PAGES

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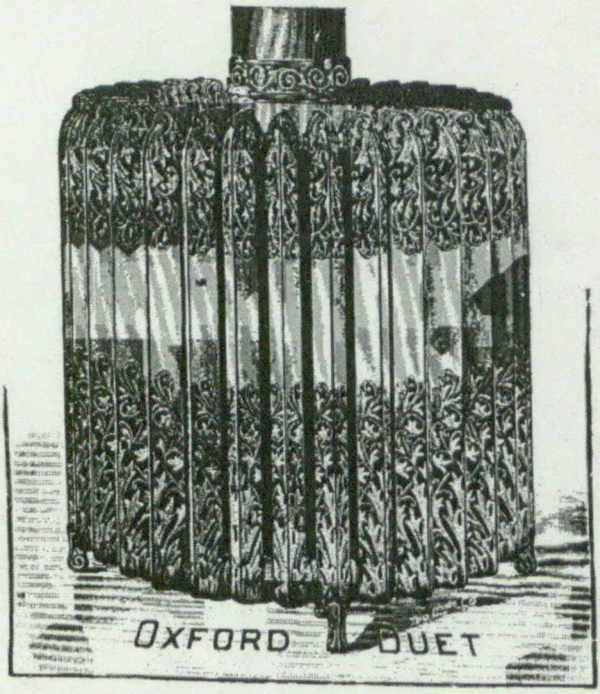

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The Canadian Architect and Builder

VOL. XV.—NO. 170. FEBRUARY, 1902.

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New Buildings, Queen's University, Kingston, Ont.—Messrs. Strickland & Symons, architects.

ILLUSTRATIONS IN TEXT.

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SPECIAL CONTRIBUTORS.

PROF. S. H. CAPPER, R.C.A., Department of Architecture, McGill University, Montreal.
MR. W. A. LANGTON, Architect, Toronto.
" EDMUND BURKE, " "
" S. H. TOWNSEND, " "
" FREDERICK G. TODD, Landscape Architect, Montreal.
" W. H. ELLIOTT, of Messrs. Elliott & Son Co., Toronto.
" J. C. B. HORWOOD, Architect, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal

Union League Club House, Chicago

The competition for the Union League Club House is an instance of a successful competition. It was a limited competition for which three well known firms were engaged, the losers to be paid $1000 each. As the proposed cost is $800,000, and the successful architect's fee $40,000, the expense fee, promised to unsuccessful competitors, is a bagatelle to the promoters, and secured them a good competition. If any building is of sufficient importance to make a competition worth while, it is worth while to spend some money in the competition. The conditions of competition are published in the Inland Architect for January, along with the plans. There is no mention of a professional advisor for deciding the merits of the plans. Decision lay with the building committee of the Club. But considering what a city Chicago is for eminent architects and that they are probably all members of the Club, the building committee was most likely an unusual building committee. The competing architects had also an opportunity of appearing before the committee, before the final decision was made, to give a detailed explanation of their plans. This was also a good feature. The result secured is a wonderfully fine plan by Mr. Burnham which seems upon examination to justify without doubt the choice of the committee.

Winter Transplanting of Trees.

An interesting piece of work is being done at St. Louis, in preparation for the World's Fair. The Fair, which is to be placed in Forest Park, where are many large trees, will require the removal of 700 trees ; but, both to preserve the trees and to have the advantage of their shade for the Fair, they are to be transplanted so as to line the broad avenues which will remain as a feature of the park when the Fair is over. As the trees are from 12 to 18 inches in diameter, this is an undertaking of more than unusual difficulty, and it will not do to waste time in failure. It is in the method employed to insure success that the interest lies for us. The trees are to be lifted during the winter, while they are dormant and when the ground is frozen so that the earth in which the roots are set may be carried away bodily. There is a suggestion here for another way than the heart-breaking destruction that is sometimes found necessary when a fine tree stands in the wrong place on a building lot. If the transplanting project of the St. Louis Fair is successful, we who have so much more frost—whose trees must be if anything more dormant, or at any rate dormant longer, and who can be sure of removing a greater depth of frozen earth—ought to be able to move a large tree within a lot, or bring to the lot from elsewhere trees that it would take more than twenty years to grow.

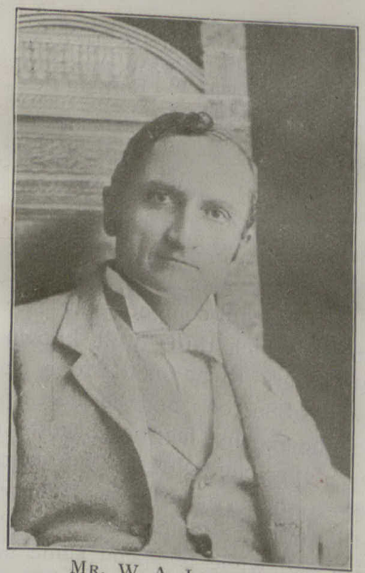
The Naming of Floor Plans

A proposition was made at one of the weekly lunches of the Toronto Chapter of the Ontario Association of Architects, recently, that members of the Association should agree to adopt a uniform nomenclature when entitling the floor plans of a building. It was further proposed that the system adopted should be the American system of abandoning the use of the term "ground floor," and calling the floor immediately above the street the first floor. There was some discussion on the reasonableness and simplicity of the American system, but it was

decided that usage alone should settle a question of this kind. It certainly seems as if usage that requires an edict in its favor cannot be called predominant yet. There is reasonableness in the English system too, and a certain descriptiveness which is strong in the mind of anyone who has been accustomed to its use. It is interesting to note that in Mr. Burnham's plan for the Union League Club House, Chicago, the entrance floor is called the ground floor. It is only two steps above the street and is devoted to such uses—the office, telegraph, telephone, coat rooms, lavatories, barber shop, etc.—that it seems proper to call it the ground floor and leave the term "first floor" free for the floor above, which is entirely given up to what the architect calls a "State Suite." Herein is a moral which may often be found in American affairs,—that the most American practice is not always the best American practice; that in the higher developments there is a tendency to return to an old world way of doing things. Let us, who inherit in many things the way of the old world, make quite sure, before we change, that a change is necessary.

Theatre Exits. The manager of a theatre in Montreal had to appear in court the other day, at the instance of the Inspector of Buildings, because on a single date his programme had not fulfilled the terms of the building by-law, that on every play bill shall be printed a plan of the theatre showing exits and stairways. This is an excellent regulation. It secures an exhibition of the floor plan in a place where it is sure to receive study, along with the jokes and advertisements on the programme which get such careful attention during the waits. To make the regulation fully effective there should be some provision in the by-law for a manner of representation that would invite attention, and a scale of drawing that would be understandable, so as to guard against mere compliance with the letter of the law by the insertion of a half-inch blot that would represent nothing to the inexpert, for whom it is most intended. An incidental advantage of the prominence thus given to exits would be to dispose theatre proprietors more to their consideration. If the law requires a nightly display of the exit qualities of a theatre, it is likely that some pains will be taken that this part of the plan may bear inspection. If, for instance, the plan of the Toronto Opera House were made prominent on the programme it would say in the plainest language that for the sake of space to let in the front of the theatre the lives of visitors to the theatre are nightly endangered, from the way in which the audience from the floor and the balcony are brought to a common exit. The streams from the balcony on each side enter at right angles the stream from the floor. It is true that a balustrade is interposed at the bottom of the balcony stairs to turn the flow from the balconies in the same direction as that from the floor, but it would not stand for a moment a panic rush; and its wreck, thrown down under foot, would insure catastrophe. If the balustrade could stand, the people from the floor might perhaps escape, but what would happen to the people rushing down from the balcony? At the bottom of the stairs from the balcony, which is about six feet wide, they would find a fence, about four feet from the bottom step, obliging them to turn at right angles through a door three feet four inches wide. This is a fine illustration of the feat known as coming out of the small end of the horn. If set down in plan it would look like the section of a sausage machine; and those persons who object to theatres, and hand tracts to people who come out of them, might make use of it to hand to them going in as a graphic representation of the tract entitled, Prepare to meet thy Doom.

Canadian Building Stone. It is surprising that the abundant building stone of this country is not more widely used. There is plenty of it and in great variety. A valuable paper read before the Ontario Association of Architects by Mr. Andrew Bell, and printed in the CANADIAN ARCHITECT AND BUILDER for March, 1896, ought to have had more effect than it appears to have had in introducing some Ontario stones to notice. Recently the Pan American Exposition has afforded an opportunity which has been to some extent taken advantage of by the Bureau of Mines in making the mineral exhibit of Ontario. The first consideration with the Bureau of Mines was an exhibition of ores but incidentally there was a very fine exhibition of building stone, and the descriptive catalogue of this exhibit should be in the possession of architects who are in the way of using stone. There were eight kinds of granite shown; half from the Lake



MR. W. A. LANGTON,
President, Ontario Association of Architects.

Superior neighborhood and half from that of Lake Ontario. The best specimens were exhibited by the Bureau of Mines itself, showing presumably that there is as yet no commercial development. There was a fine red from Brule Point, L. Superior, and a beautiful grey from Ignace on the C. P. R. in the Rainy River district, where the material is said to be found in immense quantities. The only private exhibitors were T. Sydney Kirby of Ottawa, who showed a sample of grey granite and W. C. Caldwell of Lanark, Ont, who had a dark red. There were twelve examples of Syenite, which looks like granite and often takes its place in ornamental work. The only commercial exhibit was perhaps the most beautiful, a polished block of dark, solid green from Gananoque quarries, sent by T. J. Stewart, Hamilton Granite Works, Hamilton. Sandstone is said in the catalogue to be of common occurrence throughout the eastern and southern parts of the Province. The Credit Valley and Medina sandstones of Messrs Carroll & Beharriell's and Carroll and Vick's quarries are well known. There was also a good red stone of a rather dark colour sent by the Chicago and Vert Island Stone Co., Port Arthur, Ont. Other exhibitors were F. N. Gibbs, Port Arthur; the Cataraqui Quarry Co. Kingston, Ont., and L. O. Armstrong, C. P. R. Offices, Montreal. F. N. Gibbs also sent some cut

blocks of white stone from Thunder Bay. Limestone is said to be abundant in the southern peninsula and the eastern counties. There are quarries at Queenston, Merritton, Beamsville, Wolfe Island, Guelph, Ottawa, Belleville, Huron county and other places. Marble, if one may judge by the number of exhibits, is even more abundant. There were twenty-eight exhibits of marble but most were by the Bureau of Mines. There were all colours—white, black, grey, green and shell pink. There was one piece of statuary marble sculptured ; but in most specimens there was some marking. The specimens were said to have been all taken trom the surface or near the surface and a more uniform and better quality is promised for deeper development. When will this development take place ? The principal beds of marble in Hastings, Leeds, Renfrew and Frontenac counties are not far away from the principal building centres on Lake Ontario ; and the Thunder Bay district, which supplied the remainder for this exhibition, is easily accessible by water. It seems safe to predict a market, if wealth continues to grow as it has recently. The use of good material in building will easily become a commercial necessity, and nothing will have a more important influence in developing good architecture.

THE SEWAGE DISPOSAL OF SUBURBAN HOUSES AND PUBLIC INSTITUTIONS.

By Dr. P. H. Bryce.

It gives me pleasure in complying with your invitation to prepare a paper on some sanitary problem connected with your work, to present a paper on the title indicated, as being of extreme importance, connected as it is, directly with the problem of "Pure Air in Houses," which I discussed before you last year.

As we are well aware, there is a more or less marked difference in the air of country places and of towns and cities, indicated by a small excess of carbonic acid (Co_2) in the latter and the absence of ozone, or oxygen in a nascent condition, due to the excessive presence in towns and cities of organic matters on the surface, in houses, lanes, manure heaps, drains and so on, constantly undergoing decay or reduction to simple compounds by the action of various living organisms, especially bacteria, which utilize oxygen in their biological processes. Sometimes they find this oxygen in the organic compound itself, especially in the azotic or nitrogenous compounds but also in the carbon compounds of a starchy character ; in other and under ordinary circumstances, they utilize the oxygen free in the air. As will be supposed, there are different species or classes of this minute form of largely vegetable life, some of which do not thrive in free oxygen and air and some forms what live within the bodies of animals and external to them in free air as well.

To the first class Pasteur long ago gave the name an-aerobes or microbes living apart from air, and the second he called aerobes or those which require free oxygen for their development.

The two classes have properties differing more or less from one other, one especially peculiar to an-aerobes being the liquefying of organic compounds by growing into these and really dissociating their solids, as, for instance, gelatine, forming, of course, by-products during the process both of gaseous and liquid character. The constitution of these chemical compounds varies; that of the gases being principally CO_2, H_2O, H_2S, and many highly organized volatile compounds, such as those given off by the breath of man and animals, those from the many foods and fruits, which develop during their mellowing and decay, and especially the extremely unpleasant emanations given off from putrifying meat, fish and the solid wastes, which pass off to the sewers as excreta, and kitchen and house wastes of every sort. It is a fortunate fact that the products of aerobic decomposition are less disagreeable and injurious than those from an-aerobic decay, since such are those which are most constantly exposed to air from surface decomposition of outside matter everywhere. With these preliminary remarks it will be easy to see something of the nature of the problem to be dealt with in disposing, safely and conveniently, the house wastes which go by the name of sewage, or those matters which are conveyed by water into underground pipes or sewers.

It is the experience of every local health officer, and a source of constant difficulty to the Provincial Board, that in those towns where a sewerage system does not exist and in many houses in the suburbs of towns, even where such systems are, in rural districts and in the large temporary summer resorts, hotels and cottages, the problem of what to do with excretal matters, both animal and vegetable, has been everywhere, if not difficult, yet the most constant one which the local boards have to deal with in the matter of nuisances, and which in many cases proves the most constant danger to the household immediately interested, and where streams or lakes are polluted, not unfrequently has become the occasion of some sudden and serious outbreak of typhoid fever or diarrhoeal disease. The fact that 253 examinations of water were made during the past year at the Provincial Laboratory, most of them due to outbreaks of typhoid, shows that the causal relationship between polluted water and typhoid and diarrhoea is well recognized, and general observation, as well as laboratory work is quite agreed as to the direct connection between such pollution and some accumulation of decomposits of animal or vegetable matter. Privy vaults, deep pits, or cess pools, constant contamination of the area around the house pump with kitchen washings and slops of every kind, hotel stables and barnyards, soakage from slaughter houses, the wastes from cheese factories and creameries and the heaps of refuse from canning factories, and indeed every kind of manufactory in which organic products are used, may become direct means of pollution to wells and sources of public water, and many are moreover the cause of serious injury to health from their creating effluvium nuisances.

Now, perhaps, gentlemen, as it may be only occasionally that as architects you are called upon to deal with more than one of these sources of ill-health, viz., this one of the disposal of house sewage, including excreta, kitchen and chamber wastes, in places where there are no public sewers, it is most essential that some general principles should be laid down and acted upon with a view to the safe, economical and aesthetic method of disposing of such organic wastes.

Probably every one here accepts the theory that in the economy of nature nothing can be lost, or that matter is indestructible, and perhaps all will, in a general way, agree that whatever is yielded by the soil, as, for instance, the potash, phosphates, ammonia and so on, which are contained in the grains and other fruits of the earth, should be given back to Mother Earth for her goodness to us. So in spite of man's foolish waste and ignorance, they ultimately are returned to her, but at an enormous cost of time and energy. Carried to the sea, sewage will form deposits ultimately forming new land, or in solution will become the food of microscopic vegetable forms of many species of the deeper ocean planton and of the larger plants of the ocean littoral, which in turn becomes the food of the microscopic infusoria and finally the food of fishes, molluscs and other sea animals, and so is brought back finally as food to man. Were we intelligent and careful we would see to it that not a single pound of organic waste matter is allowed to decompose out of its place, in other words, to so act as to return to the earth every ounce of C, H, O, andN, which taken from the humus or upper layer of soil is year by year being used up by cultivation and must be returned there, if fertility of the soil is to be maintained.

As however, it is found in practice in most parts of this country that there is a lack of appreciation of the manureal value of such materials, and that the adoption of what is known as the dry-earth system in houses and institutions has not proved free from objections, owing to neglect to supervise it carefully, owing to its cumbersomeness, and as moreover it does not do away with either the need for water pipes and a supply of water being laid on in the better houses, or of the need for disposing of the kitchen and chamber wastes, in any case it is evident that the growing appreciation of modern conveniences in houses is demanding some systematic method for dealing with all house wastes, whether for kitchen or closet by the water-carriage system.

I propose, therefore, to indicate how in practice such a system may be established, at once efficient and economical. In the annual report of the Provincial Board of Health for 1898 a chapter is devoted to "The Biological Principles Involved in the Purification of Sewage," which to those interested will be found to contain a very full discussion of the scientific principles of this whole matter. There will be found a table giving the average analysis of town sewage. While probably less concentrated than the sewage of a single house, since it would contain water from factories, from sub-soil drainage and so on, yet it will very well serve as an illustration of the contents of sewage. It is as follows :

1. Solid matters in suspension—
   - (a) Organic.....20 grains per gallon.
   - (b) Mineral.....10 " "
   - Total.....30 " "
2. Solid matter in solution—
   - (a) Organic.....20 grains per gallon.
   - (b) Mineral.....50 " "
   - Total.....70 " "

Or expressed in parts to 1,000,000 such a sewage would yield :

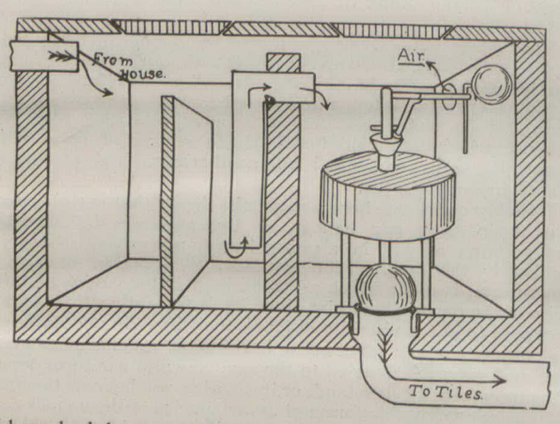
Total Solids.	Solids in Suspension.	Chloridne.	Free Ammonia.	Albumenoid Ammonia.
1428.0 parts	428.0 parts	120.0	50.0 parts	10.0 parts

Assuming what is in experience ample, 20 gallons per head per diem of sewage, it will appear that for an ordinary dwelling with 10 inmates, with a water supply laid on, there will have to be disposed of daily 200 gallons. By reference to the analysis it is clear that half the organic matter, or that in suspension, could easily be removed by any crude filtering method, as by a screen, a grit chamber, or even by passage over coke or some readily destroyed material, should it become clogged.

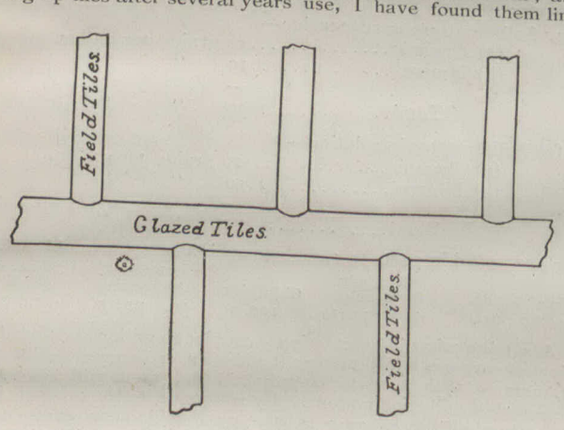
Assuming, however, that all the materials are carried to a common recepacle or tank at the end of the house sewer, there will be deposited daily 8,000 grains of organic matter, whether suspended or in solutions, and 12,000 grains of mineral matter or altogether some 3 lb., of which two-fifths is organic, or is, capable of undergoing decomposition, most of which will gradually be carried away when dissolved in the 200 gallons of water daily passing into the receptacle, the balance of carbon gradually being deposited in the tank. Of the mineral matter 50 parts are

*Paper read at the annual meeting of the Ontario Association of Architects, Toronto, January, 1902

in solution as potash, lime and other salts, which will likewise be carried away in the water. It thus appears that some 100 grains of insoluble mineral matter will deposit in the tank daily with small amounts of carbon, or in 365 days for such a household not more than 10 lbs. of mineral matters will have accumulated. That such is true may readily be proved by anyone caring to make the experiment, as I have done, that such a tank at the end of a year has not had a total deposit of solid matter, greater than can be held by a half-bushel measure. If the balance then, after decomposition, is capable of being carried along with the 200 gallons of water daily, it is clear that nearly all of it is capable, like any other soluble material, of soaking away into the soil with the water, if the conditions are favorable.



I have had drawn up for your inspection the diagram of a tank, which is intended to deal with such materials in a way to give the organic matter an opportunity to decompose, the water carrying the soluble materials, being gradually removed from the decomposing tank, which we may call the septic tank—the word septic meaning putrid or decomposing—to a second tank, whence it may be discharged by a simple apparatus, at such intervals as may be found practical to produce the best results. The question then arises: In what manner can we dispose of this organic matter in solution, conveniently and in such a way as will not create a surface nuisance, or a pollution of ground water? Let us assume that by a series of sub-surface tiles, laid in a proper manner, we can distribute the 200 gallons over an equal number of feet of surface. It is plain that each square foot would receive 1 gallon of water daily. As soils vary in their capacity for water, from a coarse sand which will hold in its interstices not more than 25 per cent. of its volume of water, to a tenacious clay which holds 75 per cent. of its own volume of water, it is apparent that if one gallon of water were poured on the surface of a cubic foot of dry soil, there would not be any water leaking away from the bottom of even a coarse sand, since a cubic foot of water equals 6.25 gallons; so that it requires 1½ gallons to be poured on such foot of dry sand before it begins to drain away from the bottom. A dry clay would hold three times as much before it began to leak. In practice it will be seen that two four-inch tiles, laid side by side, would distribute such water fairly well over the surface of a cubic foot of earth; and also that the water contained in them soaking out of the open joints and pores of the tiles would rapidly dispose of the small amount of water received by each tile daily. In practice it is found that in any ordinary porous sandy soil or sandy loam, tiles filled twice daily will rapidly dispose of the charge of soluble sewage poured into them; and, lifting up tiles after several years' use, I have found them lined



only with a fine stain of black carbon, the volume of the tile not being materially lessened. I have further found that even heavy clay soils with an occasional underdrain have been quite adequate to dispose of the amount of sewage poured into them from an institution of 125 inmates.

It may be proper now to briefly describe the method of construction of such a system of tanks and sub-surface tiles. As in any system of house sewage, it is convenient to arrange all the fixtures so as to discharge into one soil pipe. These being brought out beneath the ground-floor through the foundation, or, if the house be on a hill-side, it may occasionally be possible to bring them out under the cellar floor so that the wash-tubs there may be discharged into them, if this unsanitary plan for the laundry be adopted, the soil-pipe will be led to the top of a tank made of brick and cement in a manner similar to that shown in the diagram. If most convenient, this tank may be built directly against the house to save iron pipe and to prevent its appearance on the lawn, since, as will be seen in a moment, it is necessary that the discharge pipe of the tank on level ground be not more than a foot beneath the surface. The capacity of this tank in the case we are discussing will be such as to hold in each compartment 100 gallons, to be discharged twice daily. It will be seen therefore, that a compartment 2 x 3 x 3 feet will nicely hold 100 gallons, or a tank of interior measurement 4 feet long by 3 wide and and 3 deep is adequate for two compartments each holding 100 gallons.

The arrangement of the interior of the tank is shown in the diagram. As in all sewage tanks, the plan is adopted of having several divisions, the sewage becoming less dense as it passes from one to the other, thereby aiding to make that discharged from the valve chamber as thoroughly liquid as possible.

It will be seen that from compartment No. 1 to No. 2 the fluids are drawn off by an overflow pipe from about midway beneath the surface since at the bottom will be found sediment, while the whole surface is covered with the decomposing matter, which appears to the eye a solid mass, but is really the organic material kept floating by the contained gases of decomposition. The liquids, which pass over of course contain a large amount of organic matter in solution, being composed especially of ammonia (NH^3) and carbonic acid (CO_2) combined as ammonium carbonate with the sulphur compounds as ammonium sulphide. These are held in the second compartment until 100 gallons have accumulated, at which moment the flush valve operates automatically and discharges in a minute or two the contents of the tank into the sub-surface tiles. It is apparent that the size of the tanks may be made such as to deal with 1,000 gallons quite as readily as with a 100.

The sewage thus discharged must, it is evident, be carried to tiles so laid that each tile will get its own share of sewage and no more. It is apparent that with a rapid discharge, the tiles laid on an exact level will each receive this amount, if together they hold exactly 100 gallons, provided the air which is in them be displaced. It is found in practice that in a loose soil the air from tiles laid near the surface readily gives place to the water, if discharged under the head in the tank. Where the soil is level, as of a lawn or garden, it is apparent that the matter is a simple one. If on a slope it is equally apparent that some careful detail work will be necessary in order that the tiles may, at the same time, be kept at the same depth beneath the surface and also receive each its own share of sewage. To complete the description of the tank it is apparent that as some gases, in excess of what are in solution, may be given off into the space over the sewage, it will be necessary to prevent them from accumulating and forcing themselves through the cover of the tank. This is obtained by making the cover of rough boards, and if thought proper, they may again be covered with earth and sod. The gases, if any pass outward, will be absorbed by the soil. In addition to this however, it is necessary to provide for the ventilation of the tank. This is done by a large goose-neck leading from the distal end of the tank, which admits cold fresh air and thus will displace the warm gases of decomposition which are carried up through the soil-pipe to be discharged above the roof as in ordinary house-plumbing in cities where the separate sewerage system is in operation. It may be asked, what ultimately becomes of the organic matter carried away in solution. In reply I would say that through the action of the microbes of the soil the ammonia salts are rapidly nitrified—that is, are changed into nitrates or nitric acid, which at once combines with the lime and potash salts of the soil and thus has become a neutral salt in a condition to act as plant food for the grass or vegetables growing above it.

The following table by W. D. Scott Moncreiff, from the Ashstead experiments, 1895, illustrates the change:—

Effluent from cultivation tank.

Chlorine	Free. NH^3	N. consumed	Oxygen	Nitric Nitrogen	Total Oxidized N	Total N of all kinds
9.0	12.5	10.3	9.843	0.12	0.12	12.46

From final filter tray after complete nitrification.

7.5	0.25	0.2	0.58	9.0	9.0	0.6

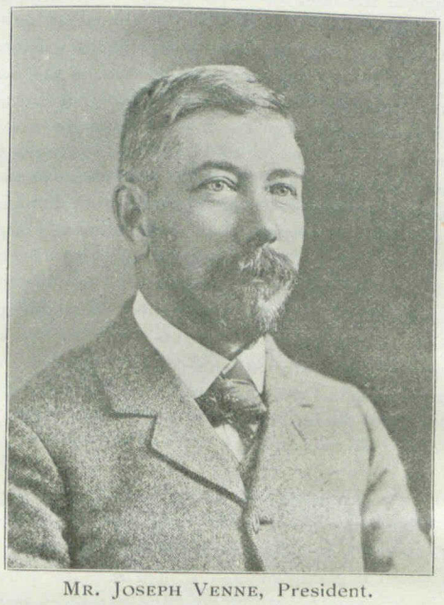
As the tank arrangement from which these experiments are taken, was essentially a tank of this kind, except that, instead of the microbes of the earth to do the work Moncreiff had arranged a series of artificial filters or pieces of coke over which the sewage from the septic tank flowed, by which means the liquids for analysis could be obtained, there is nothing different in principle to the system we are discussing.

Little more need be said, I think,, to make it clear that in these results of the study of biological processes, which convert organic matter back to its original constituents, we have not only a practical lesson of how to apply science to our every day needs and convenience, but we may also see how economical is Nature and how wholly wise in her operations if she does not have man attempting in his ignorance to violate some of her primary laws. To me it daily seems more true, the more that I try to comprehend the meaning of the processes of Nature in this fine old world of ours.

"That nothing walks with aimless feet,
That not one life shall be destroyed,
Or cast as rubbish to the void
When God hath made the pile complete."

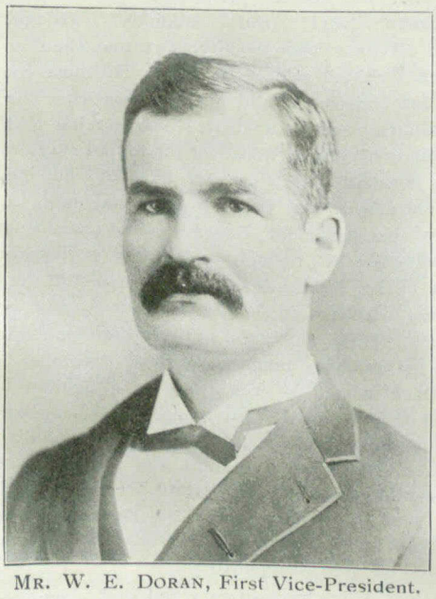
PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

The eleventh annual meeting of the above Association was held in the rooms of the Quebec Section, City Hall, Quebec, on January 23rd, the President, Mr. G. E. Tanguay, in the chair. Those present were



MR. JOSEPH VENNE, President.

Messrs. G. E. Tanguay, J. E. Larochelle,, Thomas Raymond, E. B. Stavely, J. P. Ouellet. F. X. Berlinguet, Charles Baillairge, W. D. Baillairge, J. P. E. Dussault, R. P. Lemay, H. Staveley, and J. H. Lebon, from Quebec ; Jos. Venne, G. A. Monette, J. S. Archibald, Jos. Perrault, D. Brown, J. Z. Resther, Jos. Sayer, Eric Mann, A. Raza, Prof. S.



MR. W. E. DORAN, First Vice-President.

H. Capper, R. Lacroix, Chas. Bernier, M. Perrault, J. E. Huot, A. T. Taylor, Alfred Venne, A. A. Cox, L. A. Amos and Simon Lesage, from Montreal.

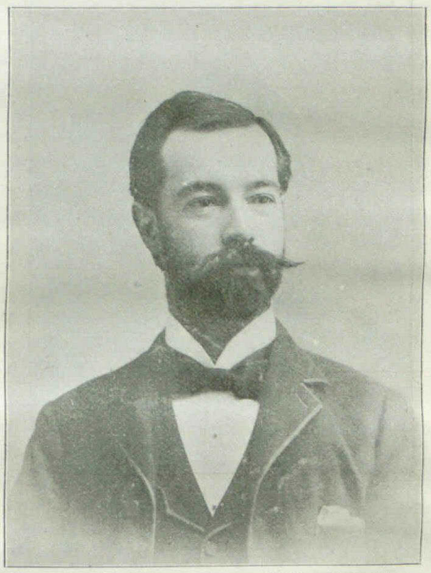
The Treasurer's report showed that from the 31st of August, 1900, to 31st December, 1901, the receipts were $2,581.54, which, together with the balance on hand at 30th August of $514.40, totalled the sum of $3,095.94. The expenses were $1,515.54, thus leaving a balance on hand of $1,580.40.

The report which was submitted is a lengthy one and deals with the various subjects of importance to architects in a lucid and effective manner.

In regard to the tariff, the Council accepted an offer by Mr. M. Perrault, M.P.P., to bring the schedule of charges, as accepted by the Association, before the Lieutenant-Governor-in-Council.

Mr. Perrault did not succeed in obtaining the Lieutenant-Governor's assent to this schedule; and, on behalf of the Association, accepted important modifications thereof. As thus modified, the schedule of charges was approved and signed on March 6th, 1901.

During the year legal proceedings were taken against

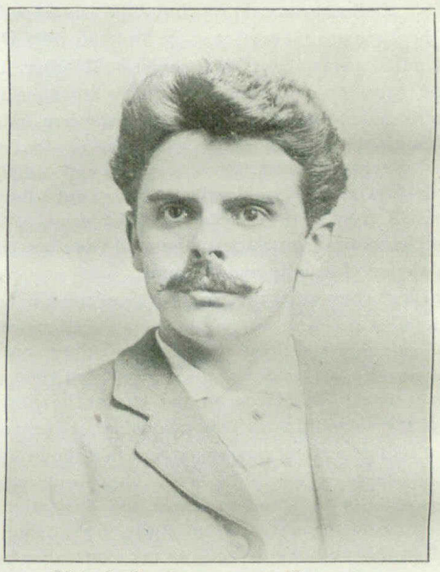


MR. R. P. LEMAY, Second Vice-President.

eleven individuals, who were practising as architects without being members of the Association. In one case these proceedings are still pending ; in every other case a satisfactory settlement was ultimately obtained.

This year the Quebec architects had the opportunity of employing for the benefit of the Association their influence with the members of the Quebec Government, in order to have the tariff made law ; and working in conjunction with Mr. M. Perrault, architect and M. P. P., they succeeded.

The Quebec section has this year started the organi-



MR. J. S. ARCHIBALD, Treasurer.

zation of a library of architectural books. The first works bought were those recommended to students for matriculation; said books are in the hands of the secretary at the disposition of the Quebec students.

It has been decided to buy each year a certain number of works on architecture, which will be the property of the Quebec section.

The following officers were elected :

Presiden.—Mr. Joseph Venne, Montreal.

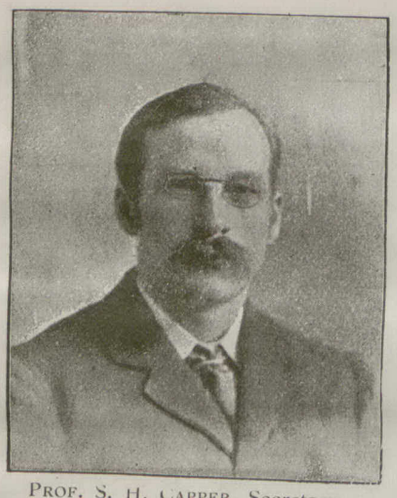
First Vice-President—W. E. Doran, Montreal.

Second Vice-President—R. P. Lemay, Quebec.

Secretary—Prof. S. H. Capper, Montreal.

Treasurer—Mr. J. S. Archibald, Montreal.

Councillors—Mr. C. E. Tanguay, Quebec ; A. Raza,



PROF. S. H. CAPPER, Secretary.

A. C. Hutchison, A. A. Cox, D. R. Brown, S. Lesage, Montreal.

DESIGN AS AN ELEMENT OF PRACTICE.*

BY PROFESSOR LAIRD, University of Pennsylvania, Philadelphia, Pa.

Good old Sir John Evelyn, in presenting to the world his "Parallel of the Antient Architecture with the Modern" delivers himself of these thoughts in addressing the reader :

"Before I do altogether resign this *Book* to thy Judgment, I advertise thee, that 'twas not my design in compiling it to teach any man." ***"I expect that men should presently say of me.***That I teach nothing particular and extraordinary here ; that the *Books* from whence I have gather'd all that I say being common and much ampler than mine, there was no need to have scummed them thus superficially over; That it had been better to have search'd and produc'd something which the World had not yet seen.***But we shall not appeal to such Arbiters as these.***"Poor Men that they are, to believe that in fantastically Designing some one kind of particular *Cornice* or like Member, they are presently the *Inventors* of a new order.***As for those others to whom Nature has been more propitious, who are indu'd with a clearer Imagination, they very well perceive that the true and essential Beauty of *Architecture* consists not simply in the minute separation of every Member *apart*; but does rather principally result from the *Symmetry* and *Oeconomy* of the *whole* which is the Union and Concourse of them all together, producing as it were a visible Harmony and Content."

Evelyn's ardent contention that the works of the ancients were worthy of the most reverent study and even literal reproduction, and his lofty contempt for those who ignored them and sought unrestrained novelty, showed that the conflict between progress and precedent was in full force on the eve of the great fire of London. And the splendid work that followed that event offers full evidence, not that precedent triumphed, but that the architectural impulse of a people grows with noble vigor into a splendid fruition when planted in a soil of unrest and aspiration, of vital interest in new problems and reverent study of old achievements.

Let me adopt this author's defence as my own. Far be it from my intention to teach or to offer from the book of experience any new thing, for its precepts have been well scanned and its lessons well learned by my audience. Yet even Evelyn's imagined critics would have conceded that the best known truths take a new force when reaffirmed, and I shall therefore venture to ask your attention to some of the more evident principles of our professional work in the hope that they may be acceptably reiterated and profitably discussed.

That Truth is the basis of all that is good in Art is but another way of affirming the breadth of principle upon which our own art is based, for the best architecture has always been an exponent of truth. And the best architecture has always expressed as its highest purpose the aim to build nobly: with the extreme of pleasure to the eye and the mind, with the utmost of stability and with the fullest adaptation of means to the end. All great buildings realize these conditions and are noble because of this fact. The same impulse and motive inspired them, whether the mind that produced them was that of priest or painter, sculptor or scholar, the impulse to build what should be more than mere building, to enrich and decorate in a way that should mean more than ornament alone, to surpass the simple utilitarian demands of the undertaking ; in other words to fuse these elements into a thing greater than their sum, nobler than their aggregate ; the highest aspiration of man's creative power—a perfect building !

In no two periods of Architectural history have the conditions been identical under which architects have worked and until modern times, indeed, the authors of buildings have not been known as architects in the sense in which we use that term. But in all ages and under whatever conditions, great architecture has been in evidence, and it should and can be no less so in this age.

Our situation as architects is unlike any that has preceded our time. We are devoted intensely and exclusively to Architecture as an occupation. We are consciously a class, standing before the world a group of men with a definite purpose and judged by high standards which we have ourselves proclaimed. The commercial and industrial development which has distinguished this age has brought into full flower the organizing of human effort and, with it, the systematizing and subdividing of human labor. Distinctions are sharply drawn between its various lines, and specialization has been forced into all fields. The architect has thus evolved as a necessary factor in modern life, emerging from those ranks which in the past were variously made up either of the scholar who indulged in Architecture as an elegant pastime, the painter or sculptor who regarded it as an allied province; the engineer, the art craftsman and the studious artizan. Any of these and all have been architects at one time or another but today the architect is none of them. He must combine the offices of artist, constructor and man of business. The range of his responsibilities covers æsthetics, engineering and finance. His obligation to his client, whatever the actual magnitude of his commission, is usually one of greater pecuniary importance than that client entrusts to any other professional man. Upon the soundness of his judgment depends the security of life of multitudes who use his buildings. Of him is required artistic performance of the highest order in the greatest of the fine arts, whose product is always on view, and universal and continuous in its influence. He is successful in his professional career only as he meets the exacting demands of these dissimilar functions, either of which might be regarded as a distinct vocation. It might well be questioned if any human being—much less every member of an entire class—could meet such demands by finding in his person the required mental and temperamental qualities. Unquestionably No! But that architects do successfully meet them is proven in numberless cases, where the requisite mind and temperament are associated in congenial companionship and effective co-operation.

The conditions which have so enlarged and complicated the practice of architecture have also rendered success possible. The commonplace that "we are the heirs of all the ages" is nowhere so true as in our own profession. The lessons and resources of history lie at our fingers' ends and all Europe at our doors. Scientific spirit and industrial development have unearthed and classified one and brought the other. Highly organized systems of technical education are available for our preparation for life work, and to aid in that work the services of specialists of every description abound on every hand. The age is that of the card index with everything in stock, duly labeled, ready at hand for immediate and effective use.

But in all this marvel of development and organization, of the multiplication of resources and the simplifying of labor, one everlasting truth shines with undimmed brilliance. There must be a

* Paper read at the annual meeting of the Ontario Association of Architects, Toronto, January, 1902.

master mind, a single dominating influence, a subordination of all functions to a dominating purpose. Creative work of any kind demands this; particularly is it true in the Fine Arts and notably so in Architecture. And in this the controlling influence must be that of Art,—not science or business enterprise, for if it be either of these the result is barren engineering or mere building for the sake of money-getting.

We must understand Art, however, as meaning vastly more than appears at first view. Broadly speaking it should mean the entire creative side of our work as opposed to the executive. In this sense it comprises all those processes of study or preparation through which the final result is reached and which are supplemented by the actual execution of the work. I do not mean that every part of this study can be regarded as artistic in itself, but that in the performance of every part the controlling motive should always be a desire to contribute toward the perfection of the whole as a work of architecture. We are too prone to think that parts of our work can be divorced and carried on independently—that some parts are non-architectural and hence can be treated in a spirit entirely foreign to that of architecture. No greater mistake could be made, for nothing so much operates against the improvement of the art of building as the notion that architecture is a detachable part of it.

Design proper, in its broadest sense, is the assembling of materials in such a manner as produce structure at once stable, appropriate and beautiful. This means that a well-designed building is one in which the plan is well composed, the resultant building well proportioned and appropriately ornamented, the structural parts well adjusted to the work each is to do and the completed building properly adapted to its uses. To effect a consistent result it is necessary that all phases of the work of design be carried forward in a sympathetic relation. The scope and limitations of each should be recognized in manipulating the others, that none transgress and prevent proper exercise to each in its own field. Let us give some detailed consideration to the several features of Design in this broader sense. Inasmuch as the artist must give initiative to the work, it is proper to look at the question first from the viewpoint of composition or design in its more academic sense. Here we must attack first the broadest aspect of the problem, leaving minor considerations to subsequent study. The general nature of the problem must be studied—the essential purpose of the proposed building, the demands of its occupants and the limitations of its site, cost and materials of construction. Once these salient points are clearly understood, the study of plan must begin by a grouping and arrangement of its greater divisions, a search for the *parti*, for that general disposition which will permit the most direct and simple, economical and convenient grouping of the parts. This is often, perhaps always, the most clearly obvious arrangement when once discovered, yet, like other useful inventions, often the most difficult of discovery.

The plan now has attained its general character and this should be regarded as fixed. The major parts of the building are found to be properly proportioned to their uses and have the most convenient relation to each other. The thoroughfare system is logical and ample. Constructional economy has been rendered possible by directness of vertical supports, the delimiting of span, the simplifying of main lines for the mechanical systems. The artistic character of the building, in the praportions of its masses, is assured of a fair prospect of certainty by the mass proportions of the plan. And the further development of the scheme in respect of its practical requirements is assured of success for if the demands of the problem are clearly stated and realized in a broad, simple direct manner in the *parti*, the detailed requirements will fall naturally into place. The plan at this stage is however quite elastic and capable of much minor modification.

During the progress of this study the elevations have been kept generally in mind and the building has assumed a more or less clearly defined general character. These may now become the object of as direct study as has been the plan. The elevations follow close upon the plan in order that they may be governed by and give expression to its fundamental character. But this must be done judiciously with full regard to proportion and scale, relation of parts to each other and the whole, and the effect of line, color and light and shade. For this purpose there must be a certain independence of action ; a freedom from the restraints of a plan whose lines have been too far fixed ; too fully crystallized. This is possible if the treatment of the exterior is preceded only by the determination of the *general* character of the plan. From that point both may well be carried on together, each being adjusted to the other while either is developed to its own natural and reasonable end.

The considerations which should control this phase of the work may be summarized as follows :

First, as to the practical uses of the building.

Distribution : the provision and disposition of the required areas.

Circulation : the development of the thoroughfare system.

Concentration : the grouping of parts, locating of thoroughfares and minimizing of space to effect economy of time and labor to the occupants of the building.

Construction : the simplifying of structural lines to effect economy of construction and installation of mechanical systems.

Second : as to the appearance of the building :—

Proportion : This must reveal itself as clearly in the plan divisions as those of the exterior. For the plan may be made as expressive of the beauties of composition as the elevation. The proportions of the building and of its component parts, as well as the inter relation of these parts, are indeed expressed by the plan in two of their three dimensions and by the elevation in but one, and although the latter completes and perfects the proportions, these may be predetermined and expressed, to a remarkable degree, by plan study. If this element does not exist in the plan it cannot be properly realized in the completed design, for good proportion is inherent in the whole mass of a building, not in any of its superficial aspects.

Expression : If the plan is as carefully studied with a view to proportion as is the exterior, the unity thus given to the whole will contribute toward, if it does not produce that vital quality known as expression—a portrayal of its principal constructive divisions ; the "outward and visible sign" of its inward and actual nature. I do not maintain that this expression should be a rigid and mathematical labeling of the internal subdivisions but that it should not only not contradict the plan but should portray its main groupings and their relative importance and significance in a manner that shall be readily grasped and understood by the observer.

So much for certain of the more theoretical considerations that affect design. Further questions arise which must be answered for each problem out of its own limiting conditions. Among these may be named : Choice of Style, Method of Construction, Nature of Materials and Limitations of Site.

In speaking of Choice of Style I shall not venture upon the troubled waters of that sea of controversy whose name is Precedent. It is a stormy waste, but its currents are well charted and its shores offer to every mariner a haven of refuge to his own liking. And it may be safe to say that if he uses a compass of plain common sense a safe course is reasonably assured to him. But otherwise not. On one hand the purist is in constant danger of misdirection and absurdity, for he will clothe the modern plan with the habiliments of Imperial Rome or of its Italian revival, or mask a frame of vertical pressures with the externals of resistance to lateral thrusts. Archæology is his god and all his buildings bend the knee to it,—for scarcely a joint in their frames escapes some adjustment to the demands of Precedent. But is the freebooter not even more dangerous, with his contempt of all that the purist holds dear, an attitude usually serving as an indifferent cloak to crass ignorance. He glories in his self-styled originality and always finds an audience to applaud its monstrous fruits. It is not difficult to excuse, although we may not approve, the purist, but who can forgive vaunting ignorance and self-confident vulgarity ?

But these extremes are happily as rare as they are extreme, and the search for the golden mean, for that course which shall carry forward into modern practice the lessons taught by the past, is the motive which is near the heart and inspires the best effort of the great body of our practitioners. And under widely different titles it is engaging the attention of the schools and the professional bodies, notably so in recent deliberations of the Architectural League of America.

I confidently affirm that we shall proceed to the solution of this problem as we frankly recognize and freely adopt on the one hand the heritage of the ages, whether it comes through the demonstration of great principles or the use of traditional forms themselves ; and on the other hand as we recognize the demands and limitations of modern conditions, of local environment, of the native building material and, above all,

of the intensely individual and unique nature of the work in hand at the moment.

When, therefore, the question of Choice of Style arises let it be answered on the basis of common sense,—for let us admit that it is bound to arise and must be faced. Let it first be decided which of the historic styles best adapts itself to the method of construction to be used and most happily expresses the purpose or uses of the building. This point is not to be determined by the success with which the pure historic form can be borrowed and applied without change, but through a careful study of its underlying principles, both constructive and æsthetic. If the style is worthy of study, it will be found to have developed consistently throughout; the essential character has grown out of constructive requirements; minor parts take form and proportion as a secondary result; ornament aids in the expression of the whole and is consistent with it in general character and feeling. In short a certain spirit permeates the whole and this must be understood and felt before it can be properly imparted to new work. Obviously the most successful work in modern times is neither that which is most archæological on the one hand nor most free from suggestion of precedent on the other, but that to which the inherent character or spirit of past work has been imparted. And this, the highest level of achievement, is one in which the individuality of the artist most clearly reveals itself and in which that quality of fine architecture most distinctly comes into evidence, which we feel but cannot define,—the quality of distinctive individual character; the most admirable species of "Style"; infinitely to be preferred over pure historic style, however correctly this may be transposed from howsoever beautiful an original.

Methods of Construction, as the second of our limiting conditions, cannot be accorded the place they occupied as controlling factors in design when they comprised only the arch or the stone or wood lintel. The ancient necessity of using one or the other gave a simplicity and directness of force to the development of the several historic styles that is perhaps the reason of their inherent vigor and vitality. In our own time, when anything can be constructed of steel, however novel or difficult it may be, and when, as a rule, the great majority of buildings can be best built of forms which it seems most difficult to treat frankly and artistically, the temptation is great to treat structure and surface as independent of one another and as irreconcilable in their very nature. But this is not inherently true of any class of buildings and not true at all of some. We are in a transitional period and have only begun to grapple with the problem of how to treat the steel skeleton architecturally. Some progress has been made by the French, but this is in the use of the metal as both constructive and decorative material, so admirably managed in the Palais des Beaux Arts at the last Exposition. The problem of combining steel for construction and masonry for protection into a whole which shall give architectural recognition to both is as yet unsolved. But we of the new world are to do it.

Our next consideration, however, that of Materials, brings us face to face with conditions about which there is little of theory and much of plain duty. For here we may not take what we choose, but must choose the most suitable of that which is offered. This often seems unattractive or repellant, or at the best ill adapted to a proper color scheme or surface texture. But is this not often because local material will not so well adapt itself to a favored scheme of design? And is it not wise to consider this element with those of construction and plan as the factors which should dominate the manner or style of treatment? Surely no architecture has greater charm than that which seems indigenous, and of the very nature of its surroundings; a thing which could not have been produced elsewhere. This character is imparted most effectively by a judicious and tasteful use of native materials, whose color and texture as well as whose structural properties are carefully studied and intelligently employed.

Other considerations, such as unpromising peculiarities of site, and the restrictions of building laws and ordinances, make imperative demands upon the patience and judgment of the designer, but, from apparent obstacles may be turned to advantage under courageous attack. This is, of course, beside the question of accessories and surroundings from whose character and effect the building should never be separately considered.

This summary, while far from complete and greatly imperfect, yet presents some of the essentials of good architecture as it can and should be realized in our current practice. It is not doubted that difficulties beset the path of him who follows truth as the first principle of practice; who determines that his work shall be thoroughly and consistently designed in every respect. This path is not an easy one to travel but its pursuit means, to the individual architect, a growth of creative power and the maintenance of professional self respect, while to the profession it means whatever of progress may be made toward better quality of work, higher ethical standards and the elevating of the whole state of Architecture.

These are generalities, to be sure, and they glitter, be it frankly admitted, after the manner of their fascinating kind. One may reasonably protest that it is easy to theorize and to dream of a millenium but that we are confronted with stern and hostile realities; that one would willingly enough do better work if allowed the means with which to do it, but that clients are, as a rule, either unable to pay for what they want or are possessed of whims and prejudices equally fantastic and obstinate. There is no denying the force of this plea; these conditions are very real and very general and must be frankly faced.

Two remedies, however, present themselves with equal readiness, and both are based on education in its broadest sense. In the first place, to begin at home, we must train ourselves to absolute sincerity of attitude towards our work. There must be no mere striving for effect, no dragging in of artificial elements or suppression of those which have legitimate place. The nature of each problem must be carefully studied, its limitations recognized and its demands acknowleged. To reconcile these and work out the result in an architectural manner we must avail ourselves to the utmost degree of the means which lie at hand, and our materials must be studied with a view to their most effective use as regards construction, color, texture and possible ornament. The site and its environment must be accepted, not only as imposing difficulties upon the designer but as affording him a possible aid of the greatest value, if its own peculiar character be seized and echoed in his design. Other limitations, of whatever character, should be met and recognized in the general treatment of the problem. This does not imply a sacrifice of essentials, for if the artist be permitted, by his client, to make the best use of his materials the result may be entirely successful whatever the apparent paucity and barrenness of those materials. It may embody the best of qualities,—proportion and scale, excellence in mass and line, refinement and virility, appropriateness of ornament of whatever simplicity, and harmony of color. Above all, permeating the design, may be the evidence of good taste and the expression of individual character. Costliness is not essential to this result, but freedom is.

And at this point the education of the client is suggested. For our esteemed patron, as a rule, notwithstanding his virtues—perhaps indeed because of their very excess—is too little aware of our abilities and too prone to supplement them with his assistance, particularly in the field of Design. His control at certain stages of the work, and his cooperation at others, is indespensable, for he must pay for and use the building and his is the greatest loss if it prove a misfit. But if the structure be unsightly the loss is the architect's and once the practical requirements of the client are clearly understood and their attainment assured, the architect must be left free to grapple with the problem of design unhampered by the suggestions or mandates of the layman—that is, if the result is to be successful in the widest sense. Where a patron is a person of actual taste in these matters his cooperation with the artist is both a delight and an inspiration; but such a person instinctively recognizes the necessity of which I speak andprefers to leave the initiative with his architect.

The protest is entered against that spirit which so often shows itself in the attitude of clients who, while ready enough to entrust their architects with the difficulties of construction, are convinced that "all men are born free and equal" in matters of taste and that architects are engaged to carry out the pet fancies of the man who pays the fee.

The only effective means of changing this spirit lies in the power of the architect, both to do what is right and to persuade others that it is right. And this he cannot do if he be not himself convinced of the right. His convictions must be rooted in a sound training and the habit of study; must be nurtured by sincerity toward his art and be reinforced by a rational and open minded attitude toward its limitations. With these weapons some headway can be made against the worst case of obstinacy and domineering bad taste with which he is likely to deal and there are few laymen who will not feel and respect in an architect the force of deep and intelligent conviction, and who will not yield to it to a greater or less degree.

In this quality is found the most effective means of educating the client, and through him the public, and by this road lies the constant advancement of professional standards and the steady uplifting of architecture, whether it be as an art or a profession, or blending of both.

In this sense, then, is design an element of practice, that, broadly conceived, it underlies all that is of real and lasting excellence in the work of the architect.

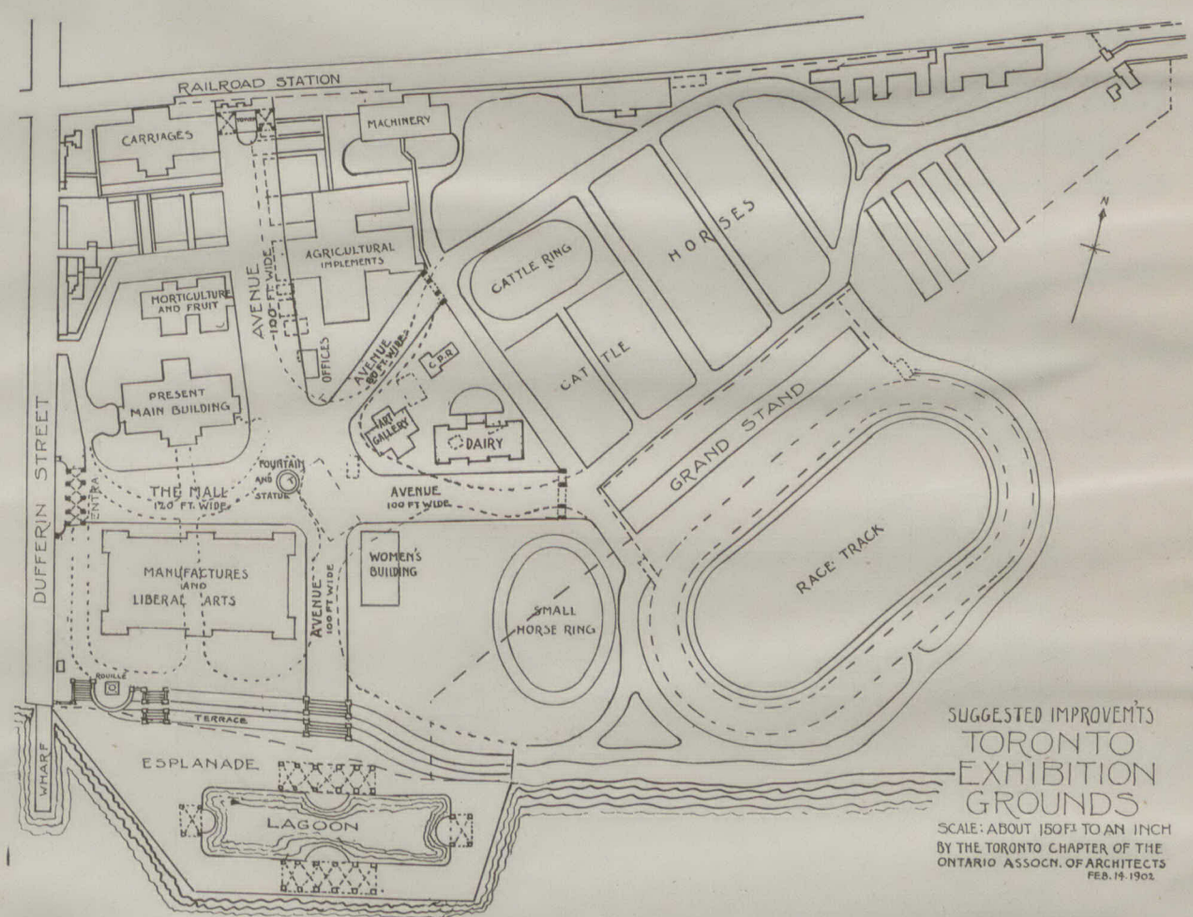
THE IMPROVEMENT OF THE GROUNDS OF THE TORONTO INDUSTRIAL EXHIBITION.

When it was proposed last year to erect three new buildings on these grounds, one of them being of much greater area than any of those now in existence, it was felt by the members of the Toronto Chapter of the Ontario Association of Architects that the time was opportune for a re-arrangement and improvement of the avenues and grounds as far as circumstances permitted.

The development of a satisfactory scheme, and its adoption before the location and commencement of the new buildings, was considered to be a matter of paramount importance, as, ocne placed in a wrong position, changes or improvements would be permanently blocked or delayed for many years.

The Chapter spent many evenings in working out suggestions for these improvements, several members submitting sketches.

The good points of the various schemes were assimilated into the plan which was most favorably received, and although it was not felt that this plan was at all perfect, especially as the Chapter was in ignorance of some of the requirements, it was submitted to the Exhibition Board which passed it on to the Parks & Gardens Committee of the City Council.



Since the revival, with the new year, of the project of erecting the new buildings, a committee of the Chapter, in consultation with members of the Exhibition Board and the Park Commissioner, have evolved a modification of the former plan, eliminating the impracticable features and providing satisfactory sites for the proposed new structures.

It is not claimed for this plan that it is a complete or entirely satisfactory solution of the problem, as such is practically impossible under existing conditions, but it is claimed that it will be an immense step in advance of the present lay out of the grounds, and some approach toward the type of grounds so well illustrated in the planning of the Pan American at Buffalo.

The commendable features of the grounds at Buffalo were the broad Plazas, direct Avenues, well defined axis, interesting focal points, and well placed buildings.

Our scheme embodies these features as far as circumstances will premit.

The new buildings can be located in the positions shown with but little change, this year, in the roadways or approaches, while only one large building, (the Annex, or Women's Building) and three or four unimportant buildings will require removal.

It will be observed that the new avenues are located in every instance as nearly as possible on the old walks and roads, which are indicated by dotted lines.

The making of the new avenues and the widening of the old may be spread over a series of years if necessary, and no large buildings, except those referred to, need be removed till they are worn out or obsolete.

The scheme, in brief, is as follows:—

The main avenue or mall 120 ft. wide to be located south of the present main building with appropriate entrance gateways on Dufferin street. The mall to open into a circle 300 ft. in diameter from which will branch avenues leading north, south and east 100 ft. wide, and north-east 80 ft. in width. The triangle between these avenues would be occupied by the art Gallery and the Dairy Building, while the Manufacturers and Liberal Arts Building would be located on the south side of the extension of the mall leading to the grand stand, and just west of the small horse ring, and not immediately south of the present main building as shown in the cut. This will permit the main avenue running north and south to be extended in a direct line to the lake. All these avenues to have their axis radiating from the centre of the circle, which would be their focal point, after the manner of the avenues in Washington, which are admitted to be among the finest and best planned on this continent.

The vistas at the ends of the avenues could be closed by appropriate architectural features such as a tower, arcade or pergola, while the circle could be accentuated by a generously proportioned fountain, embellished with groups of sculpture.

As the work of development went on year by year an esplanade could be formed at the mere expense of cribbing, the filling being done by the street commissioners department.

In this esplanade a lagoon or lagoons could be formed with appropriate architectural features on the margins.

If possession of the garrison commons should be acquired, the esplanade could be extended a long distance eastward, making a magnificent foreground or front to the grounds.

The banks along the shore, which are now but a disgraceful dumping ground for rubbish, could be terraced, with suitable balustrading and steps, making an unsurpassed vantage point for viewing aquatic displays in the lagoons beneath, or the lake beyond.

These suggestions are confessedly somewhat crude, and require working up into a systematic and well thought-out scheme.

This being done it should be quite practicable to do something each year, however little, towards the final completion of the scheme. The vital point is to secure and adopt a well devised plan now and adhere to it till the work is finished, be it ten or twenty years hence.

EDMUND BURKE,
Chairman of Chapter.

It will be observed that the plan illustrating the above article does not correspond with the text. The location of the Manufacturers and Liberal Arts Building was changed after the engraving was prepared, and too late to alter it, as a result of a conference between the Park Commissioners, the architects of the building and the members of the Toronto Chapter, at this week's lunch.

QUEEN'S UNIVERSITY, KINGSTON, ONT.

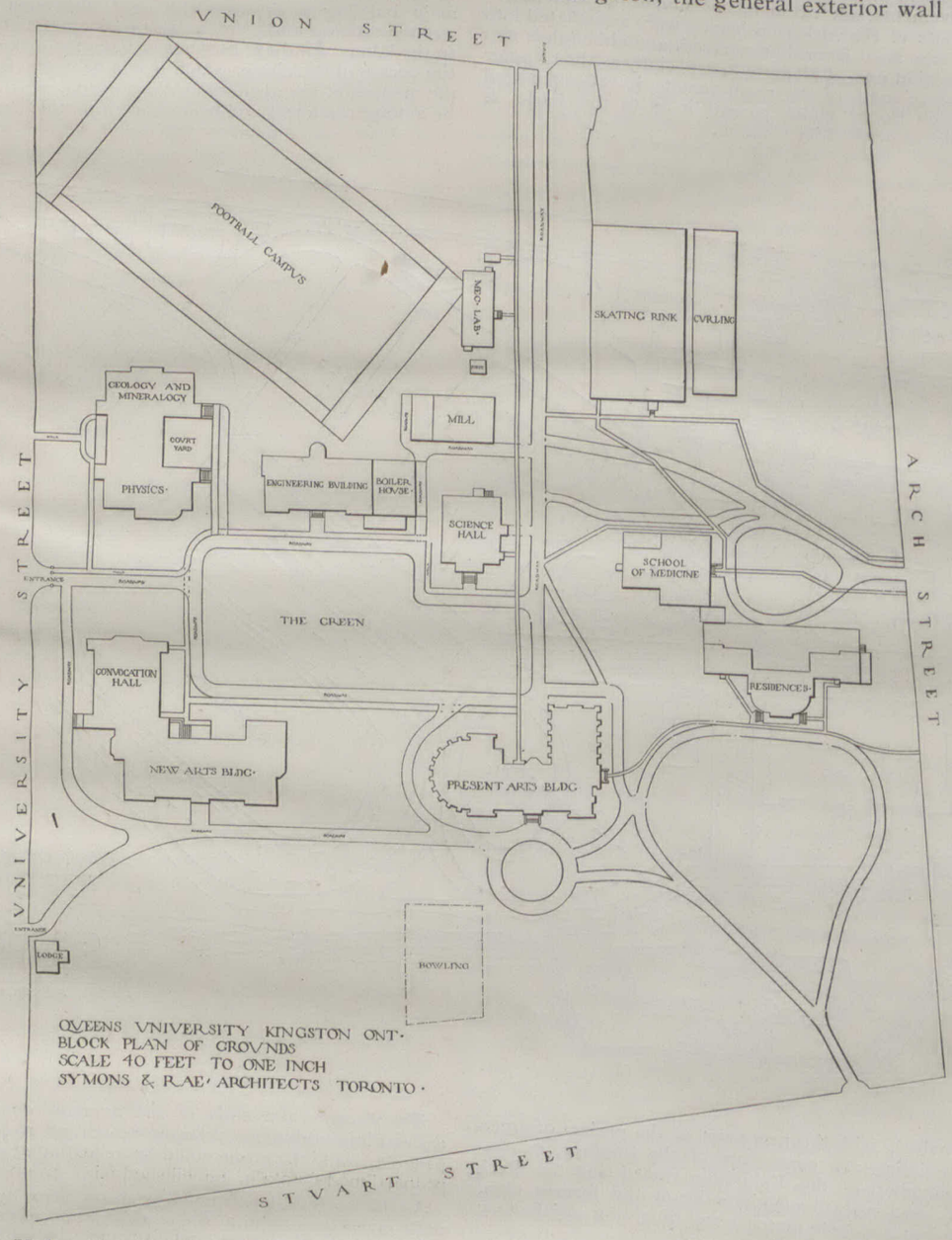
It was decided in laying out the grounds in connection with the new buildings to divide the present Campus into two parts, about equal in area, and the group of buildings now being erected will complete the lower quadrangle; leaving the North, or upper portion of the grounds, which in the meantime will be used as a football campus, for future buildings.

There are two entrances to the University grounds at present, and that from Union street may be termed the public entrance, but as the City has gradually grown westward, it was deemed advisable to plan a new entrance from University Avenue. This will ultimately be the main entrance, and leave the present entrance from Union Street, at the rear of the quadrangles, for supply purposes.

The new Arts Building situated at the southwest corner of the quadrangle has been erected through the liberality of the citizens of Kingston, who voted the sum of $50,000 towards it. Associated with this building will be the new Grant Memorial Hall, which will probably be commenced early this Spring.

To the north of the quadrangle are situated the Geology, Mineralogy and Physics Building, and Engineering Building, which are being erected by the School of Mining (in affiliation with the Queen's University,) and for which the Provincial Government have provided funds.

All the buildings are being built of stone quarried near Kingston, the general exterior wall surface being left rock face random rubble with picked dressings. As the local stone used is of a very hard brittle nature, its use for mouldings was limited; but notwithstanding, the entire work, including cornices, steps, and other exterior finish, has been executed in stone, thus doing away with any poorer effects obtained by metal or inferior materials.



In thus laying out the grounds in two quadrangles, it was possible for the building committee to arrange the new buildings so as to complete one of them, leaving the upper quadrangle unhampered in any way for future generations.

It is the intention to lay out the roadways and walks as shown on the block plan and the question of tree planting, shrubberies and general arboricultural effects will be carefully considered in the laying out of the grounds.

The new buildings being brought into such close relationship with the present Arts Building and Science Hall, it was considered best to adapt the style of the new buildings to them, and consequently a Romanesque treatment was chosen.

The buildings are of slow burning construction, the outer walls being built entirely of stone, and the interior walls of brick; the corridors and entrances being lined with pressed brick. The Arts Building, and Physics and Geology Building are finished throughout in the same manner, the general finish being in pine with the exception of the staircases which are to be of oak, and the flooring which is hardwood throughout. The ceilings of the corridors and staircases are heavily ribbed and finished in pine, and the class

rooms throughout are finished with fibre plastering.

The laboratories and class rooms are of sizes varying from that necessary to accommodate 60 students to 180, the larger class rooms having high ceilings and the walls finished in brick.

Each separate department has the necessary laboratories and workrooms in connection therewith, and also its own library and student's rooms and lavatory and cloak room accommodation for students of both sexes.

The ground floor of the Physics and Geology Building will be fitted up for a Museum, the walls being finished in brick and the floors in concrete. It is the intention to fit the class rooms and laboratories with the most approved appliances and apparatus.

The Grant Memorial Hall will have a seating capacity for about one thousand persons. The plan consists of a large nave or auditorium, adjacent to which on the east and west sides will be narrow aisles, the walls of the latter being designed to receive the general trophies of College life. The aisles will be carried up to receive the galleries, which will run around two sides and the south end of the entire Hall.

Over the arcade between the aisles and the auditorium will be arranged clerestory windows, which will ultimately be filled with memorial glass. On the north end of the building will be a dais capable of seating two hundred persons, and it is also arranged so as to be able to be used for the various stage entertainments consequent in College life.

The alcove at the north-west corner of the hall will be arranged for a grand organ. Adjacent to the dais will be suites of reception and robing rooms. The interior of the Hall will be finished in half timbered and stucco effects ready to receive the decorations.

The Engineering Building equipment is worthy of note. The building itself will contain lecture rooms and laboratories necessary for the work of civil and mechanical engineering and surveying. A draughting room occupying the entire upper storey of the building will accommodate about 125 students, adjacent to which will be the necessary rooms for photography and blue print development.

In the ground floor of the building are situated the laboratories in connection with the mechanical engineering work, and in connection with this floor will be the plant for the lighting and heating of the buildings on the Campus.

The boiler room will ultimately contain boilers of 600 h. p. in units of from 100 to 200 h. p. each, both fire tube and water tube type, and some of which will be equipped with mechanical stokers and economizers. The entire plant will be operated by mechanical draught, thus permitting the boiler plant to be placed in a central location on the Campus, without the accompanying disfigurement of a huge smoke stack.

The engine room will contain engine and generator power for the light and laboratory work in the various buildings, and is also arranged so that the plant can be used in connection with the students' work. Ultimately all the present buildings will be lighted and heated from this central station.

In the new buildings will be installed the fan system of heating and ventilation, which will be supplemented by direct radiation. The steam is conducted from the main station through mains insulated with the most modern underground pipe insulation, the return water being taken back to the boiler house from all the buildings, except the Arts Building, where it is run through an economizing coil and into drains. The fans, which will be run by steam, will propel the heated air into all the class rooms and laboratories and corridors, which will in its turn be exhausted through brick ducts into the roof chamber, from which exit will be obtained. The lavatory ventilation and also ventilation from Physics laboratory has been kept entirely separate from the general ventilation system, and is exhausted by means of electrical fans. The fan system as installed will permit a change of air, even in the larger class rooms, once every twenty minutes, if necessary.

The entire buildings on the Campus are being erected from the designs and under the supervision of Symons & Rae, architects, Toronto, at a total cost, including equipment, of about a quarter of a million dollars.

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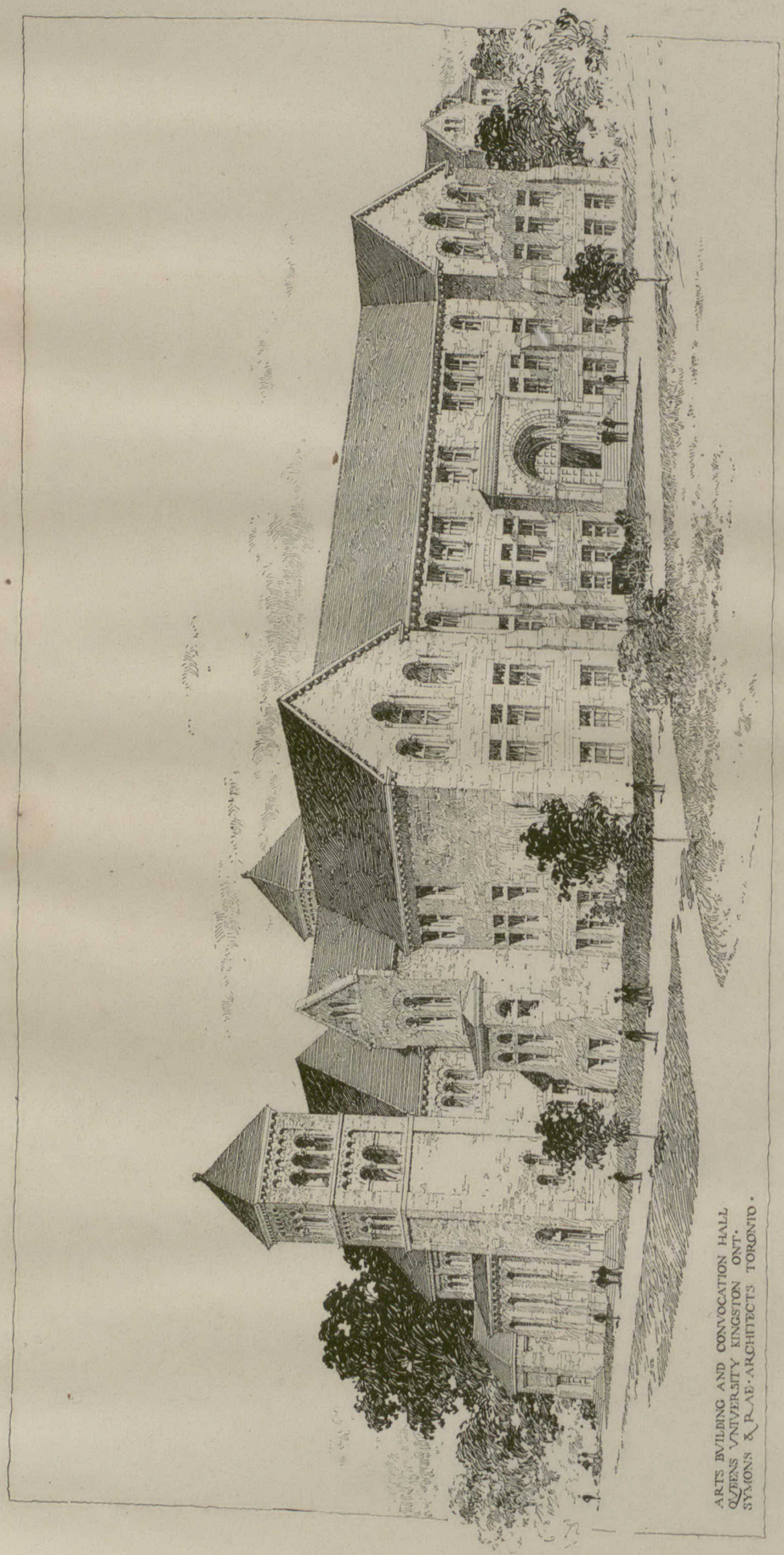

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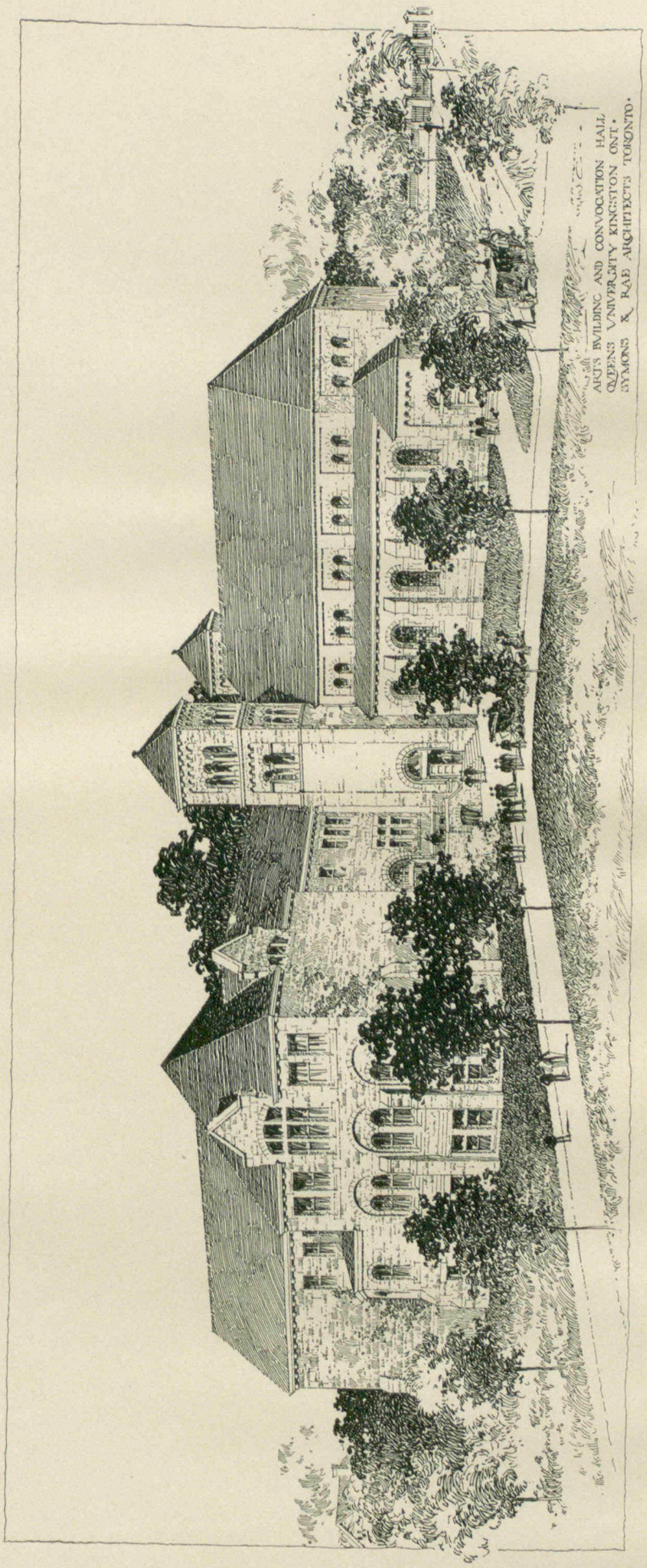

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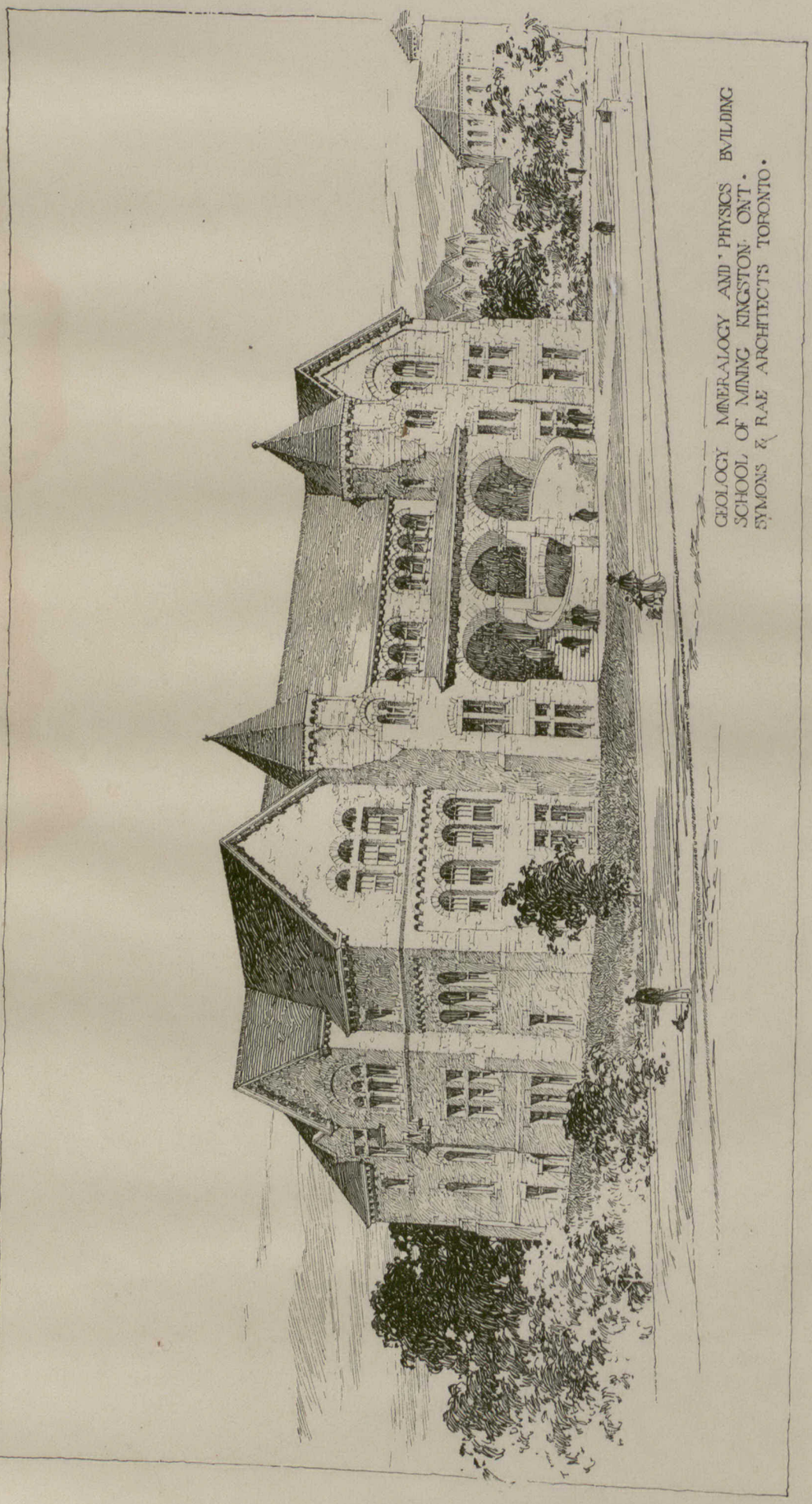

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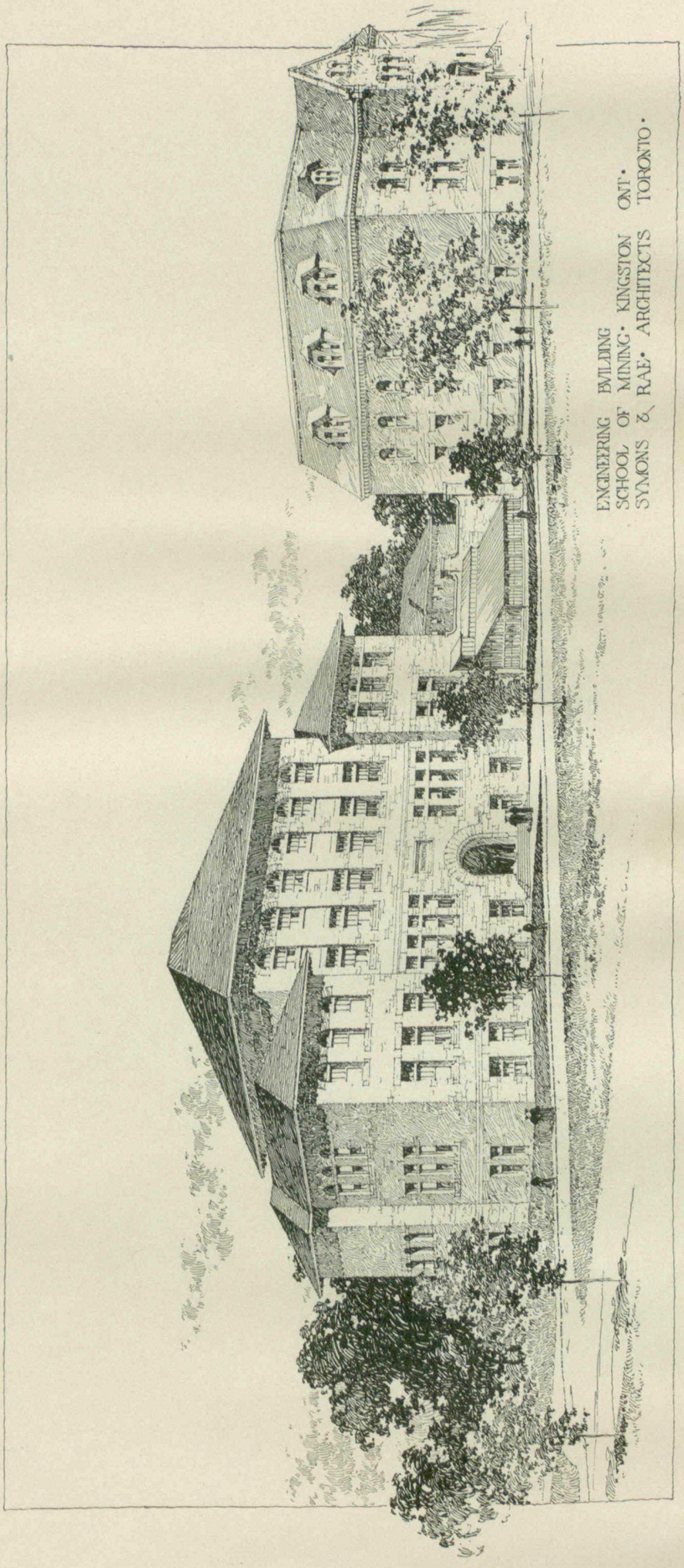

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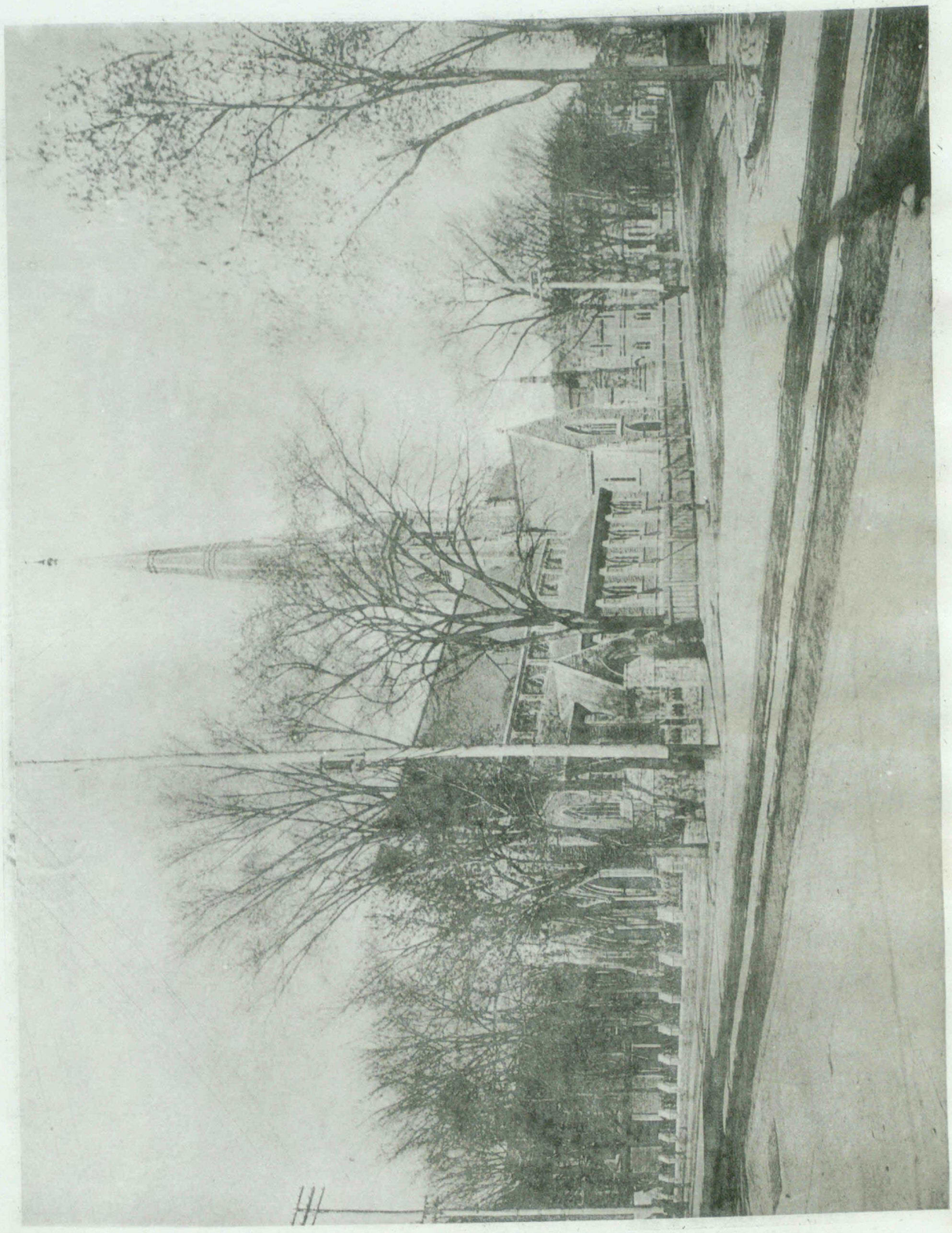
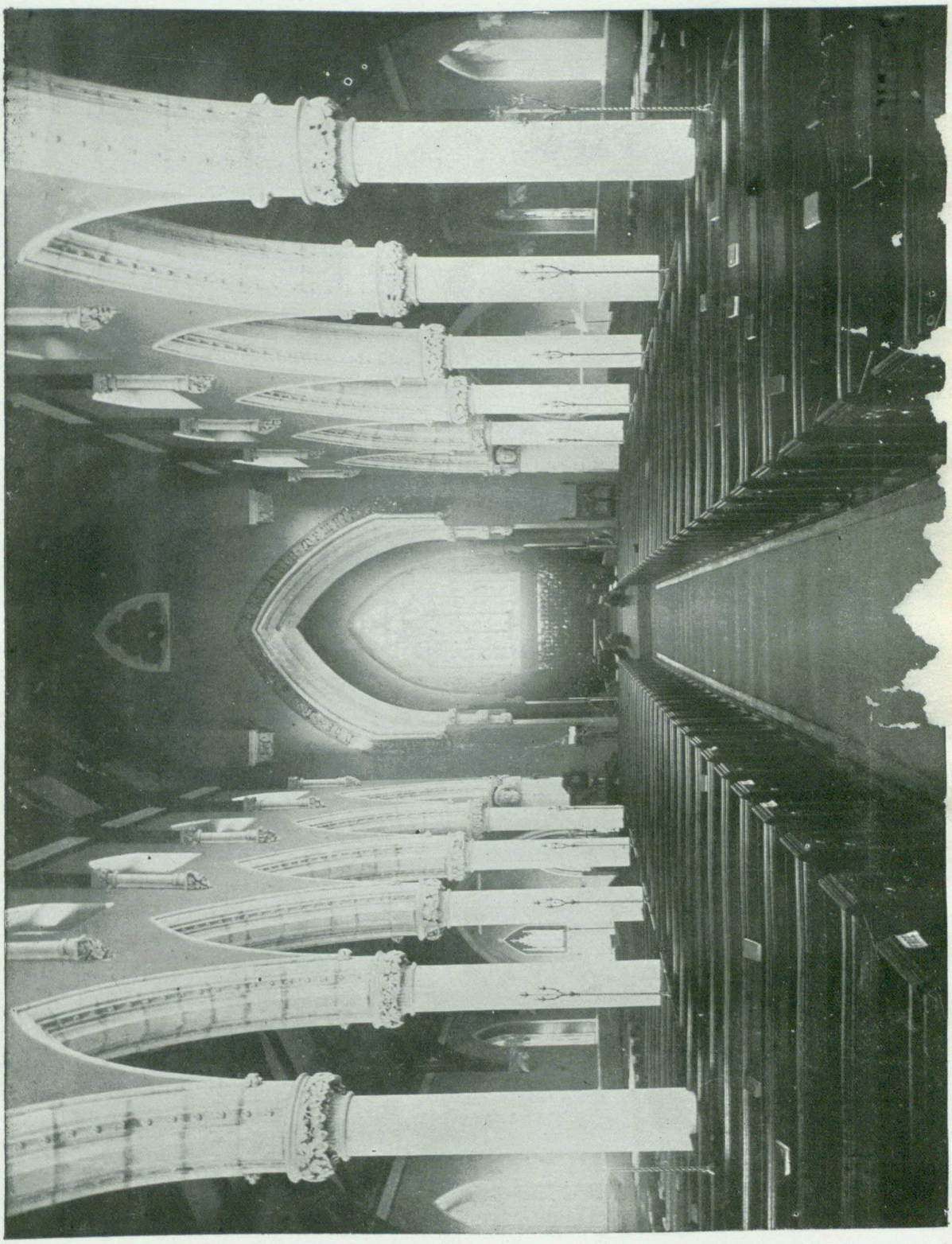


ENGLISH CATHEDRAL, MONTREAL.

JOHN WELLS, ARCHITECT.



CATHEDRAL ARCHITECTURE IN ENGLAND.

(Digest of a Lecture by Rev. Prof. Cody, M. A.)

A cathedral is not synonymous with a church of the first architectural importance. It is the seat of a Bishop's cathedra or chair, and, in consequence, the ecclesiastical centre of a diocese. But naturally, architectural splendor was made to express ecclesiastical rank; hence the size and beauty of cathedrals. The method in which Christianity was introduced into England in Anglo-Saxon times has had an influence upon cathedral architecture. There emerges here a contrast with France. In France Christianity was first preached in the towns which were centres of secular authority in the subdivisions of the Roman province. The cathedral was erected in the civic centre, in a town already important. In England dioceses were laid out on tribal lines, and within the territory of the tribe there might be no great municipal centre. The Bishop's chair had sometimes to be placed in a missionary station completely in the wilds, and some cathedrals stand still where they stood at first in tiny country towns. The most characteristic English cathedrals do not rise from among the closely-pressing houses of the laity, but stand apart, surrounded by lawns and foliage. This fact is a reminder that in most cases originally the cathedral was first in importance; the city, second.

As a cathedral chapter was collegiate, i.e. consisting of secular priests, bound by the ordinary vows of priests, and having their individual houses, or monastic, ie. consisting of monks living according to "rule," so would there be architectural differences in the buildings surrounding the cathedral. Within the precincts there was not simply the magnificent church, but a chapter house, dormitory, cloister, refectory, library, school, infirmary, bishop's palace, canons' dwellings, etc. Every kind of mediaeval architecture may be found here, from the ornately ecclesiastical to the humblest domestic and utilitarian. In no other country is there so diversified a series of cathedrals. There is nothing on the continent like Salisbury with its lovely lawns and bishop's palace, like Canterbury with its ruined monastic buildings, like Wells with its revelation of the collegiate life of the middle ages.

The English cathedrals were practically paid for by the bishop or monks of the chapter. The direction, enterprise and glory was their's. A secular guild of architects and builders would probably have been better than a monastic, and perhaps the limitations of English Gothic are due to its being the art of churchmen.

The development of style is easily traced in England. There is practically no pre-Norman left above ground in any cathedral. At the time of the Norman conquest every Christian land practiced some form of Romanesque. This was based upon Roman building, and had brought into integral union the round arch and the column. The arch sprang from the capital itself, the entablature carried on columns being thrown aside. This union of arch and column marked the birth of a new art in the widest sense of the word. The Saxon Romanesque was rudely wrought. Norman Romanesque, or Norman as it is more briefly called, being more highly organized and skilfully wrought, easily displaced it. Round-headed doorways and windows and heavy pillars are the chief distinguishing features. The ground plan of a great Norman church was cruciform. There were the long nave with lower aisles to the right and left, the transepts forming the arms of the cross and a choir forming the upper extremity toward the east. An interior section of such a church (Peterborough, for instance), shows as the first stage the pier arches supported by massive pillars separating the naive from the aisles, as the second stage the triforium or blind story arcade opening into a low story above the aisles, and as a third stage the clerestory or row of windows opening clear upon the outside above the roof of the aisle. Only the aisles of the early Norman cathedrals were vaulted with stone. A flat, painted, wooden ceiling covered the centre, and held its ground in England even when Normandy adopted stone. This love for wooden ceilings seems to have been a characteristic of English builders. The great length and comparative narrowness of Norman churches were specially conspicuous in England. This immense extension of a building of inconsiderable height would have produced a monotonous aspect had it not been for the semi-circular or apsoidal east end, the square tower at the crossing and two smaller towers flanking the west facade. In Norwich alone are the apse and centre tower preserved. There was little decoration in the Norman—only simple zig-zags, rolls or fillet mouldings. The general character of Norman architecture is strength, even to massiveness, plainness to boldness. This Titanic work, immense, awful, austere, fitting expression of the aims and ideals of the Norman race at the zenith of its power.

At the beginning of the thirteenth century, the supersession of the rounded by the pointed arch marks the beginning of the Gothic style and new structural principles. The English treated this pointed arch in a fashion of their own. The lancet-pointed or Early English style prevailed for the greater part of a century. Pointed windows, tall and slender, were grouped together without being actually united into a single complex opening. The massive pillar became lighter and was girt about with slender shafts in more or less intimate union with it—the clustered pier. Capitals instead of being square became circular, with chiselled deep-cut mouldings. Vaults were pointed. The ground plan was altered—the eastern arm of the cross grew longer owing to the growth of saint and relic worship (shrines were usually placed east of the high altar.) The aspidal east end (still retained on the Continent) became square (an English peculiarity) with groups of lofty windows. At the extreme east end of the already lengthened choir the lady chapel was built (for the growing cult of the Virgin Mary) and sometimes an eastern set of transepts was added to emphasize the distinction between choir and sanctuary. Salisbury is an admirable example of this style.

In less than a century came the full-blown Decorated, marked by elaborate tracery in the windows, enriched doorways and beautifully-arranged mouldings. The tracery passed through the stages of simple plate, geometrical flowing. In France the tracery developed into flamboyant, so-called because of its unfettered exuberance by which the lines seem to be twisted and woven into flame-like, stone defying forms. The central date of this style is 1300, a period not marked by much church building on a large scale. It was a time of splendid and expensive wars, of legislative and social innovations, of the half revolt against Rome. Architecture was military or domestic, and the prolific time of church alteration came later. The angel choir of Lincoln, and the greater part of Litchfield and Exeter are examples of geometrical Decorated, while the west window of York is flowing Decorated. Late English Gothic stiffened into the Perpendicular style—an English peculiarity—the prose of architecture as compared with Flamboyant, its poetry. The millions of the windows abandoned their curves and ran straight from top to bottom. They were cut across by strong horizontal transoms, and this panel-like form was frequently extended as a decoration over the wall space. The low four-centred curve was frequent in the arch. This style afforded an enormous window space to be filled with stained glass. The choir and lady chapel of Gloucester are good specimens.

The genesis of the window may be described as follows: First

there was the round arched head, then the pointed head, then two pointed windows close together with a projecting moulding in the shape of an arch drawn round them enclosing both and a plain piece of wall above their heads. Then began the piercing of this space. At first the window seemed to be a group of bright spots on a shadowed wall ; at last it became a tracery of dark lines upon a wide bright field, like a pattern done in black on a lighter background. The latest style represented in the cathedrals is the Renaissance or revived classical, of which St. Paul's, London, is the splendid example.

English Gothic exhibits a love of lowness and a neglect of the effects of vertical extension. As extreme elevation demands daring processes of construction, perhaps the relative lowness of English cathedrals is an expression of the national caution and self-restrain. The spirit of Gothic architecture was audacious, imaginative, aspiring ; to be deficient in these qualities was in measure to fail to exhibit the highest qualities of the art. The imaginative power of England, it has been remarked, expressed itself best in poetry, that of France in art.

Viewing an English and a French cathedral from within, one notes the vast height of the French with its resultant mystery, sublimity, impressive soul-subduing character ; the huge length of the English, length that can be seen and understood. The French structure is broader, shorter, taller, more compact than the English. The typical French cathedral strikes one as more of a unity, the typical English as a complex body with numerous and dense parts. The external aspect of each is different. The French cathedral has a compact, broad, tall body with ranks of flying buttresses ; the English a long, low, narrow, self-sustaining body, which however permits extraordinary dignity in the towers. In France as the Gothic body grew tall, the western towers grew with it and the central tower shrank into a mere spirelet ; in England the central tower grew but the western towers either remained on a smaller scale or finally disappeared. The narrowness of the English building led to great breadth of transept which assured the eye of the stability of this central tower.

Each type of building suits its surroundings. The French stands in the heart of the city. It was built by and for the people. Its west front facing the great city square is the place of common entrance, and is made correspondingly ornate and conspicuous. The English is often set apart from the busy city streets, and compassed with green sward. The chief architectural accentuation falls at the crossing of nave and transcept and still seminps one that the cathedral was built primarily for the clergy and only secondarily for the laity.

The attention of architects and contractors is called to the announcement of the Zanzibar Paint Co., Ltd. Toronto, Ont. sole manufacturers of Zanzibar Anti-Rust Paints. This is made in any color desired, and is now being used largely by railroads for bridges, train sheds and other structural iron work requiring protection from rust.

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On visiting the works of the Toronto Plate Glass Importing Company, Toronto, a representative of this Journal, learned that they have recently added to their new factory at Nos. 209 to 213 Victoria St., a thoroughly up-to-date glass bending oven. This branch of their business is now in complete operation. This is said to be the only plant of its kind in Canada for the bending of glass on the most approved principles. The

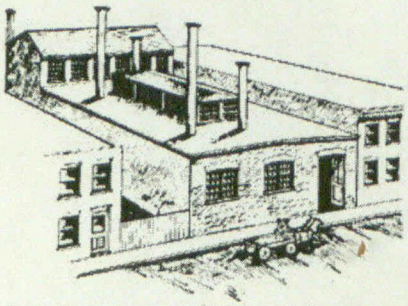

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photo in the Company's advertisement in this issue illustrates the oven used for bending all sizes of glass. It is built of brick and has a capacity of 1,000 feet of glass per 24 hours. The glass is first cut to required sizes, then placed on a truck on which are large steel moulds. It is then fed into the oven which is hot enough to bend the glass to the required shape, after which it passes through a process of annealing to prevent it from being too brittle. This process reduces the temperature until the glass becomes gradually cooled to a flesh heat. The process is very complete and produces such a finish on ordinary glass that, but for thickness, it can hardly be distinguished from plate glass. Previous to this oven being installed, a large proportion of the bent glass used by this firm had to be imported. In consequence, orders could not be delivered promptly. This delay operated against the use of bent glass. The Toronto Plate Glass Importing Company now claim that they can deliver orders, if necessary, one day after received. This promptness of delivery and reduction in cost should largely increase the use of bent glass for all purposes, and will no doubt prove to be a great convenience to architects, and those using bent glass.

A CORRECTION.

Our attention has been called to several errors in the letter of our Montreal correspondent printed in our January issue. In this letter Messrs. McKim, Mead & White are given the entire credit of being the designers and architects for the new Bank of Montreal. This statement, we learn, is entirely erroneous and misleading, as Mr. A. T. Taylor, F.R.I.B.A. is joint architect with McKim, Mead & White, and the building has been jointly designed, and is being carried out in every particular under the joint care of the above named architects. We sincerely regret this mis-statement, and others of less importance, appearing in our correspondent's letter, and take the earliest opportunity of directing attention to them, in order to repair, as far as possible, any mis-conception which may have arisen in consequence of their publication.

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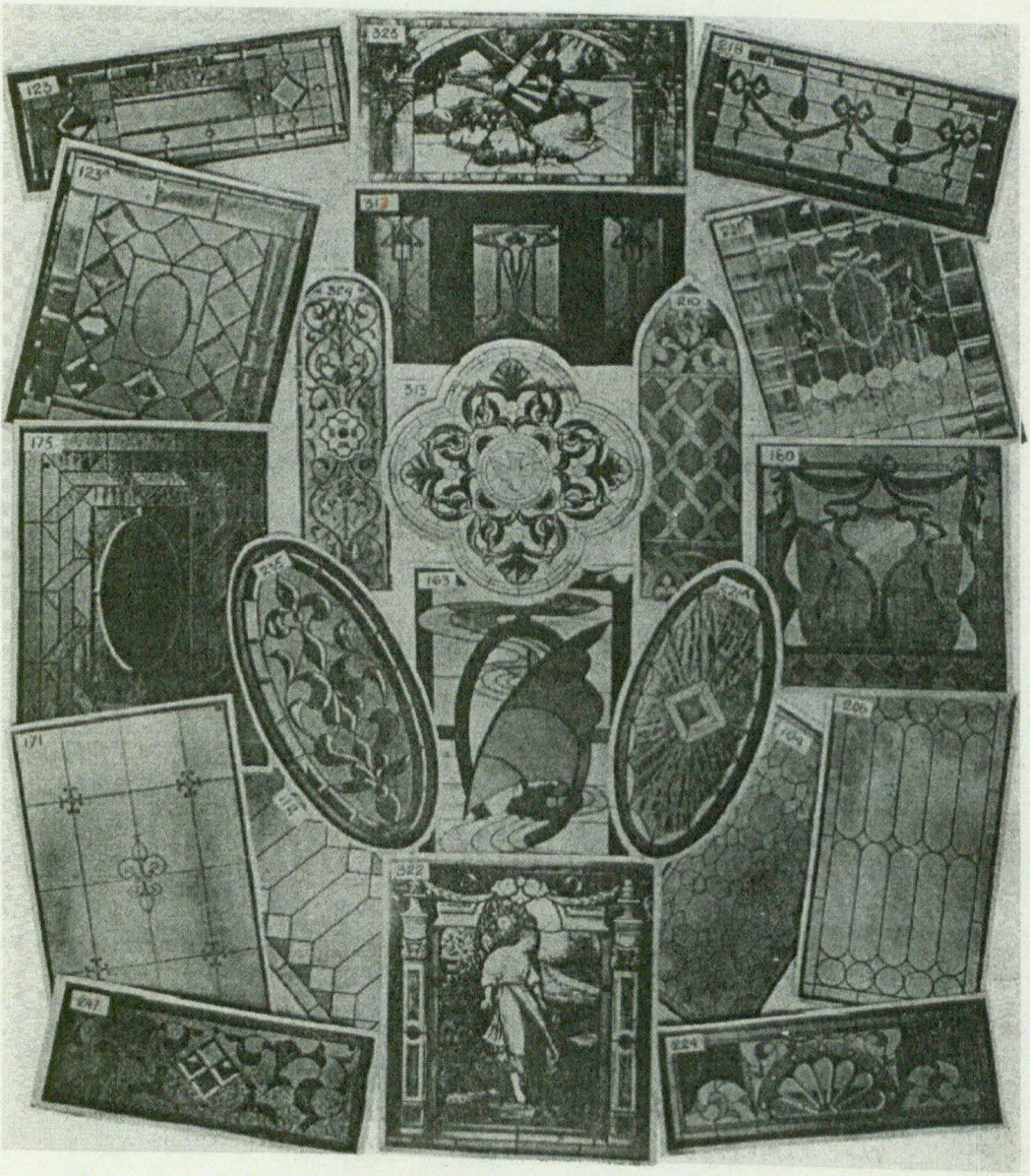

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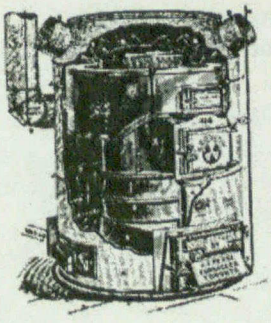

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