

PAGES

MISSING

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ILLUSTRATIONS ON SHEETS.

House for J. C. Gordon, Esq., Winnipeg.—Messrs. Darling, Pearson & Over, Architects, Winnipeg.
House for C. W. Colby Esq., Montreal.—Prof. P. E. Nobbs and Mr. D. R. Brown, Architects, Montreal.
Cottage on a Hillside.—Prof. P. E. Nobbs, Architect, Montreal.
Ottremont Convent, near Montreal.—Mr. J. Z. Resther, Architect, Montreal.
Photographs in France and Italy by Mr. J. P. Hodgins, Toronto.

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Quiet Lunch Rooms. If there is one thing more than another that makes daily life in the city disagreeable it is the necessity of lunching in the hot, crowded and noisy lunch rooms which alone are open to the ordinary business man. It is safe to predict that if any one will build a pleasant airy room, of size sufficient to keep people decently apart, with a kitchen properly cut off and ventilated, and properly fitted up so that the frequenters will know, (as they will), that their food is cleanly prepared, he will command the trade and may demand his price, (within reason). An old shop, a hundred feet from front to rear is not good enough. One does not want to eat lunch by electric light, in a tunnel, at one end of which is a superheated and infraventilated kitchen that discharges, with every opening of the service doors, a steamy air to be stirred up by the fans which do not pretend to remove air but only to move it that it may take up a little more moisture and make perspiration not quite so sensible. The hum of the fans, the scurry of attendants who have to go the whole length of this ill-planned apartment for every order, makes such a grounding of noise that conversation can only be carried on in loud tones, and as each one tries in self defence to raise his voice above his neighbour, the din,—for such it is, though one does not recognize it as such until on some occasion the fan stops and a hush seems to come over the room—the discomfort of it all makes lunch anything but the time for unbending and refreshment that it ought to be.

As a change from this one may go into a cellar that smells like the hold of a ship and occasionally find a

cockroach done to death at the bottom of one's savoury soup ; or one may sit in the kitchen itself.

Here is a legitimate field for architectural invention. The architect as an advertiser—proffering his services with the implied but unproved assumption that they are better than his neighbour's—is not in good repute ; but the architect as the inventor, seeking occasion to produce what has not been produced before, is in a different position. This is the theoretical groundwork of the architectural competition ; the reason why, when there is a problem with new elements or occasions for invention, it is thought right that young men with new ideas should be given a chance to show what they can do. And as it is time some new idea of the downtown restaurant was presented, the architect who can develop one and impress it upon the attention of some one who will carry it out will be welcomed in doing so by everybody.

There are many ways in which the problem can be agreeably solved. The problem of conveying supplies and the public to a roof garden is not too difficult or expensive for the occasion, and the utilization of the top storey in this way will be found money in many cases. But a more obvious utilization would be the insertion of a two-storey building in the waste space in the interior of a block. Here, with a mere entry on the street and a delivery at the kitchen door, might economically be erected a sky-lighted upper room upon a high and dry basement which would make an ideal restaurant ; high, quiet, clean and well ventilated ; depending for its attractions of appearance not upon the hideous splendour of the conventional restaurant but on constructive elegance and a roof that could be

mostly dormers or, if shaded by tall neighbors, might be mostly glass.

The Worship of Mere Bigness.

At last the daily press is beginning to say something in the way of sound criticism upon the senseless idea that seems to possess people in this country that our happiness is to be found in rapid growth. Grow we must, but it is the kind of growth implied by this emulous haste to be big—the kind of popular mind that is implied by it—that makes the judicious melancholy. The *Toronto Globe*, commenting upon the appointment of a Commissioner of Publicity and Industries for Toronto thinks that “the notion that a few more factories pulled in from outside towns, a few more miles of streets and buildings, a few more people gathered together within the city limits would add to the greatness of the city and to the honour of its citizenship” is “grotesque folly”. The *Mail and Empire* is strong upon the unfriendliness to other towns of trying to tempt works from them, and the unfairness to existing manufactures in Toronto to offer special inducements to others to come in. All this is delightful to read; especially the argument of the *Globe* that “the city itself—the opportunities and comfort and wholesomeness of its life—is its own best publicity agent”; that, “by improving the conditions of life in the city,” the City Council “will help to make Toronto not only a magnet to outside enterprises but also a place worth while for its own citizens.” There is nothing vulgar about *that* idea; *a place worth while for its own citizens*. What a vision of dignified enjoyment of life this calls up, compared with that other idea of haste to be big, to beat some other town in size—to be rich, if you will. Does that last possibility invalidate all protest? There is no truer philosophy of life than that those who “covet after” money (or desire it unduly), pierce themselves through with many sorrows. And it is unquestionably an undue desire for wealth that makes its attainment condition life so as to postpone the enjoyment of the passing years.

It is common talk, among those who knew Toronto thirty years ago, that the present city, with all its “improvements,” is not nearly so pleasant to live in. What are the improvements? In general they are material; light, power, means of locomotion; not civic improvements in the true sense of the term, but commercial ventures of corporations formed not so much to contribute to the happiness of the public as to profit by their necessities; and the noise, dust and crowding together, which are the disagreeable elements of city life, are so much accentuated by some of these improvements that to them may be attributed a principal share in the gradual growth of the unpleasantness that distinguishes the Toronto of to-day from the pleasant city of thirty years ago.

Mere size and the accompanying disintegration of society have of course an important place in the changed conditions of life as cities grow. These are unavoidable and it is no doubt necessary to give up with a sigh some of the former charms and turn our attention to making new ones which will mitigate the evil of mere size. To aim principally at increasing it is certainly not the way.

Here is what the *Globe* has to say upon the subject, after advocating the adoption of a definite policy of

action with regard to propositions that have already been made for the beautification of the city by a scheme of parks and driveways, lake-front and island improvement, beauty-spots, playgrounds, &c.:

“To deal with these problems would require intelligence and constructive statesmanship far beyond that involved in the appointment of a Commissioner of Industries. It is by solving these larger problems, by improving the conditions of life and beautifying its surroundings, by letting some touches of nature get back into the lives of the children who must play in the streets and of their parents who must toil in the factories—it is by progress in ways such as these that Toronto will, indeed, become a great city, and not by mere breadth and bigness.”

This is the gospel of civic improvement in brief. This must play a part, and a fundamental part, in any policy for a city's growth, Without it—to increase the labourers in a city, (and we are all labourers), and make no provision for their life—is a senseless and sordid policy that ought to be, and we may hope is, out of date. If an effort is made to increase a city's size, a parallel effort should be made to prevent greater size making the city less fit to live in. The appointment of a Commissioner of Publicity should not be made without appointing also the Commission for Civic Improvement which was so forcibly commended to the city of Toronto by some of its greatest citizens last January. The city will grow without a Commissioner but it cannot become great without the Commission. To add to the traffic on the old lines will only increase the unattractiveness of a city which is already too big for its present plan. There must be new lines of traffic run by a Commission with power to buy and sell land for the purpose. For a great part of its work we are assured such a commission would only want a loan; but it need not be required to be entirely self-supporting for it is likely to be a better agent for publicity—a greater “magnet to outside enterprises”—and in a more permanent and wholesome manner, than the publicity commissioner himself.

QUESTIONS FOR STRIKERS.

A friend of mine, whom I have known for years as a carpenter's foreman but who is now an employer, raised a couple of questions the other day, apropos of the carpenters' strike in Toronto, which seem worth passing on.

The first question is: Since perpetual rises in the wage of carpenters seem to better them but little, who gets the money. He observes that a house he bought some years ago for \$600 is now worth \$1,500, although it is not as good a house as it was, and he has come to the conclusion that he has got some of the money. And, if the value of this house has risen by mere pressure in the atmosphere of prices, he argues a prompt response in the value of houses which are being built when the strike and the rise in wages occurs. Thus, if wages rise 10 per cent., a house, which was to cost \$2,000, promptly becomes worth \$2,200. The owner is none the worse and probably a little the better; for these uncertainties in the building business require the insurance of plentiful value for houses. But, it will be said, the strikers are richer too. Are they? That is the question. They get more money, but they have raised prices in getting it. They have to live in the houses of which the rent has gone up 10 per cent. Their butcher and baker are in the same position: but these can distribute their rent in the price of bread and meat, so that it is repaid to them. By whom? Ap-

parently by the wage earner. It looks as if the wage earner if he succeeds peacefully in getting his rises, will neatly dispose of everything he gets, without being any the better for it; while if he agitates much, so as to scare prices up unduly, he will be in a worse case than he was before.

The second question is concerned with the limitation by the unions of the number of apprentices in a trade. This, for example, in the bricklayers' union, is one apprentice to every seven journeymen.

Now the average family consists of five—the parents and three children; so that the seven journeymen have twenty-one children, of which only one boy may work at their trade. There are other trades of course, but they are equally blocked, and equally stocked with children. It is a clear case (speaking in averages) of twenty-one children to one apprenticeship. Of these one half are girls, perhaps a little more; which seems to be a provision of nature for the comfort of the world. Suppose there are nine boys, what becomes of the other eight, born to be craftsmen and denied the right to learn a craft. My friend is nervous about the capacity of the jails. Honest beggary he says is of no use, because, though the advance of the world has made no difference in the rich man—he still fares sumptuously every day—the beggar can no longer lie at his gate but is moved on.

Doubtless the young men find work, but that is not the whole question. There is a suspicious parallelism between these two questions which suggests a doubt whether all this forcible direction of work and wages into artificial channels is for the real interest of wage earners, who have to pay every cent of the artificial price and make nothing out of it. Would not nature be more kind—the natural law which gives good wages to a good workman, and the best wages to the best? This provides the margin of profit in all trades, and keeps prices at their natural level; inasmuch as one has not to pay for poor work the same price as for good?

A TALK ON CEMENT.*

CONCLUDING PART—CONCRETE.

Our first article on this subject treated of the nature of cement and its use for mortar. The second treated of testing. In this number we propose to speak of the second use of cement, viz., for concrete.

A concrete consists like ordinary walling of mortar and stone or its equivalent. The function of the mortar is greatly increased so that it constitutes about $\frac{2}{3}$ of the wall, wrapping the other material all round like a mould; hence the mortar is called the "matrix" or mould (literally, womb), and the other material—stone, shingle, cinders, slag, etc.—is called the "aggregate."

The great thing is to get the concrete solid, without any interior honeycombing. This can be done by proportioning the three constituents of the concrete—cement, sand and stone (or other aggregate, but we may take stone as the type)—so that each fills completely the interstices of the other. And, if the stone is crushed so as to be of various sizes, and the sand has grains of various

size, these will fit into one another and help to solidify the mass.

The voids in sand and the voids in aggregate will vary from twenty-five to fifty per cent. They are to be measured accurately by filling a water-tight vessel with the sand or aggregate and adding water until it flushes even with the surface of the contents of the vessel. The increase in weight due to the added water, compared with the volume of that weight of water, gives the volume of the voids in the sand (or of the cement required to fill them), and is expressed as a percentage of the sand.

Suppose it is desired to produce a solid concrete, knowing the voids to be—sand, 35 per cent.; aggregate, 40 per cent. The volume of sand will shrink about twenty per cent. when wetted, and the volume of cement about ten per cent. The voids in a volume of wetted sand are therefore $\frac{35}{100}$ of $\frac{80}{100}$ or .28. The volume of cement, when wetted and reduced ten per cent., becomes .90. It is obvious that three volumes of sand, with voids equal to $.28 \times 3$, or .84, will be properly filled by one volume of cement. The mortar or matrix will therefore be 1 to 3. The volume of this mortar will probably be about equal to that of the wetted sand, or $\frac{80}{100}$ of $3 = 2.4$ volumes. This is just equal to the voids in six volumes of the aggregate described above, in which the voids were .40 of the whole. This means that a 1:3:6 mixture will give solidity.

Angularity is an advantage in the aggregate, as the bond with the cement is then strongest. For this reason crushed limestone is to be preferred to such aggregate as gravel or water worn shingle even when these are free from the loamy or earthy matters which are apt to be an objectionable accompaniment to them. Stone should be freed by screening from the dust that accompanies crushing. Cinders and slag have the advantage of lightness. Cinder concrete only weighs about 100 pounds per cubic foot, while a cubic foot of limestone concrete weighs about 150 pounds. Cinders, therefore, make a good aggregate for concrete flooring; and for other purposes, where strength is not necessary, cinders and slag have the advantage of economy. Aggregate masses more compactly (as already stated), if it is irregular in shape and varied in size. It should not be larger than two inches in any direction.

Sand should be clean, sharp and coarse, but preferably of grains varying in size. It should be free from clay, loam, sticks or other impurities.

Water should be clean and free from sulphuric acid or strong alkalis. City water has a standard quality that is known; but in country work the character of the water is worth investigation. A factory two or three miles up stream has been known to spoil a batch of concrete.

Mixing by hand requires tight platforms of sufficient size to accommodate men and materials for the progressive and rapid mixing of at least two batches of concrete at the same time. Batches should not exceed one cubic yard each, and smaller batches are preferable, based upon a

*Based on a paper on The Cement Industry of Ontario by Mr. P. Gillespie in the report of the Bureau of Mines of Ontario; Vol. XIV, Part 1.

multiple of the number of sacks to the barrel. The sand should be spread evenly upon the platform, then the cement upon the sand, and all mixed thoroughly until of a uniform colour. The water necessary to make a thin mortar is then added, and the whole spread again. Upon this the aggregate is thrown, after having first been wetted down if dry. The mass is then turned with shovels or hoes until thoroughly mixed; the aggregate covered with mortar. This will probably require four turnings. Sometimes the sand, cement and stone are spread upon one another, in that order, without water. Then the water is added and the whole mixed thoroughly as above.

In machine mixing, which is desirable when the volume of work is large, the same process should be obtainable, viz., a thorough dry mixing of the sand and cement before the aggregate and water are added; and the machine should be so constructed that the mixing may be continued until a satisfactory and complete incorporation is accomplished. Concrete of the right consistency will not, when dumped in place, require much tamping. When spaded down and tamped sufficiently to level off, it should quake freely like a jelly. The tamping must be done at once before the initial set begins.

The top of each course should be levelled to a plane as nearly as possible at right angles to the line of pressure, but its surface should not be smoothed in the process but left rough that the next course may bond the better with it.

An uncompleted course should be left with a vertical joint where the work stopped. Vertical joints, to allow for expansion and contraction, are made in long exposed walls at intervals of thirty to fifty feet, or longer when the concrete is reinforced. A temporary end is made for these sections of wall by setting up a form or plank and finishing a section against it. The plank is then removed and, when the next section is built, the new concrete is placed against the old without mortar flushing. "Locks" are used to mitigate the disadvantage of the straight joint.

It is essential that the form shall be unyielding. For this end it must be braced or tied together by means of wire or rods. The material should be dressed lumber, secured to the studs or uprights in horizontal lines. Planking once used in forms must be cleaned before being used again. In dry but not freezing weather, the forms should be drenched with water before the concrete is placed against them.

Forms must not be removed for forty-eight hours after all the concrete in that section has been placed. In freezing weather they must remain until it is certain that the concrete has had sufficient time to become thoroughly set.

A facing for the wall—of mortar of the same proportions as used in the concrete, or mixed with a special form of aggregate—can be placed next to the forms immediately in advance of the concrete. The usual finish is a wash of grout, of about the consistency of whitewash, mixed in the proportion of one part of cement to two of sand, and applied with a brush. The same finish

should be applied to seal the pores in wall tops which are not finished with a coping of stone.

Cracks in concrete lead to deterioration from the action of water and frost. To prevent this reinforcement is necessary. Reinforced concrete when properly built will not crack like plain concrete. As it is also not susceptible to atmospheric influences like stone masonry, Mr. Gillespie concludes that re-inforced concrete is the only form of construction that is really permanent.

The other advantages of this form of construction are thus summarized in an editorial article of *The Engineering Magazine*:—

"Among the many advantages of concrete-steel may be mentioned cheapness as compared with other types of massive construction, lightness, economy of space on account of thickness of walls, capacity for carrying heavier loads, ready adaptability to any desired form, speed of construction, fireproof qualities, and safety on a very poor foundation material, since the structure hangs together as a whole, and when overloaded does not collapse suddenly, but tends to deform gradually."

On the other side it should be said that, however scientific the system, it is difficult to use it scientifically for want of proper data. Mr. George B. Post, in the discussion on the subject at the International Congress, said that "those in large practice as architects in the United States use ferro-concrete with considerable trepidation, from the fact that there are no established constants that can be used in computing the strains." The position of the neutral axis in different conditions and under different loadings seemed also to give Mr. Post and others in large practice as architects anxieties from which some more courageous builders are free. The quality of the ingredients also and the manner of mixing contribute to their trepidation. "In fact," Mr. Post added, "their opinion of the material was very much like that of the distinguished Mr. Weller with regard to veal pies—they were 'werry good things when you knowed the lady as made them.'"

In the matter of reinforced concrete at present, the maker of the pie is usually the system-reviewer of the different systems of reinforcement is beyond the scope of this article. They are described in full with illustrations in the various works on concrete construction; and one of these is likely to be in the hands of any architect or builder who is working on a scale sufficient to require their aid.

Lead wool is a material recently used to a considerable extent in Europe for the joints of gas and water mains. It consists of fine threads cut from virgin lead, and is sold in strands about 3 feet long and weighing about a pound. Yarn is first put in the joint in the usual way but to a greater depth, and then the lead wool is calked in without heating. Each turn of the wool around the pipe must be well calked before the next one is inserted.

There are many quarry operators who imagine there is such a thing as a cheaper cap for setting off dynamite charges. This is like the man who curtails his food allowance, or the one who "bites off his nose to spite his face." There is no cheaper than the very best. What you are looking for is the cap which will explode the entire charge at once. The amount of powder wasted in partial explosions by the use of inefficient caps in the lime and cement quarries of this country would represent a fortune every year. This is one case where you are looking for the best to find the cheapest. —*Rock Products.*

OUR ILLUSTRATIONS.

HOUSE FOR MR. J. C. GORDON, ASSINIBOINE AVENUE,
WINNIPEG. MESSRS. DARLING, PEARSON AND
OVER, ARCHITECTS, WINNIPEG.

The key to the plan of this house is evidently the clear outlook to the river in the rear. The kitchen department therefore comes to the front, compressed into the projection on the front, which, being a projection, clears the lookout from the front verandah and the rest of the house, and gives independence in elevation for the awkward diversities which are apt to occur between different departments of the plan. The high line of the window sill in the servants' bedroom is a note of distress on the other side of this question; a suggestion of caution—excessive caution one would say, considering the effect upon the room—in connection with the freedom of this window from over sight from the rest of the house. The kitchen lookout in front is stopped too, but there is no severity here as it is clear at the side. The rest of the house is pleasantly grouped round the staircase hall. The spacious verandah overlooking a private lawn appeals to the imagination in the present weather. This ought to be a typical Canadian verandah plan. We are an open air country and our verandahs are rooms out of doors. To plant this room as is usually done at the front door, in the way of arrivals, exposed to the dust, noise and publicity of the street, is not the proper idea at all.

HOUSE FOR C. W. COLBY ESQ., MONTREAL. MESSRS.
P. E. NOBBS A. R. I. B. A. AND D. R. BROWN,
ARCHITECTS; MONTREAL.

A COTTAGE ON A HILLSIDE FOR E. RUTHERFORD ESQ.
PROFESSOR P. E. NOBBS, ARCHITECT,
MONTREAL.

The coloured originals of these drawings get little justice from photography, but the plans are fortunately decipherable. These show that the Montreal house turns its back to the street, while its family rooms—dining-room and drawing-room, with sitting-room and balcony above—are turned to the view. This house is interesting as a study of simplicity that is not formal, or freedom within the limits of a street front on a sheer building line.

The cottage on a hillside has this freedom unrestrained by limitations of site. It is not however, unrestrained. Each elevation is quiet; but nothing is formal. No feature seems to be forced from its natural position, nor are there any extraordinary features. The slight touch of formality in the front door is charming. In all other respects the exterior features are quite simple but the elevations are full of life and interest and are well worth study.

If one may venture to sum up under one head, (as a point for study), the excellence of this design, as compared with so much Canadian work that can rank as an architectural effort, it is in the matter of scale. Anything in the nature of a cottage in this country, (following the United States), has always some Brobdingnagian feature that knocks out of it any claim to be "a cottage of gentility"; some swaggering bay, with an avalanche of roof swooping round it; or a "porch" that takes the air pompously to be seen of men.

Vulgar pomposity is for palaces, but cottages must be refined to please; and one great secret of refinement is a modest scale, consistently adhered to.

OUTREMONT CONVENT, NEAR MONTREAL. MR. J. Z.
RESTHER, ARCHITECT, MONTREAL.

Mr. Resther's handsome portico is a beautiful object, and no doubt, a satisfaction to beholders, especially his clients; but we must confess to an admiration for the simplicity of the old buildings built of this stone, and a regret that the sentiment felt for them by architects in Ontario does not seem to be fully shared in the province where the stone is used. The old path in this work is one which there can be no shame in following. It is good in all styles, for its excellence is in the breadth which is a border-land common to every style in its simple work. To try for anything else is up-hill work with coarse material. It is interesting to note the departure from the old conventual manner employed here; the progressive projection towards the centre, in harmony with the new idea. The composition is certainly spirited. But Mr. Resther has been guilty of making a comfortable top storey, whereas the law of true Renaissance composition is that this must be uncomfortable. One can see how it would improve the grandeur of the building if the top storey were uncomfortable. It is better to sin against style than utility. But is there not a third way, in buildings that ought not to be expensive, viz., to hold to the inexpensive manner that is so charming in the old work?

SELECTIONS FROM PHOTOGRAPHS TAKEN IN FRANCE AND
ITALY BY MR. J. P. HODGINS, TORONTO.

The Piazza della Erbe, (the market place), of Verona, is given by Dr. Steübben as one of his examples of the irregular shape of old places of this kind in Europe. It is wider in the middle than at the ends and wider at one end than at the other.

The view of Versailles is taken on the grand vista, from a spot that cannot be distant from the palace more than half the length of the vista; near the artificial water that forms the object of interest in the middle distance of the view. The scale of the grounds, all laid out in formal avenues, may be gathered from this. Mere size kills enjoyment of the palace, which depends as a design upon composition, and is too large to be seen all at once, except as a distant object, but with the grounds it is different. Size is their merit. In the soft French atmosphere the aerial perspective of long rows of trees has a kind of beauty one cannot see elsewhere; realizing a magnificence of conception which we are accustomed to expect only from the inexpensive art of the scene-painter.

BUILDING RESTRICTIONS IN MONTREAL.

The Montreal City Council has recently passed the following enactments regulating the construction of buildings, etc., in various thoroughfares:—

"It shall not be lawful to construct, occupy and maintain any factory or livery stable or other similar place of business, nor shall it be lawful to fit up or repair any existing buildings to be used as such, on the following streets, namely:

"(1) Both sides of St. James and St. Antoine streets, from Bourget street to St. Ferdinand street.

"(2) The east side of Ferdinand street; west side of Bourget street; both sides of St. Peter, Metcalfe, Agnes streets, Park terrace, Park avenue, and Annie street, from St. James street to St. Antoine street.

"(3) The east side and west side of Beaudoin and DeLinelle streets, between the Lachine canal and the G.T.R. Company's tracks, and all the streets presently existing or which may hereafter be established within the district bounded by Beaudoin street, the G.T.R. Company's tracks, DeLinelle street and the Lachine canal.

"Every new building erected on the lots fronting on either side of Guy street, shall have a frontage of ashlar or cut stone or cement, or iron or pressed brick of the best quality, capable of supporting a pressure of 750 pounds per square inch, or of any other durable and incombustible material (to the exclusion of wood, wood and brick, wood and stone, wood cased with sheet-iron, for external walls). Ornamental terra cotta or cement may be used to ornament the frontage. The cornices shall be of sheet-iron, copper, stone, brick or cement."

THE SEVENTH INTERNATIONAL CONGRESS OF ARCHITECTS.

BY A CORRESPONDENT.

Even the most energetic and ubiquitous of reporters would have found it impossible to attend all the meetings and functions arranged for the edification and entertainment of the members of the 7th Congress of Architects. These had to be arranged to overlap because of the large number attending—some 1,700—and because everything had to be crammed into the space of one week. And a busy week it was, mornings and afternoons and evenings being all filled up—in many cases doubly and trebly—so that members had to make a selection of the subjects and places of most interest to them. The evening functions to which all were invited were very crowded. The making of all the necessary arrangements must have involved an enormous amount of thought and labour, and the smoothness with which everything moved showed how efficiently the work was done. The weather was ideal throughout.

That these Congresses accomplish the purpose for which they were designed may be assumed from the fact that they continue to be so largely attended by busy men from far distant points. It appears to be decided that the next one—in 1908—is to be held in Austria, and Mr. Cass Gilbert put in a claim for the succeeding one being held in the U.S.A., while the representative of Japan looked forward to welcoming his confreres to the land of the rising sun. The catholicity of art is emphasized by the large number of nationalities represented. Locally and individually architects may have their petty rivalries and jealousies, but there is no international rivalry of this sort, and a true international rivalry in art is a large-souled thing that can only be productive of good. Such Congresses as these must tend to further the ideas of *l'entente cordiale* and Imperial federation just as certainly in their degree as the inter-parliamentary one now being held in London. Accredited delegates were sent by nearly all of the Governments of Europe and by a large number of societies and municipalities in these countries and in the U.S.A., while ten societies in the British Colonies sent delegates, as did also the municipality of Montreal. The name of the O.A.A. was conspicuous by its absence from this list. It struck some of us as being a little odd that out of all the delegates from the British Colonies no one was named to reply to the address of welcome at the Guildhall, nor to the toast of "The Foreign Delegates" at the banquet. Perhaps this should be taken as a delicate compliment designed to make these Colonial delegates feel at home by the implication that "we're a' John Tamson's bairns," and so not to be treated as strangers.

Such a Congress as this is probably more valuable from a social than an educational point of view in that it affords architects opportunities of becoming personally acquainted with their brethren of other countries. The reading and discussion of papers must necessarily be somewhat per-

functory amid so much hurry and bustle, and the discussions are sometimes difficult to follow, owing to different languages being spoken. One cannot but notice how usual it is for professional men on the Continent to speak fluently, besides their own language, at least one or two others of which English is usually one. Many of the foreign delegates spoke in excellent English. In this matter English-speaking people are far behind. But fortunately Latin and Greek are not now the fetishes they used to be. It was encouraging to meet the other day a well educated Canadian youth who knew no Latin, but did know French and German. The papers were of the kind usually read at such meetings. New and striking ideas are not to be expected there. It is not surprising that some of the resolutions passed on the questions discussed were rather colourless, if not inept, e.g., that in regard to educating the architect as a craftsman. That referring to the preservation of ancient monuments was good and advocated necessary repairs as opposed to restoration.

It was noticeable that of the buildings visited solely for their architecture, only two were contemporary work. Probably all the members would be familiar from photographs and books with the monuments of ancient architectural art which were visited. But in seeing the actual buildings with the scenery and surroundings in which they are set, one gets a truer impression of them than any photograph can give. The mind is carried back to the times when they were built and can realize how expressive a living art is of the character of the men who wrought in it and the conditions under which such results were produced. The lion oak in the park at Hatfield was pointed out by Colonel Balfour, who did the honours there, as having been mentioned as a landmark in Domesday book. If that venerable oak could only speak! The pity is that modern eclecticism produces so few works that can be shown to visitors as being worthy to be ranked with those of the past.

The exhibition of architectural drawings and pictures was so good and so well arranged that one wishes it could be made permanent. The attentions shown to visiting members maintained the traditions of British hospitality, and some great houses inaccessible to ordinary visitors were opened to them. The banquet which closed the proceedings was an unqualified success and was attended by some 500 ladies and gentlemen. For the first time, ladies had an official status by being given the opportunity to become members, and were thus enabled to take part in all the Congress proceedings as a matter of right. This added much to the brilliance of the banquet in particular. Many of the foreign as well as the British members were accompanied by their wives, and many different types were there from the fair Saxon of the North to the dark-hued daughter of the Sunny South. The President of the R.I.B.A. made an admirable chairman, and the speaking was good and to the point. Altogether it was a fitting and happy conclusion to the Congress.

ILLUMINATION OF A WAREHOUSE.

By ERNEST C. SMITH, M. E.*

There are buildings for many lines of business in which the theory most commonly applied to the lighting installation is that the men experienced in these respective lines know best "where they want the lights." If this were naturally true it would leave much gross misuse of the means of illumination to be accounted for. It is also much more commonly believed that close calculation and the use of highly efficient accessories for the class of lighting installation with which we have to deal in this number is extravagance. It is fortunately possible to make rather close comparisons between different methods of

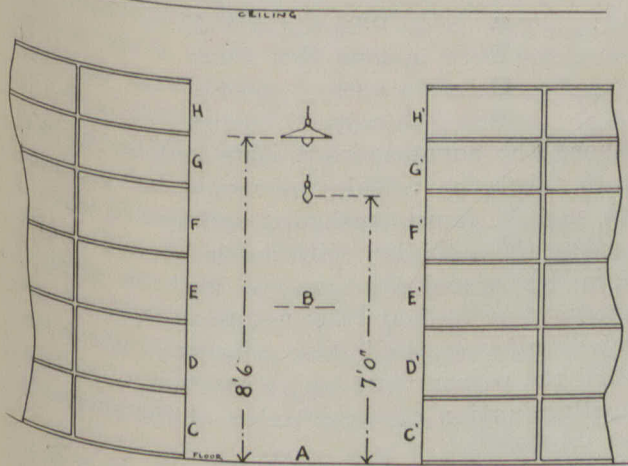


FIG. 1.

is to say, the illumination varies inversely as the square of the distance from the source. If the plane of illumination is not perpendicular to the rays the result of this calculation must be further multiplied by the cosine of the incident angle.

For the conditions illustrated in Fig. 1 we will first consider the use of an ordinary 16 C.P. incandescent electric lamp with clear bulb hung in the middle of the aisle and 7 ft. from the floor. On consulting the Uniform Illumination Curve of this lamp the following intensities of direct illumination will be found at the various stations:

- A—0.12 foot-candles.
- B—0.75 " "
- C—0.18 " "
- D—0.35 " "
- E—0.75 " "
- F—1.75 " "
- G—1.75 " "
- H—1.0 " "

If four of these lamps were placed at equal distances, that is, about 10 ft. apart along this aisle the minimum illumination in the plane B for reading purposes would be about 0.4 foot-candles, which is entirely insufficient. This method of lighting is open to the obvious criticism that the high intrinsic brilliancy of the lights materially reduces the apparent illumination of surrounding objects, with the lamps in this position.

We will next suppose the same 16 C.P. lamps to be swung 8½ ft. above the floor and fitted with flat porcelain cone reflectors. Referring again to the Uniform Illumination Curve of

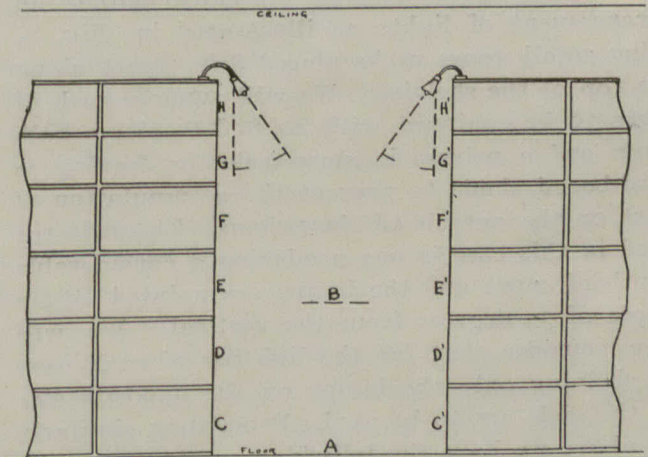


FIG. 2

this unit the following intensities at the various stations are readily calculated:—

- A—0.19 foot-candles.
- B—0.75 " "
- C—0.21 " "
- D—0.36 " "
- E—0.67 " "
- F—1.2 " "
- G—1.9 " "
- H—0.75 " "

If placed 10 ft. apart as before the minimum illumination in the reading plane B would be 0.48 foot-candles, which is still insufficient, but would enable reference to orders, as the lights themselves are further out of the direct line of vision.

As a check on the difference in efficiency be-

lighting where efficiency is of prime importance. The problem in hand is the lighting of a wholesale warehouse, the stock carried being hardware and cutlery. The building in question is 133 ft. front by 130 ft. deep, four stories and basement. All of these floors are used for stock except the ground floor one-third of which is used for offices and the balance for shipping and receiving. Inasmuch as a complete description of this installation would entail much repetition and some very obvious information I have decided to simply illustrate the application of illuminating engineering to a problem of this sort without any attempt to rehearse the schedule of equipment actually used.

Fig 1 is a sectional view of the shelving on either side of one of the second floor aisles 43 ft. in length, with a window at one end and the main aisle at the other. The points taken for the calculation of illumination will be floor A, the plane in which orders and shipping memoranda would ordinarily be read B, and the centre of the space above the various shelves C, D, E, F, G, and H.

The illumination is measured in terms of the strength of the incident rays and the distance of the object from the radiant source. Where light is measured in "candle power" and distance in feet, the common unit of illumination is a foot-candle, i.e., the illumination on a plane perpendicular to the rays at one foot distance from a light source of one candle power. For all light sources of relatively small size the law of inverse squares applies very closely to the direct illumination, that

*Engineering of Illumination, Aikins Building, Winnipeg.

tween reflectors we will consider these lamps in the same position but fitted with a form of prismatic glass reflector, having a diffusive coating of enamel. We will also assume that the tip halves of the bulbs are frosted in order to cut down the intrinsic brilliancy of the light sources within visible range. The uniform illumination curve of this unit shows somewhat better distribution below the horizontal and the following intensities at the several stations:

- A—0.35 foot-candles.
- B—1.2 “ “
- C—0.34 “ “
- D—0.5 “ “
- E—0.75 “ “
- F—1.6 “ “
- G—1.7 “ “
- H—0.8 “ “

In this case the minimum illumination in the reading plane would be 0.5 foot-candles, which is not much greater than with the flat opal reflector. With the half frosted lamps, however, and the use of diffusing reflectors the apparent illumination is very much increased, in fact the increased degree of comfort experienced with lights fitted as in this example would easily increase the visual effectiveness of the illumination twenty per cent. as compared with the preceding arrangement.

It is obvious that the lighting as shown will not go very far towards illuminating the innermost parts of the shelves. Neither is this necessary to be accomplished in any marked degree, but an improvement in this direction is of considerable benefit. We will therefore adopt an arrangement of lights as illustrated in Fig. 2, using small goose necks placed 8 ft. apart along the top of the shelving. We will suppose each of these to be equipped with an 8 C.P. clear bulb and a prismatic glass reflector, having a card-board shade to prevent the accumulation of dust on the outside of the prisms. The reflector used in this case is one producing a considerable depth of curve and the lamps are pointed at an angle of 35 degrees from the vertical. We will now consider that for the lighting of each row of shelving only the lamps on the opposite side of the aisle are to be used. Proceeding similarly as above we have the following results:—

- A—0.3 foot-candles.
- B—1.15 “ “
- C—0.5 “ “
- D—0.7 “ “
- E—0.75 “ “
- F—0.7 “ “
- G—0.52 “ “
- H—0.45 “ “

It will be observed that this illumination is much more uniform and that the average illumination on one side of the aisle is nearly as high as was obtained with the use of 16 C.P. lamps located as before described. It therefore seems probable that an arrangement of lights above the shelving, each row controlled by a switch at the end of the shelves on the opposite side of the aisle (i.e., the shelves to be lighted by the lamps

controlled), would under the conditions of actual use result in much greater economy of current as well as provide better illumination.

The uniformity secured under this arrangement will be better understood on calculating the effect of neighboring lamps. Considering the section in Fig. 2 to be anywhere throughout the length of the aisle the following intensities are obtained without any allowance for diffuse reflection:—

	Maximum.	Minimum.
A	05.	0.4
B	1.45	0.9
C	0.68	0.4
D	0.9	0.55
E	0.93	0.53
F	0.9	0.4
G	0.66	0.5
H	0.57	0.5

About the same average illumination at the points taken for calculation would be produced with 16 C.P. lamps unshaded and spaced every 8 ft. along the aisle, but with much less uniformity and far less visual effectiveness. With the arrangement now arrived at it is not necessary to use frosted bulbs, as the lights are always above and behind the person working at any row of shelves. The illumination of the interior of the shelves is also improved.

What we have done so far, however, is only to improve the illumination. The cost of this must be considered.

We will assume that the switches will be placed conveniently so that one row of 8 C.P. lamps will be turned on the same length of time as would the row of 16 C.P. lamps in the first arrangement above described. The cost of equipment per the last description is \$9.25 more than according to the first method. The consumption of power in the last case will be 160 watts as against 280 watts in the first case. With current at 8c. per K.W.-hour the saving effected during the life of the first installation of bulbs will be \$19.20 plus \$1.25 for renewals, when using only one row of lamps, or a total saving of \$20.45. Deducting the extra first cost, we have a net saving of \$11.20 during the life of the first installation of lamps. A liberal allowance for maintenance would not reduce this saving below \$10.00. In the building under consideration there are some 3,600 ft. in length of aisle, with shelving on both sides, so that corresponding economy throughout the building means a net saving of \$830.00 before the first set of lamps is discarded. Figuring the cost for renewals and 20 per cent. for breakage of reflectors and with the same liberal allowance for maintenance, the saving while the second lot of bulbs is in use will amount to \$1,286.00. This does not take into consideration the lighting of offices and shipping department.

In this warehouse there are some thirty different arrangements of shelving and in some cases the requirements were such that some modification of the arrangement shown in Fig 2 was necessary. Throughout, however, the same principles were applied that have been illustrated and in many cases a more marked improvement in the illumination has been effected than under the particular conditions chosen for an illustration of average requirements. Of course it is essential that the actual voltage be tested and that good lamps of the proper duty be purchased for the available voltage in order that the full benefits of such calculations as above described may be realized.

MONTREAL NOTES.

There is from time to time talk of a new bridge which is to span the river opposite the city. Just at what point has not, we believe, ever been precisely defined—perhaps because not definitely known, perhaps for prudent financial reasons. It has recently been announced, however, that preliminary operations are now well under way and various particulars have been published in daily papers. This project if it is to be immediately carried into effect as announced—for it is said that two years will see the completion of the work—must materially affect the aspect of the city. An integral part of the project is to be a railway station and hotel, for it is expected that the Delaware & Hudson and other railway lines on the south shore will obtain running powers over the new bridge. The promoters are the Montreal Bridge and Terminal Company, and it is expected that the tolls levied will in time pay for the erection of the work. The actual bridge is to be of cantilever principle, with a main span of 1,500 feet and clear headway of 150 feet. It will consist of two roadways at different levels—the lower for trolley and general traffic, the upper for railroad business. It must therefore practically pass over the down town portion of the town plying across St. Paul, Notre Dame, St. James, and Craig Streets and joining the up town traffic about St. Catherine Street, probably not very far from Bleury Street. The upper line will have to travel some distance farther inland before striking terra firma. The designer is Sir Douglas Fox, who designed the bridge over the Victoria Falls, on the Zambesi River. The cost spoken of is \$12,000,000, the capital being raised in England.

It has already been remarked in these notes that, as in London, England, enterprising people dream garden cities where the men of the future shall live in health amid the beauties of nature, so in Montreal aspiring minds dream grand hotels and apartment houses. In both cases, of course, a number of the schemes come in time to fruition. One of the most recently announced projects of this nature is the formation of the St. James Realty Company to erect and operate a great down town hotel. The eastern portion of St. James Street and Victoria Square are mentioned as probable sites.

Last month it was noted how many yawning chasms appeared in all the principal streets of the city. This month from these pits have been growing great crops of tall steel stanchions and framing—a sort of forests which resound with the deafening "purr" of the rivetters. Another ten-storey building, that for the Canadian Express Company, is preparing for McGill Street.

Whilst a good deal is being done to abate the telephone pole nuisance another forcible argument against them has asserted itself. On one day—the 29th of July—two street car conductors were killed while collecting fares on the step of their cars by being dashed against these cumbersome of the ground. Considering the great rapidity with which during the past few months the mo-

tor car has been coming into vogue one might almost be permitted to hope that the trolley car with their horrible and dangerous overhead wires may themselves be superseded before very long, and then at last we shall have a chance to see what the architecture of the city is really like.

We publish a view of the new Cremazie monument in St. Louis Square, which was mentioned last month. Application has been made to have



MONUMENT TO OCTAVE CREMAZIE, ST. LOUIS SQUARE, MONTREAL.

a railing put round this—not in itself a desirable object, but apparently necessitated by the disrespect of the local small boy, who insists on making the soldier's cocked hat a receptacle for dirt and rubbish! Children have also a fancy for scrambling over the poor old fellow and sitting on his knee, which seems not so unnatural or harmful.

THE P. Q. A. A. SKETCHING CLUB.

On Saturday, July 14th, the Sketching Club visited the ancient town of Chambly, which has been in existence since 1665. Besides the well known fort there exists quite a number of old stone houses, amongst which are some of typical colonial character, others are more thoroughly Canadian. The De Salaberry house has a verandah with quaint Doric pillars. The little old Protestant church has a colonial porch and a twinkling tin-scaled belfry which has quite a charm. At Chambly Canton the woolen mill is a picturesque group of buildings, the old rubble of which is full of delightful colour.

On August 4th the visit was to the new Commercial and Technical High School, which the Protestant School Commissioners are building on Sherbrooke Street. Class rooms are provided for the teaching of drawing, chemistry and physics, cooking, sewing and other subjects. There is a large assembly hall and gymnasium in the

rear and play rooms for boys and girls in the basement. All the rooms are excellently lighted and amply provided with lavatory and cloak accommodation. The floors are of Oregon pine and



OLD STONE HOUSE, CHAMBLY CANTON, P. Q.

of Terazzo. The woodwork generally is of chestnut, and the central corridor eleven feet wide on each floor has a high dado of chestnut. Mr. A. F. Dunlop is the architect in charge of the work, and it was by his permission the visit was made.



PROTESTANT CHURCH, CHAMBLY, P. Q.

After looking over the school, members of the Club went over the works at the Nurses Home of the Royal Victoria Hospital, by permission of the architects, Messrs. Ed. and W. S. Maxwell. The buildings are of rubble stonework with dressings. The floors are supported on terra cotta arches of very wide span.

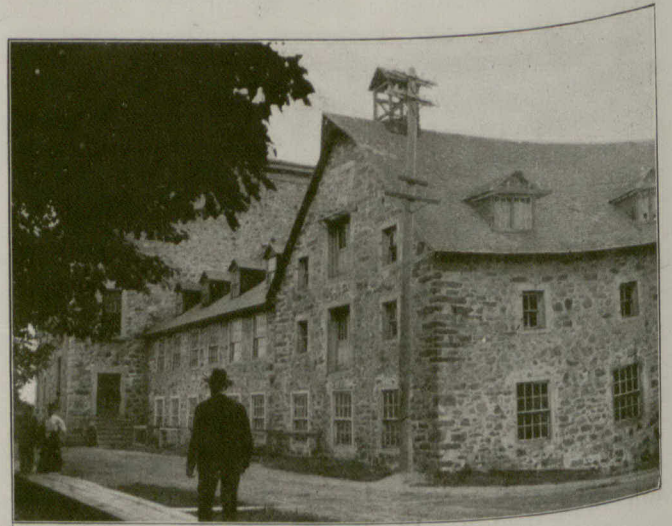
SOME RECENT BUILDING PERMITS IN MONTREAL.

Store for Henry Birks, corner of Phillip's Square and Cathcart Street; 90.0 front, 146 ft. in rear, 76 ft. deep; in five stories faced with sandstone; gravel roof. Probable cost, \$150,000. Contractors, Heggie & Stewart. Architects, Hutchison & Wood.

Three stores for Mrs. J. C. McIntyre, in Craig Street, near Victoria Square; in stone and brick; seven stories high with gravel roof; 142 ft. front, 125 ft. in rear, 135 ft. deep. Probable cost, \$143,000. Contractors, Peter Lyall & Sons. Architects, Hutchison & Wood.

Alterations to the property of La Banque Provinciale, No. 9 Place d'Armes. Probable cost, \$45,000. Contractors, O. Martineau & Son. Architects, Huot & Payette.

Cold storage warehouse in Queen Street, near William Street, 36 ft. x 97 ft., in five stories of pressed brick, for Lavell & Christmas Ltd.



WOOLEN MILL AT CHAMBLY, CANTON, P. Q.

Probable cost, \$36,000. Contractors, Heggie & Stewart. Architect, W. E. Doran.

A four-storey warehouse, No. 614 St. Paul Street, for T. S. Vipond & Co.; brick with cement and gravel roof. Probable cost, \$12,000. Contractor, Geo. Nicholson. Architects, Mavvicar & Heriot.

A four-storey warehouse, 37a to 37c St. Anthony Street, for the Kemp Manufacturing Co.; to cost about \$30,000; pressed brick with resin and cement roof. Contractor, Thos. Wand. Architects, Macvicar & Heriot.

Alterations to building for W. R. Brock, corner of Notre Dame St. and St. Helen St. Probable cost, \$30,000. Contractors, Heggie & Stewart. Architects, Cox & Amos.

House for J. J. M. Pangman, Ontario Avenue, near Sherbrooke Street; pressed brick, asphalt and gravel roof. Probable cost, \$20,000. Contractor, James Young. Architects, Findlay & McGregor.

House for M. B. Davies, Pine Avenue, corner of Peel Street; stone and brick, concrete roof. Probable cost, \$75,000; also stable to cost about \$8,000. Contractors, Dominion Engineering and Construction Co. Architects, Findlay & McGregor.

Two houses in Sherbrooke Street, corner of Mackay Street, for Mrs. M. A. Weir; stone and brick. To cost about \$25,000. Contractors, Rhéaume & Perrot. Architects, Huot & Payette.

Alterations to a church for l'Oeuvre et Fabrique d'Hochelaga, in Ontario Street, near Désery Street. Probable cost, \$39,500. Contractor, M. Huberdeau. Architect, Jos. Venne.

TWO PAPERS FROM THE INTERNATIONAL CONGRESS.*

THE EDUCATION OF THE PUBLIC IN ARCHITECTURE.

BY MR. JOHN BELCHER, A. R. A.

The following are abstracts of the paper read :

The first step, as so often is the case, will be for the public to unlearn much that has been wrongly learnt. The superstitions of antiquity and the "style" must be exploded. It must be made plain that neither a smattering of archæology nor a superficial study of styles affords a sound basis for a critical judgment in matters of present-day architecture, which must be presented to the eyes and ears of men as a living art, founded upon past achievements, it is true, but instinct with a power and vitality of its own.

Neither is architecture merely a matter of a beautiful exterior; the importance of the "plan" of a building and of sound principles of construction must be pressed home. In other words, architecture is a science as well as an art, a blending of the two in such a way that the practical knowledge of the builder or engineer is interpenetrated by the artistic spirit, and made without prejudice or loss to subserve its ideals.

Instruction of a positive order will range itself under the three heads of Principles, Qualities, and Factors.

The principles of architecture are two, Truth and Beauty. Truth requires that a building, both in its entirety and in its several parts, should never seem to be other than it really is.

This excludes all pretence of antiquity where no such claim exists.

It requires that a church should look like a church, a town-hall like a town-hall, and a private residence like a private residence.

An external shell of plaster over brick must not present the appearance of blocks of stone, nor a steel structure cased in terra cotta suggest solid masonry.

Good architecture never deceives the eye even for a moment.

There must be no false suggestion as to the purpose or construction of the building, nor any hiding under one external feature that which is usually expressed by another.

The principle of truth, however, finds its widest scope in the true use of materials.

Every material has essential characteristics of its own, and therefore a proper place and purpose in building. There is a time and a use for stone and for each kind of stone, for wood and for each kind of wood and so on.

To defy, neglect, or misuse the natural qualities of materials is not good architecture. These natural qualities will be roughly indicated under the head of Factors.

Beauty is the second great architectural principle. Its elements do not admit of popular exposition, but the public may be trained to recognize its presence by the appeal that it makes to their imagination and emotions. The fact that beauty can be felt, but not (ordinarily) analyzed, is of importance in the education of the public, as tending to withdraw their attention from mechanical rules to the spirit that animates and pervades, like a living thing, the highest architecture.

An appreciation of beauty of form is less common than susceptibility to colour effects, and needs training and development.

The qualities that distinguish good work from bad may be classed as follows :

Strength.—It is not sufficient that a building be, in fact, strong and secure; it must be so; it must satisfy the eye.

The engineer may by exact mathematical calculation know that the conditions of security are amply fulfilled, but the architect has to see to it that the work presents an appearance of strength and solidity. The larger and heavier parts must be below; every arch must have sufficient abutment or even a tie-rod as well; solids when placed over voids must be strongly supported, and so on.

Methods of support and resistance must be clear and well defined.

Granite in the upper storey of a half-timbered house may, as a matter of fact, be quite safe, but it seems to threaten danger; placed below it satisfies the eye with its impression of solidity.

Vitality.—Evidence of life and growth, most plainly illustrated in Gothic work, where the perpendicular lines rising heavenward and clothed (as it were) with luxuriant ornament suggest the life of a tree or plant.

It is vitality that gives ever fresh combinations and effects from the same primary elements.

Restraint.—The limitation of means to an end, the suppression of all unnecessary parts or details.

Whatever be the nature of the building, there should be purpose, definite purpose, in every feature or ornament.

This may be illustrated under the head of Proportional Divisions (see Factors); but the general principle is one which will be readily grasped by the intelligent layman, to whom it will often suggest a line for thought and inquiry.

Refinement is impossible without restraint, but it includes also purity of form and perfection of material.

Everything must not only be the best of its kind, but so suited to its purpose that Nature will seem to have expressly designed it for that use and place.

The fitness of certain materials and forms for defined purposes and effects is subject-matter for an important chapter in the education of the public.

Repose.—Every really good work is clothed, as it were, in an atmosphere of repose. There is a sense of power, but it is latent power; there is evidence of vitality, but it is restrained vitality.

Effects too pronounced hurt the eye; ornament too profuse wearies both the eye and the emotions. There must be no "loud" or vulgar elements.

Grace.—A dignified seriousness of purpose should be observed in the appearance of all public buildings, but an expression of the graceful courtesies of life should not be lacking. In domestic buildings this element of grace takes a more prominent place, and assumes a higher and more refined form, corresponding to the tender sentiments of home life.

The public interest ought to be readily roused in this direction, and a demand created for a better class of small suburban residence.

Breadth.—The treatment of the subject as a whole in a simple grand manner, the proper massing of the several parts, the subordination of detail to the larger forms of the composition and to the bringing of the whole design into unity.

An attempt may be made by illustration and comparison to explain this somewhat technical term, that the public generally may be led to understand and appreciate this quality of breadth which is so conspicuous in every great architectural work.

Scale.—The right relation of the several parts to one another and to the whole in point of size.

It will be pointed out that there are different scales in architecture as in music, and that the varying effects upon the mind and heart are as powerful and distinct in the one case as in the other.

Also that the scale should be appropriate to the character and purpose of the building. A building of a monumental character or of great public importance should be designed and built on a large scale, and each part and every moulding should be of a proportionate size.

Factors.—In dealing with factors—the means which the architect has to his hand, as it were, for the attainment of his ends—it will be necessary to emphasize the fact that most, if not all, of these factors have their origin in utility, and answer some practical need in the construction or preservation of the building.

To forget this primary purpose and use them as means of artistic embellishment is to sacrifice use and convenience to artistic ideals, and is not true architecture.

The public are quick to recognize the importance of this in respect of window and door openings, floor divisions, chimneys, etc., but are apt to think of columns, pilasters, sills, hood-mouldings, cornices, and perhaps even buttresses as decorative rather than useful, and to suppose that the architect has a free hand in the disposition of them. Education in this matter will include instruction in the primary use of purpose of the common architectural forms, and will give an insight into the difficulty of making these forms serve the ends of use and beauty at one and the same time.

Such an insight—like propounding a problem—will go far to quicken interest.

The subject may be dealt with under the four heads of Proportion, Light and Shade, Solids and Voids, Balance and Symmetry.

Proportion.—Certain proportions are pleasing to the eye, and effects of proportion are obtained by the relative size of different parts.

The various ways in which the constructional parts and features of a building may be utilized to obtain proportional divisions, both horizontal and perpendicular, might be described in detail.

*Reprinted from *The Builder*.

Light and Shade.—The advantage that may be taken of effects of light and shade might also be pointed out.

Solids and Voids.—The importance of a right adjustment of solids and voids, both in respect of size and position, would come next.

How easily a false scale may be set up, and a building made to look insignificant, by broad sheets of plate glass in the windows.

Balance and Symmetry.—These give a very distinct character to a building, and aid in setting forth its special purpose. There is or can be rhythm in architecture, as in verse.

Material.—The right use of the various kinds of material furnishes an interesting and useful subject for public instruction.

The general principle having been laid down that every kind of material has its special characteristics, and should be treated accordingly—in other words, that its very best should be got out of it—a brief account of the natural qualities of the chief building materials (stone, wood, metal, bricks, plaster, etc.) would follow.

The following leading thoughts are appended by way of illustration :

When stone and brick are used in conjunction, the former should be accorded the more honourable parts, e. g., quoins, architraves to doors and windows, sills, cornices, etc.

Granite, even if it could be carved for mouldings, should be used rather for strength and solidity than for ornamental features.

When the beauty of marble or wood is in its figure or colour, it is best exhibited in the form of slabs or panels; if moulded, the forms should be large.

Stone is granular, wood fibrous; each has its appropriate forms and mouldings, suggested by the natural qualities of the material.

Wrought-metal admits of the finer and more delicate forms, metal cast in moulds naturally assuming a more bulbous shape. Both kinds have their appropriate place and effective use.

Well-known examples of wrought-iron and cast-iron gates and railings afford interesting illustrations.

The foregoing summary indicates the main lines along which the education of the public in matters architectural should be developed.

Whether in public lectures, or in articles published in book-form, illustrations should be abundant.

There are signs of a wave of public interest in architecture which, "taken at the flood," may become permanent and lead to great results.

REINFORCED CONCRETE.

By PROFESSOR LOUIS CLOQUET, of the Central Society of Architecture of Belgium.

Professor Louis Cloquet, on behalf of the Central Society of Architecture of Belgium, read a paper, the following being an abstract :

The old style edifice was characterized by the separation between two distinct parts, the walls and the gable. There is a lack of solidarity between the two. At the point where the trusses of the frame rest upon the walls there is something like an articulation. The introduction of the metallic frames has not at once remedied this characteristic defect of buildings formed of stone walls and gables of wood. For a long time it was customary to combine trusses of iron similar to the wooden trusses. The solution of the problem of the large halls only made a decisive step in advance when the centred trusses were introduced, which have their starting point on the ground, like the trusses of the Dion pattern. From that moment the solidarity between the vertical and the inclined parts was secured. However, it is only the trusses which cannot be deformed. The solidarity between the vertical and the inclined parts is not realized in the inclosing surfaces. There is lack of homogeneity between the two parts of the building—that is to say, its skeleton or frame and its wall. Logic claims a more radical solution, which would consist in establishing solidarity not only between the uprights and the trusses, but rather between the wall and the roof. This is what the use of reinforced concrete enables us to realize. The side wall may even disappear or be made one with the vault. The whole will show almost uninterrupted surfaces on the outside as well as on the inside, with the absence of the encumbering internal protrusions of the frames. The new arrangement has, therefore, as a result to save the trusses, and only to maintain a surrounding wall which supports

itself without any assistance. Now experience has shown that buildings conceived on this plan do not cost more than those carried out in thick stone walls with metallic gables, and that they are solid.

If it is question of a building with stories, the floor of reinforced concrete takes with advantage the place of the old systems. The most characteristic consequence of the use of reinforced concrete is the suppression of the roof, as the uppermost ceiling can be used as a cover and constitute an inhabitable terrace. This kind of construction lends itself, moreover, to the boldest rakes or overhanging structures.

This system, if applied in a rational manner, is able to bring a change into the architectural forms. It simplifies the forms, it causes the cumbersome complexities of the frames and floorings to disappear, it simply carries out all the surrounding or separating surfaces. It makes disappear every distinction between the wall and the roof. It introduces an architecture consisting of so elastic surrounding walls that these can be given any dimensions required, according to the space it is useful to inclose. The habitations will take the shapes of parallelepipeds terminated by terraces, and the large buildings with curved vaults with visible estrades. We must be prepared to see sculptures and moulded relief work disappear and coloured ornaments to prevail. A radical change in the internal and external forms of the buildings will be the consequence of the substitution of a concrete, solidary, homogeneous structure for our former architectural organism. All the forms proper for a combination of marked-out stones and covered over with plaster, which will henceforth no longer be used, would here be devoid of expression and æsthetic value. They must be given up and other methods must be found.

We have in mind three kinds of form : those of convenience, those of structure, and those of expression.

The forms of convenience, by which the building receives its complete usefulness and a character in harmony with its destination, satisfy the mind without causing pleasure to the eye. Those forms of convenience which are, if not the most pleasing, at least the most excellent, can be carried out to perfection by making use of the processes, so eminently practical, of reinforced concrete.

The forms of expression are those by which the architect and his assistants put their imagination and their soul into the building, in order to impart to it the eloquence of a pleasant aspect. The ideal is that they shall form an integral and inseparable part of the structures. In the buildings constructed of reinforced concrete there is little scope for the artist's talent, especially the sculptor's. There remains hardly anything except the superficial decoration by painting and some polychromic, ceramic or other adornments, but for the artists in colour a vast field is opened for their creations.

The forms of structure, either real or fictitious, are the principal ornament of the buildings produced by the old methods. They are those organic forms which give life to the aspect of buildings with walls of marked-out stones.

In the old-fashioned conception a building is to be compared with a living organism where we can distinguish a skeleton, various members and a sort of muscular system. Reinforced concrete does not afford these elements of interests and charm; it leaves the impression that the work has been carried out in too docile a material, on which the sacred labour of the workman and his traditional processes have not left the traces of the noble struggle between the artisan and matter. We do not find the same beauty in this work all cast in one block in a dead and dull-coloured material, without apparatus, without organism, with which the best thing that can be done is to hide them beneath a superficial decoration.

In conclusion, the new processes, economical and powerful as they are, are precious from the point of view of certain bold and complex accomplishments. They are devoid of the charm of an artistic expression. Besides, economy is only a relative law and of a secondary character, and the boldness of the structure is not always required. A process which is prevalent from these two points of view does not impose itself to the exclusion of the others. Recourse may be had to it for the economic satisfaction of utilitarian projects, for the realization of comfort and for the solution of bold problems. But it will never eliminate from architectural practice the noble and artistic combinations of masonry work in marked-out stones, moulded and sculptured, of frameworks in wood and in metal, of superstructures with vaults, etc.

THE NATIONAL ASSOCIATION OF MASTER PLUMBERS.

The National Association of Master Plumbers Steam, Gas and Hot Water Fitters, of Canada held its Seventh Annual Convention in Ottawa on August, 9th.

The following is the Presidents' Report, presented by Mr. A. J. Hammond the late President :

WINNIPEG, July 30th, 1906.

To the National Association of Master Plumbers, Steam, Gas, and Hot Water Fitters of Canada.

GENTLEMEN,—I take it as a pleasure to submit my report to the Eleventh Annual Convention of the National Association.

On looking through the work of the past year it gives me cause to be gratified for the estimable way in which the business of the Association has been carried through, and the most considerable help derived from the co-operation of the various officers of the Association.

It may interest the Association to know that I have received and replied to something like seventy letters during my term of office. It has always been my endeavor to reply to any queries submitted to me for approval and appertaining to the general interests of the Association.

I feel proud of the work that has been accomplished and I am sure the Association will agree with me when I say that our efforts have not been fruitless and that a large amount of good has resulted thereby. My personal views are that the complication in the trade goes to prove that organization is the only visible means to save us from the evils now existing and arising partly from the uninformed and from the misrepresentations reported in the press.

I am quite certain the day is not far distant when the Master Plumbers, one in all, will have to band together for the protection of their interests and the sooner we awaken up to these facts so much the better.

It can be clearly seen that the only way to avoid a repetition of the past events and to alleviate our burden, is to be more thorough in organization on a sound basis. This is the only remedy from which we can derive any satisfaction and it is our bounden duty to up-hold any measures put forth from any individual member that will further tend to strengthen the work which we have before us.

At the close of Convention last year in accord with the recommendation that sub-Executive be appointed in one city, Messrs. Ryan and Hughes were appointed to act in conjunction with Mr. J. A. Gordon as sub-executive for the current year.

One of the first matters undertaken was the printing of annual report, which was somewhat delayed on account of said report being lost through the mail and thereby necessitating another copy being written and these did not reach the Executive until the later part of December.

I would therefore recommend in future that when the minutes are to be mailed to secretary the handling of these be left to someone resident in the city where the convention is being held, thereby ensuring prompt delivery to secretary and not left entirely to stenographers.

The usual grant was made to Mr. J. A. Gordon for previous year, also grants to Provincial vice-president, including Ontario V. P. which was passed by Executive.

Mr. J. A. Gordon and Mr. P. Ogilvie attended semi-annual Convention of Ontario at Toronto in October last and were well received. At this Convention a committee was appointed to meet a committee of the N. A. M. P. of U. S. A. to talk over certain mutual concessions, this same committee to report on all benefits to be derived therefrom. Mr. Mahony will most likely satisfy us on this point.

I am sure we were all sorry to hear of the late disaster at San Francisco, and hope that the M. P. of Canada made a hearty response to the request through the Journal for subscriptions towards the relief fund towards Master Plumbers there. A request was made for our Association to subscribe the sum of \$50, and I anticipate this was forwarded in due course.

I am desirous of bringing before the members of this Convention a matter that has been somewhat prominent in my mind of late, namely, that of Incorporation. My opinion is that if our Association were incorporated we would not as individual members have the sole responsibility on our own shoulders and in case of any legal expenses being incurred at any future date they would be borne by the Association as a whole. I am inclined to think that it would place the Association on a stronger footing, and put us in a position to overcome any further obstacles that may threaten us. This I recommend to the Association for careful consideration and discussion.

I would also recommend that we prepare a 'Dominion Directory' of members of the N. A. M. P., also a list of manufacturers' and jobbers in accord—this list to be revised from time to time. This recommendation I am well aware was left in the hands of the in-coming executive last year but this remains in statu quo. This gives us further proof of the necessity of a permanent secretary which I regret to say we have up to the present been unable to procure, for what reason I need hardly explain.

During my term of office I have kept in touch with the various local associations within my reach and have thus in a sense, obtained a bird's eye view of the work being done and consider-

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ing the difficulties we have had to contend with. I am gratified to see that we are still holding our own. This has been nevertheless, what I might term an up-hill fight, but I am sure the reverses we have undergone will eventually increase the ranks of our Association and that we will go forth with renewed vigour and determination, come what may, to take our stand for the promotion of our interests.

Nova Scotia has no provincial association, but I am pleased to say that there is a local association in the City of Halifax and which is very complimentary to them.

New Brunswick I find is in rather a more disorganized state, but trust to hear in the near future of some further developments towards organization.

Quebec—In Montreal the conditions are more satisfactory, the Association being pretty well intact and increasing in membership. It appears to me to be the main-stay of the province, and I am looking forward for excellent results from this quarter.

Toronto has organized some fifty members, and hope by this time that she has increased her membership to such an extent that will be pleasing to all, also that Ontario has taken her place at the top of the ladder again.

Alberta and Provinces of B. C.—I am not in a position to make any report thereon as I had no reply to my last inquiry but trust those Provinces will make their own report which should be satisfactory.

Manitoba—Portage la Prairie and other towns throughout the province, I find organization at present out of of the question as the plumbing business is as yet in its infancy; therefore they have no local association.

In my own city we are in much the same shape as when you left us, with a scarcely any prospect whatever of organization.

We are, at the time of writing, in the midst of a strike and we are directing operations through the medium of the Builders' Exchange of which about twenty Master Plumbers are members. Their grievance (the men's) was one what we could not see our way clear to accept. They presented their new schedule on the 30th of June with no alternative but for us to sign this on July 3rd or an immediate strike would ensue. A meeting of the Master Plumbers of this city was held July 2nd and it was decided not to accept their schedule in its present form and we notified them to this effect, but as there was no reply from the union they discontinued work July 3rd.

Up to the present there is little prospect of a settlement as every day we are gaining ground and hope to be finally masters

of the situation. The men up to the time of the strike were receiving a minimum of 35 cents and a maximum of 50 cents per hour. The new schedule called for 40 cents to 52½ cents per hour but it was not so much the extra wage we objected to as the most stringent measures they wanted to enforce in their new schedule.

At the last convention I had the honour of being appointed a delegate to the M. P.'s Association of U. S., but as I had this present strike in view and also our convention so close at hand I was reluctantly compelled to decline the proffered visit, but I was fortunate in securing a representative in the person of our secretary Mr. J. A. Gordon. Mr. Mahoney also attended the convention, so there is no doubt in my mind that their report to this convention will be of benefit and that the Association was well represented.

I took the liberty of mailing Mr. C. J. Boyd, president of the N. A. M. P. of U. S., the following letters of M. P. A. of Canada: To Mr. C. J. Boyd, president N. A. M. P. of U. S., Atlantic City.

To the members of N. A. M. P.
GENTLEMAN,—On behalf of the Master Plumbers' Association of Canada I beg respectfully to tender their compliments to your Association.

I very much regret that in person I cannot be at the Convention though in spirit I shall be with you. However, I am sure it is the wish of each individual member of the Association throughout Canada that the meeting be a progressive one and that it will be the means of further extending the interests of the N. A. M. P. to U. S. A.

Wishing for the prosperity and success of your Association, I am,

Yours respectfully,

A. J. HAMMOND,
President N. A. M. P. of Canada.

This concludes my report for the year 1905-06.

I thank you for the several honors conferred upon me, which I have tried to fulfill to the best advantage. It has been my sole aim on all occasions to promote the interests of the Association as a whole, which I hope has not been in vain nor without some beneficial results.

I wish to express to you my thanks for the way in which you have borne with me whilst I have endeavored briefly to expound the work of the Association and its praiseworthy objects. I

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hope the 11th annual convention will be a record gathering, and that all business conducted at these meetings will be brought to a successful issue.

Finally, let us all unite in one desire to further advance the craft throughout the Dominion of Canada.

Again thanking you all for your kind attention, and wishing you all prosperity in business, I am,

Yours very truly,
A. J. HAMMOND,
President.

The Officers for the coming years were elected as follows: President, F. G. Johnson, Esq., of Ottawa; Past President, A. J. Hammond, of Winnipeg; Vice-President, John Watson of Montreal; Secretary, John A. Gordon, Esq., Montreal; Treasurer, H. Mahoney, Esq., Guelph; Provincial, Vice-President for Nova Scotia, G. A. Wootin, Halifax; for New Brunswick, D. Shea, Fredericton; for Ontario, B. Noble, London; for Manitoba, C. A. Gate, Winnipeg; for British Columbia, Bert Weeks, Vancouver; for Quebec, Jos. Lamarche, Montreal; Chairman of Committee—E. J. Young, Calgary. Sanitary Committee, S. H. Hugh Wallace; Hamilton; Essay Committee, A. J. Hammond of Winnipeg.

PROVINCIAL BUILDERS' EXCHANGE.

LONDON, August 6th, 1906.

The CANADIAN ARCHITECT AND BUILDER.

GENTLEMEN,—In acknowledgement of your favor of July 26th, regarding the matter of a Provincial Builders' Exchange, must say that I am heartily in accord with the formation of such an association, and hope through the medium of your publication that you will awake the contractors and builders of Ontario to the fact, that it is essential that a Provincial Builders' Exchange be organized at the earliest opportunity. You may ask, "why is it necessary to have a Central Exchange when almost every City has a Local Exchange?" In answer to that, I may say that the Local Exchange may handle questions affecting the trade in the city or town where they are located. But there are problems, which affect the public, as well as the contractor, and these require the united efforts of all the exchanges consolidated in one Central Association. I believe that such a Provincial

Association, taking in all the Local Exchanges, is most essential to carry on a successful issue, as affecting the interest of the contractor, and the public in general. There are so many issues affected by organized trade unions, and the unfair methods used by organized labor to attain their aims, that the contractor must of necessity organize.

Then again, there are certain laws on the Statute Books of this Province which require amending, and if we had a Provincial Exchange, we could bring more influence to bear upon the Legislative Assembly, and have them so amended, that they could be of some benefit to the contractor. The leaders of organized labor always have some representative to look after their interests at all the sessions of the Provincial Assembly, and if they find it beneficial, why would it not pay the builders to have some one to represent them and look after their interests, which could be easily accomplished if we had a central association. There are also a great many other issues which would be a benefit to the contractor and builder, but I will leave them to older heads than mine to pronounce upon.

GEO. C. YOUNG,
President London Builders' Exchange.

The Canada Gazette announces the incorporation of "Desmarteau Plumbers Supply Company" (Limited), with a total capital stock of \$195,000, and the chief place of business to be Montreal, Que. The company are to acquire and take over the business and trade of plumbers' supplies and woodenware now carried on in the City of Montreal and elsewhere by the firm "J. A. Desmarteau." The promoters are Messrs. Joseph A. Desmarteau, Henri Herbert, Pierre Bilaudeau, Hormisdas Hamel, all of Montreal, and Jean B. Robert, Ste. Scholastique.

Although United States cities have been complaining that the San Francisco disaster has caused a cement famine, Canadian cities and particularly Winnipeg, will not suffer. Throughout the States cement has gone up 35 cents a barrel and the expectation is that it will continue to rise in price. Winnipeg gets all her cement from Ontario, particularly from the vicinity of Owen Sound. Rather than an increase in prices there is a steady and appreciable diminution as new firms get into the field. The trade in cement has increased with amazing speed in Winnipeg in the past ten years. In 1896 500 barrels supplied the demand in the entire northwest. Last year it took 125,000 barrels to satisfy Winnipeg alone. So long, say the dealers, as the marl lakes in the neighborhood of Owen Sound last there is little fear of a famine.

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Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and change of advertisements not later than the 5th day of the month.

EDITOR'S ANNOUNCEMENTS.

Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

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The architects of Regina, Alta., have recently formed a club, having for its object the advancement of the architectural profession and the bringing before the public the many and varied advantages to be derived therefrom which are not fully recognized in a new and growing country. The following officers have been elected: President, Mr. W. W. Hilton; vice-president, Mr. F. Chapman Clemesha; secretary-treasurer, Mr. W. B. Van Egmond; committee: Messrs. J. H. Puntin, A. C. Barrett, Ernest E. Carver.

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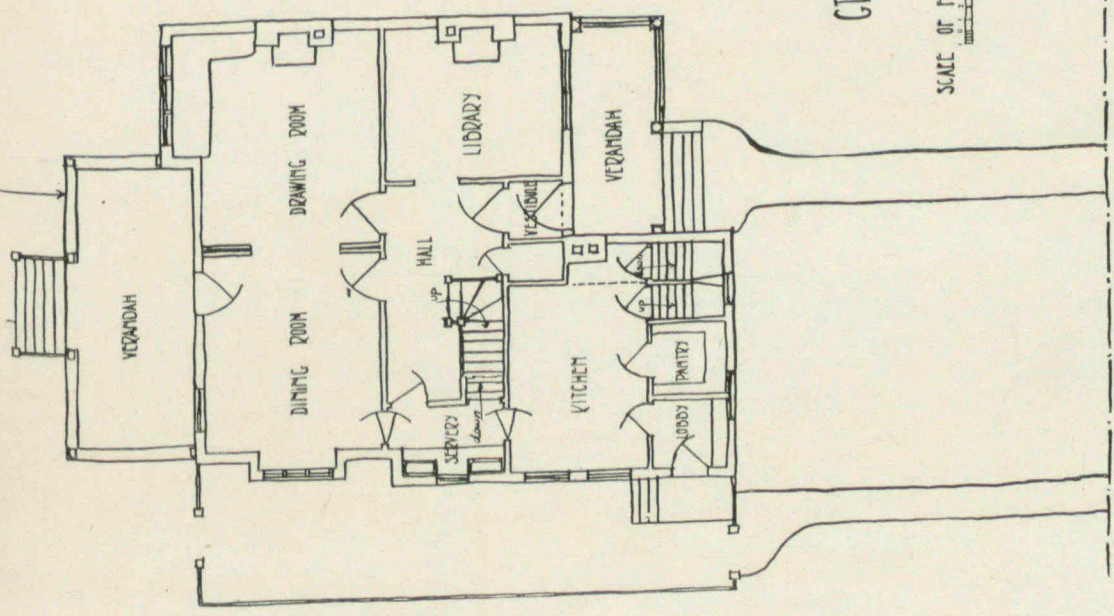


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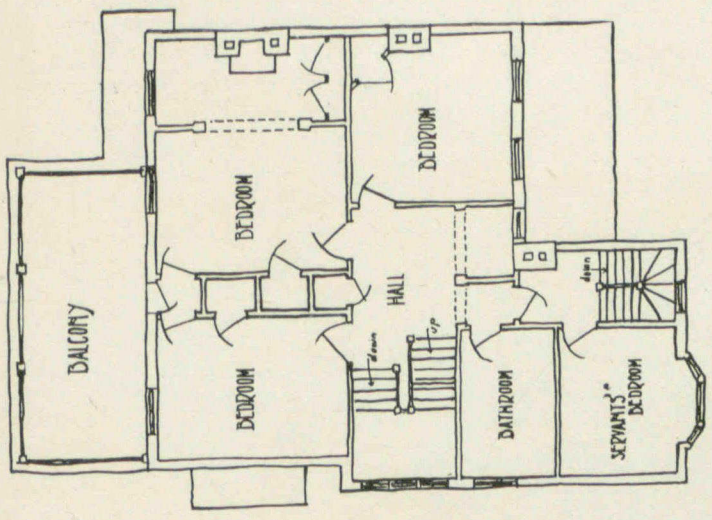
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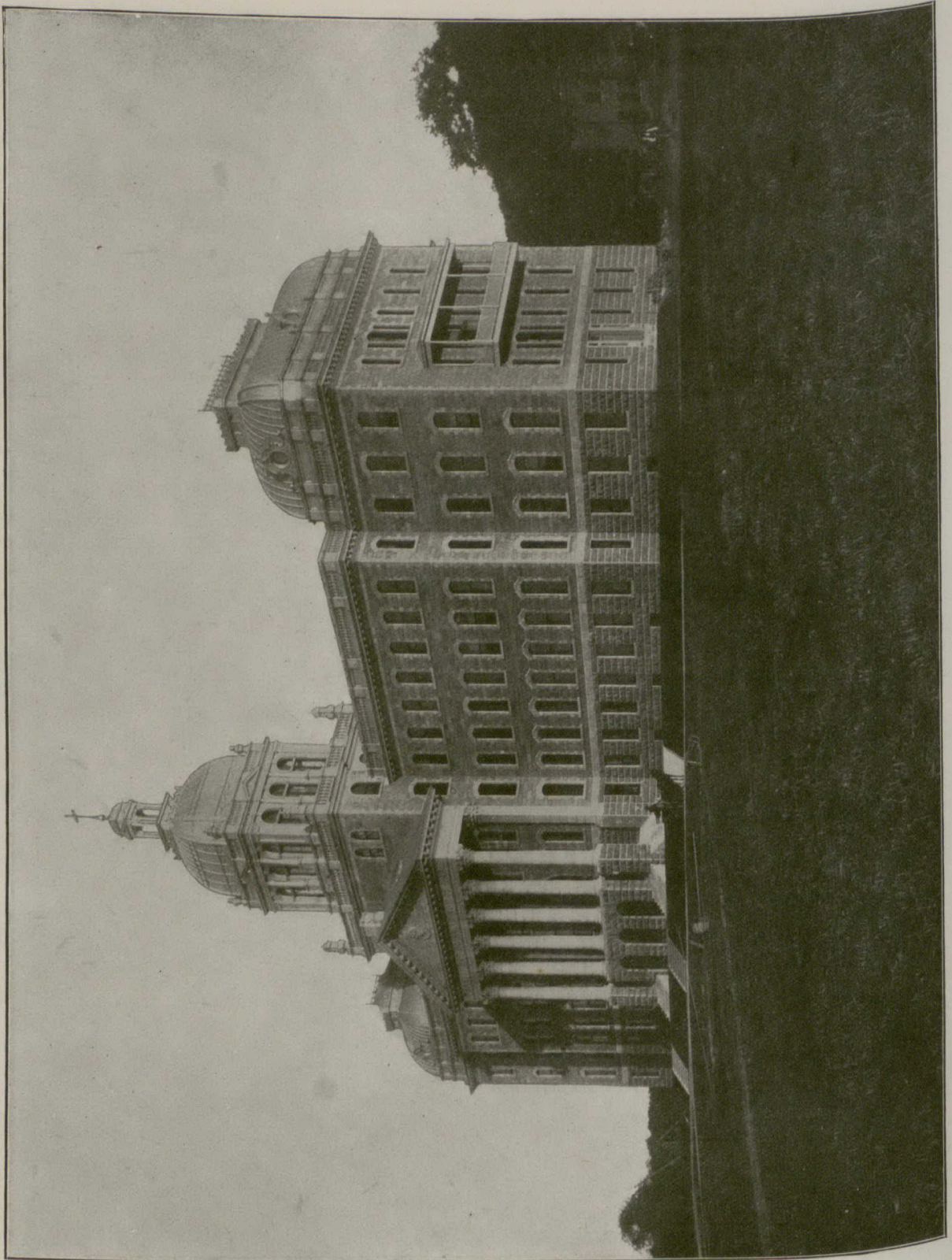
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