started in that year would be numbered 2509. By this method both plans and files indicate at a glance when a given piece of work was taken up.—ENGINEERING RECORD.

NEW PREMISES, BANK OF MONTREAL, TORONTO.—Recently Erected Structure Which Shows an Interesting Use of Terra Cotta in Commercial Design.—Planned Exclusively for Banking Purposes.—Built Along Fireproof Lines.

NOTHING PERHAPS, more definitely marks the industrial and commercial growth of the Dominion, or more fully bespeaks the nation's prosperity and strength than the extensions made by banking institutions in the erection of new home offices and branch houses. The activity in this respect during the past few years, has been such as to form one of the outstanding features of the building development throughout the country, and there are few cities or towns of any importance to-day which cannot boast of several representative structures of this particular class.

Toronto's most recent addition is the new premises of the Bank of Montreal, at the corner of Yonge and Queen streets, designed by Architects Darling and Pearson. It is a two story building of Renaissance style, which provides excellently appointed quarters for the institution whose name it bears, and office accommodations for the Royal Trust Company of Canada. The construction of the building is of steel and terra cotta, the exterior being carried out in an exceptionally splendid quality of English terra cotta, on a highly polished granite base. The arched treatment of the lower openings and the direct arrangement of the upper windows, together with the simple cornice and parapet, give the exterior a dignified and substantial character, without that over-cumbersome massiveness which at times is more disfiguring than dignifying.

The entrance is from Yonge street, though an effectively pannelled quarter cut oak doorway, having a three stone step rise from the sidewalk, and a simple, three - light, bronze electrolier on either side. This opens into the vestibule which has a vaulted ceiling and a two-color design marble floor. The walls here are dadoed in a reddish brown Tennessee marble to the height of six feet, and this treatment is repeated in the hall to the left where an elevator, enclosed in a verdigris bronze grille, and an iron staircase with marble treads and French pink Tennessee marble walls communicates with the second floor.

Access to the banking room is through swinging doors of glass set in oak frames. It is a well-lighted and well-ventilated interior of spacious dimensions. Richly pannelled high wainscotting and a light green tint plastic treatment constitutes the wall scheme. The ceiling is arched and marked off into sections at the rise of the columns by heavy festooned plastic enrichments. To the right is the manager's office which can be entered either from the public space or banking department.

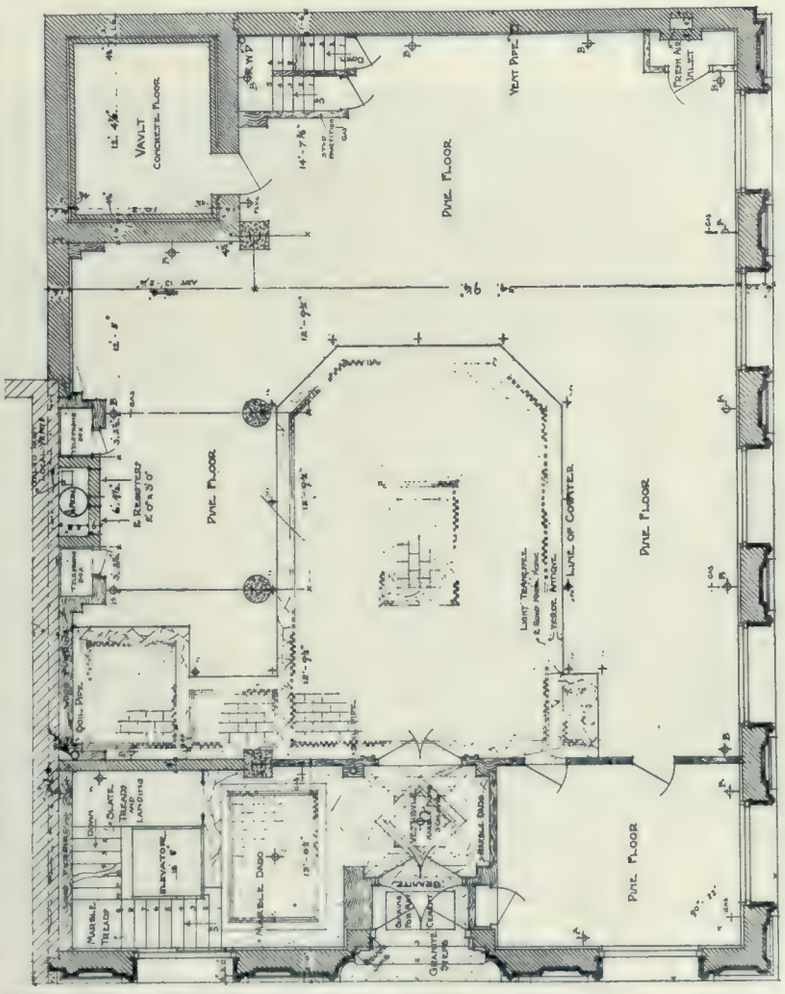
The floor in the public space is of gray Tennessee marble with a two-color dark border design conforming to the mahogany counter which encloses the central floor area on all sides. Ample light is obtained from the large well-placed window on the Queen street side, and from the ceiling lights of the inner court, which are designed to conform to the arches formed by the columns. Simple wall medallions and rich plastic capitals effectually relieve the directness and severity of the inner wall. Two conveniently placed telephone booths are situated on the side, and at the rear is the vault, aproximately 10½ by 13 feet in floor area, which is equipped with a modern fireproof and burglarproof door and finished with a concrete floor. Adjoining the vault is a stair case to the basement and the upper floor. The upper floor is divided off into splendidly appointed offices entirely for the use of the Royal Trust Company. The building is equipped with a modern heating and ventilating plant, and all the wiring is installed in iron conduits, and executed according to the latest reqiurements of the Canadian Board of Fire Underwriters.

It is altogether an exceptionally well-considered structure either from the standpoint of investment, or as viewed architecturally and constructively.

It admirably meets in every way the requirements of a building intended for banking purposes, and in no particular, is there a display of needless ornamentation, or evidence of uncalled for material waste.

The construction throughout is practically fireproof, all the structural steel members being fully protected at all parts by the terra cotta work

The various branches of the work were carried out by the following firms: Masonry, T. Cameron & Son; carpentery,, J. C. Scott & Co., Limited; plaster work, Hoidge & Company; marble work, Hoidge Marble Company; fixtures, Canadian Office and School Furniture Co.; plumbing and heating, Toronto Furnace and Crematory Co.; wiring, Rice, Green & Company; electric fixtures, McDonald & Wilson,



Ground Floor, New Premises, Bank of Montreal, Yonge and Queen Streets, Toronto. Darling and Pearson, Architects.

New Premises, Bank of Montreal, Yonge and Queen Streets, Toronto. A Recently Erected Building Which Shows an Interesting use of Terra Cotta in Commercial Design. Darling and Pearson, Architects.

View of Banking Room, Looking Toward the Rear, New Premises, Bank of Montreal, Queen and Yonge Streets, Toronto. Darling and Pearson, Architects.

View of Banking Room, Looking Towards the Entrance, New Premises, Bank of Montreal, Queen and Yonge Streets, Toronto. Darling and Pearson, Architects.

Banking Room, New Premises, Bank of Montreal, Queen and Yonge Streets, Toronto. Showing the Arched Skylights and the Treatment of Side Walls and Ceiling. Darling and Pearson, Architects.

ANCIENT HOMESTEADS IN ENGLAND.—Quaint Half-Timbered Dwelling Structures Whose Erection Antedates the Fifteenth Century.—Built Without Preconceived Form as to External Treatment.—Remaining Examples of Early "Magpies."

THE OAK-TIMBERED dwellings of our ancestors were coeval with the "Wooden walls of Old England," and it is a regrettable fact that they are fast disappearing in the devastating march of modern improvement. Many of these quaint "magpies" date back to the commencement of the fourteenth century, at which time the districts in which they stand were covered by extensive forests, the wood from which, being the cheapest and handiest material available, was utilized in the construction of cottage and mansion. Nothing catches the eye of the traveler so readily as the beautiful chequered fronts of these ancient "magpies." Bars vertical and horizontal, angles and curves mingle curiously, but always elegantly, with numerous gables breaking the skyline. In the cottage the chequer work is generally of simple and primitive design, but in the more pretentious buildings the external decoration is of the most varied and elaborate description. It is said that when these buildings were erected the builder had no preconceived plan for carrying out the work. This was more especially the case so far as the decoration of the exterior was concerned, which appears to have been elaborated as the building progressed; and to this fact the diversified methods of design may be attributed. The houses were invariably well and substantially built, and

Bramhall Hall.

they have withstood the ravages of time and tempest remarkably well, outliving many of the structures of later times. During violent gales of wind, which have wrecked many a homestead, these old "magpies," in the words of an occupant, "never flinched an inch." They were, however, not constructed in a style suited to the requirements of the more luxuriant tastes if the twentieth century, and in numerous instances the descendants of ancient families have forsaken their ancestral homes, and built for themselves mansions in a more up-to-date style, leaving the old halls to be occupied as farmhouses. There are, however, exceptions to this, e.g., Bramhall, in Cheshire, which is still in occupation as a mansion.

Cheshire and Lancashire are prolific in these old "magpies," the whole of the illustrations to this note, with one exception, being taken from these counties. It is an instructive

Bramhall Hall.

and fascinating quest for the architectural student to seek out these old homesteads and photograph or sketch them. Cheshire is one of the fairest counties in England, and the motorist or cyclist who wheels about its leafy lanes will find it a delightful experience. The adjoining county of Lancashire is too much given up to the cotton industry to permit of its highways and byways retaining their pristine beauty, but many of the historic old homesteads are easily accessible by train. Moreton Old Hall, situate on the southern borders of Cheshire, a few miles from Congleton, is considered one of the best examples of a half-timbered building in this country. Since its erection in 1540, up to recent times, it has been the home of the ancient family of Moreton. Latterly, however, the present descendants of the Moreton's have erected a modern mansion a short distance away from their ancestral home, and the latter is partially occupied as a

Moreton Old Hall.

farmhouse. Free access to the whole of the building is permitted, and refreshments are served to visitors in the spacious banqueting hall. Three sides of the building are now standing, surrounded by the moat which encloses about one acre of ground. The entrance is gained by a stone bridge on the south side, and through an ancient gateway to the courtyard. The scene here is one of great beauty, and cannot fail to impress the beholder with its antique architectural setting. Over the windows the following quaint inscriptions may be described:—

"God is al in al Thing."

"Thies Windows Whire Made by William Morcton in the Yeare of Our Lord MDLIX."

"Richard Da'e, Carpe'der made Thies Windows by the Grace of God."

From the courtyard entrance is gained to the little chapel, which is only ten feet in length. At the east end of the chapel there is a lancet window, and texts are painted in black letter within the oaken panels of the walls. Service is still held within its sacred precincts four times a year, and the main building is surmounted by a bell-cot for summoning the retainers to service. In the upper part of the south front is the ballroom, entirely panelled with oak, in which Queen Elizabeth is

The Priest's House, Prestbury.

said to have danced. On one of the windows of this ancient homestead some courtier in Elizabethan times scratched the following lines with his diamond:—

"Man can noe more know women's mind by kaire,
Then by her shadow hide ye what clothes shee weare.."

It is interesting to note that the present occupier of Moreton Old Hall is Mrs. Dale, a descendant of "Richard Dale, the carpe'der," who made the windows.

Bramhall Hall is situate on the outskirts of the village of Bramhall, a few miles from Stockport, with a station on the London and North-Western Railway. It is the ancestral home of the Davenports, who, up to recent times, have occupied it since the reign of Edward III. The interior is not usually shown to visitors, but a request to view the exterior is generally very courteously granted. There was formerly a right-of-way through a portion of the hall, and it is said that refreshments were provided for travelers free of charge. This laudable custom has unfortunately lapsed, but it is referred to in Harrison Ainsworth's "Rookwood." There are several picturesque cottages in the neighbourhood, one of which we illustrate.

"The Palace," Ditchling, Sussex.

Chester contains many examples of these half-timbered buildings, and we are able to reproduce a photograph of the reputed oldest house in that city.

In the south-eastern corner of Cheshire lies the quaint little village of Prestbury. Its Priest's House is a striking half-timbered building, dating back to the fourteenth century. During the troublous times of the Commonwealth, marriages were solemnized within this building, and the vicar preached to his congregation from the little balcony which will be observed from the centre of the building.

Kersal Cell, the doorway of which we give an illustration, is situated

The Oldest House in Chester.

on the outskirts of Manchester. It was formerly a religious house, but latterly has become famous as the birthplace of Dr. John Byrom, who wrote "Christians, Awake" within its walls. The hymn was first sung by the choristers from Manchester Parish Church as they stood around the old doorway shown in the photograph.

Of the remaining example from Ditchling, in Sussex, but little is recorded. It is known as "The Palace," and tradition states that it was once the residence of Anne of Cleves.—JOURNAL SOCIETY OF ARCHITECTS, LONDON.

ONE OF THE MOST remarkable engineering enterprizes of recent years has just been consummated in the erection of a bridge in the Jura mountains to carry the railroad across a ravine. The construction of the bridge, which consists of a single masonry arch, having an opening of 267 ft., is interestingly described in a recent issue of THE WORLD'S WORK

An Old Homestead, Bramhall.

AND PLAY: The first task was the preparation of the site on either bank for the abutments of the enormous arch. Simultaneously, the erection of temporary wooden towers from the bed of the gorge to carry the elaborate and heavy wooden centreing to support the masonry during its construction was taken in hand. This, in itself, was no mean task. First, substantial masonry plinths had to be prepared to support the wooden pylons, and this entailed the driving of piles into the river bed to secure the requisite solid foundations. The wooden piers were quickly raised to a height of about 133 ft. Three towers were necessary, one close to either bank, and the other in the centre of the gorge, and they were of massive construction to offer complete support to the enormous weight of the falsework and the masonry during its erection. The falsework entailed the use of 21,000 ft. of wood and thirty tons of iron and steel. The sides of the main arch are surmounted by smaller semi-circular arches which carry the road. The bridge cost $72,000.

Kersal Cell, Manchester.

Bridge Street Corner.

Bridge Street.

Greendale Road.

Greendale Road.

Studies in Domestic Design as Seen in Workmen Cottages at Port Sunlight, England, where the Garden Suburb and Town Planning Idea Has Been Adopted by a Philanthropic Manufacturing Concern in Providing Housing Accommodations Which Would Give its Employees Both Ideal Environments and the Advantages of Improved Social and Sanitary Conditions. These Houses Represent the Work of Different Architects, and They Give an Excellent Idea of the Variety and Beauty of the Cottages Found at Port Sunlight. The Quaintness of the Half-Timbered Cottages in Greendale Road Will Appeal to Many, as Will Also the Decorated Chimney Stacks and Carved Barge Board of the Bridge Street Houses, so Strongly Reminiscent of Tudor Architecture.

Cottages at Port Sunlight. An Eminently Successful Group Containing Seven Houses in Which the Plan of the Interior is Identical in Every Case. The Irregularity of the Frontage and Skyline Lends a Pleasing Element of Variety, While the Two Entrance Porches Side by Side in the Projecting Bays Further Contribute this Way in Addition to Effecting Considerable Economy in Floor Space. Ernest Newton, F.R.I.B.A., Architect.

ENGLISH LOW-COST HOUSES.—The "Town Planning" and "Garden Suburb" Idea and Its Influence on Domestic Architecture.—Port Sunlight and Its Charming Cottages.—Examples of Residential Design in English Country Houses.

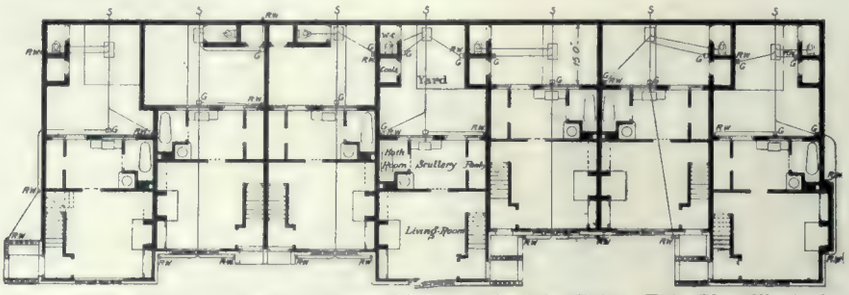
By HUCH B. PHILPOTT

JUDGED BY ITS BEST examples, it can hardly be denied that English Architecture has now reached a very high level. But it may be objected that the best examples are not fairly representative of the whole, and that the illustrations which appear very frequently in our Architectural Journals may give the reader, more especially the foreign and colonial reader, a wrong impression of the general average of English building. There is truth in this objection, and it is well, perhaps, at the outset of an article like this, that it should be frankly admitted. In selecting examples to illustrate the trend of design in British domestic architecture, one naturally chooses good examples, even if these unfortunately happen to be in a minority. The reader would not be thankful for anything otherwise, as he presumably is on the lookout for suggestions which he may adapt to his own practice rather than for horrible examples of what to avoid.

To prevent misconception, then, it may be desirable to state that there is still an immense amount of house-building in England which is no credit to the builders who carry it out, nor to the public taste which sanctions and encourages such work. Architects as a rule are not responsible for this poor quality of work. It is carried out by speculators and builders who are intent on saving architects' fees and all other expenses they possibly can. Their aim being to produce houses that attract the public eye, that appear to be cheap and consequently sell quickly, they develop suburban estates by cutting rectangular roads and building terraces or pairs of little houses, all exactly alike and none having more than the tiniest gardens so that the greatest possible number may be crowded on to the site. Questions of aspect are not considered, so that if the rooms on one side of the road chance to be right in respect of sunshine and light, the corresponding rooms in the exactly similar houses on the opposite side of the road will necessarily be wrong. "All modern conveniences" are a great feature of these houses, but they amount to nothing more substantial, as a rule, than a hot water supply to the bath room and an installation of electric bells—useful things in their way, but poor compensation for scamped brickwork, ill-fitting joinery and defective plumbing. With this type of building we are not, of course, here concerned, except to point out that it still exists in great quantities and is still being added to. The hopeful thing is that the corrupt mass of jerry-built structures is being steadily leavened by the work of architects and builders who are inspired by quite other ideals The public is beginning to appreciate these ideals, and the movement is slowly but surely towards a better type of dwelling—simpler and less pretentious, with less ornament, but more sanitary, more restful, more convenient, and better fitted for the making not of a lodging only, but of a home.

Many circumstances, no doubt, have influenced this general improvement, but, as regards the smaller and cheaper houses, especially, there has been no more important factor than the determination of benevolent employers to see their work-people housed under the best possible conditions. Mr. W. H. Lever, M.P., at Port Sunlight, Cheshire, and Mr.

George Cadbury, at Bournville, near Birmingham, made provision for the housing of a large number of working class people—mainly their own employees with their families—under



Ground Floor Plan of Group of Seven Cottages, Port Sunlight. This Plan Illustrates the Accommodations very Generally Provided in the Cottages or Smaller Houses. Ernest Newton, F.R.I.B.A., Architect.

conditions which had never before been approached for excellence. Neither Mr. Lever nor Mr. Cadbury wished their work in this direction to be regarded as philanthropic. They desired the houses to be let at a fair economic rental, and, as regards any loss they might have made by sinking capital in these concerns, they maintained that they were repaid by better industrial service of workers living under favorable housing conditions. This is not the place to speak of the social value of these experiments, but it may be stated in general terms that the evidence of the general death rate, and more particularly of the infant mortality rate, proves that life is vastly more healthy in these model communities than among people of similar social rank in the neighboring cities of Liverpool and Birmingham. Architecturally the standard of Port Sunlight and Bournville was very high, not only were the houses of individual excellence, but they were laid out on the site in a well considered plan with careful regard to their relative positions one to another, to the open spaces and vistas which were provided and to the aspects of their living rooms. In fact, these workmen's dwellings were planned and built, under the direction of eminent architects, with the same care and thought that is habitually given only to houses designed for the habitation of the wealthy.

The outcome of these efforts was in each case a village of rare attractiveness and beauty, whether regarded as a whole or in respect to its units. Naturally the system which had proved so great a success was adopted elsewhere. Other employers have provided model villages for their work people, public spirited housing reformers have begun by co-operative efforts to build villages, suburbs, and in one case, (Letchworth) a complete city on the same lines; and many private speculators recognizing the attractiveness and commercial utility of the idea have laid out estates more or less after the model provided by these two pioneer villages. Within the last year the fruitful idea of the considered laying out of a residential estate with regard to the general convenience and the seemliness and beauty of the whole, has received a great impetus by the passing of the Housing and Town Planning Act. Under this Act the municipalities may themselves accomplish much of the good work, which has hitherto been left to the reforming enterprise of private individual or groups of individuals. The municipalities may now control the development of estates by private speculators, so that the multiplication of ugly and unhealthy dwellings and the destruction of the amenities of the locality may be checked; and further they may themselves embark in the business of estate development, laying out new suburbs, and—within certain limits—building upon them after the most approved moden methods.

First Floor Plan, Group of Seven Cottages, Port Sunlight. Ernest Newton, Architect.

The development of the "town plannng" idea means a great deal for domestic architecture. The house which is to be built in a "garden city or a garden suburb" tends naturally towards a better style of architecture than that which obtains in the speculative builder's suburbs. The jewel which is to be set in a splendid setting naturally calls forth the artificer's best work. The house which is to form part of a dignified architectural scheme, which faces a public square or playing fields and has a garden at the rear, invites the best skill and attention of architect and builder The house is not to be hemmed in by its neighbors, and its back elevation is not to be hidden from public view as a disgraceful thing; consequently to get the "all round" style of designing which makes all the elevations equally presentable. The houses in a model village or suburb are not, as a rule, built speculatively for sale; consequently the meretricious ornament which entices the uninstructed buyer and the shoddy workmanship and material which makes the low price possible are both absent from these houses.

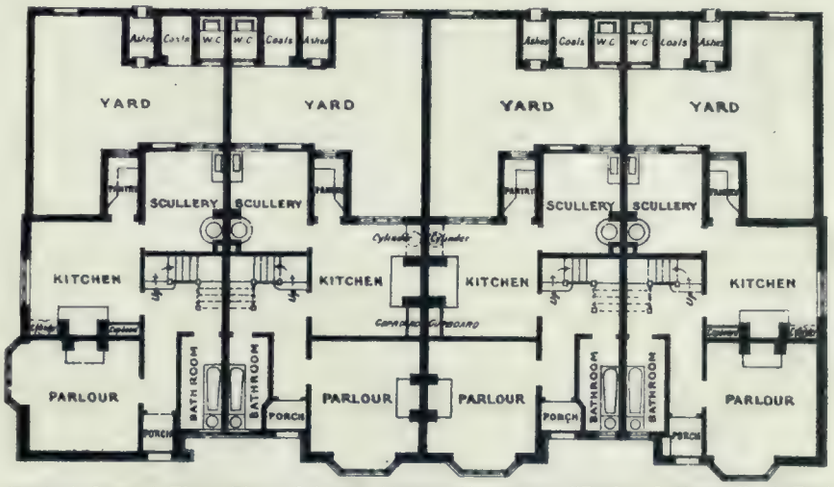
Instead, they exhibit the more solid

Wood Street, Port Sunlight. In this Row of Cottages the Walls are of Brick, Roughcasted in the Upper Portion and Finished with Decorative Plaster Work in the Gables.

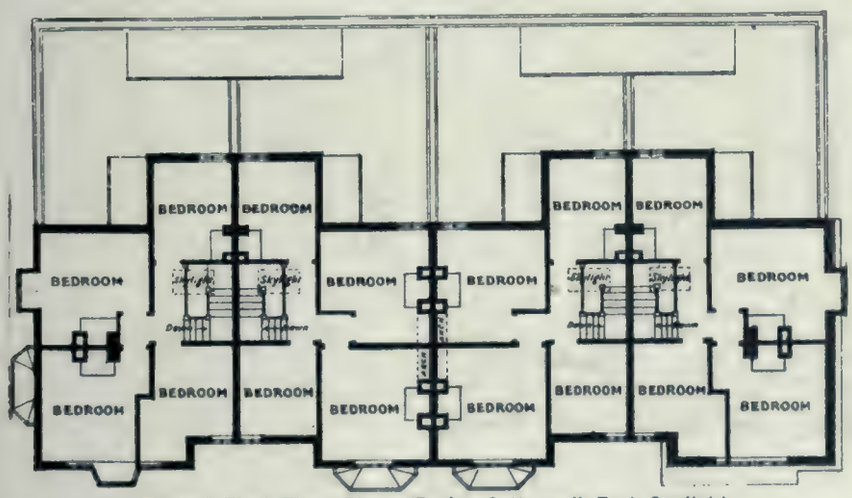
New Chester Road, Port Sunlight. Brick Walls Relieved with Stone Trimmings, Constitute the Outer Garb of this Interesting Series of Dwellings. The Gables, Executed in Dark and Light Brick, add a Decorative Touch, both Simple and Effective.

and lasting advantages of convenient planning, the natural and straightforward use of materials, simplicity, good proportion and sound construction. So general is the connection between site planning on the best lines and sound building that the public are beginning to speak of the "garden city" style of architecture which ing vaguely an architecture which exhibits the good qualities indicated above and is free from the worst vices of the jerry builder. Of course the term is illogical, but it is a tribute to the good work already done by architects and builders who have been concerned in the erection of the houses and cottages in the existing model villages and suburbs.

One delusion which these model schemes have almost completely dispelled is that good architecture is necessarily costly. Some of the most beautiful domestic architecture of recent years has been concerned with workmen's cottages costing about $1,000 each, or even less. And some of our most eminent architects have not disdained the work of designing such cottages, recognizing that the beauty of a cottage is as real and as good a thing in its own way as the beauty of a palace.



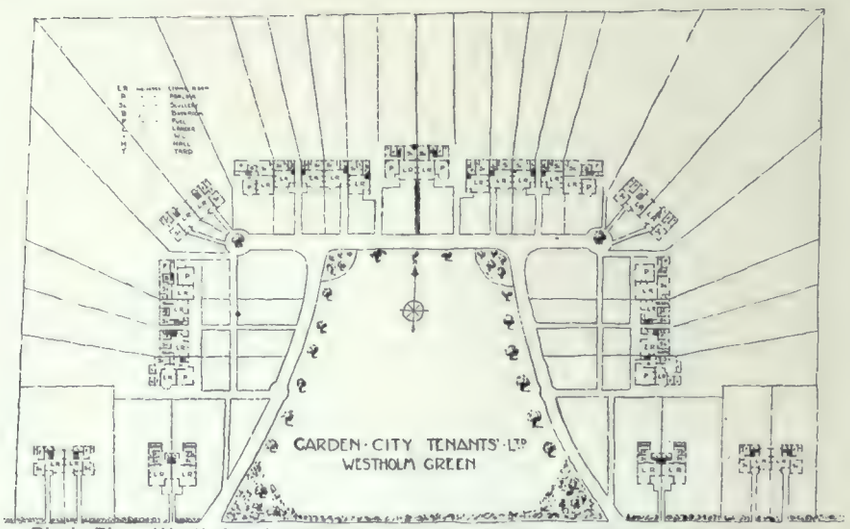
Typical Ground Floor Plan of Large Houses Known as "Parlor Cottages," at Port Sunlight. These Dwellings Differ from the Others in that They have a Parlor on the Ground Floor in Addition to a Kitchen and Scullery, hence the Name.



Typical First Floor Plan, "Parlor Cottages," Port Sunlight.

What for instance could be more pleasing to the eye and more satisfactory in every way than a group of cottages at Port Sunlight which is illustrated on page 55. The architect, Mr. Ernest Newton, F.R.I.B.A., holds a position of almost unrivalled distinction as a designer of country houses; but this group of seven cottages is as satisfactory architecturally as any of his more costly and seemingly more important work. Here we have a row of cottages exactly alike as regards their plan. To the ordinary builder this identity of plan would have been a fatal limitation, and he would have given us a row of mean-looking little houses with the same elevation repeated seven times. But here the architect, by absolutely simple devices, has triumphed over the necessary limitations and produced an architectural group upon which the eye rests with pleasure. Without exact symmetry he achieves a happy balance and proportion. The irregularity of the line of frontage and of the sky line gives a pleasing element of variety, and the placing of two entrance porches side by side in the projecting bays is a happy device which tends both to variety and the economy of space. These cottages have an appearance of considerable solidity, the lower parts being of stone; the walls above the first floor are tile-hung and the roofs are also tiled. The accommodation, as shown by the plans, is that which has been adopted very generally in the Port Sunlight cottages. It will be seen that the major part of the ground floor space is devoted to a large living-room, a much more sensible plan than cutting up the space to form two cramped sitting rooms, neither of which would be large enough to accommodate a family with comfort, not to speak of visitors—and one of which would probably be almost wasted by being kept as a "best parlor." A fair sized scullery with facilities for cooking is

Cottages at Westholm, Letchworth. These Houses were Built by a Co-operative Tenants' Society on a Self Supporting Basis. Note the Extreme Simplicity of the Elevations and Delightful Harmony of the General Scheme. Parker and Unwin, Architects.



Block Plan, Westholm, Letchworth, Showing Ground Scheme and the Manner in Which the Cottages are Grouped Around a Common Green.

provided, and the bathroom is also on the ground floor—an arrangement which, though it has some obvious inconveniences, makes for economy in plumbing work and leaves a little extra space, which is very valuable, on the bedroom floor. Three bedrooms are provided, the minimum allowance for a family having both sons and daughters.

The variety and beauty of the Port Sunlight cottages as a whole may be judged from the photographic illustrations on pages 54, 56 and 57. The examples are by different architects and exhibit considerable variety in the material employed as well as in design. The quaintness of the half-timber cottages in Greendale Road, with their projecting upper storeys, quite in the style of English Cottage architecture of the sixteenth century, will appeal strongly to many. The

Cottages at Westholm, Letchworth. In Most Cases, the Houses are Built of Brick and Covered with Roughcast Color-washed a Light Cream. The Facing Brickwork is of a Warm Red Color and the Roof is of Hand-made Sand-faced Tile Toned Down to be in Harmony with the Cheerful but Restful Appearance of the Walls.

decorated chimney stacks and the carved barge boards of the Bridge Street houses are also strongly reminiscent of Tudor architecture. In the group of cottages in the New Chester Road we have a good example of brick buildings relieved with stone dressings; the simple decorative use of dark and light bricks in the gables will be noticed. The cot-

PLAN

(A)—Cottage on Holmdale Road, Hampstead. J. Gordon Allen, Architect.

tages in Wood Street have brick walls, roughcast on the upper story, with decorative plaster work in the gables.

It is not necessary to give plans of these cottages in every case, since they nearly all conform to one or two types. The smaller houses are built on the same plan as Mr. Ernest Newton's cottages and the larger ones in general accordance with the plan by Messrs. Grayson & Ould, on page 57. These larger cottages, known as parlor cottages, differ from the others in having a parlor on the ground floor, in addition to a kitchen and a scullery, and an extra bedroom on the first floor. In some of these houses the scullery is fitted with a cooking range so that the kitchen may be used as a general living room.

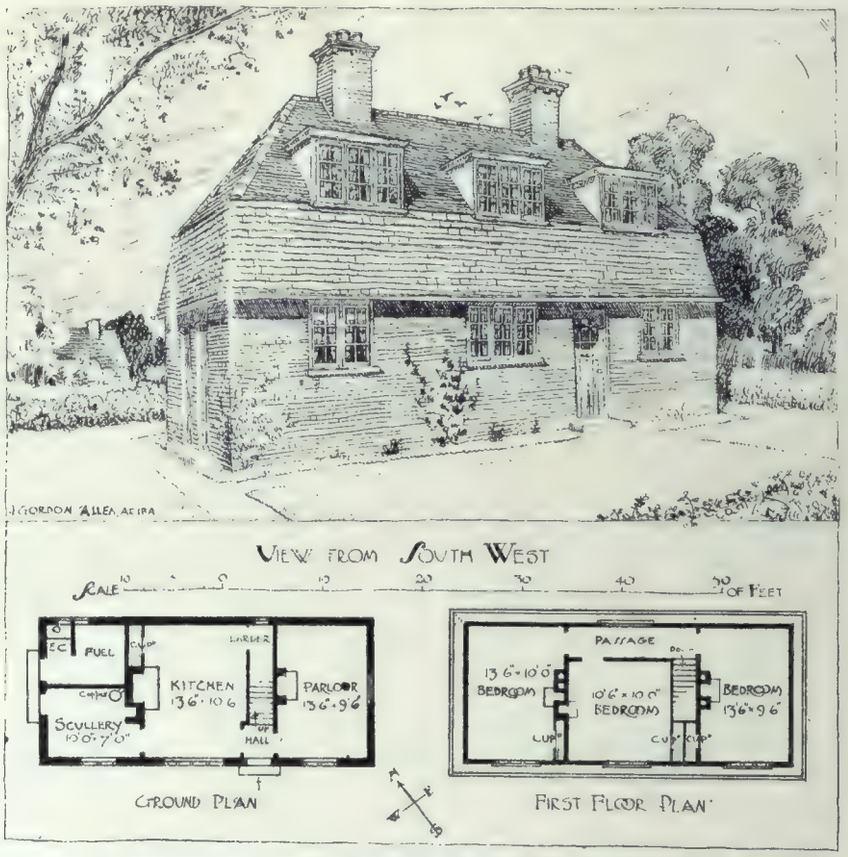
The plans of these Port Sunlight cottages may suggest that very little garden ground is allowed to each tenant, but such is by no means the case. All the cottages have front gardens screening them from the road, and these are cared for by the owners of the estate, Messrs. Lever Bros., the object being, of course, to avoid unsightly patches due to an occasional ill-kept garden and to improve the general appearance of the village. And in addition to this, large areas immediately adjacent to each block of cottages are reserved for allotment gardens, which the tenants, of course, are free to cultivate as they please.

Since Port Sunlight was built, many schemes for working-class dwellings have been carried out. But it may be doubted whether there is anywhere else in England, with the possible exception of Bournville, a collection of houses let at rentals within the reach of working-class tenants which can compare with these for beauty and general excellence. In explanation of this, it has to be remembered that the Port Sunlight scheme is heavily subsidized. Messrs. Lever Bros. expended $1,750,000 on the purchase of the estate and the erection of the buildings upon it. On this capital they receive no interest or return whatever. The rent being fixed at a sum which covers only the cost of rates, taxes and maintenance. Naturally, if a similar rental to that paid by the Port Sunlight tenants has to provide for a sinking fund and interest on capital, the cottages must be on a less sumptuous scale. The cottages at Westholm, Letchworth which are also illustrated herewith, are examples of cottages built by a co-operative tenants' society on a self-supporting basis. It will be seen from the plan that they are grouped around a common green. Skirting the green is a carriage way from which the houses are set back about 40 feet, this space being laid out by each householder as flower garden or lawn. The elevations are of extreme simplicity. The houses generally are brick built, covered with roughcast mostly colorwashed a light cream; the facing brickwork is a warm red color; the roofing is of hand-made sandfaced tiles, which are toning down very well, and the general color effect is cheerful but harmonious and restful.

Apart from large housing schemes, there have been many successful essays in planning individual cottages or pairs of cottages which exhibit some architectural character, though their cost is reduced to the absolute minimum. A young architect who has done some useful work in this direction is Mr. J. Gordon Allen, A. R.I.B.A. Several of this designer's cottages are shown in the accompanying illustrations. These have been planned for the accommodation of agricultural laborers and other working men whose expenditure on rent must be kept very low. The first two examples (marked A. and B.) show the very cheapest cottages it is possible to build in England so as to conform with the building regulations prevailing in most rural districts. Each consists of a single story. The square plan and plain pyramidal roof of A. gives the form which encloses a maximum of area with a minimum of wall and roof surface. This cottage has been built in several districts for about $650. The walls are of brick, covered with roughcast, or of concrete, which in some localities is found to be cheaper and the roof is tiled. B. is a very similar cottage costing just a little

Surface or of Concrete, with Tile Roof. $650. J. Gordon Allen, Architect.

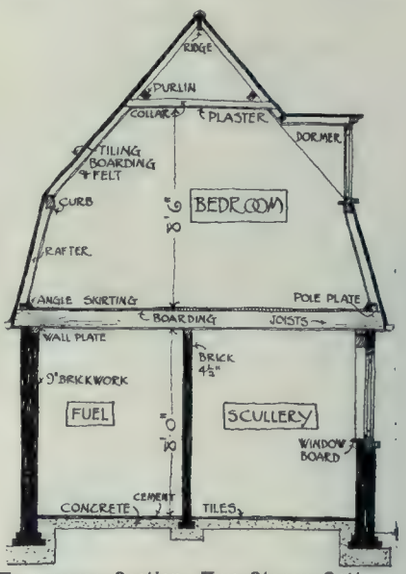
(B)—Small House, Dashmorden, Holmdale Road. Both this Dwelling and the Cottage Illustrated Above are Planned and Built to Provide Suitable Accommodations for the Agricultural Laborers and Workingmen at a Rental Charge which Comes Within Their Means. They are Especially Noteworthy in that They Show the Very Cheapest Cottages it is Possible to Build in England so as to Conform with the Building Regulations Prevailing in Most Rural Districts. This Type of Cottage Has Been Adopted in Several Districts, and the Construction is Either of Brick with Roughcast The Cost of Each House is Approximately



(C)—Two-Storey Cottage, Holmdale Road. Considering the Expenditure Involved, this House is a Most Excellently Planned and Substantially Built Structure. Economy in the Cost of Construction Was Made Possible by Restricting the 8-inch Brick Walls at the Second Floor Line and Enclosing the Upper Rooms in a Tile Roof of Mansard Design. This Type of House Can be Built in Most English Districts for $950. J. Gordon Allen, Architect.

more than A. The plan is again square, and not an inch of space is sacrificed for passageways. The next example, C. is a two-story cottage with rather more accommodation. The method of construction, which the sectional sketch makes clear, is exceedingly economical. The ground floor walls are of brick 9 inches thick, but there is no brickwork above the ground floor ceiling, the bedrooms being in a tiled roof of Mansard form. Thanks to this saving of brickwork, a cottage of this plan could be built in most English districts for about $950. D. is a cottage of superior type designed rather for a week-end or holiday retreat for fairly well to do people than for a workman's dwelling. The walls are of brick, those above the ground floor level being tile-hung, and the roof is covered with pantiles. All the flues have been gathered together to form one central stack—a method of treatment which is at once economical and satisfying to the eye. In the example E. which is illustrated by a bird's-eye view and a back elevation, the single bold chimney stack will again be noted. Here is a pair of cottages costing about $2,500 for the pair. The accommodation is shown by the plan. No separate provision has been made for a bathroom, but a bath of the tip-up variety is fixed in the scullery. Roughcast is used on the external walls with a brick plinth up to the sill level, and the roof is tiled.

A pair of cottages very similar in cost and in accommodation provided, is that by Messrs. Speir & Beavan, which has been built at St. Lythams, near Cardiff. In this case one big living room is preferred to two smaller ones and there is a separate bathroom leading from the scullery. These are country cottages and the



Transverse Section, Two-Storey Cottage, Holmdale Road.

drainage is to a cesspool, the water supply being from rainwater stored in a brick tank at the rear of the house. The walls are of 9 inch brick rough-casted on the outside; the floors of the living and bedroom are

(D)—A Cottage of Superior Type, Designed for a Week-End or Holiday Retreat Rather than a Workman's Dwelling. The Walls Above the Brickwork of the First Storey are Tile Hung, the Roof Being Covered with Pantiles. J. Gordon Allen, Architect.

(E)—Plan of Cottages, Holmstead Road, Hampstead, Which Cost About $2,500 to Build. In this Structure Roughcast is Used on the External Walls, the Roof Being of Tile. Note the Balance of the Design and the Single Bold Chimney. J. Gordon Allen, Architect.

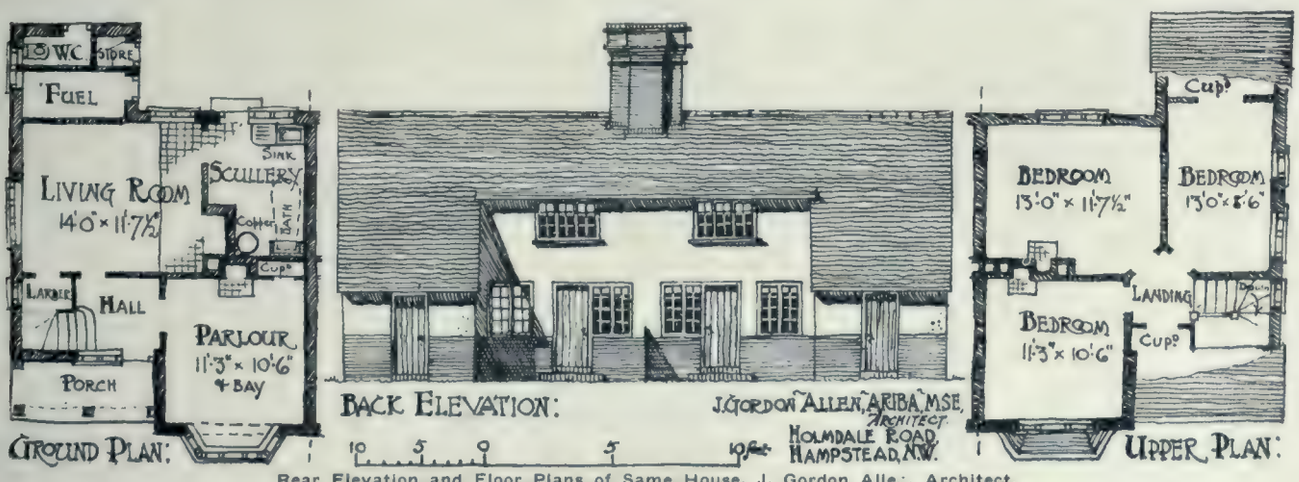
of wood and those of the scullery and offices are bricks laid flat. The roof is of green slates on timber. The cost of the pair of cottages was $2,400, this sum including builder's profit and the cost of the stone wall in front.

A great deal of the residential accommodation in most towns consists of semi-detached villas ranged in straight lines with but little space between the pairs. The subject imposes obvious limitations on the architect, but there have been lately many not unsuccessful attempts to give architectural character to houses of this type. Mr. J. Gordon Allen has built a number of villas on the outskirts of Harrow from the plan shown, which seems to be a very popular one. Considerable variety is given to the elevation and pleasing effects are produced by the use of red brick, rough-cast and tiles in different combinations. The party wall in these houses is carried 15 inches above the roof, and parapet walls are provided in two of the houses illustrated, not because they improve the design or are structurally necessary, but because they are demanded by the local authority. This is an instance of what is a cause of frequent annoyance and expense to architects and building owners in England—the needless rigidity and unintelligent application of building by-laws. The gain in appearance when the roof is unbroken by the party wall may be judged from the illustration of the almost similar houses erected by Mr. Allen in the Hampstead Garden Suburb, where this particular regulation is not in force. These houses have been found very economical to build; by bringing the roof down right over the porches the brickwork between the bays is reduced to a minimum. The cost of the Hampstead pair was $4,700. The walls in this example are of brick and rough-cast; the chimney stacks are of red brick and the roof is covered with red tiles. Parts of the bay windows are decorated with a simple design stamped in plaster. The posts and beams in the porches are of hard wood left in its natural state without paint or stain.

A rather larger pair of semi-detached villas is the example from the Shellbeach Estate, Isle of Sheppy, Kent. In this case the architects, Messrs. Rosser & Annan, have provided a couple of bedrooms and a boxroom on the second floor. The cost of the pair of houses was $6,700. As regards materials, England is again witnessing the popular combination of red brick and roughcast for the external walls with red tiles for the roof. The rough cast is lime whited. The external woodwork is painted green and the internal woodwork enamelled white.

The photograph of part of a terrace of small houses at East Sheen by Mr. F. Endell Rosser is introduced to illustrate an interesting treatment of an end house in a group and a rather successful attempt to give a certain interest to a utilitarian piece of work which affords the architect very little scope.

The Garden Suburb or Town Planning idea is influencing the villas of the middle classes as well as the cottages of the workmen. On the outskirts of London and of other cities, estates are being developed as a whole with a proper limitation of the number of houses to the acre and a provision of open spaces and gardens, which contrasts most favorably with the old method of cutting up the ground into building plots, and selling these to any builder with freedom to use them as he might choose. At Parklangley, Beckenham, which is twelve miles or so out of London, a beautifully wooded estate of about 700 acres is now being converted into a purely residential suburb. The roads are being laid out by Mr. Reginald C. Fry, on a plan which makes provision for an extensive golf course, a cricket field and tennis courts, preserves to a very great extent the natural beauties of the neighborhood and gives ample garden space to every house. The houses



Rear Elevation and Floor Plans of Same House. J. Gordon Allen, Architect.

Front Elevation

Back Elevation

End Elevation

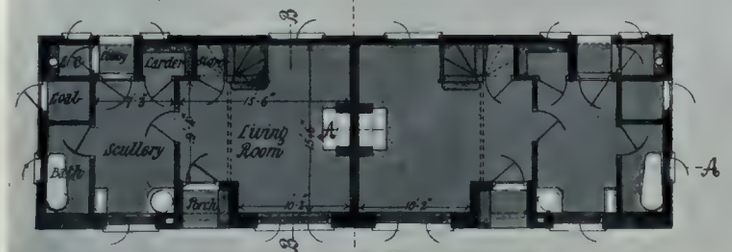
Section A-A.

Section B-B.

A PAIR of COTTAGES : At St LYTHANS GLAMn. For John Cory J.P. D.L.

Speir & Beavan - Architects - Cardiff

Scale — Eight feet to an inch



Ground Plan

First Floor Plan

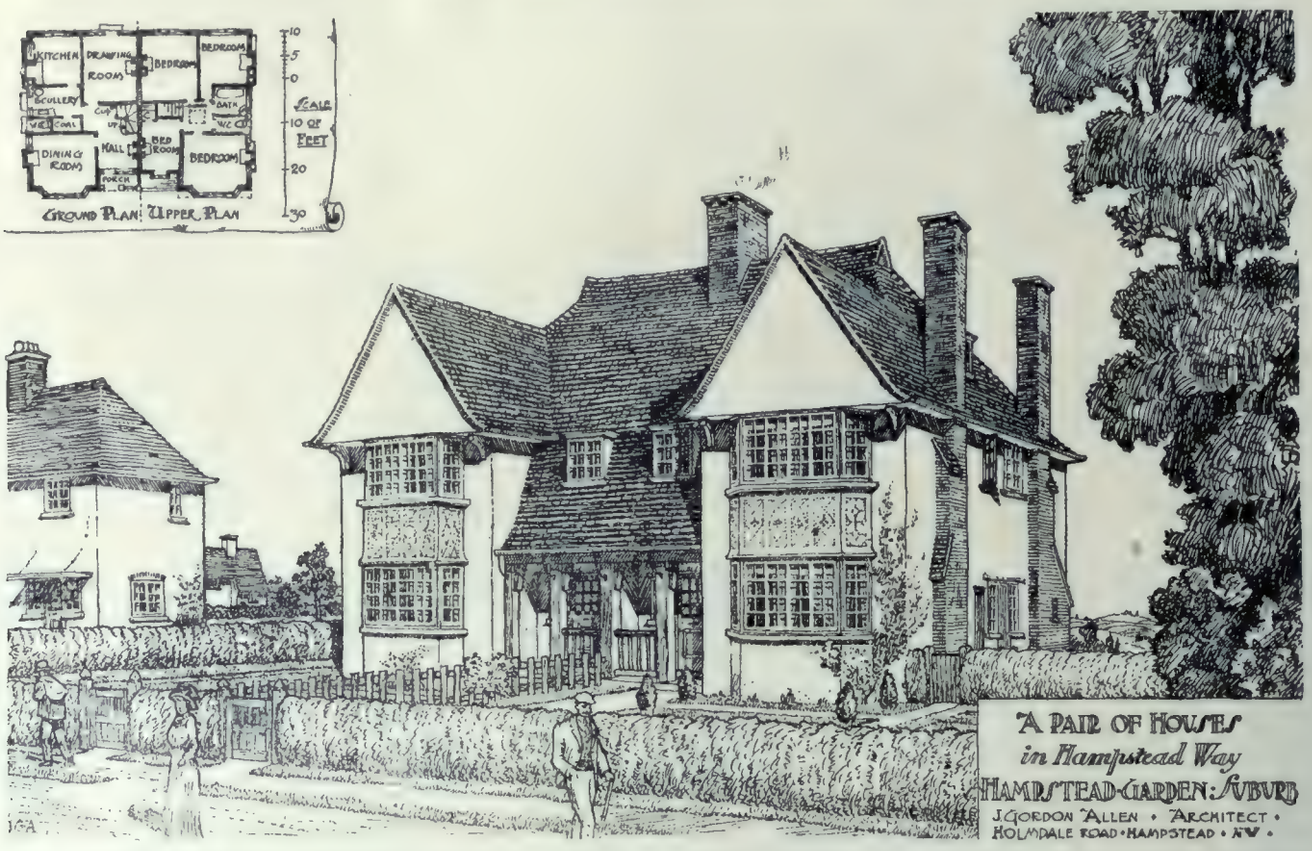
Pair of Cottages at St. Lythans, near Cardiff. These Homelike Little Dwellings Cost $2,400, Including the Builder's Profit and the Cost of the Stone Wall in Front. The Walls are of 9-inch Brick, Roughcasted on the Outside, and the Roof is of Green Slate Carried on Timbers. Speir and Beavan, Architects.

which have so far been built, are nearly all detached. All have been designed by capable architects—no two houses on the estate being exactly alike—and they are thoroughly well built. The two examples given are from Mr. Fry's designs, and are typical of the size and style which most generally prevails. In the first example shown there are a fair sized central hall with two large reception rooms and a small study on the ground floor and five bedrooms on the first floor. The small loggia with the balcony above makes a pleasant feature. The walls are of brick—the plinth being of red facing bricks the rest up to the first floor level and the entrance bay distempered in cream color and the upper portion tile hung. The roof is covered with red tiles and the arch over the entrance is formed with tiles placed edgewise. Most of the exterior woodwork is painted green, but some of the upper windows have white woodwork. The second example illustrates a house of similar size, but in this case a larger space is given to the hall and there is no study. The walls in this case are of brick rough-cast from the plinth upwards, the roof is tiled and part of the bay window has tile hanging. The outside woodwork is painted white. As the photograph shows, this house is built right in the wood, the policy of the owners of the estate being to destroy no trees needlessly but to leave the incoming householder to decide how much or how little of the sylvan surroundings of his house he will have in his garden.

Typical Floor Plan, Semi-Detached Villa at Harrows. J. Gordon Allen, Architect

A rather larger house than the others included in the illustration is the house at Wimbledon, by Mr. Ernest Newton, F.R.I.B.A. This is

Semi-Detached Villas at Harrow. These Houses are of Interest in that They are Representative of a Number of Two-Family Dwellings, Having the Same Internal Arrangement, which Exhibit Considerable Variety in their Exterior Lines, Together with Pleasing Effects in Brick Work, Roughcast and Tiles in Different Combinations. J. Gordon Allen, Architect.



Pair of Houses in Hampstead Garden Suburb. In this Structure the Extension of the Roof Line Down Over the Porches Materially Lessened the Cost of Construction by the Reducing of Brickwork between the Bays to a Minimum. The External Composition is White Stuccoed Brick Walls with Red Brick Chimney Stacks and Tile Roof. The Post and Beams in the Porches are of Hardwood Left in the Natural State and Unpainted or Unstained. J. Gordon Allen, Architect.

an example of the English suburban house of the best type—or perhaps it should be described as a country house as it would be equally suitable for a rural district. The quiet dignity of this formal style, based on Renaissance rather than on Tudor models is always impressive when handled, as in this case, with refinement and good taste. The walls are of brick, rough-cast throughout, except at the crestings of the chimney stacks. The window shutters, which are painted green, give a pleasing touch of color to the elevations. The roof is covered with red tiles. The columns supporting the central bay are of stone.

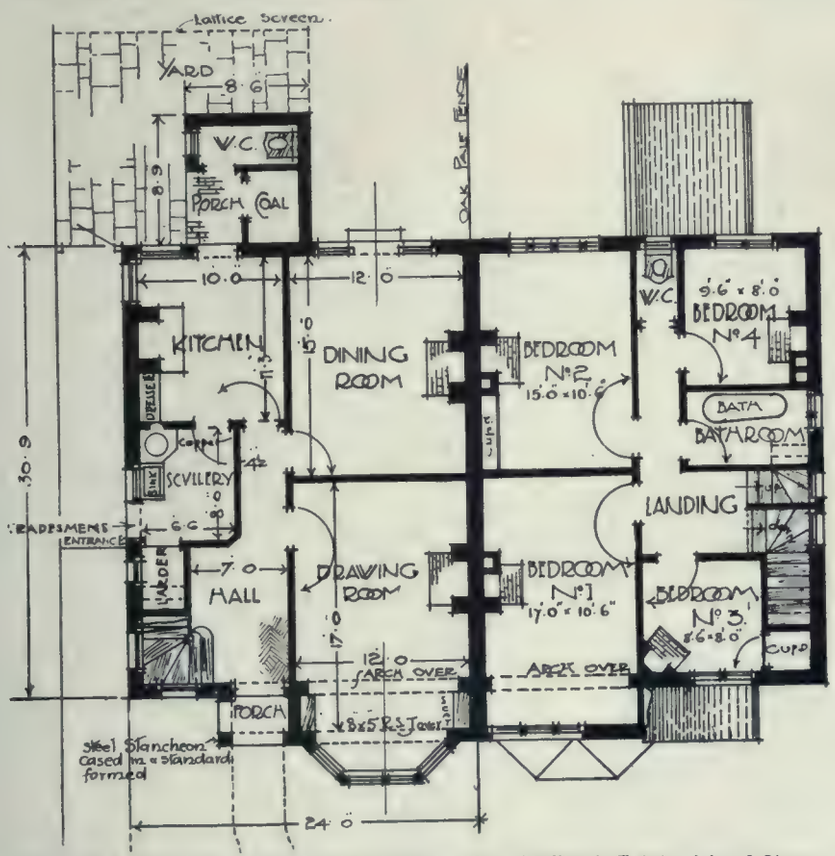
It is in the country house that English domestic architecture is seen at its best. Indeed there are points of view from which it might be said that the very best architecture of the day is to be seen in the country houses. It may seem absurd to compare such work with great undertakings, like the building of a cathedral or a city hall, but it is probably true that in their own way, which is not the way of grandeur and magnificence, but of simple homely charm, the country houses of England, both great and small, come nearer to perfection than any other class of building that is being erected to-day. Studying how best to meet the needs of a simple but refined family life, using local materials without affectation or striving after effect, free from the cramping influence of a narrow site or the too close proximity to neighbors, the architect who plans a country house has a happy task and succeeds, if he be a man of taste and skill, in enhancing rather than marring the beauty of the countryside. Let us briefly consider two or three typical examples of the smaller country house of to-day.

The house at Brixham, South Devon, by Mr. W. Curtis Green, F.R.I.B.A., reflects in its stern simplicity the ruggedness of the Devon cliffs and moorland. Built in a stone country, it is naturally and rightly a stone house. A brick, or half timber house, whatever its actual merits, would lose all its charm if placed on the cliffs at Brixham. The little house built of stone quarried on the site, seems to form part of the landscape. The stone walls are roughcast externally. The house is roofed with Delabole rag slates.

The second example by the same architect shows a group of buildings for a small holding at West St. Mary, Cornwall. The buildings are of an extremely simple and inexpensive character, costing only $4,860 com-

Pair of Semi-Detached Villas on the Shellbach Estate, Isle of Sheppy, Kent. Rosser and Annan, Architects.

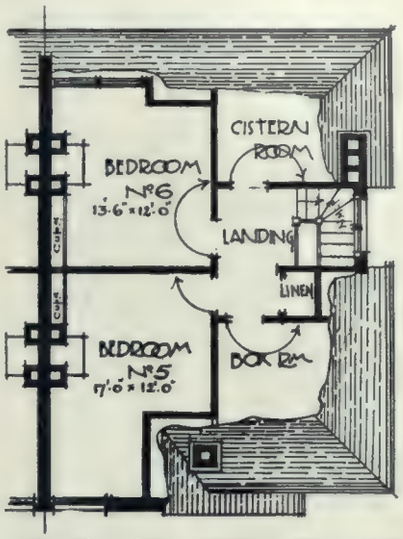
plete—the house $2,650, cottage, $900 and the stables $1,300. The house being for a country doctor, is planned accordingly, with a waiting room for patients and a consulting room. The simply constructed porch with its fixed seat will be noted. The walls for the most part are of brick roughcast, but part of the stables is weather



Ground and First Floor Plan, Semi-Detached Villas, Shellbach Estate, Isle of Sheppy, Kent. Rosser and Annan, Architects.

boarded and tarred. The roofs throughout are of Delabole rag slates, the traditional roofing material of this part of England.

The little house at Horsted Keynes in Sussex is a charming and characteristic example of the work of Messrs. Barry, Parker & Raymond Unwin. These architects have long advocated, and wherever possible have practised the provision by the architect of the furniture and decoration as well as of the actual fabric of the house, in order that jarring notes may be avoided and a sense of harmony and completeness may be produced. That this method is not necessarily costly is demonstrated by the present example. A great portion of the furniture was included in the original builder's contract, and the house with its suitably and simply designed furniture has been completed much more cheaply than it would be possible to build a house, giving similar accommodation, and furnish it out of cabinet makers' showrooms. The house and furniture have cost considerably under $4,000. The saving chiefly results, perhaps, from the fact that when designing the house and furniture together, the architect can contrive the furniture to fit the house and the house to fit the furniture, and can take advantage of every little economy which can be effected by adapting the one to the other.



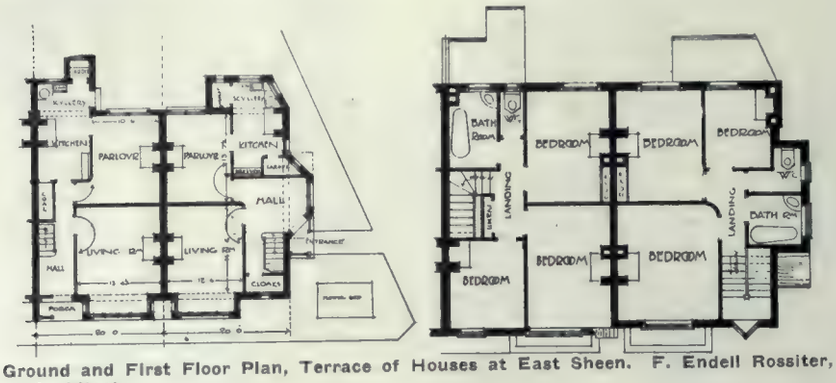
Attic Plan, Semi-Detached Villas, Shellbach Estate, Isle of Sheppy, Kent. Rosser and Annan, Architects.

The peculiar form of the plan of this house calls for a word of comment. The house was to be built in a beautiful existing orchard. The form which the plan took was determined chiefly by the fact that the fine view down the orchard and away over the country beyond was towards the Northeast, the direction in which the ground sloped rapidly, so that the living room and the hall and the three principal bedrooms must be contrived to command this view, while at the same time the living room must be so designed that if the sun shone at any time of the day on any day in the year, it shone into this room. The verandah must also face in a north easterly direction, not only because the view and the orchard stretched out in that direction, but because this was the side away from the highroad, but it must not have a feeling of being quite away from all possibility of a feeling of sunniness. Therefore all that could be done was to have French casements opening out on to it fully glazed, and the screen on the opposite side of the hall from these French doors also with much glass

Terrace of Houses at East Sheen. Note the Treatment of the End House and the Interest Imparted to a Group of Dwellings which Afforded the Designer but Little Scope. F. Endell Rossiter, Architect.

in it, so that anyone sitting on the verandah might at any rate be conscious of any sunshine there might be on the southwest side of the house.

The form of the plan was also partly determined by the importance of placing the house in the orchard in such a way that the fewest possible number of the trees need be cut down. A little difficulty in planning resulted from the necessity of getting four bedrooms over the ground floor accommodation which was needed.



Ground and First Floor Plan, Terrace of Houses at East Sheen. F. Endell Rossiter, Architect.

As regards materials, the house is built with brick and rough-cast with a tile roof and tile hanging on overhanging parts. There is a little tile work also at the garden entrance. Internally everything is severely simple; no applied decoration is introduced, the effect being gained by the straightforward use of ordinary building materials. The walls are left without paper and the brickwork is left undisguised at the fireplaces, being relieved in one case with tiles laid edgewise and in another case with hammered metal.

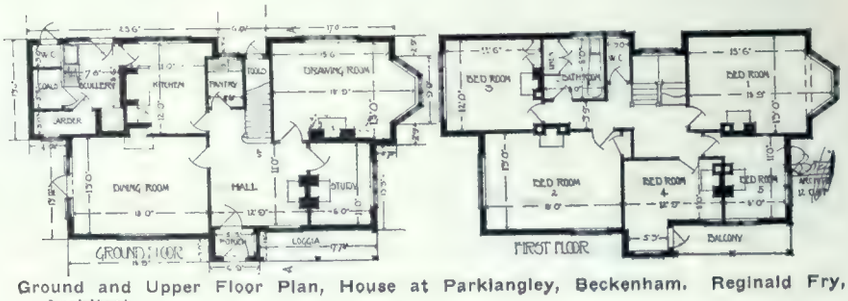
More usual in plan is the simple little white house at Bromborough, Cheshire, by Mr. P. Morley Horder, F.R.I.B.A. Here we have a fairly regular plan providing a hall with two good sitting rooms on the ground floor and four bedrooms above. As the sizes are not indicated on the plan, it will be useful to give the principal ones here: the hall is 9 feet 3 inches by 8 feet; the drawing room is 16 feet by 12 feet, with an ingle 10 feet 3 inches by 3 feet 6 inches; and a bay 3 feet 1½ inches deep, and the dining room is 14 feet by 12 feet excluding the bay. The walls of this house are of brick covered on the whole of the exterior with rough-cast, lime whitened, the roofs are tiled and the woodwork both of the house and the adjacent trellis is painted white.

Very different in appearance is the somewhat larger house by Mr. Horder built at Walton Heath, Surrey. This is an admirable example of brick building. Grey stock bricks are used with red dressings and the wall throughout has a pleasantly varied texture due to the accidental varieties of coloring in the bricks—a feature which some builders are at pains to avoid by having bricks chosen for evenness of color, but which really gives an astonishing degree of life and interest to a brick building. Further interest and variety are given to this house by the courses of tiles laid flat, which can be clearly seen in the photograph of the garden front. The roofs are covered with red tiles and there is a little tile hanging round the dormers and elsewhere. The picturesque charm of the exterior with its many angles, its diversified roofs and its tall, straight chimneystacks will be appreciated from the photographic views. Internally also there are interesting features. The dining room with its roomy ingle, its simple, well-designed mantel-piece and furniture illustrates the principle to which reference has already been made of designing the principal fittings and furniture to suit the house. The treatment of this dining room, though so admirable in its effect, is quite inexpensive. The wood used is pine which is stained brown and wax polished, the stain used being that known as Solignum.

House at Parklangley, Beckenham. One of the Type of Houses Now Being Built According to the Garden Suburb and Town Planning Idea, on a Wooded Estate About Twelve Miles from London, for Families of the Middle Class. Reginald Fry, Architect.

A good many country houses and cottages, especially those intended mainly for holiday use, are being built on the bungalow principal. The small bungalow at Seaford, a seaside resort on the south coast, is a typical example. The architect is Mr. E. B. Lamb, M.S.A. A quaint feature of this little bungalow is the large common room, which is open to the roof and has a small gallery over the porch, access to which is obtained from the ground floor by a stair in step-ladder form in the corner of the bathroom.

A sketch is also given of a larger seaside house by the same architect, erected at Studland Bay, Dorset. In both these houses the walls are of brick rough-casted, the roofs are covered with red sand-faced tiles and there are red chimney-pots. In the bungalow the common room and verandah are paved with red bricks.

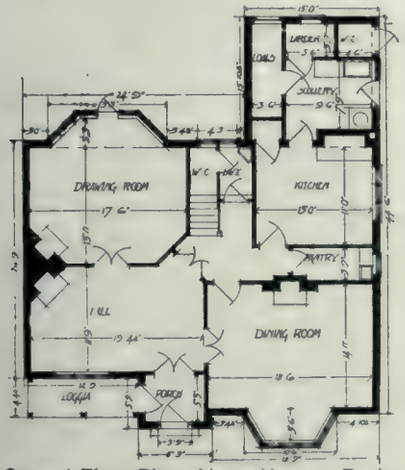


Ground and Upper Floor Plan, House at Parklangley, Beckenham. Reginald Fry, Architect.

House at Parklangley Beckenham. Another Example of the Residential Work at that Place. In the Development of this Estate, it is the Policy of the Owners to Destroy No Trees Needlessly, but to Leave it to the Incoming Householder as Regards the Growths and Shrubbery of the Premises. Reginald Fry, Architect.

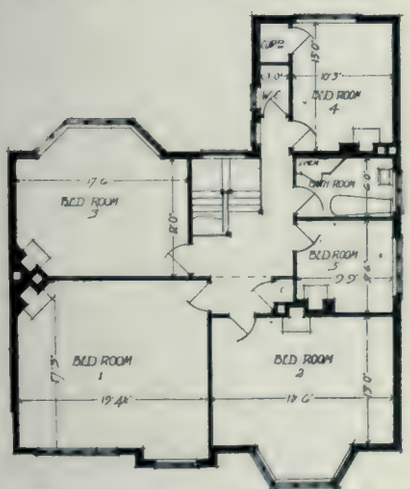
SUBURBAN DEVELOPMENT IN ENGLAND.

THE SUBURBS and the dwellers therein have often been the subjects



Ground Floor Plan, Above House. Reginald C. Fry, Architect.

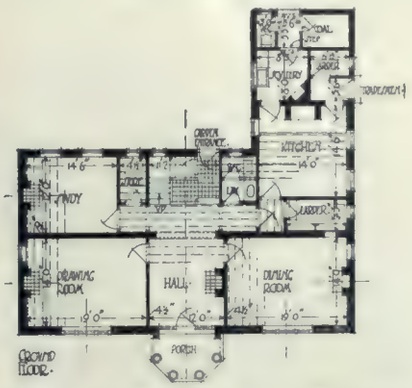
of satire. The self-conscious respectability, the snobbishness, the limita-



First Floor Plan, Above House, Reginald C. Fry, Architect.

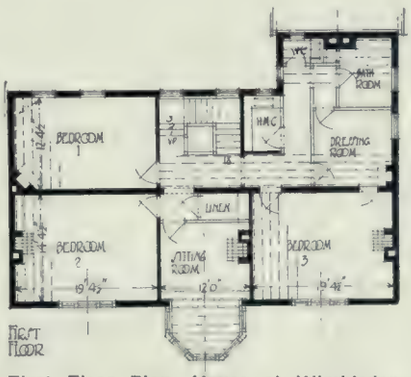
tion of outlook, which are supposed to characterize the dwellers in suburbia, have been pilloried again and again by the novelist and the essayist. Very likely the people have often been rather absurd and have deserved the ridicule directed against them; but what admits of no doubt at all is that they have been doomed for two or three generations to live in very absurd houses.

The suburban villa of the early and middle Victoria period was often well built, but it was generally badly planned, with many dark corners and an entire absence of arrangements for minimizing household work, while from the point of view of aesthetic interest, the utmost it commonly achieved was the negative virtue of not possessing offensive ornamentation. More often than not, however, some attempt was made, with the most distressing results, to introduce artistic features. Everywhere the public is tired of these villas. The basement kitchens and the great number of stairs are ana-



Ground Floor Plan, House at Wimbledon Ernest Newton, F.R.I.B.A., Architect.

thema to the housewife, and the general air of dullness is found depressing by all the family. In the inner suburbs of London and most other great cities, the "to let" boards speak eloquently of the way in which the popularity of this type of house has waned.



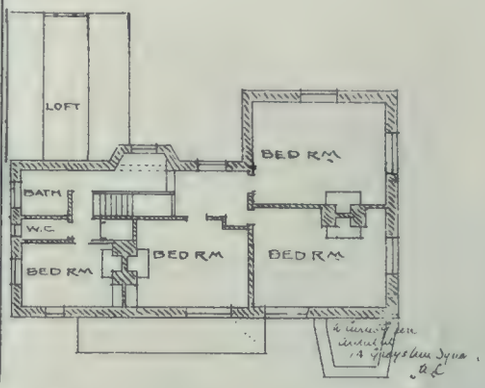
First Floor Plan, House at Wimbledon Ernest Newton, F.R.I.B.A., Architect.

The newer suburbs, which lie a little further from the centres of the cities, are now having their turn of popularity. Their general bright-

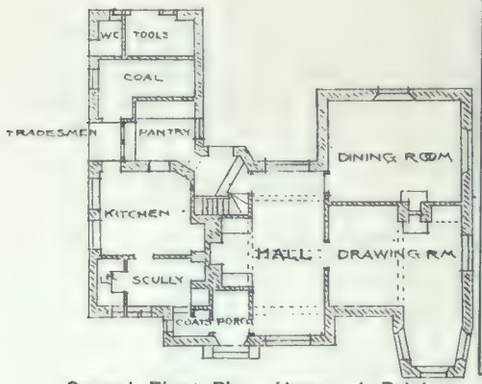
House at Wimbledon. A Large Suburban Country House with Formal Elevations and Dignified Lines. Ernest Newton, F.R.I.B.A., Architect.

ness, the more convenient planning of the houses, the provision of such conveniences as bathrooms, tiled sculleries, electric bells and wiring for lights, modern economical fires and cooking ranges—these are features which always win the suffrages of young married people, and which often beguile even elderly folk into "moving." But the change is not always a change for the better. Too often it happens that after a few years cracks appear in the walls, the doors and other woodwork shrink warp, the plaster falls from the ceilings, the electric bells fail to ring, and the householder discovers that the house which was such a source of pride and joy when he first acquired it has become a cause of constant worry, expense, and dissatisfaction.

House at Brixham, South Devon. An Interestingly Designed Home Which Reflects the Ruggedness of the Cliffs and Moorland of its Vicinity. W. Curtis Green, F.R.I.B.A., Architect.



First Floor Plan, House at Brixham.



Ground Floor Plan, House at Brixham.

Rear View, House at Brixham. This House is Built of Stone Quarried on the Site The External Treatment is Roughcast and the Roof is of Delabole Rag Slates. W Curtis Green, F.R.I.B.A., Architect.

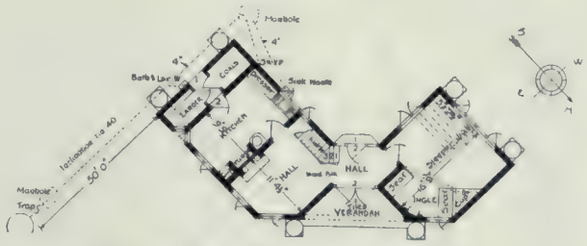
Group of Buildings for Small Holding at West St. Mary. These Structures are of an Extremely Simple and Inexpensive Character Costing only $4,860 Complete; the House, $2,650; Cottage, $900, and the Stables, $1,300. The Walls for the Most Part are of Brick Roughcast, but Part of the Stables is Weather Boarded and Tarred. The Roofs Throughout are of Delabole Rag Slates. A Noteworthy Feature is the Simply Constructed Porch with its Fixed Seat. W. Curtis Green, F.R.I.B.A., Architect.

House at Horsted Keynes. A Charming Little Dwelling Built, Including the Cost of its Specially Designed Furniture, at a Sum Considerably Under $4,000. Parker and Unwin, Architects.

Rear Entrance to Hall, House at Horsted Keynes. Parker and Unwin, Architects

At this stage he inquires into the merits of "garden suburbs," which represent the latest stage in the development of suburban life. Perhaps some even more satisfactory system of housing may be evolved in the future, but for the present the so-called garden suburb undoubtedly represents the high-water mark of housing arrangements for the middle class section of our urban population. The rich man may have his country house and his town house or flat, the very poor may have to be content with a few rooms in block dwellings, but for the middle-class man who travels to the city every day, the "garden suburb" quite fits the case.

First Floor Plan, House at Horsted Keynes. Parker and Unwin, Architects.



Ground Floor Plan, House at Horsted Keynes. Parker and Unwin, Architects

The genealogy of the model suburb idea is interesting. Mr. W. H. Lever, M.P., at Port Sunlight, and Mr. George Cadbury, at Bournville, demonstrated the immense advantages of laying out a residential estate as a whole, with proper regard to open spaces, aspects and vistas, and the relations of the houses to each other. These schemes were mainly concerned with the housing of working-class people. Mr. Ebenezer Howard went further and showed how a complete town, with all its varied industries and social activities, and its mixture of social classes, might be planned and built on similar

Glimpse of Main Hall, House at Horsted Keynes. Parker and Unwin, Architects

Detail of Rear Entrance to Hall, House at Horsted Keynes. Parker and Unwin Architects.

Corner in Bed Room, House at Horsted Keynes. Parker and Unwin, Architects

Fire Place, Main Hall, House at Horsted Keynes. Parker and Unwin, Architects.

lines. His ideas are now in process of being materialized at Letchworth. Mrs. Barnett and others applied the idea to suburban life, and the Hampstead Garden Suburb is the result. All these movements were in the nature of social reforms rather than of commercial speculations. The next step was for the commercial speculator to take up the idea and prove its practicability from a business point of view. That is now being done, with greater or less success, in several places.

One of the most ambitious and extensive of the new schemes which have been launched to meet the demand for the new type of suburban life is to be seen in the south-eastern environs of London. At Parklangley, near Beckenham, an estate of about 700 acres is being developed on commercial lines as a purely residential suburb. A very clever scheme for a shopping centre will form part of the new suburb. The site of the new suburb is one of extraordinary natural beauty, and in its development the utmost care is being taken to preserve as much of this beauty as is possible. A large part of the estate is reserved for a golf course, and wherever possible the trees are preserved. The roads are so laid out that many of the fine old trees will border the footpath or lend added charm to the private gardens; in one case a row of trees is kept in the middle of the road, which is widened at this point so that there may be ample room for the traffic on either side. Many of the houses are being built right in the wood, only sufficient clearance being made to allow room for the building; it will be for the incoming tenants to decide how much of the sylvan surroundings they will keep in their gardens. In the principal roads the foot

Ingle Nook, House at Horsted Keynes. Parker and Unwin, Architects.

Corner of Bedroom, House at Horsted Keynes. Parker and Unwin, Architects.

path is edged with shrubs and flowers, which are protected by low, dark-green railings. Even in so small a detail as the lamp posts an effort is made to give character and beauty to the estate.

The houses so far erected are good examples of medium-priced detached residences, exhibiting the convenient and spacious planning which distinguishes the best modern domestic architecture. They show great variety of style—perhaps more variety than is ideally desirable—but they are designed to meet many tastes, though it is fair to add that the architects have not allowed their desire to please a client to override their sense of what is architecturally fitting. Mr. Reginald C. Fry is the consulting architect, who has laid out the estate, and exercises a general control over the development. Many of the houses have been designed by him; others are by Mr. Edgar Underwood, Mes-

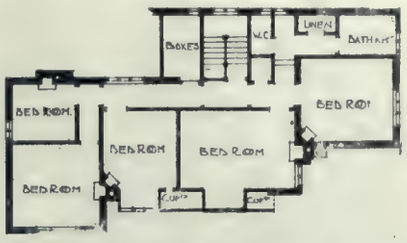
House at Walton Heath, Surrey. This House is Most Substantially Built an.. Ideal in Situation. Its Many Angles, Diversified Roofs and Tall Straight Chimneys Result in a Picturesque Charm Seldom Found in Houses of Such Large Dimensions. P. Morley Horder, F.R.I.B.A., Architect.

srs. Durrans and Groves, and Mr. Sothern Dexter. The houses are well built, and good material is used. The joinery is all made on the estate, in a workshop which is equipped with up-to-date machinery. The estate so far has made rapid progress ,and there is every reason to believe that the progress will continue. It meets

Ground Floor Plan, House at Walton Heath.

a real need, and it is altogether desirable, for the encouragement of others who may be disposed to develop estates on the same enlightened principle, that it should receive an adequate degree of public support.

We yield to none in our admiration for these schemes of social betterment as those at Letchworth and at Hampstead. But we do not regard this Parklangley scheme with any less interest because it is mere busi-



First Floor Plan, House at Walton Heath

ness. It will be a hopeful augury for the future of domestic architecture in England if it can be shown that the old, bad system of suburban de-

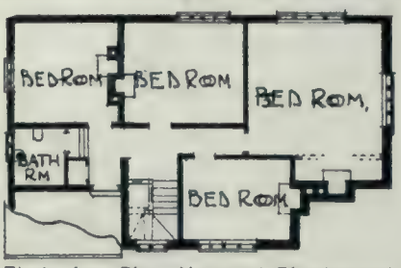
Dining Room, House at Walton Heath. The Treatment of This Interior is Both Effective and Inexpensive. The Entire Scheme of Woodwork and Furniture is Executed in Pine Stained Brown and Wax Polished. P. Morley Horder, F.R.I.B.A., Architect.

Rear View, House at Walton Heath. Accidental Varieties in the Coloring of the Grey Brick, Together with Flat Laid Tile Courses and the Red Tile Roof, Make the External Composition of this House Unusually Attractive. P. Morley Horder, F.R.I.B.A., Architect.

velopment—the making of long, unlovely streets of ill-built houses of identical design—can give place to something more intelligent, more healthful, and more beautiful; and that this can be done, not as the outcome of a philanthropic experiment, or a municipally subsidized effort in "town planning," but as a matter of ordinary commercial business.—ILLUSTRATED CARPENTER AND BUILDER.

A NOTABLE ADDITION to the attractions that Florence holds out to the lover of architecture and other arts, says THE ARCHITECT (London) has been made in the opening of the restored Davanzati Palace in the Via Porta Rossa. Built early in the fourteenth century by the Davizzi family, it, at the close of the sixteenth century became the property of Bernardo Davanzati a man of wealth, learning and ancient lineage. Like many

House at Bromborough, Cheshire. A Most Commendable Little Structure Whose Charm and Beauty lie in the Simplicity of its Design and Color Scheme. The Walls are of Brick, Roughcasted and Limewhited, and the Roof is of Tile. P. Morley Horder, F.R.I.B.A., Architect.

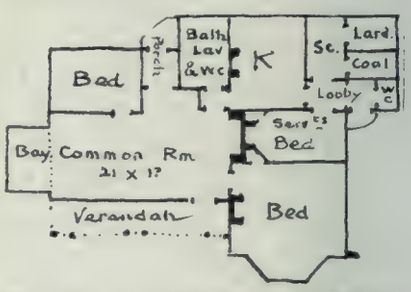


First floor Plan, House at Blomborough. P. Morley Horder, Architect.

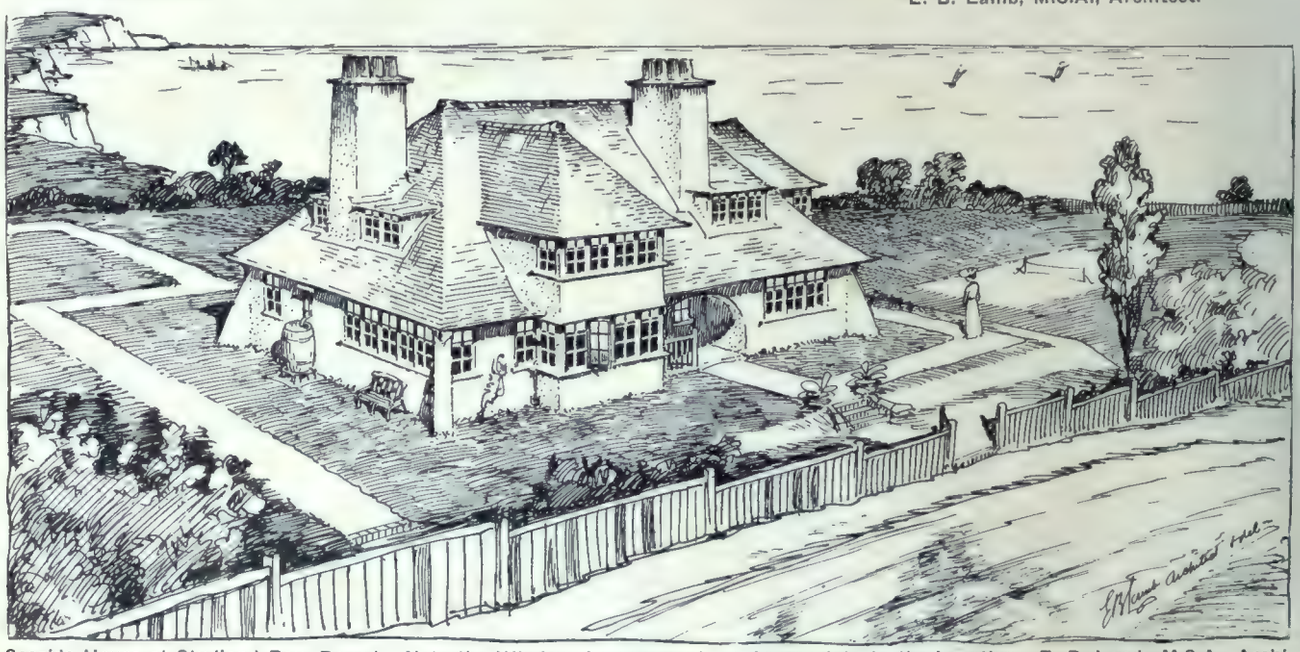
Ground Floor Plan, House at Bromborough. P. Morley Horder, Architect.

other old Italian families, the Davanzati declined in wealth and influence, an dcame to an end with the suicide of the last representative, Carlo di Giuseppe. The house, already suffering from the poverty of its owners, fell into the abysm of a tenement dwelling. In 1904 Signor Volpi, the well-known art expert and dealer bought the palace, and has since been steadily carrying out its rescue from desolation and restoration to a close approach to its former beauty. Frescoes and old woodwork have been brought to light, and Signor Volpi has furnished the palace again with unrestored furniture of its own date.

Small Bungalow at Seaford. A Feature of This Little House is a Large Living Room Which Opens to the Roof and Has a Small Gallery over the Porch. E. B. Lamb, M.S.A., Architect.



Floor Plan, Small Bungalow at Seaford E. B. Lamb, M.S.A., Architect.



Seaside House at Studland Bay, Dorset. Note the Window Arrangement, so Appropriate to the Location. E. B. Lamb, M.S.A., Architect.

CONSTRUCTIONAL STEELWORK.*—Its Application and Advantages in the Erection of Modern Buildings.—The Relation of the Architect and Engineer, and the Importance of Complete Shop Drawings and Rigid Inspection.

By S. BYLANDER

THE PREPARATION OF THE PLANS for a building where the skeleton consists of steelwork as compared with a building where the loads are carried on walls or piers differs considerably.

I intend in this lecture to deal with the general principle of steel construction as far as it may interest the architect, and will not extensively go into the question of strictly theoretical methods for the calculation of the various members in a structure.

Steel is becoming a more and more important material in building construction. As the sizes of the buildings are increased and fireproof construction adopted, steel construction can be used with advantage. Heavy brick walls are substituted with steel stanchions, and rolled-steel beams are used instead of wooden joists, thereby saving rentable space, and by the use of fireproof floors the danger of ruinous fire materially reduced.

When steel work constitutes the skeleton of the structure, it is obvious that the application of this material should be given careful attention. The architect must therefore make himself well acquainted with the principles of steel construction, or be in frequent consultation with an engineer competent in steelwork design. It is entirely wrong to prepare the final architectural design independent of the steel construction, and ask a contractor or engineer to design steelwork to suit the lay-out of the different floors.

Steel, and its Advantages.

Steel should be employed to its greatest advantage, and not merely as a substitute for brick or stone, as is often the case; for instance, where large rooms are required in the lower storeys while in the upper storeys are placed heavy division walls and brick stacks, and where positions of the columns vary in the different storeys. Economy is, after all, the essential thing to aim at, consistent, of course, with suitable planning and good architecture. The object of the design should be to obtain the best results for the minimum amount of money, and this can only be obtained when the building materials are employed to their greatest advantages. It is obvious that the steelwork, brickwork and stonework must be designed simultaneously in order that no material should be wasted. ..... The first consideration the designer has to take into account is the factor of safety and the loads which should be used in the calculations for the different members. One sometimes hears very strange opinions about the expression "factor of safety." If a specification requires that the steelwork shall be designed for a factor of safety of four, this does not necessarily mean that every member is four times as strong as that required to carry the specified load. Often a structure cannot carry more than twice a specified load, on account of the imperfect loading, material and workmanship, although it is designed for a factor of safety of four. The factor of safety is intended to cover unknown quantities which are not considered in the calculations. Good practice is to use a safe stress for steel equal to one-quarter of the ultimate strength of the material, or seven and a half tons per square inch if the ultimate strength of the material is thirty tons per square inch. As the elastic limit of medium steel is about fifteen tons per square inch, the actual factor of safety will be two. The construction of the steelwork must be adapted to suit the particular class of building for which it is required.

Buildings may be classified as follows: Apartment houses, hotel, office buildings, public buildings, warehouses, factories. The general lay-out of steelwork for a building is primarily dependent upon the size of rooms and type of floor construction; secondly, upon loads to be carried and requirements as to decorations. The spacing of columns should be uniform if possible in order to permit repetition of sections and details.

The actual live load is not used in the calculations, but the corresponding dead load, which would cause the same stress in the steel as the actual live load.

This dead load is usually referred to as "superimposed load," and varies from 70 lb. to 120 lb. per square foot for apartment houses, hotels, and office buildings, and from 150 lb. to 400 lb. per square foot for warehouses and factories. To the above loads should be added the weight of the floor itself (including steel girders and beams), which is about 100 lb. per square foot for an average concrete floor. The dead load of floor must be carefully calculated in each particular case.

Steel may be used in a building for the following reasons:—(1) By necessity; (2) for economy; (3) for fire-proofing.

Reason for its Use.

Steel may have to be used in buildings where the design will not permit of the use of only brick and stone work on account of large rooms, great loads, architectural features, or planning requirements. It is used by reason of economy where steel is found to be cheaper than other material, or where floor space saved by using steel columns instead of brick wall or piers will more than compensate for the extra cost of steel compared with the cost of brick. Steel beams and concrete is substituted for wooden joist floors and roofs in order to obtain a more fire-proof construction, often to a considerable increase in the first cost of the building. However the fireproof building may be more profitable to the owner than the old wooden construction when the reduced insurance premiums and the increased rigidity and stability are taken into consideration. No doubt fireproof construction will soon be adopted generally for large towns, and I will, therefore, in this paper deal only with that kind of construction.

In addition to the before-mentioned reasons for using steel in buildings there are others more or less important, according to conditions or circumstances:

1. Rapidity of construction.
2. Possibility of changing the arrangement of rooms after the carcase of the building is completed.
3. Increased stability and rigidity; uniform distribution of loads on foundations to prevent unequal settlement.

Rapidity of construction is generally a question of economy. By speedy completion of the building, interest on the capital is saved. Possibility of changing the arrangement of rooms saves cutting away brick walls and putting in steel girders to suit the client's requirements. Such alterations of rooms may in many cases increase the rateable value of the building. A steel-framed building where steel is properly covered with protective material is, I believe, the most durable fireproof building that can be produced at a reasonable cost.

Let us compare the setting out and construction of a brick building and a steel-frame building.

The setting out of a brick building need not be very accurate as to dimensions. The builders can set out the walls and foundations to the architect's plans and eleva-

*Paper read at a recent meeting of the Society of Architects, London, England.

tion drawn correct to scale, but not necessarily dimensioned. The accurate dimensions of the site are often not ascertained before the old building is taken down and the builder is ready to start work building the walls. A little variation between the dimensions scaled from the drawings and the actual dimensions of the site will not present any great difficulties or cause delay or additional cost. The dimensions can simply be agreed upon between the builder's foreman and the architect's representative on the site. It is neither necessary to have particulars of details when starting the work, as cutting away of little brickwork is not accompanied by any great difficulty should it be found at a later date that some alterations were necessary on account of some of the detail drawings not being ready when the work was commenced. In the case of a steel structure, however, it is most essential that the drawings are completely worked out beforehand and all details made. Ventilation, heating, drainage, lighting arrangements, etc., should be set out beforehand, and the general lay-out and steel plans made to suit the different requirements.

Method of Carrying Out Work.

Economy is the essential thing to aim at, and generally speaking steel is being used in buildings because it admits of cheaper construction than other materials and at the same time ensures a reliable structure. By the use of steel the rental floor space is increased considerably; it also permits the use of large spans and less pillars, thereby enabling the future tenants to arrange the rooms according to their requirements. Buildings can be quickly erected and completed, thus saving interest on capital. In order to obtain true economy, however, it is necessary that the planning and designing, and also the method of carrying out the work, should be systematical and in accord with the general principles which I will deal with hereunder.

The steelwork plans should be ready several months before work can be started on site to allow for the time required for the manufacture of the steelwork at the mills; also it should be borne in mind that the steel can be obtained at a smaller cost if ample time is allowed for the steel contractor. It is advisable to order the full quantity of each section in one lot, and get the pieces cut to exact lengths at the mills. Considerable waste occurs if the shop has to draw material from stock. To take material from stock should only be permitted when very quick deliveries are absolutely essential. Generally speaking, complete dimensioned shop drawings should be made in the office in preference to setting out the rivets, connections and details by workmen in the shop. It is, of course, necessary for the engineer in charge of making the detail drawings that he must have a well-trained staff of draughtsmen who are thoroughly familiar with shop work, as the draughtsmen are called upon to do such work as the template worker would otherwise do according to the old practice. Positions of every rivet should be shown on the detail drawings, and nothing should be left to the judgment of the workmen in the shops. More reliance can be placed upon drawings which have been checked than upon setting out in the shop, which setting out is not usually checked.

Shop Drawings and Inspection.

Another advantage of having complete shop drawings is that every piece can be inspected and compared with the detail drawing, and errors in shop work can more easily be detected than if the work is set out in the shop without shop drawings. Every piece can be made complete to the detail drawing without fitting the different pieces together, and still they must fit perfectly when erected. The essential thing to remember in steel construction is that there should not be any alterations of the steelwork on the site.

It is a very serious proposition to make alterations to the steel design during progress of manufacture, and still more during erection. Not only will it incur delay and additional cost, but also less satisfactory work. Alteration work cannot as a rule be so well-made as is possible if the original design was carried out. Records are difficult to keep, and inspection is unreliable. If all drawings are properly worked out and completed before work is started, the possibility of alterations is materially reduced. We will not follow the progress of manufacture of the steel from the date the steelwork drawings are ready and handed to the steel contractor.

The first thing the contractor has to do is to issue orders for rolling of the material. An inspector will be appointed by the architect or engineer to inspect the quality of material at the place of manufacture. The inspector will be at the mills when the material is rolled. He will be present when the chemical and physical tests are made, and make records of the results of the tests, and order additional tests to be made if the material does not run evenly. The inspector will reject and order such material to be removed which will not meet the requirements of the specification, and stamp and approve such which is satisfactory

The approved rolled material is stamped with the inspector's mark of approval of quality of material. Any piece coming from the rolls is stamped with the blow or melt number, and this number is referred to on the test-sheet reports. The material in one and the same blow is usually the same, as great care should always be taken to have the melted metal well mixed before it is put into the ingots. Every piece is also marked with an identification number given on the detail drawings. This number is used for reference when consulting the drawings in the shop or when locating in which place the piece is to be erected on site. After being rolled and straightened the material is placed in the stockyard until required in the shop. As a rule the material cannot be rolled in the order it is required in the shop, but in such order as the rolls go in according to the rolling programme for the rolling mill. Weeks and often months may elapse before same section is rolled again. It is often, therefore, advisable to roll the beams for the roof at the same time as for the lower floors when same section is used. In the shop, however, the material is usually fabricated in the order as it is required on the site. The inspector is kept well informed as to the dates of rolling and manufacture, so that he can be present and inspect as required and as the work proceeds.

Shop Work.

From the stockyard the material is brought to the working shop, and skilled workmen mark on the position of the holes, lines of cutting, etc., on the steel pieces direct with or without template. The number of the shop drawing and number of job is often painted on the piece before it leaves the working shop in order to assist the checker and inspector. Therefrom the marked material is brought to the drilling shop. In the case of built-up sections, as, for instance, a column composed of angles and plates, all the angles and plates are not marked and drilled separately, but only a few holes are first drilled; the different plates and angles are then bolted temporarily together and the whole thickness of metal is drilled through at the same time, thus saving time and assuring greater accuracy and all holes being true. Several drilling machines can be used for one member at the same time. Burrs are removed after the drilling, and the ready-drilled piece is sent to the assembly shop. Some pieces are milled or ground to fit; the different pieces forming one member are temporarily bolted together and sent to the rivetting shop During assembly the detail drawings are consulted and dimensions checked. When the pieces are rivetted they are sent to the milling machines if any part has to be machined, such as ends of columns or bearing plates on girders. Before assembling some surfaces must be painted, as after assembly they are inaccessible. Open holes which are to be filled with rivets in the field are marked by the assembler so that such holes shall not be filled in by rivets in the shop. Holes in small pieces and brackets are generally punched and rimered after assembling, but main members

are drilled. Before the finished steelwork is painted it is examined by the inspector and all dimensions are checked. Ends of compression members which are machined must be examined, and it is ascertained if the ends are square to the axis of the member. If all measurements are correct and the workmanship is satisfactory, the inspector stamps the piece with his shop inspection mark.

The material will now receive its shop coat of paint or oil before shipment.

Any piece or bundle of pieces must not be shipped unless having the following marks applied:—(1) Blow or melt number; (2) identification number; (3) mark of mill inspection; (4) mark of shop inspection; (5) shipping mark.

When painting the material before shipment all marks made in the shop are extinguished (except those above stated). A small circle or triangle with white paint is made around the marks previously indented by stamps. The shipping mark and the identification mark is applied by paint in large and distinct letters or figures. Sometimes pieces for different parts of the building are painted in different colors, or a spot or ring of a distinguishing color is applied to facilitate selection of the material at erection. If the above described methods are used little or no difficulties will arise at erection, and no risk is taken of material arriving at the site incorrect. The inspector makes remarks on his copy of the shop drawing when approving any piece at the time when his stamp of approval is applied. He has also to see that the material is shipped in the right order as required on the site. After completing inspection for each lot he makes up a proper list of material. The works do likewise, and the two lists are compared and checked. Several days before a shipment is made the shipping statement is written out in detail, and instructions are issued for shipment or transport of the material to the site. As the material passes out of the works it is weighed, and the inspector records the weight and counts the pieces weighed and sees if they are in agreement with the advice of shipment. The weighing machine should be checked at regular intervals by an independent party to assure that it registers the correct weight. The shipping statement, advice and invoice is now sent to the contractor as the material is shipped if the contractor only buys the material but executes his own erection.

Transportation.

According to requirements the steel is transported on van, railway car or barge, or by ship. Considerable damage to the material may occur during transport if proper precautions are not taken against careless handling when loading or unloading, so that small pieces are not bent or crushed by large or heavy pieces placed on top. Delay, mixing up of the different consignments, is a source of great inconvenience and prevents speedy and methodical erection.

The material is usually brought alongside the building on vans, and is hoisted by the erection cranes to a place on the building near to where it is to be erected, or sometimes directly placed in its final place. The different pieces are first temporarily bolted together and afterwards set to correct level and made plumb, after which all holes are filled with rivets. The steelwork is painted immediately after erection, and if more than one field coat is applied different colors of paint should be used. Floors and walls are built and fireproofing applied. The erection of the steelwork should be two storeys ahead of the floors. The floors should be put in one storey ahead of the walls as may be convenient. In cases where walls partly support the floors or girders the walls must, of course, be built the same time as the steel is erected. In order to prevent accidents to workmen below, the floors should be put in close to the steel erection, or the floor framing should be boarded over to prevent any tools or material falling on the men below. At the same time the different trades should be kept separate so as not to interfere with the rapid progress of the work. When the carcase is complete and the roof is on, heating, ventilation, etc., are installed, partitions built and joinery and finishing completed. In the carrying out of a large job it is not always satisfactory to put the responsibility on to different parties for designing, detailing, manufacture, inspection and erection, as no one particular system is followed.

In my opinion one man should be responsible for the systematic carrying out of the work.

The engineer responsible should bear in mind that no work is satisfactory unless the following requirements are fulfilled:—(1) Economic and safe design; (2) good material and workmanship; (3) correct work as to dimensions; (4) prompt deliveries; (5) proper erection.

Satisfactory design can only be obtained by making a special study of the conditions and prepare accurate drawings and calculations. Good material can be assured by tests and inspection. Correct work can be obtained by systematic working and supervision. Prompt delivery is dependent on each portion of the work being ready in schedule time. Careful watching of each department is necessary, particularly at the early stages of the work. It is wrong to suppose that after a good design and specification are made the responsible engineer's work is done. A good specification is of equal little use without inspection as a clever design without proper shop drawings. The practice of taking a few test pieces from a job and sending them to a testing firm is not reliable, and is more deceiving than convincing. It may be that the test piece selected will show good results, while material in other parts of the structure is bad. The material should be tested at the mills during the progress of manufacture.

As I have previously said, satisfactory results can be obtained by the use of steel for buildings if the architect and engineer work hand in hand and the work is carried out systematically in all details.

When preparing plans and calculations for a building the work should proceed in the following order:

1. The specification drawn up for stresses and loads.
2. The principal members for the structure to be calculated, and it should be ascertained whether the setting out of the columns and girders is economical and reasonable, and, if necessary, such modifications made as will improve the construction.
3. When the architectural plans are completed the engineer will calculate all the loads of floors, walls, etc., make stress sheets for each member, after which a set of plans is made and the required sizes given. The sizes of the steelwork thus obtained are drawn to scale on the architectural plans, and, where necessary, the engineer will modify the sections to suit architectural requirements; after which the architectural plans are practically completed, the shop drawings made, and the contract placed with the steel contractor.

CONCRETE CEMENT BLACKBOARDS will, in all probability, very soon take the place of slate, plastic board, and other materials now being used. For several years blackboard men have been confronted with the problem of how a black plastic board could be troweled smooth without producing a glossy surface. A liquid concrete finish has been found that will produce a better blackboard than slate. The foundation is concrete which may be laid on brick or metallic lath, and over this, after it hardens, is spread a layer of cement which, of course, bonds with the foundation. The result is a board which is eminently more satisfactory than slate which, up to the present time, has been most satisfactory. The cement presents a dull finish which reflects no light rays, consequently presenting no glazed appearance to the eye when viewed from any angle whatever. There are no troublesome joints or seams and the smooth surface offers little resistance to the crayon, therefore using less chalk, and making a minimum of noise. The material will stand comparatively hard usage without breaking or cracking, but in case a piece should be broken it may easily be removed and the board repaired with little trouble and cost.

Garden Front, Residence of Miller Lash, Toronto. A Home of Georgian Character, Expressed in Red Brick Walls With White Mortar Joints and Grey Stone Trimmings. Sproatt and Rolph, Architects.

Main Hall, Residence of Miller Lash, Lowther Avenue, Toronto. This Interior is in Character with the General Style of the House. The Plan is Square and Roomy, and the Walls to a Height of Five Feet are panelled in Oak, Stained a Rich Brown, in Keeping with the Other Woodwork. Sproatt and Rolph, Architects.

RESIDENCE OF MR. MILLER LASH, TORONTO.—A Noteworthy Home in Georgian Character Which is Interesting Both In Its Architectural Treatment and Setting.—Plan Provides for a Compact, Systematic Arrangement with Excellently Placed Minor Conveniences.

LIMITATIONS AS REGARDS SITE have in the majority of cases in the past beset with difficulties the composition of town and city residences. In the last few years, however, one is beginning to witness a most welcome change in this respect. Larger grounds than those which have hitherto been the vogue are, in many instances, now being provided, and architects are given a greater opportunity to produce a class of dwelling structures that are more creditable to both their own efforts and the community in which they are situated.

In the residence of Mr. Miller Lash, Lowther avenue, Toronto, shown herewith, the exterior view illustrates a home that is noteworthy both in its architectural treatment and setting. The grounds are not only of sufficient size to allow for an ample driveway to the main entrance at the side, and a large south terrace, but also to give the house considerable open space on all sides. That a spacious site of this kind should obtain in connection with a residence of Georgian character is important, as no matter how thoroughly a house of this type might be considered otherwise, it usually suffers a decided disadvantage when cramped on a lot totally restricted in width and depth.

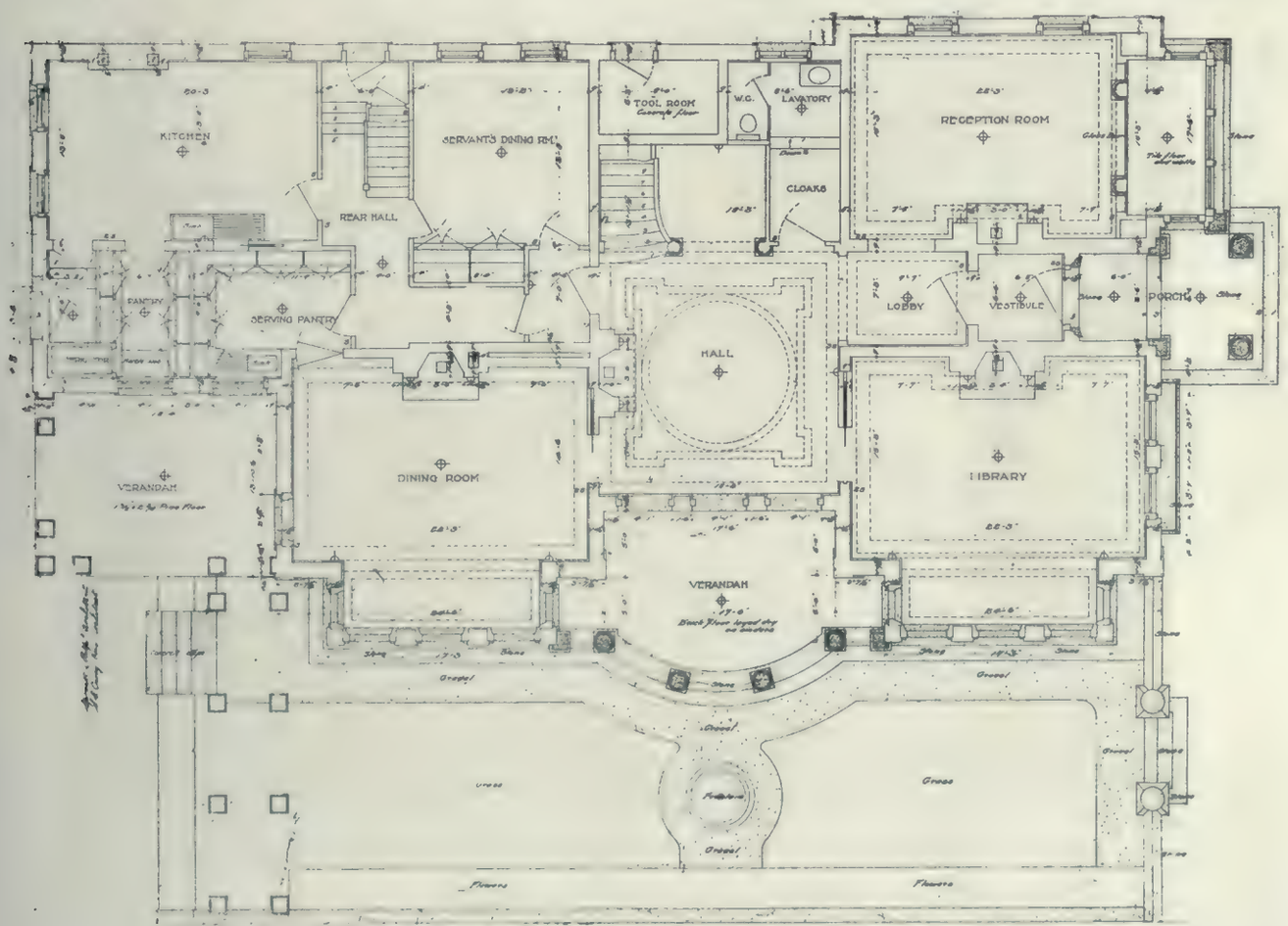
The exterior composition of this house is red brick with white mortar joints and grey stone trimmings, the principle features of the design being the portico opening at the centre of the terrace, and the verandah at the side of the dining room with its adjoining pergola extending out into the garden.

The plan of the interior forms a compact, systematic arrangement, which gives all the main rooms light from at least two sides. The hall, which is centrally located and square and roomy in plan, is reached either from the lobby and vestibule of the main entrance, or through the portico from the terrace. This interior is in keeping with the exterior style of the house. The walls are panelled to a height of five feet in oak, stained a rich brown, and the upper portion is finished in a plaster treatment with an enriched ceiling cornice. A feature of interest is the alcove formed by the arrangement of the stairs, which provides a convenient place for the pianoforte.

To the right of the hall is the library, and to the left the dining room. In both of these rooms the oak panelling is carried up to the cornice, and simplicity of treatment has been observed, an effort being made to retain dignity of materials in moulding a mantel shelf, and to avoid unrest by treating both rooms alike with minor changes in mantel and fixtures.

The reception room, which is entered from the lobby of the main entrance, is finished in white enamel and wall plaster treatment, and with the hall is more in character with the exterior treatment of the house. A noteworthy appointment here is the large Georgian mantel piece, carried out in white enamel and marble, appropriate to the decorative scheme employed.

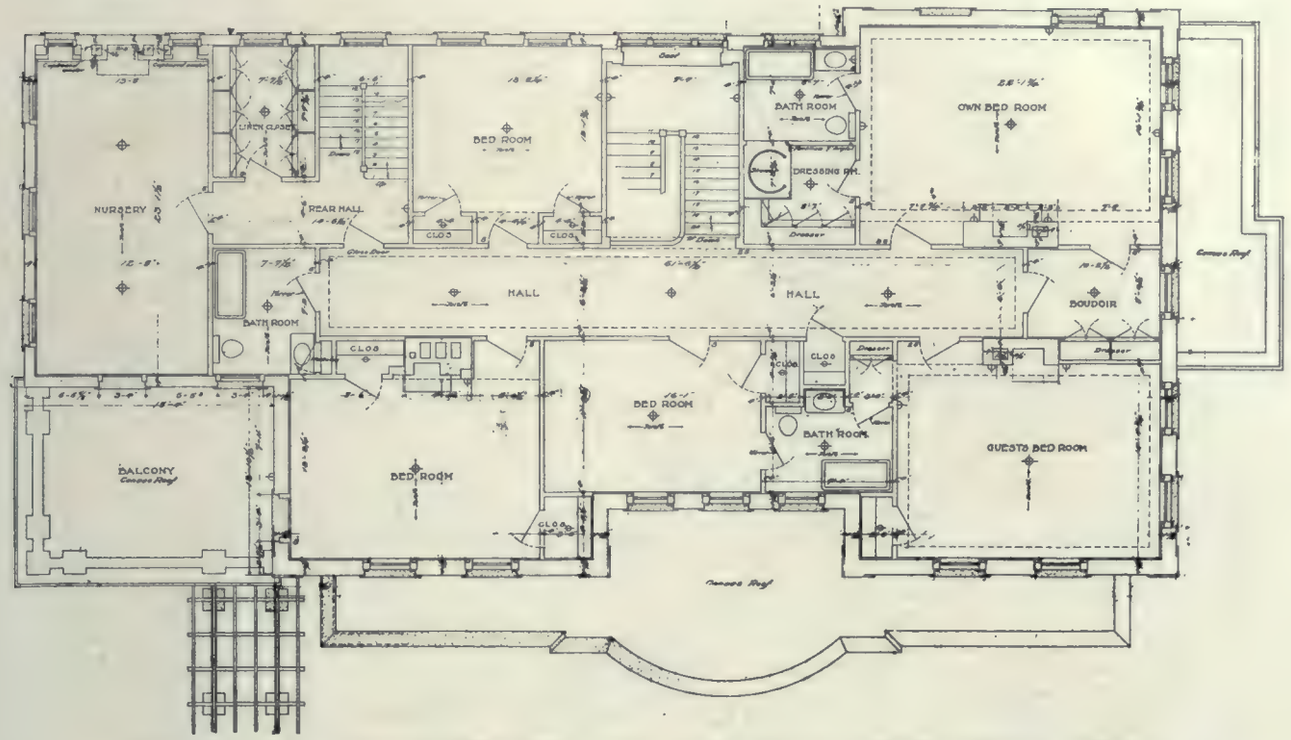
Throughout the floor, the plan provides for a number of minor conveniences. A spacious cloak room with an adjoining lavatory opens off the hall, while a room for



Ground Floor Plan, Residence of Miller Lash, Lowther Avenue, Toronto. Sproatt and Rolph, Architects.

Library, Residence of Miller Lash, Lowther Avenue, Toronto. Here the Oak Panelling is Carried Up to the Cornice, and Simplicity in Treatment has been Observed, an Effort Being Made to Retain Dignity of Materials as in the Mouldings and Mantel Shelf. Sproatt and Rolph, Architects.

Dining Room, Residence of Miller Lash, Lowther Avenue, Toronto. This Interior is Similar in Character to the Library, the Object Being to Avoid Unrest by Treating Both Rooms Alike, with Minor Changes in Mantel and Fixtures. Sproatt and Rolph, Architects.



First Floor Plan, Residence of Miller Lash, Lowther Avenue, Toronto. Sproatt and Rolph, Architects.

tool and garden implements is situated in the space at the rear of the stair case. Other features are found in the splendid series of built-in devices in the pantries and other rooms of the service portion, which is kept well within itself and apart from the living rooms, the kitchen and servant dining room being separated from each other by the service stairs.

On the first floor the rooms are arranged on either side of a central hall, extending practically through from one end to the other. All rooms are arranged to be convenient to the bath room, and the main sleeping chambers and the nursery have large open fire places.

Mantel Piece, Reception Room, Residence of Miller Lash, Toronto. This Room is Finished in White Enamel and Wall Plaster Treatment, and With the Hall is More in Character With the Exterior of the House. Sproatt and Rolph, Architects.

The house was designed by and erected under the supervision of Architects Sproatt & Rolph, Toronto.

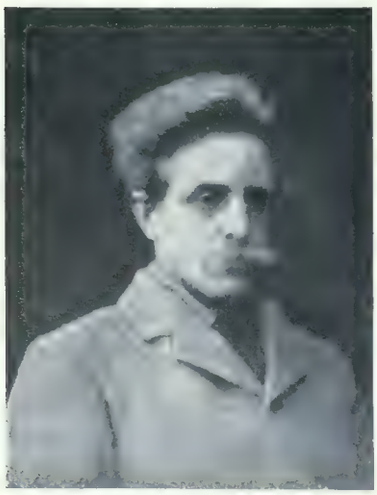
THE CINDER CONCRETE WALLS of the building used in subjecting floor constructions to fire tests at Columbia University were erected two years ago and have been subjected to five fire tests of 4 hours each, during which the average temperature has been 1700 deg. Fahr. At the end of each four-hour test a stream of water at 60-lb. nozzle pressure was played back and forth over the ceiling for 10 minutes while the ceiling and walls were red hot. After this severe treatment, Prof. Ira H. Woolson states in "Insurance Engineering," the walls are practically as good to-day as they were when new, except that the rear wall has been scored by the water to a depth of from ½ to 1 in. for 2 or 3 ft. near the top. This wall gets the direct stream for a portion of the time and always receives the deflected stream from the ceiling. He believes that the structure is good for an indefinite number of tests, the only repairs necessary being an occasional plastering to renew the wall surface washed away. A duplicate of this building torn down some years ago sustained seven four-hour tests at 1700 deg. before its removal. At that time the walls were as good as those in the present structure. Professor Woolson is of the opinion that within reasonable limits the percentage of coal and the amount of fine material in such cinders have very little if any effect upon their fire resisting qualities. He believes that sifting and washing the cinders would be a useless expense and injurious to the cinders as aggregate for concrete. The pieces of coal which came next to the surface of these walls have been burned to an ash, but remain in place and act as a non-conductor of heat. Plenty of particles of pure coal can be found in the walls less than 2 in. beneath the surface.

THE WESTERN BRANCH of an important railroad has decided to replace their wooden snow sheds by structures made from concrete. These roads have decided that wooden construction will not do on account of the avalanches and immense snowslides which so frequently occur. The cement buildings will be of such strength and solidity that they will be practically indestructible.

TOWN PLANNING.—The Art of Designing Buildings and Laying Out Streets and Public Grounds So As to Produce a Harmonious Scheme.—Examples of Town Planning in England and Germany.—Essentially a Co-Operative Art. ∴ ∴

By RAYMOND UNWIN

EDITOR'S NOTE.—The planning of a town in advance of its development, so that the buildings, road system, and public spaces form integral parts of a consistent scheme, affords a study which well merits the attention and consideration of the architectural profession and municipal authorities in Canada. Germany and other continental countries have made marked progress in this direction, and England, both prior to, and following the passage of the "Town Planning Act," as evidenced in Bournville, Port Sunlight, Letchworth and Hampstead—has carried out a number of important projects that clearly demonstrate the advantages which result, when by a carefully preconceived plan and co-operative effort, an endeavor is made to have the individual buildings contribute to the harmony and success of the total effect. In Canada and the United States nothing as yet of this character has been attempted, and even certain Latin-American countries where the respective governments are at least trying to establish a more improved and wholesome condition in the homes of their working class, show more initiative and progress in this respect. However, as regards the Dominion, the adoption of the "Town Planning Idea" is not altogether improbable. Assuredly, the time is most opportune, and as a young country with new towns and districts continually taking shape, it seems only necessary for an awakening to the advantages of the scheme, before definite steps in this direction are taken. The views of Mr. Raymond Unwin on this subject given before the Society of Architects, London, which are published in this instance, we believe will prove of interest to the readers of "Construction." Mr. Unwin is one of England's foremost architects, and an eminent authority on town planning; and his book on this subject, setting forth his experiences and observations, is possibly the most complete work of its kind issued. Mr. Unwin has the faculty of couching his views in a simple and comprehensive manner, and his remarks in this connection will be found both highly entertaining and instructive.

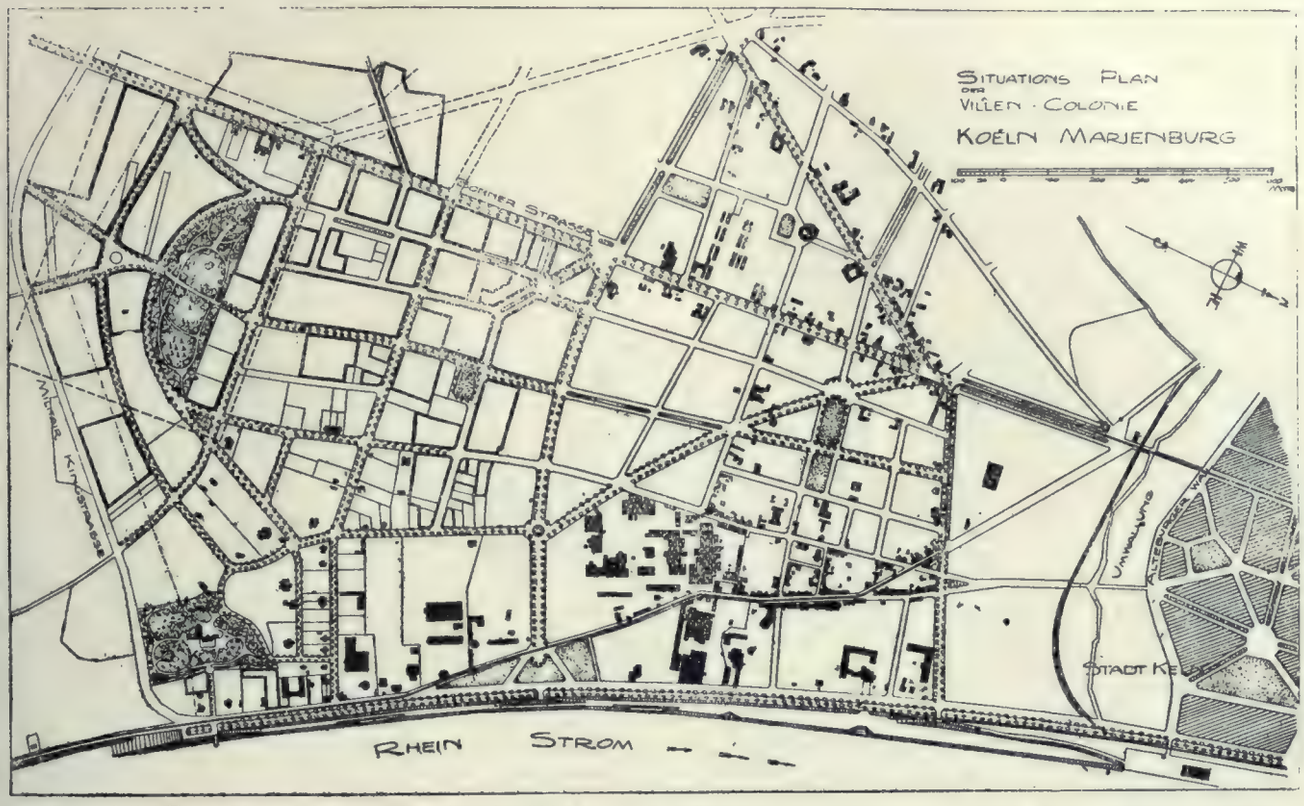


Raymond Unwin.

IT WAS SAID OF CECIL RHODES that he thought in continents. The passing of the Town Planning Bill in England throws upon the architectural profession of this country the duty to expand the scale of its thinking somewhat in the same way. For the last generation or two, in this country at any rate, the architect has centred his thought upon the individual building which he was commissioned to design, and his total inability to influence the surroundings has led him to a large extent to ignore them. The Town Planning movement, culminating, as it has just done in the passing of an Act conferring powers upon municipal bodies to lay out the plans of their towns in advance, and to make at any rate a beginning of treating their towns as large units to be considered as a whole with some foresight, calls upon our profession especially to remember, that the whole is greater than the part. We must begin to think in streets, in districts, and in whole cities, and henceforth to regard our buildings not so much as isolated efforts, but as units in a larger whole. Town Planning, though in this country almost an unknown and forgotten art today, has been practised in all ages and in many parts of the world, and town plans, when examined will be found to show an almost infinite degree of variety and individuality. What one may perhaps call the modern period of Town Planning has already passed through several phases of development in other countries, noticeably in Germany, where during the last fifty years there have developed different styles, characteristic of different periods, showing a growth analogous to the different styles and periods we are familiar with in architecture. As an example of the earlier style as applied to an entirely new town, I call attention to the plan of Dalny, which shows evidence of a study of some of the exercises in ideal Town Planning, such as those of Vasari il Giovane and Scamozzi, at the end of the 16th century, or of Roland Levirloys at the end of the 18th century, with the irregular geometrical plans characteristic alike of Haussmann's work in Paris, and of the German work in the middle of the 19th century. This plan is of special interest, as showing the care that was taken in surveying the ground before the plan was made; not only do we find careful contour levels, but also wind and weather diagrams, the prevailing winds and the aspects having both been taken into account in determining the direction of the main roads.

In the plan of Cologne, we see town planning applied to the more common case of the extension of an existing town. This plan illustrates also the change in the character of German town planning. In the centre may be seen the irregular street lines, characteristic of the medieval town, with a few more modern roads resulting from improvement schemes. In the zone immediately outside this area, which was set at liberty by the extension of the fortification lines during the last century, we see the geometrical type of planning, very like much of that which can be found on the plan of Paris. Cologne has again outgrown its line of fortifications, and, moreover, the change in the character of warfare has rendered them obsolete, and the town is now developing suburbs all round. These it will be seen are being planned by the municipality far ahead of the development, but the geometrical pattern work has been displaced by more flowing lines, showing a marked reaction from the rigidity of the former manner. This may fairly be taken to indicate the intermediate German style and period of German town planning work. It is very interesting to compare the old plan of Paris with the modern plan, and to see the extent to which Haussmann's geometrical planning has displaced the medieval irregular street lines of which Paris once entirely consisted.

The influence of Camillo Sitte in Germany, Austria, and the central European countries generally has resulted in a further development of the curvilinear and irregular style. He advocated a careful study of medieval town plans, and put forward the theory that these plans were the result of conscious design on the part of a people thoroughly imbued with artistic instinct and tradition; and he deduced some rules and many suggestions as to the causes of the wonderful picturesqueness of medieval towns and cities. The plan for the extension of the little town of Kufstein is one of the best examples I know of the most modern style of German work, in which the town planner concentrates his main attention on the build-



Part of the Town Plan of Cologne, Showing the Old Line of Fortifications, and the Lay-Out of One of the Southern Suburbs.

ing up of picturesque street pictures. Every street, every junction, and indeed, one may say every view in this plan has been carefully thought out, so that when the buildings arise on the building lines laid down, they may group together in the picturesque manner characteristic of medieval cities. It will be found also, that although in no

General Building Plans for the Town of Kufstein, by Herr Lasne, Architect. 1—Ober Standplatz. 2—Unter-Standplatz. 3—Railway Area. 4—Festa Geroldseck.

direction are there long, unbroken streets, nevertheless, the lines of the roads are so contrived that it is possible to get about the town in all directions, without inconvenience. At the same time, it would not be very easy to plan an extensive tramway system for such a town.

The plan of Marienburg is a very good example of a combination of the two styles of planning. We see certain straight thoroughfares giving a sense of framework to the town plan, while the details are filled in with the irregular streets, planned to produce picturesque groups of buildings so characteristic of the modern German school.

Signs are not wanting that there will shortly be in Germany considerable reaction against the extreme irregularity, and the excessive striving after the picturesque which has marked their recent work. Here in England, we are about to take up this new art of town design. It behooves us to study very carefully all that has been done before. We have the great advantage of being able, if we will, to profit by the extensive experiments in different styles of work that have been carried out on the Continent, during the last fifty years. We have in this country scraps of two traditions in town planning. There is the very regular and symmetrical work characteristic of the Rennaissance period, when, for a while, large schemes were grasped and sometimes carried out, as we may see in many parts of London, notably, in the squares lying between Holborn and the Euston road, and in part of the district round Regent's Park. In addition, we find in Bournemouth, Buxton, Eastbourne, and some other towns, that have grown up mainly on the property of one great land owner, town plans worked out under the influence of the landscape school of gardeners, consisting of flowing so-called natural lines, but generally speaking lacking in any large grasp or any sense of wholeness in the completed plan. I think it is of the greatest importance that we should, in this country, not make up our minds too hurriedly, as to one style or the other, until we have pretty thoroughly grasped the advantages of both, and the reasons which have led to the adoption of one or the other. I cannot help thinking, that we have here, as so often, the elements of a new synthesis, and hoping that it may be within our power to evolve in this country a style of town planning which shall show alike a due appreciation of the beauties of our usually irregular and undulating sites, and of that other beauty which springs from ordered and regular design. The problem before us really is how to weld together into one harmonious whole the undulating surface and irregular features of our country and the definite lines and ordered arrangement characteristic of good design. And, with a view to further illustrating this, I would like to contrast for you two cities.

The first is the peasants' city of Rothenburg, a unique example of unspoiled medieval picturesqueness, the character of which springs not from the possession of supremely beautiful buildings, but from the fact that in the whole of the town there is hardly one that does not show a simple, comely beauty. The plan is interesting as showing how the form of the town has been influenced by the nature of the ground, the line along the west side following the crest of the high ground on the edge of the deep ravine, which has been worn out by the winding Tauber, a small river, the musical murmuring of which, as heard all along this side of the town on a quiet evening, adds not a little to the charm of the place. It is a characteristic medieval plan marked by an entire want of symmetry and regularity, subordinated to the double line of fortifications, one dating from the 13th and the other from the 14th century, beyond the outline of which, except for a small settlement adjacent to the railway station, the town has never developed. But, while lacking that symmetry and order which goes to make up a pattern on paper, none the less this plan has in it many of the far more important elements of a good town design. It has, in a marked degree, both scale and framework. Its market place with the group of smaller *places* linking it up with the great Church, the Rathhaus, and the Herrngasse, the great street in which the patricians of the town once lived, form together a centre finely dominating the town, while the roads leading to the main gateways are also marked out in importance by their comparative width and directness. I must not omit to mention the delightful absence of that region of untidy allotments, derelict building sites and rubbish heaps which forms a girdle round nearly all our growing towns to-day; the way in which the unspoilt country comes right up to the wall of the town, inside which the crowded, I must admit, in many cases over-crowded city commences, has a very fine effect, and one which suggests to us whether there may not be found for our modern suburbs some means of defining and limiting their areas adapted to our modern conditions of life as the town wall was adapted to those of our forefathers.

Before passing from this beautiful little city, which, more than any other I know, carries one back to the time when all building work was governed by a simple instinctively appreciated tradition which seems to have made it as natural to build beautifully as our modern life has seemed at times to make it natural to do the reverse. I would like to emphasize the unity of effect which has resulted from the following of that tradition. Almost every building in the town, including the Rathhaus and the Church, is roofed with the beautiful hand-made Rothenburg tile of a quiet brown color, here and there brightened with touches of brilliant red where the tile has cleansed itself, as such tiles will. The buildings are either built of stone, the prevailing tones of which are cream and light brown, or more frequently are plastered and treated with lime-wash of very similar tones. Bits of bright green and grey occur in the woodwork, the whole producing a unity of effect which is quite astonishing to anybody accustomed to the hopeless jumble of materials, colors, styles and forms which characterize the modern town or suburb. And yet, there is no lack of variety, for while the general form of the town, the multiple gables and picturesque groups of turrets and pinnacles give it an essentially Gothic character much of the detail is distinctly Renaissance.

Let us contrast with Rothenburg the city of Karlsruhe which owes its origin to the Margrave Charles William of Baden-Turlach, who transferred his residence thither in 1715, at which date the plan of the town was made. It is now the capital of the Grand Duchy of Baden, and the Ducal Palace forms the central feature of the town. A tower ingeniously built out on a wing stands on the centre point from which a series of streets radiate to all parts of the town, so planned that this tower is the terminal feature in one direction along all these streets. On the other side, there is an extensive forest, through which straight alleys have been cut, radiating from this tower in like manner. The Market Place is formed on the axis line of the town, which coincides with the central radiating street. Before the Schloss is a large fan-shaped garden *place* having the front of the Schloss at the apex with stable buildings, barracks, residences, and a theatre, forming the radiating flanks, while round the circular arc is built up a colonnaded crescent of houses, cut at intervals by the narrow radiating streets. Beyond this crescent, a circular road links up all the radiating streets, while at right-angles to the axial line at the north end of the Market Place runs a wide, straight thoroughfare from east to west, connecting with various diagonal streets, and completing the general framework of the town. This road leads directly to the district of Muhlburg, and to the docks of Rheinhafen, which put the town in communication with the much used water course of the Rhine. Sufficient of the early 18th century buildings remain to enable one to form a fairly good idea of the effect that would have been produced if the town had been entirely built up at that period. It would be difficult to imagine a greater contrast than that between the style of this town and

that of Rothenburg. The straight, formal lines of the streets, the geometrically shaped *places,* the axial treatment of the Market Place, the regular, horizontal sky lines, and the entire absence of gables, with the symmetrical and regular treatment of the facades, all emphasize this difference, and yet, there is the same feeling of unity of effect, the same sense of scale and framework leading up to a definite town centre that marked the more picturesque and irregular Rothenburg.

Much skill was shown in the treatment of the many acute and obtuse angled corner buildings, a very good

Ravena.

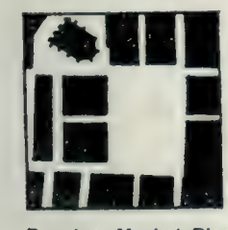
Salburg.

effect being frequently obtained by very simple means. We cannot fail to notice how such a regular treatment suffers when the style is departed from, and buildings of different heights and different characters break in upon the orderly arrangement, and, I think, we should take warning, and before embarking upon any system which depends for its success on the complete maintenance of very regular lines, make fairly sure that we can see our way to maintain these.

The site of Karlsruhe is a level plain, having apparently nothing of natural undulation or feature within the area of the town, which needed to be much considered by the planner, so that probably in this case the unusual degree of formality of treatment was justified by the conditions. The faults of the plan are the excessive and monotonous insistence of the somewhat uninteresting tower of the Schloss, the large number of acute angled corners and the uncomfortable shape of many of the *places,* road junctions, and building plots formed.

Its virtues are the definite leading up to a centre, and the interest which each part derives from being a portion of a definite scheme, the easy communication from point to point, and the simplicity of the general framework, which is easily grasped.

Bearing in mind the comparison we have made of the formal 18th century city with the informal 14th century one, let us pass to consider in greater detail some of the



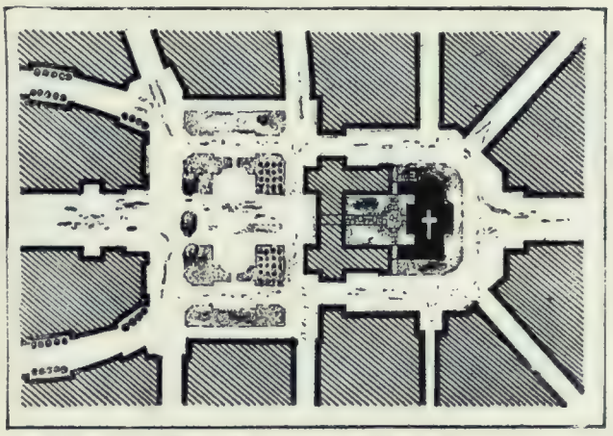
Dresden, Market-Place.

Pisa.

component parts. We have seen that both plans are alike characterized by an extensive use of *places* of various size and forms. The special characteristic of the mediæval *place* is the sense of enclosure and the completed frame of buildings which is produced; the shape is indefinite. In the Market Place at Nuremburg, for example, although at first sight there appear to be many roads leading in to the place, and forming breaks in the buildings, it is remarkable how the arrangement of these does, in reality, leave the framework of buildings unbroken. Either the roads are curved slightly after they leave the Square, or their direction is broken, or they are made to pass out at right angles to the line of vision so that it would hardly be possible to stand in any part of the Square and get a long, unbroken vista out of it. Contrast with this the modern Max Josef Platz, Munich, where the long, straight vista at the side of the theatre breaks up the frame of the buildings and gradually destroys any sense of enclosure in this part of the *place.* The Piazza del Campo at Sienna is another instance of a place of quite irregular form on plan, in which so far as its shape and arrangement are the result of conscious design, the aim appears to have been mainly to secure the sense of enclosure, and an unbroken frame of buildings. This, of course, was easy with the narrow streets common in medieval times, in which a very slight deviation from the straight line is enough to close the vista. The Market Place at Stuttgart is an example of this. We have only to imagine two modern 50 ft. streets replacing the narrow ones to realize how, unless they were very rapidly deviated from the straight, the sense of enclosure in that *place,* would be entirely destroyed.

In Renaissance *places,* quite different effects were aimed at, regularity and symmetry of shape and architectural treatment are in them the prominent features, and the sense of enclosure is sometimes wanting.

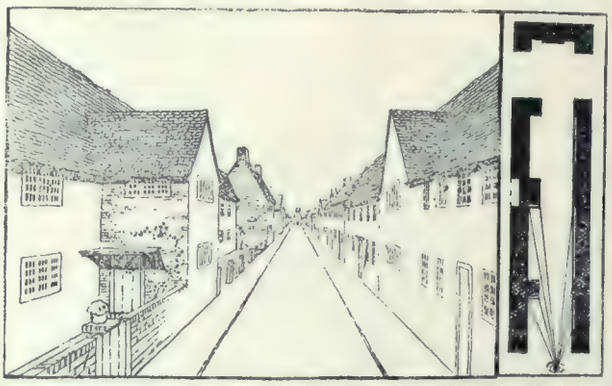
The importance of linking up the buildings and producing to some extent a continuity of frame, was, however, apparently recognized in the laying out of the fine



Town Square of Letchworth.

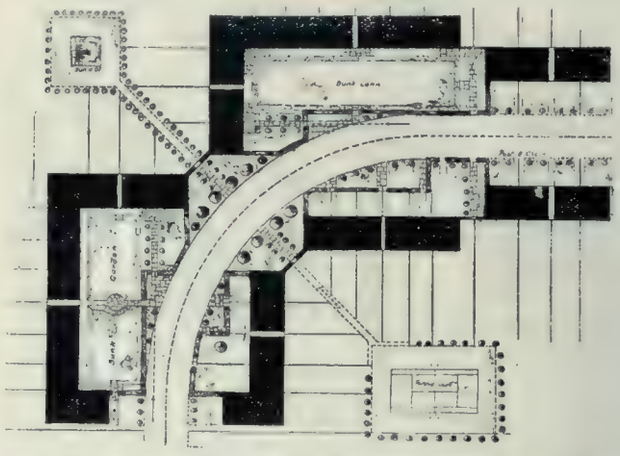
group of Renaissance *places* at Nancy. Where the angles or ends would otherwise have been open, they have been to some extent screened by wrot-iron railings, masses of foliage and semi-circular loggie or arched gateways. But the importance of enclosure and linking up of the buildings has not always been recognized in the planning of architectural *places,* particularly those resulting from, what I may perhaps call, axial treatment. It is not of course the only desirable effect to be produced in a *place,* but there is a peculiar sense of completeness and unity and a suggestion of quiet and repose which results from this treatment which it is most desirable to maintain in many *places.* The Amalienborg Platz at Copenhagen is a very fine instance of an architecturally treated *place* in which no attempt is made to secure this element of definite enclosure in the *place* itself. A monument stands on the intersection of the centre lines of the two cross roads, and the four palaces which face diagonally upon the *place* are each completed by lower wing buildings affording something of the gateway treatment to the roads themselves, and giving a fine sense of unity to the whole effect. But in reality, this *place* may be regarded rather as the glorified treatment of a street junction than a *place* in the sense in which we have been using the word hitherto.

The Karolinen Platz at Munich is another example of the treatment of a multiple road junction, with a central feature on the axis of the various roads, and with definite architectural treatment of the corners, but lacking any



Plan and Sketch of Street, Showing on One Side the Uninteresting Vanishing Perspective of the Unbroken Building Line, and on the Other the More Picturesque Result of Breaks.

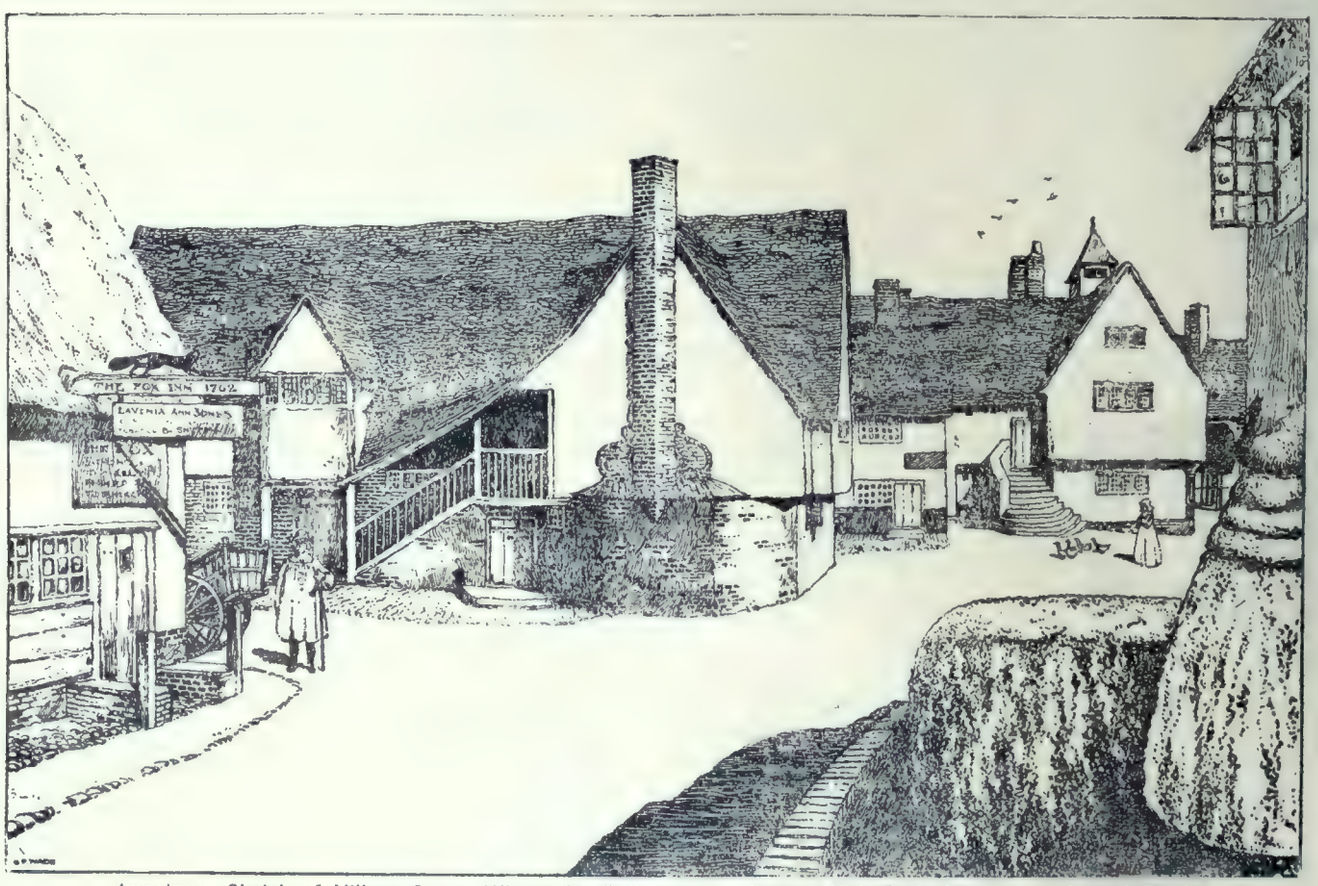
sense of enclosure. In such *places* one is not tempted to loiter; they are apt to be distinctly draughty. From these, one naturally passes to consider *places* formed mainly for the purpose of facilitating traffic. Many examples of these may be found in Paris; at points where several roads converge there is usually formed some open space to facilitate the circulation of traffic, and to secure some degree of architectural treatment to the corners of the various streets. The Place de L'Etoile is the largest of these. The whole question of the circulation of traffic, and the best way of reducing the inconvenience which must always arise in busy streets, where several streams of traffic pass in and out or across the main lines, is too large for me to touch upon to-night, and I can only just say, in passing, that there are two widely different views held on the matter. The German School of Modern Town Planners believe that as far as possible multiple road junctions should be avoided, and each branch street is better brought singly into the main street. They consider that many single junctions disturb the flow of traffic less than a fewer number of multiple junctions. On the other hand, the French School of Town Planners consider it advisable to give long, straight, unbroken streets, converging at certain points where the traffic can rearrange itself all at one point, and pass off in many directions; and in some cases, as in the Place de l'Etoile, it has been suggested that the best way of dealing with the traffic, is to keep it always moving round the centre point in one direction, which, although, it obliges a certain portion of the traffic to take a rather longer route, avoids the lengthy stoppages of first one stream and then



Group of Buildings Designed to Maintain Square Roof Lines on a Curving Road.

the other which are otherwise necessary at crowded crossings.

In connection with the new St. Paul's Bridge, which will throw a considerable stream of north and south traffic across the already somewhat congested stream of east to west traffic, at the junction of Newgate street and Cheapside, the authorities should consider whether it would not



Imaginary Sketch of Village Scene, Where the Buildings are Square With Each Other on a Curved Road.

be worth while to test the circulatory system here. If it were found possible to open out this corner somewhat, there are the makings of quite a good *place,* and the lines of three, at any rate, of the roads, and of a fourth behind the Post Office, if this could be opened up, would strike the *place* like the arms of a turbine, which would render the circulating system peculiarly easy. A carefully made test as to the usefulness of the system would be very valuable at this moment, when we are about to enter upon a town planning period in this country.

But, not the least interesting type of *place* is one which we may call the garden *place,* because it is the one which is likely perhaps to be of most use to us in the planning of town extensions, the part of town planning for which alone powers are given under the new Town Planning Act.

The Schloss Platz, Stuttgart, may be taken as a good example of this type, and, in passing, we may use the example also to indicate in some degree the style of garden treatment suitable to *places.* In the first place, to eliminate the central garden from the plan of the place, one can readily appreciate in the mind's eye how the simple masses of foliage left add to the dignity of the *place.* On the other hand, with the garden portion included, I think it will be agreed that much of the breadth has been destroyed by the way in which the garden space has been frittered away and worried with fountains, bandstands, and geometrically patterned beds of variegated flowers. Here is altogether too much treatment, and in forms which although, no doubt, on paper they would make very pretty patterns, do not when seen in reality from the point of view of the ordinary spectator reveal much but undue fussiness. I am convinced that the breaking up of *places* with architectural balustrades, fountains, bandstands, etc., in the great majority of cases is a mistake. Such features have their place, but they should never be allowed to interfere with the general breadth and simplicity of effect which is so necessary, and which forms so much more dignified a foreground for the buildings surrounding the *place.* A plain sweep of grass, crossed perhaps by paved footways where necessary for pedestrians, following the simplest possible lines, with avenues or masses of tree foliage, when properly placed, is generally an effective treatment, and the money spent in so-called architectural embellishments would be usually better devoted to masking one of the street entrances with a gateway arch.

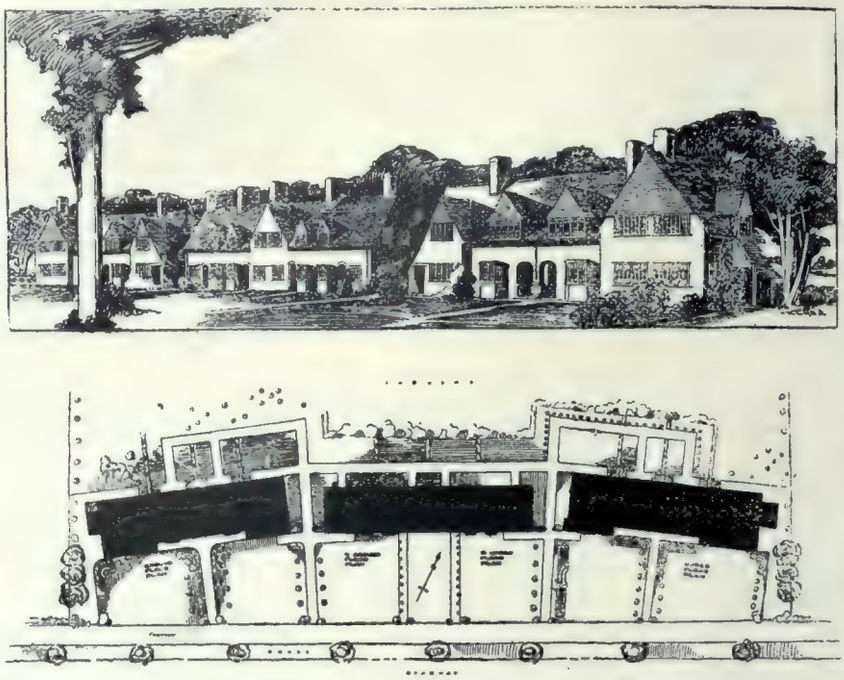
Where there is difference in level in the *place,* broad terraces with balustraded walls enabling portions of the ground to be levelled, may add greatly to the effect. But, in garden *places,* as in gardens, it is necessary to be very clear as to the effect that is to be aimed at, and to be very cautious about introducing any mere embellishments which do not form part of a scheme definitely thought out to enhance that particular effect. Indeed, it is not only in the treatment of places, but in the whole work of town planning that we need to guard against being carried away by the prettiness of our paper plan. While the importance of definite design and orderly treatment is undoubtedly great, it is equally true that only by building up in imagination the pictures as they will appear to the beholder walking about in the streets, can we test our different proposals. Very often things which may look simple and uninteresting on paper will be much finer in effect than other arrangements showing a much prettier paper pattern. If I have devoted perhaps an undue proportion of my limited time to the *place,* it is because I wish to emphasize specially the importance of introducing a sense of scale and proportion in town plans, and because, I believe, that a wise use of the *place* will, more than anything else, perhaps, help us to do this. We need a centre point to our design, nay, I would rather say we need many centre points; for it is not by jumbling together many materials and styles of building that we shall produce satisfactory variety in the large areas which modern towns cover, but rather by the careful selection of suitable centre points to each town, each district, each parish, and almost to each building site, or estate. Around these centre points the plan may be grouped, in relation to them the roads would be laid out, and the widths and treatment of them to some extent graded. Around them may be gathered the local public buildings. These centre points in turn may become the pride of the inhabitants, and may tend both to give expression to, and to foster local civic spirit and enthusiasm.

For important centres where the scale seems to need something larger than can wisely be adopted for a single *place,* the useful size of which is limited, within fairly narrow lines, we may well take some suggestion from the groups of *places* which are characteristic of so many continental towns and which may be planned, as for example, at Salzburg, so that not only does the group form a much larger whole and afford opportunities for seeing the cathedral to the best advantage from many points of view, but from no point of view is it seen without its due background and frame, in that naked isolation which we are so apt to choose for our public buildings. In large, gardened *places,* where the scale of the whole would tend to dwarf the buildings, the judicious use of masses of trees may have much the effect of breaking up the larger *place* into groups of *places,* partially enclosed by the mass of foliage, and in this way the proportion between the buildings and this limited *place* area may be the one that will be felt.

In Salzburg, the *places* are irregular in shape, but the same principles may govern us in planning regular and architecturally treated *places.*

For the town square at Letchworth, such an arrangement has been adopted, where a large garden square seemed most appropriate for the centre of a garden city, while groups of smaller *places* surround the main public buildings, and the streets are arranged to command a view of these.

Much that has been said of *places* will apply to streets also. The building up of street pictures is indeed a fascinating art, giving scope for endless variety of treatment. When it is desired to provide a route from one point to another, and no obstacle exists, nor do the contours of the ground suggest any deviation, the obvious course would seem to be to adopt the straight line. The advantages of the straight street are that it lends itself to the production of vistas, that where suitable terminal buildings can be provided at distances not too great, these buildings can be very well seen, also the straight street affords convenient building sites, and all the many conduits, tramways, etc., which form part of the engineering work of a modern town street, are more easily laid in straight lines. The disadvantage of the straight street is that it is liable to become monotonous. The Rue Soufflot, in Paris, leading up to the Pantheon, is a good example, in which the terminal feature is of sufficient importance and interest. The length of the street is not very great, and the whole forms a dignified and beautiful street picture. But where a considerable terminal feature is lacking, and where the length of the street is great, the long converging lines of windows, cornices, etc., become not only uninteresting, but wearisome. When looking down a straight street, the buildings on either side for a short distance are seen at a sufficient angle for the features to be appreciated, and to be interesting; but very soon, owing to the acuteness of the angle of vision, all the features, such as windows and doors, cease to be seen sufficiently clearly to have any interest, and become mere lines of shadow. Where a cross street occurs, a small portion of this vanishing perspective is replaced by part of the side elevation of the corner building furthest from the beholder. A little point of interest is at once introduced. In the diagram given, this point is emphasized by the different treatment of the two sides of the street, and it will at once be seen that by a judicious breaking of the building line, it is possible to fill the picture with the side elevations of buildings seen nearly



Garden City, Letchworth. A Group Composed of Three Blocks of Cottages Built in Station Road.

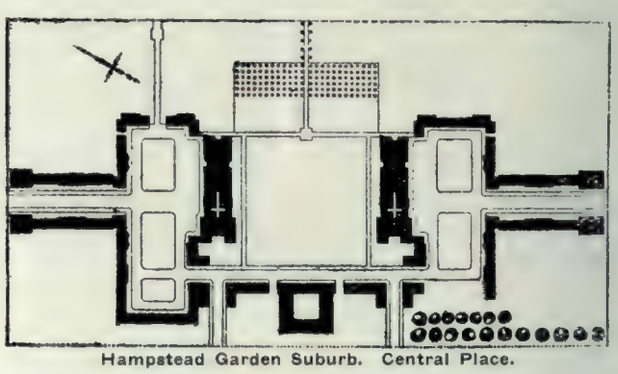
square with the line of vision, so that the features are sufficiently well seen to afford interest and variety. In this way, by the introduction of suitable recesses or forecourts, which afford an opportunity for planting trees, it is possible to build up quite interesting and picturesque views on a straight street, and to avoid any large amount of the picture being filled with the converging lines of the vanishing perspective. In the case of suburban roads, where the houses stand far apart in proportion to their height, the street view may with advantage be limited at intervals by bringing some of the buildings close up to the road line, and in this way the street pictures will be greatly improved, not only by the limitation in the distance, but by the framing in of the view.

The advantages of the curved street are that it can be more readily adapted to the usually undulating surface of our sites, and that there naturally springs up along it an ever varying street picture. I cannot illustrate this better than by calling attention to the famous Oxford High street, beginning from Magdalen Bridge, and terminating with the fine treatment of the Carfax Corner, carried out by Mr. Hare, when the increasing traffic necessitated the removal of the nave of the church. It will be noticed in this study how

Hampstead Garden Suburb. Sketch Showing Group of Houses Round a Green.

the concave side of the street is the one that chiefly adds interest and variety to the picture, and the curved street is apt to lose on its convex side in proportion to the gain on the concave. If we examine a view of the Regent Street Quadrant, we shall see how rapidly the convex side of the street vanishes out of the picture. Comparing this with the concave side, we shall see how the buildings on this side of the street are seen at a sufficiently wide angle for the interest of the features to be maintained right up the vanishing point, and we may also judge of the fine effect which may be produced by a continuous horizontal treatment of a fairly regular curve. But it must not be supposed that a beautiful result necessarily follows from a curved street. There must be sufficient unity of effect and emphasis at the right points. Let me contrast a view of Holborn looking eastward, where we have a jumble of unrelated buildings and the minimum of unity, and where the curve of the street in the distance is marked by no feature of sufficient scale or interest to dominate the picture, with the Karolinen Strasse in Augsburg, where with much true variety of treatment in the buildings, a very much greater unity of effect is attained and where the Perlach Tower, and the Rathhaus beyond form a dominating feature just at the right point in the view.

I think we may say then that there is ample place in our town plans both for curved and straight streets, but their use should be governed by some definite purpose, and some definite effect in each should be aimed at so that we may neither carelessly continue our straight lines regardless of contours, nor

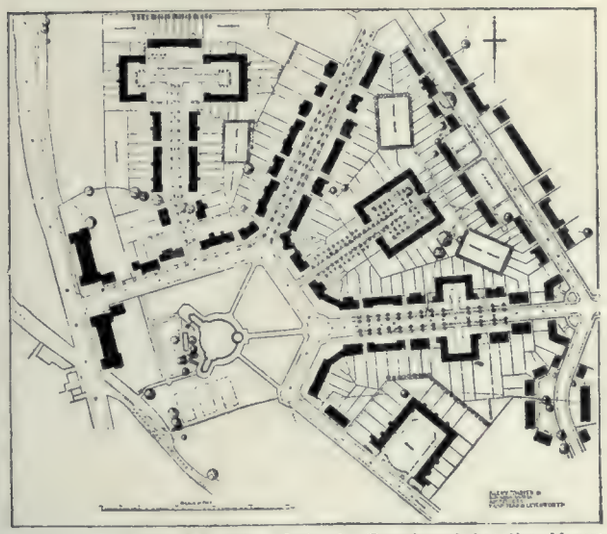


Hampstead Garden Suburb. Central Place.

imagine that we shall get a good effect by adopting aimless wiggles, merely for the purpose of avoiding straightness.

In the actual planning of our roads and streets, we cannot think only of the architectural effect to be produced. Rather, we must first think of the utilitarian purpose that the street has to serve, and find in each case such a treatment as will within the prescribed limits afford an opportunity for beautiful architectural expression of these particular requirements. While working on paper, we must always be thinking in the solid, for it is the massing and grouping of the buildings which we see and which affect our picture much more than the actual street lines; and it may often be possible to adopt quite independent lines for the buildings from those which are necessary for the road lines of the street. So important is it to consider the grouping of the buildings that after having determined in a general way the directions which roads must take to provide the necessary facilities for traffic, and to satisfy the engineering requirements, it will usually be found helpful to block out the design in buildings rather than in road lines; because within the very often fairly wide limits which would satisfy the practical requirements, the exact form may be determined wholly on architectural grounds. On residential roads much greater freedom of treatment is possible than in those solidly built up, and particularly those devoted to shop-

ping and other business purposes, and in residential roads we encounter new difficulties, partly owing to the great width between the buildings, and partly owing to the



Part of Hampstead Garden Suburb, Developed by the Hampstead Tenants, Limited, and Laid Out for Cottages.

tendency to employ detached or semi-detached units, each different from the others, producing a generally scattered effect in the areas devoted to larger houses, and to the equally monotonous plan of building long rows of smaller houses, all alike, and all alike uninteresting, in the streets devoted to smaller dwellings.

Under the new Town Planning Act, it is in the ever-growing residential areas around our towns that the chief opportunity will be afforded. Centres of considerable magnitude and having buildings of fair importance will need to be provided, where whole new suburbs are growing up on the outskirts of towns; and to these the principles which we have been gleaning from the examples of different styles and periods will be as applicable as they are to those central portions of towns which are not affected by the new Act. But in all streets alike, whether residential or otherwise, we need to consider the total effect first, and the individual buildings as units contributing to that total effect. Much may be done by the careful designing of the building line to give to each street some definite character and unity, and this may be further emphasized by the adoption of definite building materials for definite streets or areas, a common roofing material being of itself enough to give a considerable degree of

Hampstead Way. Some of the First Houses Built on the Estate of the Hampstead Tenants, Limited.

unity to a district. In the planting of streets also additional emphasis can be laid on the particular treatment adopted.

The tendency, which is becoming so marked, for areas to be developed by enlightened Garden Suburb Trusts or by Co-partnership Societies, will afford opportunity for a greater degree of grouping of buildings. In streets of cottages and small villas one of the difficulties arises from the fact that the unit is so small and becomes so wearisome owing to the degree of repetition. A great improvement can be made where instead of rows of houses all alike, a number can be designed as a definite group, and this may be carried further, and three or more of such groups may be designed so that they form together a still larger group. Thus, it becomes possible within limits easily practicable to create units in the street of sufficient size and importance to dominate the picture, although, still composed of individual cottages each complete in itself, and with comparatively little variation in the plan and general arrangement. Such a larger group of three small groups of cottages built at Letchworth is here illustrated.

With what a sense of pleasure and relief anyone wandering among the dreary ugliness that abounds in the neighborhood of Southwark street, comes suddenly upon the little group of almhouses at the corner of Holland street. These are as simple almost as the cheapest rows of cottages built, as they are of London stocks, relieved only by coigns; but it is the grouping of these almhouses around the simple grass court which takes approximately a cruciform shape that is so pleasing and affords such a contrast to the surrounding rows. Surely we may from such groups of tenements as these derive much suggestion for the treatment of residential buildings and roads. In these days, when the main thoroughfares are rendered

Top of Asmun's Place, Hampstead Garden Suburb, with Children's Playground in Foreground.

dusty, noisy, and smelly by much motor traffic, it is eminently desirable that houses should be built just off the main street, and deriving inspiration from our college quadrangles, the groups of almhouses, or the closes of our cathedral cities we may, I think, add greatly to the pleasure of life in our suburbs and to the interest of our suburban roads.

A few photographs and plans illustrating the attempts that are being made at the Hampstead Garden Suburb, to work out a few of the problems connected with the grouping of buildings, the treatment of street junctions and corners, and the development of pictures in straight streets may be of interest, and will serve also, I think, to illustrate the way in which it has been found practicable there, mainly by means of suggestion, with here and there, of course, some necessary insistence, to secure a high degree of co-operation among many architects, all thinking first of the total effect, and of their own individual buildings as forming part of that total.

I want to suggest to you that fine city building which is after all the end and aim of the art of town planning is essentially a co-operative art, and indeed, I believe, the art of architecture itself is very much more a co-operative art than many people seem to think. It is more and more necessary to bring to bear upon even our individual build-

ings types of skill and ability seldom all united in one man, and our offices are really much in the nature of guilds turning out work which is the result of a high degree of co-operation between the principal and the assistants working with him. In the same manner, fine city building can only result from a high degree of co-operation between all the architects working on the individual buildings. Something may be done on limited areas and on private estates, as at Bedford Park or Hampstead, for example, to produce unity of effect by bringing all the buildings under the controlling influence of the ideas of one man, whose attention is centred on the whole effect, rather than on the individual buildings. but these are, after all, makeshift methods. Art is not a thing easily to be controlled, and unity of effect in a whole town can only be expected when the whole of its architects are joined together by some common aim, some common appreciation of the whole effect which is being worked up to. This may seem much to expect from the present chaotic and individualistic condition of the architectural profession; but I cannot help hoping that the opportunities afforded almost for the first time in this country by the Town Planning Act, enabling us to consider as a whole, and to guide and to control the development of our towns along definite and well thought out lines planned with the due consideration for architectural effect, will so stimulate in all of us an enthusiasm for the beauty of the whole, that it will become as natural to think first of the whole, and to see our buildings in the true perspective as parts of a great street picture, as it has been natural under the conditions which have held sway in this country for so many years, for our attention to be concentrated exclusively on our own work. This is the right, the ideal form of compulsion, the compulsion exercised upon each one of us by our zeal for some ideal which shall be shared by the whole guild of architects. We should do all that is possible in our own practice, and in the education of those who are coming forward to help us and take our places in due course, to foster this spirit, because it is only by the development of this compulsion from within that we shall be able to justify ourselves in resisting some form of compulsion from without.

Did time allow, I might suggest many other ways in which town planning is a co-operative art; notably, we shall need the help of the engineer, the surveyor, and even of the sociologist and archæologist, if we are to guide the development of our towns into lines which shall at once carry on their best traditions, maintain that unique character which gives to each its individuality, and provide adequately, for all the needs of a healthy and wholesome city life. If our type of training is worth anything, it should particularly fit the architect to absorb all that is beautiful and valuable in the past, and deriving from it inspiration, to develop by the exercise of a trained imagination town extensions, which shall harmonize alike with past beauty and present needs. I have taken many of my illustrations from foreign towns, because I am anxious that we should learn from many sources, but may I remind you with the last slide, that we have in this country still left unspoilt some of the most beautiful dwelling places to be found anywhere, where the work of man, and the beauty of nature is wonderfully harmonized; that we have, indeed, rich tradition upon which to build.

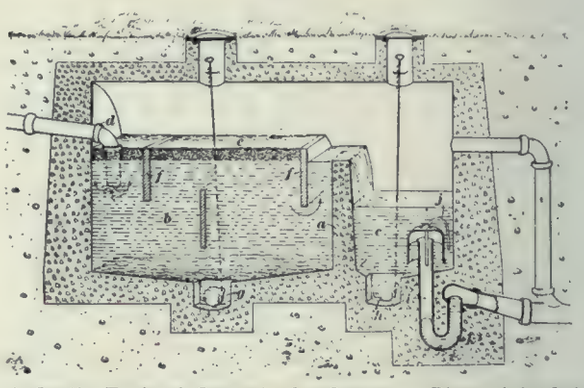
A SEPTIC TANK FOR A COUNTRY RESIDENCE.—A Practical, Sanitary Method for the Disposal of Sewage.—By J. J. Cosgrove. ∴ ∴

NO GREATER DIFFICULTY more frequently confronts the architect in planning suburban and country homes than that of sewage disposal. When no regular system is installed this problem is of special importance, and it is imperative that the greatest attention should be paid to it.

The following type of septic tank is one of the most simple as well as efficient that can be used for this work. The walls and floor of the tank should be constructed of a dense concrete, that is to say that proper care be taken in choosing the proper aggregates and mixture.

In the sketch *a*, is a wall which divides the tank into two compartments, of which *b* is the tank proper; *c* represents the collecting and discharge chamber; *d* is the point from which the sewage enters the tank. It will be noticed that this discharge pipe turns down and is submerged, which is to prevent the sewage from disturbing the scum upon the surface represented by letter *e*. One of the baffle boards, *f*, deflects the flow of sewage towards the bottom of the tank, while the other, which extends down about three feet below the surface of the liquid, prevents the surface scum from being washed over with the effluent and insures the discharge from the tank being taken from near the centre level, where the sewage is most clear. When baffle boards are used they should be spaced about ten feet apart. The board nearest the inlet should project a few inches above the line of flow and to within two and one-half feet of the bottom of the tank.

The middle board should be set with its upper edge some 18 inches below the surface and its lower edge some 18 inches above the bottom of the tank. The scum board near the outlet should extend a few inches above high water level, and the bottom edge should be midway



A Septic Tank of Concrete for Sewerage Disposal in Suburban or Country Districts.

between the surface of sewage and the bottom of the tank.

A valve sludge pipe, *g*, provides the means for draining off sludge from the tank without putting the tank out of service. It will be observed that the floor of the tank slopes towards this outlet. When the effluent is discharged into a stream, the tank *c* may be omitted. When the effluent is treated by filtration, as effluents should invariably be, the dosing chamber *c* should be so proportioned to the filter beds that one dose will properly flood the filter area. The floor of the dosing chamber is made sloping towards the centre, where is located the valved outlet, *h*, which should be cross-connected to the discharge to the filter beds, and to a sewer outfall, so that the effluent can be discharged direct at the place of disposal, or supplied continuously to the filter beds during repairs to the automatic siphon. The wall which separates the dosing chamber and the septic compartments should be made sufficiently strong to hold back the liquid in the septic tank and to withstand the varying strains caused by slowly filling and quickly emptying the dosing compartment.

The siphon apparatus shown operates as follows: When sewage overflows the wall, *a*, into the dosing chamber, it rises in the bell of the siphon and overflows into the trap, which it seals, thus confining the air in the space, *i*, which forms the long leg, thus forcing the water down on one side and up on the other, as shown in the illustration until the compressed air in *i* is just about to escape under the bend that forms the dip of the trap. Any further flow of liquid into the dosing chamber will then increase

the pressure in *i* so that the confined air can escape from the trap, carrying with it some of the water; as the air escapes from *i* the space fills with water from the dosing chamber, thus filling the long leg of the siphon, which at once is thrown into operation and aspirates the contents from the dosing chamber. When the effluent in the dosing chamber is lowered to the level of the mouth of the air pipe, *j*, the siphonage is slowly broken by the admission of air through the pipe. Besides serving as a vent to break the siphon, *j*, permits the air to escape from the space, *i*, when the sewage is flowing in to fill the dip of the trap. The depth of liquid in the dosing chamber, that will cause the automatic siphon to discharge, depends on and can be gauged by the depth of water in the short leg, *k*, of the trap. An overflow pipe is provided to carry off the effluent in case that the siphon becomes obstructed. This overflow pipe serves also as a vent pipe through which air can circulate from the outlets at the filter beds or other place of disposal up to and through the perforated covers of the manholes.

STUCCO HOUSES.—By A. G. Cutting

IT IS A VERY commendable fact that rapid advancement has been made by all connected with building operations toward better and improved constructions, but even now there are details of certain types of residences that are not given the attention they demand. We refer to the stucco house. A number of years ago stucco was quite generally used in certain localities, but owing to failures of the material to withstand the action of the elements and through other causes, this type of construction was almost entirely abandoned. During the last few years, however, there has been a very marked tendency by the building public to take up this class of construction again. Therefore, this word of caution.

Architects are very partial to stucco exterior, and if it is properly mixed and applied, will come up to their expectations in every way. So much depends on the selection of the material, proper mixing and proper application, that only skilled mechanics who are familiar with this class of work should be employed.

We have had opportunities to inspect some stucco residences in the past few years, and have found that many of them are unsightly, due to cracks, discolorations caused by improper application, and lack of proper ingredients, etc.

There was one residence in particular where there were a great many horizontal cracks in the stucco running almost the entire length of one side of the building. These cracks were about two feet apart and were very pronounced. The whole area of sides and ends was very unsightly. After a very careful investigation it was found that in nearly every instance where cracks had developed, they were at a point where the wire lath was lapped, and in many places less than ¼-in. thickness of stucco was over these laps. In some instances, by cutting out the cracks, it was found that the metal lath was not even tacked solidly in place, and yet the stucco work in general was condemned by a number of parties on the results obtained on this one building. It was quite apparent that the trouble was not due to any fault of the material, but in this particular instance was due entirely to the application of the wire lath and stucco. In addition to the large cracks at the laps of the wire lath, there were a number of hair cracks throughout the entire area, which apparently were caused by too much trowelling of the concrete mass, and as was found by investigation there was a coating or frosting of Portland cement on some of the areas, and the cracks penetrated just through this frosting. Other areas were entirely smooth and cracks had not developed.

In another case regular lime mortar plaster without any Portland cement was used for the scratch coat. The second and finishing coat consisted of a poor mixture of Portland cement and sand. The finish coat was only about ¼-in. thick. Moisture penetrated through the finish coat, and the mortar composing the scratch coat being subjected to continued moisture disintegrated, and the stucco came off in sheets.

The third case was very similar to the second, although wood lath was used instead of wire lath on a small building near the shore. The scratch coat material consisted of regular interior plaster, and the second coat consisted of Portland cement, asbestos rock and asbestos fibre. The second coat was very thin and the damp salt air and moisture penetrated through to the first coat. The lath became swelled and the stucco came off in sheets. The stucco on this work was condemned and was laid at the door of the asbestos and Portland cement. Upon investigating the matter thoroughly, it was readily proven that the entire trouble was due to the nature of the lath and the materials entering into the first coat.

In the past stucco has been applied in two coats, the total thickness being about ½-in. to ⅝-in. Past experience is teaching us, however, that 1-in. is by far better, and if the material is applied in this thickness, house owners and architects should not have reason to regret the use of this material.

Another point of considerable importance is the color. A uniform color is rather difficult to obtain on smooth surfaces particularly, but it can be obtained if proper attention is given to the selection and mixing of the ingredients and it is properly applied. When Portland cement and sand are used it is very essential that the sand should be absolutely free from any organic materials which have a tendency to discolor. It is also of vast importance that the ingredients be mixed very accurately and carefully and that a sufficient amount be mixed at one time to cover certain areas exposed to the same lights and shadows. For example, the work should not be left in an uncompleted condition half-way between windows or half way down the side walls, for just as certain as this is done, there will be a streak showing where the latter work was started. If it is necessary to do a certain given area at two operations, care should be used so that the materials are properly blended and the stucco floated or trowelled to correspond exactly to that already done. By using a little care on details of this kind the ultimate results will be much more satisfactory.

Portland cement and sand as a stucco mixture has been used with fair success where work has been carefully supervised, but there has been such a lack of proper attention to the mixing and application that there have been some very bad failures. The use of asbestos rock and fibre to take the place of sand is meeting with considerable success. The asbestos fibres have a tendency to hold the water, which is used to mix the concrete mass longer, thus giving the Portland cement ample opportunity to become properly set, and in this way stucco mixtures are possible that are more uniform in color and less liable to crack as the fibre also furnishes additional bond.

There is one point which is frequently lost sight of, that is, it is possible to manufacture or make concrete slabs that are free from cracks and that can be exposed to the elements for an indefinite period without discoloration. Therefore, should cracks develop in a well-constructed stucco work it can be invariably traced to settling of the building or the shrinking of the frame. By insisting upon thicker stucco walls, the liability of the stucco cracking is reduced to a minimum.

The price of lumber is readily advancing, and the desire for fireproof exteriors, especially in the suburban districts as well as artistic effects that may be obtained from stucco, are creating a universal demand for this type of construction, and while the initial cost may be slightly more, it is such a small part of the total outlay and such an important part of the structure that the best is the cheapest in the end.

MACHINERY AND TRADE

FIREPROOF ASBESTOS ROOFING

CONSTANTLY INCREASING fire losses on this continent have induced engineers interested in fire protection to seek with renewed zeal for all practical methods of lessening the danger of ignition and spread of flames. As a result of this, tile, vitrified facings, terra cotta, concrete construction, and various fireproof roofing materials have been brought forward. For factories, barns, etc., being at the mercy of burning sparks, and embers, that the roof be fireproof is of initial importance. One of the best roofing materials manufactured, is the J-M Asbestos roofing which is being extensively used on factories and large buildings. It is so fireproof that it will withstand the flame of a blow torch for an hour, without injury in any way. This roofing is manufactured from the two minerals, Asbestos and Asphalt. The two general characteristics of asbestos are its fibrous structure and in its incombustibility. It is found generally in association with a form of rock called serpentine, which is blasted, and treated mechanically so as to obtain the long tough fibres of asbestos. These fibres are made into sheets like felt, and are treated by thoroughly saturating them with genuine Trinidad Lake Asphalt, well known as a most permanent water proofing material. These sheets are then firmly cemented together with this asphalt, making one homogeneous mass. This practically constitutes a compound which as to its combustibility is the same as stone, because of its all-mineral nature, but at the same time it is fairly pliant and may be cut without difficulty. It offers a building protection against fire, water, wind, and weather, as naturally it cannot rot, rust, melt, run, or crack, and it does not require painting to preserve it. J-M Asbestos roofing is manufactured by the H. W. Jones-Manville Co., of 100 William st., New York. A copy of a very handsomely illustrated catalogue describing this roofing will be mailed by the manufacturers to anyone interested.

NEW MACHINERY INSTALLED

WHILE WIRE CLOTH has the advantage over perforated metal for seiving purposes, yet in many cases the rough or uneven surface of the former has been a great disadvantage. In some cases this has been overcome to some extent by passing the cloth between heavy rolls so as to flatten the crowns of the wire. The B. Greening Wire Co., Limited, of Hamilton, manufacturers of all descriptions of wire work, some little time ago installed rolls to take care of medium weight wire screens with the expectations that the result would increase the value of their product. That the innovation was a success was quickly and satisfactorily proved by largely increased orders for that particular product. This has caused the firm to instal a set of extra large rolls to operate on heavy and extra heavy wire cloth. These rolls are without doubt the heaviest to be found in any wire cloth the completion of a wire weaving plant that is equal to that of any concern in the world. The B. Greening Wire Co., Limited, of Hamilton, would be pleased to answer plant on the continent, and the installation of them marks enquiries concerning wire cloth, wire rope, or wire work of any description.

FIREPROOF SASH

THE EFFORTS of the architect or engineer have always been directed toward designing construction to obtain the requisite strength with the minimum material. In the case of steel or iron window sash this truth is apparent. "Fenestra" steel sash are made from a special grade of steel of a very high tensile strength and at the same time of sufficient toughness to stand the fabrication necessary to allow the cross-bar and section to pass through. The fabricating required for the "Fenestra" construction removes only about 10 per cent. of the material, and that from the centre, the result being a much stronger but lighter joint. This "Fenestra" sash lends itself to any one of the many schemes of ventilation, extending from the whole window or any part thereof as is considered necessary for ventilating. The moveable part may be hinged at top or bottom, at either side or at centre pivots on the sides, and may be arranged to open inward or outward. The sash is fully completed before it leaves the factory, and is ready to be set in the masonry. With ventilated sash, the ventilators are kept in position by wooden wedges and twine. These wedges are to be left in position as long as possible, while the sash is being glazed, as they insure the maintenance of the proper position of the ventilators. "Fenestra" sash are manufactured by the Expanded Metal and Fireproofing Company of Toronto. This progressive firm has recently issued a catalogue, describing this fireproof sash, and illustrating a number of large structures throughout Canada which are equipped with "Fenestra."

WOOD PRESERVATIVES.

WHAT IS CONSIDERED to be one of the most satisfactory wood preservatives of the past and present is the production from coal-tar. An old method was to use plain coal-tar, but it was found that the pitch of the tar closed up the pores of the wood, therefore, the oil was extracted by distillation and generally used for the preservation of the lumber. At the present time some millions of gallons are used per annum on railway ties and other wood products which are constantly exposed to the weather. One of the best known preservatives, a product of coal-tar is solignum. The base used for solignum is the last oil taken from the coal-tar, which is not volatile, and this means absorption by the wood instead of by the atmosphere. The great difficulty in the use of such an oil has been to retain the valuable wood preserving qualities and get a satisfactory permanent color effect—this has been overcome by the makers of solignum, Messrs. Major & Co., Ltd., Hull, England, who guarantee their product and their permanent color effects. Mr. F. Sturgeon, the agent, 34 Yonge street, Toronto, has just returned from his Western trip and reports an enormous increase in the turnover of solignum, which offers even a larger field than the East for their product. Solignum has been used on the finest of residences and buildings throughout the civilized world, and includes among its latest and best, the library of Victoria College, one of the many fine buildings for which Messrs. Sproatt & Rolph were the architects.

DICTIONARY OF HEATING

DICTIONARY OF HEATING is the name given an attractive little booklet recently issued by the Taylor-Forbes Company, Limited, of Guelph, Ontario, manufacturers of modern heating systems. This interesting little book has been compiled with the object of presenting in a brief form a little necessary knowledge on the subject of heating. All the terms familiar to Heating Engineers and the names of the various parts of heating apparatus, are, as far as possible, arranged alphabetically. The

explanation or definition of each term is given in a concise, simple form so that it may be easily understood, and all severely technical features of the subject such as are involved in dealing with the heating values of different grades of coal and other fuel, or the extent of radiation required for given areas, are omitted. The main object of the Dictionary is to explain the economic and other advantages of Hot Water or Low Pressure Steam Heating. Under the heading of "Sprinkler Tank Heating" an illustrated explanation is given of the method used to prevent the freezing of a sprinkler system in a large building. The Taylor-Forbes Company are to be complimented on issuing a booklet of this class which does not take the form of a catalogue, but rather a reference book of handy information relative to modern heating systems.

CALCUTTA'S MAMMOTH STEEL TANK.

A DEFINITE CONCEPTION of the Calcutta's mammoth water tank, which has been briefly referred to before in these columns, may be obtained from the accompanying data regarding its construction and capacity. The foundation of this huge structure which is now nearing completion is 340 by 340 feet, and the top 321 by 321 feet. The tank is 16 feet in depth, with a capacity of nearly 10,000,000 gallons, and rests on columns grouped in fours; each group will support 800 tons, including their own weight. The columns rest on shoes set in concrete 2 feet 6 inches deep, this being the depth of the concrete floor underlying the whole—the foundation supporting the great structure upon which the tank rests.

The tank will supply 100,000,000 gallons per day, without undue loss of head in meeting any emergency demands. The average ordinary supply will be 40,000,000 gallons a day. At present Calcutta is taking about 28,000,000 gallons of filtered and 20,000,000 gallons of unfiltered water per day.

The steel used in the structure was imported from Luxemburg and England. The Luxemburg steel is composed of broad flange beams, such as not made in England, and comprises about 40 per cent. of the total material used. The small structural steel and plates comes from England. The beams were all cut to length before shipment from England, but the drilling of the rivet holes was done on the job. The plates were cut to lengths and the holes drilled in England. The average cost of the steel used in the structure was about $63.40 per ton, and the freight $4.86 per ton. The cost of the structure will be about $475.000.

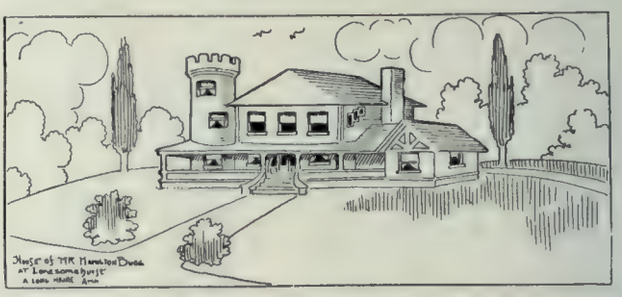
The tank is only supplementary to the waterworks, yet it will add not only to the water facilities of the city, but it will provide a pressure in case of fire that may save many times the cost of the structure.

A FEATURE OF THE DWELLING HOUSES in small Italian towns is the roof composition. The roofs are constructed of stone slabs, which seems to confer a simple beauty even on the most humble buildings. Owing to the absence of coursing, they have a curious appearance of having been thrown promiscuously on the roof, and though they lie closer than they appear to, there must be some method in the construction that the searching snows of winter may be excluded. These roofs possibly excel in texture and beauty of color, the stone roof of the Cotswolds, and to anyone looking down from the Sacro Mounte upon the huddled homes of Varallo, the little town seems clothed in mouse-colored velvet, with an occasional patch of tiling to add a splash of color.

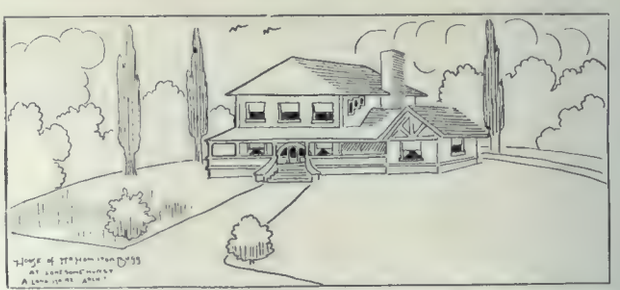
A SUCCESSFUL SOUND-PROOF WALL has just been completed in New York City. The second and third floors of one house contained noisy machinery, and the upper floors of the next house were occupied by apartments. On account of the din of the machinery the flat dwellers applied to the landlord to relive the disturbance. The wall was accordingly constructed, of hollow terra cotta fireproofing blocks, stuffed with mineral wool. The mineral wool serves in conjunction with the hollow chamber, in which it is contained, as a muffler, excluding practically all sound.

THE FOLLOWING IS A RECIPE given by a well-known authority, for preparing caustic potash lye for removing old paint from iron: Dissolve 2 pounds of potash in a bucket of water, add about 1½ pounds of slaked lime and stir it well. With a mop apply this mixture to the paint, and after a few minutes it may be easily removed by scraping. As rapidly as the old paint is scraped off rinse the iron with fresh water and dry it. This will leave the iron clean and bright.

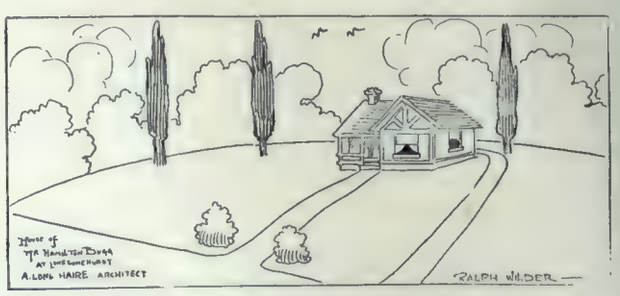
MR. BUGG'S TASTE IN ARCHITECTURE AND HIS POCKET BOOK GET TOGETHER.



March 1, 1910. Mr. Long Haire, Archt., Dear Sir,—Drawing received. It is exactly what I want, but the price is a little too much. We could get along without the tower. How would it look then? Yours, Hamilton Bugg.



May 10, 1910. Dear Haire,—I note what you say about high prices; but we must have a house. How much would it cost if the left end was left off? Yours, Ham. Bugg.



July 9, 1910. Dear Haire,—My wife thinks this is "just too cute"! As our lot is only 20 feet wide, perhaps it will be better to have a small house, so let's go ahead. Would it cost much more to have another tree? Yours, Ham.

—American Carpenter and Builder.

CONSTRUCTION

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Annual Exhibition of Architectural Drawings

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Saturday Night Building

TORONTO - - - - - CANADA

BRANCH OFFICES

MONTREAL—Board of Trade Building, LONDON, ENG.—Byron House, 85 Fleet St. E.C.

"YOU WILL BE ASKED TO CONSIDER the employment by Canadian capital of architects practising in the United States, who have no other interests here than the commission which they derive from their plans. The work of the skilful gentlemen may have assisted the architects of Canada, but we feel that the time has arrived when Canadian architects can do the work. The only evident manner in which this object can be attained is through placing a heavy import duty on the services of foreign architects. With us this is purely a matter of self-protection. We are always ready to meet and welcome visiting architects, but I think that it should be the object of this institution to protect its members as other bodies protect theirs."—*President F. S. Baker at R.A.I.C. Assembly at Winnipeg.*

In view of the wave of opposition sweeping over the country, against the incursion of foreign architects it appears timely that we should point out that CONSTRUCTION *since its first issue has consistently contended for the protection of the profession against the employment of foreign architects. The following excerpts from the editorial columns of July,* 1908, CONSTRUCTION, *should prove interesting at this time.*—EDITOR.

If our buildings are built by foreign architects whose work must necessarily be influenced by the conditions prevalent in their own country, how can we ever hope to develop a Canadian architecture that will reflect our national traditions, our tastes, and our social habits and commercial pursuits? And if we are to have no architecture peculiar to us as Canadians, how can we ever boast of being a nation? A pitiable condition it would be indeed if our finer structures, in which we must necessarily take national pride, bore no mark of the handiwork of our own people, but were the product of foreign designers whose work was influenced by the traditions and conditions of the country from whence they came.

In view of these obvious facts, it is most unfortunate that many of Canada's largest institutions, in which Canadians have a right to take pride, find it necessary (so they say) to employ architects from the United States. They tell us they would prefer to give the work to a Canadian architect, but they can find none who have had sufficient experience in designing the especial type of building they desire. Even though this were true, it would be a most un-Canadian stand to take. We would ask how can we ever have architects with experience in designing large buildings if we give this work to foreign architects? We must be a nation of highly unbalanced incompetents if our business institutions find that they require structures of a type that cannot be built by Canadians. Some of our financial institutions are the worst offenders in this particular, institutions whose success depends upon the development of our country more than those in any other branch of business. They say to us, "We have been successful in handling your money to the extent that we are enabled to build a stately, dignified home for our business, a structure that will be a monument to Canadian industry and enterprise, an indication of our confidence in Canada's future. But this building is to be better than you can build." The cost of such a structure is surely a monument to Canadian enterprise and commercial development, but the building itself is nothing short of a monument to our national incapabilities and unbalanced development. . . .

The reason for the employing of American architects on Canadian buildings is simple. Owners get an exaggerated idea of the importance of their project. They assert that they will build something greater than has heretofore been attempted in Canada, and having been dazzled by the exaggerated greatness of things American, they believe that to accomplish this end they must go beyond the borders of Canada for an architect.

The United States has many highly capable architects well suited to the conditions prevalent in their own country, but they are not as well fitted to execute work especially adapted to conditions in Canada as are our own designers. If we want to develop an American architecture in Canada, we should employ American architects, but if we have sufficient national pride to desire an architecture distinctive to Canadian traditions, life and conditions, it must be developed by Canadian designers. . . . . .

When a foreign architect is employed to design a Canadian building, he is selected because of the character of the work he has executed in his native country. In the execution of this work he has used certain materials and appliances with success, and when he plans the structure and prepares his specifications, the connection formed from many years of business association with the manufacturers of these materials and appliances is bound to show its influence. We have not only employed the architect, but we have also brought with him his connection.

The New York architect does not know our contractors; he does not know our brick, our stone, our cement, our appliances or our fittings. He only knows the contractors and materials he has had long experience with in his work in New York. He does not care to know things Canadian. He is employed to erect a building Canadian designers were not equal to, and he is not inclined to investigate materials that are untried in a work of such great magnitude. . . .

The almost invariable rule is, therefore, that the American architect will use his influence with the owner in favor of the contractor he has tried and the materials he knows. Thus, while possibly the owner may have originally intended to only employ a foreign designer, he finds, when his building is finished, it is purely an American production. Almost every dollar expended in its erection has been forever lost to Canada, Canadian money, produced in Canada, by Canadians, from Canadian industry and resources. . . .

We wish to make it plain that we quite understand that we are obliged to use many foreign makes of materials in our buildings, but we have Canadian made materials and appliances that may be used to advantage if the designer knows these materials and feels favorably inclined towards them. This cannot be expected of the architects who never used our materials, and does not know them.

¶ Messrs. Carrere & Hastings reply to editorial in July CONSTRUCTION—Say that no architect of standing and good repute will approve of same—Real issue avoided.

IT WAS ONLY REASONABLE to believe that Messrs.. Carrere & Hastings, and their associate, Mr. Eustace Bird, of Toronto, would bitterly resent the criticism of the latter's published statements relative to the inferiority of Canadian Architects, as appeared in an editorial in July CONSTRUCTION.

It is only human that they should undertake to show that a wrong interpretation had been placed upon Mr. Bird's public statement, and, it is quite within the usual order of events that they should endeavor to undo the evil perpetrated by an unfortunate press interview that never was, and even now, has not been withdrawn.

Thus, in accordance with that which was expected, we have received a letter—a letter addressed to the editor from Messrs. Carrere & Hastings, which reads as follows:

Sir,—Our attention has just been called to the editorial in the July number of Construction referring to an interview with Mr. Bird which appeared in the Toronto Daily Star.

Without any desire to reply to your editorial, or to enter into a controversy, we write to protest against this gratuitous, unfair and unseemly attack upon us and upon our associate, Mr. Bird. Any fair-minded person who reads the interview, and reads the editorial, must see that you have perverted the facts, misquoted Mr. Bird—or rather attributed to him statements which he did not make, though they form part of the article; that you have given to what he did say an entirely different meaning from what it is evident that he intended. We cannot believe that any architect of standing and good repute can possibly sympathize with your motives, or with your manner of presenting your case.

There is one statement which you italicize, namely, "The plans for the Bank of Toronto were designed by Mr. Bird in his office in the Traders Bank building, and were examined and approved by Carrere & Hastings," which Mr. Bird did not make, and could not have made, because it is not a statement of fact. The designs were made by us in our office in New York in collaboration with Mr. Bird, and developed into working drawings by Mr. Bird in our office in Toronto. This same statement applies to all our Canadian work. Mr. Bird is not our representative in Canada, as you state, but our full associate.

You make the statement: "Mr. Bird had evidently taken special care to inform the Star's reporter of the names of the Canadian architects and architectural firms who submitted plans with him for the structure in question that were by the way considered inferior to his."

If you will take the pains to read the report of the interview, you will find that the Star does not quote Mr. Bird as making such statement, and we are informed that he did not make any such statement.

As a matter of information, Mr. Bird (who was born in Barrie) is a Canadian. He has long been associated with us in our office in New York, and his ability induced us to send him to Canada when we were urged to open an office in your city.

Our first Canadian commission came to us unsolicited. It may surprise you to know that we were urged, not only by our clients, but by some of our fellow Canadian architects, to open an office in Canada, and we are not conscious of anything that has happened in the course of our practice to justify the attack which you have made upon Mr. Bird and ourselves, and which we must resent.

As a further item of information it is proper for us to state that the commission to design the Bank of Toronto was given to us more than a year ago; that we have been studying this problem with great care and deliberation ever since. The bank in its wisdom thought best to consult other architects. Recognizing their right to do so and to dismiss us upon compensating us for services already rendered, we could offer no objection to the course which they were pursuing, and did nothing to influence them in their decision.

We have endeavored to be absolutely fair, and have a right to expect the same treatment for Mr. Bird and ourselves.

Yours very truly, CARRERE & HASTINGS.

IVAN S. MACDONALD, ESQ.,
Editor and Manager of Construction,
Toronto, Canada.

It will be noted that the above letter is a criticism of the editorial policy of CONSTRUCTION, and our "method of presenting our case rather than an explanation of Mr. Bird's rash, unethical act. Why did Mr. Bird not come forth with some defence on his own behalf? Why does he not tender the profession and the Canadian public some explanation for such unwarranted and unprofessional behavior? But, he is silent, and Messrs. Carrere & Hastings deprecate, not the action of their Associate, but the "perverted" policy of CONSTRUCTION.

If our correspondents will read, carefully, the editorial in question they will note that their Associate was not misquoted but that the statements attributed to him were only those that so appeared in the article in question as published in the public press. If the reporter of this paper misquoted Mr. Bird, he should have seen to it that the remarks accredited to him were corrected. In his not having done so we have every reason to believe that the interview was not only correct, but, that its publication was quite in accordance with his wishes.

With regard to the remarks of the reporter in connection with the interview, both as to whom the other competing architects were and as to where the plans were actually drawn, we would say that it is most unusual for a newspaper man to, unnecessarily, go to more than one source for information, in the preparation of an item of this character. Mr. Bird was in possession of all the necessary information—he was the man being interviewed. Why, therefore, should he not be the man who answered all the queries of the interviewer? More than this, we say again, if Mr. Bird resented the unethical manner in which his interview was handled—if the statements made in the article in question were not correct why did it not protest and have them rectified?

The fact that Mr. Bird is a Canadian augurs for nothing except that it should cause the profession in Canada to further resent the statements made by him. There might have been a greater excuse for a man who came from New York or Europe *from whence we must get our architectural inspiration.*

Our correspondent further states that "no architect of standing and good repute can possibly agree with our motives." So remember! Canadian architects, that if you resent the inference that you are untrained because you live in a country where architecture is undeveloped—if you do not agree that it is only reasonable that large Canadian corporations should go to New York for architects to design their buildings—if you agree with the re-

sentful spirit of an article that undertakes to protect the profession against the insidious attacks of a representative of a foreign architectural firm, then, mark you! because of these things you are not an architect of "standing and good repute."

It must be remembered that we have no quarrel with American architects who come to Canada to secure work, so long as they conduct their practice and themselves in a manner compatible with professional decency. But, we have a right to resent the incursion of foreign architects who undertake, either themselves or through their Associates or representatives, to enhance their own reputations by casting aspersions upon the profession in Canada. We do not blame American architects for attempting to secure work in Canada, but, we do maintain that it is not right that Canadian corporations, whose very existence depends up on the wealth and prosperity of the country, should employ them.

And last, but not least, our correspondents inform us that they were employed by the Bank of Toronto to design its proposed new building more than a year ago and that they had been studying the problem "with great care and deliberation ever since." We further learn that the Bank saw fit to dismiss them and consult other architects. These other architects, we are told, were given two months to study the problem and get in their plans as against "a year of great care and deliberation." We do not dwell upon this matter with any idea of belittling the work of our correspondents but simply to demonstrate that the Canadian competing architects were working at an extremely great disadvantage.

¶ Allegheny County Court House competition limited to resident architects—A spirit of local pride displayed that we in Canada as a nation do not possess.

AN ARCHITECTURAL COMPETITION is being conducted by Allegheny County, Pa., for a new County Court Building to be erected at Pittsburg. The structure will not only be the largest and most important building in Pittsburg, but it is proposed to erect one of the finest public buildings in Pennsylvania.

If a competition were being conducted for a structure of like proportions to be erected in one of our Canadian cities by some of our larger corporations, they would feel it incumbent upon them, in justice to their stockholders, to call in New York or Boston architects to submit designs, but strange to say, Pittsburg, a United States city, finds it quite possible to get along without the services of the architects from these important art centres. They have not found it necessary to even admit designs from Philadelphia, a city of the same State. In fact, the competition has been limited to fifteen architects and architectural firms that are residents of Allepheny County.

The report made to the county commissioners and signed by Architects Cass Gilbert and J. Monroe Hewlett, of New York, and County Engineer J. G. Chalfant, states that the names were selected from among the architects of Allegheny County, "who, by past experience and training, appear to have demonstrated their special fitness for architectural work of this character."

In addition to the award of the commission for the erection of the building, there will be a number of awards of money prizes. The first prize, of course, will be the erection of the building; the second prize will consist of $1,000; a third prize $750, and several fourth prizes of $500 each, the number to be determined later.

Allegheny County displays a pride, a spirit, an independence as a small community in a local way that we in Canada, as a nation, do not possess.

Here is a county that, even in so great an undertaking, forbids the incursion of architects from other cities in its own State, let alone those from cities in other States in the same country, while we in Canada tolerate, yes, invite, encourage, architects of a foreign country to design and construct our larger and more important structures. Large architectural firms in the United States find less opposition in securing work in Canada than in cities outside of their own State. The reason for this deplorable condition is not to be found in the fact that we have not capable architects of our own, but because we have no national backbone.

If owners in American cities find it expedient to refuse to employ architects outside of their own county, what chance would an architect as a resident of Canada (be he ever so capable) have of securing a commission anywhere in the United States? The answer appears quite clear.

¶ A review of the operations of the cement interests for the past year—The Cement Merger—Its promises—Its policy and its effect upon the industry. . . .

WHEN THE CEMENT MERGER was formed on the 20th of August of last year, the news was received by consumers and independent manufacturers alike with some misgivings. The consumer thought he foresaw, the successful establishment of a great monopoly that would sooner or later raise the price of portland cement (a commodity that is to-day regarded as the "staff of life" in constructional development) to an exorbitant degree, and thus seriously hamper the work of improvement and development, upon which our industrial success as a young nation depends so much. When confronted with the argument that the importation of foreign cement would solve the difficulty, should prices of Canadian-made cement soar too high, it was even whispered that the merger would be strong enough to railroad through Ottawa an increased import duty on the materials and thus make impossible foreign competition.

Some of the cement manufacturers whose plants were not included in those that formed the merger, thought they saw in the hazy distance a "Standard Oil Octopus" in the cement industry in Canada and that trust methods would be employed to whip them into submission or crush them out of existence, one after the other, until every tentacle of the giant monster had drawn firmly into its grasp its quota of the spoils. The incorporators, on the other hand, declared emphatically, that there was absolutely no ground for any such alarm, but that the merger had been formed only for the purpose of affecting economies in management, manufacture, sales and freights, together with the object of increasing the consumption of cement through a systematic educational campaign, as to where, how and when, cement may be profitably used. In addition to this, the merger frankly declared, that it proposed to bring to an end the ruinous competition, that up to the time of its birth, was eating the very vitals out of the industry. The merger, in this manner, committed itself to a constructive policy and disclaimed any intention to adopt any method or undertake any procedure that would demoralize the market either from the standpoint of the consumer or the independent manufacturer.

One year has passed, and it is gratifying to note that the merger has made good its promises and kept faith with both consumer and independent manufacturer alike.

The consumer will get his cement for 1910 at an average price of $1.25 per barrel at the mill—a price lower than has heretofore prevailed in Canada, with the exception of the short interval during 1909, when cement was being sold below actual cost of production, a condition that could not continue for any length of time.

The following average price per bbl., for cement during the past five years, according to the report issued by the Department of Mines, is interesting: 1904, $1.41; 1905, $1.42; 1906, $1.49; 1907, $1.55; 1908, $1.39; 1909, $1.32. Thus it may be seen that the present conditions under which cement is sold in Canada, have by no means

abnormally raised prices. It is argued that cement is sold cheaper in the United States, and while this is true, to some extent, it must be remembered that the cost of manufacture is considerably less across the border. This is due to the fact that coal is such an important factor in the manufacture of cement and the United States mills are advantageously situated in close proximity to the great American coal fields, thus materially reducing the cost of one of the largest items of expense in the manufacture of cement.

The independent mills very wisely came to an understanding whereby they jointly appointed a sales agent, who has so thoroughly organized his sales and delivery systems that cement may be delivered to any point, from the closest mill, in accordance with the natural laws of commerce, thus eliminating unnecessary long hauls, and thereby bringing the cost of delivery to a minimum.

Both the merger and the independent companies (through their sales-agent) have launched out into great educational campaigns with the purpose of increasing the consumption of cement by the farming community and the lay public, thus demonstrating that both branches of the industry are proceeding to increase their outputs rather than abnormally raise prices.

The conditions under which cement is sold in Canada to-day, may be termed most favorable. Because of the stability of prices, the architect and engineer are safe in making their estimates, the contractor is safe in making his tender, the dealer is protected in his purchases and the consumer is given a standard product at a reasonably fair cost, plus a minimum freight rate, made possible through following the natural laws of commerce. The general public is being served through the, undoubted, future increase in the adoption of cement as a structural element in the place of inflammable and unstable materials, promoted through the systematic campaigns of instruction now being carried on by both sections of the industry.

As long as the cement interests continue to develop the industry along these lines, as long as their policy continues to be constructive, they are deserving of the good will and support of the Canadian building public. But should they ever become over-confident of their entrenchments and undertake a policy of coercion, they will have dropped the bone for the shadow.

Constructional development and improvement is and will continue to be in Canada for some years hence, one of the greatest factors in our growth. Cement has become as indispensable in structural work of every character and type, as are the hands of the laborer who does the work and an ambitious country will never tolerate a monopoly in a material so universally used in both public work and private enterprise.

¶ Action of U.S. Congress in the appointment of Commission of Fine Arts contrasted with the policy of Canadian Government in the erection of buildings at Ottawa. . . .

WHILE THE CANADIAN GOVERNMENT is preparing to erect a Four Million Dollar Departmental Building at Ottawa after plans prepared by the underpaid, inefficient staff of the Government Architect, we learn that the United States Congress has enacted a bill creating a Commission of Fine Arts to pass upon the location, plans, etc., for all future buildings, monuments and the like in the District of Columbia. It seems ludicrous that deputations representing the architectural profession in Canada should be obliged to go to Ottawa to plead with the Government to deter from adopting plans for so important a national work, that on the face of them must appear faulty in every important particular, to every citizen of good taste—plans prepared by an inferior staff under the most adverse conditions.

It would seem that the Minister of Public Works, even though he may have a perverted taste in architectural design, would find in the Art Museum bungle enough evidence of the inefficiency of the Government Architect's staff, as far as work of such magnitude is concerned, to cause him to realize that it is at least of as great importance to employ the best architectural brains in Canada for large Government buildings as it is in the case of private and commercial work. Surely there is no more important architectural work in Canada than our National buildings at our official home. We say it is extrordinary that the architectural profession should be obliged to plead with the Government to pursue the course which is so obviously the only right and safe one—the course which, if conscientiously and earnestly pursued, would bring honor and credit to the Government, approbation and distinction to the Minister of Public Works, and contribute to the beauty of our National House, of which Canadians should be enabled to be justly proud.

Without going into the details of the architectural bastardy in the exterior design of the Art Museum recently completed in Ottawa, and of which the Government Architect was the author, it is sufficient to note that the monstrosity, is structurally defective—that great cracks have developed in its walls and that the building is in such a precarious condition as to give even its designers no little concern.

We learn that the massive, meaningless, gingerbread tower is settling on its foundation, and that the cracks recently developed show a tendency of the whole mass to fall out, away from the structure proper. But this is not enough; the Government proposes to give us another one of these architecturally, indecent and structurally defective masses of cemented building materials designed by the same man—designed after the same style, only this one is to be larger, higher and more costly.

It would seem in the face of all these things, that if Mr. Pugsley were to act, in this matter, with only our national welfare, pride and honor in view, he would find it high time to change his course of procedure.

In direct contrast to this attitude assumed by the Minister of Public Works, is the action taken by the United States Congress. The United States Government buildings at Washington have all been designed by America's most prominent architects, and they all bear evidence of having been the product of the brains of thoroughly trained men. But even this is not sufficient. The United States is not satisfied to entrust anyone of their future national structures to the judgment of even the best individual architects in the country. They have decided that in work of such national importance it is well to have the collaboration of the combined brains of the best architects in the United States. Just note the personnel of this Commission of Fine Arts.

Mr. Daniel H. Burnham, of Chicago, the eminent architect, who prepared plans some years ago for the beautification of Washington, is named as chairman. The other members are Messrs. Thomas Hastings and Cass Gilbert, of New York, two of the most rarely gifted of American architects; Messrs. Daniel C. French and Frank D. Millett, of New York, each standing respectively in the front rank of American sculptors and painters; Mr. Frederick Law Olmstead, Jr., of Boston, landscape architect and worthy son of a famous sire, and Mr Charles Moore, of Detroit. These men have practical business sense as well as the truest artisitc instincts, and they will do much toward making Washington one of the finest capital cities in the world.

Commenting upon the appointment of the Commission, STONE says: "It is high time that there should be some regulation of art and architecture in the National City of the country. Most of the great public edifices are dignified and worthy of the Nation, and there are many striking public memorials. But there are also statues that would disgrace any art-loving city. It may be impossible, owing to sentimental reasons, to displace these, but the new Commission may prevent the erection of similar atrocities to keep them company. It is a pity that there was not

suitable supervision from the start of the Hall of Statuary. The idea that underles this gallery of heroes of the various States of the Union is admirable, and most of the individual statues are good enough in themselves. All that was needed to make this a display of which the country might be proud, despite the varying merits of conception and workmanship, was such general supervision as would bring the statues in harmony one with the other. The public will welcome the Art Commission, especially as President Taft has risen to the full level of the occasion in naming the first incumbents."

Canadians have just as strong an appreciation for the æsthetic in architecture as have the citizens of the neighboring Republic, and the Canadian Government in refusing to provide means whereby the proposed addition to our national group at Ottawa will be such as we can take a justifiable pride in, is not by any means carrying out the will of the people.

Washington appoints a Commission of the most eminent architects and artists in the country to pass upon the designs of all its national structures, and Ottawa delegates an underpaid, overworked, official of mediocre ability with an inefficient staff to act as their architectural advisor and designer and constructor of our national buildings. It is time that Mr. Pugsley woke up to the realization of the importance of the responsibilities of his office. It is not too late, as yet, for him to change his proposed course.

¶ July building operations show big gain—Month records an average increase of 47 per cent.—Indications point to a heavy volume of fall work. . . . .

CONTRARY TO THE SOMEWHAT QUIET ORDER of things which usually prevails in the mid-summer season, building operations in July showed a strong and substantial forward trend. An average gain of 47 per cent., as based on comparative figures supplied CONSTRUCTION from centres in practically every section of the Dominion, bespeak for the month a growth and progress which stand out far ahead of even the highly satisfactory records made in the same period during the past few years. The force of activity for this season of the year is more significant than would appear on the surface, particularly so in view of the heavy operations of the preceding months, in that it is a pretty good sign of an uninterrupted continuance of the present prosperous condition as well as an indication of a volume of fall work greater than has ever been carried out at any previous time.

Montreal's tremendous total in itself reflects a development in new buildings and structural improvements that augurs mightily for the expanding industrial and commercial strength of the country, and would be a big credit to even a more thickly populated and equally as prosperous a centre. Her aggregate value for permits issued amounting to $3,206,708 and equivalent to an increase of 470 per cent., gives the metropolis priority for the month over all other cities in the Dominion in volume of work undertaken together with the second highest standing as regards percentage gain. From Montreal east the returns to hand show no break in the situation, and the assumption is, in view of the universal activity manifest in the more important Maritime cities, that the intermediate points experienced their full quota of the month's work. Halifax and St. John reversed the less favorable order of the preceding month by noting increases of 33 per cent. and 183 per cent. respectively, while Sydney adds to her prestige by again annexing a gain of 154 per cent.

Ontario, however, was less assertive, although Toronto in a total of $1,953,285, representing a 5 per cent. gain, registers the second highest amount recorded. A retrograde condition, as far as comparative figures indicate, is noted in this province in five instances, viz.: Fort William, 16 per cent.; London, 48 per cent.; Ottawa, 73; Berlin, 20 per cent.; and Peterboro, 28 per cent. In most of these cases, however, the decrease denotes no serious decline as far as actual investment is concerned. On the other hand, Port Arthur turns to good account with an increase of 51 per cent.; Hamilton advances 30 per cent.; and Brantford and Windsor annex gains of 12 per cent. in either case.

In the West, the progress of the immediate past give but little indication of diminishing. Winnipeg notes an aggregate total of $1,044,800 and a gain of 8 per cent.; while Regina phenominal uplift of 490 per cent. is the biggest increase noted for the month. Saskatoon and Calgary are also on the safe side of the ledger with an advance of 187 per cent. and 185 per cent., respectively; as is likewise Brandon, which has to her credit an increase of 46 per cent. over the corresponding period in 1909. Victoria and Lethbridge, however, fail to equal their last year's amount for the month, the loss in order named being 40 and 30 per cent.; although the falling off in the latter case can be ascribed to the fact that in July, 1909, the permits included an item of $50,000 for the erection of a municipal power plant. The outlook in both of these places, as in all western cities, is encouraging. Calgary reports a heavy volume of warehouse and business property scheduled for this Fall, while Vancouver expects August to establish a record month.

	Permits for July, 1910.	Permits for July, 1909.	Inc. per cent.	Dec. per cent.
Berlin, Ont.	$ 19,800	$ 27,200	....	27.20
Brandon, Man.	29,960	20,480	46.28	....
Brantford, Ont.	61,825	54,877	12.60	....
Calgary, Alta.	520,098	182,280	185.32	....
Fort William, Ont.	156,200	186,235	....	16.12
Halifax, N.S.	65,150	48,635	33.95	....
Hamilton, Ont.	268,500	205,475	30.67	....
Lethbridge, Alta.	84,520	121,988	....	30.70
London, Ont.	37,700	73,808	....	48.92
Montreal, Que.	3,206,708	562,156	470.43	....
Ottawa, Ont.	202,500	760,100	....	73.35
Peterboro, Ont.	30,725	43,245	....	28.94
Port Arthur, Ont.	173,375	114,260	51.73	....
Regina, Sask.	305,030	51,300	490.60	....
St. John, N.B.	77,100	27,200	183.08	....
Saskatoon, Sask.	147,275	51,315	187.00	....
Sydney, N.S.	45,169	17,750	154.47	....
Toronto, Ont.	1,953,285	1,854,105	5.34	....
Vancouver, B.C.	639,530	549,107	16.46	....
Victoria, B.C.	222,290	372,120	....	40.26
Windsor, Ont.	37,950	33,650	12.77	....
Winnipeg, Man.	1,044,800	962,300	8.52	....
	$9,319,490	$6,319,986	47.46	

OFFICERS of the Royal Architectural Institute of Canada for the ensuing year, as elected at the third annual General Assembly held at Winnipeg, are as follows: President, F. S. Baker, Toronto, (re-elected); vice-presidents, J. S. Resther, (Montreal), Edmund Burke, (Toronto), S. Frank Peters, (Winnipeg). Alcide Chausse, Montreal, and J. W. H. Watts, Ottawa, were again chosen to fill the office of honorable secretary and honorable treasurer, respectively. The meeting which was well attended, considered a large number of important subjects of interest to the profession. These subjects, together with the general business of the assembly will be dealt with more fully in the October issue of CONSTRUCTION, as will also the proceedings of the Ontario Association which convenes in Toronto during the period of the National Exhibition.

CORRECTION.

We desire to draw our readers attention to an error appearing in the August issue of CONSTRUCTION. In connection with the Confederation Life Building, used as an illustration on page 36, in the advertisement of the Standard Ideal Company, Messrs. Wickson and Gregg are accredited with the design for the splendid new addition recently erected, instead of Mr. J. Wilson Gray. We beg to take this opportunity to rectify this regretable mistake. Mr. Gray was not only the architect for the new extension, but was also the designer of the original building which is one of the oldest and most important office structures in Toronto.

THE LOAN EXHIBIT of Architectural drawings by the Ontario Association of Architects in the Applied Arts Building at the Canadian National Exhibition, will prove to be a most important factor in the promotion of a better appreciation of architectural design by the Canadian lay public. The designs exhibited as reproduced in the following pages fairly represent the development of architecture in Canada, as well as demonstrate the more recent accomplishments of Canadian architects. In their endeavor to add interest to the exhibit the Ontario Association of Architects secured the loan of a large number of drawings from some of the more prominent British architects. A large number of these are also illustrated in the following pages. Owing to the fact that some of the designs of both Canadian and British architects were not available for reproduction at the time of going to press we were unable to illustrate the complete exhibit.

Design for the Saskatchewan Parliament Buildings at Regina. Design for Proposed Justice Building, Ottawa. Design for Nurses' Home, Royal Victoria Hospital, Montreal. All by Messrs. E. & W. S. Haxwell, Montreal.

Competitive Design for Proposed Departmental and Justice Building, Ottawa, by Geo. W. Gouinlock, Toronto.

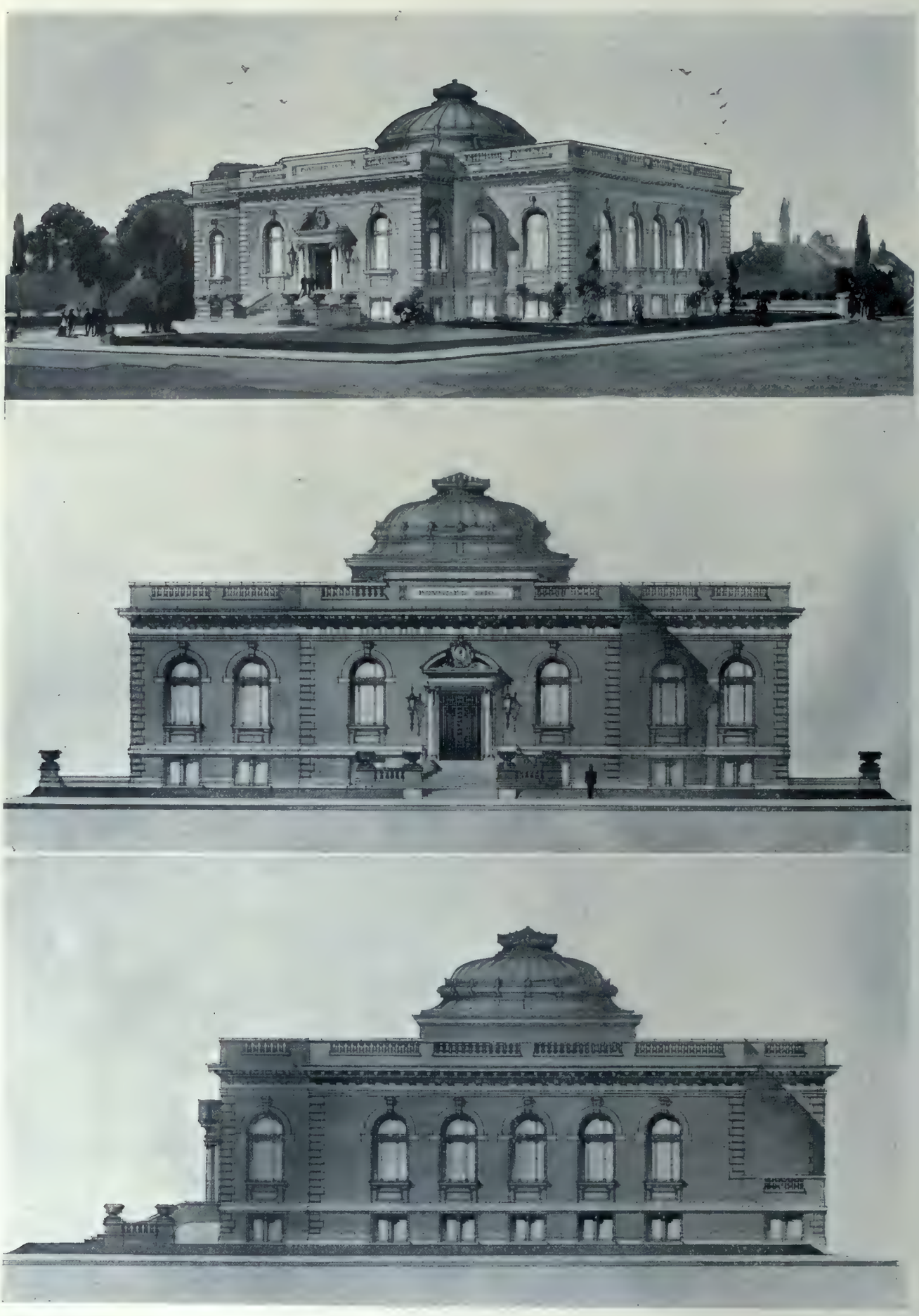
Competitive Design for Proposed Bank of Toronto Building, King St., Toronto, by Geo. W. Gouinlock, Toronto.

Competitive Design for University Building, Vancouver, B.C., Design for Astronomical Observatory, Toronto, Design for Country Club, by Geo. W. Gouinlock, Toronto.

Competitive Design for Proposed Head Office Building, Bank of Toronto, Toronto, by John M. Lyle, Toronto.

Side Elevation, Competitive Design, Proposed Head Office Building, Bank of Toronto, by John M. Lyle.

Design for Union Station at Cochrane, Ont., by John M. Lyle, Toronto. Design for Residence, by the Same Author. Design for Residence, by Geo. W. Gouinlock, Toronto.



Design for Proposed Hamilton Library, by John M. Lyle, Toronto.

Study in Ecclesiastical Design, by Messrs. Wickson & Gregg, Toronto.

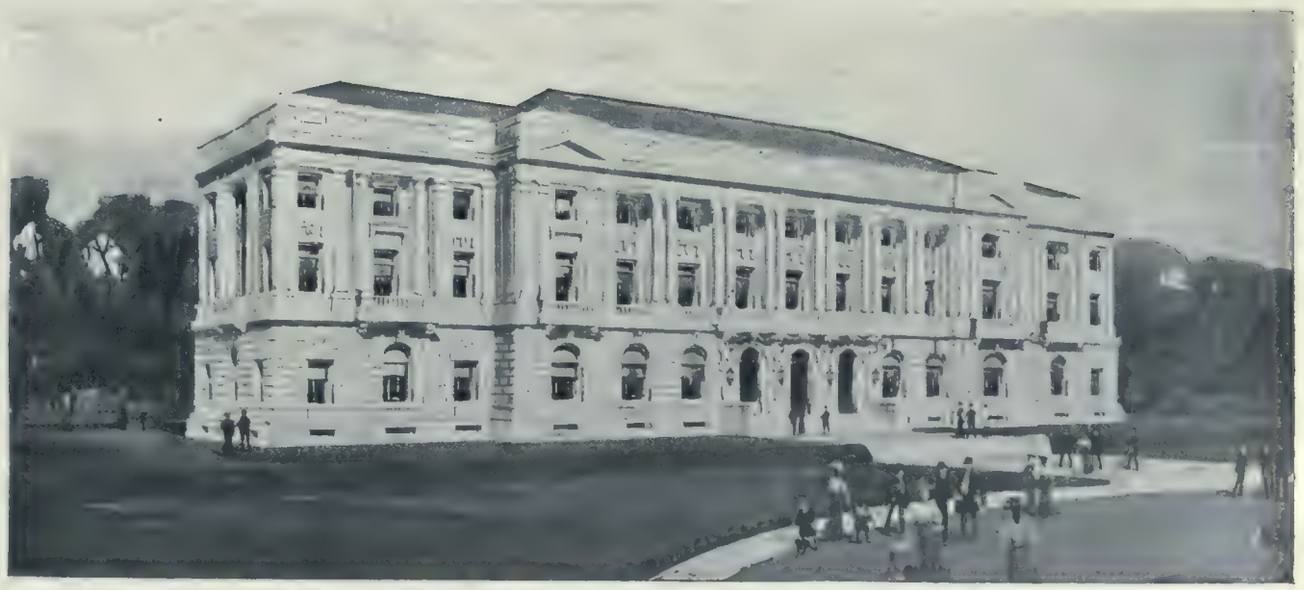
Competitive Design for the Proposed Head Office for the Bank of Toronto, by Sproatt & Rolph, Toronto.

Design for Victoria College and Library, by Messrs. Sproatt & Rolph, Toronto.

Competitive Design for Dominion Express Co.'s Building, Montreal, by Messrs. Burke, Horwood & White, Toronto.

Design for the Imperial Trust Co.'s Building on Richmond St., Toronto, by Messrs. Chadwick & Beckett, Toronto.

Birdseye View Perspective of the Proposed Toronto General Hospital. Darling & Pearson, Architects, Toronto.



Design for an Academy of Music, by Murray A. White, of the Firm of Burke, Horwood & White, Toronto.

Design for Proposed Building for the Canadian Bank of Commerce, by Darling & Pearson, Toronto.

Design for Standard Bank Building, King St., Toronto, by Messrs. Darling and Pearson, Toronto.

Design for Proposed Museum, University of Toronto, Together with Design for Residence, by Messrs. Darling & Pearson, Toronto.

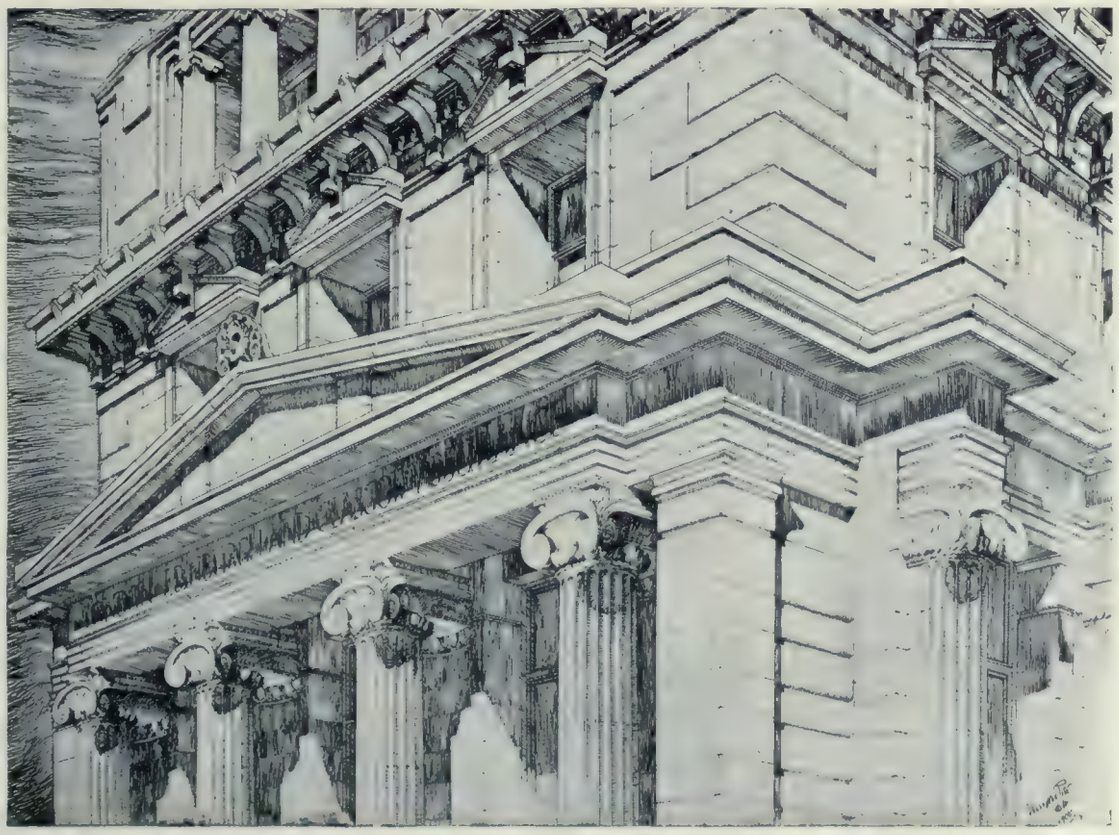
Designs by R. J. Edwards & Saunders, Toronto, Including Elevation for Masonic Hall on College Street, Toronto.

Design for the Presbytery of Our Lady of Lourdes, by Herbert E. Moore, Toronto.

Design for St. Barnabas' Anglican Church, Toronto, by Andrew Sharp.

Upper Left Design, Residence at Bibsworth, Worcestershire, Eng.; Lower Left Design, Residence at Park Down, Surrey.; Upper Right Design, Conkwell Grange, Wilts.; Lower Right Design, Dog and Doublet Inn and Cottages Round the Village Green at Sandon, Staffordshire, Eng. All by E. Guy Dawber.

Design for Villa at Antibes, Eng., by Ernest George & Yeates.



Detail of Pediment Assurance Offices, Euston Square, London, Eng., by Bereford Pite.

Design for Interior of Saint Wilfred's Church, Bognor, Sussex, Eng., by George H. Fellowes Prynne.

Interior St. John's Church, Sidcup, Kent, Eng., Designed by G. H. Fellowes Prynne.

Upper Design, Garden Front and Interior for English Residence, by Halsey Ricardo; Lower Left Design, Hatfield Herts, Four Acre, Winfield Hants, Eng., by Ernest Newton; Lower Right Design, Proposed Offices, Guild Hall, London, Eng., by Sydney Perks.

Design for Interior of Hall at Hengrave, Suffolk, Eng., by Walter J. Tapper.

Design for Covering in the Great Roman Bath at Bath, Somerset, Eng., by Frank W. Baggally

Front Elevation, Ardenrun Place, Blindley Heath, Surrey, Eng. Designed by Ernest Newton.

Rear Elevation, Ardenrun Place, Blindley Heath, Surrey, Eng. Designed by Ernest Newton.

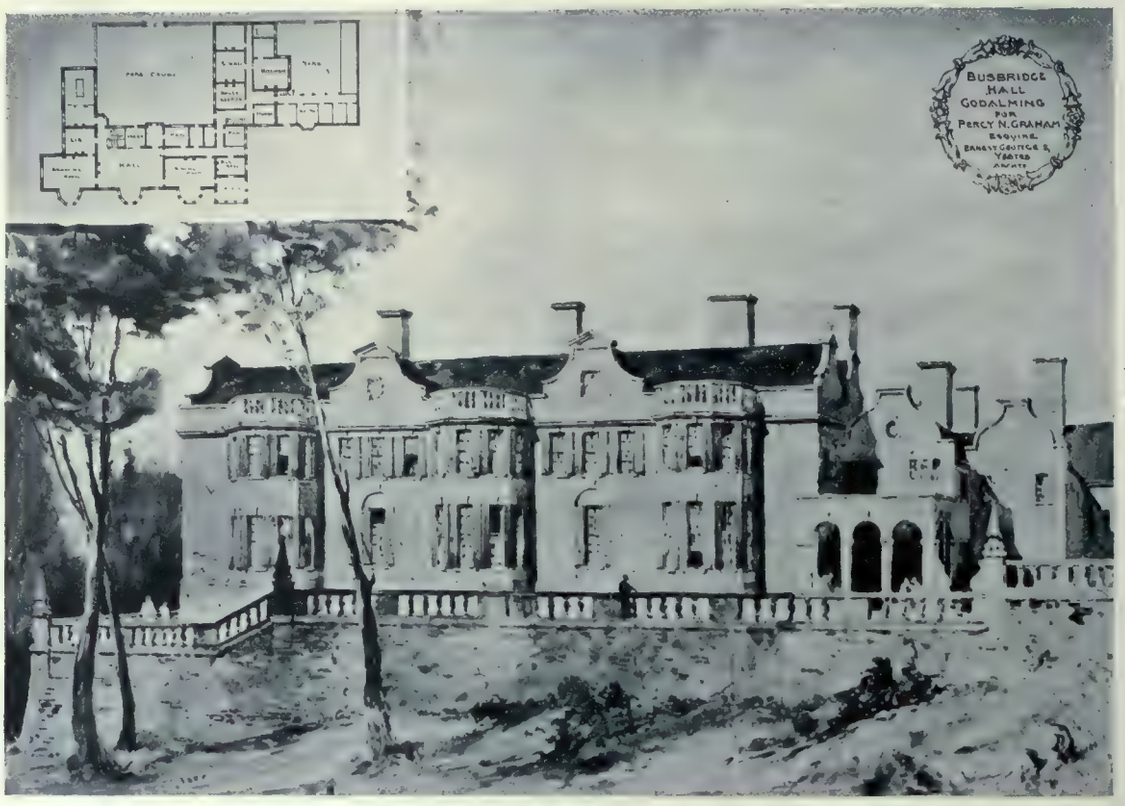
Design of New Premises of the London and Midland Bank, Limited, Eng. Messrs. Gotch and Saunders, Architects.

Design for Memorial Fountain at Kettering, Eng., by Messrs. Gotch & Saunders.

Design for Library, University College of South Wales, Monmouthshire, Cardiff. W. D. Caroe, Architect.

Design for Proposed Residence at Hampshire, Eng., by Sydney Perks.

Design for Wyphurst Additions at Cranleigh, Eng., by Reginald Blomfield.



Design for Busbridge Hall, Godalming, Eng., by Ernest George & Yeates.

Designed for Bryn Haford, Kettering. Messrs. Gotch & Saunders, Architects.

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

Ivan S. Macdonald, Editor and Manager

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Vol. 3 Toronto, September, 1910 No. 10

CURRENT TOPICS

BRISTOL HAS THE OLDEST SHOT TOWER in the world, which was erected by William Watts, plumber, in 1769, and is 120 feet high. It was "built" by sawing a square hole in the centre of the various floors of his house, and locating the well in the cellar. This tower is still in use, although it has been heightened by the addition of some stories. Watts secured a patent on December 2, 1782, and sold his London rights in 1800 for £10,000.

* * *

THE RESTORATION OF THE PALACE OF THE POPES at Avignon is steadily proceeding, and numerous interesting archæological discoveries are being made. The apartment called the "Salle des Audiences" is now completely restored, and in the chapel the stained glass which was destroyed during the occupation of the building as a barracks has been replaced according to its original design. The municipality of Avignon are occupied with the restoration of the ancient battlements extending along the bank of the Rhone, between Porte Saint-Dominique and Porte de l'Oulle.

* * *

IN THE COMPLETION of the new City Hall, Trinidad, Colorado has just come into the realization of a dream of twenty-two years. The foundation of the building was laid in 1888, but nothing further was done until a few years ago when the work was resumed. The cause of the intervening lapse of inactivity was due to omissions and imperfections in the original plans, such as the failure to include a heating plant, or to provide a chimney of any kind for the building. The "statue quo" and troubles in connection with Calgary's new municipal building, sink into insignificance when Trinidad's experience is considered.

IN THE COURSE OF EXCAVATIONS being carried out on the prehistoric and Roman settlement at La Croix St. Charles, on the Mont-Auxois (Cote d'Or), the remains of four temples were discovered during 1909. The largest is octagonal, each side measuring about 25 feet 6 inches; another rectangular temple possesses a stone tank. These buildings are considered to date from the reign of Trajan or Hadrian, and to have been destroyed at the end of the fourteenth century, but they replaced older sanctuaries. The wooden pipes of the water supply, placed end to end and connected together by iron rings, have been found *in situ.*

* * *

CIVIC ADVANTAGES in the way of sanitation, cheap power, and products of utility from heretofore purely waste matter, has been established in the English city of Coventry where a new dust destructor has just been completed near the towns electrical works. In this undertaking Coventry displays an administrative ability, and an economic wisdom that can be profitably studied by a large number of Canadian municipalities. The plant is equipped with two furnaces designed to destroy 80 tons of refuse a day, and it is calculated it can deliver 197,000 pounds of steam to the electrical works. The clinker is to be made into paving slabs. The slab-making plant has a 500-ton hydraulic press and pumps and a hydraulic accumulator driven by a 50-horsepower horizontal engine. The total cost of the destructor was $105,000.

* * *

THE WORK OF RECONSTRUCTION in Valparaiso, Chili, is progressing very rapidly, according to a report of U.S. Vice-Consul Charles F. Baker. The central plaza and several streets leading to it are being raised about a meter (39.37 inches), necessitating a vast amount of new installation of all kinds. In the same section of the city there are many new buildings in course of construction, mostly business blocks of two to three stories, and of reinforced concrete work.

There is also a great deal of building going on in Santiago, though not so much of the concrete work, only the larger buildings about the centre of the city. Many of the better buildings are of brick plastered over on the outside with cement, while many of the larger dwelling houses have the "tabique" wall. The upright pieces are 4 by 4 inches, placed 16 inches apart, and filled in between with sun-dried bricks. Then wires, size 14 to 16, are run around this wall inside and out, about 6 inches apart from bottom to top. The wall is then plastered over with mud or cement.

The plans for the work of the rebuilding of Valdivia will soon be completed, but until that time nothing but temporary building will be done.

* * *

THE SECRET OF SUCCESS IN CONCRETE WORK, says an eminent authority, lies in the knowledge of what to avoid, and may be briefly summarized as follows: Avoid an unknown cement, cement delivered in unbranded sacks or casks, or one of foreign manufacture. British-made is good enough, and is branded. Avoid lumpy or caked cement. Avoid a quick-setting cement. Avoid accepting the first aggregate to hand; choose the best obtainable for the purpose. Avoid the acceptance of an aggregate on sample; see it in bulk. Avoid the use of a natural aggregate without knowing its history, and insist upon screening and apportioning sand. Avoid muddy water or water of a decided coloring. Avoid slovenly methods of gauging and mixing. Avoid sloppy concrete or semi-dry mixtures. Avoid mixing quantities of concrete which cannot be immediately disposed of. Avoid the use of dead concrete. Avoid frost, and carefully protect finished work. Avoid laying concrete in water. Avoid heavy or long-continued ramming. Avoid earth and rubbish falling upon and mixing with concrete. Avoid weak shuttering or sparse timbering. Avoid the removal of centering, shuttering or timber until the work is hard. Avoid the temptation to generalize in specifying.

IN HIS ANNUAL REPORT, U.S. Consul George Horton, of Saloniki, Turkey, states that the population of that city is steadily increasing, and shops and houses are being erected at the rate of 120 to 150 a year. Most of the building material comes from European countries. The United States supplies a little hardware, but has lost the trade in nails, in which it formerly led. A good business could be done in American pitch pine, oak, and other kinds of wood for furniture manufacturing, and for floors, windows, and doors, if some reliable importer there could get into touch with a firm willing to co-operate. A small amount is now brought from Smyrna, but the extra commissions, freight, and handling make extensive business impracticable. This should be equally as good a market for Canadian materials.

* * *

CONTINUED ACTIVITY IS NOTED by U.S. Consul John Q. Wood, of Venice, in the exploitation of new hydro-electric plants of North Italy. He cites some examples: Work is progressing rapidly on the 9,000 horsepower works at Ponte della Serra in the Province of Belluno, under the direction of three electrical companies, one of which is the Edison (Italian company), whose central office is located in Milan. The Milani hydro-electrical plant, producing a force of 10,000 horsepower, was inaugurated in November, near the city of Verona. The electrical equipment was supplied by the Westinghouse Company of Havre. Electric car lines are springing up in all parts of this district, enormously stimulated by the cheap electric power. The State frequently subsidizes these companies, as in the case of the line from Belluno to Pieve di Cadore, which will receive $115 per kilometer $0.62 of a mile). Railroad activities are also progressing. The line from Bologna to Verona is nearing completion, much to the regret of the citizens of Padua and Vicenza, for these cities will be cut off from the international line to and from Milan and Bologna, and incidentally Venice will lose many visitors who have been accustomed to stop off at Padua and pay a little visit to Venice before proceeding north or south. A new road from Belluno will penetrate the Dolomites at Lavaredo, and be extended to Toblach, in Austria-Hungary, thus opening up another means of communication with central Europe.

* * *

COMMENTING UPON THE PROPOSED alterations and improvements for Buckingham Palace, THE BUILDER says: "Several of our leading daily and weekly papers have rushed eagerly into the fray on the question of refronting Buckingham Palace. The evident popularity of the discussion almost persuades one that the public are at last beginning to take an interest in matters architectural —though we fear that the multitude of counsellors will do but little towards arriving at a conclusion. The Sphere puts forward a scheme that is certainly not an improvement on the existing building, though the design of 1824, which is also illustrated, has considerable artistic merit. The Illustrated London News has a series of views of Royal Palaces, among which our own does not come out so badly; indeed, if it were not for the effect of poverty due to its being painted, it may be doubted whether any change is likely to be one for the better. We are rather inclined to agree with the Guardian in the view that, while the Palace is no doubt dingy and uninspiring, little confidence can be felt that, if it were demolished, the artists and architects of the day would be able to guarantee us anything better in its place. It is, at any rate, broad in its massing and scholarly in detail, which is more than can be said of most of the buildings recently erected in London. Probably the existing vogue of over-accentuated verticality and 'original' decoration is a passing one, but while it lasts we should be sorry to see a building that possesses, whatever its faults, the qualities of breadth and repose replaced by one that fails in these respects."

AS THE DURABILITY OF CONCRETE WORK is occasionally called in question, it may be useful to recall that in the south of France the concrete arch bridge known as the Pont du Gard was erected in the year 56 B.C. The concrete in this was not composed of crushed stone or other small aggregate of the variety now employed in concrete bridge work, but was of the old style, consisting of alternate layers of large and small stones, gravel, etc., and of cementitious materials. Vitruvius describes the materials and methods in use before the Christian era, and other writers, like Alberti in 1845, and Palladio in 1570, accurately described the method which the "ancients" (as they call them) employed, "of using boards laid on edge and filling the space between with cement and all sorts of small and large stones mingled together." It is very improbable that the Pont du Gard would have withstood the rigors of a northern climate, but its actual state of preservation, as well as that of many other specimens of ancient concrete work, proves that if modern work is honestly executed it will many times outlast any reasonable bond period, so that a very small yearly sinking fund per cent. is all that is required for properly designed and erected concrete work.

* * *

THE PRECARIOUS CONDITION of the Leaning Tower of Pisa is the cause of much alarm at present and is the subject of world-wide discussion. THE BUILDER, London, in commenting upon the recent signs of failure developed in this famous tower, says: "The Royal Commission appointed to consider the present state of the campanile have reported that their investigations led to the wholly unforeseen and distressing discovery that, instead of being founded upon a massive spacious base, as was generally believed since Grassi, in 1831, and Rohault de Fleury, in 1859, published their collections of plans, the actual foundation simply consists of ring-shaped masonry exactly corresponding in girth to the huge cylindrical mass superimposed thereon. In fact, the inner diameter of the ring foundations is 7 metres 40 centimetres, which is precisely that of the space inside the tower. This discovery, taken together with the further astonishing fact that the foundations are merely 3 metres (9 ft. 9 in.) beneath the surface, constitutes henceforth incontrovertible proof that the campanile was originally built perpendicularly, and that its leaning propensities, which are becoming more and more accentuated, are due to other causes than the intention of its constructors. In 1829 it was 4 metres 388 millimetres out of vertical line, but during the last eighty years the Commission affirms that the tower leans an additional 5.5 millimetres for every metre of its 54 metres in altitude. The reasons given for this dangerous state are principally that the base of the tower has always been immersed in water, and that a deep cistern dug quite near seventy years ago in an unsuccessful attempt to drain the area around the foot of the tower made matters worse. The tower had already been considerably weakened by earlier excavation for a basin for mensuration purposes. Later in 1834 the severest shock of earthquake ever felt at Pisa left the leaning tower some 13 centimetres more out of the straight. It is to be hoped that speedy measures will be taken to place this important example of Romanesque art out of danger."

THE ARCHITECTURAL FIRM of Messrs. Watt, Jacques & Williamson, London and Windsor, have dissolved partnership. Mr. John M. Watt, architect, will take over the head office at London, and Messrs. Jacques and Williamson take over the Windsor branch, under the name of Jacques & Williamson, architects. Mr. John M. Watt will be located at 216 Masonic Temple, London, Ont., and Messrs. Jacques & Williamson will be located in the Jordan and Griffith building, Windsor, Ont.

"Travancore"—A Recently Erected Montreal Apartment House, which Introduces Several Features in Design Quite Uncommon to Dwelling Structures of this Type.

APARTMENT · BUILDING WITH ROOF · PERGOLA AND FORMAL · GARDEN

Located at entrance to Mount Royal Park, Montreal, the "Travancore" presents several new features in apartment house comforts and luxuries.

CANADIANS, generally speaking, have been slow to adopt the apartment house mode of dwelling, and in the comparatively few that have been, up until recently, erected in Montreal, Winnipeg, and Toronto, there are certain evidences which indicate that we have not as yet become as expert in the designing of this type of dwelling as have our American cousins, with whom the apartment house has long been an established fixture. By this we do not wish to imply that our architects are unable to design that which we require in this type of structure, nor do we desire it to be understood that we have not well designed and constructed apartments in some of our larger cities. But the apartment house fever has not as yet taken sufficient hold upon us to force landlords to vie one with the other in offering prospective tenants, conveniences and comforts made possible through plan and equipment peculiar to their own building.

Montreal and Winnipeg, however, seem to have advanced along these lines more than has Toronto, and in these cities there are to be found several recent apartment houses that give evidence of a strong tendency among landlords to spend money for every reasonable equipment that their architect may provide compatible with domestic comfort and convenience.

One of the most recent structures in which this tendency of the owners of modern high-class apartments is demonstrated is the "Travancore" erected in Montreal by A. H. Creed.

Apart from all the usual modern conveniences that have become an essential adjunct to the high-class apartment building, the "Travancore" is notable for two exceptional features: a pergola on the roof and the spacious formal garden at the rear.

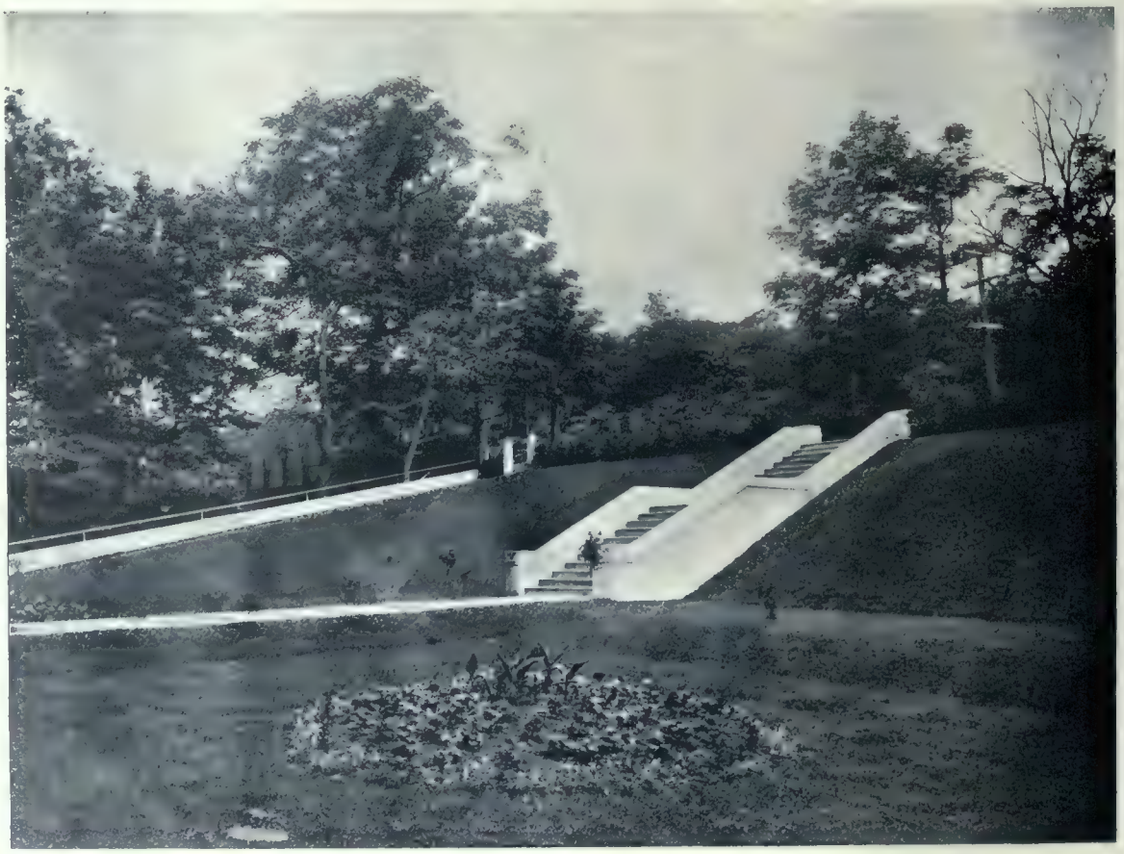
Through the introduction of these additional accommodations, two of the greatest objections to apartment house life has been overcome, viz., lack of access to open air and sunshine, and the absence of a well kept lawn. Few apartment house owners have been successful in overcoming these two important deficiencies of the modern apartment building. The "roof pergola" provides the tenants of the "Travancore," in addition to an unparalelled view of the beautiful surrounding scenery, an ideal lounging place on summer evenings, where they may enjoy the cool mountain air.

The large formal garden at the rear lends an air of refinement and beauty to the whole scheme and eliminates the usual stuffy and cramped atmosphere attendant to apartment house life. It serves to give the tenant all the comforts of a luxurious private house on a beautiful spacious site, together with all the comforts and conveniences of the modern apartment building.

The Travancore is located at the western entrance to Mount Royal Park in Cedar avenue, on the southern slope of the mountain, where it commands a magnificent view of the city of Montreal, the river St. Lawrence and all the surrounding country. A more ideal site could hardly be conceived of.

In the plan the architects have worked out one excel-

An Unusual Adjunct of the "Travancore" is a Roof Pergola an Excellent View of which is Obtained Herewith. This Innovation Suggests Certain Possibilities in "Roof Gardening" which Might Well be Considered by Architects in Providing Outdoor Advantages, Especially where the Ground Dimensions are Restricted on All Sides.

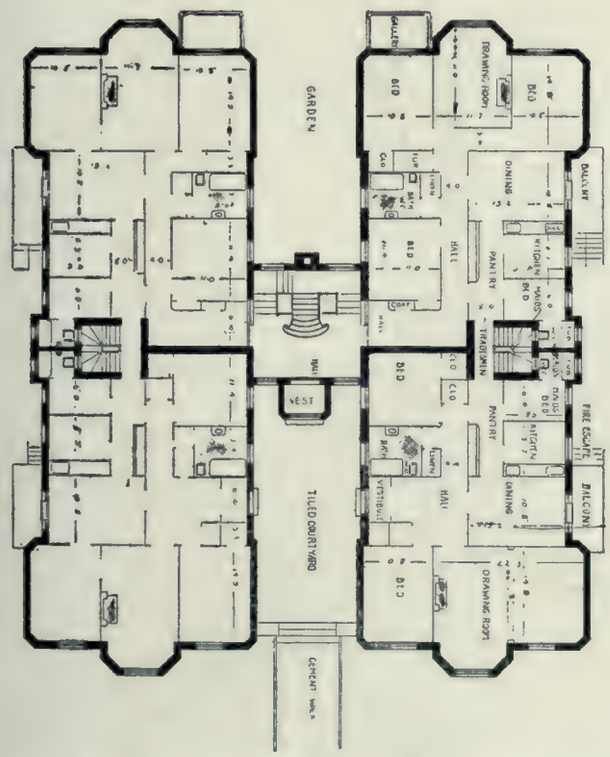


This View Shows the Formal Gardens with its Well-kept Terrace and Lawns, a Feature Which Gives the Occupants of "Travancore" the Advantage of More Than Sheltering Walls and Internal Comfort and Conveniences, besides Rendering the Erection of a Structure of this Type, less Objectionable in the More Exclusive Residential Districts.

lent scheme. The structure is built in two distinct sections (one of which is an exact duplicate of the other) in the form of an H, the section represented by the crossbar of the H contains the entrance hall and main stairways. Through this arrangement of plan each and every room in every apartment has been provided with direct outside light, air and view. One of the troublesome tasks of the designer of the apartment building is to strike upon a practical and economical plan that will render unnecessary "inside" rooms.

The building contains fourteen apartments of seven rooms each, viz., drawing room, dining room, kitchen and pantry, three bedrooms and bathroom, servants' bedroom and separate bathroom. The floors throughout are of hardwood and the woodwork of natural oak, with rubbed finish. The main bathrooms have tiled floors. The plumbing throughout is of the highest class open work and includes pedestal china lavatories, china W.C.'s, and porcelain enamelled baths, sinks, wash tubs, etc., furnished by the Standard Ideal Co. of Port Hope, Canada. Each suite is equipped with wall safe, gas stove, refrigerator, curtain poles and window shades.

The exterior walls of the structure are of red shale brick of a deep rich tone, with sandstone trimmings. One of the commendable features of the building is the provision made in its construction and equipment for protection against fire. The central connecting section containing the entrance hall and main stairways is of fire-

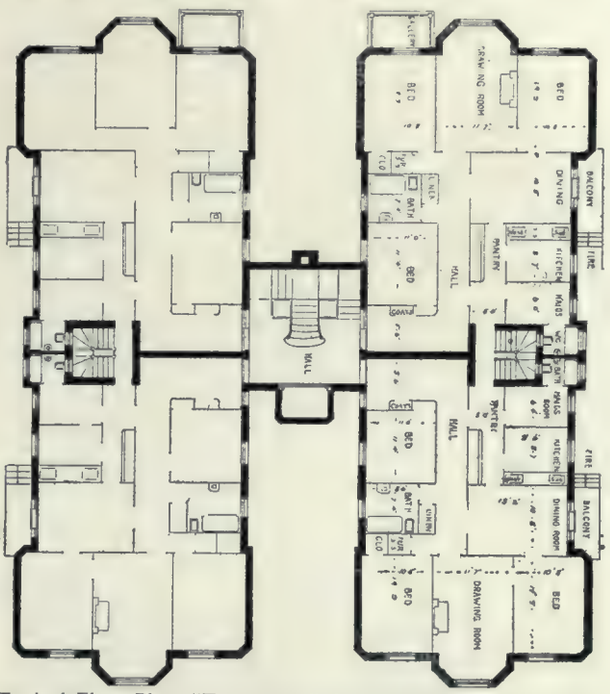


Ground Floor Plan, "Travancore" Apartments, Montreal, Showing the Tiled Court Yard, the Main Vestibule and Hall, and the Garden Approach at the Rear.

proof construction, having solid walls of brick laid in cement mortar, floors of reinforced concrete and staircase of wrought iron and marble. This section is cut off from the sections on each side containing the apartments, by fireproof doors. The two main sections of the structure are divided into four sections by fire walls. A stand pipe is provided with which is connected fire hose in the main hallway on each floor, and each apartment has an exterior wrought iron gallery connecting with a wide, well constructed fire escape.

In all, the "Travancore" in the matter of luxurious appointments, and modern, convenient and complete equipment, is one of the finest apartment buildings in Canada.

UNDER THE HEADING "MODERNIZATION OF CANTON, U.S. Vice-Consul-General Myers, at Canton, in a recent report makes some interesting comments on the construction work in progress at that city. The report says in part: On Shameen, during 1909 a municipal bath house was constructed at a cost of approximately $8,160. A "go-down" and junior staff quarters for the Hongkong-Shanghai Banking Corporation, and a building for the Chartered Bank of India, China, and Australia are under construction. The examination shed and quarters for the outdoor staff of the Imperial Maritime Customs, situated opposite Shameen, at Honam, was completed last year. The bund from Tai-sha-tau to Shameen was also pushed forward and practically finished. Many new buildings, semi-foreign, were erected along the bund during this time. At Tai cha-tau the imposing railway terminus for the Canton-Kowloon Railway was completed. At Tung-shan residences and railway buildings for the use of the



Typical Floor Plan, "Travancore" Apartments, Montreal, Showing the Arrangements of the Upper Suites.

staff, and also several schools and residences for American missionaries have been constructed. During the year the new dormitory building of the Canton Christian College was completed at a cost of about $14,300.

ENTERTAINING IN LIFE PECULIAR IDEAS as to the hereafter and determining not to have his body disturbed in future aeons of time, William Lay, a coal merchant of Honeoye Falls, N.Y., left a unique will. from which the following is an extract: "That a grave be prepared of at least the ordinary size and depth; that the bottom thereof, for a depth of at least six inches below the place prepared for the body be constructed of reinforced concrete; that above said foundation a space be left for the reception of the body, and the said space be large enough so that there will be an opening about six inches on all sides above and around the body; that my body be placed in a winding sheet of suitable material and placed in said grave without box or coffin; that said grave then be filled and the body entirely covered along the sides and above with reinforced concrete, consisting of one part Atlas Portland cement to three parts of clean gravel; that said concrete be brought up to a point about two feet above the level of the ground, and the ends of the solid concrete levelled and the top given an oval form. that the same be furnished with a smooth surface, and upon the same may be placed an inscription containing my name, 'William Lay,' the figures '1854,' that being the year of my birth, together with figures indicating the year of my death, and that no other inscription be placed thereon."

THE · ARCHITECT AND · FIRE · PROTECTION

By IRVING K. POND, A. I. A.

An address before the convention of the National Fire Protection Association, at Chicago, May 19, 1910, by the President of the A. I. A.

THE SUBJECT OF THE RELATIONSHIP of the architect to substantial building and to fire protection is one of wide significance and with many ramifications. The matter is not so simple as at first appears, for it deals not only with the present status of building development, but with the past as well, and reaches far out into the future.

Speaking from his purely personal standpoint and regarding only his selfish interests, the architect might urge thorough and yet more thorough methods of building construction and protection, that the monument to his skill and genius may last throughout the ages, adamant against the destructive agencies of water, fire, climatic conditions, and shock. The architect likes to consider himself as a maker and recorder of permanent history, but build as stably as he may, the Nile will undermine the foundations of Karnak and Luxor, fire will lay low the "Ephesian Dome," frost and moisture will sunder the massive buttresses and earthquake will scatter the columns of the temples which man has reared to carry the glory and fame of his race on through the ages.

But the architect of the present has to deal with other causes which go toward the unmaking of history as embodied in architecture. The changing conditions of everyday life act as destructive agents, so that the economic loss in the demolition of the present to prepare the ground for the future is as appalling in a way as is the destruction by any of the natural causes. The philosophic attitude to maintain toward the whole subject is, that out of each great loss must come some gain, and that no great good is attained without the payment of an adequate price. And so in considering the matter of permanent building and protection against the elements, we are brought face to face with the modern problem which is taxing the ingenuity and genius of our architects and economists, the problem of city planning for the present and the future.

The value of building for permanency is to be carefully considered where conditions are ever shifting and buildings to serve the special purpose of to-day may not meet the requirements of to-morrow. The logic of city planning must appear as keen as the logic of house planning, and the distorting of the function of one part of the city must appear just as chaotic and as fatal to the economic order as the derangement of the functions of various rooms in the dwelling. The furnace room should be equipped to receive the furnace and fuel and calls for certain protection which need not be afforded to other portions of the house. To erect the furnace in the drawing room or to install the range in the boudoir is to derange the life of the household and stultify the meaning and design of the house and to presage a lapse into barbarism or to indicate a non-emergence from that estate; and thus is indicated the possible connection between city planning and logical construction and necessary protection. The logical planning of the city—the laying down of permanent lines of development, the laying out of permanent avenues of intercommunication and lines of transportation that the functions of the various portions of the city shall not be deranged, but shall be susceptible of logical and rational growth and development—bears directly on the matter of comparative stability of construction. The wisdom in creating city planning commissions and even in applying the theory to smaller districts becomes apparent and should be emulated in our own country by our legislative bodies, and warrant of law rather than individual initiative should bring about the desired result. This idea which has been in practice and has justified its existence for a long time in Austria, is coming into vogue in Germany and is just now being adopted in England. Various of our American cities are attacking the problem from some special point of view individual to the locality, but the wider problem in all its manifold bearings on social organism, industrialism, housing, sanitation, morals, and beauty has as yet to be conceived by the general body of American city planners. When our civilization is established and we cease to be a restless body pushing forever toward the frontier, our cities will partake more of the nature of fixed abiding places and less of the nature of the camp, as our residences to-day are smacking more of the permanency of buildings and less of the ephemeralism of the tent. At such time sanely conceived civic centres will be established, calling for permanent structures suited to the needs of the locality and connected with other similar centres by great arteries of intercommunication, which themselves will be of a permanent and lasting nature. The industrial quarters, the residential quarters, the wholesale quarters will be distinctly differentiated as are the apartments of the logically designed dwelling, and will be susceptible of logical and predetermined growth. When the laws of economics shall have been understood, when each man's duty to his neighbor and to the community shall be as thoroughly recognized as are the rights he arrogates to himself, when the laws of order and the love of beauty shall have been established in the heart of the race, the overtopping commercial structure in the centre of other commercial structures or in the centre of the residence district will be a thing of the past. In fact, in the logical city overtopping commercial structures will not, as now, add their disfigurement and their problems of transportation and of sanitation to the neighborhood they infest, and the matter of protective construction and protective appliance will be simplified.

It would seem impossible that the city should develop without certain destruction of existing forms and functions, and it will be seen that this condition should be recognized in the problem of construction and of protection especially in the earlier stages of the city's development. The possibility that factories or that apartments may be torn down within a comparatively short period of time, to be replaced by buildings more extensive and devoted possibly to other uses, must affect the character of the construction, and to insure against great economic loss in the wreckage of existing structures the protection of life and property should be made to depend more largely upon external means and appliances.

Passing now the relationship of construction and protection to city planning and coming down to first principles, perhaps the most effective method of protection as it affects the community generally would lie in the operation of a law making the loss or damage to extraneous property or to life to hold against the owner of the property from which the fire spreads or the damage emanates.

If the title to such property were vitiated until claims had been settled there would be less argument as to the desirability of protection in specific cases, and there would be smaller need to penalize neighboring buildings of a higher type. It may at some time be the function of the American Institute of Architects by itself or in conjunction with your able body to suggest such legislation and assist in its advancement; but without awaiting that time the Institute may find other methods of serving the community along these general lines.

The American Institute of Architects, the function of which not only is to elevate the status of the entire architectural profession, but to better the building conditions in general, is contemplating the formulation of a typical building code which shall be on a par with its standard form of contract and general contract conditions and its standard specification. In this it needs the affiliation of the protection and insurance engineer. A body like the American Institute of Architects should be eminently fitted to undertake such a work, for it not only understands the technical details of building construction, but it comes to the work without any personal bias or any individual to serve, regarding only the highest good of the community. The architect's desire to build a monument for himself may in this instance be disregarded. The protection engineer, however, as represented by the National Fire Protection Association, is a necessary co-operator in any scheme of code formulation, for he has tested in his laboratory the action of the elements upon materials under the most severe conditions and can lend most valuable technical aid. His tendency, however, from the side of underwriting, would be to stiffen up on conditions, possibly to the disadvantage of the building owner, in order to protect his interests against possible losses. There would always be the suspicion of self interest in the advice of the underwriter. The formulation of a standard building code is quite as difficult as it is desirable, for its mandates must be in general terms, susceptible of application in all sections of the country. The architect would have a more open mind to the use of certain materials; for instance, unprotected cast iron in window mullions, or unprotected lintels supporting short spans of masonry, for he has known the metal used in these forms to stand the most severe test possible under actual conditions, whereas, under the artificial conditions of the laboratory the protection engineer has found them to fail. A liberal yielding by the architect from his point of view to that of the underwriter and a reciprocal action on the part of the underwriter would result in a code of great general value and equity. The architect would endeavor to study conditions so as not to penalize the high class building and legislate against the owner of such a building in favor of a neighboring building of lower type. The high class building should be protected against the lower class building by equitable legislation and the lower class building should not be allowed to jeopardize the entire neighborhood as well as itself. At the same time the higher type of building, especially when it runs into an inordinately high structure, should not be permitted to jeopardize the safety of life and limb within its own confines. This entire subject impignes on that of city planning and the logical distribution of various types of industries and commercial activities.

As a practical phase of the general topic it is well to note the valuable work which the Board of Underwriters and your Association are doing in promulgating data with reference to fire protection. In relation to this a suggestion has been made by an eminent architect that this work is too technical in its nature to reach the generality of architects and owners who naturally should, and under certain conditions would make use of the provisions. At present the information with regard to the simpler forms of fire protection is contained in large pamphlets from which it is to be with difficulty extracted, and, moreover, the information is generally so put that it is not quite clear to any but engineers and architects who have had special practice along those lines. The few architects in the larger cities who pay any special attention to this subject, of course, keep up to the mark by special correspondence, consultation with insurance engineers, and constant reference to the Board of Fire Underwriters in specific cases; but the great majority of the architects of the country know absolutely nothing about the simplest matters of fire protection methods.

An educational propaganda can best be carried on by a series of primer-like leaflets of uniform size, mailed regularly, perhaps once a month, to every architect in the National directory, and to every builder, forming in due course a portfolio of technical sheets which can be replaced from time to time as they become obsolete. One leaflet could deal with brick enclosures for staircases, another with brick enclosures for elevators, giving diagrams of roof houses and doors, or even more important, a statement as to costs showing how little more of expense it involves to incorporate these refinements and how much it adds to safety, and finally how sure it is to be adequately recompensed by the saving in insurance. A series of leaflets on various types of fire doors and automatic and other metal window frames with an explanation of their advantages and a general statement of the cost as compared with wooden frames; data as to modern methods of mill construction embodying the latest types of girders and flooring and column and beam connections, should be given out in this form, as well as suggestions as to the construction of simple fireproof stairways, especially those of reinforced concrete, such as can be constructed in any town by a clever mason at small expense. An important feature would be a sheet on automatic sprinklers, with an appeal for their use, and a statement of approximate cost of their equipment such as an ordinary building, 50 x 100, on the ground, and six stories high, would require; and it would be quite to be desired that the information given on these sheets as well as the information which is given to architects personally should be such that the architect could place reliance on it and not find after he had installed certain appliances and introduced certain specific methods of protection, that they were for naught and would have to undergo costly reconstruction.

It is not infrequent in actual practice that the means adopted or appliances installed under specific recommendation of one official of the Board of Underwriters have been summarily rejected by another official, and there is no redress. Remove and reinstall, or up go the rates or no rates will be considered. This is rather trying to the architect who has done his work conscientiously, and it forces a situation rather difficult of explanation to a client who naturally cannot comprehend the case and quite naturally conceives his architect to be at fault. Discretionary power on the part of public commissions is being considered and recommended as a panacea for modern legislative ills, and should be, where the drastic enforcement of non-elastic laws operates at the same time against private interest and public good. But on whom can such arbitrary power safely be conferred in the case of the general government? The Board of Underwriters has not to consider that question, for it need not be governed by drastic laws, but in all justice and logic may make the particular method suit the particular case.

A word as to certain specific architectural functions must be uttered, especially as it concerns a matter in which unenlightened and arbitrary rulings make or break. The architect is forever struggling to encompass beauty to endow all his forms with grace and charm; otherwise he is no architect. In this he is not aided by the Underwriters' rules, which tend more and more to make the objects to which they apply more crude and ungainly. This is especially so in the matter of frames and sash and the proportions of windows. So, too, with fire doors, and their appliances; and so with many matters. In many instances the matters might be adjusted by a commission, were its ruling not to be negatived immediately by another commission. These suggestions are not uttered in a carping spirit, but to indicate that equity between man and man should be conserved, equity between associations and

capital also. The ethical element will enter into the operations of even a Board of Fire Underwriters and the aesthetic element will not down where the true architect is concerned; and so it must be apparent that questions of business ethics and personal fair dealing and questions affecting public taste, inhere in the problems of the protection and the insurance engineer and the powerful association they in general so wisely represent.

PANAMA CANAL IN FINAL STAGE OF CONSTRUCTION

Method of carrying out huge engineering task and description of mechanical equipment.

THE BUILDING OF THE PANAMA CANAL is now in its fourth and final stage. The first stage was the sanitation of the Canal Zone; the second, the re-building of the Panama Railroad so as to supply facilities for transporting the spoil from the excavations to the dumps; the third, the excavation of the canal; the fourth, and last stage, the building of the Gatun dam and locks, and the locks at Miraflores and San Miguel. On August 1st of this year, the excavation (182,000,000 cu. yds., of which 40,000,000 cu. yds. available had been done by the French) had advanced to a point where only 101,000,000 cu. yds. remained to be done, which, as officially stated by Col. Goethals, can be finished by August 1st, 1911. The remaining excavation is proceeding at the rate of about 3,000,000 cu. yds. per month.

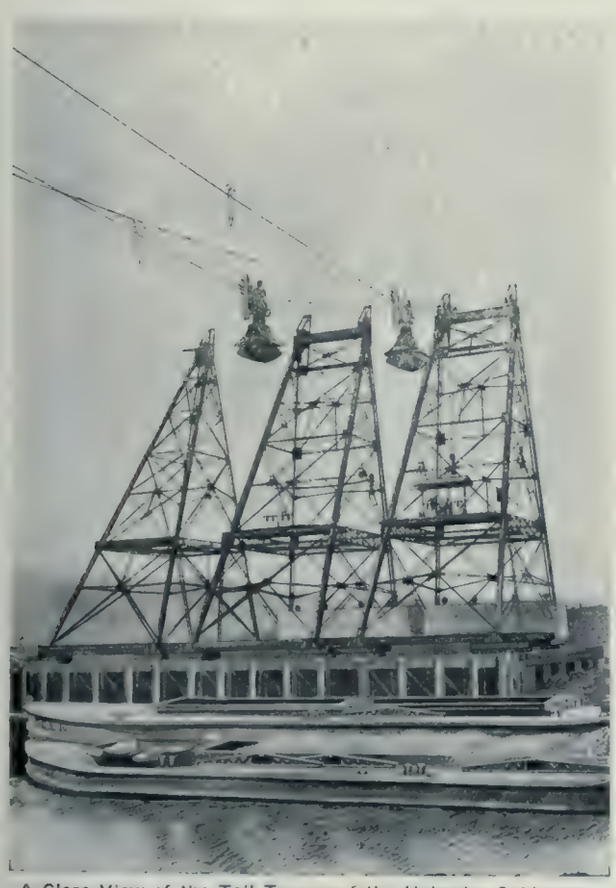
Keeping pace with the speed of excavation are the construction operations in connection with the Gatun dam and locks. The most important part of the mechanical equipment are the 13 Lidgerwood high-speed cableways, which were especially designed and installed for building the Gatun locks. Upon five of these, known as the unloader cableways, will fall the brunt of the work, and upon the ability of these five to handle the amount guaranteed, or more, must depend the question of whether the canal will be finished and in operation on January 1st, 1915, or earlier. These cableways have exceeded their guaranteed capacity by such a large percentage that the engineers in charge of this section of the work are confident that it can be finished at a much earlier date. They are recognized unofficially by Col. Goethals as "that 1913 crowd."

The work of these five cableways is to handle the broken stone and sand which will be required for the walls and floors of the locks. There are six locks, each 1,000 feet long in the clear and 110 feet wide. They lie side by side in flights of three, making a total length of more than 3,000 feet. Together they provide a total lift of 85 feet with some to spare for changes in the initial water level. In these locks there will be used 2,000,000 cu. yds. of broken stone, 1,000,000 cu. yds. of sand and 2,200,000 barrels of cement. The stone and sand arrive in barges on a branch of the old French Canal. The unloader cableway takes it out of the barges with great grab buckets and delivers it 600 feet or more away in heaps in the storage yard. From here it is taken by the cars of an automatically operated electric railway to the mixers, and from the mixers the concrete is taken in other electric cars to where the second set of eight cableways can put it in place in the forms for the walls and floor. Four cableways arranged in pairs on two sets of towers handle the broken stone and a single cableway with independent towers unloads the sand from the barges and deposits it on a storage pile. Each cableway has a span of 800 feet. In the duplex cableways the cables are 18 feet apart. This corresponds with the distance apart of the transverse bulkheads in the barges. The cableways

The Five High-speed Lidgerwood Cableways which are Handling, from Barges to the Storage Heaps, the 2,000,000 cu. yds. of Broken Stone and 1,000,000 cu. yds. of Sand Required to Build the Gatun Locks at Panama Canal.

Looking Down at a Loaded Barge from the Operators' Booth, Showing the Ease with which the Operators Direct the Movement of the Grab Bucket.

are all mounted on steel towers 85 feet high. The towers are mounted on trucks and travel on tracks, so that each cableway performs the function of a travelling crane. The unloader cableways travel the length of the storage yard. Those for building the locks travel more than 3,000 feet. They are all moved electrically, each pair in unison. From the carriage of each of the five unloader cableways there is suspended an improved special 70 cu. ft. iron-ore type of excavating bucket. Each bucket grabs an average load of 54 cu. ft. The load is hoisted 85 ft., conveyed about 600 ft., dumped on the storage pile, and the carriage and bucket returned. This round trip has been made in 1 minute and 8 seconds. The cableways were guaranteed to handle 50 cu. yds. an hour each. They have carried 90 cu. yds. in an hour, and the average operation up to date is 60 cu. yds. per hour. This ought to be materially increased with practice. The present record is declared to be double that of any cableway previously employed anywhere.



A Close View of the Tall Towers of the Unloader Cableways, Showing the Position of the Barges and of the Operators.

The high speed and consequent increase in the capacity of the cableways is due to the ease with which the operation of the cableways is controlled; the rope-lead that simultaneously raises and traverses the bucket; the high-speed shock-absorber with which the fall-rope carrier is equipped, and a new type of button-stop.

The hoisting and conveying machinery in the head tower is controlled by an operator in the tall tower stationed on an elevated platform commanding a clear view of the bucket at all times and in all positions. He controls two 150-h.p. motors by master controllers of the New York Subway type, and the air brakes by two levers operating magnet valves 800 ft. away. The physical effort of operation is so easy that the operator can comfortably maintain the high speed. In all previous cableways this effort was so fatiguing that, although it was possible to attain a speed of 35 round trips per hour with mechanical levers, this could not be sustained for any length of time.

The rope-lead which simultaneously hoists and traverses the bucket causes the latter to move in a curved line corresponding somewhat to the hypothenuse of a triangle, instead of moving on the vertical and horizontal sides. Considerable increase of speed and diminution of travel is thereby effected. The high-speed shock-absorber with which the fall rope carrier is equipped is the invention of Spencer Miller. It permits the carriage to travel at the unusual speed of 2,500 ft. per minute, more than double the speed of any previous cableway. The button-stop employed has been successfully tested experiment-

ally with a fall-rope carrier running at the speed of 3,000 ft. per minute.

On account of the ease of operation of these cable-

One of the Cableway Operators in His Booth, Showing the Simple Apparatus with which He Controls the Operation of the Bucket and Carriage.

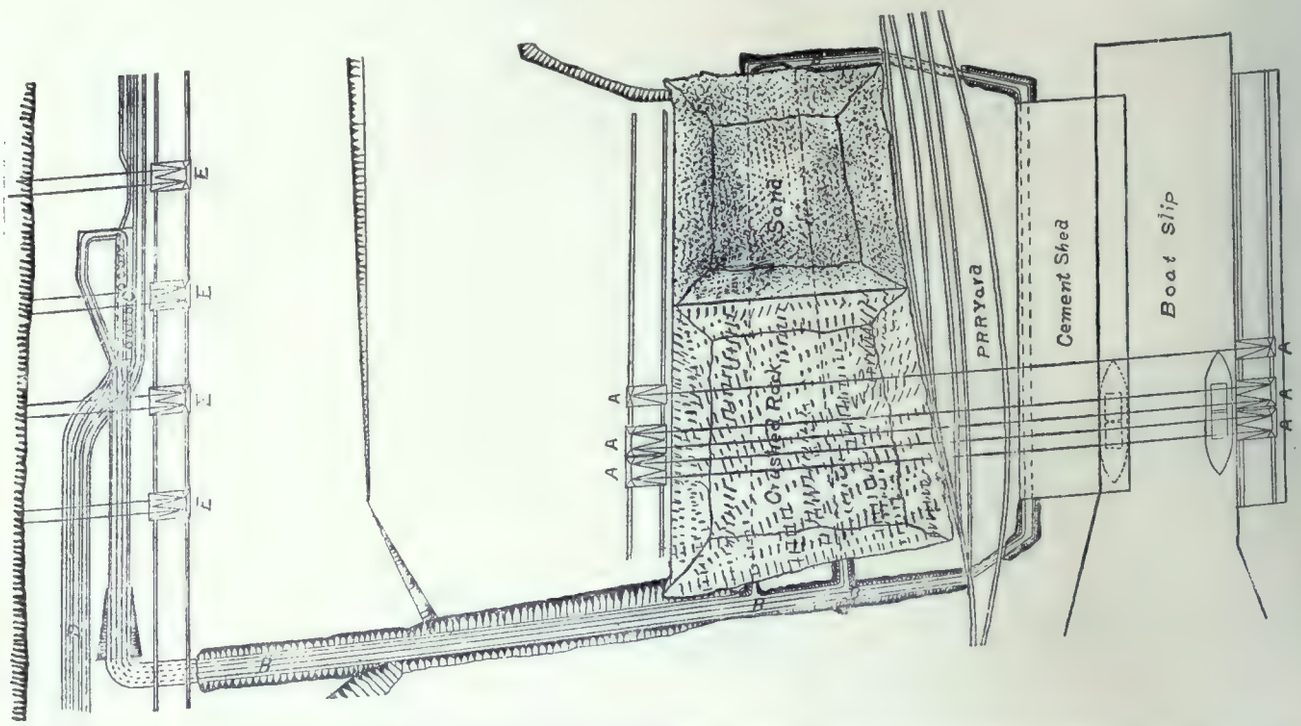
ways, considerable difficulty has been experienced in retraining the operators from racing with each other. The cableways have frequently been operated at a speed of 3,000 ft. per minute, which, being at present too severe for the fall-rope carriers, is now limited to 2,500 feet per minute. Some of the small pieces forming the heads of the fall-rope carriers are being replaced with heavier pieces which, it is believed, will admit of even the higher speed.

Another feature of these cableways which is new is that the bucket is counter balanced like a passage elevator. Thus only the net load has to be hoisted and only enough power is required to do this and overcome friction and inertia.

The eight cableways used for putting the materials in place in the lock walls are similar in span, height, style of

Another View of the Carriage and Buckets, Showing also the Fall-rope Carriers.

towers, and method of control to those for unloading the materials, but they will never be called upon for such rapid work. While they will handle the entire amount of concrete, and besides this, the wooden forms and the many tons of old rails which are to be put into the concrete for reinforcement, there are eight of them as against five of the others, and each will have much less to do. This is necessary as the placing of the concrete requires care and deliberation. The immense quantity of concrete material for the Gatun locks will perhaps be better appreciated if one remembers that handled separately it amounts to more than 3,300,000 cu. yards., while the total cubical contents of the Great Pyramid is only 3,800,000 cu. yds. Tradition says that it took 100,000 men a hundred years to build the Great Pyramid. The Gatun locks are morally sure to be finished before January 1st, 1915, and may be ready for opening the canal for use in 1913, thus justifying the confidence of "that 1913 crowd."



Plan of the Cableways, Showing their Relationship to the Br anch of the Old French Canal where the Barges Arrive, the Cement Shed, the Storage Yard, and the Automatic Electric Rail ways.

THE · ARCHITECTURE OF · ADVENTURE

By PROFESSOR W. R. LETHABY.

"The spirit of experiment in building has been the living force and active principle of all architecture."—Paper read before R. I. B. A.

BY THE ARCHITECTURE OF ADVENTURE is meant the spirit of experiment in building which has been the living force and active principle of all architecture. If it is desired to give two separate though consistent meanings to the words architecture and building, by the first we must mean building enhanced by sculpture and painting—that is, building completely furnished as Morris says. In any case mere needful and experimental building is the main substance, force, and origin of the art. So far as it has to meet changing conditions and ideals it must be experimental. Therein lies the present difficulty. From a review of the attempts made it would seem impossible to continue in old ways or revert to past types. We have passed into a scientific age, and the old practical arts, produced instinctively, belong to a different era. History shows that any basis on which there can be general agreement over a long space of time will produce architecture of a sort. The one thing essential is this agreement, so that a process of development may be set up by continuous experiment. The only possible basis of agreement at the present time is the scientific method.

The Greeks probably took over the notion that architecture was to be reached through a system of ratios from the Egyptians; in any case it belongs to many ancient peoples. Greek thought on the matter was very clear-cut, and with them proportion meant a definite pre-arranged relation of measured quantities. Polycletus, the sculptor, wrote, "Success in art is attained by exactness in a multitude of arithmetical proportions." Greek artists all agreed to such a theory. Notwithstanding this their architects, as a matter of fact, seem nearly always to have been engineers. The engineering element in Roman architecture is most marked and it was this indeed which entirely burst the old bottles of tradition and transformed the art into one of daring structural adventure. Most of the great Roman architects seem to have been engineers in the strict sense. The identity between engineers and architects continued into the Byzantine period, and into the Middle Ages. The great Mediæval buildings are solutions of problems of how to throw stones high into the air and balance them there. A great French castle or cathedral was not designed as beauty, it was developed along a line of experiment as surely as the great ocean liners are being so developed.

With the Italian Renaissance men there was a set-back. The mighty architecture of ancient Rome was studied certainly, but for the mere fashion of outward adorning and not for its science of construction. The notebooks of Leonardo da Vinci, however, are full of practical exercises and of experiments. Indeed he was the first to enter on a systematic inquiry as to the mechanics of architecture. Amongst his schemes was one for a town, for he was a pioneer in town planning as well as in aviation. The only other artist of the Renaissance who caught the idea of investigating principles was Durer, and he possibly had access to Da Vinci's notes. In his manuscripts in the British Museum are some studies of domes of a parabolic section and some exercises in plan schemes.

Although Wren was not a world-genius like Leonardo da Vinci, he was in many respects an English Leonardo, and the one architect we have had whose formal thought (as opposed to the flashes of insight of a dozen men like Pugin) matters. More even than a great artist, Wren was a great man. Robert Hook, another scientific architect and his friend, says of him, "Since the time of Archimedes there scarce ever met in one man in so great a perfection such a mechanical hand and so philosophical a mind." Wren was almost certainly the first in England to apply the methods of scientific investigation to the laws of structure, and Hook is said to have been the first who stated the mechanical properties of the arch.

It seems clear that Wren contemplated writing a history of architecture and also a general philosophy of its first principles. The notes were probably written when, over eighty, he had retired from active work to pass his time in contemplation and studies. His intention appears to have been to give "a larger idea of the whole art" of architecture, beginning with the reasons and progress of it from the most remote antiquity, and thereby to reform the generality to a better taste.

Architecture aims at eternity, and therefore is the only thing incapable of modes and fashions in its principles. "The orders are not only Roman and Greek, but Phœnician, Hebrew, and Assyrian, being founded upon the experience of all ages, promoted by the vast treasures of the great monarchs and skill of the greatest artists and geometricians, everyone emulating each other." The orders, that is, were admirable so far as they embodied much experiment and long experience. He complains that while architects dwell too much on the ornamental side of architecture they slightly pass over the geometrical side, "which is the most essential part of architecture. For instance, can an arch stand without butment sufficient? If the butment be more than enough it is an idle expense of materials; if too little it will fall; and so for any vaulting; and yet no author hath given a true and universal rule for this nor hath considered all the various forms of arches." Wren then investigates the laws of stability by consideration of the centres of gravity of the several parts, and concludes: "The design where there are arches must be regulated by the art of statics and the duly poising of all parts to equiponderate. Hence I conclude that all designs must in the first place be brought to this test or be rejected." He says that he adopted the form of vaults used at St. Paul's from Sta. Sophia "because it was the lightest manner and requires less abutment; I have therefore preferred it to any other way used by architects." Some sketches for the great dome show that its section was conceived as conforming to a general parabolic curve rising from the plinths of the great piers and passing through the abutments and over the crown of the so-called cone. Wren saw, and probably was the first of architects to do so, that necessity, which he equates with nature, must be one with beauty.

There is a view as to the meaning and content of architecture which holds that it is primarily building according to the natural laws of structure and stability, according to need and order, and always with care and finish. That it must ever vary with ever-changing conditions, and that

this ordinary building may have associated with it painted and sculptured stories, or inlays or fretted works and gildings, while the essential architecture is still structure, and the method of architectural growth is by continuous experiment in the possibilities of structure. Nevertheless it should be clearly understood that any quest for originality just blocks the way, with our preconceptions and limitations, to any possibility of realizing a true originality, which properly is of the root, not of the appearance. True originality is to be found by those who, standing on the limits of the sphere of the known, reach out naturally to some apprehension and understanding of what is beyond; it is the next step in an orderly development.

What should be urged is concentration on practical, experimental, and scientific education. What we most need at the present time is the accumulation of power; we want high mechanical training, wide practical experience, and great geometry. And then we want to cover the field by a systematic research into possibilities. The possibilities of walls and vaults, and of the relation between the walls and the cell, and between one cell and another, want investigating. It is true such a training would not include the whole of architecture, but it would open the way to the best we can attain. We might hope thus to give up hugging the coasts of the known, to sail boldly forth under the stars. Thus, and thus only, may we enter again upon the architecture of adventure.

Building has been, and may be, an art, imaginative, poetic, even mystic and magic. When poetry and magic are in the people and in the age they will appear in their arts, but there is not the least good in saying, "Let us build magic buildings. Let us be poetic." Yet it is because these things are wanted that this problem must be faced.

Something desperate must be done. We should devote the next session to papers on constructive science, get Professor Karl Pearson to give his researches on the arch, Professor Perry to draw up a report on the application of mathematical inquiry to structures, and our Fellow, Mr. Dunn, should lecture on modern constructure problems. As talking of reason in design is to be tabooed as a self-evident truism, someone who is prepared to commit suicide should examine the prevalence of *irrationality* in modern buildings. The scientific side of our examinations should be rapidly screwed up, and the archæological side as rapidly unscrewed. All our travelling studentships should be made to bear on the same quarter. Pugin students should be made to analyze varieties of mediæval vaults, and Soane students varieties of staircase arrangement. Tites should be sent to study French railway stations, Grissells to work at German hotels, and Godwins to American hospitals.

To emulate the highest in our art we need first the natural, the obvious, and, if it will not offend, the reasonable, so that to these, which might seem to be under our own control, may be added we know not how or what of gifts and graces. Thus may we hope to combine the two realities, the reality of natural necessity and common experience, and the reality of the philosophers, which is the ideal, and to reconcile again art with service.

HARD WOOD IS USED only to a limited extent for floors. The condition existing in the vicinity of Liverpool is quite the reverse from that throughout the continent of Europe, where even the most modest apartment houses are equipped with hard wood floors. In Liverpool the great majority of residences are carpeted, and it is principally in modern office buildings, which are of recent date that hard wood flooring is used. The hard wood flooring used is principally of oak and maple. Very little beech is used. The usual sizes are as follows: Mostly 1-inch thick, some 1¼-inches; widths, 3, 3½, 4, and 4½ inches, chiefly 3½ and 4 inches; lengths, practically all three feet and up. Two-foot lengths have been called for, but do not represent more than 5 per cent. of the trade. Prices, £30 to £40 ($145.99 to $194.66) per standard, Liverpool. In parquet flooring the sizes are: Thickness, 1 to 1½ inches; width, 2 to 3 inches; length 9 to 12 inches. It appears that while ordinary flooring is tongued and grooved with matched ends, parquet flooring is grooved on the sides for mortar, or tongued and grooved, and end grooved on both ends, (but not tongued on the ends). Parquet flooring is steel polished, not sanded on the face. The price paid in carload lots is about 5s. ($1.21) per cubic foot. It is shipped in bundles or sacks and in uniform lengths only. Only ordinary flooring is bored for secret nailing. All flooring is hollow backed. The hard wood flooring used in this market is imported prepared for use.

HOT WATER HEATERS AND RADIATORS

THE HOT WATER HEATER has become fully established as an adjunct in the equipment of the modern building. It has both a sanitary and ecenomic feature that makes its adoption at least to be desired, if not an absolute necessity. The two essentials to be considered in the installation of a hot water heater, is, first, its efficiency; and the other, economy; that is how to obtain efficiency and an adequate hot water supply with the least possible fuel consumption. An exceptionally splendid apparatus in this respect, and possibly one which stands without a peer to-day, is the "Electric Weld" Combination Boiler and Gas Heater, for which A. Welch & Son, 304 Queen street west, Toronto, are the Canadian agents. This heater is adapted for use with either coal range or gas, and is suitable for all kinds of hot water service for residences, apartments, hotels, office buildings or any place where hot water is required. It is spontaneous in operation, and heats 1.3 gallon of water from 64 to 140 degrees, and 3 gallons of water from 64 to 90 degrees for immediate use. This means water at bathing temperature instantly from the lighting of the gas, at the full rate of a ¾-inch faucet, with city pressure. Where natural gas, which has nearly double the B.T.U. of artificial gas, is available, the results obtained are, it is claimed, in like proportion. The burner of the "Electric Weld" heater is of the Bunsen type, with raised gas ports, giving perfect combustion and adjustable to a gas consumption of from 30 to 50 feet per hour. It is not permanently attached to the heating coils in any way, and can be removed without breaking any of the connections. The heating coils, themselves, are formed of brass sections—hollow six-limbed crosses of cast brass, and arranged in such a way that the heat from the boiler impinge against each separate column from top to bottom. One feature in this connection is that the heating sections can be readily cleaned, if necessary, while same are in position, by the use of a small brush—the same that is in use for cleaning lamp globes. There is absolutely nothing to get out of order. The apparatus is decidedly simple in construction, and it can be disconnected or assembled by any plumber without the necessity of cutting the pipe or changing the fittings. The parts are made in standard sizes, and they can be obtained at a moment's notice either from the factory or branch agencies. They are simple and few in number, and where repairs are necessary, their installation does not require the service, or entail the cost of an expert. The Canadian National Exhibition at Toronto, where Messrs. A. Welch & Sons will have a display, will give the architects, plumbers and others interested in the hot water problem an excellent opportunity to judge the exceptional merits of the "Electric Weld" heater. It will also give them a chance to inspect Kinnear Pressed Radiators for steam and hot water heating, which this firm also handles. These radiators are made of pressed metal, and they were first put on the market in 1903, from which they have rapidly grown in favor. Among the advantages claimed for these radiators over other makes, are that they occupy only from one-half to three-fifths of the space otherwise required; weighs one-quarter as much, cost 75 per cent. less for freight and handling; has absolute heat control; no holes or pockets to catch the dust, and will not burst with frost. They are highly artistic in design, and can be furnished in single, double or three column sizes for wall or floor space, as the occasion demands.

MACHINERY AND TRADE

NEW TORONTO SHOW ROOMS.

THE STANDARD IDEAL COMPANY wish to announce the opening of their new building, formerly Oak Hall, King st., East, and to extend a cordial invitation to architects, and those interested, to visit their show rooms and examine their extensive line of high grade, sanitary, enamelled plumbing ware.

The new premises have been remodelled to facilitate inspection and enable architects and owners to readily select the character of plumbing fixtures best suited to meet their particular requirements.

There is no item in the erection of a building that is more important or demands greater attention than that of the plumbing fixtures. While appreciating the necessity of carefully considering the equipment of the lavatory, bath room or toilet, there are few prospective owners who can clearly conceive from a building plan, the exact scheme as worked out in the architect's mind. Realizing the need of more adequate facilities for practical demonstration, the Standard Ideal Company has accordingly altered their new premises, so as to give every reasonable means to those interested in sanitary enamelled plumbing fixtures, to properly judge what is required either as regards individual pieces or combination sets.

Oak Hall Building, King St. E., Toronto, Recently Acquired by the Standard Ideal Company, Port Hope, Ont., and Remodelled into Modern Show Rooms and Sales Department for High Grade Plumbing Fixtures.

One of the exceptional features of the new show rooms is the tiled bathrooms completely equipped with "Alexandra" ware. These bathrooms have been fitted up at considerable expense and are designed to show the advantage the many different styles of "Alexandra" fixtures. "Alexandra" ware is the most sanitary and most beautifully designed cast iron enamelled ware manufactured. It is made in two parts, enamelled inside and out, light in weight, and convenient to handle. In design there is no ware in any point of comparison which equals these beautifully white symmetrical fixtures. In sanitary properties "Alexandra" ware is par excellence. It is manufactured of the highest grade of cast iron, with which is united a specially prepared procelain enamel so that the expansion and contraction of the two materials are equal, thus rendering it impossible for the enamel to craze or crack, which is the case with so-called solid porcelain ware that in time, through the crazing of the enamel, becomes water logged and unsanitary.

These new show rooms in their complete equipment not only give the architect, plumber and owner an opportunity to view samples of the company's exceptionally large line of cast iron enamelled ware, but, in these specially designed bathrooms, it is possible for them to appreciate the most wonderful achievement that has been made in the design and manufacture of bathroom fixtures and sanitary fittings, and to appreciate the beauty and sanitary properties of "Alexandra" ware, as it appears when actually installed.

I.C M.C. COMPETITION.

IN KEEPING WITH THE AGGRESSIVE METHODS employed by the Ideal Concrete Machinery Co., they have announced it their intention to conduct a $500 prize competition, consisting of 16 prizes for photographs of the best buildings erected of Ideal Concrete Blocks. The contest is open to all users of Ideal Concrete block machinery in the United States and Canada, and in all section of the world, and the programme provides for photographs of every type of building in which concrete blocks were used, including residences, barns, garages, churches, factories, stores, hotels, banks, halls, silos, etc. It further provides that all photographs must be made from 8 x 10 negatives, or larger if possible. If it is impossible to obtain negatives of this size the 5 x 7 size will will be acceptable. All photos should be mounted on linen, and should be sent in either to the company's office at London, Canada, or to South Bend, Ind., U.S.A., before November 1st.

The following is a list of the prizes offered:

First Prize—For the most artistic construction of Ideal Blocks	$100.00
Second Prize—For the second best construction of Ideal Blocks	75.00
Third Prize—For the third best construction of Ideal Blocks	50.00
Fourth Prize—For the fourth best construction of Ideal Blocks	35.00
Fifth Prize—For the fifth best construction of Ideal Blocks	25.00
Sixth Prize—For the sixth best construction of Ideal Blocks	15.00
Eeventh Prize—For the best Silo construction of Ideal Blocks	70.00
1 Special Prize of $50.00 for the most artistic construction of Stucco on Ideal Blocks	
1 Special Prize of $50.00 for the most artistic porch built of Ideal Ornamental Mold products. (Ideal Blocks used with molds admissible.	

In announcing this competition, Mr. M. Wetzstein, president of the company, says in part: "We intend making the Ideal Concrete Building Block the standard building material to be specified by the architect and used by the contractor and builder if we must sit up day and night to accomplish it. Every day we are learning of splendid buildings of all kinds being erected of Ideal Blocks. We want the public to know this and, therefore, cause a demand for Ideal Blocks that will increase the output of every Ideal Block manufactory.

The five judges selected are: Mr. C. W. Boynton, inspecting engineer, Chicago, Ill.; Mr. E. R. Austin, Government architect, South Bend, Ind.; Mr. Henry G. Christman, contractor and builder, South Bend, Ind.; Mr. Ivan S. Macdonald, editor Construction, Toronto, Canada; Mr. Jno. Moore, architect, London, Canada.

In connection with this competition we might state that that the Ideal Concrete Machinery Co. is to be complimented upon their constant endeavors to promote better design in structures constructed of concrete blocks, and the many very excellent buildings that have been erected of this material bear unmistakeable evidence of the fruit of their labor in this direction.

We predict that the number of photographs of highly creditable work in concrete block construction will be surpisingly large and their publication will prove interesting to both architect and contractor alike.

EADIE-DOUGLAS LTD., ENLARGES.

IN ORDER to better facilitate the carrying out of contracts and to further add to the already high efficiency of their present services, the Eadie-Douglas, Limited, of Montreal, have opened, in conection with their other lines, an exclusive mechanical and steam department under the management of Mr. G. M. Milligan, until recently associated with Manning, Maxwell and Moore, of New York. Mr. Milligan has had a broad experience in mechanical and steam engineering, and the conduct of the department

New Premises of Eadie-Douglas, Limited, 12-14 University Street, Montreal.

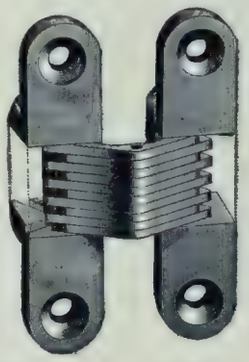
under his management, assures the architect and engineer a quick and satisfactory service in the execution of their contracts. The new department will be devoted exclusively to highest grades of mechanical and steam specialties and supplies, and will enable this firm, through their various connections, to quote promptly on complete specifications.

The new premises of the Eadie-Douglas, Limited, on University Street, which is illustrated herewith, interestingly incorporates in its construction, a number of the various building materials in which this concern specializes. This building was remodelled by Messrs. Saxe & Archibald, architects, to meet the particular requirements of this rapidly growing firm. The lower portion of the structure is finished in Burmantofts Marmo terra cotta, and the ground floor which forms a large, well-lighted and excellently appointed show room, is floored throughout with Terrano flooring. On the upper floors, the space is divided in modern offices which give every facility and accommdation for the various departments and clerical staff. In addition to the Eadie-Douglas direct interests, the Terrano Flooring Company, Limited; the Insulyte Company, and the B. F. Sturtevant Company, whom the Eadie-Douglas firm represent, also have offices in the building.

INVISIBLE HINGE.

MUCH ATTENTION HAS BEEN GIVEN to interior trim by architects, contractors and millmen during the past decade and the degree of perfection that characterizes the interior schemes of the simplest residence and the loftiest skyscrapers has been carried to a point little dreamed of a few years ago.

Hardware has played no little part in this exceptional development. The original, hard, utilitarian characteristics of interior hardware fittings have given place to



Soss Invisible Hinge as it Appears when Open.

beautifully wrought, stamped and cast designs to harmonize perfectly with any interior scheme, the architect may desire to carry out. There is invariably, however, one jarring note in the otherwise harmonious effect produced by beautifully designed modern hardware. That jarring note is the hinge.

The protruding hinge has successfully defied all the skill of the modern craftsman. Its utilitarian functions remain always its predominant feature, and cannot be hidden even by the most expert designer. It has remained for the Soss Invisible Hinge to solve the difficulty. If the hinge cannot be made beautiful, then we must hide it. That is simply what has been successfully accomplished in the Soss Invisible. This hinge is simple, strong and highly practicable.

A view of one of these hinges, as it appears when the door is open, is shown in the accompanying cut; the hinge is very strong, being made of a composition metal that is frictionless, and will stand as much rough usage as the old-fashioned hinge. The Number 116 invisible hinge will carry a door 1⅜ to 2½ inches in thickness. The Company furnishes a template for use in laying out the mortise, so that the hinges will fit perfectly when applied. The point is made, that any carpenter can hang a door just as easily and quickly, as with a common butt. The

hinges are provided with a roller bearing and work smoothly and with entire satisfaction.

The illustration which we present herewith, represents No. 112. The hinge can be seen only when the door on which it is applied, is open, as there is no projecting metal on either side of door. It is applied to the same part of the door and jamb, as the ordinary butt, and requires no special arrangement of the work. The hinges are adapted for wide application, but will be found especially suited for panel work, lockers, closets, partition doors, cabinets, bookcases, wardrobes, folding tables, china closets, ladies' writing desks, caskets, etc.

Another feature of the Soss Invisible Hinge is the fact that it is absolutely sanitary, and is therefore especially adapted for use in hospitals, sanitariums, hotels, etc., for which it is being rapidly adopted.

It is also now being used on Pullman cars, motor boats, etc. In fact the Soss Invisible Hinge is rapidly coming into use wherever a hinge is required. It has no unsightly straps exposed, and enhances the beauty of the door, room or cabinet wherever it is used; simple, strong, durable, practical and invisible as it is, the Soss Invisible Hinge promises to be a favorite with architects, contractors and owners alike. It is manufactured by The Soss Invisible Hinge Company, 104 Bathurst Street, Toronto, Canada, who will be pleased to supply additional information, prices, etc., upon request.

RAPID CONSTRUCTION.

STRUCTURAL STEEL WORK as applied to the erection of buildings excited little or no attention a quarter of a century ago. This was because at that time the adoption of structural steel to building construction was practically an untried quantity. It remained for the advent of the modern business building—the skyscraper which thrusts its huge frame in towering outline to set the wayfarer of the city street in amazement at the wonderful accomplishments being carried out. There is a picturesque quality about the "cowboy of the sky," as the structural steelworker is known, as he trips along his narrow path of steel, or swings through the air at the end of the boom, assembling the beam and girders, far above the pavement below, which makes him a fascinating character, and an inspiration to writers to record his daring both in epic and prose.

Toronto recently had an opportunity in the erection of Ambrose Kent and Sons' new building, at the corner of Yonge and Richmond streets, to witness the speed with which work of this nature can be carried out. The framework of this building, which is a ten-storey structure, embodying 650 tons of steel, was carried to completion in the remarkably short time of 28 working days. The work was begun July 19, and the structural members of the steel frame was completely in place on August 24th. It has been the general opinion until lately that the facilities of Canadian manufacturers and steel fabricators were in adequate to the task of executing work in a time such as modern business conditions and requirements will allow. Increasing land values and the demand for accommodations make it imperative for work of this character to be accomplished in the shortest time possible. But, the erection of the steel work of the Kent Building demonstrates the fact that it is not necessary for Canadian interests to go beyond the boundaries of the Dominion; and this fact is further demonstrated in the erection of the framework of the Standard Bank Building, King street, Toronto, which was put up by the same concern.

During the process of construction, the work proved a subject of daily interest to the passing throngs, and the rapidity and thoroughness with which it was carried out is a glowing tribute to Canadian manufacturing resources, engineering skill and working organization; and conclusive evidence that Canadian architects and engineers can easily have their largest and most important structures executed by Canadian contractors.

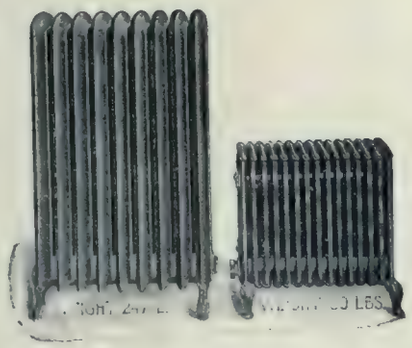
WOOD STAINS.

THE IMPORTANCE OF WOOD STAINS and preservatives is something which has thoroughly impressed itself upon the architect and builder. It has simply remained with them to test and judge the merits of preparations of this nature, to ascertain the one which will produce the most consistent decorative results, and enhance the durability of the character of material to which it is applied. Attention is called in this instance to the well-known preserving qualities and beautifying effect of "Creosote Shingle Stains," whose value as a preventative of decomposition in wood construction has long been demonstrated by the fact that for many years these stains have been specified and adopted by both the foremost architects and builders in England and France, as well as on this continent. It is, however, only in recent years that "Creosote Shingle Stains" have become generally used. First coming into prominence as an artistic exterior finish, it is now being employed almost universally, not only on shingle roofs, but on barns, fences, outbuildings and wherever the architect and builder seeks to produce a harmonious blending of colors with the surrounding landscape. One of the essential features of this particular stain is that, as its name would imply, being made of creosote oils, it possesses a penetrating quality and germ-destroying virtue, such as is claimed is not found in other stains in which creosote oil is not a constituent. A number of Canadian houses have in recent years come prominently to the front in the manufacture of this line, among them the Manton Bros., whose announcement appears elsewhere in this issue. This firm supplies the trade from coast to coast, and they are perhaps the largest producers in this respect in the Dominion.

Kinnear Radiators

ARE

Noted for Extreme Lightness and of Handling. They Require but One-half the floor space and Weigh One-fourth as much as Cast Radiators.



Comparative size of Kinnear and old-time Radiators.

KINNEAR RADIATORS are strong, efficient, light, compact, sanitary, durable, and quick acting. Can heat a room in half the time it takes to heat with a cast heater. **Kinnear Pressed Radiators** will last a life time.

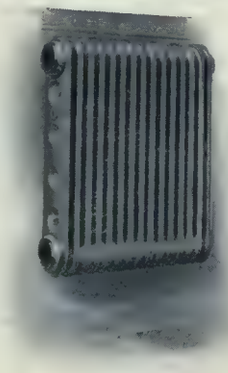
Kinnear Radiators Weigh 60 Lbs., the Cast 247 Lbs.

Kinnear Radiator

They are Built on the Plan of a Sheet Iron Stove, to Get Instantly Hot on turn of the Valve, and to get Heat out into the Room, Where it Heats You, not the Radiator.

You have absolute control of heat, will not burst with frost, have better circulation of water, and greater condensation power for steam.

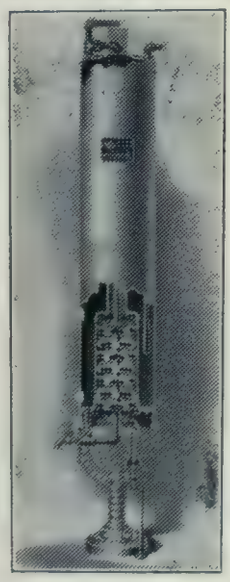
Hold 40 per cent. less water than cast radiator, consequently effect a great saving in fuel, as it is much easier to heat 36 gallons of water than 60.



Kinnear Wall Radiator.
Requires half the space of the Cast Iron.

Why persist in heating up a ton or two of cast iron before you get any heat out of your radiator for yourself?

Kinnear Radiators are being specified by leading Architects on the American Continent. Send for us.



The Electric Weld Combination Boiler and Gas Water Heater

Adapted for use with either Coal Range or Gas. One of the chief features of this, the most economical and efficient heater on the market, is the fact that it is absolutely automatic in operation, being fitted with a thermal valve. It can be regulated to heat water to any temperature and as the heated water is drawn it is automatically replaced and heated to the same temperature. Suitable for all kinds of Hot Water service; for Residences, Apartments, Hotels, Office Buildings, or any place where Hot Water is required. It is not necessary to place the Electric eld Heater in the basement, it can be placed anywhere. It is dustless, ashless, odorless, cool, quick, safe and convenient. Unlimited hot water for family using several bathrooms, laundry and kitchen, for half a cent an hour. Electric Weld Heaters are simple, so can easily be repaired.

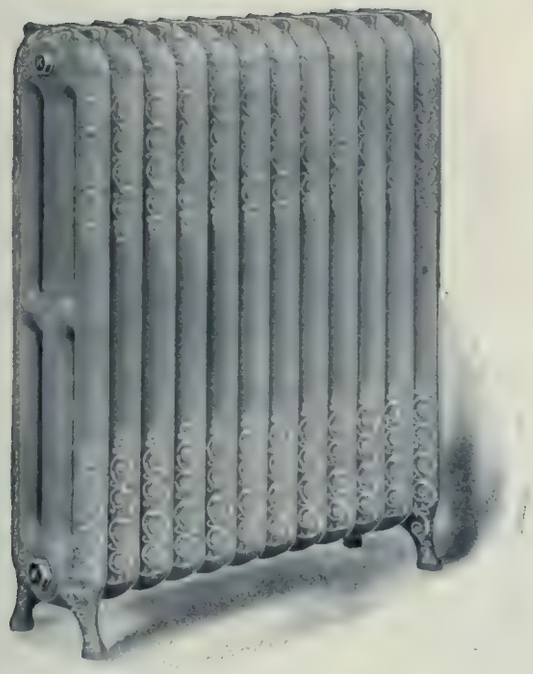
Electric Weld Combination Boiler and Gas Water Heater. Consumes only half as much gas as the independent heaters. Guaranteed in every way. Costs half of other instantaneous water heaters. Price, with thermal valve, $48.00; without, $38.00.

We have a large exhibit at the Canadian National Exhibition. Look us up, and be convinced that we have the best on the market.

A. WELCH & SON,

Selling Agents for Ontario,

302 Queen St. West, TORONTO

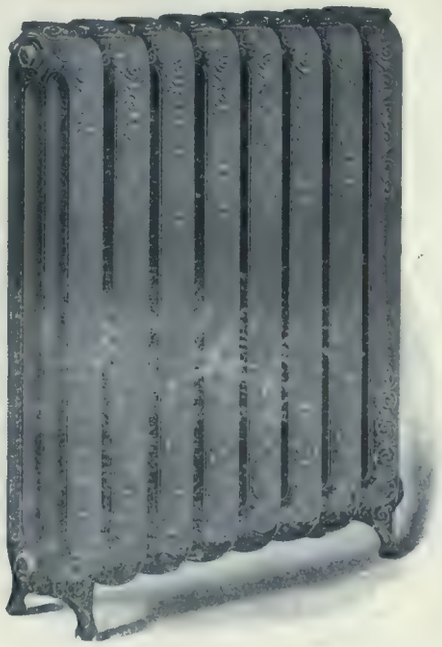


King Radiators are honest radiators in build, rating and design. They are made in the best and finest equipped radiator plant on the continent, which employs only the most skilled workmen.

The superior quality and smoothness in finish of the castings used, and the graceful and artistic lines in their construction, make

King Radiators

scientifically, practically and mechanically a masterpiece —the most perfect steam and hot water radiators on the Canadian market. The ornamentation is raised—not sunk. They are handsomely built, aesthetic in proportion, and the relief ornamentations are such as to adapt the **"King"** to various combinations in color decorations.



See them—then compare with others

THE KING RADIATOR CO., LIMITED

St. Helens Ave., near Bloor. TORONTO

CLUFF BROS., TORONTO, SELLING AGENTS

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

Vol. 3 **TORONTO, OCTOBER, 1910.** **No. 11**

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H. GAGNIER, Limited, Publishers

Saturday Night Building

TORONTO - - - - - CANADA

BRANCH OFFICES

MONTREAL—Board of Trade Building. LONDON, ENG.—Byron House, 85 Fleet St. E.C

Lincoln Cathedral—View showing the Great West Front with its Massive Twin Towers and the Great Central Tower in the Background. (See page 45.)

¶ Building returns show brisk activity—Substantial advances noted in eighteen out of twenty-four important centres—Average gain for August, 24 per cent. . . .

BUILDING OPERATIONS throughout the Dominion still remain strikingly brisk with little or no signs of an approaching subsidence. On the contrary, the outlook for fall work was never more promising. August wound up the summer season in a manner quite in keeping with the marked development which has continued throughout since the beginning of the year. Permits issued in twenty-four important centres reporting to CONSTRUCTION, total $8,257,984, as against $5,799,800 for the same period in 1909. This gives an average increase of 42 per cent., a gain which can be taken as being fairly representative of the situation in general.

While all sections fared exceedingly well, the West in particular, enjoyed a most consistent expansion. Omitting Vancouver's loss of 11 per cent., which borrows but little from the splendid total gain already made by that city, not a solitary break is noted. Saskatchewan presents in itself an array of statistics which show a most marvelous state of development. Saskatoon has an increase of 927 per cent., Prince Albert a gain of 586 per cent., and Moose Jaw an advance of 502 per cent., thus giving this province the highest increase per cent. recorded for the month in one, two, three order. Regina also shows a very gratifying total although the gain, 5 per cent., is not nearly as pronounced.

Equally as prosperous was the condition in Alberta. Calgary made a gain of 82 per cent., representing an investment of nearly a half-million, and Edmonton and Lethbridge surpassed their corresponding figures to the extent of 34 and 67 per cent. in order named. Aside from these places, other gains noted are: Victoria 50 per cent.; Winnipeg 27, and Brandon 55 per cent. Winnipeg total is second largest amount registered, permits having been issued for new buildings aggregating value $1,449,100 as against $1,135,250 in August 1909.

In Ontario three losses occurred, viz: Windsor 23 per cent., Ottawa 54, and London 30 per cent.; but these are effectively counteracted by the heavy investments made and the high percentage attained in other centres. Hamilton made an excellent showing, netting a gain of 123 per cent; as did also, Port Arthur, where the total was 186 per cent. greater than last year. Fort William and Brantford are ahead by a margin of 21 and 10 per cent., respectively, while Toronto, with an advance of 28 per cent., registers the highest amount ($1,713,040) recorded in the Dominion. Berlin does not submit comparative figures, but an amount which places operations for the month at $17,400.

In Quebec the condition seems to be clearly indicated by the figures of Montreal, which show a rise of approximately $700,000; the exact value of permits being $1,393,047, and the increase noted 99 per cent. It is quite likely, in view of the pronounced activity in this case, that other cities in the province also made substantial strides. Further east, St. John and Sydney annex gain of 22 per cent. and 17 per cent. respectively; although Halifax is in arrear with a decrease of 45 per cent., the comparative amounts recorded, however, being quite small.

	Permits for July, 1910.	Permits for July, 1909.	Inc., Per cent.	Dec., Per cent.
Berlin, Ont.	$17,400	.....	.....	.....
Brandon, Man.	45,450	$29,200	55.65	.....
Brantford, Ont.	56,680	51,218	10.66	.....
Calgary, Alta.	440,998	242,175	82.09	.....
Edmonton, Alta.	133,900	99,707	34.29	.....
Fort William, Ont.	204,580	168,935	21.09	.....
Halifax	13,800	25,117	.....	45.06
Hamilton, Ont.	230,100	102,755	123.93	.....
Lethbridge, Alta.	122,325	73,100	67.33	.....
London, Ont.	40,705	64,137	.....	36.54
Montreal, Que.	1,393,047	699,255	99.21	.....
Moose Jaw, Sask.	314,275	52,150	502.63	.....
Ottawa, Ont.	146,800	321,600	.....	54.36
Port Arthur, Ont.	75,200	26,600	182.70	.....
Prince Albert, Sask.	212,750	31,000	586.29	.....
Regina, Sask.	175,615	166,924	5.20	.....
St. John, N.B.	69,825	56,900	22.71	.....
Saskatoon, Sask.	348,330	33,850	929.04	.....
Sydney, N.S.	22,250	18,950	17.41	.....
Toronto, Ont.	1,713,040	1,335,332	28.28	.....
Vancouver, B.C.	745,235	841,020	.....	11.39
Victoria, B.C.	212,814	141,040	50.88	.....
Windsor, Ont.	63,775	83,625	.....	23.74
Winnipeg, Man.	1,449,100	1,135,250	27.64	.....
	$8,257,984	$5,799,840	42.38	.....

¶ R.A.I.C. holds successful assembly in Winnipeg—Federation of Provincial bodies completed—Importation of foreign plans and the labor situation discussed. . . .

IN THIS ISSUE we give considerable space to a report of, and papers read before the Royal Architectural Institute of Canada. This national organization of architects has journeyed through many difficulties, but has eventually arrived at the point where it may be termed a "going" institution. We have said much in these columns with regard to the organization of the Institute, and with the various difficulties that have had to be overcome by its organizers, and the fact that these difficulties have been overcome, and that the Royal Architectural Institution of Canada is a real effective working organization is evidence of the consistency, good judgment and untiring energy of its promoters.

The banquet was one of the largest, if not the most fully attended of any ever held by an architectural organization in Canada. The speeches were bright and the western hospitality, which is so well known by Easterners who have had the privilege to have had experience

in the West, showed conclusively that the West is surely a substantial arm of Canada.

The control of labor in the building trades by United States officials was dealt with by President F. S. Baker, and his remarks were very much emphasized by those of Mr. Carter, President of the Winnipeg Builders' Exchange with reference to the existing lock-out of buildings trades employees in Winnipeg. President Baker also made some very terse remarks with regard to the employment of American architects in Canada, stating that the Dominion Government should view with a greater concern the inefficiency of our present tariff laws on architectural plans. Mr. Baker recommended an increase in the duty on imported plans. A very interesting coincidence occurred during the Convention of the R. A. I. C., which we have reason to assume was prompted somewhat by the operations of the Institute, in the seizure of the plans of the Bank of Montreal, prepared by Messrs. McKim, Meade & White, of New York. The action of the customs authorities was unanimously approved of by the members in convention. President Baker, who was re-elected, is to be greatly commended upon the success of his efforts in arranging for the adoption of a constitution that has been approved of by the various provincial bodies in the Dominion.

¶ American contemporary deprecates CONSTRUCTION's attitude toward the employment of United States architects in Canada —Believes that better reciprocal relations should exist.

WE PRODUCE HEREWITH an editorial from our contemporary, "The Western Architect," and from its contents one would assume our American friends were really desirous of being reciprocal, but are they? How many Canadian architects have ever had a commission in the United States? And if a prominent Canadian architect did secure a commission to erect a building in the United States, how would they get their plans over there? We know of one or two of our Canadian architects who have had some experience in this direction. This editorial reads very much like a letter that was received by a prominent Canadian architect from a fellow architect of New York, who deprecated the unethical attitude of CONSTRUCTION toward the interview that appeared in "The Toronto Star," and stated that he was rather sorry to learn that Canadian architects did approve of such severe criticism. He also spoke of some work he had done in Canada, and of the fact that he believed Ontario architects were too broad-minded to approve of such methods. He further stated that the line between Canada and the United States was purely an imaginary one and thought that American architects should not find it a barrier.

We are perfectly free to admit that it would not be a bad plan if there were some reciprocal relation between Canada and the United States in the matter of architectural plans, but we are not free to admit that the plans of American architects should be admited into Canada, and that those of Canadian architects should be barred from the United States.

In regard to the statements of our contemporary relative to the interview in "The Toronto Star," we would state that they know little or nothing about the affair, and are in no position to make any intelligent comments upon the same. We would state that we do not require American architects to erect Canadian buildings. It is perfectly true and right that the architectural profession of this country and of the United States should be friends, but until such time as Canadian architects are permitted to prepare plans for buildings to be erected in the United States, we have no right to believe that American architects have a right to assume that the boundary line between this country and the United States is purely an imaginary one. The remarks of our contemporary in question are as follows:

"The happily infrequent 'growing pains' of latter day architectural progress on the North American continent have broken forth during the past month over statements said to have been made by Eustace G. Bird, of the firm of Carrere and Hastings, of New York, who have designed the proposed Bank of Toronto building in Toronto. The editorial pages of 'Construction' for July quote Mr. Bird in an interview said t have been given to the Toronto 'Star' in which the American charges Canadian architects with being inferior to American architects. We cannot but surmise that Mr. Bird has been misinterpreted by his original interviewer. Inasmuch as Canada and the United States are both straining every nerve and sinew to attain the best, the benefit to both countries as an undivided unit always has been and will be sought. 'Construction' knows that the very enterprise that sends American architects into Canada hails the Canadian artist to Washington or New York. Both countries need each other, and both will build up the cities of each. After all the word 'best' is comparative when viewed in the light of individual needs. Mr. Bird may be the best for this particular work, and the prominent gentlemen mentioned as the exponents of the best in Canadian architecture are needed for their special ability in design. It is a case of give and take. In so far as Mr. Bird's alleged remarks are concerned, it must be remembered that the American and Canadian press have sunk more navies in time of battle than ever floated the high seas. Let us grasp hands and keep on with the upward march."

¶ Architects as advertisers—The ethical importance of professional dignity in the practice of architecture—The difference between the business and the profession of architecture. . . .

IS IT PROFESSIONAL for an architect to advertise? If so, why should an architect not pay for the connecting of his name with a building which he has designed? We maintain that an architect, as a professional man, has a right to demand that his name should be connected with his work in the public press, whether the work is commendable or otherwise. In other words, the public press has the right to connect the name of an architect with a failure; it also has the right to connect his name with a success. The provincial attitude maintained by our Canadian press in assuming that the name of the architect is not entitled to be published with the illustrations of his building, is peculiar to Canada for the reason that the press does not view architecture as a profession. If a prominent man is taken seriously ill, the press mentions the name of the physician that is in attendance. If a prominent case before the law courts is under discussion, the press assumes that the name of the attorneys are of interest to the public; but when illustrating or describing a building it, unfortunately, is the custom of Canadian publications to omit the name of the architect, for the reason that they are not inclined to give "free advertising." But when an architect, after having contended that he has these rights, as a professional man, undertakes to apply business methods (in the way of advertising) to his profession, he not only brings the profession of architecture into disrepute but he undertakes to employ a business advantage in professional work. If architects have a right to demand professional recognition as do lawyers and doctors in the daily press, then they must adhere to the principles as laid down in the ethics of their profession.

We reproduce herewith two advertisements, each of which occupy a page in a special edition issued by a Vancouver paper, in which certain architects have undertaken to show (in a business way) their ability to design and execute work. It is reasonable to assume that every architect in Vancouver and Victoria was solicited for like advertisements, and it is also reasonable to assume that there are several architects in these two cities who could have shown work that would have been

quite as much to their credit as those illustrated in the two advertisements in question. The layman, as a rule, does not understand the ethics of the profession of architecture, and it is unfair to those architects who adhere to the ethics as established by the profession, to have professional men use business methods in the prosecution of their profession (if it might be so called).

If the advertising department of the daily press can insist upon architects paying the price for space in their special or regular editions, then how can we expect the press to give the architect credit for his work in their news columns? If doctors advertise they would be obliged to pay a fee to have their name connected with a prominent case, likewise with the lawyers, also painters, sculptors too, and it is the same with architects. Canada is a new country and it is quite within reason that there should be ambitious men engaged in the architectural profession the same as all other avenues of our progressive, industrial activity, some of whom may be more or less impatient for immediate success. That success in the view of some may be obtained through the use of money in giving publicity to the character and quality of their work, but if the public press has reason to believe that money may be secured for giving publicity to the buildings erected by these architects, then it has the reason to assume that it should deal with the architect in the discussion of his work, the same as with ordinary business institutions. We deal with this matter only to point out to architects generally, that if they expect to be treated professionally by the press, they must assume a professional attitude towards the press.

If, in the columns of this paper, we should undertake to publish illustrations and plans of buildings and solicit the architect for a remuneration for connecting his name with such photographs or plans of buildings, we would be told that our policy in this connection was professionally indecent. If architects feel that they should be looked upon as professional men they must conduct themselves as such.

There is a clearly marked line in the practice of architecture which every designer should not fail to recognize. On one side is an adherence to certain defined principles laid down to preserve and promote the best interests of both the art and the profession. On the other, a condition which, if adopted and persisted in, is to engender a disregard or perversion of architectural effort in the interests of pure commercialism. The line is strictly defined and all too obvious, and a designer is known according to the side on which arrays himself.

West Choir, Lincoln Cathedral, as it Appears Looking Towards the Great Organ.

Lincoln Cathedral—View showing the Beautiful Detail and Outline of Structure, as It Lifts Itself in Majestic Grandeur above the Neighboring House Tops.

LINCOLN CATHEDRAL ONE OF ENGLAND'S OLDEST CHURCH EDIFICES

The least known of England's Great Churches. Started in 1074 A.D. during the reign of William the Conqueror. An historical description compiled and arranged by Oscar Raven.

SITUATED ON THE RIDGE of a steep hill dominating the city, and about 250 feet above the level of the plain around, stands the beautiful Cathedral of Lincoln, where it has stood for more than six centuries almost unchanged in its general outline.

The first cathedral church was begun about the year 1074 by Bishop Remigius, who was one of William the Conqueror's followers. It was ready for consecration in 1092. This original church followed the Norman model of which so many examples were then rising in every part of England in that it was cruciform in plan, ending at the east in a semi-circular apse. The structure was designed for a pair of Western towers, which so commonly formed a part of the Norman design. Of this original pile the only parts remaining are the central portion of the west front, with its three deeply recessed portals, whose arches are unrelieved by any moulding or ornament, and a fragment of the first bay of the nave and the lower stories of the two western towers. Remigius's work is characterized by the stern, almost savage plainness of the early Norman style.

In this Norman portion of the west front, now remaining, is a curious band of rude bas-reliefs, representing Scriptural subjects and extending in a fragmentary band along the facade; the date of these is uncertain, but they probably belong to a period anterior to the time of Remigius and were inserted by him in his new cathedral as sacred relics of an earlier age.

An accidental fire in 1141 entirely destroyed the flat timber ceiled room and otherwise damaged the church. It was restored "with subtle artifice," writes the chronicles, "that it looked fairer than in its first newness."

Alexander "the Magnificent" was bishop. He vaulted the whole church with stone, and to him may probably be ascribed the three beautiful western doorways with their richly carved shafts and grotesque arch mouldings in the deep recesses of the Norman front. The interesting arcade above the two side recesses of the west front and the lower visible stories of the western towers are also his work. These are all in the later Norman or Transition style.

In 1185 the cathedral was shattered by an earthquake, and when in the following year Hugh of Avalon was made bishop, he found his cathedral rent from top to

Lincoln Cathedral—The Great East Window is Seen in the Foreground with the Chapter House situated at the Right of Main Structure.

East Choir, Lincoln Cathedral, Showing Great East Window in the Background.

EDITOR'S NOTE.—While chronicling the work of present day designers of the new world, with all its modern utilitarian influences, it is well that we do not let pass from before us the beautiful old work of the designers of earlier times—times when the architect was left free to carry out his conceptions, unhampered by any of the modern influences that show themselves so conspicuously in the architecture of our present commercial age. It is well that we keep before us the work of men who were not obliged to build for profit, to build within a stipulated sum, to build to meet the demands of a money-mad age. It is only in the complete understanding and thorough appreciation of the work of these old masters that we can look for a toning influence on present-day tendencies in architectural design. By this it is not argued that we should undertake in this age to reproduce the work of mediaeval times, but we do maintain that the aesthetic in our present-day architecture is measured to a great extent by our appreciation of the wonderful work of earlier ages.

With the object of bringing the younger members of the profession closer to the masterpieces of the old world, we undertook some months ago to run a series of notable pieces of European architecture in "Construction" from time to time. This month we give herewith an illustrated, detailed description of the least known of England's famous cathedrals—Lincoln Cathedral—written and compiled by Mr. Oscar B. Raven. Mr. Raven is a native of Lincoln, where this famous old pile has stood with its many additions, alterations, misfortunes and glories, through the centuries of changing conditions, through conquests, rebellions, wars within and wars without, through famine and prosperity since the days of William the Conqueror. The Cathedral is the pride of every native of Lincoln, and Mr. Raven's description of the structure, with its history as compiled by him, together with the many illustrations of its beautiful detail, reproduced from photos selected from his very large collection, we believe will prove of interest to Canadian architects generally.

bottom. Its restoration was one of his first cares, but he rebuilt it from the foundations in the new style. Early English Gothic, which had been developed step by step out of the rude Norman. It was determined to build it in every part as worthy of its high purpose as human skill could make it. Six years were spent in preparing for so great a work. The plan of Canterbury Cathedral was followed; the choir was provided with a second pair of transepts, each with two apsidal chapels on the east side, and it is said that Heoffery de Noiers was the architect. In 1192 the foundations were laid, and before the death of Bishop Hugh in 1200 the choir and eastern transepts

Lincoln Cathedral—Chapter House.

and a portion of the east walls of the western transepts were built. The choir consisted of five bays, the easter-

capitals. The walls of the triforium above consists of two pointed arches in each bay springing from clustered piers, and subdivided by a single shaft from which spring smaller arches, the spandrel of the arches being pierced

1. Flying Buttress of Chapter House. 2. Flying Buttress Connected on Exterior of Clerestory to Resist the Thrust of the Stone Vaulting.

by a quatrefoil. The wall of the clerestory is pierced by three narrow lancet windows, each bay containing good modern stained glass.

The aisles of the choir have two tall lancet windows in each bay and the wall beneath enriched by the wonderful double arcading, which is also continued around the transept walls.

At the western angles of the choir aisles and the transepts are two very remarkable piers of almost unique design, which call for special attention. Eight detached Purbeck marble shafts, four cylindrical and four hexagonal with hollow sides all banded and having rich capitals surround an octagonal stone pier, from four sides of which sprout crockets from base to capital, between the marble shafts.

The east end was, like Westminster Abbey, in the form of a polygonal apse with a six-sided Lady-chapel behind. This portion of the cathedral, built by Bishop Hugh, affords the earliest known example of the pure Lancet Gothic or Early English architecture in England, free from any trace of Norman influence.

The western transepts were completed and the nave gradually carried westward in the Early English style most one, opening into the eastern transepts, the remaining four bays having deeply moulded pointed arches springing from clustered piers with delicate foliage during the 50 years following the death of Bishop Hugh. To the close of this period, namely, the middle of the

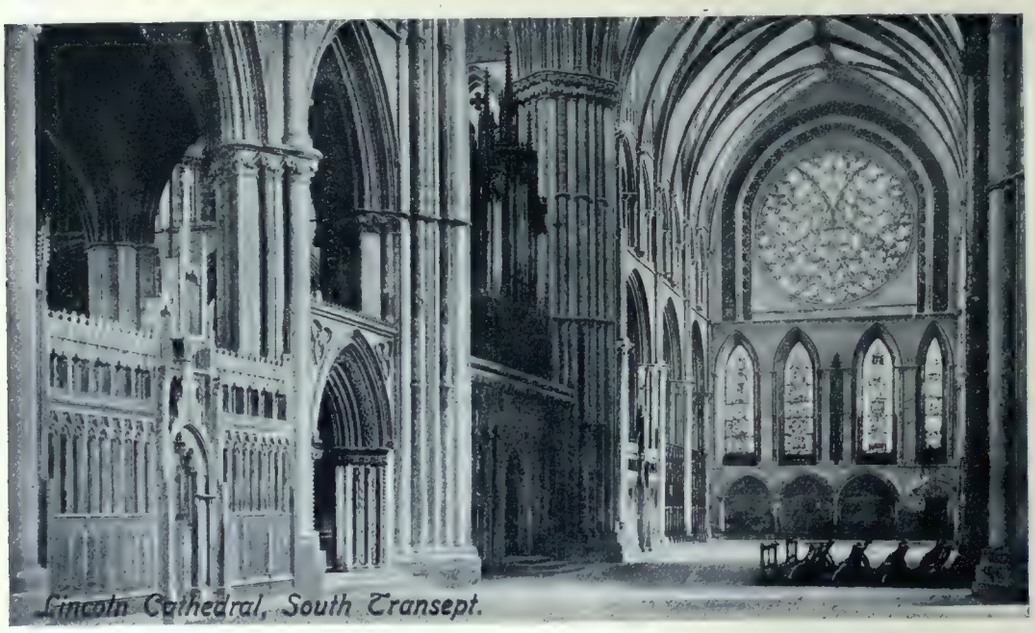
13th century, may be assigned the two western chapels, the arcaded screen wall of the west front, the chapter house on the south and the Galilee porch and the vestries on the north.

The plain wall of Remigius's Norman west front is set in a kind of frame of richly arcaded work of Early English date, and probably contained at one time an army of statues, though architecturally a mistake (for it does not honestly answer to anything behind it, and is little more than an ornamental screen wall, and moreover hides the lower portion of the western towers), it cannot be denied the west front is a composition of singular grandeur of outline and beauty of detail. The centre recess of the front had its semi-circular Norman arch removed, probably by Bishop Grossteste (1232-1253) and replaced by a pointed arch, ornamented with rich mouldings and carvings. In the head of this arch is an Early English unique-foil rose window, containing ancient stained glass with the figure of Remigius in pontifical vestments, holding the church of which he was founder.

Below this window and above the main doorway is a window of later date, an excellent example of the perpendicular period, below this again is a row of statutes of English kings.

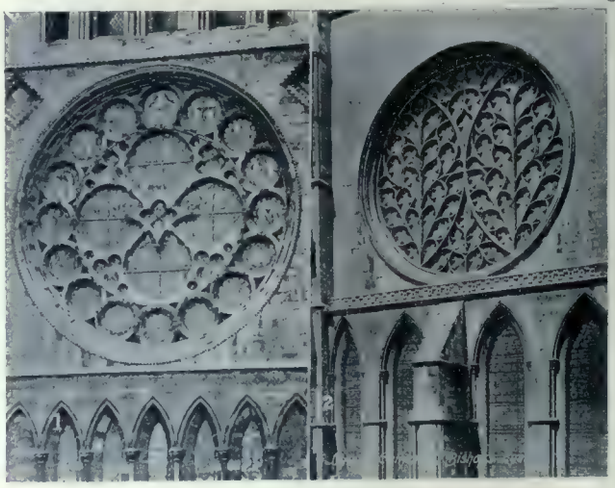
The two octagonal turrets at the extremities of the west front contain spirel stairs crowned with spirelets; that to the south bears on its summit a statue of St. Hugh, the holy bishop, who may be truly called the second founder of the cathedral. On the north spirlet is a figure known as the "Swineherd of Stew," blowing his horn to call his herd together. According to tradition, this swineherd collected a peck of silver pennies in his lifetime and bequeathed them to the fabric of the cathedral.

North Transept, Lincoln Cathedral, Showing Rose Window, "Dean's Eye" in the Background.

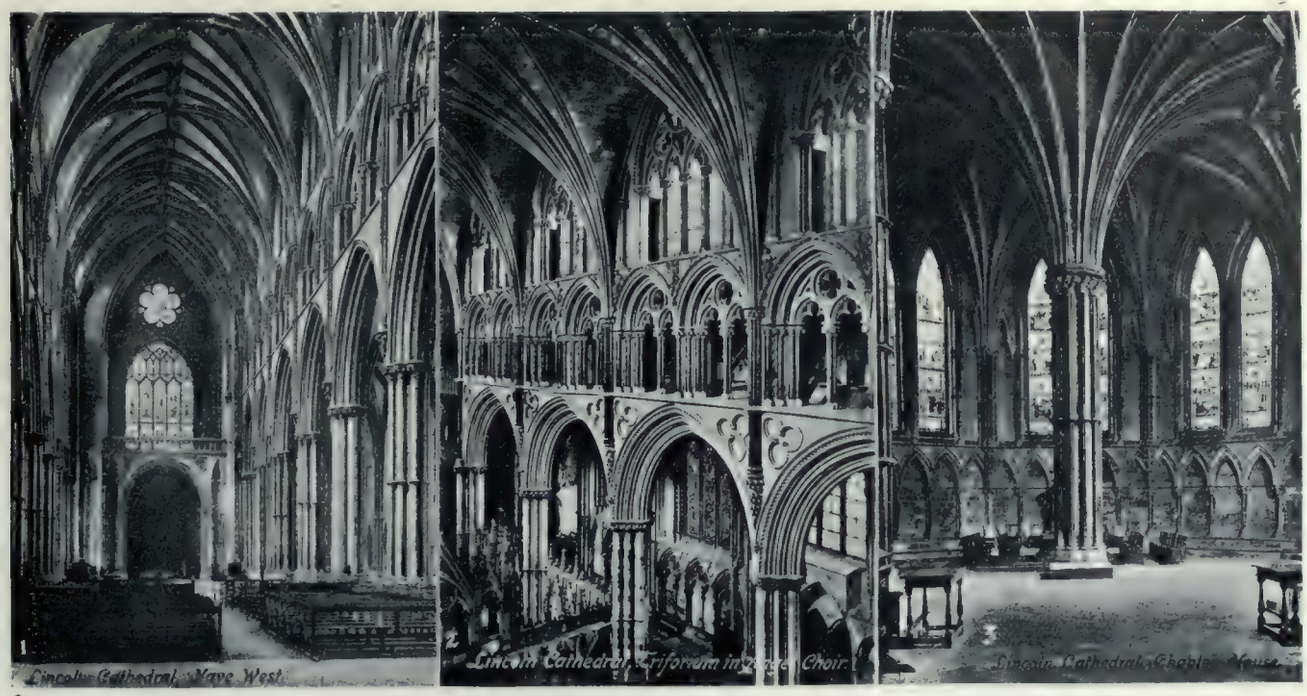


South Transept, Lincoln Cathedral, Showing Rose Windows, "Bishop's Eye" in the Background.

The west front was restored in 1852. The nave consists of seven bays in the Early English style, and exhibits that bold disregard of rigid uniformity, combined with general harmony, which imparts to mediæval buildings a living character, as things that have grown bit by bit, not monotonously fashioned by rule and measure. The piers supporting the superstructure consist alternately of moulded shafts of solid coursed stone, and detached shafts of Purbeck marble surrounding a central cove, all bearing rich foliage capitals of varying design. The thrust of the stone vaulting is



Rose Windows, Lincoln Cathedral. 1. "Dean's Eye." 2. "Bishop's Eye."



Lincoln Cathedral—1. Nave West. 2. Triforium in Angel Choir. 3. Interior Chapter House.

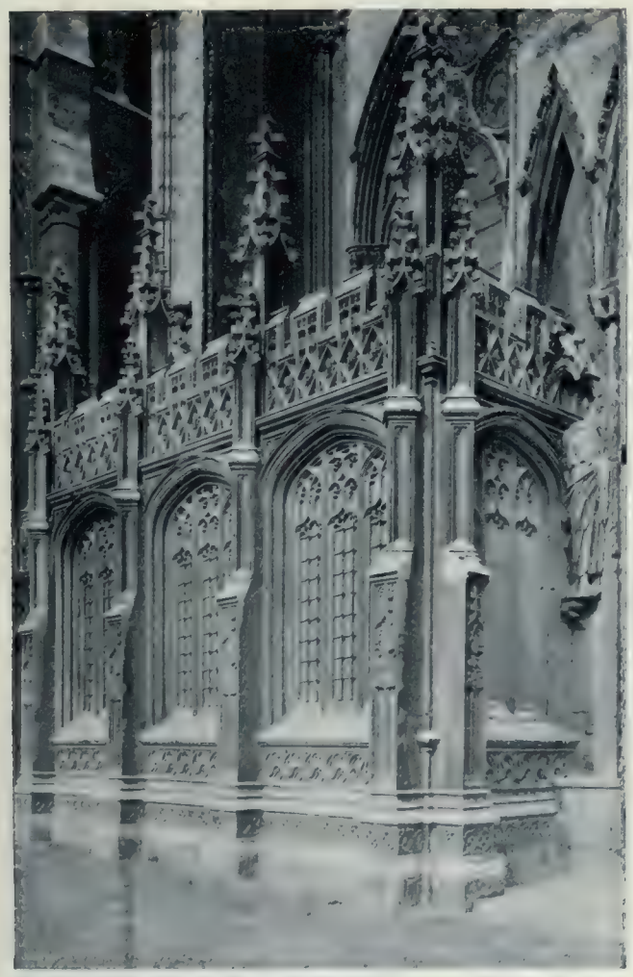
resisted by massive "flying" buttresses on the exterior connected to the clerestory by means of an arch over the nave aisles.

The nave aisles are uniform in general design though varying in detail, each bay containing two rather broad, single light lancet windows filled with modern stained glass.

The wall below these windows is relieved by a continuous single arcading, differing in design on the two sides of the nave.

The two Early English chapels at the west end open by lofty arches from the aisles; that to the north having its stone vaulted roof supported by a central group of Purbeck marble shafts of remarkable lightness.

The central tower is supported on four lofty arches, springing from four enormously massive piers, composed



Lincoln Cathedral—Rectangular Chantry on the West, Erected as a Monumental Chapel to Bishop Longland.

Lincoln Cathedral—State Canopies.

Choir Triforium.

Window Detail, South-East Cloister.

of a central cove surrounded by twenty-four shafts with rich foliage capitals alternately of stone and Purbeck marble.

The spandrels of the arches are enriched by the characteristic diaper work which covers their whole surface.

The great or western transepts open on either side of the central tower, each having an aisle on the east side, divided into three chapels, but having no aisle on the west side. The north arm has a magnificent rose window with "plate" tracery which is filled with priceless stained glass of the same date as the window—1220.

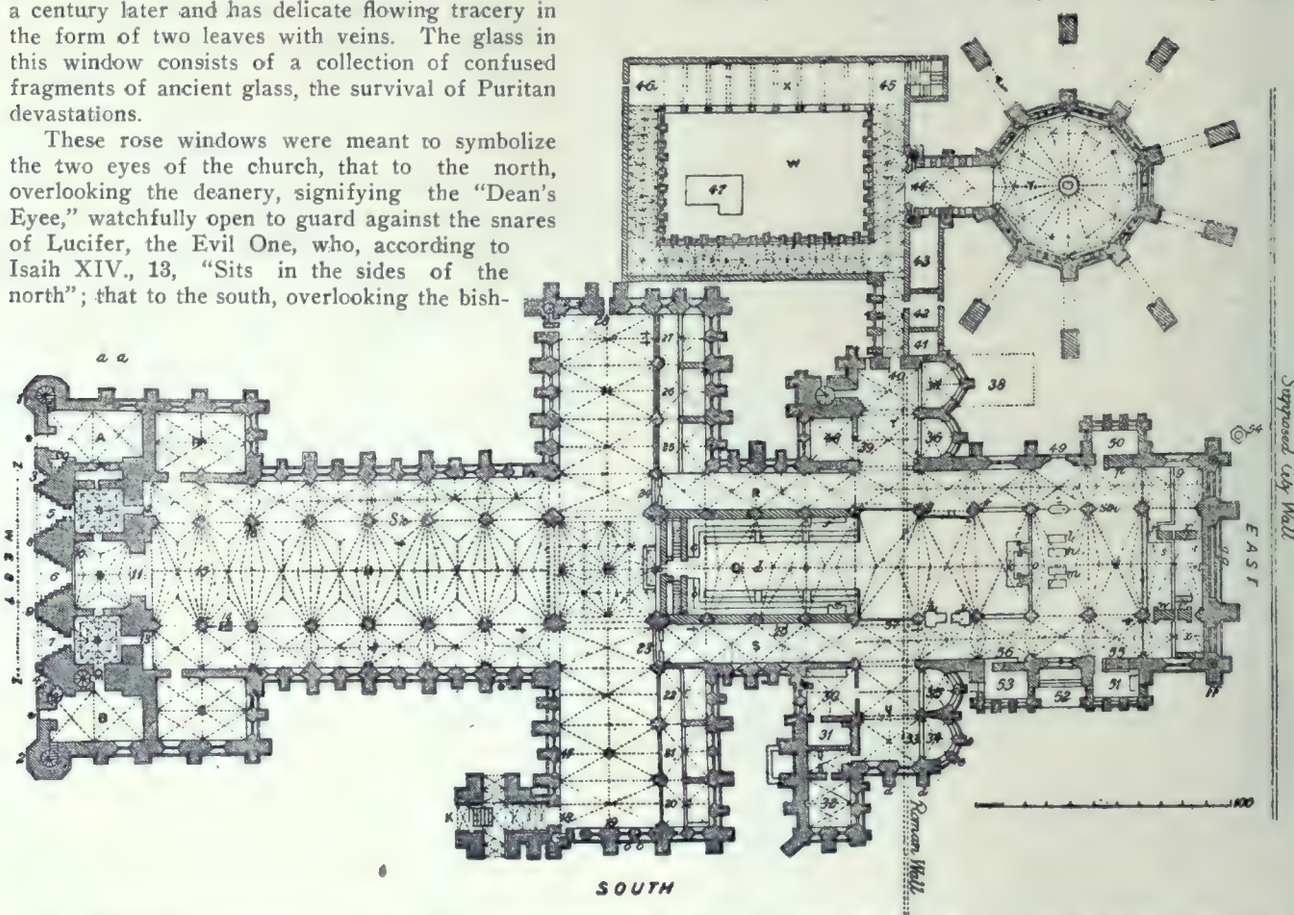
The south arm has also a rose window, originally of lead plate tracery similar to the northern one, and of the same date, but the window which supplanted it is a century later and has delicate flowing tracery in the form of two leaves with veins. The glass in this window consists of a collection of confused fragments of ancient glass, the survival of Puritan devastations.

These rose windows were meant to symbolize the two eyes of the church, that to the north, overlooking the deanery, signifying the "Dean's Eyee," watchfully open to guard against the snares of Lucifer, the Evil One, who, according to Isaih XIV., 13, "Sits in the sides of the north"; that to the south, overlooking the bishop's palace, known as the "Bishop's Eye," inviting the genial influence of the Holy Spirit.

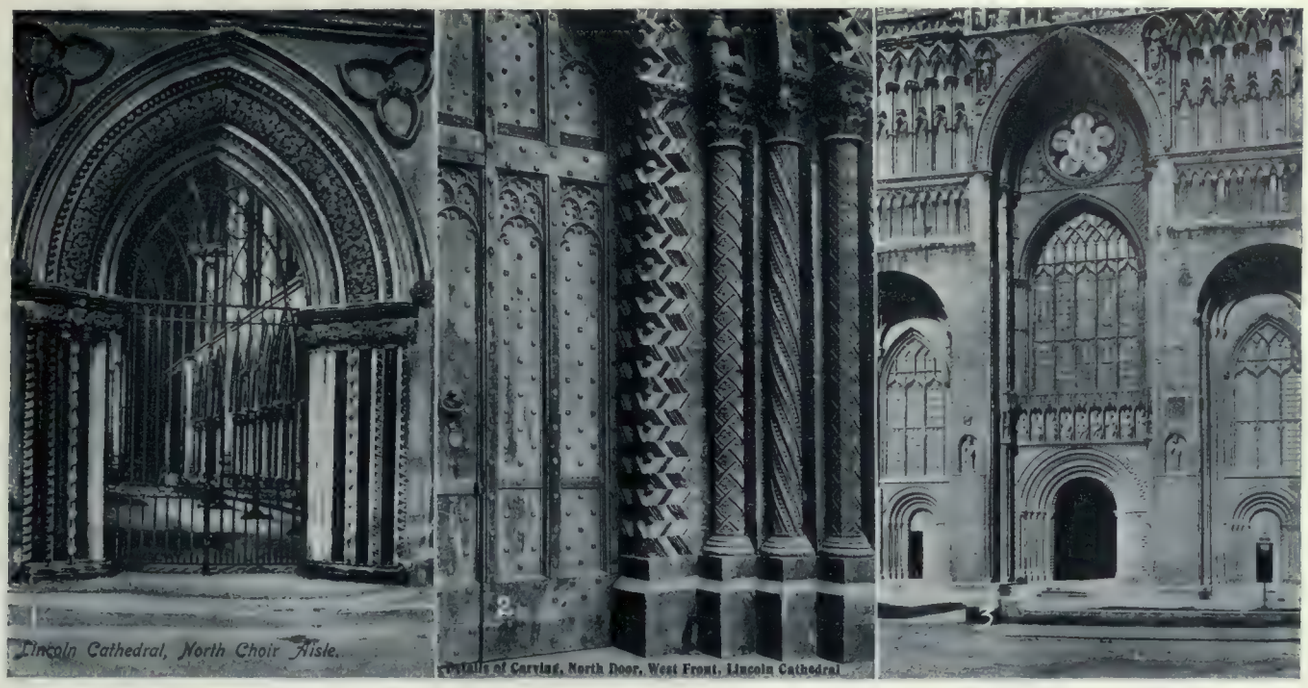
The windows above these rose windows light the false roof and are not seen from the inside of the cathedral.

The lancet windows beneath the rose windows contain very rich ancient glass. The walls below and all around the transepts are enriched with single arcading, except where it joins the double arcading of St. Hugh, which was not continued beyond the first bay of the transepts, where he left it at his death.

At the southwest corner of the south transept stands the two storeyed "Galilee Porch," a cruciform structure with large open arches on three sides, and a rich double doorway on the east side, opening into the transept. This



LINCOLN CATHEDRAL.—REFERENCES TO PLAN.—*A.* North-West Chapel; *B.* South-West Chapel, St. Hugh's or Ringers' Chapel; *C.* St. Mary's Tower; *D.* St. Hugh's Tower; *E.* The one remaining Norman Bay; *F.* Morning Chapel; *G.* Consistory Court; *H.* Nafe; *I.* North Aisle of Nave; *J.* South Aisle of Nave; *K.* Galilee Porch; *L.* Former Churchyard; *M.* Dean's Green; *N. O.* North and South Transept; *P.* Board Tower; *Q.* Choir; *R. S* North and South Aisles of Choir; *T. U.* Lesser Transept; *V.* Board Tower; *W. Cloisters; X. Library; Y. Chapter House; Z. Z.* Limits of Norman West Front; *a.* Choir Screen or Rood-Loft; *b. c.* Stalls; *d.* Litany Desk; *e.* Bishop's Throne; *f. g.* Easter Sepulchre; *h. i.* Monuments of Katherine Swynford and Duchess of Westmoreland; *k.* Altar; *l.* Reputed Site of St. Hugh's Grave; *m. n.* Tombs of Bishop Gardiner and Bishop Fuller; *o.* Altar Screen; *p.* Monument of Bishop Fleming; *q.* Monument of Bartholomew, Lord Burghersh; *r.* Monument of Bishop Burghersh and Father; *s.* Base of Shrine; *t.* Monument of Queen Eleanor; *u. w.* Monuments of Lord Cantilupe and Prior Wymbush; *x.* Monuments of Hilton and DeWint; *z.* Monument of Bishop Wordsworth; 1, 2, Northwest and Southwest Stair Turrets; 3, 4, Recesses of Remigius Front; 5, 6, 7, Bishop Alexander's West Doorways; 14 Font; 17, Site of Bishop Dalderby's Shrine; 18, Entrance from Galilee Porch; 20, 21, 22, Chapels; 23, 24, Ornamented Doorways to Choir Aisles; 25. 26. 27. Chapels; 28, Dean's Door; 29. Shrine of Little St. Hugh; 30, Chorister's Vestry; 31, 32. Vestry and Ante-Vestry; 34, St. Peter's Chapel; 35, St. Paul's Chapel; 36, Chapel; 37, St. John Baptist's Chapel; 38. Foundation of Extension of St. John Batpist's Chapel; 40, Entrance to Cloisters; 41, 42, 43, Anciently the "Common Chamber"; 44, Vestibule to Chapter House; 45, Stairs to Library; 46, Doorway to Deanery; 47, Site of Roman Tessellated Pavement; 48, Dean's Chapel, formerrly the Dispensary; 49, Northeast Door; 50, Bishop Fleming's Chantry; 51, Bishop Russell's Chantry; 51, Southeast Doorrs; 53, Bishop Longland's Chantry; 54, Minster Well.



Lincoln Cathedral—1. Door to North Choir Aisle. 2. Detail of Carving North Door, West Front. 3. Entrance to West Front.

porch with its simple but elegant vaulting, its deeply moulded wall arcades and vaulting ribs, and its multitudinous dog-tooth ornament may be justly considered one of the chief beauties of the cathedral. The upper storey, lighted with lancet windows, is finished with a richly panelled parapet of the perpendicular period.

At the end of the north arm of the transept is a rich doorway, curious for having a flat stone lintel.

St. Hugh's choir is entered from the nave under a very richly carved and vaulted stone screen of the 14th century, originally resplendent with gilding and color, on which in earlier days stood the Great Rood or Crucifix, with the image of the B. V. M. and St. John on either side. This screen now supports the organ. On either side of the screen is a doorway of uncommon richness, the arch containing a band of carved foliage deeply undercut. These give entrance to the choir aisles.

In 1232 the central or broad tower fell, and the two lower storeys of the present tower were built during Bishop Grossteste's episcopate (1232-1253). The walls are encrusted with the diaper work seen also in the gable of the west front, and popularly known as "Grossteste's mark." The upper storey of the tower was not added until the beginning of the 14th century; it is the crowning ornament of the tower, and is as pure an example of the decorated style as the lower storeys are of the Early English. The whole tower is a most beautiful combination, and is the chief and crowning glory of the cathedral. Originally it had a timber spire covered with lead, the loftiest, it is said, in England, being 524 feet high. It was destroyed by a tempest in 1548 and was not rebuilt. The pierced parapet was not added until 1775. As it now stands the tower is 271 feet to the top of the corner pinnacles, and it is the highest tower in England, excluding spires.

The western Norman towers were originally capped with tall timber spires, which were removed at the close of the 14th century when the lofty belfry storeys were added; these, too, were finished with timber spires, but having fallen into decay, and needing constant repair, were taken down in the early years of the 19th century, to the great indignation of the people of Lincoln, who were with difficulty persuaded that they were unsafe. These towers are 206 feet high to the top of the pinnacles.

The Chapter House was commenced in 1225 and is a polygon of 10 sides; 60 feet internal diameter with a stone vaulted roof springing from a clustered central pillar and supported by huge flying buttresses exterially. Nine of its sides contain two tall lancet windows, each filled with excellent modern stained glass; the other side contains the entrance, through a vestibule, from the cloisters. The walls beneath the windows are relieved by a continuous arcade whose mouldings are enriched by the dog-tooth ornament.

The remains of Bishop Hugh were deposited in a chapel at the east end of the cathedral, but so great was the reverence with which he was regarded, and so many miraculous cures, according to the belief of the age, be-

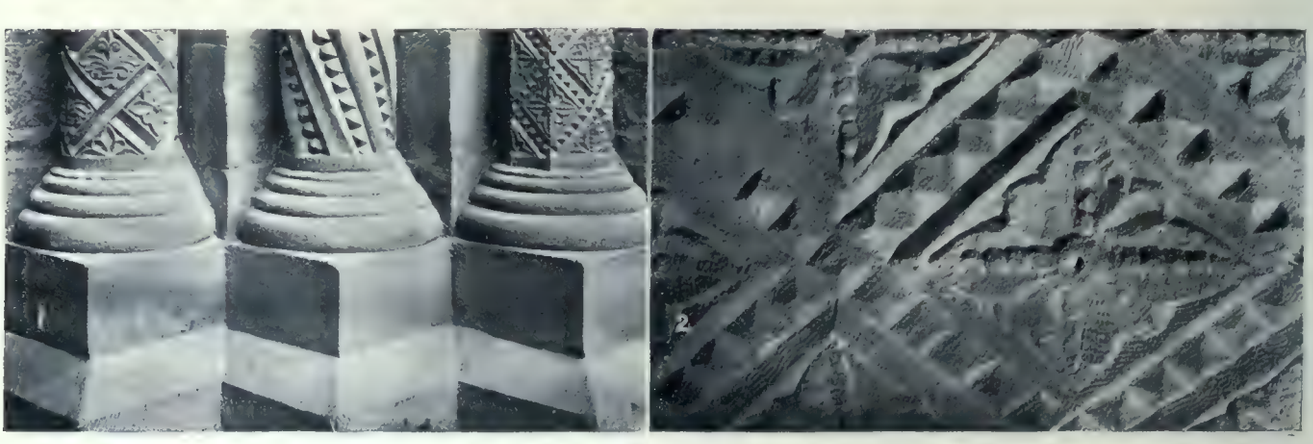
South Door. Arcading in Choir.

Vail Arcade, South Side, and Nave Arcade, North Side.

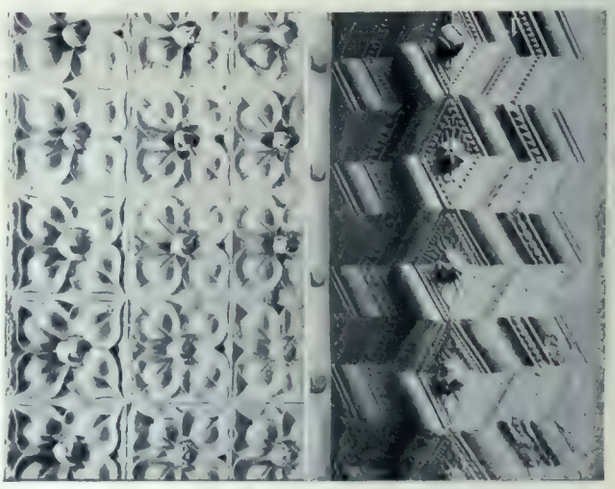
gan to be worked at his tomb, that he received cannonization from the Pope in 1220, and the immense influx of pilgrims to his shrine rendered more space necessary. As a result of the offerings of devotees who supplied the necessary means, it was decided to demolish the eastern apse and chapels of St. Hugh's chair and to erect a building worthy to receive the shrine of the sainted founder. The foundations of the apse and chapels still remain under the pavement of the choir, and were seen during excavations some few years ago,. Five bays were added east of St. Hugh's transepts. This addition, popularly known as the "Angel Choir" from the sculptured angels which fill the spandrels of the triforium arches, was begun in the year 1255 and was ready to receive St. Hugh's shrine in 1280. It belongs to the period of transition between the Early English and the decorated styles, just when Gothic architecture was touching its highest development, and exhibits a refinement and elegance as well as delicacy of finish which has rarely been equalled and never surpassed. The piers supporting the superstructure are alternately composed of solid moulded Purbeck marble and stone. The arches springing from these piers are beautifully moulded and are enriched with the dog-tooth ornament. The triforium is of most exquisite design, Each bay contains richly moulded arches, springing from clustered piers of stone surrounded by marble shafts. These again are divided by a cluster of three Purbeck marble shafts from which spring trefoiled arches, all the piers having delicate foliage capitals. The spandrels are occupied by sculptured angels, which give proof of the excellence attained by the native sculptors of that period. The clerestory windows of geometrical tracery are remarkable as having a double plane of tracery, contributing much to the richness of the effect. The aisles contain pointed windows with tracery of beautiful design, one in each bay. The walls beneath the windows are enriched by an arcading consisting of arches with tracery similar to that of the windows.

The illustration of this portion of the cathedral will give a better idea of its magnificence than any description.

The great east window of eight lights is the noblest example of geometrical tracery in the Kingdom. It is 57 feet high and 34 feet wide, occupying the entire east end as seen from the inside. It is filled with stained glass (depicting the work of Our Lord), put in by public subscription a few years back in place of some very miserable kaleidoscope patterns executed in 1762. The east windows of the aisles are smaller examples of the same design as the large one, and contain ancient glass of great beauty. The large window in the gable above the east window lights the false roof. A remarkable feature in this portion of the cathedral is the great south porch. No other example of a porch of this character, or in this position occurs in an English cathedral, though common in France. This entrance occurs in the middle bay of the Angel Choir on the south side. It is formed of a very deeply recessed arch under a pedimented canopy, and is divided by a central shaft into two openings with unique-foiled heads. The recessed sides are lined with canopied niches, the southermost containing excellent statues of kings, unfortunately with their heads broken off by Cromwell's soldiers, who did much damage in other parts of the cathedral, chiefly by breaking ancient stained glass windows and taking all metalwork they could lay hands on. The arch mouldings of this entrance contain a hollow fretwork of carved leafage, containing statuettes of the Apostles and other saints. The Lympanum or head of the door is occupied by a carving of the "last Judgment." Our Lord is seated in the centre, to his right the



1. Detail of Base and Pillars, North-West Door. 2. Detail of Pillar, North-West Door.



Diaper Screen South Choir Aisle and Moulding on North-West Door.

1. Moulding, West Door. 2. The Imp. 3. Capital in Chapter House.

blessed are rising from their tombs, and are borne upwards by angels, to his left, demons are dragging the lost to the mouth of hell.

The doorway on the opposite side of the choir is of Early English design. It is divided by a pillar of later date, on which is a shield of Edward IV.

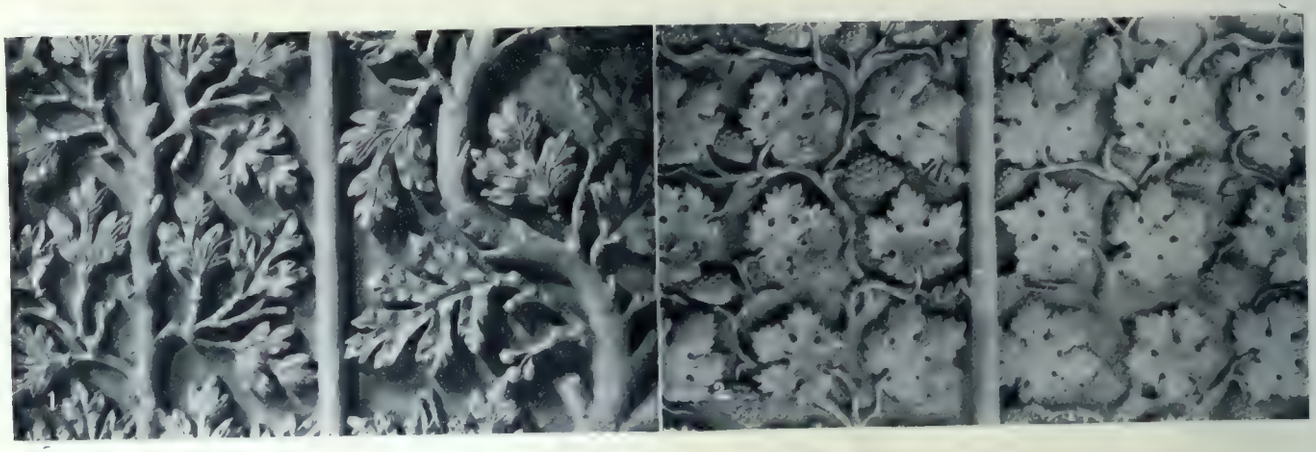
With the erection of this Angel Choir the main portion of the fabric was completed. The small side chapels and the cloisters were added later. The whole work of re-edification forms the laying of the first stone of St. Hugh's Church to the completion of the portion built to contain his shrine occupied less than a century (no unduly long time for so great a work). The rectangular chantry chapels on either side of the south porch are very rich examples of the late Perpendicular Period, that to the east is the monumental chapel to Bishop Russell (d. 1496), to the west is that of Bishop Longland (d. 1547), the confessor of Henry VIII. They are entered from the choir aisles. Opening into the north aisle, opposite to Bishop Russell's Chapel, is another chapel of similar design, to the memory of Bishop Fleming (d. 1431). Each of these chapels has three wide windows with perpendicular tracery, between slender buttresses richly carved and finished with crocketted pinnacles, the battlemented parapets are enriched by carved work of various patterns.

The choir stalls of oak, which occupy the west end of the choir, next the organ screen, and the north and south sides of St. Hugh's choir up to the eastern transepts, are crowned with spire-like canopies of great beauty. They are of late decorated date.

They have no equals in England for "variety and beauty of design and accuracy of workmanship." The niches in these canopies, long vacant, are now occupied by statuettes of the saints of the Anglican Calendar, and have been put in in recent years and are all voluntary offerings. Each stall has a hinged turn-up seat with a

1. Bases of Columns, West Door. 2. Capitals of Columns, South Choir Aisle. 3. Column Base, Galilee Porch.

1. Capital in Arcade, North Choir Aisle. 2. Capital in Arcade, South Choir Aisle. 3. Capital in Arcade, South Choir Aisle.



Rich Foliage Stone Carving in Easter Sepulchre.

1. Caps and Crockets, Angel Choir. 2. Caps and Crockets, North-East Door. 3. Caps in Triforium of Nave.

Capitals of Columns in Vestibule to Cloister.

projecting bracket on the under-side, known in old times as Misericords or Misereres. This name they gained from being merciful provisions for the relief of wearied human nature, offering a partial support to the body during the protracted services of the earlier church, without adopting the attitude of sitting during prayer, then considered irreverent. Those who used them, however, had to beware lest drowsiness overtook them. If the body was thrown too far forward the seat lost its equilibrium, and the sleeper was in danger of being hurled down, to his own disgrace and the derision of others. All these miseres leave quaint carvings, some of sacred subjects, some of grotesques.

Beyond the stalls, on the south side in the bishop's "throne," the cathedral or official seat of the bishop, from which a cathedral receives its title. It was erected in the last century from the designs of Essex. The exquisitely carved oak pulpit opposite the bishop's throne on a marble base, and surmounted by a very elaborate canopy, was erected in 1866 from the designs of Sir Gilbert Scott.

The eastern transepts are divided from the choir by beautifully wrought iron grilles.

The cloisters are entered from a door in the north wall of the northeastern transept, and are connected by a vestibule of the decorated period, having windows of geometrical tracery.

The cloisters, erected during the episcopate of Bishop Oliver Sutton (1289-1300) are small, but excellent examples of the decorated style, having unglazed windows of graceful tracery on three sides. They are vaulted in oak, and have carved bosses at the intersections of the ribs. The north side of the cloister is occupied by the library, which contains many valuable documents and books. It was built by Sir Christopher Wren in 1674 in the classical style, not at all in harmony with its surroundings, but still, an excellent work in itself. It consists of a gallery 104 feet by 17 feet, supported on the south side, over the cloister, by doric columns.

A few facts and figures concerning the cathedral will

(Concluded on page 64.)

1. Capital of Pillar, South Transept. 2. Capitals in Triforium, South-East Transept.

Capitals, Clerestorey, South-East Transept.

Detail of Carving, South Choir Aisle Door.

THE ARCHITECTURE OF CANADA

By PROF. PERCY E. NOBBS

"Art is a simple and natural human activity, not an inexplicable quintessential mystery."
Paper read before Third Annual Assembly R.A.I.C.

I FEEL VERY GRATEFUL for the honor of this opportunity to address you on a subject so intimate, so general and so important to us all—"Canadian Architecture"—the work of our heads and hands and hearts. And as Canadian architecture is as yet a small affair, though, I verily believe a thing of mighty promise for the future, I hope I shall not bore you if I deal very little with its facts and rather profusely with its theories. Theories are, of course, invented to help us to "bear our ignorance," so I take it they are the proper medium wherein to discuss that which is not yet.

And before going any further it is necessary, in justice to those who will disagree with what I have to say, to state the fundamental artistic creed underlying what follows, so that they may at once preceive wherein "their doxy" and "our doxy" differ, and leave it at that without further ado; for nothing in this world is less profitable than an argument on matters aesthetic (and I would add on matters ethic) when the disputants erect their retorts on foundations different in kind.

The Epicurean sty in which those wallow who eternally do sing "Art for Art's sake" and base their aesthetic satisfaction on the mere charm of the senses, is an unsavory quag wholly unfitted to be considered even as a possible site on which to rear our structure. This Hedonistic Theory which measures the Arts in terms of pleasure has, unfortunately, permeated the literature of the last century so that it is now in all men's minds—and that is why the public and the artists of to-day are more thoroughly out of sympathy with each other than ever they were since history began.

Purpose of Art.

And even less suited for a foundation do we consider the clouds of mystification where the idealists flap their undisciplined wings in search of artistic delights "to utterly utter" to be expressed by the aid of any known syntax. To come to the point let me state briefly that Art is a simple and natural human activity, not an inexplicable quintessential mystery, that its purpose is always expression, that the subject matter of this mode of expression is that whole range and gamut of emotion and sentiment, and that the means employed—the raw material of this expression—is sensuous pleasure. It is by arrangement that this raw material undergoes its transmutation into that very elusive thing called beauty, best described in the words of Santayana as "pleasure regarded as a quality of a thing." Pleasure and pain are, as it were, the light and shade of consciousness. Beauty you see is just a state of mind. Without producing that state of mind the Arts are dumb.

Now pleasure and beauty and arrangement and emotion and expression are all matters that take a thousand pages to define in the light of at least five sciences, physics, anatomy, psychology, ethnology, and archaeology, and all these sciences have made vast strides in the last twenty years. That alone would justify an attempt to modernize the theory of Art.

An example will make this common-sense modern view of the aesthetic problem clear. I suppose we all know that terrible architectural tragedy, Old Newgate Prison (recently pulled down to make way for the stately new Old Baily). Poor Peter Ibbotson knew it also in his early dreams; one of the grandest achievements of our art. Truth, not in the minor veracities merely of having stone walls on more than one side, and windows and doors where they are wanted, but truth in the very sentiment of its dreary purpose.

This subject was a goal, and there is every reason to believe that as goals were done then the thing was up to date and scientific and fulfilled its purpose. But it did far more. It expressed not only its purpose but the sentiment with which the great sympathetic soul who designed it, Mr. Dance, to wit, regarded that purpose, so that no one could behold its grim distorted arches without becoming a partaker with him of the horror of crime and the yet greater horror and responsibility of retributive justice. There you have the activity to express a sentiment so that others may realize and hear it with you and so ease your pain, which accounts for so much of the Art of the world, and the thing is done by the arrangement of pleasure sensations, for every truly cut stone with its rustic face making play with the blessed sunshine is a potential pleasure. For all its tragedy we experience the sense of a peculiar satisfaction and interest as mere beholders; we are infected with thoughts and feelings not our own which we intimately associate with the object arousing them. The very ugliness of the thing is beautiful—especially beautiful.

As another example take the Percy Shrine at Beverley from the heart of the Middle Ages. This monument, to a lady of the Percy family, in the Minster Church at Beverley, is in very truth a monument to the spirit of Edwardian England. It must date from about 1370. In structure it is nothing more than a canopy above a tomb, set between two of the thirteenth century piers of the choir arcade. But what a canopy! No period has produced a conventional folias at once more stony and more vital, than the abstract vine and hawthorn of English fourteenth century art, and nowhere do these flowers of a well-ordered fancy show more brilliant handling or better composition in relation to the structure they adorn. The vaulting, the tracery, the enrichments, the grotesques and the figure sculpture of this one small monument would provide rich inspiration for the detail of a whole cathedral, so lavish is their invention. To perfection of execution and an exuberance of imagination is added an astounding liveliness of insight. From the kindly dignity of the Christ to the humors of a grotesque orchestra and the fine frenzy of the wave-maned lions, there is rythm and life and power and feeling or fun in every stroke. What human sympathy those carvers had, what warmth and temper. But the monument is no chaso of sporting feeling. The structure is as individual and emphatic as it can be, a simple climax of effect enriched to the very limit of ingenuity, yet with no dissipation of interest, an orderly unit after all. This treasure house of gems of fourteenth century though and feeling, when regarded as a whole, is a very epitome of the pomp and pageantry of those heroic days when England was newly made and her heart beat high with the zest of feudal chivalry. The tombs of the great in that period alone evince this spirit of gallant pride and gay virtue—a very scorn of death

but a happy scorn, with no bravado and much of faith about it.

Now these two works of architectural art are typical. In any work of Art there are three main elements—the individual subject, some bank, church, theatre, love song, elegy, landscape, portrait, goal, tomb or whatever it may be. Then there is the far more important matter of the sentiment with which the artist invests that subject—the life and meaning he puts into it. And lastly, there is the element of sensuous beauty in his medium expression. This last is all a matter of skilful arrangement. Form, mass and color are what we use. The musician's code is made up of aural sensation, as in the last resort is also that of the poet. But this indispensable element of sensuous beauty on our own or any other art is the mere instrument of art, not its aim or object, and the subject of a work of art is after all little more than an excuse or opportunity. It is the sentiment of the thing that really matters most, and the one criterion by which to judge of the excellence of a work of art is its potency to infect the emotions of the public it is made for.

A little illustration will show you what I mean by artistic expression in this connection, for there is no art in merely expressing. Such expression merely informs us and leaves us cold. But when form or arrangement enters into the expression its effects are magical. It was many years ago this point was first brought to our attention by an old painter. "If you are leaving the country," said he, "and sup at a restaurant with the lady of your choice before train time, and say, 'Waiter! Wine list! Thanks! No. 93, Moet & Chandon! That's right,' there is no art, although the mere act of incurring the expense has expressed an emotion. But if you say or sing:

"'Gae bring to me a pint o' wine
And put it in a silver tassie,
That I may drink afore I gae
A service to my bonnie lassie.'

that is art, and every man with bowels of compassion who hears not only knows just how you feel, but feels that way himself."

Now this is, I believe, a common-sense view of the great aesthetic problem. Any mere bank director or cabinet minister or dry-goods clerk could by applying it get an infinite insight into the arts, but persons of these classes, as a rule, much prefer, if they deign to give arts a moment's attention, to content themselves with what they call their likes and dislikes; to approach the arts, that is, as we approach a bar where mixed drinks are sold, for the sake of just as much sensuous pleasure as the arts convey. And the worst happens when artists are content to put themselves in the position of purveyors of sensuous pleasure. If a building only "pleases the eye" as the phrase is, it fails utterly as architecture. And how many buildings there are concerning which that is about all that we can say. Now, the builders of past generations have succeeded marvellously well, not only to express through what may be called pure design (i.e. structural truth and honest relation between planning and elevating, etc.), but also through the use of ornament added thereto, a wealth of feeling and emotional thought.

Architecture and History.

The styles of various periods convey to us the very spirit of the ages that brought them forth. If no Greek or Latin or Early English literature had come down to us we could still reconstruct from extant monuments not only much of the actual history of Greece and Rome and Mediæval England, but what is far more important, the sentiment with which these people at certain periods regarded life in general. But more than that, going behind the generalization of periodic style, we can realize the very spirit in which various types of buildings were wrought, and more yet, the individual feelings of the individual man who gave character to individual buildings. For architecture is essentially monumental, history writ large and lastingly.

And from such a point of view it is a matter of no small satisfaction to our national interest to realize that at certain periods Englishmen, Scotchmen and Irishmen had sentiments to express and a power to express them in no sense inferior to the best in the glory that was Greece or Rome or Italy or France.

And perhaps our art, so near to nature in the matter of materials and science, so close to humanity in her dependence on social conditions, has expressed better than any other art the peculiar characteristics of nationalities. Certainly it is the most democratic of all arts—no affair of luxurious personal patronage or public treasure houses, but a very adornment of popular life both private and public.

When men have had great feeling to express and great power of expressing them, happily joined with great opportunities, styles have been developed and evolved and brought to perfection, and from these we can deduce something of the everlasting laws and principles of our art in the light of which to model all sorts and conditions of designs.

Think of a real cosy Jacobean dining room in some old English manor house. With you I know I need not dwell on the elements of such a composition with any searching description. You know how the two great oak beams carry the lesser joisting of the ceiling, and how the plaster is put up between them. You know the mullioned with its leaded glazing and iron casements?—the broad brick hearth on which the crimpy iron dogs keep quiet company within the delicately moulded jambs and lintol, the pannelling on the walls, the heavy floor boards, the tapestry at the end, the tall-backed chairs, the squat, pot-bellied table legs—yes, you know! And it is all to speak to you of a certain kind of life and character which, as I am a builder and not a historical novelist, I shall say nothing more about.

Without a gradually evolved tradition behind it, in those chief matters of scale and proportion, and a naturalness in construction, the thing could convey no impression at all. The ultimate laws of design are all respected there just as truly as in the Doric temple or the Early English abbey, the great Italian palazzo, or city church by Wren. The thing possesses an essential unity of its own, not fortuitous or accidental.

Now, when a firm of decorators or any other style monger, whether tradesmen or architect, offer to fit out anywhere on the face of the earth, "from Greenland's icy mountains to India's coral strand," a Jacobean dining room "just like that" they are doing a very clever, a very scientific, and perhaps a very honest thing, in that they are acknowledging that they can't design worth a rap, but they certainly are not creating a work of art as they are apt to pretend, they are not expressing a sentiment which is very much to do with the subject—a modern dining room—and in ninety nine cases out of a hundred such a room has a false beam ceiling made of boards instead of logs. The thing would be partly legitimate if the owner of the room had close family association with just such a room, and if the constructions were all quite true and also natural to the district in material and technique. "It's clever, but is it Art?" Certainly not. But the original old room had something of the good sentiment of all English rooms of all English centuries, and as all good things that are English form, I believe, an essential part of the inheritance of this land and people, I make no apology for stating that something of that sentiment should be expressed in many of our Canadian dining rooms.

Schools of Architectural Thought.

But how is this to be done? Especially if we are not to imitate good old English things as they have been left to us. It is a matter of the spirit, not of the letter of the law. Extract the sentiment from your traditional models and leave alone the mere sense of forms. So may you arrive at the higher beauty of true design. Of schools of architectural thought to-day there are two (and I purposely ignore the claims of the Secessionists and Art Nouveautists to form the third. Let the heathen rage!) The great exponents of the academic school recognizes

the eternal principles of design and composition, the everlasting unities, and they use for purposes of exemplification and instruction a convenient cut and dry set of forms —the order and arches, etc. They fail utterly to interest their votaries and neophites in the technique of the crafts. To them a column is a column, whether made of big stones or little ones, plaster wire lathe or pine boards, cast iron or trellis work, and their lintol may be one stone or a hundred pieces of terra cotta. On the other hand, the non-academic school knows nought of the grand manner and cares still less about the abstract proportions of columns, so they are big enough to last, and do their work in whatever material they have their being. Craftmanship and the regeneration of ornament and decorative art are their main cares. This they hope to attain chiefly by the study of mediæval technique.

The stronghold of the academic school is, of course, the Ecole des Beaux Arts in Paris, and as there is wonderfully little building going on in France its fruits are to be found chiefly in the United States of America. And London is the stronghold of the modern craftsman architect, with his imitation guilds and highly colored politics.

Now, if the academic school could be induced to pay more attention to the far-flung vault of Beauvais and the jewelled walls of Blois, there would be more hope for them, and if the English exponents of architectural culture would realize that the grand manner as practised in Egypt and Babylon and the cities of Alexander's Empire and the Imperial Rome and gay Versailles, has that in it which would impart a discipline to their planning and a coherence to their compositions, they, too, would gain in power of expression. But the rival systems are too deeply rooted, each in its own conceit, to afford much hope of widened horizons.

To come nearer home, there is an interesting development going on. The Anglo-maniacs of New York have so far challenged the supremacy of the Beaux Arts influence that in a recent novel the author makes bold to write the following:

"Architecture!" said Smagg one day, "there's been no such thing since that first drunk and disorderly Dago tripped over and smashed Corinthian capital and saw it for the first time after he and the rest of 'em had been messing around it for a thousand years. That there Renaissance you have been talking about was nothing but a surgical operation for the emasculation of thought, the first idiot 'correspondence school' for the suppression of intellect. Fenestrations and ratios! Men were so crazy about their foot rulers they'd rather measure an old cornice than figure out a new groined arch. It took brains and blood to build Kornak and the Parthenon and St Marks' and Durham and Chartres! But these modern monkeys are only working out puzzle pictures for fools! A man would think the Parthenon had gone wrong and come over and littered all over Manhattan! Greek temples for bun-shops, Greek temples for subway entrances, and Greek temples for garages! Judging from the Pennsylvania Station, how far have we advanced from the Taj Mahal? Is the Singer Building better than the Doge's Palace? And how about that bum cathedral, that garbage box with the badly foozled approach? Is it up to the standard of any little old parish church in England?

"Oh, I've been talking with these architect-chaps who think on a scale of one sixteenth of an inch to the foot, and I know what's wrong. There's a bucket shop called the Ecole des Beaux Arts over in Paris where the little Yankee kid goes and gives up the last bit of small change of feeling they have, and they get in return a bunch of stock certificates in a bum gold brick mine that was played out before it was ever dug, and is now nothing but a *rive gauche* Rathskeller where the menu is harsh, sausage and dope. Then they chest themselves back over the Atlantic, and the hay seeds of high-life gurgle, 'Oh, aint them colyums and consoles and cartauches elegant!' That's all they get—a Parisian version of a Renaissance misunderstanding of a Roman translation of the orginal Greek! Gawd! every time I see an Ionic column I know its a vulgar gravestone in memory of the unknown dead. Yes, I know there's a few men trying to do Gothic, though they ain't got no Gothic minds. Well, they're butchering a real style, anyway; and they're to be pitied, because they know right from wrong. But these academic asses, I envy them. They don't even know there is any such thing as right!"

(1) *Lady Mechante or Life as It Should Be,"* by Gilett Burgess.

Should Not Imitate U.S. Designers.

The great leading influence of McKim in American taste has tended latterly towards Roman Renaissance, rather than French models, and from that it is but a step to the sobriety of Georgian tradition, the vogue for which is undoubtedly on the increase. But architecture in the States is not a question of evolution of styles, but merely of the institution of fashions, and that is a matter wherein we should do well to fail to flatter our great neighbors by imitating their example.

If the true teaching lies, as I believe, somewhere between the Beaux Arts and the Arts and Crafts, we are indeed well situated to develop a sound foundation for the future structure of Canadian design. Though the French-Canadians have little enough in common with Parisian ideals, they must always constitute a channel through which French influences, both old and new, will find their way to us and we can rely on the pushful beaux-artist from across the border not to let it be his fault if our cities lack splendid follies, bedight with columns and cartouches. The English culture of the crafts is also with us, and gives every promise of forming a strengthening tie to the bond of our British ideals. Let us hope that our own academically inclined designers will learn to realize that wrought iron and cast iron are two perfectly different things, and that if the tender comes in too high to do their will in marble, they will at least take the trouble to redraw the details before calling for its execution in mahogany; and also that the arts and crafty ones among us will try and find out the meanings of the words "scale" and "proportion," and apply that knowledge even in their efforts in opal glass.

Tradition grows it cannot be made, and with reasonable goodwill it might grow very quickly among us. Without tradition we cannot evolve an art at all and must content ourselves with going on being clever. But if we can see our way to attaining a tradition that is only one matter out of many affectng the future of our art in Canada.

The Question of Labor and Workmanship.

Labor and artizanship—these are the most discouraging questions we have to face. Trades unionism, in its early days, did much good, but of late it has tendered to produce a degrading slavery which robs the nations of the best effort of their sons of toil. I try to know, and I hope I love my partner the working man, but I feel the realization of his pet political hobby would destroy utterly what is left of the soul he once had in abundance.

Ruskin and Mauris sought to regenerate the arts through the revival of the happy conditions of the Middle Ages, when a man's chief pride was in his work, as what time has left of it to us most clearly shows. But since labor has made unnatural laws for itself, to exist by skilled employment or the strength of the hand has come to be a humiliation. Ruskin and Mauris failed egregiously. I suppose we architects realize more clearly than other people that the working man, when taken individually, is not as black as he is painted by any means, and that if his master, the contractor, on the one hand, and his master, the union, on the other, would only let him, he would be willing enough to develop a higher ideal of execution and ability to think for himself. I have no hesitation in stating that in the ordinary trades—stonecutter, mason, bricklayer, plumber and joiner—this country is rapidly going back to a barbarous standard. Eighty,

sixty, forty, yes, twenty years ago, all these things were better done in this country than they are to-day. For neither love nor money can I get a ceiling put up in Montreal that will not crack inside three months, and Montreal has lots of ecilings half a century old without a shake in them, and so all through.

Of course, in ordinary work to-day we must just do without ornament and decoration (which quite as much as reward are able to sweeten labor) except mere enrichment of the most perfunctory, cast-by-the-yard, stamped-by-the-mile, kind. Yet, but five hundred years ago, any cottage, any village church had lavished upon it a taste in design and a skill in execution which would to-day obtain for its author a reputation as a past master.

Well, we must adapt our work to the conditions of our age, and do without a great many nice things, and above all, we must avoid the temptation to resort to imitations and shams of better things. That, I think, is the great blot on the taste of our time here—that neither architects, nor contractors, nor workmen, nor clients, nor the general public seem to resent the most palpable sham and hypocrisies, and it is in the churches that the defect of stage carpentry instead of building is most in evidence. Canadian churches are sometimes well ventilated, usually well heated, nearly always comfortably pewed, and invariably full of structural and material lies. In notable contrast to the cheapness and vulgarity of our places of worship of all denominations is the good taste and extravagant outlay (and these things do not necessarily always have to go together) on the banks of most of the financial corporations. I am not here to judge between the banker and the parson on the question of which vocation is most necessary. Every community builds its best monuments in honor of that which it most reveres; that has been true since the dawn of civilization. Undoubtedly the future of Canadian architecture is bound up with the evolution of the banking hall. There has been no visible effort in any section of the community to advance the art of church building, which has from the beginning of historic times been the main problem of the art.

We shall therefore expect that the sentiment of unbounded wealth, rolling prairie, limitless forests, and all that sort of thing, converted into barrels, nay, cargoes of gold, will yet fail to evince itself in Canadian architecture.

Just as the fourteenth century architecture of our race is inspired in the main by the sense of pageantry and chivalry—the zenith of feudalism in all its glory—while the temper of our art in the thirteenth century was by contrast an affair of disciplined monastic refinement, and in the fifteenth a decidedly bourgeois affair, so we must expect to see a barbaric plutocracy as the backbone of our social system affecting our art just as did the abbot of 1250, or the baron of 1350, or the burgess of 1450. But that is neither your affair nor mine, gentlemen; what is "our affair" is to express in our designs the temper of the time we live in and, just for the initated, a little of what we feel about it; and we are beginning to do it.

Canada and Architectural Art.

But perhaps I am dwelling too much on the difficulties before us and not saying enough about the great prospects for architecture as an art in this country.

In art as in war it is the opportunity that makes the master, and surely nowhere in the world is our profession better situated. Study and training can perhaps lay the foundations of skill in design, but it is only by actually designing and carrying out work that a man can master this art, trade and mystery. Wren was about in middle life before he built anything. His early efforts were neither better nor worse than those of other much younger architects, but he got the opportunity, and he had the head and the heart to profit by it. And Michel Angelo had architecture forced on him late in life, and his earlier efforts were preposterous absurdities, but he profited by experience, lived a great age, and abandoned all the other arts of which he was a master for "the mistress art," and his masterpiece, the Dome of St. Peter's, means something.

Truly, we have the opportunity if we have but the power to avail ourselves of it. And apart from this question of actual chances of practising, we have another very great advantage in our miraculous climate. A friend of mine considers the climate, or rather climates of Canada, excellent, but complains that we have too much of them, and I believe there have been very few normal days during the last ten years. To the climate I shall add the material available and their market forms, and to the materials I shall add the technical devices for handling them.

Here we have three sets of conditions unlike anything that our ancestors who built so well know. Surely we can rely on these to help us out of the *rut of style mongering* towards the evolution of sane design. Originality in art is not a thing worth striving after for its own sake, and when so sought is fatal to success, but inventiveness has always been the life and soul of our art, and we have got to be inventive whether we like it or not.

It seems from the look of the plates in the British professional press to be very difficult to be at all inventive over there. The Georgian plaster ceiling and the Elizabethan plaster ceiling seem to have come to stay. The mullioned country house and sash-windowed country house seem to be fixed quantities down to their least details, each type maintaining its respectful relation to the work of 1600 and 1750, and this is not unnatural since the climate and materials are as they were in 1600 and 1750, and the type of window and roof thereby evolved to perfection at these dates cannot be improved upon.

But we should in establishing our type derive great benefit from the fact that we have to invent our own solutions of the roof problem and not accept our great grandfather's, and as to the window question, there is no really satisfactory solution in sight yet that I am aware of. If we remember that it is the roof and the window that makes the architecture, we see then we have our work before us. The feature of the English architecture—chimneys, parapets, bays, ranges of lights, rain heads and all the rest of it, are absolutely inappropriate for our use. But the simple inventive spirit in which these things were evolved and welded together in vernacular use, and the reserved but kindly sentiment which these evinced, we can surely take to heart and apply now.

Our predecessors in this country up to about 1825 were doing pretty well in this matter. The stone houses of Quebec and Nova Scotia and the clap-board houses of New England showed real evolution of style, and in them a good many of our problems were solved at an early date. The lamentable thing is that the secret has been lost, and we have now to substitute architectural education at universities and other temporary expedients till such time as it is regained. To think that neither for love nor money could such a thoroughly sound piece of work, sound in taste and sound in construction, be put up to-day in any town or village throughout this broad Dominion as can be found, once at least in five miles, on the shore all the way from Mulgrave Straits to Ottawa City, and all dated before 1840.

Scholarships.

Now, when I say we cannot borrow a tradition ready-made from Europe or anywhere else, I must not be understood as deprecating the study of European architecture. It is for this very reason that the study of ancient architecture can do us nothing but good. The master builders of 1370 did not study any ancient architecture at all, but then they had traditions, and the same applies to the master builders of 430 B.C.

When, for a variety of causes, which it is quite beyond the scope of the present paper to analyze, the eighteenth century tradition was lost, in the nineteenth century revivals and scholarship was resorted to as a substitute. Artistic achievement in design ceased altogether for the space of half a century and more. But certainly we need have no fear of scholarship as long as we do not misuse it and regard it as technology. The masterpieces of the past, if approached in the light of the theory with which

we started, can show us many a useful principle in design—how to express sentiment by means of the beauty that is in stone and brick and other common things. And besides that, they can fill our hearts with the very soul and spirit of many a bygone poet in stone, when for a time we drop the enquiry of how the thing is done and are content to apprehend the resulting meaning, for to that end were these things created.

But we allow the false hedonistic theory of art to possess us, and what can scholarship do for us? We would then approach the very Parthenon not for its meaning but for a sensuous satisfaction. We would conclude that this building was very successful because so many people *"liked"* it, and we would assume some magic virtue to *"please"* in the proportions of its part as such and probably miss the spirit of the thing as a significant whole. Then, in the hope of giving as much "pleasure" as is possible in this sad world, and getting as much credit for it in fame and dollars as we could, we would proceed to put up things as like it as we could—which I believe is the practice of fellows of the baser sort who, having eyes, yet do not see. Scholarship pursued in that spirit leads nowhere.

Responsibilities of the Architect.

Our responsibilities are immense. Every time we put up a meaningless ornament, a blank cartouch, run a moulding round three side of a stair wall in plaster and the fourth in cast iron, build a stone front with brick flanks, rule ashlar joints in Caen stone cement, make a false construction or emulate a superior material, we prostitute the ideals of our art. All these things come so easily, naturally and logically once we accept the theory that is in the function of the arts to please. But when art is recognized as the most potent of modes of expression, these devices fail utterly.

It may be some time before the new philosophy of art gains general acceptance among designers. It will be longer still before it becomes common knowledge, and till then our lot will remain a hard one, out of sympathy with our public and our executant labor.

In the present lamentable state of ignorance, or rather positive misinformation on the subject, beauty is taken to be a matter of prescription like a peach melba or a mint julep. "Take four Ionis columns, put them in a row with the caps uppermost, flank with ashler pilons pieced with bull's eyes, garnished with cartouches on top; over the column place an entablature with blocking course or parapet to taste, serve as a bank. If the columns are large and ripe, flute them, roof with a skylight powdered with snow and serve as a picture gallery. If the columns are small and meagre, then pierce the pilons with windows as required and serve as bank manager's house. *Note.*—The other ingredients will in all cases be proportionate to the columns as explained in preliminary chapter of this cook book."

There is probably a really best way to build a bank of given size in Canada, just as there is to build a temple of given size in Greece, or a parish church in England. Then again a post office, a museum, a private house, should be very different from the bank, temple or church, and from each other, not only in size and form, because the practical requirements are different, but in sentiment and expression, because the ideas associated with these things are so very different.

Yet if all these things are in Canada and done in one decade, they should express that to a certain technical similarity. Now, I think we all have a good deal to learn, because we have not established the type of our cycle very clearly, and we are still at sixes and sevens with our traditions. The French, who profess to know, say: "L'Art c'est d'etre toujours soi meme."

These, gentlemen, are the conditions of our competition, designs should be sent in to-morrow and the award will be made on doomsday.

A Canadian Architecture in 50 Years.

I verily believe that the next fifty years will decide the type and character of Canadian architecture for centuries to come. Is it to become a blind, second-hand, late-in-the-day immitation of the art of luxurious cosmopolitanism, which passes muster in the United States? Or is it to express something distinctive and characteristic of our aspirations and institutions and the sources from whch they spring? If we have any hopes or intentions towards this latter alternative, it is high time we bestirred ourselves to that end.

The first and most essential step to take is the institution of travelling studentships that our young men may go to Europe and see for themselves that the traditions of our civilization are something more than the tricks of manner invented for the delectation of Louis X. and watered down in the practice of the U.S.A. offices to which our best draughtsmen drift at present for wider experience.

Such scholarships should involve at least as much attention to the architecture of the United Kingdom as to that of France and Italy.

The next matter to consider is that of museums. The splendid model of the Trocadero Museum of Paris should find its counterpart in each of our great cities. At the Trocadero there is a historically arranged collection of many thousands of casts and full sized models of French architecture and sculpture with subsidiary collections representing the typical achievements of different countries. It has been my endeavor for several years past to make such collections possible for us. The great difficulty has been the lack of initiative at South Kensington, where one can buy a cast or photograph of almost any subject of art in Europe in five minutes, and where neither for love or money can you obtain a photograph of an English building or cast of an English archmould or niche figure. It is therefore with very great satisfaction that I can announce to you that a beginning will be made at the Victoria Memorial Museum at Ottawa forthwith, and that within a couple of years I hope to see there a collection of architectural ornament and sculpture in three dimensions of equal scope.

A.—Classic and Italian.
B.—French.
C.—English—at last!

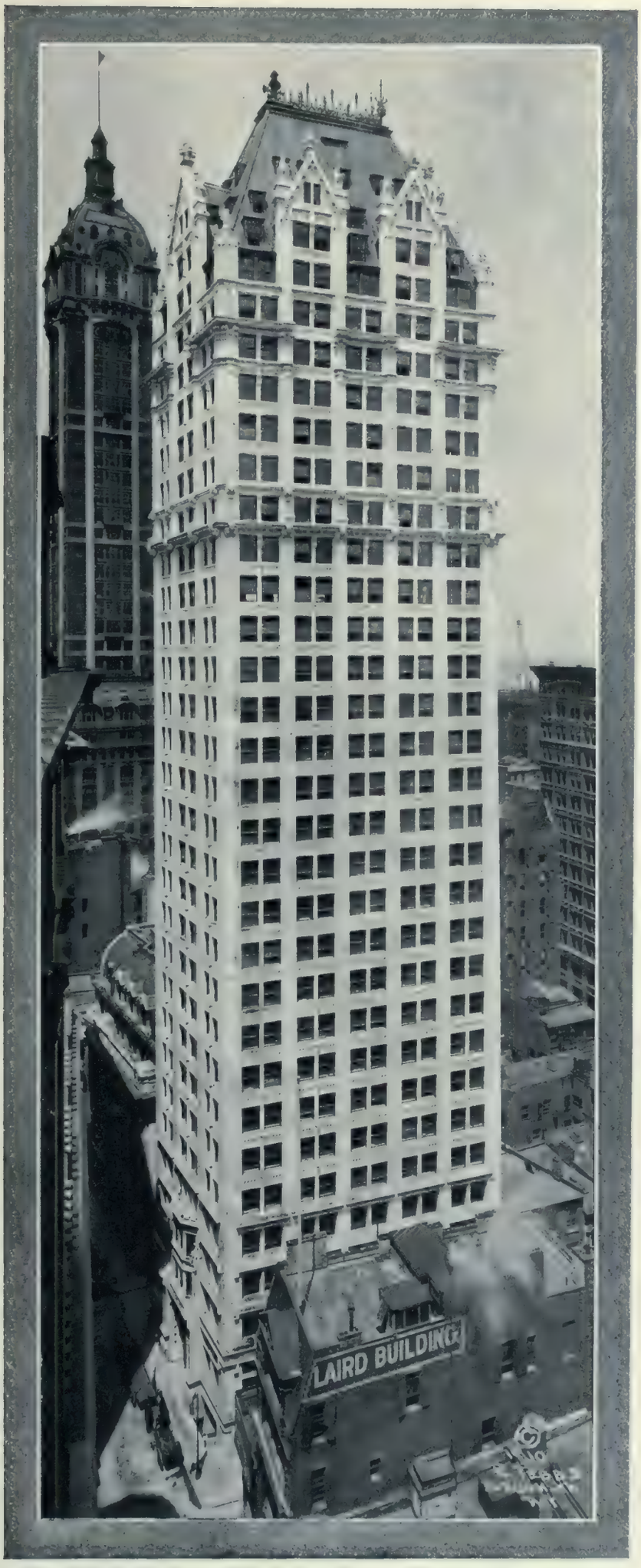
Also, that the museums now in course of erection at Toronto and Montreal will ere long be provided with a properly selected set of casts and models to illustrate the evolution of British art. Let us hope that the other cities will see their way to provide themselves with similar collections. A set of invaluable examples varying from casts a couple of feet long to models, say, 14 feet x 6 feet x 4 feet can be got for a mere $5,000. How often is such a price paid for an indifferent and perhaps dubious example of the Dutch daubster's art. Such a collection as I propose would be an educational force of immense value in any community to the designers and to the general public alike.

A third matter would be the establishment of a proper system of indentured pupilage. Our young architects learn their trade too cheap, and like anything else that is too cheap, what they get in the deal is often not worth having. I am a strong believer in the good old system of apprenticeships in the interest of the student, the principal and the art.

We are prone on this continent to expect too much of schools of architecture at universities. The result is that such schools have to do a lot of teaching which is mere technology, and are unable to find time in the curriculum for the foundations of culture so essential to our vocation as artists and as professional men.

Gentlemen, I have endeavored to enunciate a plain, common sense, theory of art, which would guide us to use our art rather than to play with it—to express rather than to please. I have endeavored to suggest what some of the main meanings and feelings contained in our art might be. I have enumerated the disabilities under which

(Concluded on page 64.)



Liberty Tower, Liberty and Nassau Streets, New York.—A Recently Erected Thirty-story Structure which Beautifully Illustrates the Successful Adaptation of Gothic Detail to Tall Office Building Design, and Demonstrates in a Practical Manner the Extent to Which Terra Cotta is Being Employed in the Field of Modern-Day Commercial Architecture. Henry Ives Cobb, Architect.

Liberty Tower, New York.—View of U pper Stories, Showing the Detail of Cornice and Pinnacles, together with the Treatment of Roof and Apex. Henry Ives Cobb, Architect.

Liberty Tower, New York.—View of Lower Portion of Structure, Showing the Detail of Entrance and Treatment of Bay Forming the Central Feature Over Doorway. Henry Ives Cobb, Architect.

THIRTY STOREY OFFICE BUILDING IN GOTHIC DESIGN

Liberty Tower, New York's latest skyscraper.—An interesting study of Gothic detail as applied in the architectural treatment of a modern business building.

A QUARTER OF A CENTURY AGO speculation was rife as to what would be the ultimate effect of the tall office building, or, as the more common allusion expresses it, the skyscraper, on commercial architecture. To-day it is a quantity less conjectural, as the skyscraper has become sufficiently common to admit of conclusions more definite and affixed.

Its advent, which demonstrated the ingenuity of man in meeting even changing conditions, could perhaps be consistently regarded more as an engineering than an architectural undertaking. Originally adopted in New York, where the capabilities of steel fabricators first made possible the erection of buildings greatly in excess of the then present prescribed height, it was an experiment purely economic. Restrictions in the way of natural limitations, coupled with a rapidly congesting district and a growing geographical and commercial importance, gave the city practically no other alternative but to build upwards. Since, then, however, and under circumstances less mandatory, excepting, perhaps, the case of Montreal, where the condition is somewhat analogous, the construction of the tall office buildings has been generally adopted as a means of centralizing business and exploiting to the utmost increased land values, until it has become a conspicuous fixture closely associated with the growth and development of cities of even secondary importance.

The constructive formula once established, it remained with the architectural profession by applying approved principles of design to save the skyscraper from a prosaic fate, give it grace of outline, symmetry and eloquence of expression, and in architectural writ to tell the coming generations of the enterprise and art of people who have gone before them. For, if the tall office building is nothing else, it is at least a splendid monument to the commercial and industrial enterprise of the present age.

No less a person than Professor S. D. Adhead, of the University of Liverpool, in a recent visit to the American metropolis, declared that the street architecture of New York was the finest of any architecture in the world, that there was nothing trivial, and that everything was on a grand scale; and while there is undoubtedly a vast difference of opinion on this point, it is, nevertheless, true that New York is a city of *modern babels,* and it might be added incidentally, owing to its cosmopolitan character, a city also essentially polyglot.

Being the first to adopt the skyscraper as a means of solving a problem one time peculiarly its own, it is only natural that one should turn there for some of the best examples of tall office buildings, both in construction and design. That work of this character offers a fertile field for architectural endeavor, is made abundantly plain in the splendidly considered Liberty Tower building recently erected at the corner of Liberty and Nassau streets. Rising to a height of thirty stories, and terminating with a French attic roof with dormered windows, this handsome structure beautifully illustrates the successful adaptation of Gothic detail to tall office building design, and it is regarded by many to be architecturally the most consistently considered structure of its kind that has as yet been erected. It is as much the adaptation as the style itself which gives the structure its eloquence of outline and beauty of expression. There is no excess of ornamentation or over-studied effect. Instead the detail is simple, rich and expressive, the effect of the treatment being at once majestic, dignified and refined.

The construction of the building, it is needless to say, has been carried out according to approved fireproof methods. The exterior is of granite and marble to the sills of the second floor, with white mat-glazed terra cotta above, and the roof is covered with rolled sheet copper. In addition to the superstructure there is a basement and sub-basement, making the structure in all thirty-two stories. The foundations consist of concrete caissons extending down to bed-rock and averaging in depth ninety feet below the curb. These support the footings of the steel columns. In floor construction the bottom arched type of reinforced concrete floor has been adopted, and the interior partitions are of four-inch plaster blocks finished in hard plaster with steel trim and doors. The window frames and sashes throughout are of the hollow metal type, and the main corridors and toilet rooms have marble wainscot and floors. The building has a total height from curb to roof of 385 feet, having a frontage of 57 feet 11 inches on Liberty street and a depth of 82 feet and one inch on Nassau street. It has its own electric light, heat and power plant, with the usual plumbing installation, the fixtures being porcelain throughout. Henry Ives Cobb, New York, was the designing and supervising architect.

In the commercial centres of Canada a decided tendency has developed towards the construction of tall office buildings, and it might be said in this connection that it is greatly to the interest of the architects of the Dominion to study closely not only the constructive features and equipment of such buildings, but what is more important, the advantages of the tall office building from a standpoint of investment, and the opportunities of which it admits in the way of design and architectural expression.

THE ARCHITECTURE OF CANADA.—By Prof. Percy E. Nobbs.—Continued from Page 60.

we labor, and the advantages we enjoy, and I have ventured to suggest certain steps for the fuller realization of these great advantages.

In closing, I shall say just two words and no more on Canadian architecture as it appears to me; they are capable of expansion into many phrases of high commendation and bright augury which I will leave unsaid. Our art in this land has plenty of head behind it and plenty of hand in it, but it still lacks something in matters pertaining to the heart. I have no doubt but that the heart will come in time, and if I have said anything to-day which might hasten that consummation by a day or an hour, or which might tend to influence that heart at all for good, I am amply repaid for the real sense of guilt which I suffer for intruding so long on your patience and good nature.

LINCOLN CATHEDRAL.—Cont'd from Page 55.

perhaps not be out of place here and will form a fitting conclusion." The entire inside length of the cathedral is 481 ft., the nave being 215 ft. long, and, with the aisles, 80 ft. broad. The height of the nave vault is 82 ft. and that of the choir 74 ft. The western transept is 223 ft. long and 61 broad; the eastern transept 171 ft. long and 36 ft. broad. The interior area of the entire building is 57,200 sq. ft. The height of the central tower is 271 ft. and the outside measurement of each face is 54 ft. 6 in. The height of each of the western towers is 206 ft. The internal diameter of the Chapter House is 60 ft. and the height 40 ft.

The bell, known as "Great Tom of Lincoln," hangs in the central tower. It weighs 5 tons 8 cwt., is 6 ft. ¾ in. high, 21 ft. 6 in. in circumference at its base. The hammer striking the hours weighs 224 lbs.

The eight bells, which are rung as a peal, hang in one of the western towers. The roofs throughout the whole building are covered with lead. A staff of stonemasons is kept employed the whole year round, restoring and renewing. The organ was remodelled and enlarged in 1897 at a cost of over £25,000, and is blown by means of dynamos connected with the city electrical supply.

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

Ivan S. Macdonald, Editor and Manager

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Vol. 3 Toronto, October, 1910 No. 11

CURRENT TOPICS

THREE HUNDRED THOUSAND DOLLARS will be spent under the terms of the Good Roads Act, in improving the main highways leading to Toronto. The expense is to be borne equally by the city in question, the County of York, and the Ontario Government. Unless present plans miscarry, the work will be started early next spring.

* * *

OPPORTUNITIES ARE ABUNDANT, according to Ernest L. Harris, U.S. Consul-General at Smyrna, for the installation of electric power in Asia Minor. The probabilities are that the near future will see great progress, and already the electrical plants of Europe are maintaining permanent agents in Turkey in anticipation of the boom. No attempt has been made yet to utilize the water power of that country, and this is explained by the fact that up to within two years ago the importation of all electrical devices and equipment was prohibited.

* * *

FORT WILLIAM IS CONSIDERING a number of improvements that are designed to bring the city up to a higher aesthetic standard. Plans are now being formulated whereby the present wooden electric-light poles along the main streets will be replaced by ornamental electroliers and elaborate iron trolley wire standards. Another project in contemplation is the widening of Victoria avenue, the principal business thoroughfare, where the abutting property holders for a distance of five blocks have agreed to deed to the city, property valued at $50,000. The avenue at the present time is 66 feet wide, and in order to increase the width to 80 feet, the landlords have asked the city to accept a strip 14 feet deep from every lot between Syndicate and Franklin avenues.

STEPS ARE SHORTLY TO BE TAKEN by the Government of France to relieve the congestion of traffic at Paris, a problem of constantly increasing difficulties. The work is to include the electrification of the city's surface lines, and the railway service out of the St. Lazare station. It is estimated that the expenditure will amount to $40,000,000.

* * *

AN ADDITIONAL EQUIPMENT of two hundred stamps, now being installed on its property at Juneau, Alaska, will give the Alaska Treadwell Mining Company the distinction of having the largest stamp mill in the world. When the new equipment is in operation, the mill will have 1,100 stamps in all, or 100 more than the famous Home-take Mine, which formerly topped the list in this resject.

* * *

A FEDERAL EXPERIMENT STATION, to be used exclusively for testing wood pulp, is being established by the United States Government at Wausau, Wisconsin. It is the intention of the forestry service department of that country to conduct investigations for the purpose of determing the value of native growths as wood pulp, with a view to developing methods and materials for making paper heretofore unknown. The sum of $40,000 has been appropriated for research work during the first fiscal year. The plant will be the first of its kind in the United States.

* * *

A COAL HANDLING BRIDGE, said to be the most modernly equipped of its size in the world, and the only one of its kind in Canada, has just been set up at the Mission docks of the Fort William Coal Company at Fort William, Ont. It is one of two portable bridges of similar type that the company is installing. The bridge is operated by a cantilever attachment, which provides for the conveyance of surplus coal to outside yards when the inside yard is filled. Together with its boom and cantilever, it is 319 feet in length. The operation of both bridges will be done by two 15 h.p. motors.

* * *

CAMPBELLTOWN (N.B.) IS RAPIDLY REBUILDING from the disastrous fire that wiped out $3,500,000 worth of property on July 11. So far, approximately four hundred buildings have been erected. These include dwellings, stores, warehouses, etc. Activity in this direction promises to be marked for some time to come. One thing conspicuously noticeable is the large amount of concrete work—both block and monolith—that is being undertaken. This is due partly, it is said, to the remarkable performance of concrete during the fire, and again to the fact that the establishment of fire limits has demanded better construction.

* * *

A WALL OF OLD BROKEN CHINA, laid in kaleidoscopic pattern and striking in the combination of its varied tints and hues, has been built by a Mrs. Denler, the wife of a Detroit, Mich., police captain, in the conservatory of her residence at 300 Dragoon avenue in that city. This unusual mosaic, towards the fashioning of which have gone thousands of bits of shattered bric-a-brac, exemplifies what feminine ingenuity and patience can do in partially offsetting the effect of "the bull in the china shop," and destructive propensities of the average housemaid. The fragments are inlaid on a plaster of paris bed, and the patterns were formed by first placing the pieces under water and arranging the particles according to their size and color. A highly glazed over-finish imparts to the whole an enhancing touch, and brings the colors out in a vivid yet harmonizing contrast. The scheme in its every detail was entirely carried out by Mrs. Denler, and it is decidedly novel in both its conception and execution.

HARNESSING THE WIND and the sun is a novel scheme which Prof. Fessenden, a British scientist, has in mind to produce electrical energy. As to what could possibly be attained by exploiting these forces was outlined at the recently held meetings of the British associations, where Prof. Fessenden stated that a number of windmills around the coast could give power enough to run all the railways, factories, and electric light stations in Great Britain. The practicability of the scheme is strongly doubted, as the uncertainty of the source of energy owing to atmospheric changes makes it decidedly defeasible and visionary.

* * *

RECENT TESTS MADE AT SANDY HOOK, says the WASHINGTON STAR, to determine the resisting power of reinforced concrete as a defence against high-powered projectiles, confirm the calculations of the penetrating power of the twelve-inch gun. A concrete wall twenty feet thick, heavily reinforced with steel beams, was pierced by a twelve-inch projectile fired at high velocity. The blow delivered was sufficient to penetrate twenty-two inches of armor plate, and the reinforced concrete withstood the attacks so well that it will probably be used in the construction of the new coast defence fortifications in the Philippines. A similar attack is to be made with the fourteen-inch gun.

* * *

ONE OF THE LARGEST TRAVELLING CRANES ever built is now being constructed at the wharf of the Western Lumber Company at Fraser Mills in the vicinity of New Westminster, B.C. It is 80 feet long and 40 feet wide and will be run on rails the full length of the loading wharf, which is almost 400 feet in length. The arm of the crane is 105 feet in length and is strong enough to pick up several tons at one lift. It will be driven by electricity from a motor situated on one end of the car. When in operation the great machine will not lift one load like an ordinary donkey engine crane and deposit it aboard the ship, but it will be possible to load the car on which the crane is situated with thousands of feet of lumber.

* * *

HIGHWAY IMPROVEMENTS IN ONTARIO during the past twenty years, according to approximate figures, amounted to over thirty million dollars. This is based on a recent report issued by Mr. W. A. McLean, Provincial Engineer of Highways, which gives the township expenditure for the years 1889-1908 as $19,017,343, and the statute labor in the latter year as 1,141,976 days. Since 1902, $2,128,122.93 has been spent on county roads, of which amount $709.374.30 has been borne by the Province. In good road grants the Province contributes one dollar for every two dollars raised by the counties. Since county road systems have been undertaken the total amount spent on construction has been $1,040,497.88. As near as can be estimated 1,125 miles of roads have been built at an average cost approximately of $1,250 per mile.

* * *

BOTH YOKOHAMA AND TOKYO, two important Japanese cities, have as yet seen very little of reinforced concrete construction. Tokyo has not much more to show in this regard than the Hirso bridge, built with ordinary merchant bars, while the most important work so far undertaken at Yokohama is the Yoshida bridge. This latter structure is being built according to the Kahn system across the Oka River, and will have a total length of 120 feet. Concrete blocks, however, have been used in quite a number of buildings, and it is quite probable, in view of the interest lately manifested, that reinforced concrete will eventually find itself in much greater demand. At the present time the construction is of a type involving moderate original expenditure. The form popularly used is a wooden frame, faced with flat tiles and cement or plaster, or sheathed with brick.

CIVIC IMPROVEMENTS being carried out this year in Montreal include permanent sidewalk construction amounting to $500,000, alone. The marked activity in this direction, it is said, is due to the continuous criticisms which have been leveled at the city regarding the bad condition of the streets and pavement. The work, according to a rough estimate, involves over twenty miles of permanent sidewalks, including 25,000 square yards of flag stone, 80,000 yards of asphalt, and 50,000 of cement.

* * *

RUINS OF AN ANCIENT CIVILIZATION, says the SLATE TRADE GAZETTE, of an age that no one has been able to estimate, are sprinkled over the length and breadth of Lower Mexico. The remains are stone, sometimes a soft limestone, sometimes marble, and sometimes granite, and show not only large extent but massive details, and, moreover, artistic adornment in the shape of sculpture, carried to a high plane. Some of the existing facades of temples and palaces are made of huge blocks of stone, bearing on their surface elaborate friezes and pictures of men and animals, deeply cut or in high relief and there is every indication that these carvings were done before the stones were placed in position, thus showing the use of designs or cartoons by artist-architects. Of this advanced civilization there are now few ethnogenic remains. The natives of the country have no idea who the people were who built those great monuments and they possess none of the art of those ancient days. The supposition is that the civilization caused national weakness, and that barbaric peoples overwhelmed the civilized people and blotted them out. The land relapsed into jungle, and the ruins are half hidden, even when known to exist.

* * *

REGULATIONS IN EUROPEAN COUNTRIES regarding the erection of buildings are more drastic in their enactment and more stringently enforced than are those employed for similar purposes on this continent. The collapse of a building or structure of any kind is practically unknown, and loss from fire, owing to the character of materials and type of construction demanded, is reduced to a figure incredibly small. A specific instance in this connection is offered in the case of Prague, a Bohemian city with a population of over 500,000, where, in the past 15 years, not one loss of life has been chargeable to fire, while the average destruction of property in the past three years has been less than $20,300 annually. The building department of that particular city consists of two sections—the administrative and the technical, with several subdivisions. This enables the authorities to exercise a vigilant supervision of all work undertaken. When applications for permits are presented they must be accompanied by plans in duplicate. A commission from the administrative department is then appointed, consisting of two officers from the city building department (one an administration official and the other a technical expert), one city councilman, and one officer from the sanitary department, whose duty it is to examine the plans and proposed site and see whether everything is according to the building laws. No building can be erected that will exceed twice the width of the street on which it fronts, and no exposed woodwork is permitted except in doors and window frames—and even this in a large number of cases is not allowed. The construction in general is brick, stone, concrete and terra cotta, with fireproof floors, hallways and kitchens. In the latter case, the floors are concrete and the walls tiled. As a result, the city is under a much less expense in the way of fire protection than would otherwise be necessary. The equipment is not nearly up to the standard of that of the average city in Canada and the United States of equal size, nor is it necessary that it should be, owing to the form of construction adopted and the care and supervision with which all buildings are erected.

MYTOON A · MEDIAEVAL CASTLE · IN THE · WOODS

An unusual design in a Summer Home in the primeval forests of Northern California. A design that harmonizes well with the romantic environments.

ONE OF THE MOST REMARKABLE summer homes on the North American continent is that of Mrs. Phoebe A. Hearst, the mother of Wm. Randolph Hearst, the well-known American newspaper owner and politician.

Mrs. Hearst's home is situated at the base of Mt. Shasta, in the far northern part of the State of California, and may truly be termed a "mediæval castle." It is questionable if any more beautiful or romantic site could have been selected for a summer home, so exceptional in its every particular. The base of Mt. Shasta is three hundred miles in diameter, and within this circle lies a country for the most part with primeval forest and broken up into valleys and elevations, through which hundreds of rivulets, flowing from never disappearing banks of snow, seek a lower level, finally to be lost in the larger volume of the Pit and McCloud rivers. The McCloud river is the most limpid, clear and impressive of all California streams. Its flow is incessant and rapid. From its source in the crest of Mt. Shasta to its junction with the Pit, it falls 14,000 feet; its course is a succession of water-falls, and its meanderings have never a restful moment. It is in the midst of such inspiring surroundings that Mrs. Hearst has built her picturesque "Castle in the Woods," which, from the standpoint of design and construction, is something absolutely new in the architecture of this continent, and is exceptionally noteworthy, because of the harmonious manner in which the architect has carried out his quaint scheme in keeping with the romantic environment of the site.

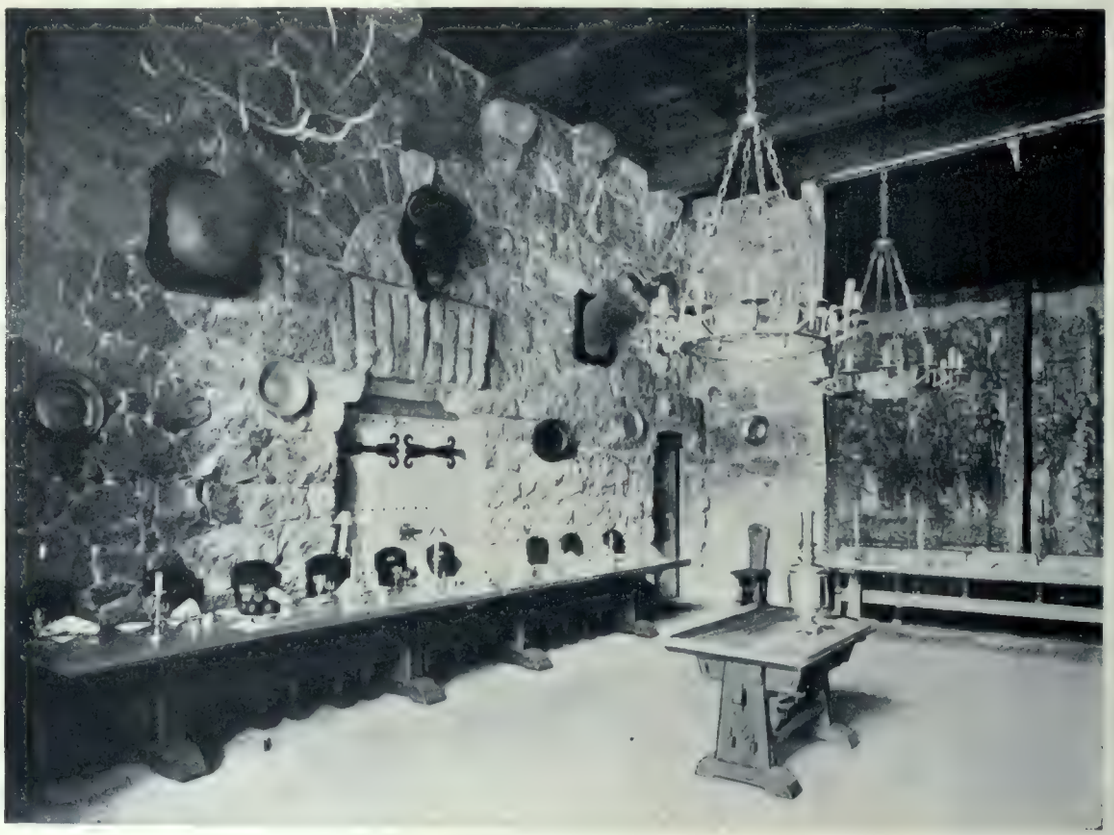
This exceptional "summer house in the woods" is situated on a site at an elevation of 3,000 feet. close to the banks of the St. Cloud River and affords an inspiring view of Mt. Shasta, as well as a magnificent prospect visible in every direction. "Myntoon" (the name it bears) for its originality of design, massiveness, picturesqueness and attractive features would be difficult to surpass.

"Mytoon"—"A Mediaeval Castle" Designed for a Summer House for Mrs. Phoebe Hearst in the Primeval Forest of Northern California. Note How Perfectly the Architect has Suceeded in Creating a Design that Conforms with the Site and Harmonizes with the Clusters of Giant Trees that Surround it. The Crowning Walls on the Tower and Main Building as Well as the Projecting Attics Were Necessary Because of the Heavy Snowfall. Maybeck & White, Architects.

Here on the slopes of the great Western mountains has been reproduced, in every minute particular, a feudal castle of mediæval times, as perfect in architecture and interior furnishings as those structures which were the pride of overlords of Germany centuries ago, modified only to meet the exigencies of modern habits and life. Fortunately the architects were not limited in the construction, motive, material, color and form by economic

considerations, and were enabled to develop the ideas of the owner and produce a structure correct as to historical tradition as well as to embody a true idea of baronial life on European frontiers toward the end of the Gothic period, and to harmonize it with the great trees which surround the castle, the beautiful river rushing by, and in the seclusion from the outside world maintain the inspiration which the unequaled and splendid environment of the situation affords.

The plan of the castle was made to conform to the original character and slope of the ground and to fit into a cluster of enormous trees which grew upon it. Considerations of sunlight and prospect also influenced the form adopted. The dimensions of the structure are great enough to admit the introduction of all the necessary detail which it was decided to incorporate into it. From east to west, the length of the castle proper is 120 feet, the greatest width, from north to south, being 56 feet.



"Mytoon"—The Baronial Hall Faithfully Portrays the Mediaeval Spirit. Note the Massive Heavy Detail of Whole Scheme. The Tables are Placed Against the Walls with Seats for Guests on One Side Only. Maybeck & White, Architects.

"Mytoon"—The Great Living Room,—Eighty Feet Long and Thirty-six Feet Wide—is Illuminated at One End by a Stained Glass Window of Thirteenth Century Design. This Room Takes the Place of a Mediaeval Chapel, the Place of the Altar being Occupied by a Massive Fire-place. Maybeck & White, Architects.

A great cellar, 45 feet in depth, extends below the entire structure. The foundation walls are 6 feet thick.

The axis of the castle is the central tower, 75 feet in extreme height and built of stone throughout. Halls, being a modern innovation, were discarded, the one referred to in the plan representing the piscatoribue or lavatory, where the spoils of the chase were displayed and the hunters cleaned up their arms and washed away the evidences of the conflict. In the chamber below is the wine cellar. There are six stories of sleeping-rooms, entered from the tower through doors placed at each half revolution of the stone stairway.

The stone of which "Mytoon" is constructed was quarried near-by, and is a bluish grey lava, common to the locality, a stone of enduring quality and fine texture. The massive timbers were felled upon the estate and shaped in a neighboring sawmill. The walls are massive in fact as in appearance, and the impression of great strength is fully borne out in construction as suitable to the character of an edifice representative of great qualities for defence. The buttresses are designed to accentuate the

"Mytoon"—The Chief Feature of the Exterior is the Central Tower which is Seventy-five Feet High.

solidity of the structure as well as to give stiffness to the walls, tower and roof. As it was impossible to have the modern porch without creating opposition to the prejudices of the higher senses, this architectural feature was dispensed with and mediæval substitutes adopted, hence the entrance loggia, outer stairs, terrace to dining room, etc.

Crowning walls on tower and main building with projecting attic was architecturally necessary owing to the occasional immense snowfalls, many feet deep, which if not provided for would crash roofs not protected against such an emergency. To harmonize the tints of the building with the environment, and to create a color scheme in unison with the grey of the Shasta forest, bright red for the tiles was manifestly too brilliant and glaring. A green, glazed tile were selected, and as they were not to be had in this country were especially manufactured in Holland. The temporary bridge spanning the McCloud River in the foreground is to be replaced by a stone arch 100 feet in length.

To impart a mediæval type to the exterior of the castle was a task easy enough for the designer, whose difficulty lay in the successful treatment of the interior, and to create, as a whole, an impression of absolute harmony both without and within. In this respect a notable success was attained. The great living-room is the prin-

"Mytoon"—The Structure Stands on an Elevation of 3,000 ft. not far from the St. Cloud River.

cipal feature of the interior and is 80 x 36 feet in dimensions and 36 feet high to the apex of the roof. The walls

"Mytoon"—The Great Fire-place in Which a Man can Stand Separates the Alcove from the Living Room and takes the Place of the Altar in the Chapel of a Mediaeval Castle.

of stone, where the buttresses join, are 7 feet thick. The timber construction is without ties. On the west is the

(Concluded on page 72.)

THIRD ANNUAL GENERAL ASSEMBLY OF R.A.I.C.

Winnipeg Convention adopt motion to amend Charter in compliance with joint resolutions for federation of provincial bodies. To ask Government for higher import duty on plans.

THE ROYAL ARCHITECTURAL INSTITUTE of Canada, at its third annual assembly recently held at Winnipeg, has resolved to incorporate a policy of federation among the provincial architectural associations of the Dominion, and also to appeal to the Dominion Government for a higher import tariff on the services of foreign architects employed on Canadian work. These two questions, which were the most important considered by the Institute, were disposed of unanimously by the assembly. On the question of an increase in the duty to be imposed upon foreign plans, the stand taken was quite pronounced and without hedging; it was declared that the architects were entitled to the same protection that is already afforded other professions in the Dominion.

The movement for federation, which had been thoroughly dealt with in council, was a matter of but slight comment when it came officially before the assembly. A joint resolution from the four existing provincial associations was read, asking the assembly to consider definite action in the matter of federation. The issue, which has been a live one for the past eighteen months in the association, was apparently thoroughly understood by all the delegates. Messrs. Gardiner (representing Quebec), Russell (Manitoba), and Burke (Ontario), took places on the platform with the president during the discussion.

A motion for amending the charter, which read as follows, was moved by Edmund Burke, Toronto, and seconded by E. L. Horwood, of Ottawa:

"The council be hereby empowered to obtain amendments to the charter of the Royal Architectural Institute of Canada, and to take the other steps necessary to alter the constitution of the Royal Architectural Institute of Canada, to comply with the request in the joint resolution of all the official provincial associations throughout Canada to form the R.A.I.C., into a federation of official provincial architectural bodies, with the approval of such official bodies."

President F. S. Baker explained that the federation movement was probably the most important one to come before the assembly. The chief object of the motion, if carried, would be to make the R.A.I.C. the central body of the provincial associations, whereas it was at present an absolutely independent institute. There was some argument as to whether or not the council should be clothed with arbitrary power in the matter of amendments, but on a final vote the motion as presented carried unanimously.

In consequence of this action, it is quite within reason to predict that federation will shortly become a manifest reality. Representatives of the provincial bodies are to be approached as early as possible with a view to obtaining a draft of the changes necessary before the next session of Parliament, when the amendments to the charter will be applied for.

Election of Officers.

The election of officers for the Institute virtually resolved itself into a vote to continue the present incumbents in office for another year. Practically every member of the old council and executive was re-elected. The report of the scrutineers was as follows:

President—F. S. Baker, Toronto.

Vice-presidents—J. Z. Resther, Montreal; Edmund Burke, Toronto; S. Frank Peters, Winnipeg.

Hon. Secretary—Alcide Chausse, Montreal.

Hon. Treasurer—J. W. H. Watts, Ottawa.

Council—W. H. Archer, Vancouver; C. B. Chappell, Prince Edward Island; A. F. Dunlop, Montreal; D. Ewart, Ottawa; H. E. Gates, Halifax; C. E. Fairweather, St. Johns; H. B. Gordon, Toronto; E. L. Horwood, Ottawa; J. P. Hynes, Toronto; R. P. LeMay, Quebec; C. P. Meredith, Ottawa; G. A. Monette, Montreal; James A. Wise, Edmonton, and Sam Hooper, Winnipeg.

The convention opened Thursday, morning, Aug. 25. in the Manitoba University, but owing to the absence of Secretary Chausse, who was unfortunately detained *en route*, a large volume of the important business scheduled for early disposal was laid over until later during the convention. W. P. Over, of the Manitoba Association, undertook the duties of secretary, *pro tem.*

Mayor Evans, in extending to the assembly a civic welcome, entered into the technicalities bearing on the surface of the architects' profession, and appealed to them as a body to use every influence in favor of fireproof buildings, and also to act as missionaries for architectural beauty both in specific structures and in maintaining harmony of architectural design in streets and districts, so essential to the city beautiful.

The question of the employment of American architects by Canadian capital was dwelt upon by President Baker in his opening address. It was pointed out that the object of the Institute in seeking a higher import duty on the plans of foreign architects was solely to protect the interests of the architects and the building fraternity in Canada. The training of Canadian architects was such as to remove all doubt as to their ability to design such structures as we require in Canada.

There was a unanimity of feeling on the point, and when it was moved by Mr. Peters that the Government be asked to increase the duty on the plans of foreign architects, the motion passed without a dissenting voice. The Institute has been promised the support of the Canadian Manufacturers' Association and of other bodies in this fight for protection, and the matter will now be placed before the Dominion Government for consideration.

Among the papers read before the assembly were those of Professor P. E. Nobbs of McGill University, Isaac Campbell, K.C., and S. Frank Peters of Winnipeg.

To the architects, the papers of Professor Nobbs and that of Mr. Campbell were of deep interest. Discussing the conditions under which the architect worked, Mr. Campbell, in his paper on "Architectural Jurisprudence," summarized all the legal aspects of the profession and dealt exhaustively with the relation of the architect to the contractor and owner.

Professor Nobbs took as his subject, "Canadian Architecture," the full text of which is published in this issue.

Montreal was chosen as the place of the next annual meeting.

During the convention a number of pleasant functions were arranged and carried out. These included the annual banquet which took place Friday night in the Royal

Alexandra hotel, a dinner given by the Vulcan Iron Works at the same hostelry, and a trip to the Tyndall marble quarries and to St. Andrew's Locks on the Red river. Friday morning a sight-seeing trip was made through the business and residential sections of the city.

PRESIDENT BAKER'S ADDRESS.

WE ARE EXCEEDINGLY GRATIFIED by these kind expressions of welcome, and are glad to find ourselves here once more assembled to conduct the business of the third general annual assembly of the Royal Architectural Institute of Canada.

Nothing could be more hearty than the kind welcome which has been held out to us.

I was rather interested in hearing Mayor Evans say that he fully realized the complexity of the architect's work, but I am rather afraid that even the man above the average does not entirely take in the complexity of the architect's work. However, when he spoke of the modesty of the architect I think he was quite right.

Since our last meeting, there has occurred a very important event to which I should refer, and that is the death of our late King, Edward VII., who was a great supporter of architecture and patron of the Royal Institute of British Architects, with which this institution is in alliance.

He upheld what was good in architecture and supported it at all times. Among his personal friends I believe could be counted several prominent English architects. However, it is the way of the world that a man cannot remain here for more than a certain length of time, and in his place we now have King George V., who has already consented to become the patron of the Royal Institute of British Architects, which we regard as the leading institution in the world of architects, and I have no doubt that he will encourage and advance good architecture in every possible way.

You will be asked at this assembly to consider a very important matter, and that is, the proposed federation of all the official provincial architectural bodies in this Royal Architectural Institute, and you will be asked to consent to the necessary amendment of the charter and bylaws of this institute to comply with the joint proposal of these official provincial bodies.

That matter will come up for discussion this afternoon, and I hope the meeting will be largely attended, so that the matter may be fully discussed pro and con, and that so important a step may not be taken without the most careful consideration.

It is a matter of gratification that this institute has been asked by the Royal Institute of British Architects to conduct the examinations held in Canada in future for the British Institute, and the first of these examinations will be held in Toronto in November.

There has been a great deal of discussion during the past year and previously upon the question of the employment by Canadian capitalists and corporations of architects practising in the United States, who have no interest in this country other than the commission which they may derive from the work placed in their hands.

In some ways, no doubt, it may have been very useful to the Canadian to see on our territory the work of these skilful gentlemen, but it seems to me that the time has come when Canadians can be quite properly and satisfactorily taken care of by the professional men of all the professions within the boundaries of this country.

To overcome this there seems to be only one way, and that is by urging the Government to establish heavy import duties upon the services of these foreign architects. I am sure it will be fully understood that it is a matter of self-protection purely with us, and that we are always glad to welcome visiting architects from foreign countries as visitors and to show them all honor and to make their visits here happy and pleasant ones. But I think it is the duty of this institute, if it is to be considered a representative Canadian body, to take steps to protect the architects of the country in the same way that the other professions or the Manufacturers' Association or any other Canadian body or power protects its members.

We submitted this matter, for instance, to the Canadian Manufacturers' Association, and their answer was: "Certainly. We will give you every possible support, but we expect that you will specify goods of Canadian manufacture and that you will support Canadian manufacturers."

It is not only the local architects who suffer through the foreign architects coming in to execute work here, but the manufacturers and the supply men are also thrown into competition through the bringing in of foreign workmen and contractors and the long train of resources and supplies which follow in connection with all large contracts. I hope that this meeting will take earnest steps to meet this growing difficulty.

I was interested to read in the papers this morning the remarks of a prominent Canadian contractor referring to labor difficulties, and I believe that what he said was good common sense.

He said that he would maintain an open shop as long as the international unions of labor existed in Canada. But as soon as the Canadian working men would get together on a basis of national federation, properly incorporated, he would give them his full support.

Now, it does seem a reasonable thing in a vast country like this, that the working men should make their own regulations, and any funds which they are pledged to contribute should be contributed to Canadian coffers instead of those of foreign countries.

It also occurs to me that in the incorporation of such a federation the classes of labor might be placed in three grades, a first class, a second class, and a third class, and that then the employer would know exactly what to expect in the men he employed and the wages could be regulated accordingly. I may be wrong, but it would seem to me a wise move.

We must have labor and we want to see our laborers as comfortably situated as possible and deriving the largest benefits possible from their work.

I also read in this morning's paper, though I have not been very long in town, that there are some two hundred new towns in course of construction west of Winnipeg at the present time.

I don't know whether it has come home to you architects that in any centre, large or small, it is the duty of the architect as a man of culture and taste and considerably more knowledge in that direction than any other class of citizen, to see that the laying out of towns should be very carefully considered.

Mr. Evans has referred to this matter in a way which is very hopeful, and if it were possible that he could be relieved of all the other duties of the chief magistrate for a time, I have not the least doubt but that he would soon plan a very beautiful Winnipeg, but the enormous amount of work that officers in towns and cities are called upon to perform seems to send to the wall those things which seem unimportant just now, but which are really exceedingly important in the development of this country, which should avoid the mistakes of other countries, having so many horrible examples before it.

There are throughout the United States some large and some smaller cities which it is a great joy to visit, and the reason of this is their well-paved streets of sufficient width—streets that are well planned. The spaces between the houses are ample, and instead of the street being simply a cast-iron, dusty thoroughfare, it is a restful park, which costs very little more to produce than the ordinary street. But where pulling down has to be done, producing wide streets is a very expensive matter.

I urge upon you the desirability, and it is the duty of the architect in the various centres to bring the attention of the authorities to these important matters.

There is to be held in London this fall a town-planning conference, and if any of the members contemplate a visit to England in October I would be very glad indeed if they would let us know so that we could be officially represented at the meeting.

There is another matter which is one that has always been with us and upon which considerable complaint has been raised, at the same time it has been condoned by the larger men. I refer to the accepting of commissions by architects under salary, commissions whereby they carry on private work, outside of their office hours presumably. But I think the personal feelings of these gentlemen in the end should overcome the desire for this class of work because it is surely an injustice. It is surely not intended that the salaried man in a salaried position should go outside and do work at rates which he fixes himself.

I think also that architects should take a firmer stand in connection with the building bylaws of municipalities. In a great many cases they are simply monstrous, and on the other hand some are quite insufficient.

In Toronto the city architect takes the trouble to go over every one of the plans and specifications in their entirety.

On the other hand, in Montreal, according to the by-law, the architect of the city looks to the architect, and seeing that he is a member of the provincial association he puts his seal of approval on his plans.

I don't know how you do it in Winnipeg, probably the same as in Toronto, although I believe that you have a new law providing for the qualification of architects which perhaps may relieve the Department, as in the case of Montreal.

We have had during the year several important competitions, and I am sorry to say that they have not all been satisfactory.

All we can do in this direction is to keep on urging on the promoters of the competitions the necessity of adopting a sane and reasonable method of holding competitions for the purpose of selecting an architect. Most people think that the object of the competition is to select or to secure plans and ideas. The real object of the competition should be for the purpose of selecting an architect, and I hope that we will see a great improvement in this direction.

We have a great deal of business to take care of and I will ask the secretary to read the report of the council for the past year.

SUMMARY OF REPORT OF COUNCIL.

The report of the Council showed that the past year had been a busy one. Three meetings had been held, one following the Annual Assembly in Toronto on Oct. 6, 1909, one on Jan. 18th of the same year, and the other on July 11, 1910. The principal business at the first meeting was the election of Mr. F. S. Baker to fill the vacancy in the Council occasioned by the resignation of Mr. A. H. Gregg, and the providing of a sum not to exceed $200 per year to be paid to the Honorary Secretary's assistant.

At the second meeting, it was proposed in view of the alliance which had been effected between the Royal Institute of British Architects and the Royal Architectural Institute of Canada, that all future examinations in Canada for admission to the former organization should be conducted by the latter body. This has since been arranged through Mr. Baker, the representative of the R. I. B. A. in the Dominion. Upon the proposal of Mr. John A. Pearson, Fellow, that the Royal Architectural Institute should conduct a competition for a Tower to be erected near Halifax, in commemoration of the Federation of Canadian Provinces, a committee of two members of the Council and Mr. Pearson were appointed to make the necessary arrangements. A report from the Secretary stated that a delegation of members of the Institute in a visit to Ottawa had urged the Hon. Mr. Pugsley, Minister of Public Works, to employ architects in private practice, to design and erect the more important public buildings, including the proposed Departmental buildings, in collaberation with the Government's Department. The Minister promised to give the matter his serious consideration. Other buusiness consisted of the polling of letter ballots regarding the application of Mr. J. H. Noel and Mr. A. B. Von Staffeldt for associate membership. Both were declared elected. Consideration was also given to a letter addressed to the President from Prof. P. E. Nobbs asking the endorsation of the R. A. I. C. of a project to accumulate details and to establish in various parts of Canada, architectural museums, a movement to which the Council promised to give its fullest support. Through the instrumentality of the Honorary Secretary, a collection of plans and projects of municipal improvements in Canada was exhibited at "Congress de Govern Municipal" and the "Association de Arquitector de Catalina" at Barcelona, Spain. In addition, the Council commented on a new society of architects in Winnipeg, and elected Mr. F. S. Baker to the Presidency, to succeed Mr. A. F. Dunlop whose resignation was received with both reluctance and regret, and who was then elected to fill the vacancy in the Council occasioned by Mr. Baker's elevation.

At the third meeting, July 11, 1910, a formal request from the R. I. B. A. that its future examinations in Canada be conducted by the R. A. I. C. was received, and a committee consisting of Messrs. P. E. Nobbs, Frank Darling and F. S. Baker was appointed a duly authorized Board for this purpose. Attention was also directed to the new class of members (licenciates) established by the R. I. B. A., admission to which can only be obtained during the current year. An announcement was made by the President that he had forwarded to the Honorary Secretary of State a letter of condolence respecting the death of His Late Majesty, King Edward the Seventh, and that negotiations had been carried on with Sir Wilfrid Laurier and the Hon. Minister of Public Works respecting the employment of an architect in private practice to design and erect the new departmental buildings at Ottawa, and also suggesting the appointment of a member of the Institute to act upon the Advisory Arts Council of the Government, and that in the future this council should pass upon the designs of all important public buildings before they were published. Further business dealt with correspondence carried on with the Hon. Dr. Reaume, Minister of Public Works for Ontario, regarding the published terms for a proposed competition for a new Lieutenant-Governor's residence in Toronto. In this connection the President was authorized to write the members of the Institute advising them to refrain from entering the competition and to call their attention to Clause 9 of the Code of Ethics. It was also reported that the conditions of competition for the proposed Memorial Tower at Halifax had been issued, and that twelve competitive designs had been received and were under consideration. The progress in the matter of the proposed Confederation of Provincial Architect Associations with the R. A. I. C. also came up for consideration and it was resolved to submit resolutions regarding same at the Winnipeg Assembly after each member had been duly notified as to the propsed amendment to the charter. Another matter considered was a letter from Prof. Nobbs proposing that in view of the alliance with the R. I. B. A., some arrangement be made with that body, whereby some reductions in the amount of fees and some increases in the amount of benefits would be conceded to its members in Canada. Messrs. Watts, Burke and Horwood were appointed a finance committee to pass upon and approve of all expenditures, and to collect all amounts due, on behalf of the R. A. I. C., in accordance to the provisions stated in the existing by-laws. Mr. J. Foulis was declared elected an associate of the Institute.

MYTOON—Cont'd from Page 67.

alcove, lighted by a great stained glass window of thirteenth century design, and fabricated in Holland. Between the alcove and the living room is a great fireplace, with an opening in which a full grown man can stand upright. The room is the chapel of the ancient castle, but the altar is replaced by the fireplace. The west end of the room has its fireplace also. The hangings are tapestry, of antique design, and, as in earlier periods, serve to conceal the stone walls and to add to the mediæval atmosphere of the apartment. The chandelier of the room is Gothic in pattern. The dining room follows closely the living room in general effect, and has also a double fireplace. The tables stand against the walls, the guests sitting on benches. The furniture in all the rooms is Gothic.

The kitchen wing is approached from the dining room through the butler's hall, and is spacious and well appointed. Its dimensions are 40 x 40 feet and include a room for the servants. It is entered from the outside through a portecoulisse and stairway. This wing has a foundation of rubble stone. The upper construction is one-half each, stone and rubble, and is surmounted by an attic of light grey slate.

The cellar extends under the entire main building to a depth of 15 feet and contains storeroom for various purposes and the steam heating apparatus for the castle. A rear entrance porch gives access. The entire structure presents a fair idea of conditions in the feudal period before forests had disappeared from European countries. A critic has found fault with the prominence of the kitchen wing, but this will be modified with the growth of shrubbery. The pain and sorrow of the feudal age is not depicted, but all else is so interwoven with the forest that the influence the structure wields leaves the mind and body healthier for having been a guest at "Mytoon." The architects of this interesting structure are Maybeck and White, San Francisco.

ARCHITECTURAL JURISPRUDENCE

By ISAAC CAMPBELL, K.C.

A paper read before the Third Annual Assembly of the R.A.I.C. at Winnipeg, dealing with the legal rights of contracting parties in the erection of buildings.

THE TITLE ASSIGNED me is a very wide one, and in the limits of a paper cannot be treated as a whole. Some features of the law pertaining to architects and to the contracts with which they deal, though, more can be discussed.

The architect is the recognized head of the building trade. His professional knowledge is the element in this pre-eminence. His character, energy and attention must sustain it.

As to the architect himself I have noticed a remarkable paucity of reported law cases in which the architect is directly a party. The contests between owners and contractors are numerous. Rarely does the architect appear except as a witness or as one whose previous exercise or non-exercise of authority is relied upon by any contestant. We lawyers are not so fortunate, perhaps we are more in the open. Some cynics say that the doctors bury their mistakes. Let us assume that the absence from the index of the law reports of the heading "architect' is due to the superior qualities of the men who have chosen your profession. I remember the late Dr. Kelly, of Brantford, an eminent educational authority, used to maintain that amongst the best means of educating conscience and to secure ethical strength in the character of youth was the careful teaching of mathematics. And I remember him once amidst some amusement to put forth his contention. He admitted, of course, some proficiency in the handling of arithmetical figures, mere dollars and cents, might enhance the skill of a future scoundrel, but that mathematics, even if somewhat elementary, relating to the external and accurate relations of form, the diameter to its circumference, the sphere to its segment, and those concepts upon which the various series of progression are based, demanding accuracy of thought and result, apart from any sordid suggestion of gain to the student, must in harmony with truth itself promote the very love of truth which results in honesty. And he used to claim with some appearance of triumph that while supple arithmeticians give the criminal courts and the detectives a good deal of trouble mathematicians never do so. In their quest for truth they themselves become that which they sought. This might explain why the word "architect" occupies such a small space in the digests of the law courts.

Duties and Power of the Architect.

It is a maxim of high and immemorial authority that no man can serve two masters. As applied to the architect his position under such a rule makes his profession a most responsible one. He is, to begin with, the agent of his employer. He is required to secure certain results by changing labor and material into a finished structure and in doing this to control the contractors, the artisans and workmen who fashion and finish the fabric. As such agent, if authorized, he can do what the employer can do in adding to or subtracting from the work, and in all this he would make available his professional knowledge and skill. Certain implied powers and implied duties arise from this agency. I am speaking now of the architect limited entirely to his professional position as an adviser, and as an agent clothed with the rights and responsibilities which the common law of nearly every country gives him. But in practice, and arising out of contract, there is added what is sometimes his most important and most difficult work. He is created a quasi-judicial officer to decide questions of difficulty and dispute between his employer and the contractor. He thus has a double function to perform. He is required to produce results, to produce them within a reasonable minimum of time and at a reasonable cost, and if the contract so provides, upon him is thrown the duty of deciding most serious questions between two or more parties whose interests and opinions may greatly differ. It is not surprising, therefore, that lawyers and judges in discussing these varied relations of the architect, have not been able to adopt a uniform opinion, at least, have not been able to express in any brief formula an opinion concerning his position. Mr. Gregory, who wrote his work after his experience of twenty years as an architect, and twenty years as a lawyer, recognizes the difficulty by saying that from the very force of circumstances there is an admitted tendency to bias in the position of the architect; and starting with that he proceeds to discuss the practical means of meeting it. In short, he recognizes the difficulty which might be expressed by the formula; the architect is the agent of one of the parties, yet he is made a judge between the two. The old common law rule, "No man can be a judge in his own cause," is departed from when by the modern written contract the architect is clothed with all the powers now found therein.

The author I have referred to thinks the necessity of the case demands the apparent inconsistency of position. He assumes the architect's loyalty to the owner or builder, and discusses the question from the point of view of the contractor, namely, as to the motives which would induce the latter to place himself in the hands of a professional man who at least might be assumed to be subject to a "tendency to bias." I do not notice that he discusses at any time what sometimes is the case with a contractor of widely extended interest. There might be an opposite tendency.

Authority as Arbitrator Invested by Contract Only.

You must keep in mind that an architect does not by virtue of his profession or employment become an arbitrator between parties. That authority is given him only by contract, or agreement, and is not implied from his employment as architect. That employment in itself merely regards him as a highly skilled agent. It is the agreement of parties which makes him an arbitrator or a judge. The difficulty of position being thus pointed out (a difficulty which architects must have fully appreciated and have endeavored to solve), let me point out some matters of practice that the architect should remember. It is said there may be complete detachment in the study of pure mathematics, but absolutely mental detachment from environment in the ordinary affairs of life is impossible no matter how judicial a man's temperament may be. Honest men will to the end of time by reason of their limitations differ in opinion.

The architect receives a reward for his work either as stipulated or in accordance with a generally understood rule or scale of his profession. This reward should be paid him only by his employer. The architect should not

have a further personal or pecuniary interest. He ought not to be a part owner of the property or of the building or structure to be erected and completed. If he is such then he or his co-owners must give the fullest information to the contractor or proposing contractor concerning the facts. If he is so closely related to the owner, has intimate business dealings with him, especially if he is indebted to him, these too are circumstances which so affect the tendency to bias, that there should be the most absolute good faith in communicating a notice of them. A contractor may agree even with the owner himself that he will leave the decision of all questions to that owner. A contractor may agree that he will leave them to the owner, agent, architect or superintendent. In such cases, having acted with his eyes open, he will be bound by any decisions given against him unless these decisions are so palpably perverse as to raise in the mind of a court the presumption of fraud. If, therefore, there be relationships between the agent, the architect or superintendent, and the owner which gives such agent, or architect, any interest greater than the interest of working for salary or professional reward, all these relationships should be notified to the man on the other side. He has a right to know about them.

If, in any specific case, the architect has entered into an undertaking with the owner as, for instance, to what a building will cost, so that in consequence of such undertaking his judicial discretion may be interefered with, that fact should be known to the contractor. The consequences of omitting to furnish such information may not immediately react upon the architect, but where the injustice is gross or palpable the failure to notify the contractor would relieve him from the binding obligation of a contract which committed to the architect the right of final decision, and if the court thought that a contractor had not been properly dealt with, it would proceed to ascertain how much he should be paid by the owner or builder. Later on, the latter and the architect might have to dispute over the loss between themselves. Let me give you some illustrations of the above principles.

Court Interpretations.

Kimberly vs. Dick, an English case, in 1871.—The architect entered into an undertaking with his employer that a manor house should be erected at a cost not exceeding £15,000, including architect's commission and all expenses, and he engaged the services of a contractor who without being informed of the undertaking and without close verification of a bill of quantities given him by the architect, entered into a contract with the employer for the completion of the work from the architect's plans and under his supervision for £13,700, with power to the architect to order extra work and with a clause providing that all questions arising between the parties should be settled by the award of the architect. On a suit by the contractor, claiming to be entitled to be paid by the owner for all work executed by him beyond what was included in the estimate and for certain extra work, it was held that on the evidence the architect was the agent of the employer, that his undertaking as to cost having been concealed from the contractor the abitration clause in the contract could not be enforced and the plaintiff was entitled to an account for what was due him for any works executed by him under the architect's direction not included in the contract, and for any works so included in the contract the price for which was therein included, and for any variation made under the architect's direction. The undertaking referred to by the architect was contained in a letter sending down from London, a report upon a building suggested for the owner, in which this language was used: "So that you may safely rely upon the £15,000 covering everything unless you want more done than I have proposed. Indeed, I can now promise it shall not exceed that sum." In another case, language which scarcely rose to the height of an undertaking, but was in the form of a strong assurance, was pronounced as sufficient for the same result, although, as I understand the report, the case really went off on another point. An architect should therefore be very careful as to the language he employs in furnishing estimates of cost. Where the written contracts for the work are made for the whole work, practical difficulty will not often arise, but even in such cases in view of "changes" and "additions," an architect should exercise care in the representations he makes to his employer, and between the two of them they should let the contractor know of any such undertaking. In the case cited the owner of the building would have had to pay what the Master of the Court may have found against him. There is no further report showing how much that was, neither do I find anything indicating how the owner of the manor house and the architect may have settled it between themselves.

In the case of Ludlam vs. Wilson in the Province of Ontario it was brought out in evidence that the owner's superintendent was his uncle, who was greatly indebted to him as a result of certain business dealings. These facts were not known to the contractor for a large amount of building material which went into the house. One judge of the Ontario Court of Appeal held directly that this want of knowledge on the part of the contractor would absolve him from the arbitration clause of the contract. The other judge who gave a reasoned opinion referred to the circumstances as being objectionable, but based his decision chiefly upon the fact that after the work was stopped, the owner had discharged the contractor from its completion. As I read the report, therefore, it is not a new authority on the point I have noted, but it indicates, plainly enough, the duty of parties.

The Contract and its Wording.

The architect's powers as a judge or arbitrator arise from contract or agreement. Without that, in case of dispute the courts of law must ascertain the rights of the parties as to compensation or damages. By agreement the architect is almost universally appointed as arbitrator, and those who prepare such contracts endeavor if possible to completely oust the jurisdiction of the courts. The inconveniences from tendency to bias or otherwise, that might arise from this are thought to be less than the inconvenience and delay and loss arising from a trial that might take place for many months after the work was done and after the evidence on the ground was lost except so far as preserved in the defective memory of fallible witnesses. Better have the matter decided while it is open to inspection than to delay it long after when the evidence will depend upon memory and the decision has to be given by a man who cannot be so well qualified as a skilled architect or engineer. From this results a warning or advice which should be given always to those interested: "What is the language of your contract? What is the contract? What does it say?" Because only to the extent that it varies the common law, does it confer new powers.

Such contracts usually give the architect powers to add or to subtract from the work, and of an arbitrator or valuer to determine the compensation, to determine even the number of days' delay for which the contractor has to make recompense or to suffer punishment, and usually to determine the construction of the contract itself and all disputes arising out of or respecting it. This latter clause makes the architect a judge in every sense. In a case of dispute, where each of the parties has an opposing view to put forward, "an arbitrator," in the strict sense in which the term is used, should be careful to give both sides a hearing in the presence of each other; but where in a building contract it is provided that the engineer or architect to be appointed by the employer for the directing and superintending of the work, shall certify the completion of the work or the amount to be paid to the contractor, or the fulfilment or the measure of any other contract undertaking, the intention is not that he shall before certifying be required to afford the parties an opportunity of a formal hearing. It is his own knowledge and skill and his own observation that it is intended he shall act upon, and not upon facts to be established by

the evidence of witnesses nor upon the evidence of expert witnesses.

But as a matter of good practice, I would recommend in a case where the owner or employer has taken an active part in the oversight of his building, and especially where it is known that he has either in the presence of the architect or otherwise, discussed questions with the contractor during the progress of the work, if there be a dispute, or if a dispute be likely, that the architect bring the two parties before him, let him thrash out the difference, and as a judge give his decision. In a good many cases such a course will obviate an appeal to any other tribunal.

There must be no collusion between the architect and his employer to the disadvantage of the contractor. The architect must not be submitted to, or be subject to, any pressure from his employer as to his decision. To act under the orders of an employer in measuring or certifying work would, if accompanied by evidence which left room for the court to draw an inference of unfairness, have the effect of setting aside the architect's decision. What is fraud in such a case has not received a general definition. Each case must depend upon its own circumstances.

Defective Plans.

The editors of the American and English Encyclopedia of Law state generally as follows: "In England it is held that where plans and specification for the execution of a certain work are prepared for the use of those who tender bids for its execution, the person asking for the bid does not impliedly warrant that the work can be successfully executed according to such plans and specifications. In the United States, however, it seems that there is an implied undertaking on the part of the builder (the owner) that the plans and specifications are sufficient for the successful construction of the work, and where the work is constructed by the contractor to the plans and specifications, there is no agreement upon the part of the contractor that the work when completed will be safe and fit for the purposes intended." In the United States there are now some forty-seven different judicial jurisdictions, each of which is final in itself and without appeal in matters not involving constitutional questions nor business or works extending over State limits. So that a general statement as to the law of the American States usually seems no more than that a large majority of the courts of the several States have concurred in a decided principle. In most of the cases that have arisen there has been something in the language of the contract which affected the decision. In all such cases, the first question is: "What was the contract? What was its language?" The leading English case for the principle referred to is that of Thorne vs. The Mayor of London in respect to the Blackfriars Bridge across the Thames, Vol. I., Appeal Cases, page 120. An eminent engineer drew plans for the bridge including caissons, instead of the usual coffer dams. It was found that above low water the caissons could not resist the force of the current. This resulted in great delay and loss to the contractor, who sued for damages on the ground that there was a warranty that the works could be executed according to the plans provided. The final court, House of Lords, held "there was no warranty . . . and that the plaintiff should have elected either to refuse to tender or should have asked for a warranty if the novel mode of procedure alarmed him. He must take his chances. If he goes on he must either obtain an express agreement or take the risk."

In the case following, Lord Justice Brett held, where the foundations were found defective: "If the proposition is that the thing shall be done in a particular time, it does not seem to me unreasonable that he must consider and calculate for himself whether the proposed work can be done within the time; and it is but a step further to say that he must consider also for himself and calculate whether the work can be done at all, so as to enable him to earn the price to be paid. I think it may be said that both parties must make their own calculations, that if the contractor finds that the employer is proposing to him something that cannot be done he ought not to offer to do the thing which, in his mind, cannot be done; and if he does not enquire into the matter, or runs the risks, he must take the consequences, or if he thinks it doubtful, he ought to correct the agreement by an express covenant."

Important questions must from time to time arise which have not been as yet anticipated in the decision of the courts. Most of them will turn upon the question of what was the contract. The structures to which damage is important enough to lead to litigation, are usually provided for by contract. With the increased height and weight of buildings, with the increased loads that warehouses are now required to carry there is usually provision made, especially in the latter class of cases, from which a warranty is at least implied. Contracts are made from time to time providing for a cargo or storage load of so many pounds per square foot of floor space. Such a warranty would necessarily extend beyond the final certificate and the time of acceptance of the building. Its nature must be derived from its language, and whatever the contract is, it would be enforced. Where apart from such warranty a contractor agrees to erect and finish a building he must erect and finish it. He must fulfil his agreement. The contractor must at least hand over the building. The contract is there and must be complied with. It would be impossible to discuss in a short paper the varying decisions due to variation of language employed in such contracts. But where the contractor is eliminated, and the question of the architect's responsibility to his client comes in question, then the principles of the ordinary law of negligence apply. The contractor may become bankrupt, leaving a cumbersome ruin on the owner's land. The architect holds himself forth as a man of professional and superior skill. If natural conditions are unknown to him he should so report and let the owner take the risk. In short, the old Roman maxim translated into our language, "The trusted man must show the utmost good faith," will apply. In the large cities this question will often be important. I understand that certain soils vary in their capacity to resist pressure from 500 pounds per square foot up to as many thousands. Further, that it is not merely a question of vertical pressure, but a matter of slipping or of lateral escape that is to be feared, because you tell us that if watet could be confined laterally it could be built upon. Therefore, the existence of neighboring heavy buildings will seriously affect the problem. To anticipate exactly what will happen is, therefore, impossible. The architect cannot always know. may be trouble. He should make the possibility of this No matter how he multiplies his margin of safety, there clear in any case where there is room for suspicion.

Miscellaneous Rulings.

In the case of Moneypenny vs. Hartland, Vol. I., Carrington & Payne, page 352, the following is the language of Chief Justice Abbott: "If a surveyor who makes an estimate sues those who employed him for the value of his services, and it appeared that he was so negligent that he did not inform himself, by boring or otherwise, of the nature of the soil of his foundation, and it turned out to be bad, this goes to his right of action, and if he went upon the information of others which now turns out to be insufficient, he must take the consequences; for every person employed as a surveyor must use due diligence, whether the plaintiff has used due diligence or not is a question for the jury; and if the plaintiff went on the statements of others that is no excuse, as it was his duty to ascertain how the fact was or to report to his employers that he only went on the information of others, or that the fact was not certain."

I conclude also that whatever may be the rule of decision as between the English and American courts, the difference is found in contests arising between contractor and owner, and that the law as to the architect's relation to his own client is practically the same in both juris-

dictions. The English courts may have been slower to accept evidence imputing negligence as conclusive than the courts of some of the States, but they may have in some of the States men not so well qualified who had assumed certain judicial functions.

The rule in France is that the architect is responsible to both the employer and the contractor, and there is a double responsibility as to all recommendations he may make, if he should make any in connection with the work at all. It is suggested that some of the Quebec Province decisions have almost gone as far as that, but I don't understand that to be the case in the other provinces. But our rule is that the responsibility exists between the professional man and his client. He is not responsible to a third party. There are some cases where the architect's authority has some judicial authority. Without an agreement, however, the architect is only the skilled agent of his client.

In an American case a mason took a sub-contract to do the work of a principal contractor, and the fact that when the owner saw the stone piers being built he made no objection, did not amount to an acceptance of the benefit of his labor, as he had a right to suppose it was being done by the principal contractor (Campbell vs. Day, 90 Ill. 363). In such a case as this the architect should have been careful to have kept an index showing the names of the principal and the various sub-contractors. Further, in such a case as this the architect should be careful not to misrepresent his authority. Where a party holds himself out as an agent for another with authority to bind him, he is held to his representation. If he had not authority to bind, he might be made personally responsible. That is not peculiar to the architect, but it applies to all professional men. If a representation is made to some other one, and there is no authority existing, he has to make good the loss which the party which relied upon his assertions may suffer.

Where there is a difference between the contract and the plans and specifications referred to for details of construction, the contract controls.

So where there is an inconsistency between a copy of the plans and specification furnished to the contractor, upon the faith of which his bid is made, and the contract entered into and the original plans retained by the builder, the former will control, and the builder (owner) cannot take advantage of such inconsistency to the prejudice of the contractor.

Where there is a variance between the plans or drawings and the written specifications, the latter will prevail. This is upon the principle that the drawing are illustrative of the specifications; but I think that the following rule should apply in such a case, namely, that where there is a variance between the terms of the contract, the plans and specifications should all be reconciled in a practical manner, if possible.

I can conceive that very often the contractor or his foreman would follow the plans as a matter of course rather than the specifications. Therefore, the rule should be to take all the parts together to find the consistent meaning, if possible. If not, then the specifications would govern the plans if clearly in contradiction to them.

If the contract is ambiguous, great and sometimes controlling weight will be given the construction which the parties themselves on previous occasions placed upon it.

Written matter will control printed in a case of repugnancy. It is assumed to have been the result of deliberation.

Technical meanings are to be given to trade terms rather than the ordinary meaning of the separate words.

Apart from agreement conferring the authority, an architect has no implied authority to bind other parties by his construction of the contract. This again illustrates the importance of the question: "What is the contract?"

The amount of damages, general or specific, for delay is nearly always a subject for a certificate of the architect; but he has no implied power and this must be provided for by the contract.

The architect may "approve" of work so as to make his employer liable, without writing. The contract providing for his approval would be satisfied by evidence of his actual approval. For the purpose of preserving evidence, it is always best to provide that the written certificate be required.

The courts have been reluctant to interfere with an architect's decision where the contract has given him complete authority. Under the English decisions collusion is necessary. There may not be derict evidence of the collusion. That may have to be gathered from injustice and wrong on the part of the architect or engineer, so palpable and so perverse that it leads to a presumption of fraud.

Manitoba Legislation.

In Manitoba there is nothing special to report on the legislation affecting architects. Provision was made by 1910 statute for examinations to be conducted by a board appointed by the Provincial Government. The architects in practice at the date of the statute are, by right of that fact, entitled to register with the board without examination. Your profession is in a somewhat peculiar position with regard to its corporate rights in each province because so much can be done without your jurisdiction.

Your president referred this morning to men from over the international boundary getting so large a patronage in the Dominion. . . . That is a matter which will have to be dealt with by the federal authorities in order to give you protection.

Of course, architects are affected by the vast body of municipal legislation empowering municipal councils to provide as to the height and strength of walls, the access of light, provision for sanitary appliances, and the multitude of other details which are common in any municipal Act and in any body of municipal by-laws. I understand that there is not much difference in the Canadian provinces between either the empowering legislation given by the various provincial parliaments, or in the subsequent civic legislation enacted by urban councils. The city of Winnipeg not long since enacted a very comprehensive by-law. After a good deal of deliberation the draft was submitted to the architects practising in the city, and their suggestions were invited, and many of them were embodied in the by-law finally enacted. It is desirable that architects should not merely give their individual suggestions, but that, in their corporate capacity, they should be consulted freely as to the general body of civic regulations.

Architects in Manitoba are entitled to the benefit of the Mechanics' Lien Act, but, along with material men, they are postponed to mechanics and workmen for the 15 or 20 per cent. rebate, as the case may be, which an owner has to hold back, up to thirty days' wages. This right comes under the statute, and in reading a statute, as in a contract, the question always is, "What does the statute say?" In the American States the rule is not at all uniform. In Pennsylvania, the architect gets the benefit of the statute if he superintends the work of the building. The one, however, who merely draws the plans is not entitled, nor is a consulting architect. They have done no work on the building. But in Manitoba, "Any person who performs any work or service upon or in respect of, or places or furnishes any materials to be used," etc., "in a building, wharf, etc., is entitled to a lien." So that the statute is clear in favor of the lien in this province. There was a considerable amount of interesting discussion in an Ontario case some years ago, where the language of the statute gave the benefit to "builder or other person," in which the right was found in the affirmative.

Uniform Contract.

In previous sections of this paper, I have referred to the architect's powers, as usually found in contracts and referred to in the law books. In the city of Winnipeg,

what is styled "the uniform contract" has come to be almost invariably adopted. It subjects the architect's final authority to several limitations. Provision is made for arbitration by way of appeal from his decisions in several cases, such as the valuation of work added or omitted, and the amount of expense to an owner who has taken the work out of the contractor's hands, when audited and certified by the architect. The duration of the extension of time to which a contractor in certain contingencies is entitled is also a matter for arbitration, if either party is dissatisfied with the architect's allowance. Loss to the contractor by owner's delay in furnishing materials outside of contract to other trades is first fixed and determined by the architect, but is subject to appeal. There is a clause providing that if the work be substantially completed, except in some details, the completion of which, owing to the time of the year, would involve disproportionate delay, the architect shall estimate the actual cost of these, add fifty per centum and issue a final certificate. This clause would seem to have much equitable merit. The owner is made liable for fire or tempest, and is required to insure so as to protect the contractor. Combined with this is a provision giving the owner the right of election as to rebuilding. If he elects to rebuild, the contractor is entitled to the actual additional cost of completion and restoration which the fire and tempest had occasioned. If he elects not to rebuild, the architect makes a proportionate estimate of the work done and material supplied up to the time of the disaster, and this is to be treated as a final estimate. I understand that there have been comparatively few arbitrations since this form of contract was adopted. How far members of the Winnipeg profession may have been conscious of its provisions when making their decisions, I cannot determine, nor, probably, can they.

Municipal Extensions and Improvements.

I had intended to devote the larger part of my paper to a discussion as to future legislation regarding city building, the laying out of streets and parks and providing for separate districts for manufacturing, mercantile and resdence purposes. You will all have noticed not long ago that commission has recently made a report to the government of the city of Berlin, embodying recommendations which anticipate at the end of forty years a population for that city of 10,000,000. They intend to deal with the railway question and railway terminals with a view of abating railway noise and smoke. I am not sure how they propose as to the manufacturing and other districts, where smoke, noise and offensive odors are inevitable, whether by way of zones from a common centre, or by way of sectors, like the spaces between the spokes of a wheel. They propose to control the right of private property, to interfere to a considerable extent with the views of the individual real estate owner, and they also propose that the administration of their plan shall be committed to a body of skilled men—engineers for the laying out of streets, architects for the buildings, and landscape men for the parks. Probably such a plan would be difficult for general adoption in Western communities.

I have not been able to get such a plan, but some of my architect friends have asked that such a plan be sent over.

Who can anticipate the growth of an urban population? The real estate owner who buys acreage at $100 and sells it in four or five years at $5,000, could not fairly complain of such an administration reasonably exercised. The rapidly increasing value of his land is due to the community, and in most cases to nothing else. If, then, the good of the community requires a modern and enlightened plan for civic betterment, the community has the right to secure it. Delay in securing information, however, has prevented me entering upon a discussion of this Berlin plan. I understand that the proposals have advanced beyond the stage of a mere outline, though authority has not yet been given to make them law. In any such matter the assistance of skilled men should be called in; not merely for advice, but they should be clothed with authority to make their decision effective. But you, gentlemen, can do much in your local and your larger provincial and national meetings, to educate the public in such matters. There is certainly much yet to be done. For the city of Washington, the president recently appointed a commission with authority for the construction and administration of both the present and future public buildings and grounds in that city, with a view to securing artistic uniformity and beauty. It cannot be contested that the present individual freedom does not lead to a great deal of inartistic incongruity, which a central advising authority with some power to act and control might greatly improve for the public benefit.

The trend of population from rural to urban life during the last hundred years has been remarkable. The figures, indeed, are startling. The invention of labor-saving machinery is accountable probably for most of it. Whether some of the inventions which ameliorate country residence may not make a difference in the future, it is difficult to say.

City problems have become more and more pressing, therefore. Doubtless most thinkers are agreed that the moderate sized city is a better haven for the average welfare of its inhabitants than the very great city. But we cannot close the gates. How to provide, therefore, for the future city is a matter for the good citizen. It is certainly a matter for the profession which designs the business blocks, the factories and shops where the people work and the houses in which the people dwell.

The challenge of the great city is becoming more and more insistent. The smoke nuisance, the noise, the dust, the anxiety of the rush hour, to say nothing of the older problems of drainage and water, are increasing. At any rate, our comprehension of them is growing more plain and positive, and unless they are taken hold of in a broader and more comprehensive way, we will still be using the old inadequate methods of dealing with them.

The city councils have large authority, and they are criticized because they are slow, but when I think of the multitude of matter that they deal with, and of the numerous cross-currents and interests which bear on a city council, it is surprising to see how well its work is done. But it is not fully well done, and in matters of this kind there must be the fullest information which would come best from an organized body like yours.

I don't know that the sky-scraper has yet become very troublesome in our city, where there are only two buildings of ten stories or upwards in height, but from what we hear from observing men who talk of it in other cities, it is a serious question there. While not germane to a legal paper, we may ask if in New York City the sky-scraper is a necessity. Manhattan Island is not so congested as to need sky-scrapers. If you take the city below Forty-second street, take that as the line from the Battery up, three and a half or four miles to Forty-second street, and if all the stories were stratified or spread all over the other buildings, they would not increase the height of Lower New York by three-quarters of one single story. Individual owners may need the sky-scraper as an advertisement, and a building where tenants can announce themselves as in "Suite No. 3044," for instance.

The Germans with more phlegm are wiser. They say they don't want the sky-scraper and they won't have it. When an American applied in Berlin for permission to build a sky-scraper, he was met with the response: "You want a big building to spread yourself. Then spread out instead of up." That, however, is only a side issue. The fact is the sky-scraper cannot become universal. The streets could not handle the traffic. If you make New York City twenty stories higher, the rush hour with last practically all night.

These, gentlemen, are some of the matters which I thought might interest you. Some of them may have been new to you, or have recalled what has not been in your minds all the time, although I fear a lot of the points have been commonplace. When I get a complex building case I go to a friendly architect and talk over the law practice that is germane to the point, and I find that al-

most universally they have the articulation of the various principles much better in mind that I have. So I hope that I have not unduly wearied you.

He was an architect who planned the first cave and hut; later on, but long ago, the architect defined three great ideals—firmitas, utilitas, venustas—stability, utility, and beauty, and while there has been age-long discussion as to whether beauty is an end in itself, or whether it should be derived from the other two, yet architects have not to-day enlarged the definition of their ideals. Firmness, utility and beauty still express them.

I don't know that in this northern country beauty will be too much loved for its own sake. Heating and lighting constrain us to certain types of buildings which cannot be radically departed from.

Lord Brougham has made us familiar with the boast of Caesar Augustas who "found Rome brick and left it marble." But his days marked the beginning of the great city's decadence. It was only a little time after when the tribes of the north came down on the plains of Italy, and the men who occupied the palaces were unequal to their defence.

It is well to co-ordinate the third ideal of the architect with the other two. Severity and justice will be more beautiful than generous prodigality.

Your annual meetings should have increasing importance. It is satisfactory to be assured that on each succeeding occasion your progress has been notable. As an old member of a sister profession, I cannot but congratulate you. I hope you will continue to build wisely and well, maintaining the high traditions and enhancing the honor of your great profession.

ARCHITECTURE OF THE WEST

By S. FRANK PETER

Full text of paper read at Winnipeg before Third Annual Assembly of the Royal Architectural Institute of Canada.

AS STATED IN THE GENERAL PROGRAMME, this subject was to have been handled by Mr. Joseph Greenfield, an ex-president of the Manitoba Association of Architects and F.R.A.I.C., than whom there could be no one more suited to do justice to the subject, owing to his natural ability in this way, and also to the fact that he has had a large experience in the West which would undoubtedly have made his remarks most interesting and instructive.

Unfortunately, Mr. Greenfield is unable to fill this position on account of serious illness, for which, I am sure, we are all very sorry, and none more so, I can assure you, than the member who is now about to endeavor to outline the architecture of the West. I can only hope, therefore, that you, sir, and fellow architects, will extend to me that generosity—which I believe to be characteristic of the profession—while I try to undertake this duty, the call for which, while not sudden, as least was not expected, and which, had longer time been available for preparation, might have resulted in less opportunity for severe criticism in considering such an important subject.

It seems to me that the first point to be observed in connection with the architecture of the West is the vastness of its extent as well as the varied character necessarily accompanying it. Like the West itself—what a boundless prospect. Who can attempt adequately to describe its extent and possibilities? At the threshold of its development, so to speak, one's vision is limited and we have to indulge in imagination, which of itself, however, affords a large amount of satisfaction and gratification, at least to members of the architectural craft, accustomed as they are to indulge in "dreams"—so to speak—of well proportioned, beautiful and stately buildings.

Doubtless many present have come west of the Great Lakes for the first time, and they are just commencing to see for themselves the glorious vista spread out before them, and realize more fully than is possible from the study of either pen, pencil, or brush sketches, the grand opportunities of the architect in the preparation of suitable designs of all classes of buildings for the many millions of inhabitants who will yet dwell in the land.

To those of you who might possibly take a run further west or north on the occasion of this visit, the numerous villages and towns of but yesterday's growth will seem truly marvellous, and with the continued growth of population this building up of such centres in the different section must continue. And in addition to the vast extent of growth, it must be borne in mind the class of settlers is a very superior quality over that usually found in the settlement of new countries, and which will materially affect the development of architecture in the West, and at the very commencement the class of buildings will be much superior to that possible under less favorable conditions.

As we are all aware from trade and municipal returns many of our Western cities are establishing record growths. Commencing with Winnipeg, the "Gateway of the West," statistics have already shown a more rapid growth than even Chicago, the great internal metropolis of the United States, could ever claim. And it looks very much as though Vancouver, on the coast, is going to establish a similar record, to say nothing of the enormous development of Port Arthur and Fort William at the head of the Lakes and the enormous possibilities there.

Calgary and Edmonton in Alberta, Regina and Saskatoon in Saskatchewan—the latter of which places only ten years ago with a little over 100 citizens, now boasts a population of nearly 15,000—and many other places in the West and away to the far North, which time will not permit me to mention, are all showing phenomenal growth.

It is unnecessary, I think, to describe to this association the class of habitations of early days—the Indian tepees, the mud huts and log houses of the early settlers, the shack of the railroad contractors and prospectors, and gradually trace them in their different stages, excepting that a reference to the old Hudson's Bay Post is always interesting. One known as Fort Garry, which used to stand where our Main Street now runs, near the junction of the Assiniboine and Red Rivers—a single gateway of which only has been saved from the hand of the ruthless destroyer—was a most interesting piece of good old masonry, built by clever Scotchmen, who knew more of good masonry than all the labor unions put together. Fortunately, the post known as Lower Fort Garry—about 27 miles down the river—still remains, and it is to be hoped will be preserved for all future generations to admire as opportunity favors them to visit this interesting spot.

Next to the vast extent of our field for labor in connection with the architecture of the West, is the fact of the necessity of looking out for suitable materials with which to erect and furnish our structures. At present even material of ordinary use in vast sections of our country in the West is being imported from foreign countries, or at least freighted enormous distances. That this condition of affairs will continue is impossible, as it is not consistent with the spirit of the West, which from investigation is proving from day to day that it will be able to supply material of all kinds that may be necessary for the construction of the largest and most costly buildings. Following the development of material will come the permanent residence of many new and well qualified mechanics and artizans, who are already arriving in large numbers, and those who are not so already, will undoubtedly ultimately become good Canadians and be able to adapt their knowledge to the peculiar requirements in the establishment and practical building up of a national architecture status.

It might not be out of place here to refer to the importance in buildings of all kinds in this Western land, to be careful of our foundations. In many localities the subsoils are deceptive, and in addition to the usual enquiries most thorough tests should always be made, particularly for the larger buildings, so as to avoid the unsatisfactory distinction of having leaning towers of "Pisa" as a result. Wind pressure is also a most important factor to consider, as with a wide sweep of prairie comes also the strong and steady wind pressure, against which due provisions must always be made.

As regards the style of architecture of the West, it must, of course, be based on classic and ecclesiastical lines, the foundation of all good work in our public structures, and also in our domestic architecture. This will undoubtedly be secured as the result of the efforts that are now being made to provide suitable education and opportunities for the student, both by the Governments of the day and by the associations themselves, which are so greatly interested in the work. And while on this subject, Mr. President, I cannot help expressing the hope that the R.A.I.C. will be recognized by all provincial and subordinate associations as the parent organization, so to speak, and that we shall continue to work together to secure the ends in which we are all so much interested, viz., the establishment of a national style of architecture which while necessarily varied according to the different sections, will all maintain the elements of good design and national characteristics.

To assist in obtaining this object it will certainly be desirable that errors of the past—in admitting settlers to this country who are exempt from real Canadian citizenship in many ways—should be rectified. This is particularly noticeable in certain sections of the great West, where foreigners have been allowed to come and settle under conditions, the result being that there is no progress in those portions, such as there should be along the architectural lines referred to.

Another point I would like to refer to, as it is most intimately connected with architectural designing, is the importance of town planning, the laying out of parks and the other great centres of attraction. There is no doubt it is most important for every municipality, instead of waiting till the days after the first stage of progress shall have been accomplished, to set to work at the start to establish definite lines on which to build, by the engagement of artists and men of skill in that line of work and after careful consideration by the best business men of the community. What, sir, is a magnificent pile of buildings, no matter whether smaller or larger in extent, without suitable and well laid out grounds and approaches, so that the impression of the mass itself may be adequately benefited by its surroundings and so that the surrounding areas may be properly appreciated from the site itself?

There is no doubt the West affords an opportunity of magnificence unsurpassed by any other portion of the country, and while it is never creditable nor desirable to copy designs of foreign countries, I cannot help thinking that, take for instance the so much talked of Government owned elevators, what a grand chance that would be to erect such a class of buildings if grouped in each locality instead of being scattered and thus made a reasonable and attractive "sky-scraper" in each of the different central grain sections through the West.

On the other hand, for our cities, I cannot help expressing my regret, and I believe that a large number of my fellow architects will join me, in that there is such a tendency amongst the business men of our communities to copy the sky-scraper kind of building for office purposes, and which is so often of such unsightly shape and proportions. No doubt such buildings may prove financially successful to the fortunate owner who is allowed to erect them, but I believe the beauty of our cities would be greatly enhanced if there were a reasonable limit placed to their height. Take for instance the most beautiful capitals of Europe—the sky-scraper is practically unknown there, and who will think of comparing the sky-line of New York, for instance, with many of the beautiful cities of the Continent? Of course, New York has a style of its own, and it may be that the sky-scraper is a necessity in that city, but I believe there are a great many wise men living in New York who hold the opposite opinion. However, even if New York decided that the sky-scraper style of building was necessary for them, surely such a style is totally unnecessary in a city like Winnipeg or in other cities—at least of the West—surrounded as they are by boundless prairie, and where there can be no necessity for cooping up a mass of hard workers within such a restricted area.

A most important point comes in here with the subjust, the architecture of the West, viz.: that the rising generation should be thoroughly trained on artistic lines in conjunction with their regular practical work so that they may fully appreciate the beautiful in all departments of life, in which case they would certainly be brought up to admire and cultivate good architectural work, which should be a constant source of pleasure, instead of being compelled to view structures conveying very different feelings as are often experienced under less favorable conditions.

It is also to be hoped, sir, that in the erection of the many large and important public buildings that will be required in the development of the West, all proper efforts will be made to secure suitable designs by fair and honorable competition. Our public men should realize that meritorious designs for all large public buildings—no matter to which class they belong, can only be secured by engaging the best talent in the land, and where such is not secured directly, then by the institution of a set of conditions for competition so that the best of our architects will be glad to avail themselves of, resulting not only in the advancement of architecture in the West, but also of architecture throughout the entire country, and in the ultimate erection of public buildings which will be not only a credit to the designer but also a standing monument to the wisdom of the citizens of the country. Federal buildings in the different provinces, as well as provincial should certainly be carried out on these lines—of course, always in conjunction with the Department, whose chief architect should be called in as consulting or even supervising architect. Also as regards style for the Western country, which is of such gigantic extent it must necessarily vary from that suitable for a broad expanse of level prairie to that of the more picturesque and romantic mountain scenery, thus giving opporunity of developing artistic work under such vastly different conditions.

To sum up, sir, it seems to me that it would be much more preferable for us to take our ideas from the work at large, and not tumble too hastily into the styles set by our neighbors to the south, much as their is to admire in their work, and who are establishing what is known as the American School. Let us, on the contrary, by all means in our power, assist in establishing a Canadian architecture which shall have close touch and sympathy with the dear old mother land, and together help to perpetuate and extend any architecture that shall be known throughout the world as British architecture, holding the same relative position in future generations to that of Rome and Greece in the "grand old days of old."

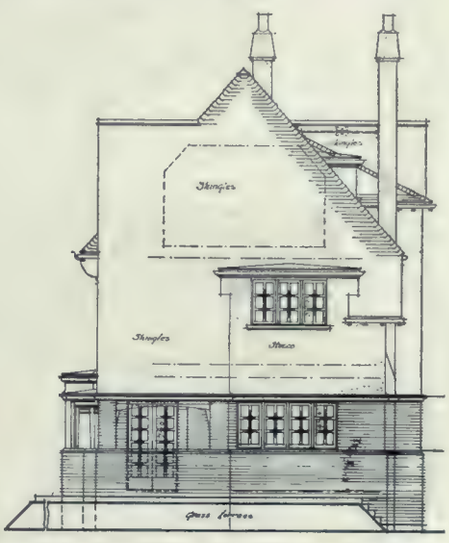
ALL BUILDINGS of five or more stories erected hereafter in Calgary will be of fireproof construction. Owing to the rapid growth of the city, the municipal authorities have deemed it both wise and necessary to pass a by-law demanding the use of only incombustible material in the construction of the more important structures undertaken in the future. In this step Calgary displays a progressive spirit which other cities might well cultivate, as it means economy and protection to both the community and the individual.

Living Room, Residence of F. A. Coryell, Jameson Avenue, Toronto. An Inviting Interior with a Simple Architectural Scheme, having Walls done in Dark Orange Paper below Plate Rail and Freize and Ceiling in Gray Stucco. The Fireplace is Built of Red Brick and the Woodwork is Stained a Golden Brown. Chadwick and Beckett, Architects.

Dining Room, Residence of F. A. Coryell, Jameson Avenue, Toronto. Finished in Mahogany Stained Gum Wood with Wall Panels of Light Green Muslin and Gray Stucco Ceiling. Chadwick and Beckett, Architects.

Residence of F. A. Coryell, Jameson Avenue, Toronto. Chadwick and Beckett, Architects.

South Elevation.



East Elevation.

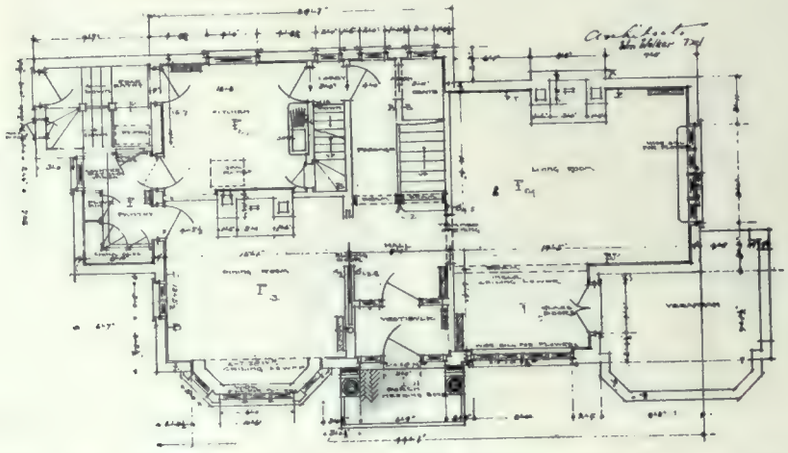
North Elevation.

West Elevation.

AN ATTRACTIVELY DESIGNED HOUSE ON A NARROW LOT

Residence of F. A. Coryell, Jameson Avenue, Toronto. Situated and adapted in plan to obtain the full advantages of its surroundings.

THE NARROW LOT is not the most infrequent nor the least vexatious of the architect's problem in house-planning, yet when such limited advantages as sometimes obtain are fully taken into consideration, the undertaking of a residence to fit a site of this character is not wholly destitute of opportunities for individuality and highly pleasing results. In the residence of F. A. Coryell, Jameson Avenue, Toronto, illustrated herewith, the designers, Messrs. Chadwick and Beckett, have not only admirably met the conditions imposed by a somewhat restricted site, but have produced a structure that is eminently satisfactory both in its design and architectural setting.



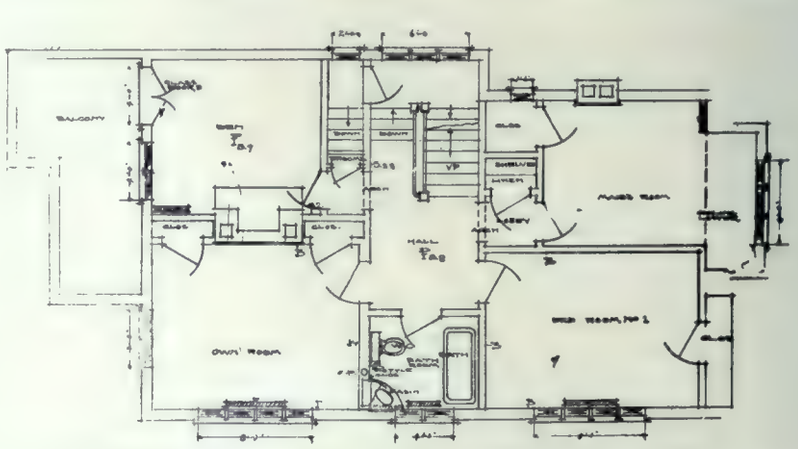
Ground Floor Plan, Residence of F. A. Coryell, Jameson Avenue, Toronto. Chadwick and Beckett, Architects.

The lot of this house is 40 by 200 feet, running east and west with the approach from Jameson Avenue on the east. To the south is the lake with two parallel lots intervening on which the houses are so situated as to provide an unbroken vista between the two. In order to take advantage of this opening, it was decided in planning Mr. Coryell's residence to set the structure slightly back on its site with the main elevation and entrance to the south. By doing this it was possibly to adopt an arrangement giving all main rooms the benefit of an unusually splendid outlook, in addition to keeping the entrance private, and providing ample space on either side.

In the exterior construction, the house is of red brick with white mortar joints for the lower story and cement plaster on metalic lath above; the roof and woodwork being stained brown and the entrance and window sashes finished in white paint. The porch has a brick floor in herringbone pattern, and the vestibule and hall are centrally located with the main staircase and a coat room at the rear. A feature of the living room which occupies the entire floor space to the right, is a depression in the ceiling to form an ingle connecting with the large verandah overlooking the east lawn. This interior in finished in white pine stained a golden brown, with dark orange paper below the plate rail, and a gray stucco freize and ceiling. The fire place is built of red brick, and the sills across the windows at either side of the room are sufficiently deep to serve as a convenient place for flowers.

In the dining room the fireplace is of buff brick. Here the trim is in mahogany-stained gum wood, with strapped dado walls having light green muslin panels. The freize and ceiling are in stucco, similar in tone to that in the living room. The pantry and kitchen adjoin conveniently, and these are arranged to effectively obviate unnecessary steps in both the itchen work and service.

Upstairs the woodwork is painted a French gray, with the exception of the den, which is finished in a fumed oak color with brown ceiling. This room has also large red brick fireplace and a doorway opening onto a balcony to the west. The floors throughout the house are of Georgian pine, and the bath room is equipped with modern enamel sanitary fixtures.



First Floor Plan, Residence of F. A. Coryell, Jameson Avenue, Toronto. Chadwick and Beckett, Architects.

A MODEL COTTAGE.

A FULL SIZE MODEL of a workingman's cottage, to be built from the design awarded first prize in a competition conducted by the National Congress on Tuberculosis, is to form one of the interesting features of the Cement Show to be held in Madison Square Garden, New York City from December 14 to 20. This house was designed by Architect Milton Dana Morrill, of Washington, D.C., and it has been described and illustrated in a previous issue of CONSTRUCTION. The Cement Show is to be one of the biggest affairs of its kind ever held, and it will give a splendid opportunity to bring the economic, hygiene and sanitary features of this type of house to the attention of the public and municipal authorities. The house is to be of reinforced concrete throughout, and is a two-story, five-room cottage. A number of these houses are now being built at Virginia Highland, a new suburb of Washington.

Every room has windows on at least two sides, thus giving ample light and ventilation. The windows are of the casement type, swinging out, with no trim. While the house is of a plain box-like appearance, much has been done to enhance its beauty by the use of window boxes, flowers and vines and a little exterior decoration in ornamental concrete. The house is so built that it may be thoroughly cleaned with a hose, the cement floors being graded to plugged spout to discharge on the lawn. There are absolutely no places inside the house for the shelter of dust, vermin or insects.

MANITOBA ACT FOR ARCHITECTURAL REGISTRATION

First province in the Dominion to adopt legislation regulating the practice of Architecture. Provides for admission to the profession by examination only.

Editor's Note.—Since September 16th just passed, according to legislative enactment, it has become unlawful for any person in the province of Manitoba to carry on the practice of architecture, or to advertise as thus being engaged, without an authorized certificate of registration. The law which was assented to by the Lieutenant Governor-in-Council on March 16th of the present year, went into effect two months later, with a time allowance of four additional months for practicing members of the profession to duly qualify. In draft, the measure is modelled after the "Illinois Licensing Act," and the power of enforcement is invested in a provincial Board of Examiners, consisting of four practicing architects and a member of the faculty of the University of Manitoba. As the subject of registration has been a topic of broad discussion for some months past in various parts of the Dominion, the operation of the law, the first of its kind in Canada, will undoubtedly be closely watched, and we believe that in this connection, the full text of the Act published herewith will prove to be of no little interest to our readers.

MANITOBA is the first province in the Dominion to adopt a bill providing for the licensing or registration of architects. The draft of the measure is modelled after the Illinois Licensing Act, and its full text is as follows:

The expression "architect" means any person who shall be engaged in the planning or supervision of the erection, enlargement or alteration of buildings for others, and to be constructed by persons other than himself; but nothing contained in this Act shall prevent draughtsmen, students, clerks of works, superintendents or other employees of those lawfully practising as architects under certificates of registration as hereinafter provided for, from acting under the instructions, control of supervision of their employers, nor prevent the employment of superintendents of buildings paid by the owners from acting if under the control and employment of a registered architect.

The term "building" shall be understood to mean a structure consisting of foundation, walls and roofs, with or without other parts;

The term "board" means the board of examiners appointed under the provisions of this Act.

There shall be appointed by the Lieutenant-Governor-in-Council within sixty days after the passage of this Act a provincial board of examiners of architects, to be composed of five members, one of whom shall be a member of the faculty of the University of Manitoba and the other four shall be architects residing in the Province of Manitoba, who have been engaged in the practice of architecture for a period of at least five years. Two of the said architects appointed as examiners shall be designated to hold office for two years from the date of the passage of this Act, and the other two, together with the member of the faculty of the University of Manitoba shall hold office for four years from the passage of this Act; and thereinafter upon the expiration of the term of office of the person so appointed, the Lieutenant-Governor-in-Council shall appoint a successor to each person whose term of office shall expire, to hold office for four years, and the said persons so appointed shall have the above specified qualifications. In case the appointment of a successor is not made before the expiration of the term of any member, such member shall hold office until a successor is appointed and duly qualified. Any vacancy occurring in the membership of the board shall be filled by the Lieutenant-Governor-in-Council for the unexpired term of such membership.

The members of the board of examiners shall, as soon as organized and annually thereafter in the month of January, elect from their number a president and a secretary, who shall also be the treasurer. The treasurer shall file a bond for the penal sum of one thousand dollars with, and to the satisfaction of, the Provincial Secretary before entering upon his duties. The board shall adopt rules and regulations to govern its proceedings not inconsistent with this Act, and shall also have a seal of office, to be kept in the custody of the secretary.

The secretary shall keep a record of all the proceedings of the board, which shall be open at all times to public inspection. The secretary of the board shall receive a salary which shall be fixed by the board, but which shall not exceed the sum of six hundred dollars per annum. He shall also receive his travelling and other expenses incurred in the performance of his official duties. The other members of the board shall each receive the sum of $16 for each day actually engaged in this service, and all legitimate and necessary expenses incurred in attending the meetings of the said board. The above salary, fees and expenses shall be paid from the fees received by the board, as provided for by this Act, and no part of the salary or other expenses of the board shall be paid by the Province of Manitoba.

All moneys received by the treasurer in respect of the fees hereinafter mentioned shall be held by the treasurer as a special fund for meeting the expenses of the said board and the payment of salaries and allowances of aforesaid and the costs of the annual report of the proceedings of the provincial board of examiners of architects.

At any meeting of the board three members thereof shall constitute a quorum. Special meetings of the board shall be called by the secretary upon the written request of two members, by giving at least seven days' written notice of the meeting to each member, not including the day on which the notices are mailed, telegraphed or personally delivered.

The board may, subject to the approval of the Lieutenant-Governor-in-Council, adopt rules and regulations for the examination of applicants for certificates of registration to practise architecture in accordance with the provisions of this Act, and may amend, modify and repeal such regulations from time to time; provided however, that any such amendment, modification or repeal

shall not become operative until sanctioned by order of the Lieutenant-Governor-in-Council.

The board shall immediately upon the election of each officer thereof, and upon the adoption, repeal or modification of its rules of government or its rules and regulations for the examination of applicants for certificates of registration, file with the Provincial Secretary, and after approval thereof by the Lieutenant-Governor-in-Council, where such is required, shall publish in The Manitoba Gazette for at least two insertions a statement signed by the secretary, setting forth, in the case of the election of an officer or officers, the name and address of each officer, and in the case of the adoption, repeal or modification of the rules and regulations, a copy of such rules and regulations and the amendment, repeal or modification thereof.

Provision shall be made by the board hereby constituted for holding examinations at least twice in each year for applicants for certificates of registration to practice architecture, and any person over twenty-one years of age, upon payment of a fee of fifteen dollars to the secretary of the board, shall be entitled to an examination for determining his qualifications. All examinations shall be made directly by the said board, or a committee of two members delegated by the board, and due notice of the time and place of holding such examinations shall be published, as in the case provided for the publication of the rules and regulations of the said board provided that in special cases such publication may be dispensed with in the discretion of the board. The examination shall have special reference to the construction of buildings, and a test of the knowledge of the candidate of the strength of materials, and of his ability to make practical application of such knowledge in the ordinary professional work of an architect, and the duties of a supervisor of mechanical work in buildings, and shall also seek to determine his knowledge on the laws of sanitation as applied to buildings. If the result of the examination of any applicant shall be satisfactory to a majority of the board under its rules, the secretary shall, upon an order from the board, issue to the applicant a certificate to that effect, and upon payment to the secretary of the board by the candidate of a fee of $25 he shall thereupon issue to the person named therein a certificate of registration, permitting the holder thereof to practise architecture in this Province in accordance with the provisions of this Act, which certificate of registration shall contain the full name, birthplace and age of the applicant and be signed by the president and secretary and sealed with the seal of the board.

All papers received by the secretary in relation to applications for certificates of registration shall be kept on file in his office and a proper index and record thereof shall be kept by him.

Notwithstanding anything herein contained, any person who shall by affidavit prove to the satisfaction of the provincial board of examiners that he or she was engaged in the practice of the profession of architecture in the Province of Manitoba on the date of the passage of this Act, shall be entitled to a certificate of registration without an examination, provided such application shall be made within six months after the passage of this Act. Such certificate of registration when granted shall set forth the fact that the person to whom the same was issued had been practising architecture in the Province of Manitoba at the time of the passage of this Act, and is therefore entitled to a certificate of registration entitling him or her to practise architecture without an examination by the board of examiners.

The fee payable by any person so applying for a certificate of registration by affidavit shall be twenty-five dollars, upon the payment of which sum the secretary shall, with the approval of the board, issue to the person named in said affidavit said certificate of registration, in accordance with the provisions of this Act.

In the case of two or more architects carrying on their business in co-partnership, each member whose name appears as a member of the firm must hold a certificate of registration under the provisions of this Act.

No joint stock company or corporation shall be registered under the provisions hereof, but such company or corporation may employ duly registered architects.

Every architect registered in accordance with the provisions of this Act shall have a seal, the impression of which must contain the name of the architect, his place of business, and the words "Registered Architect, Province of Manitoba," with which he shall stamp all working drawings and specifications issued from his office for use in the Province of Manitoba.

After the expiration of six months from the date of the coming into force of this Act, it shall be unlawful for any person not holding a certificate of registration in this Province under the provisions of this Act to advertise or put out any sign, card or other device for the purpose of, or with a view to, indicating to the public that he or she is entitled to practise as an architect.

Any person transgressing any of the provisions of this Act shall incur a penalty of not less than fifty dollars and not exceeding one hundred dollars for the first offence, and for each offence committed subsequent to any conviction hereunder a penalty of not less than one hundred dollars and not exceeding three hundred dollars, and the cost of the prosecution, to be recovered by a summary conviction before any two justices of the peace, one of whom may take the information and issue the summons, or before a police magistrate, one moiety to belong to the prosecutor and the other to the treasurer of the board for the use of the board. In default of payment and of sufficient distress, the defendant shall for the first offence be liable to imprisonment for any term not exceeding one month, and for each subsequent offence for any term not exceeding one month. Every prosecution under this Act shall be commenced within six months from the date of the alleged offence.

Notwithstanding anything contained in this Act, it shall be lawful for any person, mechanic or builder to make and prepare plans and specifications for, or to supervise the erection, enlargement or alteration of, any building that is to be constructed by himself or his employees.

No civil engineer shall be considered an architect within the meaning of this Act unless he plans, designs or supervises the erection of buildings, in which case he shall be subject to all the provisions of this Act and be considered as an architect.

All certificates of registration issued in accordance with the provisions of this Act shall remain in full force until revoked for cause as hereinafter provided. Any certificate of registration so granted may be revoked by unanimous vote of the board for gross incompetency or recklessness in the erection of buildings, or for dishonest practice on the part of the holder thereof, or for failure to stamp working drawings and specifications with the seal of the holder thereof in accordance with the provisions of this Act; provided, however, that no certificate of registration shall be revoked until the holder thereof shall have received at least twenty days' notice in writing of the charge against him and of the time and place of the meeting of the board for the hearing and determining of such charge.

After the expiration of six months from the revocation of a certificate of registration, the person whose certificate was revoked may have a new certificate issued by the secretary upon certificate of the board issued by them on satisfactory evidence of proper reasons for his reinstatement and upon payment to the secretary of a fee of five dollars.

For the purpose of carrying out the provisions of this Act relating to the revocation of certificates of registra-

tion, the board shall have the power of a court of record and the power to issue subpoenas to compel the attendance and testimony of witnesses. All witnesses subpoenaed by the board shall be entitled to the same fees as witnesses in the Court of King's Bench, to be paid in like manner. The accused shall be entitled to obtain from the board subpoenas for his witnesses, and shall be heard in person or by counsel as in open public trial; provided that any architects subpoenaed to give evidence under the provisions of this section shall be entitled to be paid the sum of four dollars per diem and travelling expenses, as in the case of professional witnesses in the Court of King's Bench.

Every registered architect of this Province who desires to continue the practice of his profession shall annually during the time that he shall continue in such practice pay to the secretary of the board during the month of July a fee of five dollars. The secretary shall thereupon issue to such registered architect a certificate of renewal for the term of one year. Any registered architect who shall fail to have his certificate renewed during the month of July in each and every year, shall be liable to have his certificate of registration revoked at the discretion of the board, but the failure to renew such certificate of registration within a reasonable time shall not deprive such architect of the right to renewal thereafter; provided, however, that the fee to be paid on the renewal of registration after the month of July shall be ten dollars in each case.

Within the first week of December after the organization of the board, and annually thereafter, the secretary of the board shall file with the Provincial Secretary a full report of the proceedings of the board, and a complete statement of the receipts and expenditures of the board, attested by affidavits of the president and secretary, subject to the approval of the Provincial Secretary.

This Act shall come into force on the day it is assented to.

Passed by the Legislative Assembly of Manitoba, in the Third Session of the Twelfth Legislature held in the Tenth Year of His Majesty's Reign, and assented to in the King's Name by His Honour the Lieutenant-Governor on Wednesday, the Sixteenth day of March, A.D., 1910.

Headquarters and Examinations.

The headquarters of the Board shall be at Winnipeg, and the examinations shall take place at the University of Manitoba at Winnipeg, or such other place as shall be designated by a vote of the Board.

Finance

All funds collected shall be deposited in a chartered bank to the credit of the Board, and all cheques shall be signed by the Secretary and Treasurer and countersigned by the President, and no disbursements shal be made except on the order of the Board. There shall be an auditing committee of two to pass on all accounts of the Treasurer. Bills of members for time and expenses shall be audited by the Board when presented at regular meetings.

Meetings.

Regular meetings of the Board shall be held on the second Monday of each month at 8 p.m., at the Board Room, unless the time and place be otherwise ordered.

Examinations.

The Board shall arrange a programme for the examinations for registration and all other matters connected therewith.

Class Examinations.

The regular class examinations shall be held in April and October and shall occupy not less than three days. Two days shall be devoted to written examinations, and one day shall be devoted to ascertaining the ability of the candidate to make practical application of his knowledge in the ordinary work of an architect, which will include an effort towards ascertaining the qualifications of the applicant in accurate draughtsmanship and the proper distribution of constructional members from a practical standpoint.

Applications will be received at any time. If the number and urgency of the applications received make it seem expedient to the Board to institute class examinations at any other than the times mentioned in the semi-annual advertisements, due notice of such additional examinations will be forwarded by the Secretary to those whose applications are on file at his office. Applications for the regular class examination should reach the Secretary's office one week before the date set. All applications must be upon the form provided and must be accompanied by the examination fee of $15. If the applications are in regular form, notice will be mailed to applicants, with detailed information as to the time, place and extent of examinations. No certificate shall be issued to those having taken the class examinations unless their percentage of marks on each subject of the examination be 60 or more. All applicants who fail to receive the above percentage of 60 on not more than two subjects shall receive a certified statement from the Secretary of the Board of their success or failure in the various branches of the examinations and they will be entitled to receive special examinations in those subjects in which they failed. Said special examination shall be held semi-annually at such place and time as may be determined by the Board.

Special Examinations Before the Board—In What Cases Allowed.

In cases where an applicant for examination shall cite to the Board existing buildings erected from his or her design and under his or her supervision and when the character of such erected buildings and the applicant's connection with the design and supervision thereof, as ascertained by this Board, are such as to satisfy this Board that the said applicant for examination is possessed of the necessary knowledge and of the ability to apply the same as required in section No. 10 of the Act, then and in such case the demonstration of the applicant's knowledge and ability so made may, if found sufficient by this Board, take the place of written or oral examinations. Such examination in all cases must be accompanied by the usual examination fee of $15. Applicants failing to satisfy the Board in such exhibit-examinations shall be allowed to take the regular examination upon a further payment of half the regular fee for such regular examination.

Application for registration, without personal appearance, from practising architects, may also be considered at any meeting of the Board and certificates issued upon payment of the registration fee where the qualifications submitted are in the opinion of the Board of such satisfactory nature as to render the examinations unnecessary. Applicants failing to convince the Board of their standing will be required to take the exhibit examination as required above.

Rules Applicable to All Applicants.

Due notice of the result of examinations will be sent to candidates. All certificates shall bear the date of the time when finally approved by the Board and must be renewed July 1st every year.

In all cases in which applications for examinations have remained on file one year or more and the applicants have not appeared for examinations two-thirds of the examination fee will be returnable and the applications cancelled.

Lost or Destroyed Certificates.

When a certificate previously issued has been lost or destroyed, a charge of one dollar $(1.00) for a duplicate thereof shall be made to cover the expense of such du-

plicate certificate. No such duplicate shall be issued except by order of the Board.

Publication.

All publishers of directories or journals shall be allowed to have free access to the files of the Board for the purpose of publishing lists of registered architects.

Architects' Seals.

The seals of registered architects shall be circular and two inches in diameter. The words "Province of Manitoba" shall appear at the top, between two circular lines, and the words "Registered Architect" at the bottom, between the same lines. The name and place of business of the architect, to which the street and number may be added if desired, are to be placed within the inner circle. Where there is a co-partnership of architects the individual names of the several members registered may appear on one seal. As stated in the law, the seal is to make an impression, hence a rubber or inking stamp will not be lawful.

PROGRESS OF WORK ON HAGUE PEACE PALACE

Description of Building which will be the headquarters of the International Court of Arbitration. To be completed in 1913.

BEFORE THE OLD TOLLGATE, which marks the former boundary of the Hague, stands a great forest of scaffolding, a little distance from the road. Among these scaffold poles is rising the Palace of Peace, the future headquarters of the International Court of Arbitration, toward the erection and maintenance of which Mr. Andrew Carnegie handed over to the Netherlands Government the sum of £300,000, "believing" (as the Trust Deed of October 7, 1903, has it) "that the establishment of a permanent Court of Arbitration by the Treaty of the 29th of July, 1899, is the most important step forward of a world-wide humanitarian character which has ever been taken by the joint powers, as it must ultimately banish war, and further, being of opinion that the cause of the Peace Conference will greatly benefit by the erection of a Court House and library for the Permanent Court of Arbitration."

To the architectural profession this wonderful Peace Palace is of more than passing interest, for there is no work of modern times for which so many designs were submitted by the world's most prominent architects as for this great International Court House.

The usual accuracy of the current "Baedeker" has been betrayed by the abandonment of the site first proposed, which lies a mile away on the other side of The Hague. The present site forms part of the grounds of the miniature palace which belonged to and in which died, Princess Anna Pantowna, wife of King William II., and grandmother of the reigning Queen. Passing, in course of time into the hands of a company, the grounds, to the extent of at least sixteen acres, were acquired by the Government at a cost of over £58,000. The old palace still stands by the gate and, with its lofty rooms and old-fashioned decorations, forms charming quarters for the architects and their drawing staff. It will, however, be swept away when the time comes for laying out the grounds of the Palace of Peace.

To make room for the great building now in course of construtions, a large space had first to be cleared in the thick wood which covers the grounds. The authors of the scheme have shown equal wisdom and good taste in setting the building well back from the road. The palace, built in brick and stone, with roof of blue Welsh slate, of an architecture partly Dutch and partly Flemish in character, has the noble proportions of some of the old town halls in Belgium. The architect is M. L. M. Cordonnier, of Lille, who has associated with him the resident architect, J. A. G. van der Steur of Haarlem. His design was selected out of 216 from all countries by a jury composed of six leading architects of Great Britain, Holland, France, Germany and the United States, and an inspection of some of the "next best" designs which hang in the workrooms of the old palaces leaves no doubt in the minds of the visitor that the jury chose rightly. M. Cordonnier's original design has, however, been very considerably altered, thereby gaining greatly in compactness of internal arrangement as well as in lightness of external appearance.

The palace, on which 200 men are at work and of which the roof was begun yesterday, is expected to be finished in 1913. It consists of a half-basement containing press rooms, a telegraph and other offices, a heating and lighting plant with fourteen boilers, accommodation for the staff of the building, and (most important of all) a spacious restaurant. It is creditably asserted that the more tangible success of the first Peace Conference as compared with that of the second was largely due to the facilities afforded the plenipotentiaries at the House in the Wood of getting to know one another over their lunch. However that may be, the convenience of being able to feed on the spot or smoke a lone cigar in the garden afterward will be immensely appreciated by those whose duties bring them to conferences or arbitrations in the Palace of Peace.

The main entrance is approached by curving slopes, not steps. An arcade with bannisters in front extends on either side. On the left rises a square tower to the height of about 260 feet. At the opposite corner of the facade and in the outer wall of the Great Court is the foundation stone, laid on July 30, 1907, by M. de Netidoff, president of the second Peace Conference, with the inscription, "Paci Justitia firmandae Hancaedem Andreae Carnegii Munificentia Dedicavit." The Great Court, which is, of course, the inner shrine of the Temple of Peace, is a hall about 70 feet long, 40 feet wide and 83 feet high. On one side is three large windows, on the other three galleries. At one end is a fourth large window; at the other the dais for the Tribunal. At the other end of a corridor lined with beautiful Greek and Italian marble, and behind the base of the tower above mentioned, is the Small Court, almost exactly half the size of the Great, and having also three galleries.

The ceiling of the Great Court has a barrel-vaulting; that of the small is flat and heavily moulded. The latter seems likely to produce the better acoustic properties of the two. The remainder of this floor is occupied by reading rooms, a map room, consultation rooms and other appropriate accommodation for the parties to a case. On the upper floor, approached by a magnificent staircase projecting into the central courtyard, are the rooms of the Administrative Council and other officials of the Permanent Court of Arbitration, and a library capable of containing 200,000 volumes, with a booklift to the reading rooms below. The centre of the building is occupied by a courtyard 144 feet long and 111 feet wide, with a fountain in the centre, where the air to be breathed in the building will be washed before being filtered and otherwise dealt with by the ventilating apparatus. The whole building is, roughly, 260 feet square.

All countries are contributing after their kind to the adornment of the palace. Great Britain gives the four stained glass windows of the Great Court; France a picture by Besnard for this court and Gobelins tapestries, designed by Luc O. Mercon, for the Small; the Dutch Government a collection of paintings by Ferdinand Ball for a room over the Small Court and seven stained glass windows for the staircase; Germany the monumental entrance gates to the grounds; Italy part of the marble for the corridor; Austria the bronze and crystal candelabra; Norway the granite for the entrance slopes; Sweden grau-

ite for the basement and certain columns; Denmark the porcelain for the fountain in the courtyard; Switzerland the works of the clocks; Russia a jasper vase over 11 feet high for the central hall; the United States a large marble group representing the purpose of the building, "Peace Through Justice," for the first landing for the staircase; Mexico onyx for the staircase; Belgium probably the bronze doors of the building, and Japan some gold embroidered tapestries for the room of the Administrative Council, which is panelled in wood from Brazil.

THE LEGALITY OF EXTRAS IN BUILDING WORK

Decisions of the English Court in which the liability and right of disputant parties are defined.

THE MATTER OF EXTRAS is one of the vexations and ever-recurring phases of building construction with which architects and contractors have to contend. Quite often an unintentional omission or a deviation from the working drawings, as well as the substitution of a material other than that specified, necessitates additional services and expense that brings the cost of the work to a greater figure than that originally agreed upon. The position and rights of the contracting parties in such matters forms the subject of a timely article in THE ARCHITECTS' AND BUILDERS' JOURNAL, in which the legality of extras, as based on decision of the English Court is interestingly discussed.

Extras, says our contemporary, may be defined as work not expressly or impliedly included in the original contract. The matter has to be considered from several points of view. The building owner, who probably reckons on the work being done for a fixed sum, does not want the limit to be exceeded. The builder may find the task he has undertaken to be impossible unless he is allowed to charge for extras. Consequently the architect, who is in a middle position, is often in a dilemma. On the one hand, he does not want to make a slovenly job by refusing to allow as an extra something which has been inadvertently omitted from the specification; for unless his skill be something more than human, it will be almost impossible to provide for everything when executing a very large contract. On the other hand, he does not like to ask the building owner, who has employed him, to pay a large bill for extras.

The Position of the Architect.

The first thing an architect should do when called on to decide as to extras is to look at the terms of the contract. Sometimes it defines his duty very clearly. Thus it usually provides that the builder shall have no claim for extra payment beyond the contract price in respect of any work done by him for the employer, whether executed before or after the completion of the contract, unless such payment is expressly ordered. The duty of ordering payment is left to the architect, the contract providing that he is to grant a written order expressly stating that the work is to be the subject of an extra charge, and then only for the amount which the architect in his final certificate shall certify to be due to the builder in respect of such alterations and additions. The contract should also provide that extras shall be executed subject to the same conditions as the other work specified for, and that the prices contained in the bill of quantities shall be applicable as far as possible.

The Burden of the Building Owner.

It often happens that when proceeding with the work something occurs to increase the burden which may have to be placed upon the building owner. In order that the architect shall be kept informed of any such additional expense, it is well to provide that the builder, in proceeding with the works in accordance with any supplementary detail or other drawing, sketch, or instruction, that will cause any additional expense, he shall immediately intimate the same to the architect.

Lump-sum Contracts.

If the contract is a "lump-sum" contract, it is obvious that anything extra must be done and paid for under some contract express or implied which is distinct from the original contract. Unless there is such an express or implied contract, the builder does the extra work at his peril; he cannot recover the price of it. For instance, if work is to be done at a given price, and the builder does the work better or uses better materials, the employer is not liable to pay any greater price (Wilmot v. Smith, 1828, 3 C. and P. 453). But the "extra" clause does not apply to work wholly outside the original contract. Thus, where plasterers who were employed to do the inside of a house under a written contract were verbally requested to do the entablature outside, it was held that they might sue for the price of this without producing the written agreement. (Reed v. Batte, 1829, M. and M. 413).

Contracts Under Seal.

Where the contract is under seal, as where, for instance, a builder agrees to do work for a corporation or other local authority, the original contract cannot be varied or altered except by a new contract under seal. Consequently, if the builder, at the verbal request of the local authority or one of their officers, does some extra work, he could not recover anything in respect of it. But where such a contract contains the usual clause allowing the extras to be ordered by the architect, his order need not be under seal.

Authority for Extras.

It is a general rule that the architect cannot order extras without authority. In other words the cost of extras done pursuant to an order which the architect has no authority to give, cannot be recovered from the employer. For instance, in (Cooper v. Langdon, 1841, 9 M. and W. 60), a builder was sued for not building a house in accordance with his contract. He pleaded that he deviated from the drawings, etc., by the direction of the architect. It was held that this was no answer to the claim, as it was not proved that the architect had power, under the terms of the contract, to bind the employer by allowing deviations from the drawings.

Further, he must authorize extras in the manner in which he is directed to authorize them. If an express order or direction in writing is necessary, nothing less than an express order or direction will suffice. (Russell v. Sa Da Bandeira, 1862, 13 C.B.N.S. 149). So, a mere sketch made by an architect was held not to be a sufficient written direction for extras. (Myers v. Sarl, 1860, 30 L.J.Q.B. 9). These cases will show that the architect who is called upon to allow for extras should exercise the greatest care in complying with the requirements of the contract.

Architect's Liability.

The architect may become personally liable for extras if he orders them on a representation that he has authority to do so. The authority of the architect to order extras does not extend to things wholly outside the contract. The extra clause must not be construed as authorizing the architect to allow the contractor to depart materially from the general design of the work under execution. Dealing with the "extras" and "omissions" clause in the old case of Rex. v. Peto (1826, I.Y. and J. 53), Alexander C.B. said: "Everyone who is at all conversant with building knows that, in the course of building, it occurs sometimes to add, and sometimes to desire, that certain things may be omitted; this appears to have been in the contemplation of those who prepared this instrument; and accordingly they have introduced that clause, which was clearly inserted to prevent in the first place any such direction affecting the rest of the contract, and in the next

place to provide for the manner in which the contractor was to be paid in case that event should happen." After reading the clause, he said: "Is it possible that this clause was intended to give to the surveyor, a person who ought to be in general but an overlooker of the owner, to see that the work is accurately performed, a power to vary the whole scheme of the building? Or, if it were so intended, that it could have been expressed in such language? In sound construction it should be limited to that to which the condition has confined it, namely, to such extra work as may be done, or something which is is to be omitted; but it cannot refer to the substitution of one thing for another, more especially anything so important as the making of the foundation on which the whole validity and security of the building depends."

Employer Ordering Extras.

If it can be distinctly proved that the employer ordered extras, he will be liable to pay for them, as in that case a new contract will have come into existence. But an allegation that he assented to alterations will not be sufficient. In Lovelock v. King (1831, 1 Moo. and Rob. 60), a carpenter had agreed to alter certain premises for a fixed sum. Considerable deviations were made from the original plan, which it was alleged the employer had seen and had not objected to. The carpenter sued for the "measure and value" price of all the work done. It was laid down that the employer was not liable for any larger sum than that fixed by the contract, by reason of his assenting to deviations unless he was expressly or impliedly informed that such deviations would increase the cost.

The Final Certificate.

The architect's final certificate may have an important bearing upon the question of extras. The result of many cases appears to be that even where extras must be ordered in writing, the final certificate of the architect is conclusive, both in the case of the employer and the contractor, whether the order in writing was actually given or not. As an illustration, reference may be made to the Irish case of Connor v. Belfast Water Commissioners (1871, 5 Ir. L.R.C.L. 55). There the plaintiff contracted to do certain works for the defendant commissioners. The contract provided that no extras should be made without an order in writing, and that such extra works should be valued by the engineer, and that the valuation should be final. It also provided that if extra works were ordered, the contractor should send in accounts within a month, and that in default of his so doing, the defendants should not be bound to pay for them. It was also provided that the defendants should not be bound to pay for any works, except upon the production of a certificate signed by some principal or resident engineer, and that the principal engineers or engineer for the time being should be the exclusive judges of the execution of the works and of everything connected with the contract; and that the certificates under their hands or hand should be binding and conclusive on both parties. It was held that the engineers having given a certificate for the extra works, the defendants were precluded from setting up as defences to the action for the price of the extra works; that the extra works had not been ordered in writing, and that no accounts had been sent in for them, as required by the deed.

The final certificate may also amount to a determination by the engineer as to whether certain things are extras or not. This was held to be so in a case arising on a contract which provided that all extras or additions should be paid for at the price fixed by the surveyor appointed by the contractor's employer. It was held that extras was conclusive (Richardson v. May, 1883, 10 Q.B.D. 400).

AN UNFORTUNATE OCCURRENCE which happened recently in England was the shattering of a fourteenth century window in the Parish Church of Ashton-under-Lyne by culprits whose object was the robbing of the offertory.

PRELIMINARY WORK STARTS IN ERECTION OF LONDON COUNTY HALL

Foundation work well advanced for important structure to be built in the English Metropolis, and the construc ion of superstructure soon to be undertaken.

THE LONDON COUNTY COUNCIL ACQUIRED the premises between Belvedere road and the Thames, formerly occupied by (a) Peter Brotherhood's engineering works; (b) Crosse & Blackwell's riverside pickle and jam factory; (c) the Lambeth Borough Council's yards, stables, and premises, which were formerly in the possession of Messrs. Maudslay, the well-known marine engineers; (d) the premises known as Westminster Bridge Wharf; (e) the row of shops abutting on the north side of the eastern approach to the bridge.

Most, if not all, of these premises, stood upon a site known for centuries as Pedlar's Acre, by which name the road itself was commonly known until it was decreed that it should be called Belvedere road. Legend has it that some 350 years or more ago, a pedlar with his dog appealed for assistance and shelter to the priest in charge of Lambeth Parish Church, and having been kindly treated he demised at his death, in gratitude for this small benefit, some land bordering the river and a little way north of Lambeth Palace and church. Since that time this land has been the property of the Parish of Lambeth, until its late compulsory acquirement by the London County Council for their County Hall site.

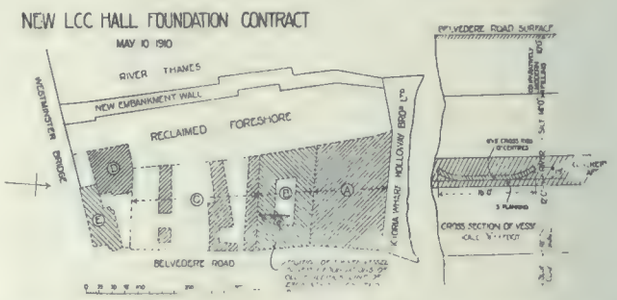


Diagram of Site and Foundation Work for the Proposed London County Hall.

In addition to the above-named premises, the Council have acquired, with a view to ultimate extension, the new premises, northwards, at present in the occupation of Messrs. Holloway Bros., Ltd., and beyond them again there are the old London County Council Works Department premises, of which the Council are already the freeholders, so that future requirements would seem to be amply provided for.

Besides the land area at present involved, comprising a little more than 2½ acres, the Council have reclaimed foreshore to the extent of nearly two acres more, making over four acres as the area of the land to be covered by the buildings now in contemplation, and the embankment wall, etc.

Excavation.

The whole of the site is being removed to a depth of about 25 ft. from the street level in Belvedere road, and the strata dealt with has turned out to be a top layer of comparatively modern rubbish filling of 10 ft., followed by 14 ft. of river silt, hardened into a clay of the consistency of cheese, at the bottom of which the river gravel is reached, one foot of which is removed, and upon the level thus reached the concrete raft, 5 ft. thick, is to be laid.

on the surface of which the nine great blocks comprising the greatest town hall in the world will presently be placed.

Discoveries.

Various small objects of interest have been unearthed, but in no case either so ancient or so numerous as might from the situation have been expected. There, however, has come partly to light a sunken ferry barge of exceeding interest, the date of which has not yet been determined, but which probably belongs to the period of the Roman occupation. The point to which the excavation has at the moment proceeded has cut the vessel obliquely, as indicated upon the plan annexed, and the section has revealed a ship 16 ft. width by length at present unascertained, and a depth of 11 ft. 9 in., having a flat bottom, roughly represented by an inverted ellipse. It has cross-ribs 6 in. by 5 in. at 12 in. centres, and an outer covering of 3 in. planking, all being of oak, black and nearly perished. It is intended shortly to remove the earth down to the level of the sides, and then, under careful inspection, to clear out the remainder, so as to obtain a perfect view of the vessel before its removal, which unhappily cannot be effected otherwise than by demolition, owing to its state of decay. Some articles of interest also may be discovered among its immediate contents.

Its position in the strata above-named is at the bottom of the river deposit, and resting upon the sandy gravel. From this situation it is quite clear that it must have sunk at a time when the full flow of the river was over this spot, since which time the centre of the channel has changed, or been diverted westwards, with the result that the mud began to silt up over it, which process continuing for ages, the 14 ft. of accumulation has accrued by the time that the mud bank foreshore was bequeathed by the pedlar to the Lambeth Parish.

Concrete Raft.

About one half of the material to be removed under the contract has been cleared, and the concrete raft has been begun. The Council requires the mixture to be deposited in 12 in. layers, and well rammed. The lowest of these layers is being covered with a damp-proof course of washed sand, and cement ¾ in. thick, above which the remaining four layers are placed, breaking joint vertically where for any cause the work has to be temporarily stopped off.

Composition of the Concrete.

The concrete is composed of broken brick and old concrete, obtained by the demolition of the old buildings and foundations upon the site, adjusted to contain two-thirds coarse and one-third fine material, with Portland cement from Strood, in the proportions of six of the aggregate to one of cement.

Mixing Machines.

It is being mixed in machines of ingenious and novel construction, invented and patented by the contractors, in conjunction with one of their managers. These machines are triangular in form, having hoppers for aggregate and cement at one end of the base, and from these up one of the sides two elevators operate, one placed over the other, the buckets from which fill themselves as they pass through the hopper bottoms, and are immediately struck off by weighted strikers, ensuring accurate measure. When the lower or aggregate bucket reaches its highest level point the cement elevator bucket immediately overhead overturns its contents upon it, whence at once the contents are discharged down the other side of the triangle, which takes the form of a trough in which are four mixing drums, each having four wings or blades, which pick up the material on its descent, and turn it completely over. The first two drums mix it dry, when it encounters a sponge pipe, the remaining two turning it in a wet state. Thence it emerges at the opposite end of the base as mixed concrete ready for depositing in position.

These machines are so placed that their tops are about at the old ground level, and the hoppers are extended upwards, and into these extended hoppers the aggregate and cement are wheeled and tipped, and the concrete is delivered at the foot into contractors' narrow railway trucks, and run away to its destination.

From the architect's and engineer's point of view, the machines appear to afford two great advantages: (1) The mixing of the concrete in small quantities at a time, ensuring the proper and regular distribution in the mass of cement and aggregate; (2) the impossibility, provided the hoppers are kept filled, or errors and irregularity in the proportions of one to the other. The cement buckets can be altered at pleasure, to suit any desired proportion of cement by increasing or reducing the thickness of the packing pieces which are placed on one side of every bucket for the purpose.

The motive power is derived from an electric motor placed on the platform forming the base of the triangle, whence it is applied by a system of belt and pinion wheels, so that all parts of the machine work at the same pace.

The output of each machine continuously worked may be taken at about 150 yards per day, but its capacity is really only limited by the ability to remove the resulting mixture.

All the excavated material unsuitable for manufacture into aggregate is being trucked and craned to the contractors' own jetties, alongside, where it is deposited into barges and taken down the river to fill up low-lying lands bordering the stream at its lower reaches.

WINNIPEG ADVANCEMENT.

CANADA, COMMERCIALLY CONSIDERED, is making rapid progress. Roughly speaking, the East manufactures and the West consumes. The farms of Western Canada are producing a gross income of $250,000,000 annually and the men who make the farms produce this large sum of money are free spenders of their income. They buy heavily of all lines of manufactured goods from farm machinery down to wearing apparel and nearly all of these goods are brought in from Eastern Canada, Great Britain and the United States. This producing and purchasing power of the West was strongly impressed upon the two hundred manufacturers from Eastern Canada, who recently passed through the Western Provinces on their way to the annual convention of the Manufacturers' Association at the Coast. They saw—some of them for the first time—the great progress the West is making and the great opportunities the country offers for large increase of a traffic which is already enormous and highly profitable.

Effective Methods Employed.

In the West, cities and towns are bidding for new enterprises by the establishment of municipal leagues and bureaus through which advertising campaigns are being vigorously pursued. Winnipeg is an example of what can be accomplished by the united efforts of this nature. Four years ago that city formed an official institution composed of representatives of several business bodies, headed by the City Council, Board of Trade, Bankers' Association, etc., and known as the Winnipeg Development and Industrial Bureau. It is a perfect organization, that now has representatives of sixteen business bodies on its Board of Directors, having 8,700 affiliated members, 425 of whom are business firms who contribute to its financial requirements. These firms pay annual membership fees of $20 and every year they appoint a delegation to wait upon the City Council and ask for a sum they deem to be essential outside of members' contributions, to carry on the work of advertising for the current year. They get it too. In 1906, the city grant was $1,-

500; in 1907, it was $3,000; in 1908, $6,000; in 1909, $10,000; and in 1910, $25,000.

Civic Advertising Pays.

In welcoming the Canadian Manufacturers' Association to that city on September 13th, Mayor W. S. Evans, in his remarks, directed attention to the growing importance of Winnipeg as a manufacturing city. Mayor Evans pointed out that in 1900 the value of the manufactures produced in Winnipeg was $8,686,000. In 1905, it reached $18,983,248 and, according to a census taken by the Civic Bureau, the annual output has now reached $38,500,000. Fourteen thousand hands are now employed who receive a monthly wage exceeding $750,000, and $20,000,000 is invested in industrial enterprises. Mayor Evans pointed out to the four hundred guests at this banquet, that there was room and opportunity for all, as the wholesale houses of Winnipeg handled in addition to the local manufactured output, a total of over $100,000,000 of goods made elsewhere during the year.

Offers Cheap Power.

That Winnipeg welcomes the manufacturer is shown by the fact that the city has under construction one of the largest and best equipped power plants on the continent that will cost, when completed, $3,500,000. The Dominion Government has in the past month officially opened St. Andrews Locks on the Red River, thus placing Winnipeg in direct water communication with Lake Winnipeg—a lake 2,000 square miles larger than Lake Ontario, and surrounded by a country in which raw materials of various kinds abound, a country of vast undeveloped resources that will surely yield richly for the upbuilding of Winnipeg industries.

AN ARCHAEOLOGIST S HOME.

WHAT IS REGARDED from a decorative standpoint as one of the foremost examples of the artistic use of concrete is found in a home now rapidly approaching completion near Doylestown, Pa. It is the design and handiwork of Mr. Henry C. Mercer, known as an archæological student of some renown and as a producer of artistic pottery.

Mr. Mercer, says THE PHILADELPHIA RECORD, was in charge of an archæological expedition into Yucatan some time ago, and he has conducted a great deal of other valuable work along this especial line. He has travelled all over the world in following up his line of work and has made many notes and sketches, which he has drawn upon in the building of his prospective home. He devoted considerable time and money to a collection for which he is entirely responsible, now in the custody of the Bucks County Historical Society, known as the "Tools of Nation Makers," which consists of implements of all kinds used about the homes and farms of the earliest settlers.

During the course of this work he took up the subject of stove plates, the old iron-castings which comprised the essential feature of the old-time oven on which it was the fancy of our forefathers to impress their family emblems or some favorite design or inscription. Around these old pieces of iron, taken from old stone walls and uncovered in old vaults, he has woven a thread of romance which makes their study positively entrancing.

It was in endeavoring to transfer some of these castings into clay that he became interested in the subject of pottery and tile-making, and to-day his "tile-mosaics" are to be found in the most approved architectural efforts of the country. The particular building under discussion has every appearance of an ancient structure reared hundreds of years ago. As one contemplates it, it seems impossible that its lines and curves should have been formed within a year's time.

There are massive pillars supporting noble arches, the surfaces all chastely decorated with the use of delicately-tinted tiles and colored cement. The pillars represent a variety of lines, som round; others square; some heavy and others slender; yet all in absolute harmony. The designer has done this deliberately, for he says you might as well require that the trees of the forest should be all of the same size and shape.

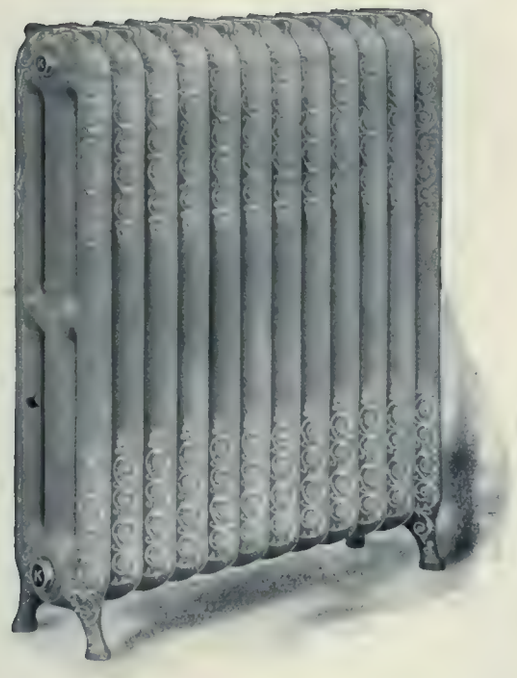
Neither architect nor engineer, Mr. Mercer has made himself familiar with the principles of the plastic materal of which the house is built, and has clung tenaciously to the rules and formulas laid down by the leading authorities. He has allowed a wide margin of safety, and his house is strongly built as the rock itself. He has followed some remarkable ingenious methods in accomplishing results.

For instance, the building of an arch is usually a very serious matter, and elaborate processes are usually followed, such as the construction of much false-work of a rather slow and expensive nature. He has made a successful short cut of this problem in the present case. When he reached this point of the building operation, a dozen or two old packing boxes were piled one on the other until the desired height was approached, after which a layer of straw and similar materials was placed on top. The whole was shaped off according to design, and a final covering of sand laid. On this the metal reinforcements were laid and then the cement poured into place. After the mass had hardened the boxes were taken away, and the arch was complete, except for the finishing decoration. In some instances tiles were laid as desired in the sand before the pouring in of the cement, and in this maner the tiles took their place as part of the ceiling decoration.

MOVING A CHURCH TOWER.

THE REMARKABLE FEAT of moving a church tower to permit of the church being enlarged, says the SLATE TRADE GAZETTE, (Hull, Eng.) is being accomplished at Bocholt, Belgium. The work is being done by two American engineers and the vast undertaking occupies only eight workmen. New foundations have been prepared for the tower about 30 ft. away, and along the machinery constructed for its transport the tower, which dates from the fourteenth century, and is said to weigh 2,700 tons is now being moved. The work begun some weeks ago. The tower commenced moving last week. It had been raised by the insertion of a movable platform over steel cylinders, which in their turn move along a railway line. The first day the tower moved 4 in., the second 17 in., the third 34 in., the fourth 6 in., and the fifth time 6½ in. It is said that the engineers have proposed to the Italian Government a similar method of removing and placing in new foundations the tower of Pisa, regarding the safety of which there has been of late much apprehension.

THE AMERICAN RAILWAY AND MAINTENANCE OF WAY ASSOCIATION has issued a very useful bulletin (No. 117), containing the report of the Committee on Iron and Steel Structures. In any bridge (the committee say) the qualities to be desired are: adequate strength, freedom from vibration and excessive deflection, economy in first cost, economy in maintenance, and permanence. The theory of flexure of reinforced concrete is sufficiently well understood to enable safe and economical designs to be made of this material, and experience with reinforced concrete structures carrying dead loads only has been abundant. Experience with such structures carrying heavy live loads and subjected to the shock and vibration of these loads, moving at high speed, has not been so extensive, but reinforced concrete girders can be designed and built in short spans of any strength required, or likely to be required, by railway loads. In the event of overloading or defective construction, reinforced concrete will give quite as much warning of probable failure as other materials.



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scientifically, practically and mechanically a masterpiece —the most perfect steam and hot water radiators on the Canadian market. The ornamentation is raised—not sunk. They are handsomely built, aesthetic in proportion, and the relief ornamentations are such as to adapt the **"King"** to various combinations in color decorations.

See them—then compare with others

THE KING RADIATOR CO., LIMITED

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MACHINERY AND TRADE

STAVED COLUMNS.

BETWEEN THE PRODUCT of old planing mill and the product of the modern wood working plant there is a vast difference. The old planing mill still has a tenureship in some parts, but gradually it is being superseded by manufactories in which operations are being established strictly on the basis of an industrial art. With the development in this direction has come a specialization in which the output of certain plants are confined to certain materials and products. Prominent among concerns working in specific lines, is Batts Limited, with offices and mill at 368-388 Pacific Avenue, West Toronto. This firm's forte is the manufacture of staved columns, pine and veneered doors, newels, balustrades, interior trims, flooring and kindred materials relating to building construction. Since its inception the plant of the company has been marked by a consistent and steady expansion, until now it has an operating space of 54,500 feet, exclusive of kilns and offices. Each department is equipped with specially designed machinery, and all work is closely supervised by competent heads, so that each and every product turned out is perfect both as to workmanship and finish. The ability of this firm to meet the requirements of the architect and builder was practically demonstrated at the Canadian National Exhibition recently held. During the two weeks that this event was in progress, the splendid display of columns and other products shown proved an irresistible attraction to prospective owners and members of the building fraternity. A section of the columns exhibited is illustrated in connection with the company's advertisement in this issue. These columns are made with a lock joint to prevent the staves from opening and to insure perfect sealed joints in all parts. In their manufacture careful study is made to obtain a true entasis, and every feature is carefully considered so as to be absolutely correct in architectural detail. The company's 1910 catalogue, which can be obtained upon request, is profusely illustrated, and exceptionally well arranged throughout. In addition to a wide variety of columns, it also shows the line of high grade veneer doors, together with such products as newels, balustrades, green house frames, etc., in which the Company specializes. It is a book that can be used to great advantage in specifying materials for either exterior or interior work, and one that architects and builders should not fail to have in their possession.

AN INCIDENT AT THE BRUSSELS FIRE.

DESTRUCTIVE ELEMENTS seldom set to work without demonstrating something of value to the structural world. In fact, it is only by observing the effects of ravishing forces that the true worth of materials and appliances are fully recognized. THE L'AMI DE L'ORDER, a prominent Belgium daily, prints an account of the remarkable performance of "Adroisite" Cement slates in a test that was rather unexpected. It says in part: "During the disastrous fire which caused such heavy damage last month to the Brussels Exhibition buildings, specialists witnessed an incident quite without precedent. The roofs of the large restaurant, "Le Chien-Vert" with all its towers and domes covered with "Adroisite" cement slates sustained the assault of the raging flames for over one hour. That the fire did not spread to the other side of this part of the Exhibition was solely due, they unanimously say, to the roofing of the restaurant. After the fire, experts inspected the roof and found that not a single slate had even been cracked." This evidently speaks very highly for the uninflammable and durable character of this particular product. Mr. Frederick Nicolai, who represents the manufacturers of this article in Canada, was quite elated on reading the report in question, as he believes that this incident, in connection with the publicity already given the fire at the Brussels Exhibition will materially assist him in acquainting architects and builders with the advantages of the product which he is at present introducing in the Dominion. The office of Mr. Nicolai is Room 15, Saturday Night Building, Toronto, and a request for specimen slates and further information will receive prompt attention.

SANITARY CHEMICAL CLOSETS.

A DISTINCTLY UNIQUE INVENTION, and in many cases an essential hygenic requisite, is the "Parkyte" Sanitary Chemical Closet, manufactured by Parker and White, Ltd., Montreal. This closet is made for the purpose of establishing sanitary conveniences in houses where the advantages of a water system and sewer connections do not obtain. It has a number of important features that well merits the investigation of architects and builders in providing modern sanitary facilities, under such conditions. The company has just been awarded a special diploma by the Board of Directors of the Winnipeg Exhibition, for their comprehensive and attractive display made in connection with the recent event of this annual affair. Offices are maintained by the company in the principal cities of the Dominion.. An illustration of the "Parkyte" Closet can be seen in this firm's advertisement, page 97 of this issue.

STEEL PLATE FANS.

BULLETIN 54, consisting of separate sheets bound in book form, is a handy little booklet on "Steel Plate Fans," just issued by Sheldons Limited, Galt, Ont. The purpose of the booklet, which is attractively illustrated and printed on book coated paper, is to better acquaint those who may be interested in fans for heating and ventilating, exhaust, or down-draft purposes, with the many important features and advantages of the particular types of apparatus which the company manufactures. The Sheldon steel plate fans stand inestimably high in the minds of those who are competent of judging the efficiency and construction of such products. They are designed to give a maximum amount of air with a minimum expenditure of power. In their construction only patent levelled and rolled steel plates, free from buckles and of the greatest rigidity, are employed. These sheets are riveted to angles to ensure perfect solidity to the whole structure. The inlet rings to which the bearing brackets are bolted, are of cast iron; and the bearings are swiveled, or self-aligning to prevent the shaft from springing should the fan be placed on a defective foundation. The "Bulletin" in question is quite explanatory of their many other essential features, which time and space makes it impossible to dwell upon here. It also contains tables and much other useful information that makes it of value to those in whose hands it might happen to fall.

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

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H. GAGNIER, Limited, Publishers

Saturday Night Building

TORONTO - - - - - CANADA

BRANCH OFFICES

MONTREAL—Board of Trade Building. LONDON, ENG.—Byron House, 85 Fleet St. E.C.

Seventh Avenue Front, Main Façade, Pennsylvania Terminal. McKim, Mead and White, Architects.

Thirty-first Street Façade, Pennsylvania Terminal—Showing One of the Side Entrances. McKim, Mead and White, Architects. (See page 75.)

¶ Building Returns Show Country Active—September makes Substantial Increase over Same Month in 1909—Average Gain of 27 p.c. noted in twenty-two important centres.

ALTHOUGH THE TOTAL INVESTMENT as compared with the previous month is somewhat less pronounced, the building returns for September, submitted to CONSTRUCTION from twenty-two important centres, registers an average gain of 27 per cent. over the corresponding period of 1909. Taking into consideration the extraordinary strides that have been made throughout the spring and summer seasons, the advance noted is not only in itself satisfactory, but is a pretty good indication that nothing other than an active condition will obtain for the remainder of the year.

In the cities reporting, the aggregate total for permits issued amounted to $6,686,128, as compared with $5,254,291 for the same month last year, and in many cases the figures reflect a most prosperous condition of affairs. Of the five losses noted, three occurs in Ontario, viz., Ottawa, 6 per cent.; Peterborough, 52 per cent.; and Port Arthur, 84 per cent. Despite these reversals, however, the Province in general forged ahead substantially. Toronto's total of $1,332,525, representing a gain of 27 per cent., is by far the largest total registered in the Dominion, while Brantford's phenomenal advance of 403 per cent. is the second highest increase per cent. attained. London is also substantially ahead with a gain of 171, and an excellent showing was made at Hamilton and Fort William, which exceeded last year's figures for the month by 46 and 5 per cent. in order named. In all these cases the amounts noted are of gratifying proportions. Again, Windsor is ahead by a gain of 117 per cent. and Berlin comes to the fore with an advance of 75 per cent.; while Kingston, which does not send in comparative figures, reports activities to the extent of $17,576.

The largest proportionate growth for the month, however, was experienced in the Manitoba town of Brandon, whose mighty onward march reflects itself in a gain of 664 per cent. Work amounting to $437,675 was undertaken as against $57,200 in the same month in 1908. Winnipeg, of the same province, registers $804,400, and thus managed to slightly top its corresponding figures. Other Western increases are noted in the case of Prince Albert and Regina, which over-reach their last year total to the extent of 112 and 295 per cent. respectively. Calgary also witnessed a high state of development, and Victoria made a gain of 41 per cent. Calgary advance of 156 per cent. represent $439,635 more in new buildings than was undertaken in the previous September. Edmonton and Vancouver, however, were behind for the month, although Vancouver's loss is so infinitesmal as to practically amount to nothing, while Edmonton's decrease, which was 68 per cent., can be ascribed to the fact that improvements for the months were principally of a residential nature.

In the Eastern portion of the Dominion, Montreal, Sydney and St. John all turned the month to good account. Montreal's total of $993,386, representing a gain of 59 per cent., shows an investment that was only surpassed in one instance. Sydney and St. John increases are 37 and 8 per cent. in relative order.

Notwithstanding the lateness of the season, a large amount of prospective work is reported from many sections, and unless severe weather interferes with present plans, operations will be continued at a brisk pace up to the end of the year.

	Permits for September, 1910.	Permits for September, 1909.	Inc. Per Cent.	Dec. Per Cent.
Berlin, Ont.	$ 25,200	$ 14,350	75.60	.....
Brandon, Man.	437,675	57,250	664.49	.....
Brantford, Ont.	89,775	17,835	403.36	.....
Calgary, Alta.	720,372	280,737	156.60	.....
Edmonton, Alta.	159,763	505,199	.....	68.38
Fort William, Ont.	170,340	161,935	5.19	.....
Hamilton, Ont.	266,475	181,950	46.45	.....
Kingston, Ont.	17,576	.....	.....	.....
London, Ont.	148,950	54,890	171.36	.....
Montreal, Que.	993,386	620,955	59.97	.....
Ottawa, Ont.	160,950	172,100	.....	6.48
Peterborough, Ont.	21,865	46,485	.....	52.97
Port Arthur, Ont.	42,450	271,900	.....	84.39
Prince Albert, Sask.	63,655	30,000	112.18	.....
Regina, Sask.	209,750	53,000	295.75	.....
St. John, N.B.	17,200	15,800	8.86	.....
Sydney, N.S.	25,110	18,225	37.77	.....
Toronto, Ont.	1,332,525	1,046,065	27.38	.....
Vancouver, B.C.	740,715	744,530	.....	.52
Victoria, B.C.	199,686	140,935	41 68	.....
Windsor, Ont.	38,300	17,600	117.61	.....
Winnipeg, Man.	804,400	802,950	.14	.....
	$6,686,128	$5,254,691	27.24	.....

¶ The Labor Question—Montreal Architect Advocates formation of Canadian Union—Thinks Profession should Aid in Solution of Difficult Problem.

THE LABOR QUESTION in the building trades has in the last few months, become a real live one, and it now looks as if we were at last going to have a Canadian Federation of Labor. For many years, our labor unions in Canada have been dominated by American officials, who are not and canot be in sympathy with conditions as they exist here. In the case of a coal strike in the West, Canada was subjected to the indignity of sending a Minister of the Crown to Indianapolis, Ind., to try to get Canadians to go back into the mines and provide the coal that should keep the West from freezing up. Recently a strike occurred (or a lock-out) in Winnipeg. The whole affair was conducted by men who are not citizens of our country and the situation was dominated by United States labor

officials. In Montreal there has been a strike in the carpenters' section of the builders' trades unions that was called and is conducted by American labor officials. This condition, which seems at this time to be fairly prevalent in Canada has caused employers to look about for some fair and reasonable solution of this unfortunate problem. That solution is evidently the formation of Canadian unions controlled, financed and operated by Canadians. President F. S. Baker, of the Royal Canadian Architectural Institute of Canada, made some very direct remarks along this line at the recent assembly in Winnipeg of the R. A. I. C., and in view of conditions, the following letter from Mr. Gardiner, of Montreal, is most interesting:

EDITOR CONSTRUCTION:

Dear Sir,—The Labor Question is undoubtedly one of the most important questions before the country at the present time, and if the Architects' Associations can do anything towards placing the building trades on a more satisfactory footing the whole community should be benefited thereby.

The architects certainly have a great deal to gain if labor can be placed on a more equitable and solid footing and in such a manner that there will be every inducement for the mechanic to work well and intelligently.

The question, then, for the architects to consider is the best method by which this can be procured. If the Provincial Associations could all agree upon a definite plan then this plan could be placed before the Minister of Labor and possibly some outcome, that would be satisfactory to all parties, could be obtained.

As a preliminary suggestion it might be proposed that the first step would be to form the building trades into a Canadian union, then to have this union incorporated, then to form a body of say five men to act as arbitrators to settle all disputes between the union and the employers, each of the arbitrators to be satisfactory to both parties, and both sides binding themselves to abide by all decisions of the majority.

By this means the loss of time by the men while a dispute is being settled is obviated (as the men work during the time of arbitration) and the building trades are not stopped, as they are by the present method, to the detriment of all parties concerned.

It is also proposed that the men belonging to the union should be graded and given certificates according to their qualifications. Such qualifications being determined upon by a board of examiners approved by both parties.

This would surely give a stimulus to the men to work from a third class to a second class certificate, and from a second class to a first class certificate, as the men would be paid according to their certificate. It would make the men ambitious to do better work and not, as with the present system, tend to lead the good men down to the level of the man with the minimum wage.

If these four (4) things, viz.: A Canadian union of all trades, incorporation of the union, arbitration of all disputes, and the grading of the mechanics into three classes, to be paid according to the certificate held by each, could be procured, would not the labor question in regard to the building trades be on a much more equitable and sound basis for both sides than it is at present, and if the architects from Vancouver to Halifax consider it to be the right solution of a difficult problem, why not say so and get the Dominion Institute to place our case before the Minister of Labor and the various Builders' Exchanges and unions in the Dominion?

The above is merely placed before your readers as a suggestion, and it would be interesting to hear other sides of a many-sided problem.

Yours very truly,
J. RAWSON GARDINER.

¶ Extraordinary Conditions of Ontario Government House Competition—Result Worked Out as Predicted—Whole Competition a Deplorable Farce.

THE RECENT COMPETITION for a new Government House for the Province of Ontario, which has just been concluded, is, to say the least, one of the most extraordinary architectural competitions ever held in the Dominion of Canada.

The conditions of the competition were severely criticized by prominent members of the profession, together with the president of the Royal Architectural Institute of Canada. Believing, however, in the face of these criticisms, that the Government of the Province of Ontario would be inclined to deal fairly with the profession, a number of architects (presumably about twelve) submitted plans in this competition.

We reproduce below a complete copy of the general conditions.

1. The Government of the Province of Ontario propose to erect a residence for the Lieutenant-Governor, a cottage for the Gardener, a cottage for the Steward, a stable and coach house, conservatories and greenhouses, upon lots 102-118 on the north side of Bloor street east, in the City of Toronto, extending to Rosedale Valley Road.

2. The cost of the whole of the buildings, and work upon the grounds, roads and walks is not to exceed the sum of two hundred and twenty-five thousand dollars ($225,000.00). The competing architects are to furnish estimates giving the cost of each building, first, if the outside walls are constructed of stone and brick, and, second, if faced with grey stone.

3. The competition to include the placing of the various buildings on the site and laying out of the walks and roads.

4. Only architects who have been resident in Canada for one year or more will be allowed to compete. Designs that may be submitted by others will not be considered.

5. The competitive designs will be limited to sketches in ink. All drawings of the buildings, including plans, elevations and sections to be made to a scale of one-eighth inch to one foot. Brush work in India ink will be allowed on the elevations. Color may be used on plans and sections to designate material. The plan of the grounds to be drawn to a scae of 16 ft. to 1 inch.

6. Perspective drawings will be furnished at the option of the architects, to be line drawings on the same scale as the elevations, shaded with India ink, and must be accompanied by a perspective diagram. A bird's eye or isometric view may also be submitted, showing the arrangement of the buildings, walks, roads and grounds. A descriptive memorandum in typewriting must be accompany the drawings.

7. No motto or distinctive device is to be attached to the drawings or memorandum.

8. Each competitor will send in his name in a sealed envelope without any distinctive mark. The judges will number the envelopes and drawings as the packages are opened.

9. Drawings are to be made on white paper, to be sent packed in folio, and to be shipped by express prepaid, addressed to the Hon. J. O. Reaume, Minister of Public Works, Toronto, Ontario. All designs must be in the hands of the Minister of Public Works on or before the fifteenth day of July next

10. Subject to the foregoing instructions, conditions and requirements, the following premiums are offered:

For the best design $1,000.00
For the second to the best design ..... 500..00

The two prize designs will become the absolute property of the Ontario Government. The drawings of the unsuccessful competitors will be returned to them within a reasonable time.

11. All designs submitted in the competition will, with the consent of the owners, be publicly exhibited after the award is made.

12. The following is a schedule of the dimensions required or suggested:

Residence—Basement: To provide for heating apparatus, coal vaults, wine cellar, store rooms and cold storage.

Ground Floor: Vestibule; cloak room; hall, containing about 1,400 ft. floor space, including space for staircase; reception room, floor space about 500 ft.; drawing room, floor space in all about 1,300 ft.; library, on either ground or first floor, floor space about 450 ft.; state dining room, floor space about 900 ft.; private dining room, floor space about 250 ft.; breakfast room, floor space about 250 ft.; Lieutenant-Governor's office, floor space about 300 ft.; secretary's office, floor space about 170 ft.; fireproof vault, floor space about 50 ft.; ball room, floor space about 3,500 ft.; kitchen, floor space about 550 ft.; scullery, floor space about 270 ft.; butler's pantry, serving pantry, refrigerator room, china room, butler's room, servants' dining room, servants' sitting room, boot room, store room, back stairs, conservatory and greenhouses.

First Floor: 12 bedrooms, 3 dressing rooms, 4 bath rooms, 4 w.c.'s, billiard room, 2 linen rooms, 1 sun room.

Second Floor: 12 bedrooms, 2 bath rooms, 2 w.c.'s, store room, sewing room, 12 servants' bedrooms, 2 servants' bath rooms, 2 servants' w.c.'s, elevator from ground floor to second floor.

Gardener's Cottage and Steward's Cottage—Separate buildings, to be in two stories, seven rooms in each building.

Coach House—To provide accommodation for two double and two single rigs, with space for cleaning; harness room, three living rooms and bath room for coachman.

Stable—To provide accommodation for four single stalls and two box stalls; loft to be used for hay and feed.

Garage—To provide accommodation for two large automobiles.

J. O. REAUME,
Minister of Public Works.

Department of Public Works, Ontario,
Toronto, May 12th, 1910.

The points objected to most strenuously by members of the profession are as follows:

1st. That no statement was made that would commit the Government to the acceptance of the plans awarded the first prize.

2nd. That no statement was made as to whom the assessors in the competition should be.

3rd. That no statement was made that would justify an architect in believing that the man who was to assess his plans was professionally or technically competent as an assessor.

The result has been very much as was anticipated by some of the more prominent members of the profession who refused to enter the competition. It is true that a first prize of $1,000 has been granted to one architect, the

second prize of $500 to another, and that all the plans have been sent back to their authors, but we are anxious to know who is going to design the new Government House. We also would like to know who were the assessors of the several plans submitted to the Government under this unfortunate programme. Again, we would like to know who the technical advisor of the Cabinet was who evidently recommended that the Provincial Government architect should proceed to design the Government House. It occurs to us that it is high time that Canadian architects get together and work out some arrangement whereby a committee on competitions may be created, that would advise the profession as to whether the various programmes for competitions are in accordance with accepted rules. It is extraordinary that twelve architectural firms should each go to the expense of $500 in the preparation of plans for an individual project for the Province of Ontario at the solicitation of the Government, and receive in payment $1,500 (in $1,000 first prize and $500 second prize). If the profession were assured that the prize winner would secure the commission to build the proposed structure it would be somewhat different, but here's a case where twelves architects compete one with the other at an expense to themselves of at least $500 each, for prizes amounting to $1,500, without any assurance that they would secure the commission to build the proposed building. This unfortunate condition exists only because Canadian architects are not sufficiently positive in asserting their rights as professional men, and conditions of this kind will re-occur just so long as architects see fit to enter into competitions, the conditions of which are unfair to themselves, to the profession and to the community generally.

We reproduce the complete conditions of the competition only to show how specifically the profession was instructed as to what the buildings should be and as to what they should contain. It would appear that in so far as the Government has seen fit to hold the architect down to a definite programme, it should have, reasonably, intended to accept the design given first prize. Under conditions of this kind, it is inconceivable that a doctor or a lawyer would submit to the treatment which has been tendered the architectural profession. One of the most pronounced weaknesses of architects is that of submitting to non-professional treatment, through the members of the profession being timid in asserting their individual and professional rights, for the reason that they might offend some of the individuals or interests which they have served or aimed to serve. If an outrage of this nature had been perpetrated upon the legal or medical professions they would have had no compunction about the proper assertion of their individual and professional rights. We say again that it is high time that architects (if they aim to be professional men) should demand professional recognition. This competition is a glaring instance of the architect's inability (or lack of inclination) to make his private interests subservient to the integrity and ethics of his profession.

¶ The British Columbia Association of Architects—Provincial Organization now in Process of Formation—Will seek "Registration," and Affiliation with R.A.I.C.

THE EFFORT which is now being made to effect an organization of British Columbia architects constitutes the welding of the final link in a complete chain of provincial associations. Following as it does the recent step of Saskatoon in this direction, the move is not only a timely one, but one that should effectually unite with the prevailing and growing spirit to conserve Canadian interests, and to place the profession of architecture in the Dominion on a more dignified and ethical basis.

There is possibly no section of Canada that has been more seriously hampered and handicapped by outside influences than the Pacific Coast district; nor any part of the country where United States architects have more boldly usurped the rights of Canadian designers than in the particular province in question. Much of the blame for the condition that has existed, and also for certain other discrepancies which have crept into the practice of architecture, through the unprofessional conduct of some few designers, can be ascribed almost wholly to the lack of proper organization. The proximity of British Columbia to Seattle and other large western towns in the United States, especially under the existing state of affairs, makes it a most fertile field of exploitation for designers and contractors from across the line, and annually thousands upon thousands of dollars, which should remain in Canada, pass into the hands of our neighbor to the south. That an organization, such as is proposed in the British Columbia Association, will do much to remedy this condition, and work a vast amount of good in promoting the welfare of the profession and the contracting and commercial interests of the province, is all too obvious to require further comment here. The importance of the province geographically; its mild climate and wealth in natural and material resources, are a sufficient guarantee that it will prove to be for some years to come, one of the most active fields in architectural and constructive work on the American continent. For this reason, it is double essential that some effort should be made to organize the architecutral forces in that province so as to perpetuate the best traditions governing the conduct of the profession, and by a spirit of unity and cooperation reach the highest that is to attained in the pursuit of art, and that measure of protection that is neecssary for the best interest of things Canadian.

As we understand it ,the new association, which is to be known as the British Columbia Association of Architects, will seek the enactment of a registration or a licensing bill such as was recently passed in Manitoba, and also affiliation with the R.A.I.C., from which body the proposed membership of the new association is now awaiting a draft of the uniform constitution proposed at the Winnipeg Assembly. As is the case in the early experiences of all associations, the formation of the British Columbia body has been beset by certain indifferences that has made organization difficult; but this apathy, however, is being gradually overcome, and due to the self sacrificing efforts of the promoters, and especially Mr. S. M. Eveleigh, who is acting in the capacity of Hon. Secretary, what might come to be ultimately regarded as the key stone in the arch of architectural unity in Canada, is now in process of being shaped. It is to be sincerely hoped that the efforts of the organizers will be met in every way with the success they deserve, and that the new association will in the near future be an active and potent force in the architectural development of the important province whose interests it is destined to serve.

THE EDISON CONCRETE HOUSE, of which so much has already been said, will be seen for the first time at the cement show to be held in Madison Square Garden, New York, December 14-20, together with the complete set of molds to be used in its erection. Adding interest to the attraction is Mr. Edison's announcement that he will personally superintend the carrying out of the work. The house to be installed will be 25 x 30 feet, and is of the type that are to be for $1,200 in gross lots. The chief part of the invention is Mr. Edison's concrete mixture, which is reported to flow like water, holding the aggregates in suspension and securing a uniform distribution of the concrete throughout the molds. This apparent overcoming of the laws of gravity will be of unusual interest to concrete men all over the world. The completed house and the molds in which it has been cast will undoubtedly prove one of the big features of the show.

General View of the Older Portion of Paris on the Island Known as the Cite, Showing Pont Neuf, built 1578-1604, with a Portion of Pont des Arts in the Foreground, and Pont Au Change, Pont Arcole and Other Bridges in the Upper Left of Picture.

General View, Looking Down the Seine—Showing the Frequency With Which Bridges Occur.

Font Alexander III.—Completed in 1900 by Resal and Abby, the Engineers, and Regarded as One of the Most Beautiful Bridges in the World.

THE MUNICIPAL BRIDGES OF PARIS

By R. E. W. HAGARTY, B.A.Sc.

A plea for the development on the American Continent of that Condition of Constructive Excellence which combines Art with Utility.

PARIS—the gay, beautiful, and historic capital of France—is geographically divided into two great parts by the river Seine. Popular parlance designates these divisions respectively as the "Right Bank" and the "Left Bank," although the city limits extend several miles in each direction from the river. The older portion of Paris is situated on a large island known as the Cité; but, in a general classification, may be included in the "left bank."

In the upbuilding of a large city, natural boundaries and dividing lines frequently have considerable influence in the distribution of the population, according to social, political and commercial distinctions; and such has been the case with the big French metropolis.

On the right bank may be found modern business and fashionable districts of the city, which include the principal boulevards, handsome streets and squares, most luxuricus hotels, cafés and restaurants, the best theatres and the most attractive stores, etc. Here, also, are situated the Louvre, the celebrated gallery of art; the Champs Elysées, the Hotel de Ville, the Trocadéro, l'Opéra, Palais-Royal, Bibliotheque Nationale, the Bourse, Banque de France, and other financial buildings and numerous other places of interest.

On the left bank and in the Cité are located those sections varying from the slums, the Latin Quarter, and the lower grade hotel districts to the middle class boarding houses, etc.; although, at the west-end are several ministries, embassies, and a number of large military establishments. Also, on the left bank one may find the famous Panthéon (Napoleon's tomb), the Jardin des Plantes and the Hotel des Invalides.

Strange to say, however, in spite of the fact that the river Seine intercepts nearly equal portions of the city, yet the traffic conditions from one bank to the other are noticeably different from those of certain other centres of population similarly situated as regards the presence of one or more large rivers.

For example, New York's millions find three or four main arteries sufficient to accommodate the intercourse with Brooklyn, while the same condition exists to a less marked degree in London; but, in Paris, one finds that a bridge is seemingly the necessary adjunct to every street heading toward the river. In a distance of less than ten miles one is surprised to find some twenty-six bridges. It is obvious, therefore, that the traffic conditions in Paris are amply provided for, although the number of bridges is by no means in excess of the requirements.

Pont d'Iena—Showing the Continuous Roadway Effect, Which is a Prominent Feature of Parisian Bridges.

Pont des Arts—Built in 1802-04. This Bridge is Built of Cast Iron and is Used by Pedestrians Only.

Pont de la Concorde—Built 1787-1790, the Upper Portion Being Constructed from Stones Taken from the Bastille.

View Along Same Bridge, Showing the Magnificent Approach to the Place de la Concorde.

Pont Au Change—Although One of the Most Ancient Bridges in Paris, It was Entirely Rebuilt in 1858-59.

Pont d'Arcole, As It Appears Looking from the Cite Toward the Hotel de Ville.

There are several other features worthy of notice in considering the various phases of "Parisian bridges." Among these is the historical importance which is attached to certain of the older structures. The native Parisian tells with considerable pride of the wonderful and interesting deeds committed in the vicinity of certain bridges, or of certain other bridges which commemorate the valiant acts of bygone heroes. Thus the fact is evinced that the average citizen regards "the bridge" as something beyond a mere commercially necessary evil, a tax-raiser or a political gratuity.

This spirit of public interest is further exemplified by the marked presence of art and architecture. Artistic design is so skilfully combined with engineering accuracy as to supersede entirely the crude apparency of the latter.

The mere mention of this feature is undoubtedly sufficient in itself except to say that the same marvellous aesthetic development is probably the greatest object lesson the bridges of Paris have to teach the architects and engineers of our own continent.

Referring to the engineering features of bridge construction along the Seine, there are certain points worthy of notice.

When a Canadian or American engineer visits Europe he is surely impressed with the prevalence of the arch in all types of construction. "Les Ponts de Paris" are practically all of this kind, from the massive gray stone circular arch of the sixteenth century to the cast iron bridge of recent years and the neat appearing steel parabolic structure of the present day.

One hesitates to give specific reasons for this condition; but, it might be proper to infer that the inborn sense of beauty and early schooling in classic works of art of the average European might be in some way accountable for the general adoption of the arch type for artistic municipal bridges.

Another striking feature which is especially noticeable in the more recently constructed bridges, is the clever effect successfully attained in designing the structure so as to give the entire bridge-crossing an appearance exactly continuous with that of the adjoining boulevard.

To illustrate: A tourist motoring in Paris is alleged to have asked of his chauffeur:

"Est-ce que nous avons traversé la Seine?"

And the latter replies:

"Eh, Mon Dieu! vous avez passé le Pont d'Iéna depuis cinq minutes, Monsieur."

Investigating further, one might notice that although the more elaborate structures are built of cast iron or steel, yet, when the engineer views the austere, cemented stone arches which have withstood the wear of the water for several centuries, it is evident that the longevity of the masonry bridge must not be neglected as a factor in modern bridge designing.

Although a complete description of the architectural and engineering features of Parisian bridges is not within the scope of the present article, yet the foregoing remarks may perhaps be enhanced somewhat by a few facts concerning the more important of the structures.

Pont de la Concorde.

We might refer first to the Pont de la Concorde, which crosses the Seine from the Place de la Concorde to the Chambre des Députés. This bridge was built by Perronet in 1787-1790. The upper portion of the bridge was constructed with stones originally taken from the Bastille. The piers, which take the form of half columns, were adorned with a number of statues, which have been removed to Versailles.

Pont Alexandre Trois.

At the end of the Avenue Alexandre-Trois, and leading to the Esplanade des Invalides, is situated the Pont Alexandre Trois.

Not only is this bridge the largest and handsomest bridge in Paris, but it is generally conceded to rank as one of the most beautiful bridges in the world. The foundation stone was laid by Czar Nicholas II. in 1896, and the bridge was completed in 1900 by Résal & Alby, the engineers, and Cassien-Bernard & Cousin, the architects. The bridge consists of a low rise steel arch 352 feet in length by 130 feet in width. At each end is a massive pylon 75 feet in height, surmounted by gilded groups of Pegasi led by Fame, by Frémiet (right bank) and Granet and Steiner (left bank); these are flanked by groups representing France at different epochs of history, by Lenoir and Michel (right bank), Coutan and Marqueste (left bank), and by lions led by children (Gardet, right bank; Dalou, left bank). The allegorical groups in the centre of the arch are by Récipon; on the downstream side are the arms of Paris; on the other those of St. Petersburg.

Pont des Invalides.

Farther on is the Pont des Invalides, originally built in 1827-29, and rebuilt in 1854-5. This bridge is adorned with Victories by Diéboldt and Villain.

Pont de l'Alma.

Another structure of considerable importance is known as Pont de l'Alma, which was built in 1856 and named in memory of the Crimean War. The buttresses are embellished with handsome figures of a zouave and a private of the line by Diéboldt, and an artilleryman and a chasseur by Arnaud.

The recent flood of the river Seine, of which the world's newspapers gave vivid accounts, did not have the damaging effect depicted by certain journals. The only bridge that was seriously affected by the high water was the Pont de l'Alma. The level of the water assumed a higher elevation than the crown of the arch of this bridge. Hence the structure was temporarily converted into a dam with all the consequent stresses for which the bridge was probably not designed.

Pont d'Iéna.

Somewhat below the middle of the Parc du Trocadéro one finds Pont d'Iéna, constructed 1809-13 by Lamandé, to commemorate the victory after which the bridge is named (1806). The bridge was widened by 33 feet in 1900. The principal decorative features of the bridge are a series of figures of eagles. There are also four colossal horse-tamers, a Roman, a Greek, an Arab and a Gaul. The surface of this bridge is a notable example of the through-street effect which is a prominent feature of these bridges.

Pont de Passy.

The Pont de Passy crosses the river at the upper end of the Allée des Cygnes. It was built in 1903-6 in place of the old Passerelle de Passy. The bridge has two decks, the upper one being used by the Metropolitan Railway of Paris (the underground). One may find on the bridge several large statues and reliefs; also four splendid groups (by Michel) representing the "Blacksmiths of Industrial France" and the "Boatmen of the Seine."

Pont-Viaduc d'Auteuil.

Situated at Auteuil, one of the suburban districts of Paris, is a large bridge and viaduct known as the Pont-Viaduc d'Auteuil. The bridge consists of 234 arches, and upon it is situated the immense viaduct of the Chemin de Fer de Ceinture (underground belt-line of Paris). The bridge is constructed of masonry throughout.

Pont Neuf.

At the west end of the Cité is a bridge 1,080 feet long and 75 feet wide, crossing both arms of the Seine, known as the Pont Neuf. In spite of the remarkably good condition of the masonry in this structure, one is surprised to find it the oldest bridge in Paris. It was constructed in 1578-1604, although it was remodelled in 1852, and the end next the left bank was restored in 1886. The masks supporting the cornice on the outside are copies of those originally executed by Cercaux. On the island halfway across the bridge is the fine equestrian statue of Henri IV. by Lemot, erected in 1818 to replace one which had stood there from 1635 to 1792. In the latter year it

was melted down and made into a cannon. Louis XVIII. retaliated by causing the statue of Napoleon on the Vendome Column and another of the Emperor intended for the column at Boulogne-sur-Mer to be melted down in order to provide material for the new statue. On the back of the monument is an exact copy of the original Latin inscription, and at the sides are two bronze reliefs representing Henry IV. distributing bread among the besieged Parisians and causing peace to be proclaimed by the Archbishop of Paris at Notre Dame. From this bridge one may obtain a splendid view of the Louvre, the famous Parisian art gallery and museum.

"In the seventeenth and eighteenth centuries, the Pont Neuf was the favorite rendezvous of newsvendors, jugglers, showmen, loungers and thieves. To this motley crowd Tabarin, the famous satirist, used to spout his witicisms from a platform which he set up between Nos. 13 and 15 in the Place du Pont Neuf."

"One of the first hydraulic pumps, the 'Samaratine,' was erected on this bridge."

Pont au Change.

Leading from the Place du Chatelet to the Cité is situated a bridge known as the Pont au Change, which is one of the most ancient in Paris, and is almost as celebrated as Pont Neuf. The structure takes its name from the shops of money changers and goldsmiths located in the neighborhood. It was entirely rebuilt in 1858-59.

Pont des Arts.

At the eastern limit of the Quartier Saint Germain, one finds the Pont des Arts. This bridge is built of cast iron and is used for pedestrians only. It was constructed in 1802-4. It received its name from the Palais des Arts, as the Louvre was once called.

Pont du Carrousel.

The west portion of the Quartier Saint Germain is connected with the right bank by a series of handsome bridges. One known as the Pont du Carrousel, formerly called Pont des Saints-Peres, was erected by Palonceau in 1832-34. It was embellished by four large statues by Petitot, representing Plenty and Industry on the right bank, and the Seine and the City of Paris on the left bank.

Pont Royal.

Another of this series is known as Pont Royal, built in 1685. The bridge consists of five stone arches which span the river opposite the Pavillon de Flore.

Pont de Solférino.

Near Pont Royal is situated the Pont de Solférino. It consists of three cast iron arches erected in 1858-59.

Pont d'Austerlitz.

Pont d'Austerlitz was erected in 1802-7, and was rebuilt in 1855, and enlarged in 1884-5. The bridge owes its name to General Valhubert, who was killed at the battle of Austerlitz in 1805.

The foregoing synopsis will probably be sufficient for a partial understanding of the part which bridges have to play in the history, art, architecture and civic development of Paris. However, in concluding, it might be noticed that the conditions which affect European bridge building are not quite analagous to those prevailing in our own municipalities. On this continent the lives of persons famous in history are usually commemorated by costly monuments, tombs or mausoleums. We have not yet fully attained that degree of constructive excellence which combines art with utility. There are, nevertheless, indications of progress in this direction, notably the handsome series of small bridges in Belle Isle Park, Detroit. New York, Boston, St. Louis, Toronto, and other places are beginning to undertake ventures of this kind, and it has been the purpose of this article to stimulate, if possible, this meritorious tendency. Further, it may be reasonably supposed that along with the perfecting of structural concrete arches, the artistic and historical factors of American municipal bridge building will receive the increasing attention they well deserve.

AN ANNOUNCEMENT is out making known the partnership of Mr. Percy E. Nobbs, M.A., F.R.I.B.A., A.R.C.A., and Mr. George T. Hyde, B.Sc., B.S., who have opened an architectural office at 157 St. James street, Montreal, under the firm name of Nobbs & Hyde. Neither of these gentlemen require an introduction in architectural circles, especially Mr. Nobbs, who as Professor of Architecture at McGill University for several years back, and as a contributor to architectural literature, has done much to assist the advancement of the profession in Canada. CONSTRUCTION desires to join the many friends and acquaintances in extending felicitations and in wishing the new firm every possible success.

Pont de l'Alma—Built in 1856 in Memory of the Crimean War. This Structure was the Bridge Most Endangered by the Flood of January, 1910.

ARCHITECTURAL QUALITIES AS RELATED TO CHURCH AND STATE

Factors and Influences in Early, Mediaeval and Modern Work, as Manifested in the Architectural Character of Ecclesiastical and Public Buildings.

THE ATTITUDE OF THE ANCIENT GREEKS towards religion, art, dialect and rhetoric is worthy of consideration. Their Pantheon, says Viator, in The Architect of September 17th, was peopled by a mythological crew of demonic divinities, who were actuated by human passions and were willing, in consideration of bribes, to divert the otherwise proposed course of events. Originally these divinities merely symbolized various forces and propensities of Nature, but after a lapse of time they received an accretion of individual and divine power. The Greeks treated their gods and goddesses with a cool aloofness of passion that has in it an amusing element; there was no religious ardour such as is now understood, and characters like Socrates were not numerous enough to affect the general racial characteristics, the latter including many interesting and even fine qualities, though amongst these we do not find religiosity. This being so, what wonder is it that the Classic temples, however much we may admire them as works of art, do not appeal to our religious sense? They leave us sensuously cold and uninspired and conscious of the insincere religion that accompanied their production. Insincere! That is a most suitable adjective to use, for as it well defines the Grecian attitude towards ethical matters, so was the opposite quality—sincerity—the potent factor in all that concerned their art; and it is directly due to this unaffected bias towards the fine arts that the Greeks produced buildings which cause beholders to forget purpose and fitness in the rapt artistic admiration engendered by the other essential qualities of good design.

Examining further we may note the Athenian love for academic debates, their rigorous adhesion to and devotion for good laws, their virile belief in the *mens sano in corpore sano;* and thus we learn to realize the fact that in these matters their art aided the sense of fitness instead of opposing it. For though the academic qualities of their religious buildings served to express in the main their own attitude towards religion, we hold that such is not the natural or rational attitude. On the other hand, the dignified sedateness and the restrained beauty of their secular public buildings were more worthily and suitably decked in Classic garb than they would have been in any other known to the children of men, Renaissance alone excepted.

Though Roman as compared with Grecian art was somewhat debased, yet it possessed the same elemental features and a similar aspect in regard to religion up to the days of Constantine the Great. But the Romans developed a love of luxury unknown to the Athenians in their palmy days, and this taste acted adversely respecting the architectural design of many of their public buildings, though bathing establishments and places of entertainment would benefit; and in this connection the Pantheon at Rome, regarded as a hall attached to public baths has indisputable claim to admiration, whilst viewed as a temple it is unsatisfactory.

Following upon those remarks that child of Classic architecture known under the name of Renaissance is similarly less fitted for the expression of religious ideals than are those styles which bear the stamp of indigenous religious fervour. And it is to be observed generally that people are more soulfully impressed in places of worship designed in one of the Gothic styles, even if at times they are more intellectually moved by Renaissance churches.

Before, however, adverting to Gothic art, a few remarks may be accorded to early Christian and some other styles, and to the position they hold in regard to inherent suitability for Church or State architecture. Respecting early Christian populations there cannot be two opinions as to the sincerity of their religious tenets, a sincerity not necessarily reflected in their ecclesiastical buildings for reasons now to be stated. Where persecution of the believers was not actively exercised, it was nearly always to be anticipated; consequently religious enthusiasm expended itself in acts of devotion and martyrdom, though it was at the same time recognized as impolitic and unchristian to invite the imposition of that thorny crown by any show of luxury such as might provide a lever wherewith the persecutors could raise a specious case against the followers of the new faith. Not, indeed, that there was much chance of being luxurious, as the early Christians were for the most part poorly endowed with the world's goods, and were thus deprived of the means of gratifying a natural desire to honor their Master by the presentation of choice gifts. Policy and poverty thus combined to prevent the early Christian churches from being places of grandeur. As a result the buildings erected were mere *aulœ* or *basilicœ,* the plan being that of the old heathen Hall of Justice and not infrequently structurally decorated with portions of the old heathen disused temples; of necessity the result was nearly as cold and formal as Classic art itself, and it could in no way interpret the mysticism attaching to Christian tenets.

But (it may be remarked) Oriental art is not cold and formal; Chinese, Japanese, Byzantine, Indian—these are not cold and formal, nor actuated in regard to expressing religious sentiment by any such restrictions as just detailed. To dispose of the first-named it is well known that the Celestials have been conservative in art as in religion and everything else from the early days of their very ancient empire; any reforms and progress observable in their territories have been forced upon them by external pressure. Though a very ancient civilization—or, perhaps, because of its antiquity—it is one that other nations regard as childish in many respects; with childhood, crude ideas as to form and color go hand in hand. The religion of Confucius is one apart from all other known creeds and is, perhaps, justly given effect to by the fantastic designs of Chinese art. In fact, this nation is adapted (and possibly better adapted than others) to express garden architecture and similar work, but it cannot do justice to Church or State buildings.

Any nation, also, whose taste for luxurious display pervades all its actions at home and abroad, a nation that regards the Ruling Power as supremely sensuous and the future state of existence as a life of voluptuous pleasures, any such nation is but ill-adapted to express religious or State architecture in a manner that would adequately realize their respective claims; and consequently, under the ban of unsuitability, we must include Oriental styles generally.

Byzantine architecture gives evidence of the co-operation of true religious feeling and expression, though for the full development of this we must seek the Gothic styles. In the eastern empire of Constantine, buildings were erected whose planning was no less serviceable for the proper exercise of worship than that of the early Christian buildings, and whose architectural treatment, unshackled by considerations either of prudent seclusion or of economy, yet evinced an artistic avoidance of exuberance combined with a justifiable use of color and of structural design.

It is, however, only when the period of the later Romanesque work is reached that a distinctly expressed ecclesiasticism is observable. Perhaps the main factor responsible for this is the religious ardour arising after the close of the tenth century of our era, when people were relieved from the fear that the world would end

with the close of the year 1000. The bar safely crossed, the nations put out to sea full of hope and thankfulness, and being more simple-minded and direct than those of to-day they were not afraid to express their love and gratitude in buildings devoted to their religious worship.

It must be evident that where the idea of a God is of an exalted Being inhabiting space and far removed from the pettinesses of mortals, this will best find expression where no cramped effects are to be seen; and as the curious notion has ever been prevalent that heaven is above us, not around us, this would again be best expressed by a lofty building.

But there is another point to bear in mind as probably influencing the adoption of loftier church interiors, and this is the introduction of the organ fairly contemporaneously with the advent of the eleventh century. To give due effect to the tones of this majestic instrument a spacious building is required.

At the same time also (or perhaps somewhat earlier) there arose from whatsoever cause a general disuse of Autolycan trifles from ancient heathen edifices such as had formerly been introduced mosaic-wise into Christian churches. A certain "feeling" of Classicism in the ornament was to be expected, but progressively this gave place to other forms not intrinsically better by any means, but as having no resemblance to what had preceded they kept the mind of the observer free from any suggestions of heathen work. Anything in the nature of affectation in this matter of suitable mouldings and ornament is to be deprecated; the bowtell, dog tooth, cat's head, roll moulding, diaper, etc., are no more expressive of religious feeling than are the echinus, scotia, egg-and-dart, honeysuckle or acanthus. Where the difference arises is in the workmanship, mediæval art showing an individuality, a freedom from undue restraint, a lack of cold formality, altogether opposed to the practice of Classic art.

The desire to obtain increased proportionate height prepared the way for the use of the pointed arch; and here, once again, is apparent an added interpretation of religious ideals. With the semicircular arch the eye is held within a confined space travelling from one springing point to the other almost unconsciously; with the pointed arch the effect is just the reverse, the eye tending to continue the course of flight upwards. Quite unconscious interpretation we may believe this use of the pointed arch to be, but none the less effective. The idea that pointed architecture had its origin either in leafy avenues or in intertwining round arches may be set aside as being more plausible than probable.

A reference was made earlier to the mysticism attaching to Christian tenets; this may be contrasted with what may be termed the "mystery" connected with some of the more remote faiths wherein the prevalent idea was that the gloom of the temple interior should be in direct ratio to its sanctity. This effect of gloom and mystery was obtained by two methods, if not three; the ancient temple consisted of a congeries of rooms progressively narrower, lower and more shut off from the light of day as the innermost sanctuary was approached. This could not but result in a tendency to making a terror of religion, and the heirarchy enhanced this impression on the lower orders by calling to its aid the use of scientific tricks and mechanical subtleties.

How different to the more modern ideal of concentrating the resources of art and shedding a brilliant light upon the central point of attraction in a place of worship as most effectively seen in the chancel of a church. The soul of religion is not wrapped in mysterious veilings, and the faith of worshippers is invited to satisfy its cravings intelligently, not blindly. The accidental mysticism arising from what has been termed "dim, religious light" has been, perhaps, unduly insisted upon, as the feeling is probably the result of environment.

The fitness of pointed architecture for ecclesiastical buildings having been analysed in brief, what may be said about its suitabilities for State edifices? Firstly, it is evident that the more elevated the purpose of the building the more should it express dignity, formality, reserve, stateliness and continuity. It would be unpardonable to suggest that in most Governmental methods there is any continuity of policy in the generally accepted sense, and yet, on the principle that "under all circumstances the King's Government must be carried on," there is an underlying idea of continuity that should find expression in the "frozen music" of architecture. In Gothic art there is a lightness of touch, a certain irresponsibility and other qualities mentioned earlier, that militate against its fitness for the expression of State architecture; and whilst these qualities may recommend it for private and for certain public buildings, yet it is conceivable that other qualities may prove adverse to its free use even for these purposes.

The English Houses of Parliament are well adapted to point a moral, though they do not adorn the tale of nineteenth century progress. Who does not recall Carlyle's denunciation of them ("Latter-Day Pamphlets"), written as the time of their completion approached? "A wilderness of stone pepper-boxes with tin flags atop . . . if this is ideal beauty, except for sugarwork and the more elaborate kinds of gingerbread, what is real ugliness? Can any earnest soul pass them without mentally exclaiming 'Apage!' and striking a pious cross in the air?" So far Carlyle. Dignity (that is, the expression of it) is at a discount, and where the whole surface is cut up into restless elaboration the expression of continuity is impossible; and with the absence of these is also to be noted the absence of formality (though not of stiffness by any means), reserve and stateliness.

When our eyes are turned to the English Law Courts in the Strand we see another phase of Gothic, also unsuitable. The Palace of St. Stephen's (criticised in the preceding paragraph) is Classic clothed in Gothic garb; the Law Courts renounce Classicism altogether and presents to passers-by a confused jumble of buildings that quite fail to typify the orderly process of law.

But when we regard the various blocks of Government offices within sight of St. Stephen's, their fitness is at once apparent, and we are in a position then to establish the justice of our adverse criticisms above and to absolve ourselves from any charge of jaundiced views.

In State architecture it is proper to include Royal palaces, where the predominating influence may indeed be traced to their public character, though the privacy attaching to a home must also find due expression. We may exemplify three Royal palaces here—one at Madrid (not the Escurial), one at Vienna, and one in England; all three are Renaissance in style. The Spanish palace exhibits a dignity, formality and symmetrical disposition that relegate it in appearance to the rank of a worthy Parliament House, for it bears no impress of domesticity. The Vienna palace, though less formal, shows just as few signs of the domestic character. Hampton Court Palace, however (we refer to Sir Christopher Wren's work there), by its greater freedom of treatment (and more particularly in the use of cheerful red brickwork as an integral portion of the design) acquires an air of combined stateliness and homeliness which in conjunction with its noble proportions and fair surroundings at once sets the palatial seal upon it and inspires in the beholder a sense of its absolute fitness. Gothic art in one or other of its phases may serve for private palaces, but with domestic architecture in general this article is not concerned.

SAND FACE BRICKS of a type used in the monasteries of the Middle Ages, are again being adopted to quite an extent in Continental Europe. This style of brick, which is 11 x 3 x 3 inches, promise to have considerable vogue and to vie strongly for popularity with the thin Roman brick which became fashionable a few years back.

DOOR KNOCKERS— EARLY SANCTUARY AND DOMESTIC TYPES

Custom of Ancient in announcing their presence and early adoption of time honored device. Some Knockers of 16th and 18th Century designs.

THE QUESTION as to whether the old fashioned knocker has any longer a legitimate place as a doorway requisite, is something which every now and again obtrudes itself for quiet discussion in certain corners of architectural circles. Where adopted at the present time, its lack of utility is usually indicated by an electric bell set in the frame of the door, but even for some years before the advent of this particular device, the door-knocker had been rendered archaic by a non-observance of its primary function on the part of visitors generally who deemed it less disturbing and more polite to announce their presence by means of the more gentle rap of the hand. There are, however, a large number of both designers and laymen who respect its tradition as an index of privacy, and as a simple decorative feature which greatly adds to the character of the

Iron Knocker of the 18th Century.

Brass Knocker of the 18th Century.

entrance; and there are many who think that with a few modifications, it could be made to serve advantageously as a sort of a push plate in connection with an electric call, and thereby again be reinstated in an utilitarian capacity.

As to when knockers first came into use, says Henry Walker, in the Journal of the Society of Architects (London) it is difficult to determine. In the houses of the Greeks and Romans the doorway contained two doors folding together, and these were fastened by means of bolts pushed into sockets in the sill. At night the front door of the house was further secured by means of a wooden or iron bar placed across it, and inserted into sockets on each side of the doorway. It was considered improper to enter a house without giving notice to the inmates. The Spartans gave this notice by shouting, the Athenians by using the knocker, where it was provided, but more commonly by rapping with the knuckles or with a stick. In the house of the rich a porter was always in attendance to open the door. He was generally a eunuch or slave, and was chained to his post. To assist him in guarding the entrance a dog was kept near, and the warning "cave canem" was sometimes written near the door. It will be readily appreciated that the attendant at the door would frequently weary of his vigil, and tumble off to sleep. Hence the necessity of finding some means of awakening him, and this necessity probably suggests the invention of the door knocker.

Laquered Brass of the 18th Century—Taken from the Birthplace of Philip James Barley Poet, of Nottingham.

Italian Bronze of the 16th Century—Formerly on the Door of Nottingham Castle.

The earliest knockers appear to have been plain rings without any attempt at ornamentation.

Sanctuary Knockers.

In England, the oldest remaining examples are those known as "Sanctuary Knockers," of which that on the north door of Durham Cathedral is typical. Some of the cathedrals and parish churches in this country were, at one time, sanctuaries or harbours of refuge for criminals and others. If the pursued could reach the sanctuary before being captured they were safe, and were housed, fed, and protected for a period not exceeding thirty-seven days. This provision necessitated a constant attendant, night and day, at the gate, and a knocker had to be provided in order to arouse him. Many of these sanctuary knockers are grotesque, others symbolical, and

Cast Iron Knocker of the 18th Century.

all worthy of the closest attention by students of architectural detail.

Domestic Knockers.

In domestic architecture the knocker was first of all crude in design and workmanship, but from the 15th to the 18th century knockers of excellent design, in bronze, brass, and iron, were produced, many of which remain

(*Concluded on page* 63.)

Reception Hall, Residence of Mr. E. R. Wood, Toronto—An Interior Characterized by a Dignified Simplicity in Treatment, and Finished in White Enamel with a Soft Yellow Tinted Ceiling. Sproatt & Rolph, Architects.

Drawing Room, Residence of Mr. E. R. Wood, Toronto. With the Hallway, this Room is in Georgian Character. The Color Scheme is in White and Fawn, with Delicate Touches of Green and Red in the Draperies and Carpets. Sproatt and Rolph, Architects.

Residence of Mr. E. R. Wood, Toronto. An Interesting Example of Modernized Elizabethan Architecture in English Domestic Design. Sproatt & Rolph, Architects.

AN ATTRACTIVE TORONTO HOME IN ELIZABETHAN DESIGN

Residence of Mr. E. R. Wood. An excellently planned and beautifully appointed House, which in design and construction is exceptionally well adapted to its environments.

A VERY SHORT DISTANCE south of the Bloor street stone gates to Queen's Park, Toronto, on the west side, setting behind two beautiful old elms, with a low cut English hedge in front, is one of the best examples of modernized Elizabethan architecture in domestic work to be found in Toronto. It is the home of Mr. E. R. Wood, and was designed by Messrs. Sproatt & Rolph. Although the exterior is simple, in general effect it is rich in the extreme. The absence of heavy pilasters, broken with quoins and bands, that had a tendency to render the architecture of the Elizabethan period gorgeous rather than elegant, together with the simple breaking of the gables and the excellent square treatment of the windows gives the building all that is desirable in the architecture of this period in domestic design, and produces an effect that is elegant, graceful and comfortable, rather than one that is rich and gorgeous.

The exterior color scheme is well suited to the environment; the brick is of the dark red common variety, with one-half inch grey mortar joints; the trimmings are of grey cut limestone, while the roof is of green slate.

The general lay-out of the house has been planned with a view to comfort and convenience, rather than display and grandeur. The ground floor contains reception hall, drawing room, living room, library, dining room, palm room, billiard room and kitchen service.

The front entrance opens into a spacious reception hall, with beamed ceiling and heavy pilasters. The wood work is white enameled, and the panelling in the ceiling is of a delicate tone of yellow. The drawing room to the right is decorated in white and fawn, relieved with a touch of delicate tones of green and red in the draperies, silk wall hangings and carpet. This room, as well as the reception room, in both decoration and furnishings, have a strong feeling of Georgian.

To the right of the hall are the living and dining rooms. The woodwork and the mission furniture in the living room are of oak, finished in an Early English tone. A large Elizabethan recessed fireplace lends an air of comfort to this large well appointed room.

The most unique, and at the same time, the coziest room in the house, is the library, which is at the left of

Library, Residence of Mr. E. R. Wood, Toronto. Here the Woodwork is Enamelled a Sea Green, and the Freize and Ceiling Decorated with Naturalized Mural Designs in Subdued Tones. Sproatt and Rolph, Architects.

Living Room, Residence of Mr. E. R. Wood, Toronto—Finished in Early English Oak. The Large Elizabethan Recessed Fireplace is Especially Noteworthy. Sproatt & Rolph, Architects.

the living room. The woodwork is enameled a sea green and the walls above woodwork, with the ceiling, are decorated with mural work of naturalized ornament in sub-

Ground Floor Plan, Residence of Mr. E. R. Wood, Toronto. Sprott & Rolph, Architects.

dued tones. The furniture is of the heavy mission style, with Early English finish, and has dark red leather cushions. The color combination, although unusual for a library, is harmoniously worked out.

The dining room, which has a large bay, with southern exposure, is finished in mahogany. The wall panelling

Detail of Entrance, Residence of Mr. E. R. Wood, Toronto. Sproatt & Rolph, Architects.

runs up to within three feet of the beamed ceiling. The walls above the panelling are finished in a grey tone with a greenish tint, relieved with a narrow gold stripe. The ceiling panels are painted a delicate yellow, with borders of blue and a narrow stripe of gold. This room, with the living room, in decorative detail, is purely modernized Elizabethan, although they lack the cumbersome, heavy ornaments that characterized the work of the early designers of this period. The carved mantel and built-in sidebcard are among the best pieces of modern Elizabethan decoration we have ever seen.

The palm room, which leads from the dining room back to the billiard room, is decorated and furnished in Georgian style. The woodwork is white enameled, and the walls are hung with a silk of a delicate sea green. The furniture is upholstered with silk of the same texture and color. This, is a very bright room, and in addition to a large bay on the south, has a skylight of slightly ornamented glass. The billiard room is panelled with selected circassian walnut to the coved ceiling, which is

Detail of Fireplace in Living Room, Residence of Mr. E. R. Wood, Toronto. Sproatt & Rolph, Architects.

richly decorated in white plastic relief work. It has two large bay windows, one in the south wall, and one in the west wall. At the north end of the room is a high, richly carved mantel.

The arrangement of the kitchen service is ideal. The pantries and kitchen are so located as to provide the maximum degree of convenience, with the least possible domestic labor.

Fireplace in Dining Room, Residence of Mr. E. R. Wood, Toronto. Sproatt & Rolph, Architects.

Palm Room, Residence of Mr. E. R. Wood, Toronto, Looking Toward the Living Room. The Woodwork is Stained a Rich Brown, with the Columns and Pilasters Enamelled White, and the Walls finished in a Silk of Delicate Sea Green. Sproatt and Rolph, Architects.

Billiard Room, Residence of Mr. E. R. Wood, Toronto, Showing the High, Richly Carved Mantel. The Walls are Panelled with Select Circassian Walnut, and the Ceiling is Finished in a Soft Grey Tone. Sproatt and Rolph, Architects.

The main stairway leads to a large hall sitting room on the first floor. To the left is the owner's bedroom, which is tastily decorated in white and old rose, with mahogany furniture of Early English design. The guests' room, located at the southwest corner of the house, is decorated in white and pale green. A feature of this room is a fireplace nook on the south, with windows and seats on each side of the mantel.

All the bedrooms and the first floor hall sitting room have white enameled woodwork, and the same general style of simplicity of decoration prevails throughout. In all, the house has about a dozen bedrooms, and five large, well appointed, tiled bathrooms. The servants' quarters are finished in white enamel, and are cut off from the main portion of the house.

Built-in Sideboard in Dining Room, Residence of Mr. E. R. Wood, Toronto. Note the Exquisite Hand Carving. Sproatt & Rolph, Architects.

In short, this Elizabethan home may be termed a well designed, tastily decorated, appropriately furnished English house, in which there has been no lavish expenditure in meaningless ornament, vulgar decoration, or costly, cumbersome furniture. It is a home made elegant and graceful by the architect in his design, and beautiful and comfortable by the owner in his tasty decoration and appropriate furnishings.

GLASS BRICKS IN GERMANY.

THE DEMAND FOR GLASS BRICKS in Germany has increased somewhat in recent years, and a number of concerns are producing them, says U.S. Consul Robert P. Skinner. There are no statistics available, and it is extremely difficult to estimate the product of the German factories, especially as they are produced in connection with other lines of glass goods. It is certain, however, that the business has attained large proportions within comparatively recent years.

Three types of glass bricks are well known to the builders and architects in this country. One, the Falconnier hollow brick, of a singular and irregular shape; another, a hollow, rectangular brick similar in shape to a common brick; and, finally, a pressed-glass brick molded into the form of a thick letter U.

Glass bricks can never be more than special-purpose building materials, particularly useful where walls instead of windows are essential, while at the same time light must be provided.

Limitations of Use.

The chief obstacle to their more extensive use is their inability to support more than their own weight, or even this when the wall exceeds 15 feet in height. Consequently girders must be provided or ordinary window openings made in such manner that the walls of glass sustain no pressure. Perhaps in the United States, where steel buildings are constructed so extensively, and where brick and stone walls carry little load, builders might find opportunities for a more extensive use of glass bricks than in this country.

When these bricks are carefully handled they seldom crack or break, but as they are sensitive to changes in temperature, builders must use them with considerable discretion. They are delivered to contractors loosely packed in straw and are shipped in the same manner in carload lots from the factories. The mortar used in laying them should be composed of one part of fine sand to four parts of cement, the latter to include 50 to 75 per cent. Roman cement.

The rectangular, hollow, blown glass bricks have become of late the most popular form among German builders. They are thicker than the Falconnier bricks, and are therefore more valuable for fireproofing purposes, although a little more expensive than the Falconnier. These bricks cost an average of 13 cents each in dimensions of 125 by 250 millimeters (4.9212 by 9.8425 inches), or half that price for half bricks, 125 by 120 millimeters (4.9212 by 4.7244 inches). Brickwork of this kind costs about $4.20 per 10 square feet.

Cheapest Not Popular—Porcelain Not Common.

The pressed glass bricks made in the form of a thick letter U are the cheapest, but are also the least popular, as changes of temperature facilitate the passage of moisture and dust through the mortar, and as the latter lodges on the inner surface of the bricks they eventually lose their transparency.

It is not understood that any of these forms are protected by patents. A large Hamburg building contractor estimates that to erect a first-class plant for making glass bricks as a specialty would cost $178,500 to $238,000. However, it appears that many German manufacturers of glass produce bricks as one of numerous lines whenever market conditions make it profitable.

DOOR KNOCKERS.—Continued from Page 57.

to this day. A walk round any old town in search of these interesting old knockers seldom goes unrewarded, and occasionally a rare example may be met with. It is remarkable how often the lion's head appears on the older knockers. Ruskin has a tilt at this. "The lion," he says, "is the power of death on earth, conquered by Heracles, and becoming thenceforward both his helmet and ægis. All ordinary architectural lion sculpture is derived from the Heraclean. The Christian lions are the Lion of the tribe of Judah, the Lion of St. Mark, the Lion of St. Jerome, and the Lion of the Zodiac. These four will give you, broadly, interpretation of nearly all Lion symbolism in great art. How they degenerate into the British door knocker I leave you to determine for yourselves."

The examples which illustrate this note are from dwellings in Nottingham. They are now in the City Museum, where they will be carefully preserved. It is a regrettable fact that these old knockers are fast disappearing. Dealers in antiques are beginning to search for them. With the advent of the electric bell their practical use is almost gone, but it will be deplorable if they are removed from the doors they have graced so long.

Church of our Lady of Lourdes, Corner of Sherbourne and Earl Streets, Toronto—As It Will Appear When the Extensive Enlargement and Alterations Now Under Way are Completed. J. P. Hynes, Architect.

REMODELING OF OUR LADY OF LOURDES CHURCH, TORONTO

Brief description of new addition and improvements now being made to edifice ere ted twenty-five years ago.

THE CHURCH of Our Lady of Lourdes, corner Sherbourne and Earl streets, Toronto, as it will appear when the present addition and alterations now underway are completed, is shown in the accompanying illustrations. The half-tone view shows the exterior in perspective from a south-east point on Sherbourne street, and makes obvious how the new extension is being carried out to form a consistent and co-ordinate development entirely in harmony with the existing structure.

The original church was erected in 1886, Mr. F. C. Law, R.N., being the architect. It was built as a memorial chapel with a seating capacity of less than three hundred, but was subsequently converted into a parish church, with the result that the accommodations for the congregation have gradually become more and more inadequate.

At the time the improvement was suggested, several propositions were put forth for enlarging the seating capacity, even to the building of another church adjoining the present one; but as a harmonious and adequate extension was shown to be practical, the latter scheme was adopted. According to the plan decided upon, the altar is placed under the dome of the original edifice, the existing sanctuary is used for the choir, and the portion east of the dome is retained to supplement the seating accommodations.

The new extension, which is entirely for the use of the congregation, will give the structure in all a seating capacity of eight hundred. It is built to the south at right angle to the axis of the original church, thus making the remodelled structure similar in outline to a T shape, or restricted cruciform plan.

The portico of the present entrance will be removed, and the main entrance (as shown in illustration) will be made from Sherbourne street at the south end of the new extension, through a portico and vestibule. The central portion of the extension is a replica of the present church, having a semi-circular coffered vault, intersected by lunnettes, in which are placed the windows. This vault is supported by an arcade on either side, which

(*Concluded on page* 66.)

Plan of Our Lady of Lourdes Church, Toronto. Showing the New South Extension, and the Original Structure, which now Forms the Transverse Section. J. P. Hynes, Architect.

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

Ivan S. Macdonald, Editor and Manager

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CURRENT TOPICS

IT IS REPORTED that an English syndicate will construct an immense cement plant to be operated entirely by electricity, on the Chilliwack River, near New Westminster, B.C. A site having lime rock to a depth of from 100 to 500 feet and two miles in length is said to have recently been staked off by Mr. C. D. McRae, who is acting in an engineering capacity for the parties interested.

* * *

COMPETITIVE DESIGNS are now being received by the Cuban Government or a new Presidential Palace to be erected on the Villenueva Station plot in the City of Habana The competition is an open one, with prize offerings of $10,000 and $5,000 respectively for the two best designs. A circular setting forth the programme to be followed has been issued by the commission in charge of the erection of the building, and plans will be received by the Department of Public Works up to 2 p.m., April 15th, 1911.

* * *

A MONTREAL CONTRACTOR of considerable prominence and affluence, has offered the Board of Control of that city, sufficient land for a boulevard four miles long and 125 feet wide. To the man on the curb this seems to be "the long lane without a turn," or a re-turn to speak more correctly, as the donor seeks nothing for his property, or imposes no stipulation other than the city bear the expense of the survey, and carry out the work of running the boulevard through. The proposition looks good on the whole, and if accepted, it should do much to start Montreal on the right road towards establishing a system of driveways that would be both a credit and an advantage to so important a centre.

WHAT IS SAID to be a new method of concrete fireproof construction for small buildings, consists of a frame work of steel tubing filled with concrete and a net work of wire strung to a tension of 1,000 pounds, for the basis of walls, floors and roof. It is difficult to see, however, where this method has any commercial or structural advantage over the present metal stud and metal lath systems now on the market.

* * *

THERE HAS RECENTLY BEEN COMPLETED at Rotterdam, one of the largest reinforced viaducts in the world. It is over a mile in length and carries a two-track heavy electric railway line. The structure comprises two sections, one built within and the other extending beyond the city limits. The former has sixty-three normal spans and a length of 2,300 ft., while the remaining portion is 3,150 feet long and includes seventy-nine normal spans.

* * *

CEMENT BLOCKS 50 YEARS OLD, were recently examined at Bridgeport, (Conn.), and found to be in an excellent state of preservation. They were taken from a pioneer house of this type of construction, which has just been razed on a site at the south side of the east approach to the Congress street bridge. According to the "Times,' published in that city, the blocks are not only free from any signs of disintegration, but are in a better condition now than the day they were placed.

* * *

INSTEAD OF SELECTING varieties and grades of wood entirely according to external appearance as formerly, it is now examined by means of the compound microscope. This instrument is used to determine the commercial value and proper industrial use to which the wood may be put, by viewing the longitudinal and transverse section of the sample. Fine grain and thick walled cells assure the solidity and resistance which are required in carpentry while other characteristics in turn fit the wood for other purposes.

* * *

STATISTICS BROUGHT FORWARD by M. Ziffer, of Vienna, at the recent International Tramway Congress held at Brussels, show that wooden sleepers "treated" by approved methods have a life as long as metallic sleepers, the comparatively slight use of which indicates that they have not entirely fulfilled expectations. Among the new types being brought forward for trial, concrete sleepers have in several cases been adopted on a large scale, and with a certain measure of success. Such sleepers, it was pointed out, deserve to be kept in mind, though it is not yet possible to pronounce a definite opinion concerning them.

* * *

THE WORLD'S LARGEST GAS TANK, which is being built at Toronto for the Consumers' Gas Company, has approached that stage in its construction where it is possible to judge somewhat definitely as to what will be the magnitude of its ultimate dimensions. Already the framework of its huge bulk lifts itself many feet above the site on which it stands, and the constructors are employing one hundred skilled workmen in order to have the entire work completed December 31st. This mammoth receptable is being built in four telescope sections, each 40 feet high. It will have a capacity of 5,000,000 cubic feet of gas, and when completely filled will be over 200 feet high. Some idea as to vastness of the work may be gathered from the fact that it requires 3,500 tons of steel, while 12,000 rivets are used in the base alone. The diameter of the tank is 218 feet, and the entire frame work will be enclosed with 1¼-inch steel plates. The work is being carried out by C. & W. Walker, Ltd., an English firm, at a contract price of $1,000,000.

PROMINENT BUSINESS INTERESTS in Montreal, according to a recent news item, are back of a scheme which is at the present time promoting a Canadian-Franco-British-American Exposition to be held next year. So far, it is stated, $500,000 has been pledged towards the exhibit, by local parties, while additional capital is promised from outside sources. The Exhibition will include manufactured products, a pure food display, arts and craft department, women's section, electrical devices and appliances, automobiles, self-culture hall, and other features which have not as yet been fully decided upon. That the event bids fair to materialize, is indicated by the fact that a site has already been secured, and that the erection of the necessary buildings, is to be proceeded with shortly. The headquarters of the affair, are in the Bank National building, and, it is said, that a definite announcement as to the opening date, will be made within the next two weeks.

* * *

IN TWO PARTICULARS the Shoshone dam, recently completed by the United States Reclamation Service is unique among other structures of its kind in the world. It is the highest and the only one in existence in which the height is the greatest dimension. Built in the famous Big Horn Basin of Wyoming, this important structure forms a mighty reservoir capable of empounding approximately 149,000,000,000 gallons, an almost inconceivable number. It is built entirely of concrete, and is the controlling feature of an irrigating system which is designed to convert 150,000 acres of barren waste into a tract of rich, productive, arable land. The dam has a maximum height of 328.4 feet, making it the highest in the world. The maximum thickness in portion below the river bed is 108 feet, and the length 60 feet. At the top the dam is 10 feet thick and 220 feet long, the radius of its curvature being 150 feet. This rather pronounced curvature imparts great resisting powers to the structure, else its upper part must needs have been made much thicker. The comparatively small gravity action is atoned for by the arch action. The location was peculiarly adapted to this form of construction and offered great advantages to the engineers. The upstream face of the dam falters 15 per cent. from the vertical and the downstream face 25 per cent. The dam, spillway and tunnels in all cost the U.S. Government about $1,-000,000.

* * *

CONSIDERABLE EFFORT is being made in England to meet the conditions in roadmaking imposed by motor and trolley traffic. As a definite step in this direction a new and direct roadway is proposed between West Hartlepool and Middlesborough, near Newcastle, in the County of Northumberland, a direct line of 7¾ miles. In designing the roadway the engineer in charge has given attention to the possible development in both heavy, slow, and fast vehicular and motor traffic, each of which demands separate consideration, and possibly different methods of road-surface treatment. The plan accordingly provides for a centre footpath 9 feet in width; on the east side of the footpath a road for motor and light fast traffic 24 feet in width; and on the west side of the footpath, a road for heavy, slow traffic 22 ft. in width. This gives a width for highway purposes of 55 feet. The plan further shows on the westernmost side of the footpath a width of 14 feet reserved for light railway or trolley purposes, making a total width of land to be acquired of 69 feet. A scheme similar to this will doubtless control future road making in England, and existing roads may be reconstructed on a corresponding plan. One of the chief advantages in separating the several kinds of traffic would be in permitting different methods of surfacing to be used, and those best suited to the traffic adopted. Another adavantage would be the lessening of the chances of accidents. A third advantage would be the greater speed permissible to fast travelling.

SAN DIEGO, CAL., has attracted national attention in the United States by the recent feat of raising $2,000,000 for an Exposition to be held in 1915, simultaneous with the one for which San Francisco is now preparing. As a city of 50,000 population, this means a per capita subscription of forty dollars—an amount that may well set the tongue of civic pride and enterprise advocates "awag." Winnipeg is asking the Dominion Government to contribute a like sum ($2,000,000) towards the proposed Selkirk Centennial. With commendable enterprise the business interests of that city have already subscribed large amounts in order to assure the undertaking, and it seems that the Government could do much worse than to endorse by a financial grant, an event which promises to at least assume semi national importance.

* * *

THE NETHERMOST EXTREME so far reached in the size of modern commercial structures, finds expression in a diminutive reinforced concrete building which stands at the gore of Montgomery Avenue and Jackson Street, in the Californian city of San Francisco. This structural "lilliput," which is the outgrowth of a peculiar clause in the City's charter preventing the sale of municipal land, is in all likelihood, the smallest cass "A," or strictly fireproof commercial building on the American continent. It occupies a triangular site, having one frontage of 12 feet and ⅜ inches; another of 7 feet and ⅞ inches; and a base of 9 feet and 3 inches; while in total height the structure itself does not exceed 12 feet. Notwithstanding its limitation as to size, the building has been dignified by the architectural effort of Mr. Wm. Mosher, one of the city's foremost designers. The land is leased by the city for a sum of nine dollars a month, and the building which is occupied by a retail tobacconist, net a revenue in rentals which insures the owner a very satisfactory interest on his investment.

* * *

THE UNDERGROUND POSTAL RAILWAY, which has been under contemplation for several years past at Berlin (Germany), now seems likely to be carried out. A contemporary remarks, that a line built for experimental purposes is now under trial, and that this will serve as a model for the final construction. The present section consists of a 1,300 ft. subway, having double tracks, with a 1 ft. 5 in. gauge, on which is operated an electric locomotive working upon three phase current at 200 volts, coming from an overhead trolley line. The locomotive is about 5 ft in length and 1 ft. 6 in. high, and it is designed to run automatically with four small cars, each carrying a sack of mail, at a speed of 25 miles an hour. As to the actual subway which is planned, the project has not as yet been fully decided upon. It is designed to have a width of 6 ft. 6 in., and a height of 2 ft. 8in., with a trench between the two tracks to allow employees to circulate within the tunnel. One source of heavy outlay in building the line lies in the fact that it must pass under the Spree in two different places.

REMODELING OF OUR LADY OF LOURDES CHURCH.—Continued from Page 64.

separates the central portion of the church from the aisles, the ceilings being formed in a succession of small domes having central lantern lights, dispensing entirely with windows in the aisle walls. The arcade and dadoes are worked in Caen stone cement, and the communion rail is in marble, extending the full width of the church, with brass gates in the centre. Marble is also used for the sanctuary floors and steps, as well as for lining the large pier which rises to the cornice under the dome.

The new addition and alterations are being made from designs by Architect J. P. Hynes, Toronto; and the remodelled edifice, which is now nearing completion, is interesting as a structure which effectually combines the efforts of two designers laboring twenty-five years apart.

45 feet wide by 225 feet long leads to the main waiting room, entrance to which is made by a grand stairway 40 feet wide, at the head of which is a striking statue of Alexander John Cassatt, the moving spirit, during his later life, of the great work which has just been thrown open to the public.

"Apart from its long reaches of imposing facades, the distinctive feature of the station is the waiting room, which is 314 feet 4 inches in length by 108 feet 8 inches in width, and whose stupendous vault spans the great interior at a height of 150 feet above the floor.

"This magnificent hall, dignified with massive, classic columns, and enriched by the warm soft tones of its clothing of travertine stone, is one of the most impressive interiors in the world. In clear height it is matched only by the nave of the Cologne Cathedral.

"Parallel to the main waiting room, and of equal length, and 200 feet in width, is a concourse from which access is had to the platforms below by stairways.

"It should be mentioned that the storage tracks of the station will accommodate 386 cars, and that there at the station some four miles of standing tracks. The station contains eleven passenger platforms, with 25 baggage and express elevators. The maximum capacity in trains per hour of all the tunnels is 144, and the initial daily service will consist of about 600 Long Island trains, and 400 trains to and from the Pennsylvania system to the West.

"Not the least important of the improvements has been the electrification of the Long Island system, which, now that the new station is open, is placed in close relation with the heart of Manhattan Island. The service will be operated by multiple-unit trains, running under short headway. As evidence of the valuable character of this improvement, it may be mentioned that Jamaica (L.I.) is now brought within 18 minutes of Manhattan, and that similar reductions have been made in the schedule to other Long Island towns.

"While the service to Long Island will be worked by multiple-unit trains, that to the West, consisting mainly of through express trains, will be operated by the huge locomotives, each of which has a capacity of 4,000 horsepower, exerting a drawbar pull of 60,000 pounds, and weighing complete 166 tons."

The *Architectural Record* of New York has published the following architectural criticism of the structure proper, which is interesting:

"The excavations and the edifications of the new Pennsylvania Terminal have been made in a neglected quarter of Manhattan which not one Manhattanite in a thousand has occasion to visit from year's end to year's end. That, in fact, from a civic point of view, is one of the interesting points about the undertaking, that it is a project of reclamation as well as of "reclame." One of our chief civic needs is that of multiplying and scattering "centres." To establish a new centre which shall serve to divert traffic from the old ones and relieve their congestion, which shall create or enhance values in a neglected and derelict neighborhood is a civic benefaction, even though the enterprise was entirely selfish on the part of its promoters. The successful establishment of a new centre pays for itself very speedily, in so great and growing a city as New York, in the "unearned increment" of the value of the surrounding land. The success of this establishment may be already assumed. The terminal and the post office together insure the creation of what may fairly be called a new city on the shore of the North River.

"Doubtless this aspect of the improvement has been or will be dwelt upon sufficiently by the Pennsylvania's Press Bureau. It is only the strictly architectural aspects of the project that invite and indeed compel illustration and comment from an "Architectural Record." Probably no larger and costlier building than the station has been under construction concurrently with it. Certainly no larger. There are other buildings of greater cubical contents contemporaneous with this, notably the Metropolitan Life in New York, and very many superior in altitude have been going on at the same time. In fact it is the lowest big building of recent years, only the New York Public Library, of buildings in the same city, having so little height in proportion to its area. But the area of the station is enormous. The frontage, from Seventh to Eighth avenue, is almost exactly the same as that of the Capitol of the United States, including the wings. There is nothing in New York anywhere near as long, excepting the front of the Museum of Natural History, which one supposes to be about the same. The Metropolitan Life, indeed, occupies a block front each way. But the block from Madison to Fourth is, of course, only half a "long block," half the distance from Fourth to Fifth avenues, the other half being occupied by Madison square, whereas the new station occupies the whole space from Seventh avenue to Eighth. And the other dimension is equally exceptional. The closing of Thirty-second street west of Seventh avenue gives the shorter fronts the unequalled length of 430 feet. The area is thus not far from 300,000 square feet, half as much again as that of St. Peter's, nearly three times that of Milan. Doubtless we are dealing with a "big thing." To find an American building of as great area as the new station, we should have to recur to the temporary and occasional architecture of the fairs of Chicago and St. Louis.

"The lowness is, of course, an architectural advantage in the sense and in the degree that it emphasises the horizontal extent of these walls. Excepting the emergence of the roof of the great concourse at the centre in what is virtually a sort of transept, though it is not carried out to the street fronts, the enormous spread of the structure has a height of only three moderate stories and a moderate attic. The level line of the cornice, unbroken except by the moderate projection of the portico at the centre of each front, stretches away interminably to an undeniably impressive effect which might, it seems, have been enhanced by a more pronounced and emphatic base-moulding. Everything, indeed, concurred to enable the architects to emphasize this "horizontal extension" which, according to Freeman, is the character of "classic" as vertical extension is of Gothic, and as "rest," or immobility, is of Romanesque. No doubt the classic effect is attained, especially in the most elaborated and "important" front, the Eastern, which contains the main entrance, and carries a colonnade along its whole extent—

As where, from Pluto's garden Palatine
Mulciber's columns gleam in far piazzian line.

Another adventitious advantage, especially for a strictly classic treatment, the architects had in the comparative blankness of the walls, at least of the most conspicuous walls. An American architect in the days of the old Greek revival incurred just enough ridicule by saying that modern architecture would not be so difficult if it were not for the windows. In other words, if men would be content to live and do business behind blank walls, their claims would not conflict with those of the buildings which they foolishly imagined to be meant for their accommodation, holding that architecture was made for man, not man for architecture. Of course the retort upon the foolish architect was obvious that if classic architecture did not allow for the admission of necessary light, it was his business to find or make some architecture that did. All the same, the foolish man was right enough from his point of view. In the Greek and Greco-Roman templar architecture, the portico, the colonnade, which is to say the architecture, was relieved against the absolutely blank wall of the cella, and doubtless it was much more effective with that relief than with any form of opening whatsoever in the intercolumniations. When the Romans undertook "miscere utile dulci," to unite the practically necessary with the architecturally agreeable, they used the order which was the entire construction of the temple as a kind of trellis to overlay a construction of arches, so that the Roman building involved a contradiction which was never reconciled until what Freeman calls "the classical or transitional Roman" had ceased for some centuries to be built,

Even now, an architect who starts out to make his architecture out of the "orders" is very lucky if he can ignore the openings and produce a building

> Where the blank windows blind the wall
> From pedestal to pedestal.

That good luck has befallen the architects of the Pennsylvania station in unusual measure. It results from the lowness, the prospective shows, that the interiors can almost all, or almost all on the conspicuous and "architecturesque" fronts, be lighted from above, or from courts, and that the walls can be treated as mere backgrounds or foils for the colonnade. That is conspicuously the case on the principal or eastern front. And nearly half way down the side, or until you come to the central portico of the entrance, the order, here subdued from columns to pilasters, is relieved against a wall virtually blank, to the great enhancement of the architectural effect. The western front is apparently the "business end" of the structure. It accordingly contains four tiers of practicable windows. The architects have hardly attempted to bestow more abundant comeliness upon these more uncomely parts. They have simply carried through the order, in the form of pilasters, and make the openings mere rectangular holes, not "treated" architecturally at all, but recognized perforce as an ugly necessity. This, you will observe, is precisely the method adopted in the public architecture of Washington, in the Treasury and the Patent Office, by the Greek revivalists of half a century ago. It is hard to see what better could be done, given the primary commitment to strictly classic architecture. It is true that one cannot exactly see a Greek architect resorting to such a confession of impotency. But still less can one see a Greek architect resorting to the hybrid construction of the Imperial Romans. If not what a Greek architect would have done, it is exactly what Isaiah Rogers and Thomas U. Walter and Robert Mills and Amni B. Young would have done, if they had had all this money to spend and all these dimensions over which to spread themselves. It is what they would have done for it, it is what they did. In fact, the exterior of the Pennsylvania station, with one notable exception, is what would have been done in this country seventy years ago. It has no trace of the later inculcations of the beaux-arts. There is no more taint of "modernism" about it than about a Papal allocution. This must not be taken as dispraise of the architecture. Quite the contrary. Given Greek architecture, the absence of anything "smart" or modish, or modern, is an advantage as an adherence to the type that has "pleased many and pleased long."

"Doubtless the structure has the defects of its qualities, and also of its conditions. The lowness, the massiveness, the solidity and the blankness make for g'oom as well as for dignity. The poet may be right in saying that

> Stone walls do not a prison make.

But these stone walls do. A stranger set down before this Seventh avenue front, out of sight of the emerging mass at the centre, and told to guess what it was all about, would be apt to guess it a good substantial jail, a place of dentention and punishment of which the inmate were not intended to have a good time. The simplicity of arrangement and detail furthers this impression. The plain unfluted Roman Doric of the order, of which this is an impressive example, is the most "serious" of the orders, as serious as the Greek Doric in the modern, not the Greek use, in which it is not relieved and enlivened by sculpture or by color, and more so than the sprightly Corinthian, or even than the Ionic, of which the voluted capital has an interest in itself to which the Roman derivative Doric does not pretend. The carving of the porticoes, excellent as it is in adjustment in scale and in execution, by no means suffices to relieve the sadness of the interminable fronts. The architecture raises one or two questions which it does not answer. Why should the central intercolumniations of the porticoes be wider than the others? And particularly why should the otherwise unbroken horizontality of the design be subjected to the single exception of the projected pediments of the terminal pavilions on the Seventh avenue front, when the pediment does not reappear at the centre, nor on the sides of the same pavilions, nor anywhere else throughout the vast structure? It has undoubtedly an anomalous air. If it be meant to denote and signalize the corridor to which the portals under the pediment give access, it is manifest that this purpose would be equally secured by a reduced reproduction of the central portico, in the same plane with it, and like it crowned with a pedestal instead of a pediment, relieved against the flat attic. If it be an attempt to enliven the architecture, and to relieve it of monotony, the attempt has plainly miscarried. And in fact, the monotony of the building, the interminable sequence of "magnitude, uniformity and succession" is not only connected with its artistic quality, but is its artistic quality. It seems a mistake to have disturbed it, most of all to have disturbed it in one solitary instance. For the impressiveness of the building is very great. Whatever abatements and qualifications we may be moved to make, it is securely one of our public possessions, and liberal owners and sensitive and skilful designers are entitled to the public gratitude for so great and grave an example of classic architecture.

"Much of the interior work is of the same grave and simple character as the exterior, and here we may perhaps expect that, in the fulness of time, the gravity and simplicity will be relieved without being disturbed, by mural decoration. The tympana in the loggia of the entrance seem to have been reserved expressly for such an enrichment. One may walk for long distances in the interior, as he may inspect the entire exterior, without once being reminded that "we live intimes unknown to the ancients." The most emphatic recognition of that fact is in the treatment of the great hall, or "concourse," both inside and out. "Modernism" and Gallicism are unmistakably indicated from the outside by the emerging mass of the transverse roof, with the three heavily mullioned arches, each decorated with a protruding keystone, and covered with its own low gable. Within, an enormous and lofty shed of iron and glass is an architectural feature for which no classic precedent exists, since no Greek architect or Roman engineer ever had occasion to treat such a construction. Originality, or at least modernism, is here enforced. The architectural treatment is constructional and straightforward, with as much, perhaps, as the case admits, of the gravity and simplicity of the abundantly precedented design of the exterior, but with necessarily much less of the impressiveness of massiveness, and of the monotony which the massiveness here entails. But of the design, classic or modern, in masonry or metal, one has to own that its dignity everywhere escapes frivolity. In the language of Mr. Edmund Sparkler, there is no nonsense about it."

"KITCHENETTE APARTMENTS," consisting of suites of two rooms, one of which, as the name indicates, is a kitchen on a decidedly small scale, are growing in popularity in New York City. Generally speaking, the kitchenette is equipped with a sink with running water, an ice box, a one or two hole gas cooking appliance, a small dish closet and a dumb-waiter or some other means of receiving supplies. In short, the up-to-date kitchenette may be said to consist of a miniature kitchen minus laundry tubs, gas range and perhaps an outside window. It occupies a comparatively little space, is easily looked after and yet is equipped so that the tenant may prepare a simple hot meal for one or two persons without the necessity of resorting to that Mecca of the furnished-roomer —the delicatessen store. The demand for this type of kitchenette has grown to such an extent that many builders in putting up apartment houses now provide from six to eight kitchenette two room apartments, and even some former furnished room houses have lately been altered so as to provide the same convenience.

Bungalow of H. J. Simmons, Vancouver, B.C.—The Low, Broad Lines and Massiveness of the Design, make the Heavy Timber Effect and External Construction of this Dwelling Eminently Suitable. E. Stanley Mitton, Architect.

Ingle Nook, Residence of H. J. Simmons—An Inviting Corner Forming a Feature of the Living Room, and Carried Out Entirely in British Columbia Fir. The Small High-Placed Windows in Art Design, are Both Novel in Character and Appropriate to the Particular Treatment Employed. E. Stanley Mitton, Architect.

Residence of H. D. Hulme, Vancouver—A Clapboard and Shingle House, which Typifies the Construction Usually Prevalent in British Columbia for Small Moderate Priced Dwelling Structures. E. Stanley Mitton, Architect.

Hallway, Residence of H. D. Hulme—Looking Toward the Entrance and Living Room, and Denoting in its Treatment an Interior that is Both Comfortable and in Good Taste. E. Stanley Mitton, Architect.

Living Room, Residence of H. D. Hulme—Note the Cross Strapping of Ceiling, and the Attractiveness of the Scheme in General. E. Stanley Mitton, Architect.

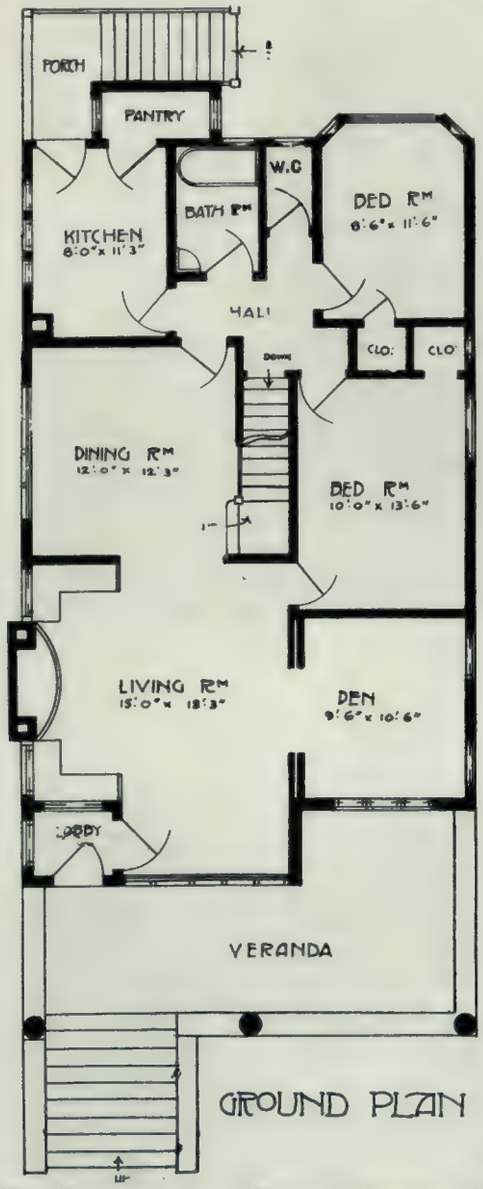
Dining Room, Residence of H. D. Hulme—In Keeping W ith the Architectural Character of the Living Room. The Sideboard with Windows Above is a Noteworthy Feature. E. Stanley Mitton, Architect.

Residence of A. P. Watkins, Vancouver—A Small House Which is Made Interesting by Sheltering Roof Lines and Effective Window Grouping. E. Stanley Mitton, Architect.

Living Room, Residence of A. P. Watkins—Showing the Tile Fireplace and Simple Wall Treatment. E. Stanley Mitton, Architect.

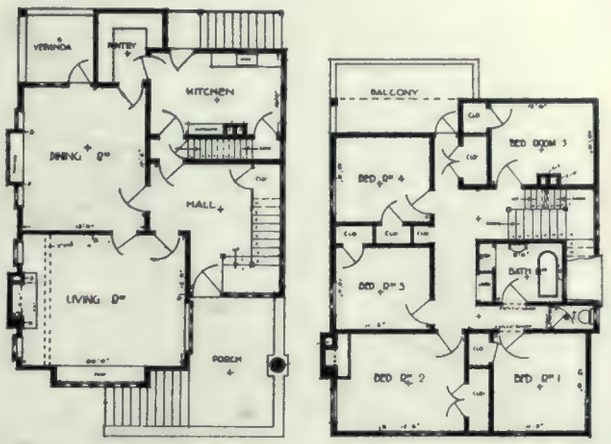
WESTERN BUNGALOWS.

FOR LOW PRICED, moderate sized dwellings, it is doubtful if any particular style in domestic work, admits of greater opportunities for individuality of design and inviting homelike interiors than that of the bungalow. By adopting such characteristic features as may be considered representative, and studying the



Floor Plan, Bungalow of H. J. Simmons, Vancouver, B.C. E. Stanley Mitton, Architect.

small house from the most logical standpoint, it is not only possible to produce a dwelling structure that is artistic, convenient and modern in its entirety, but one that is in itself unnecessarily expensive. As regards Canada, the bungalow type of residence occurs with general frequency in the Pacific Coast district, and even a large number of good examples are to be seen as far east as Edmonton, but more this side little has been done in this particular style of design. Several exterior and interior views of Vancouver bungalows are illustrated on the accompanying pages. These typify to an extent the character of comfortable and inexpensive homes that are being erected in that city. It might be said in this connection, that the architects of British Columbia have, in a large number of cases, succeeded in producing most excellent results, and the true, simple, homelike effects as seen in some of their better designed bungalows, is something which the eastern designer can study to advantage. As a rule, only simple element of composition are employed, and mainly the results are obtained from well-poised and well- restrained lines, simple window grouping, low, sheltering roofs, convenience of plan, and effective ex-



Ground and First Floor Plan, Residence of H. D. Hulme, Haro Street, Vancouver, B.C. E. Stanley Mitton, Architect.

terior and interior stains. Of course, British Columbia fir, owing to its availability, is material usually employed for both external and internal work; and while this wood in its rich grain, and splendid staining surfaces gives opportunity for certain effects, yet this in itself is purely a secondary advantage as the design and architectural scheme could be equally as well reproduced in the materials common to other vicinities.

THE USE OF WOOD BLOCK PAVING IN GERMANY

Varieties of wood employed, method of impregnation, foundation work and manner in which blocks are laid.

ACCORDING to the latest statistics issued by the authorities at Berlin, Germany, less than 2 per cent. of the street pavement of that city consists of wood blocks. The varieties of wood blocks most used are Swedish pine, and, to a more limited extent, the Australian hard-wood varieties, tallow-wood and black-butt.

Ground and First Floor Plan, Bungalow of A. P. Watkins, Fourteenth Avenue, Vancouver, B.C. E. Stanley Mitton, Architect.

The native pine and beech varieties are, however, also used in Germany, as are also the American cypress and yellow and pitch pine. The wood used is carefully selected and free from knots and cracks. It is considered unwise to use in the same section of pavement, woods

Residence of Fred J. Calvert, Vancouver, B.C.—A Shingle Clad Dwelling of Moderate Size, Designed to Admit of a Well Arranged and Convenient Interior. E. Stanley Mitton, Architect.

Hallway, Residence of Fred J. Calvert—With its Built-in Window Seat and High Wall Panelling, a Similar Wall Scheme Being Seen in the Dining Room Through the Opening on the Left. E. Stanley Mitton, Architect.

Residence of W. O. Webster, Vancouver, B.C.—While Characteristic of the Bungalow in Design, this House is Placed on a High Foundation, in Order to Take Full Advantage of the View Which its Site Commands. E. Stanley Mitton, Architect.

Ingle Nook, Residence of W. O. Webster—Note the Treatment of the Architectural Scheme, and the Simple Design of the Fixtures and Furniture. E. Stanley Mitton, Architect.

from different countries, wood gathered at different altitudes, or wood of different species.

The dimensions of the paving blocks vary, the width ranging from 7 to 10 centimeters (2.75 to 3.94 inches), the length from 18 to 30 centimeters (7.09 to 11.81 inches), and the height from 12 to 18 centimeters (4.72 to 7.09 inches). The so-called Paris standard dimensions are 7.5 by 22.5 by 15 centimeters (2.96 by 8.86 by 5.9 inches).

Impregnating the Blocks.

To prevent decay, the wood blocks are impregnated with a zinc chloride solution or with creosote oil. The zinc chloride solution (3° B.) contains 2 parts, by weight, of chloride of zinc ($ZnCl_2$) and 30 parts, by weight, of water. The creosote oil should contain not less than 5 per cent of creosote and not more than 15 per cent. of naphthalin, and is distilled at between 180° and 270° Cel. The specific weight of the oil is 1.07. The creosote oil impregnation is considered preferable because it also serves to forestall the subsequent swelling of the blocks by dampness, after they have been set, and the resulting bulging of the pavement. To impregnate

Ground and First Floor Plan, Residence of Fred. J. Calvert, First Avenue, Vancouver, B.C. E. Stanley Mitton, Architect.

with creosote oil, the blocks are dried out for three to four hours in a tank or boiler at a temperature of 100° to 140° Cel., when they are transferred to another tank and allowed to remain for an hour in a vacuum of one-tenth to one-fifth of an atmosphere, after which creosote oil, which has previously been heated to approximately 50° Cel., is pumped in and forced into the wood under a pressure of 6 to 8 atmospheres.

A combination of the creosote and zinc chloride impregnation is the so-called English system in which a mixture of crude carbolic acid or creosote and a water solution of zinc chloride is used. This method is that employed to a large extent in southern Germany and Austria, and is said by German authorities to give the best results from the point of view of the preservation of the wood blocks.

Still another impregnation method, which was first used in Paris, and is now employed considerably in Germany, consists in immersing the paving blocks in large tanks containing a mixture of gas tar and heavy oil, and allowing them to remain until thoroughly saturated. The time of immersion varies from a few minutes to three-quarters of an hour. In Paris this system has been altered by the omission of the tar. The paving blocks are packed in box-shaped wagons which are run under a pipe leading from the oil tank from which the wagons are filled. After the blocks have become saturated, the remaining oil is drawn off at the bottom of the wagons and pumped back into the tank. A variation of this method has been made in Germany, in that smaller boxes are used and so arranged that all the blocks to be impregnated may be put into the boxes and all taken out at the same time. This system has been proved equally successful with that used by the French, but from the German standpoint none of the last-mentioned systems are as efficient as the English method described, because the oil has not an opportunity to penetrate as deeply into the blocks.

Constructing Wood Pavements.

In constructing the wood pavement, the lower sides of the impregnated blocks are first dipped into hot tar or asphalt and then laid in a carefully prepared level layer of concrete, of from 15 to 20 centimeters thickness (5.9 to 7.87 inches). The blocks are set side by side close to each other, a space however, of from 2 to 5 millimeters (0.079 to 0.197 inch) being left at the ends between the rows. This space is filled with tar and in some instances with asphalt. When asphalt is used, the intervening space is twice as large as when tar is the binder. To gauge the space between the ends, wood battens of the proper thickness are used. The rows of blocks may be set either at right angles with or at an angle of 45° to the axis of the street.

After the pavement has been laid, the surface is covered with a thin layer of asphalt or tar, over which a layer of coarse sand or fine gravel is spread. This when pressed into the blocks forms a durable coating, which serves to prolong the life of the pavement. The sand or gravel is usually spread on the pavement once a month.

If the pavement is kept clean and if good materials have been used in construction, under ordinary conditions of traffic and of weather, the surface wears at the rate of about 0.5 centimeter (about 0.2 inch) annually. Wood block pavements on an average last from ten to fifteen years, but in damp places, not exposed to sunshine, the blocks will decay in half the time.

The approximate cost of block pavement in Berlin is 14 marks ($3.33) per square meter (1.196 square yards).

THE PLAYGROUND PROBLEM in overcrowded tenement districts is shortly to be solved in a novel manner at Cleveland, Ohio, where plans have been completed, and approved by the city authorities, for a building intended to provide better housing accommodations and sanitary advantages for the poorer class of workmen and their families. In order that the children of the occupants may have the advantage of recreation grounds, the building is to be built on pillars or stilts, leaving an open space of seven feet between the lower portion of the structure and the ground. This opening will also serve to ventilate six great air shafts, each 20 by 25 feet in size, which will extend up for the full three storeys, being entirely open at the bottom and top, so that the air can circulate freely. Of the three hundred rooms the tenement house is to contain, every one is to have an exposure either on the outside or in one of the spacious light courts. The whole structure will be strictly fireproof, and will be of reinforced concrete, with exterior walls of brick. The rooms are to be so arranged that they can be either rented separately, or in suites comprising any required number of interiors, the plan being such that the rooms conveniently and systematically open into each other. Communication to and from the ground will be by a series of iron staircases connecting with balconies at each respective floor line, both on the outside and in the inner courts. The sanitary devices throughout are to be modern, the heating will be produced by a steam system, and the lighting and cooking will be by gas. The cost of the structure complete is estimated at $75,000.

BRICKS

A·DEPARTMENT·DEALING WITH·THE·ARCHITECTURAL AND·CONSTRUCTIVE POSSIBILITIES·OF·BRICK

BRICK HINTS FOR THE ARCHITECT-BRICK POINTERS FOR THE CONTRACTOR-BRICK SUGGESTIONS FOR THE MANUFACTURER

Legg Bros., Toronto, Designers and Engravers.

Residence of E. R. Wood, Esq., Toronto. Sproatt & Rolph, Architects. A Good Example of Red Brick in Elizabethan Domestic Design.

Fort Garry St tion, Winnipeg—A $4,500,000 Terminal Building in Which the Only Bricks of the Vast Quantity Used, are of Sand-Lime Manufacture. Warren and Wetmore, Architects.

THE TEXTURE AND GENERAL QUALITIES OF SAND LIME BRICK

A brief treatise on the manufacture, color possibilities, structural character, and economic advantages of a product that is growing in favor in architectural and constructional work.

ONE OF THE MOST MODERN, most economical, and most practical of all bricks is the sand lime brick. We find buildings constructed of these bricks in almost every portion of the Dominion. Their pleasing, warm grey tone, resembles very closely Indiana limestone. Architects often complain that color schemes are impossible with sand lime bricks. This is not so, for by the aid of artificial coloring materials, an unlimited range of coloring shades can easily be produced. These colors are numerous and are proof against climatic changes. More than this, they are uniform, thus rendering it unnecessary to sort them in order to obtain a sufficient quantity of a particular shade. In this manner, architects are enabled to obtain color effects not possible with any other building material.

Power House, Built of Sand-Lime Brick, St. Andrew's Rapids Dam, Manitoba. H. E. Vautelot, Consulting Engineer.

Lord Selkirk School—One of Winnipeg's Several Important Educational Buildings, in Which the Entire External Wall Construction is Executed in Sand-Lime Brick. Designed by Commissioner of School Buildings J. B. Mitchell.

As the name denotes, sand lime brick is made from a mixture of sand and lime. This mixture was used in even the most remote ages for mortar. As a material for the production of an artificial stone, it, however, found very little use, although some contend that the Temple of Salamo in Jerusalem was built of sand lime brick.

It was not, however, until the beginning of the nine-

teenth century that the town of Postum in Germany, which is surrounded by large sand hills, utilized sand with a mixture of lime in the production of bricks. These German bricks were made by moulding the mixture of sand and hydraulic lime. The green bricks were allowed to weather for a period of about six months, at the end of which time they were ready to be erected into walls. It was discovered by Dr. Michaelias, of Berlin, that at the time of curing it could be very much exhilarated by subjecting the fresh bricks to the action of steam. This experiment proved successful, and the number of sand lime

Somerset School—Another of Winnipeg's Sand-Lime Brick School Structures. Designed by Commissioner of School Buildings J. B. Mitchell.

brick plants in Germany increased with great rapidity. One of the oldest and yet the most enduring and dignified edifice built of sand lime brick or "mortar brick" was the Howard University at Washington, D.C., constructed by General Howard in 1867. When the crude method of manufacturing these bricks is considered, together with the permanency of the building which they composed, the admixture of sand and lime into a composite brick, especially under the advanced modern conditions by which it is produced, most assuredly justifies their adoption by pres-

Dufferin School, Which, Together with Other Buildings of Similar Character Illustrated on this Page, Shows the Extent to Which Sand-Lime Brick is used in Winnipeg Schools. Designed by Commissioner of School Buildings J. B. Marshall.

ent day architects. The steam hardening process under high pressure was introduced in America in 1910, but the lime at that time became an aggregate in a raw state, and was stored in silo or bin to slack with the sand. This did not prove satisfactory, but it was discovered that by hy-

La Verendrye School, Winnipeg, Most Recently Erected and Elaborately Equipped School Building, Built of Sand-Lime Brick. Designed by Commissioner of School Buildings J. B. Mitchell.

drating the lime through a steam process before mixing with the sand that the hydrate product is made possible, and that it has proven itself a commercial success.

Sand lime brick plants have been established in various portions of almost every province in the Dominion, and in some sections they have proven more successful than in

Norquay School, Winnipeg. Designed by Commissioner of School Buildings J. B. Mitchell.

others. In those communities where there is not to be found a good brick clay that can be burned at a reasonable cost, sand lime brick has done much to relieve the situation, but even in the city of Toronto, where we have in close proximity possibly the finest clay beds in Canada, we find residences, warehouses, and churches built of

King Edward School, Winnipeg. Designed by Commissioner of School Buildings J. B. Mitchell.

sand lime bricks. In the West where good common clay brick is very hard to obtain, we find sand lime brick very much in use. All of Winnipeg's recent school buildings have been built of this material, together with a large number of warehouses and residences in the same city. Port Arthur and Fort William also has a number of most

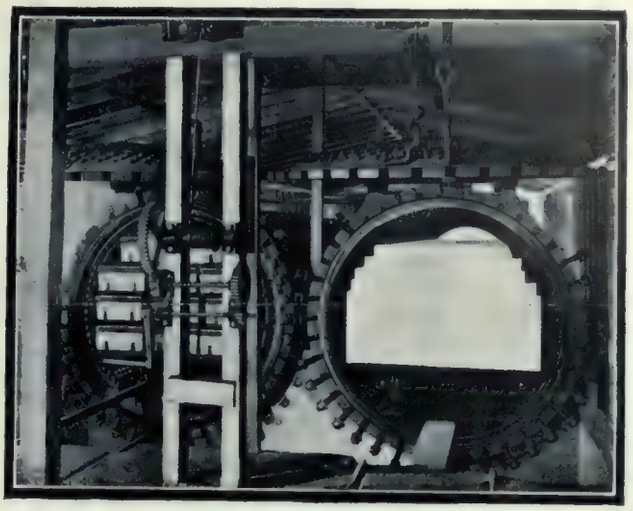
A Sand-Lime Ecclesiastical Edifice—High Park Presbyterian Church, Roncesvalles Avenue, Toronto. Smith and Gemmell, Architects.

noteworthy structures constructed of this material. It should be of considerable interest to architects and contractors, as well as brick manufacturers, to know something about the process of manufacture, raw materials, the method of treatment, mixture, time and cost of manufacturing and the margin of profit in connection with the merits of this exceedingly important building material.

With regard to the process of manufacture of this particular brick, sand and lime constitute the raw ma-

Process View—Showing a Sand-Lime Brick Press with a Minimum Capacity of 20,000 Bricks per Day.

terial. The lime is hydrated; it is then mixed in the proper proportions with dry sand and the required amount of water is added. The mass is then thoroughly pressed into the form of bricks, and these bricks are hardened by the action of steam and high pressure. There are two



Process View—Showing Hardening Cylinder Filled with Sand-Lime Brick Ready to be Sealed for Hardening.

kinds of sand that may be used in the manufacture of sand lime brick; one kind inferior to the other. One occurs as fine round particles. The latter in the form of sharp and irregular grains. For the purpose of sand lime brick manufacturers, the latter kind is preferable, although the former kind of sand may be used to fair advantage. The presence of clay in sand is most injurious; it will not make a strong brick. The lime used in the manufacture of sand lime bricks must be a high calcium lime, and thoroughly hydrated. The mixture used for the manufacture of sand lime bricks is variable, and according to the quality of sand and lime the usual proportion is about six per cent. by weight of hydrated lime to ninety-four per cent. dry sand. Excess of lime is very injurious to the strength of brick.

Time and cost of the manufacture of any building material are very important features in connection with their production. It is maintained by the sand lime brick in-

Sand-Lime Brick Yard—Showing a Day's Run Taken from the Cylinder and Ready for the Market.

terests that their system of brick making produces a perfect product in very much less time than is possible in the manufacture of ordinary clay bricks. Another contention of these manufacturers is the cheapness of manufacture Raw materials are plentiful and cheap in most localities, and it is maintained that through this particular process of the manufacture of bricks that there is a great saving in time, labor and fuel. It is contended that high grade front brick, equal in appearance, weight, and quality to anything offered in face brick which can be made to be laid in the wall for about $3.50 per thousand. (Of course this is the contention of manufacturers). This is qualified, however, by a statement that this is under ordinary conditions where the plant to be located near the sand bank, and where the cost of labor and fuel are normal. It is further maintained that a standard sand lime brick

(*Concluded on page* 92).

ANCIENT BRICKS AND POTTERY

By HAROLD SLICER, M.S.A.

Some notes on the early manufacture and use of clay products. Biblical and Arabian Records. Color combinations and size of bricks employed in various countries.

THE WORDS OF SOLOMON applied to the making of many books of which, he said, there was no end, might with equal force be applied to bricks, and one has only to inspect the Patent Office records to be astonished at the ingenuity of man year by year in this respect.

Some Biblical Records.

A number of Biblical records of brickmaking are extant. About the year 2247 B.C. (Genesis xi. 3), we find the descendants of Noah travelling eastward and coming to a plain in the Land of Shinar, where they settled down and made bricks. These they used for stone, and slime for mortar. In connection with the building of the Tower of Babel, Josephus states that Nimrod, the grandson of Noah, incited the people to build a tower which was built of burnt brick cemented by bitumen that it would be impervious to water.

Then there is the reference to the refusal of Pharaoh to provide the Children of Israel with straw to make brick (Exodus v.), about the year 1491 B.C. There are, however, earlier records of brick construction in existence in Egypt, as for instance, the tomb of King Zer of the first dynasty, 5400 B.C., which contained brick partitions, while Egyptian pottery dates back to about 7000 B.C., and if the people of that day were capable of manufacturing pottery, red in color with a black top and ornamented with imitations of wicker or basket work, it is highly probable that they were also capable, at least, of making sun-dried bricks.

This would be the first kind of brick made and their manufacture probably arose from the use originally made of clay for filling in the interstices between the reeds or wattles of which their houses were constructed.

In Egypt, glazed tiles were extensively used for wall decoration before 5000 B.C., but glazed bricks were not used as the dry Egyptian climate rendered any preservative for the wall surface unnecessary, and the bricks were not burnt, but simply sun-dried.

The sizes of the bricks in prehistoric times and through the first and second dynasties were 9 to 10 inches long, half as wide, and about 3 inches thick, or about the same size as the modern brick, showing that the Egyptians had some considerable knowledge of the proper size of bricks for bonding to the best advantage. The bricks of the Ramesseum vaults are 14 inches by 7 inches by 2½ inches thick (Circa, 1330 B.C.).

Glazing was known to the Egyptians in the prehistoric age, but its use was then confined to beads and amulets.

Prehistoric Glazed Pottery.

The earliest known glazed pottery dates from the time of King Mena, and has his name inlaid in violet glaze on a green glazed body. Though glazed vases were used in the first and second dynasties they became rarer and their use was not revived until much later times. This art of glazing in two colors took a new form in the eighteenth dynasty, when large objects, 5 feet square, were covered with a single fusing of glaze, and inscriptions were executed in glaze inlaid in white stone walls. True glass was first manufactured in the time of Tahutmes III., in 1500 B.C., and was wrought pasty and not blown, the latter method belonging to the Roman age.

Arabian Records.

There are very few historical records in Mesopotamia before the time of Nabunasir, in 747 B.C. It is computed from the excavations which have been made in various mounds, such as the one at Susa, and at the north-eastern extremity of Parthia near Askabad, that pottery was made there at least 5000 B.C.

In Semitic times, brick making for building purposes was the main industry of the country, and the temples were erected on immense piles of bricks. For example, the brick Ziggierat or fine stepped pyramid at Nippur, was 190 feet by 128 feet and about 100 feet high.

The earliest baked bricks measured 8.7 inches by 5.6 inches by 2.2 inches, but were later enlarged to 12 inches by 7.8 inches by 1.9 inches and towards the close of the Sumerian age, square bricks were used. Sargon made baked bricks 18 inches square and 3½ inches thick (B.C. 772). From the time of Ur Engur (3200 B.C.) onwards, the baked bricks were about 12 inches square, and were used for facings and other important work, pavements and drains. The great majority of these bricks, however, were made of crude materials as in Egypt, being used for common work with baked bricks as facings, bitumen being often used as the cementing material.

There are evidences also of bitumen being used as a damp-proof lining to store rooms and tanks, the inside of the chamber being lined with this material; pottery also abounded as in all periods. Coming to the later Semitic age, wherein the Sumerians and Semitics were intermixed, we find large building operations going on.

Each town had its artificial hill of bricks built in stages to support the Temple of its god at the top, and every city had its enclosing walls of an immense thickness. Those of Babylon are said to have been 85 feet high and 340 feet thick, surrounded with a moat lined with burnt bricks laid in bitumen. The use of brick was necessary on account of the lack of stone, but the Assyrians became so used to its employment that, even where stone was plentiful, brick was used for palaces and temples. It is easily seen that the use of bricks to this enormous extent was a serious question. In building city walls, the excavations for the materials were made just outside the proposed area of the city, forming a boundary ditch, which, when filled with water, became the moat. Where houses and temples were concerned this caused a serious difficulty, the excavation becoming a stagnant pool or a perilous pit, a trap for the unwary.

Herodotus says, that in building the walls of Babylon, the clay dug out of the trenches, afterwards to form the moat, was made into bricks as soon as it was carried up, and burnt in kilns. When they had made a sufficient number, the bricks were cemented together with hot bitumen, and at every thirtieth row craters of reeds were inserted.

The bitumen was obtained from the River Is, a tributary of the Euphrates, and was brought to Babylon, lumps of bitumen being found in great abundance floating in the river.

In the alluvial plains of Assyria, both clay and bitumen were found, the bituminous cement bubbling out of the ground. It is collected by the Arabs at the present day.

The Babylonian bricks were more commonly burnt than those at Nineveh, for the latter people, like the Egyptians, mainly used sun-dried bricks.

The Babylonians used glazed bricks to a very large extent, and burnt bricks were usual, because, unlike the dry Egyptian climate, the Babylonians had changeable weather and a damp atmosphere to contend with. All the facings and main parts of their structures were composed of these indissoluble bricks, the interiors only being built of crude brickwork.

The use of glazed brickwork was, however, mainly developed in the ninth century B.C., and onwards, when it came to be used on the external face of the wall.

Previously used only for external decorative effect, its property of weather resistance or utility—for which reason it is nowadays so much employed externally—was now first realized.

The finest remaining example of this is the facade of colored glazed bricks in relief from Susa and of the Persian age, now in Paris, restored from the fragments, and representing the Royal Archers. Amongst other things baked jars of large size and coffins of the same materials were used, as also cylindrical drains large enough for a man to descend therein to perform repairs.

The walls of Nebuchadnezzar's palace were built of bricks of a pale yellow color and of excellent quality, laid in fine lime cement, and stamped with his name and titles.

The Warka Temple was built of bricks of various sizes and shapes, the cement being simply mud, and reeds were largely used in the construction. This temple, like the other Babylonian temples, was built of masses of brickwork in stages one upon the other, and its date is about 2500 B.C.

The Early Jerry Builder.

I might here mention the fate of the jerry builder at this early period. In 1901-2, De Morgan, in making excavations of the "Tell" or mound of the Acropolis at Susa, unearthed a huge block of black diorite, upon which is engraved the Laws of Hammurabi, depicting the social condition of Babylon, about 2200 B.C.

This code of laws was engraved upon the monolith in forty-nine long columns of writing, with introductory and concluding texts, forty-four columns of which are still preserved; the head of the stone being carved with sculptural representations of Hammurabi receiving the laws from the sun-god Shamash.

The laws dealt with the three classes into which the people of Babylon were divided, defining the penalties to be enforced when these were broken. These laws state that: slaves could acquire property and purchase their own freedom; marriage regulations thereto, rights of widows, the employment of agents for sale of goods, fees for water carriage of merchandise, the responsibility of unsound workmanship in boat building to rest upon the boat builder; repair of channels and dykes; agricultural regulations as between land owner and farmer; the protection of patients against carelessness or unskilfulness of doctors, and the protection of the public against carelessness on the part of builders.

In the latter two cases, if death resulted from bad workmanship, the law held that punishment in kind was merited.

In the case of the jerry builder, with whom even in these early days they seem to have had trouble, the penalties were most severe. If a builder erected a house which afterwards fell and killed the owner, the builder himself was put to death. If one or more slaves were killed, the builder had to restore to that owner slave for slave, and if the owner's son was killed by the house collapsing the builder's son was put to death. The builder had also to pay to the owner compensation for damage to his goods arising from such mishap, and he had further to rebuild the house or re-erect the parts that had fallen down.

To Babylonian influence and example, we can attribute the extension of the use of bricks to those surrounding countries where stone was to be had with little labor. Babylon had no stone, and therefore the buildings consisted wholly of brick. The perfection of this art was imitated at such places as Elam, Assyria, and even in Syria, where stone abounded. Further, the want of stone and timber led to the invention of the brick column, although this was seldom used.

At first timber was obtained from Amanus, and later from Lebanon, when the first source failed. Timber in the form of cedar trunks was obtained at great expense, but even these were not extensively used as columns. The Assyrians followed the Babylonians in this respect.

The ordinary brick was dried in the sun, whilst burnt bricks were used only for extra strength, and as a protecting coating to the sun-dried bricks. Abundance of asphalt was at hand for cementing the burnt bricks together, where they were used in foundations, for pavements, and as already stated, for strengthening the walls of unburnt bricks.

Near the end of the reign of Sargon, who died 705 B.C., the great palace bearing his name was built, restorations of which suggest a considerable use of the arch. It was built at Khorsabad, which lies to the north of Nineveh, upon an artificial eminence of brick and overlooking the city.

Some bricks enamelled with colors and showing figures representing the winged deities of the Assyrians have been found belonging to the arch of the palace gate. They were in four courses, the lower course—laid as stretchers—had a length of about three and a half times the depth, the second and third courses were laid radially to the centre, their narrow face being a quarter of the length of the brick, and the fourth course were laid like the first, i.e., as stretchers.

We also have from Sargon's Palace a favorite Assyrian decoration, glazed bricks depicting a lion, the whole being enclosed in a colored border. The panel is ten courses of bricks deep, the lion taking up nine courses, and in length from nose to tip of tail nearly five and a half bricks long, the bricks being about three and a half times as long as the depth, on face.

Layard found in the Tel of Arthur, the Lieutenant of Nimrod about 2200 B.C.), remains of walls and a pavement of baked bricks. He says these bricks had evidently been taken from some other building, for upon them were traces of colored figures and patterns, of the same character and styles as those on the sculptured walls of the palaces. Their painted faces were placed downwards, as if purposely to conceal them, and the designs upon them were in most instances injured or destroyed. The colors had faded, but were probably once as bright as the enamels of Khorsabad. The outlines are white on a pale blue or olive green ground. The only other color used is a dull yellow. A few of these fragments are now in the British Museum. Layard says that these fragments can be attributed to the King Tiglath Pilesar.

The absence of other building materials than brick in Babylon is accounted for by the fact that there were no alabaster or limestone quarries in the district, such as existed at Nineveh. The city was built in the midst of an alluvial country far removed from the hills. The mighty rivers deposited the rich clay which formed the plains of Mesopotamia, and of which the Babylonians made such good use. The favorite material used by the Babylonians for their detached figures, namely, black basalt, came from the Kurdish mountains.

With this river deposit—which they combined with chopped straw—they made bricks, the cementing material being natural products found close at hand, as, for instance, bitumen in the rivers. That the process of glazing was also known we are aware, for they covered bricks with a rich enamel for use both internally and externally to their edifices. Layard says that their cement was of a very fine quality, equal to the best of his day, and from several passages in the Bible we learn that the walls of their temples and palaces were coated with plaster and mortar. As in Assyria the bricks were either simply baked in the sun or were burnt in the kiln. Of the kiln-burnt bricks there was more than one shape and quality, some were square, others were oblong. The usual dimensions of the Babylonian bricks were 12 inches by 12 inches by 3½ inches.

In color those from the Birs Nimroud (Palace of Nimroud, constructed of bricks called by the Arabs, Al-ajur, meaning kiln-burnt bricks), are generally of a dark red color, whilst those from the Mujelibe are mostly of a light yellow.

In the Mujelibe the 'overturned' or Kasr, the bricks —as mentioned—are of yellow color firmly bound together by a fine lime cement, and of a quality not exceeded by any found in Babylonia. Upon nearly every brick is stamped the name and titles of Nebuchadnezzar, the ascribed face being nearly always placed downwards. Many of these bricks are covered with a fine glaze of enamel, the colors having preserved their brightness and resisted the efforts of time, ornaments and parts of figures can be traced upon them. The principal colors are a brilliant blue, a deep yellow, black and white.

At Susa, the ruins of the Palace of Artaxerxes, was examined in 1885 by Mr. E. Disulafoy, wherein he discovered many fragments of painted and glazed tiles. When these were carefully pieced together they showed representations of striding lions, the coloring being: blue turquoise ground, lions (white, yellow and green), and inscriptions in white characters. The tile design below the frieze was grey and rose colored.

It is known that Dareious, the son of Hystaspes, the second successor of Kyros, had Susa rebuilt and ornamented, but it has been found that this was destroyed by fire and built over by his son Artaxerxes, the work being not inferior to the Babylonian models from which they were taken.

Another frieze showed the Royal Archers of the Guard. The designs vary although the cut of the clothes is the same, clearly showing that the Archers belonged to different corps. Their hair is held by golden circles, they have gold bracelets on their wrists and jewels in their ears, whilst their spears have a silver ball at their lower ends.

The embattled stair parapet which led from the plain to the palace, having shallow and broad steps at so gentle a slope that they could have been mounted on horseback, was encased in enamelled brickwork, fragments of which were found.

Of color combinations, the following were most frequently used:

Ground: light blue, prevailing color, white with touches of green and pale yellow.

Ground: dark green, prevailing color, golden yellow with touches of blue and white.

Ground: black, prevailing color, golden yellow with touches of pale green and white.

The gateways were colored in a white and rose colored mosaic, above which stretched the grand lion procession.

The following table of the sizes of bricks is very instructive: compared with the present standard English brick which is 9 inches by 4.375 inches by 2.6875 inches, or a London brick, 8⅞ inches by 4¾ inches by 2⅝ inches.

	Length.	Breadth.	Thickness.
Egyptian (21st Dynasty, 100 B.C.)	18 in.	9 in.	5 in.
(Ramesseum Vaults, 1330 B.C.)	14 in.	7 in.	2½ in.
Syria (Earliest baked bricks)	8.7 in.	5.6 in	2.2 in.
Later baked bricks Sumerian Age)	12 in.	7.8 in.	1.9 in.
(Latter part of Sumerian Age. Large square bricks).			
Mesopotamia (King Ur-Enqur, 3200 B.C.) Baked bricks, 11 in. or 12 in. square.			
(King Sargon, 772 B.C.)	18 in	18 in	3½ in.
(City Walls Babylon 604-562 B.C.)	12 in.	12 in.	3 in.

Babylonian bricks vary 12 in. or 13 in. by 3 in. or 4 in. to the largest 19¾ in. square by 3½ in. thick.

Birs Nimroud, 13½ in. long, 4½ in. thick.

Roman large flat bricks, 1 in. to 11in. by 1 in. to 11 inch, by 1½ in. thick.

Saracen, 9th Century, 7½ in. by 2½ in. by 1¾ in. thick.

Of Roman bricks there were two kinds—Lateras—sun-dried; and Testae or tegulae—kiln-burnt.

These were made from clay carefully selected and exposed to the weather for two years before being made into bricks. The clay was thoroughly beaten and mixed with chopped straw, moulded into shape and finally put in the sun to dry. In some cases the length of time they were thus exposed before being used was very long, as for instance at Uttica where they were kept for five years.

The use of unburnt brick was discarded after the first century; unburnt bricks being mostly used in the reign of Augustus, but there are no examples left.

The sizes of Roman bricks varied considerably, one size called Lydium, being 18 inches by 12 inches was used in Rome. These were protected by Stucco to prevent weathering, the general practice of the Romans; but where the bricks are not thus protected the joints between the bricks are thinner and the bricks themselves are not so thick as in the covered work.

The size of the large square Roman bricks or tiles was in many cases the guiding factor in the thickness of their concrete walls, which were two Roman feet or a multiple thick (about 1 in. to 11½ in.), was the size of the tile, but burning caused shrinkage to about 1 ft. 11 in. square.

Tiles 12 in., 14 in., and 18 in. were also used, whilst smaller ones 8 in. or 9 in. square were employed for short pillars or to place over wooden entering into which concrete was poured.

Arch facings to concrete walls have nearly always the 6th or 7th brick one large through bonding tile (1 ft. 11 in. square), the others being half tiles broken for the purpose.

Bricks were also used of a triangular shape, equilateral triangles varying from 4 in. to 14 in. length of side, although 10 in. is perhaps the most common.

These were used to form the surface to concrete walls by laying them in horizontal courses with their apexes pointing into the wall, the courses being laid in a similar manner in elevation to courses of headers, thus breaking joint. These were used even in thin walls, 7 inches concrete walls being treated in this way. In the thicker walls the large tiles were used as bonding bricks passing right through the concrete wall, every 9th course or so being of these 2 feet tiles, the remainder of the wall face being of triangular bricks.

There were many kinds of clay used for these bricks; the colors, red, yellow, and sometimes brown, all of which are well burnt and sound.

Middleton gives the following table of the thicknesses of bricks and their mortar joints:—

	Date.	Average Thickness. Bricks.	Joints.
Rostra of Julius Cæsar.....	442 B.C.	1½"	¼"
Pantheon of Agrippa.....	27 B.C.	1½"	⅜" to ½"
Prætorian Camps of Tiberius	23 A.D.	1¼"×1¾"	¼" to ½"
Aqueduct of Nero (Aqua Claudia) c	62 A.D.	1"×1¼"	⅜" to ½"
Baths of Titus	80 A.D.	1½"	½"
Palace of Domitian c	90 A.D.	——	——
Temple of Venus and Rome.c	125 A.D.	1½"	1"
Palace of Severus c	200 A.D.	1"	¾"
Aurelians Walls of Rome....c	271 A.D.	1¼" to 1¾"	1¼" to 1½"

These are common kinds of brickwork only.

—From the Journal of the Society of Architects, London.

MACHINERY AND TRADE

MANUFACTURING PLANT FOR SALE.

PURSUANT TO the winding-up order made in the matter of The Parkin Elevator Company, Limited, and wtih the approbation of the Local Master of the High Court of Justice at Berlin, sealed tenders addressed to The London and Western Trusts Company, Limited, London, Ontario, and marked "Tender for Parkin Plant" will be received up till 4 p.m. of the 5th day of November, A.D., 1910, for the purchase of the real estate, buildings, plant, machinery, stock-in-trade and assets belonging to The Parkin Elevator Company, Limited, and situate in the Town of Hespeler, Ontario, of which the following is an inventory:—

(a) Real Estate and Buildings	$14,936.00
(b) Plant Equipment	6,633.00
(c) Foundry Equipment	3,165.00
(d) Machinery	9,580.00
(e) Patterns	8,183.00
(f) Patents, Prints and Tracings ..	1,200.00
(g) Office Furniture	695.00
(h) Office Supplies	850.00
(i) Tools	875.00
(j) Stock-in-trade	17,731.66
	$63,848.66

The real estate and plant will be sold subject to an existing mortgage thereon bearing interest at 4½ per cent. per annum and payable in equal annual instalments.

The buildings are new and modern in every respect and the plant is up-to-date. The Town of Hespeler is admirably situate for manufacturing purposes, having both C.P.R. and G.T.R. connections. Switches adjoin the property. Several very large manufacturing industries are located there among others, R. Forbes Woollen Mills, Canada Machinery Company, Limited, Jardine Tool Works, Hespeler Furniture Company and W. A. Kribs large lumber and planing mill plant.

The following is a description of the real estate:—Lots numbers five and six on the north side of Sheffield Street, in the George D. Forbes survey.

The property will be offered subject to a reserved bid and subject to conditions of sale.

Terms:—A marked cheque for One Thousand Dollars payable to the order of the Liquidator shall accompany each tender and the balance shall be payable in cash within thirty days from the date of acceptance of tender without interest.

The Local Master will attend at his Chambers, King Street, Berlin, on the 11th day of November, A.D., 1910, at four o'clock in the afternoon to consider the tenders.

For further particulars, conditions of sale, form of tender, inspection of inventory or other information, apply to The London & Western Trusts Company, Limited, Liquidator, London, Ontario, on the factory premises at Hespeler, or to Melvin A. Secord, Galt, Ontario, Solicitor for the Liquidator.

J. J. A. Weir,
Local Master at Berlin.

Dated 7th October, 1910.

Melvin A. Secord,
Galt, Ontario,
Solicitor for the Liquidator.

SEAMAN-KENT'S NEW FACTORY.

THE REAL MERITS of any commercial product can possibly best be measured by the growth of the concern which manufactures it. Quality and demand invariably go hand in hand, and where the one is recognized a constant increase in the other follows as a natural sequence. Although only a firm of eight years' existence, the Seaman-Kent Co. has, by progressive business methods and the production of a uniform high-grade hardwood flooring, won for itself a place in the foremost industrial ranks of Canada. During that time, the company has not only been under the necessity of enlarging its factory at Meaford, Ont., but within the past few months it has found it advisable to establish a large branch plant at Fort William in order to meet the demand and better serve the interests of its rapidly expanding western trade. The new plant occupies three acres of a twenty-acre tract, and is excellently situated, having 600 feet of dockage on the Mission River and direct transportation facilities to assure the prompt delivery of all orders. It comprises in all four buildings, viz., a 400 x 100 feet factory built of reinforced concrete and heavy timber construction, a power plant 65 x 100 feet, dry kilns 123 x 80 feet, and a two storey office building. The remaining portion of the site is utilized as storage yards for lumber. At the present time, the working staff of the new plants consist of eighty employees, but it is expected that the business will warrant the working of two hundred hands by the early part of next summer.

In addition to manufacturing "Beaver Brand" hardwood flooring, which has gained for the company a universal reputation throughout the Dominion, the new plant will manufacture quarter cut and plain cut oak flooring, together with birch and beech products and hardwood interior trim. During the winter, five million feet of lumber will be turned through the machines, but a much larger proportionate amount of material will be required when the plant is working to its full capacity.

The company in so thoroughly preparing to look after the needs of such an important and promising field as the West, take a most aggressive step, and the business sagacity and enterprise which it displays in this connection, is something upon which the members of the firm are to be highly complimented.

THORNE HOLD-FAST BAR SYSTEM.

STORE FRONT CONSTRUCTION is something which, owing to economic reasons, requires careful consideration. The unsightly wooden post, cornices, and bulky transom bars now in use have their decided drawback; and even the so-called all-glass construction is claimed to be unsatisfactory, principally because of the high rate of insurance and the fact that dust and water enter the show window through mitred or ground edges, and again because of the great delay in replacing broken glass. For these reasons the metal store front has come to be accepted as the most logical form of construction, and the growing popularity of this type attests to the fact that it has a number of individual advantages. What is regarded as one of the most perfect inventions of this character, is the Thorne Hold-Fast Patent Metal Bars. This system has been designed and made with the object of providing a method for holding the glass firmly together, so as to withstand wind pressure, and still cover

the smallest possible surface of the glass, thus assuring a store front with an attractive and finished appearance. This particular construction includes corner, transom, dividing, jam and drip sill bars; and its adoption brings an end to the rotting out of wooden members, besides furnishing a method of setting glass which is water tight, dust proof, and prevents steaming and frosting of show windows. In this country the Thorne Hold-Fast Metal Bar system gives promise of being widely adopted, and already the Hobbs Manufacturing Company, Ltd., who are the Canadian selling agents, have made a large number of installations in various parts of the Dominion. Architects, owners and contractors who may be interested, can secure a complete set of samples and catalogue, with carriage prepaid, by notifying the nearest office of the company—London, Toronto, Montreal or Winnipeg.

"FAMOUS WAGON" ON OVERLAND TRIP

THE ACCOMPANYING ILLUSTRATION shows the new auto power wagon recently made by the Grabowsky Power Wagon Co. for Berry Brothers, Ltd., the well known varnish manufacturers of Walkerville and Detroit. This wagon is a replica of the now famous toy wagon introduced by this firm many years ago, and which has brought joy to the hearts of youngsters in every quarter of the globe. The body of the auto truck is constructed of handsome quartered oak, well finished with Berry Brothers' varnish, and has a capacity of two tons. The lettering on the truck and its general characteristics are in exact imitation of its small prototype, and the truck

Load of Varnish en route to New York in Auto Truck Modelled After Berry Brothers' "Toy Wagon."

excites much comment, especially from the young folks, who instantly recognize the giant cousin of their toy wagon. An interesting item in connection with Berry Brothers' toy wagon is the shipping of a load of varnish overland packed in toy wagons from Berry Brothers' factory to their New York warehouse at 262 Pearl street. The vehicle transporting this unique load is one of the new Grabowsky auto trucks, and the trip with its heavy load will practically demonstrate the good qualities of this particular power wagon. Upon request Messrs. Berry Brothers, Limited, Detroit, Mich., will send a card printed in colors showing their auto truck illustrated above.

AUTOMATIC CEMENT BLOCK TAMPER.

CATALOGUE NO. 13, the latest advertising effort of the Ideal Concrete Machinery Company, of London, Ont., and South Bend, Indiana, is a very handsome book, 9 x 12 inches in size, which fully describes and illustrates the Ideal Automatic Power Tamper and the Ideal Scraper and Finisher Attachment. The illustrations show a numbers of working views of this equipment used in conjunction with the Ideal Block Machine, and the text is full of interesting and useful facts concerning the practical and economical manufacture of concrete building blocks. Many reasons are advanced in support of the contention that machine tamped blocks are best and to prove that by the use of this particular equipment the manufacturing cost of hollow concrete blocks is reduced at least one-half, while a much better, stronger, water proof and more saleable block is produced. Any block maker who wishes to improve the quality of his output and increase his profits, will do well to secure and read this interesting catalogue.

In this connection it might be mentioned that the company will have an elaborate exhibit at the Cement Show to be held, December 14th to 20th inclusive, at Madison Square Garden, New York City. The extensive preparations that are being made for this important event are attracting widespread attention, and a large number of visitors from all parts of the continent are expected to be in attendance. To those who come from Canada, the Ideal Concrete Machinery Company will give special attention, and any one who may be interested in concrete machinery and appliances, together with the recent development of "Tycrete" stone products will be well compensated by paying a visit to this firm's exhibit.

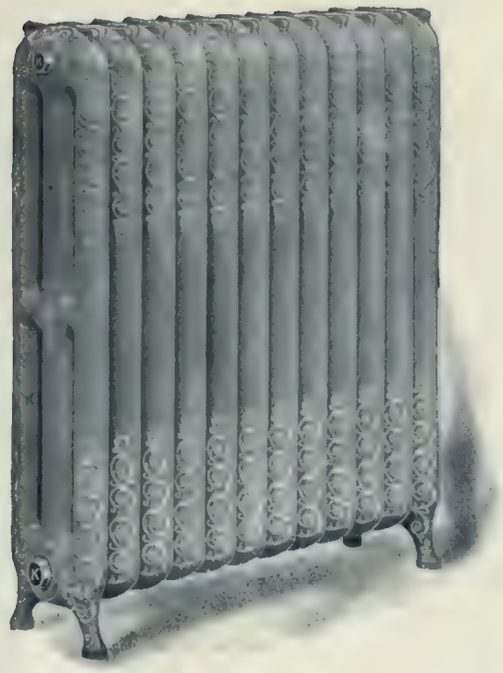
MONTREAL FIRM GETS BIG CONTRACT.

THE NEW TRANSPORTATION Building at the corner of St. James and St. Francois Xavier streets, Montreal, Messrs. Carrere & Hastings and Ross & Mac Farlane associate architects, will be constructed of Marmo semi-glazed terra cotta. This contract, which is said to be the largest terra cotta contract ever placed in Canada, has been awarded to Eadie-Douglas, Limited, 12 University street, Montreal.

SAND-LIME BRICK—Continued from Page 87

plant will produce about 20,000 bricks a day at an average cost of $3.50 per thousand bricks. If these are sold for common bricks, they will bring from $8 to $10 a thousand, while those that are suitable for face brick will bring from $10 to $20 a thousand, according to color, and of course, demand. If these figures have been carefully calculated, it would appear that in communities in Canada where good clay is not obtainable, and where sand pits are sure to be found, an impervious strong and everlasting material may be obtained through the admixture of lime with sand. In connection with this article we reproduce a number of illustrations of buildings erected of sand lime bricks in the Eastern as well as Western Canada which should prove interesting to architects as well as contractors.

ALTHOUGH THE IRISH ROUND TOWERS are simple in form and construction, they present puzzles to the observer not only as regards their origin and purpose, but also as to the use of some of the parts, says the *Architect and Contract Reporter*. G. H. Orpen points out in the Journal of the Royal Society of Antiquaries of Ireland that although innumerable visitors have seen the round tower at Glendalough, near Dublin, one feature appears to have been unnoticed by them as well as by archæologists. Almost directly, he says, under the elevated doorway, about 15 in. above the slightly projecting base, is a rectangular hole about 8 x 6 in., pierced right through the wall. The two side stones of this hole are "thorough stones," and it is roofed by two stones. The wall is about 4 ft. thick, and the doorway about 10 ft. above the ground. What was the purpose of this hole? It was certainly an original feature, and was not a loophole for a missile. Mr. Orpen suggests that it was a spy-hole, to enable the occupants of the tower to ascertain, before opening the door, who was demanding admittance. Such a squint was not uncommon in after centuries beside the doorway of castles and even of ordinary houses.



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