PAGES

MISSING

The Canadian Architect and Builder

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ILLUSTRATIONS ON SHEETS.

Hall in No. 500 Wilbrod Street, Ottawa.—Mr. J. W. H. Watts, R.C.A., Architect.
Staircase in No. 500 Wilbrod Street, Ottawa.—Mr. J. W. H. Watts, R.C.A., Architect.
Bishop's Court Apartment Building, Montreal.—Messrs. Saxe & Archibald, Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

No. 500 Wilbrod Street, Ottawa.—Mr. J. W. H. Watts, R. C. A., Architect.
Station at Bismarck, North Dakota, for the Northern Pacific R. R.—Messrs Reed & Stem, Architects, St. Paul, Minn.

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OUR VANCOUVER OFFICE.

The publishers of this Journal have recently established an office in Vancouver for the purpose of looking after more carefully the interests of subscribers and advertisers in British Columbia. This office is located at 536 Hastings Street, Suite 3, opposite Molson's Bank, and is in charge of Mr. G. A. Gall, who will be pleased to meet any of the friends of this Journal, and to serve their interests in any possible way.

Free Plans for Cottages

The Commercial Club of Indianapolis has applied to the architects of the city requesting each to furnish the Club with plans and specifications for a small house that could be built for from $1,000 to $1,500. The plans are to be given all possible publicity to insure their use, and printed copies of them, filed at the Commercial Club, will be furnished to everyone who applies for them and pays a nominal fee to cover the cost of their printing. It is expected that the architects will respond favorably as a matter of public spirit and, with the plans thus furnished available, cottages will both serve the purpose of their owners much better than they do now, and will also contribute to the architectural beauty of the city. In order that they may do the latter it will be necessary for the architects to lay aside ambition and, if the competition feeling comes over them, feel that they are competing for the beauty of simplicity.

The Sanitariness of Beauty.

The *Lancet* sees in the adoption of a forced draught for destructors in London a presage of the abandonment of tall chimneys for factories and of a smokeless London. One would expect the rest of the article to be chiefly concerned with the delights of cleaness and fresh air, both matters of interest to Englishmen. But not at all. The gain in health that the *Lancet* looks for is to come through the eye; from seeing more beauty, or at any rate less ugliness. The *Lancet* does not positively say that the sight of beauty is tonic, but it does say that the sight of ugliness is depressing. "Few will deny," it says, "that a prospect can be, so to speak, noisome to the eye, and, when the harmony of prospect is ruthlessly disturbed, the eye that detects it transmits a feeling of pain to the whole system. 'It gets on one's nerves,' we say of an ugly sight as of an ugly sound, and the expression has a substratum of physiological truth." So here is en-

couragement for the architect, who aims at beauty, to think well of his aim. His is a benevolent profession.

Radiation from Radiators.

An ingenious correspondent of The Builder has entered a protest against the abandonment of open fireplaces in hospitals and similar places where people remain in a room for long periods continuously. Having first established that there is no radiant heat from a radiator, on the very slender grounds that paper held before a hot water radiator will not scorch, (that is to say that 150° of heat will not do the work of something over 212°) he argues that all heat from a radiator must be by convection. Therefore it is impossible to impart heat to the human body unless the air is at a temperature of over 98°. And, as air heated to this degree is unbearable, he asserts that the body, which does radiate heat, must, be, in a room heated to a bearable degree, always parting with its heat. He therefore condemns dependence upon "radiators" (of which he cannot bear to speak except in inverted commas) and advocates the retention of open fireplaces as well. In this he will have our sympathy. A cool house with a hot spot is the greatest comfort, and they do well in England to stick to the open fireplace, as long as the house is not too cool and they have not got to stick to the fireplace too close. But it will not do to base consideration of the value of hot water heating upon a false premiss that hot iron does not radiate heat. It is possible, much as we may regret it, to warm one's self at a radiator; and it is not necessary, much as we wish it were, to have a fire in every room. Fortunately a fireplace has a perpetual function, in making a room habitable, which justifies its insertion for occasional use to increase its warmth.

A Very Modern Building.

The Leonardt Warehouse, in Los Angeles, Cal., with an area of 104 × 150 feet, is built entirely of concrete. The span is the remarkable feature. It is a one storey building and was intended to have a steel trussed roof; but the owner consulted Mr. L. J. Mensch of Chicago, as to the feasibility of an arched roof of reinforced concrete. As the roof had to carry a suspended gallery on each side, 16 ft. wide, (calculated to carry a load of 150 lb. to the sq. ft.), and also suspended tracks for light travelling cranes, the idea of an arched roof was abandoned in favour of straight girders. The girders have a span of 102 ft. and are 16 ft. 6 in. on centres. The girders are 14 in. wide, straight on the under side but pitched on top to the slope of the roof; that is to say, they are 6 ft. 6in. at the centre of the span and 3 ft. 6in. at the ends. Brackets projecting about 4 ft. connect the girders with 2 ft. x 2 ft. reinforced concrete piers. The walls are of hollow concrete blocks and are 1 ft. thick. The purlins connecting the girders are 6 in. x 11 in., 17 ft. on centres. Four inch roof slabs rest on the purlins. Over this, for waterproofing, was spread a roofing composition. There are six sheet-metal and wire-glass skylights.

The building is said to have been erected in less time than it would have taken to deliver the steel trusses. The centring took about two weeks, the concreting one. The concrete was composed, in the lower part of the girders of one part cement (Iola or Colorado), 1½ parts of sand, and 3 of crushed granite; for other parts the porportion was 1 : 2 : 4.

The concrete girders and roof cost more than steel trusses and corrugated iron, but this difference in price was offset by building the walls of 12″ concrete blocks inrtead of 17 in. brick, and by the use of reinforced concrete footings.

The Rosedale Association, Toronto.

As an instructive illustration of what can be done by united action to keep a neighbourhood from injury, the Directors' Report, presented at the annual meeting of the Rosedale Association in Toronto, is interesting reading. Rosedale is a distinct district in Toronto, cut off in a natural way by ravines, and, as these force some curvature upon the roads, the distinctness from rectangular Toronto is still further emphasized. The residents formed an Association two years ago, to obtain recognition by the city authorities of the principle of local option in matters not in conflict with the general welfare of the city, and to see that the ordinary functions of the city departments were properly attended to in their case. Since then the Act has been passed empowering cities to establish residential districts by By-law; and Rosedale promptly had itself made a residential district; so that neither the butchers, apothecaries and undertakers, (the pioneers of civilization) nor the Chinese laundryman, (the harbinger of the yellow invasion) can plant their outposts there. They have attacked and made to move on two disagreeable smelling industries. The Association have prevented the erection of a crematory in their immediate neighbourhood and subsequently of a planing mill in the same place. They have poked the city up to keep in proper repair the bridges which form their way of approach across the ravines. They have made an alliance with the Park Commissioner so that he has consented to take them into his councils in the matter of planting trees and in the still more anxious matter of cutting them down. And sundry sidewalks and roads for portions of Rosedale, which would be constructed in the ordinary course of affairs, have been got through with greater smoothness because endorsed by the officials of the Association. There is no question but that, in serving their own interests, the property owners of Rosedale are serving the interests of the whole city. Rosedale is now one of the places to which the tally-ho drivers from the hotels take the summer visitor. It is a question if they would continue long to do so if the outer edges of the district were eaten into by obectionable industries and the centre spotted with supply shops. Beauty must be massed to tell, in a city as in any other work of art. Good buildings here and there throughout a town are still good buildings (though not so effective as in conjunction), but the town is nothing. Since we have come to conceive of cities as susceptible of design, we must, in considering their beauty, aim at the secret of all good design—breadth, which has been defined as a great deal of one thing in one place. It does not do to allow a good neighbourhood to be frittered away for want of attention. And the best way to prevent it is the association of neighbours for its preservation and improvement.

THE GARDEN FRONT.

For five months in the year, in this country, it is a pleasure to have some land about one's house and be able to get out of doors. During the course of three of these months there are days so hot that to sit out of doors, instead of in the house, and if possible to dine out of doors, is the only way to keep reasonably comfortable. The invariableness of the porch or verandah in new houses, even of the smallest kind, and the outbreak of additions of this sort to every kind of old house shows that public attention is aroused to the inadequacy of the old fashioned habit of sitting on the front door steps in hot weather.

But a porch in the same position, close to the street, is no great gain ; especially when the street has rails upon it and has reached the high development of a three minute service. Here the porch is not the poeti-

FIG. 1.

cal feature it might be in a village. It suggests not the fresh air of summer and the quiet of moonlight nights but the crude disturbances of the trolley car ; a rush and a roar every minute and a half, followed by a cloud of dust that spreads wide and settles on everything.

The proper place for sitting out of doors in connection with a city house is at the back. The English house shown in the cuts (taken from an English journal), is an excellent example of the difference between

FIG. 2.

front and back as a place for out of doors life. In this case, if anywhere where the house is on a street, the front would be acceptable ; the neighborhood is suburban, the house set well back from the road, and the road is quiet. But how much more retired the "garden front" is ! How much more dignified to live out of doors there than in the front, in the face of the public !

The difficulty with us is how to get back the use of the rear of the house for the family, after having for so long devoted it to the service department.

With a basement kitchen the problem is easy, but usage in a great part of the country is against that plan. Servants prefer, in a small house, to be penned up in the smallest possible kitchen in the rear of the ground floor rather than have plenty of room in the basement and the possible privilege of an outlook on the front. The trouble is difference of level between the kitchen and the dining room and front door. And prospective housekeepers will not accept the risk of having a basement kitchen and finding that they cannot get servants to fill it. That this is, to a great extent unnecessary apprehension is proved by the smoothness with which domestic affairs continue in the cities which were built before the "extension kitchen" plan came in, and which continue to have houses with basement kitchens. In the more modern city of Toronto also there are certain old families, with old houses and basement kitchens, who are better served than the moderns. And in at least one new house, where the mistress, greatly daring, decided for a basement kitchen, the result has been peace below stairs and happiness above, where they have the whole floor to themselves, and (which is the present point of interest), a verandah in the rear, in which they can dine overlooking the garden.

It is worth remembering, as we are apt to think the ground floor kitchen is a modern product from which there is no retreat, that the only thing modern about it is its application to the town house, since the taste for space grew with the opportunity this country affords and the English idea of building in rows in a town was abandoned. We must remember that rows and the basement kitchen have never gone out in the United States, where the necessity for compactness came upon them as early as the taste for space, and that when our time comes when the kitchen must be either at front or back (because there is no side) some relief will come to us from the United States in the form of the high basement.

The "American basement" is this much better than the English, in point of service accommodation, that it is all out of ground and the servants are not interred. In point of service again, attendance on the front door is reduced in labour for all calls that do not involve communication afterwards with the living rooms. Otherwise there is not much difference in this point, except that in small houses it is very likely that the dining room will come down stairs and occupy the garden side, transforming the plan thus from an elevated basement to a lowered ground floor, for there will probably be a sub-basement for heating.

This is, in effect, what we have to aim at in the meantime, in our ground floor which has not descended. If we are to have the garden front free for family use the kitchen must come to the front. The servants will not object to that ; and it will keep them cheerful, which nobody else will object to.

There are examples of this plan in houses facing north, which thus get the kitchen in its proper quarter,

in the north-east out of the sun, while the living rooms on the south are in it. Public opinion is nervous about the appearance of servants at the front windows, and sometimes the kitchen windows are kept uncomfortably high for this reason. It is not necessary to have windows too high to see out of in order to conceal the operations of the kitchen. Where there has been less caution in this respect there is no sign of the kitchen to the passer-by. Would it matter so much if there were? In no country in the world is the dignity of the dwelling more perfectly sustained than in England. Yet as you pass by the wide basement areas of a London house, in the best quarters, you can look down into the servants' hall, which is usually to the front, and the spectacle of the servants eating, always eating, only adds to the magnificence of the conception. But there is no chance for such conspicuousness as this in a ground floor kitchen. With a floor 3 ft. or so above grade (which means more at the sidewalk) a window set with the stone sill 3 ft. 6 in. above the floor should conceal the servants without immuring them.

In a wide house it is easy to place the kitchen anywhere. It is the narrow house which really raises the question how to avoid the plan of lapping the kitchen extension over the rear end of the dining room, or, as is often done—too often—giving the full rear end to the kitchen and letting the dining room in the middle get its light from a 6 ft. passage between it and the neighbor.

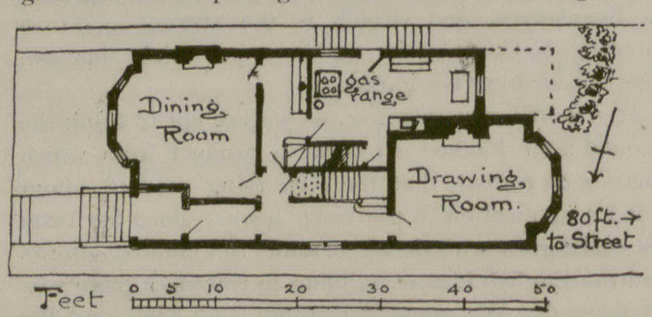


FIG. 3.

It would be easy again to put the kitchen in the middle and let it suffer. But that will not do; a basement kitchen would really be better. The plan of Fig.

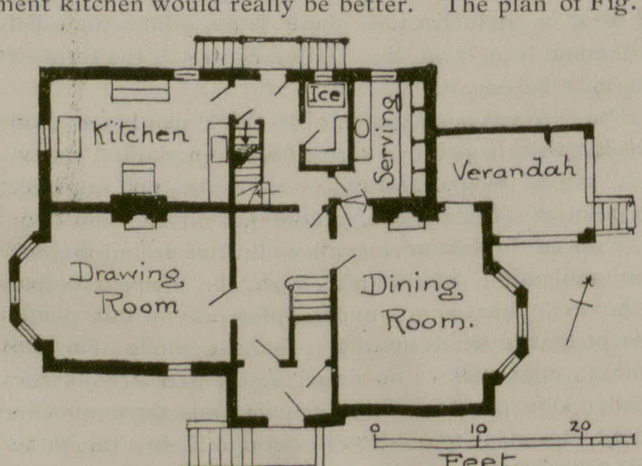


FIG. 4.

3*, a house on a 30 ft. lot, with 3 ft. of passage on each side, suggests a solution for a house looking East. The kitchen still looks into the garden but a little back of the drawing room, and with a small space of its own devoted to a clothes line and screened off from the garden by a row of shrubs.

But an outlook to the street is the best, in spite of public opinion to the contrary, and especially for the small house with one servant who requires much cheering to support her secluded life. If the test of a good rule is that it works both ways, the case for a garden front is clear; for the publicity and racket that degrade a front verandah and its occupants become life and cheerfulness and wholesome touch with the world for the solitary occupant of the kitchen.

One more plan, Fig. 4, showing the case of a house facing west, but with a little more ground this time, will perhaps help to suggest further exploration in this matter which is really of the most serious importance for city house planning. Though our houses are detached they are essentially front-and-back houses. There is the advantage over the row plan that we can light stairs and passages from the middle of the house; but the living rooms should face front and back and the inner side of the lot, where we have always a hundred feet or so of land, should be a garden and should be part of the living rooms as an additional space for summer use.

*The absence of a garden entrance in this plan, other than from the front door or by the kitchen steps, is due to the garden being for the eye rather than for the habitation. The house lies between two streets about 150 ft. apart, so that neither side is private. The out of doors quarters are in a balcony (shown by dotted lines) which opens off a sitting room above the drawing room.

THE HAMILTON CONVENTION OF MASTER PAINTERS & DECORATORS.

At the meeting of the Canadian Association of Master House Painters and Decorators, to be held at Hamilton on July 25th, 26th and 27th, the following papers will be read:—

"Master Painters' Associations and Why We Exist," by Mr. J. W. Morley, Winnipeg.

"The Advantages of the Open Shop to Employer and Employee," by Mr. A. N. Dubrule, Montreal.

"The Importance of Bookkeeping to a Master Painter," by Mr. Frank H. McCausland, President of the Toronto Association.

"Measurements and Prices," by Mr. J. W. Knott, Toronto.

"Simple Methods of Testing Painters' Materials," by Mr. Robt. Simpson, Sarnia.

"The Paper Hanger and His Difficulties," by Mr. Harry Holcombe, Hamilton.

"Zinc vs. Lead, Its Advantages and Disadvantages," by a member of the London Association.

"Apprenticeship and Technical Schools," (A continued paper) by Mr. W. T. Castle, Montreal.

"Fate of the Master Painter as Sub-Contractor," by a member of the Montreal Association.

"Lead Tests," by Hamilton Association.

"Question Drawer," conducted by expert.

The Times says that students of applied mechanics at Cambridge are "taught to look at mathematics from the practical standpoint—that is, as a means of predicting the behaviour of things under given circumstances." This makes an excellent definition of the use of mathematics.

There is to be a twenty-storey tenement house erected in Brooklyn, N.Y., for the express purpose of providing a refuge for people with children. The birth of an American citizen in many apartment houses means the expulsion of the parents. One is faintly reminded of Adam and Eve, but the analogy between the garden of Eden and a flat is imperfect. In Mr. Oliver H. P. Belmont's new tenement house in Brooklyn, prospective tenants must have at least one child to make them eligible for admission. Special provision will be made for the entertainment of children, and, as the building will cover a whole block, a play-room or rooms of adequate dimensions can be provided

OUR ILLUSTRATIONS.

NO. 500 WILBROD ST., OTTAWA, J. W. H. WATTS R. C. A., ARCHITECT, OTTAWA.

We give the street view of this house (which is interesting as a piece of formal composition) and two views of the hall. The situation on the Rideau River is attractive.

PASSENGER STATION AT BISMARCK FOR THE NORTHERN PACIFIC R. R. MESSRS. REED & STEM, ARCHITECTS, ST. PAUL, MINN.

The testimony of a passenger upon the Northern Pacific as to the agreeableness and architectural quality of the surface of this concrete building induced us to procure the photograph of it which is reproduced in the illustration sheets. By inquiry we find that the surface was produced in the following way. The outside inch of concrete was mixed with Georgia marble chips and tamped close to the form. After this material had set sufficiently the form was removed and the entire outside surface gone over with a steel brush producing a pebble dash effect by rubbing the material off the Georgia marble. The tamping causes a slight projection at the bottom of each layer. This was treated with the point with imperfect results.

As this imperfection gave part of the character that pleased our informant, the news that the architect has succeeded elsewhere in removing the projections entirely, by using the steel brush on them while the cement was soft enough to rub out, is somewhat disappointing. There are, however, still the layer lines to enrich the surface. These are said to be caused by the different mixtures coming together imperfectly. The result is happy, and perhaps shows the better for brushing, for the lower work is evidently more carefully treated than that which is high up and, as can be seen in the arcade under the shadow of the eaves at the end, the white lines are very conspicuous there.

BISHOP'S COURT APARTMENT BUILDING, MONTREAL. MESSRS. SAXE & ARCHIBALD, ARCHITECTS.

The building has a frontage of 98' and a depth of 100' and is three storeys high and basement.

Access is obtained to the building through a arge stone porch which leads into the area. This area is floored with Scotch fire brick. The entrance to the different wings is off the area. Each entrance gives access to six suites.

The entrance halls, vestibules and staircase, to level of first floor, are finished in white marble. The whole finish throughout the suites is of chestnut. The woodwork in the dining rooms and living rooms has been stained dark brown ; that in the bed rooms is finished in silver grey.

The building has been planned so that all trades and servants come in by the rear lane and rear staircase, communicating directly with the kitchens. The side areas are connected with the rear lane by a covered passage way at the ground floor level.

Each kitchen is provided with a large refrigerator which is cooled from the refrigerating plant in basement.

The suites communicate with the janitor's apartment by private telephones.

The exterior of the building is faced with brown sandstone laid up in random coursed work. All trimmings around doors, windows, etc., are of Roman stone.

BOOKS.

A TREATISE ON CONCRETE PLAIN AND REINFORCED. BY FREDERICK W. TAYLOR M.E. AND SANDFORD E. THOMPSON S.B. PUBLISHED BY JOHN WILEY & SONS, NEW YORK. PRICE $5.00.

The many complications in the cement processes appear to be fully treated in this volume, and there are special chapters by specialists on the chemistry of hydraulic cements, on proportioning concrete, and on the effect of sea water. But the book aims at meeting the needs not only of the civil engineer and large contractor but of those seeking simple directions as to the exact procedure in laying a small quantity of concrete. The early part of the book treats the subject thus, giving an elementary outline for the inexperienced, the heads of which are afterwards treated in detail for more scientific or extensive users and for those who wish to make an exact study of methods and principles in using cement and to understand how it is made. The first chapter, on Concrete Data, is arranged to be both an index and a summary of the contents of the book. The subject matter in this chapter is arranged in sections with descriptive heads and the caption words underneath have not only a page reference to the place where the matter in question is treated, but a short summary of the information that will be found there. For instance under the head of PROPERTIES OF SAND AND SCREENINGS there is the item "COARSE SAND requires less water than fine sand, and when mixed with cement makes a denser mortar, p. 216"; and a reference to the page explains the matter fully. This helps very much the usefulness of the book. There is a chapter on reinforced concrete and examples of its practice ; indeed plain and reinforced concrete seem hardly to be entirely separable now. The book has numerous illustrations.

EASY LESSONS IN THE ART OF PRACTICAL WOOD CARVING, BY FRED. T. HODGSON. PUBLISHED BY FREDERICK J. DRAKE & CO., CHICAGO. CLOTH $1.50.

The title of this describes very well its purpose and range. It is a plain and practical help to doing carver's work. It is Mr. Hodgson's forte to shed the light of common sense upon building operations. In this case he does the same for carving. He disclaims the possibility of imparting "feeling", or even great skill by means of a book. The first is an inborn quality ; the latter is a matter of practice. But the use of carver's tools and appliances, and the care of them, and such knowledge of the qualities of the material as is necessary, can be taught, nor is there any difficulty in understanding the basis of decorative design. These matters are the substance of the book. It is pleasantly and lucidly written and copiously illustrated, and the beginner who reads it in conjunction with practice will acquire a sensible and and efficient attitude of mind towards his work that will make a workman of him.

Thn modern idea of a garden is well expressed in the following description, by Oliver Bunce. "My house stands among trees and flowers, but there is not one distinctive flower-bed in all its grounds." Shrubs and flowers together—the shade of the one a background for the color of the other—is the pleasantest arrangement, and most like the combinations that attract ns in nature. This is a fair mean between the hard artificiality of the formal garden and the landscape gardener's imitation of natural scenes.

LIGHTNING RESEARCH.

A committee of members of the Royal Institute of British Architects and of the Surveyors' Institute, appointed nearly five years ago have, after conference with experts, presented a report which has just been published. The new point at the bottom of their recommendations, as stated in a preface by Sir Oliver Lodge, is the fact that the electrical energy stored in dangerous amount between the earth and the clouds should be dissipated not, as was formerly thought, as quickly as possible, but as quietly as possible. Sir Oliver Lodge says: "These are the two points of novelty. (1) The possible occurrence of a totally unprepared for and sudden flash in previously unstrained air, by reasons of overflow from a discharge initiated elsewhere: What is called the B spark, occurring as the secondary result of an A spark. (2) The effect of electrical inertia or momentum, so that the discharge is not a simple leak or flow in one direction, but a violent oscillation and splash or impulsive rush, much more like an explosion, and occurring in all directions at once, without much regard to the path which had been provided for it; no more regard, in fact, than is required to enable the greater part of it to take the good conductors, and to prevent any part of it from being able to enter a perfectly inclosed metallic building." The practical inference from this fact is that a larger area of protection is necessary and the committee recommend, in the first place, a pair of vertical conductors, instead of one, on a tower or spire, and, secondly, a horizontal conductor connected them, which should encircle the building, throwing up points at intervals and receiving the ends of rods erected on minor vertical projections of the building. Thus the energy of the dispersed B flash may be quietly dissipated. The best material for conductors is iron, which seems to be peculiarly effective in dissipating electrical energy; but it is difficult to keep iron unoxidized and clean in smoky towns. Copper is therefore good for inaccessible positions; and it is good for main conductors. Steel roofs and steel frame buildings have no record of damage against them and are apparently self-protecting; but it ought to be better to connect the columns of a steel frame with the earth than to leave them to finish on a stone foundation. In the suggestions of the committee, given below, clause 6 offers a suggestion in this respect. The suggestions may be summarized, in fact, under two heads: (1) That the highest points of the building should have one or more vertical lightning rods projecting from them and carried to the earth. (2) That all exposed exterior metal should be connected with a vertical rod. There is also a third suggestion for the interior, to ground the gas service pipes. Here is the text of the suggestions:

1. Two main lightning-rods, one on each side, should be provided, extending from the top of each tower, spire, or high chimney stack by the most direct course to earth.

2. Horizontal conductors should connect all the vertical rods (a) along the ridge, or any other suitable position on the roof; (b) at or near the ground line.

3. The upper horizontal conductor should be fitted with aigrettes or points at intervals of 20 ft. or 30 ft.

4. Short vertical rods should be erected along minor pinnacles and connected with the upper horizontal conductor.

5. All roof metals, such as finials, ridging, rainwater and ventilating pipes, metal cowls, lead flushing, gutters, etc., should be connected to the horizontal conductors.

6. All large masses of metal to the building should be connected to earth directly or by means of the lower horizontal conductor.

7. Where roofs are partially or wholly metal-lined they should be connected to earth by means of vertical rods at several points.

8. Gas-pipes should be kept as far away as possible from the pnsitions occupied by lightning-conductors, and as an additional protection the service-mains to the gas-meter should be metallically connected with house services leading from the meter.

INVESTIGATIONS FOR THE EMPROVED USE OF CONCRETE.

1. THE PREVENTION OF EFFLORESCENCE IN CONCRETE BLOCKS.

Mr. Beaumont Jarvis, Toronto, has been trying to get rid of efflorescence from concrete for facing by washing the cement before it is mixed with the aggregate. As the components of efflorescence are obviously soluble, this seemed a feasible way to separate them from the cement. In order to test the effectiveness of the method of proceeding and also to find out how the strength of the cement is affected by it, he put the matter in the hands of Mr. J. C. Johnston, Analyst for the Municipality of Toronto, whose report Mr. Jarvis kindly allows us to publish. It is as follows:

TORONTO, NOV. 3RD, 1905.

BEAUMONT JARVIS, ESQ., Architect,
McKinnon Building, Toronto.

DEAR SIR:—I beg to hand you herewith my report of the recent tests that, acting under your instructions, I have made.

The object of these tests was to ascertain, if possible, a method of manipulating the cement to be used in the manufacture of concrete blocks; so that when in use the concrete block would show no appearance of that white surface deposit that has been so troublesome.

Throughout the entire tests Alsen's German Portland Cement has been used. This cement has the following chemical analysis:—

Silica	22.44%
Alumina } Ironoxide }	8.95%
Lime	61.44%
Magnesia	2.45%
Anhydrous Sulphuric Acid	1.17%
Alkalies	0.82%
Carbon Dioxide	1.45%

A physical test of the Cement resulted as follows:—

Specific Gravity	3.09%
Fineness, Residue on No. 100 sieve	8.50%
Hot Test—Sound (i.e. no free lime in the cement.)	
Setting Initial	175 Minutes.
" Final	355 "

Tensile Strength	Neat	3 Sand to 1 Cement
24 hours	277 lbs. per sq. in.	63 lbs. per sq. in.
7 days	610 " "	178 " "

Water used in mixing:—

Neat	24.5%
3—1	10.0%

Both the chemical analysis and the physical examination show that the cement is first-class.

Now the first step was to make an analysis of the white deposit taken from the surface of a concrete block. The result of this operation was that I found the deposit to be composed of:—

Silica	6.74%
Alumina and Iron Oxide	2.20%
Lime	10.15%
Magnesia	2.86%
Anhydrous Sulphuric Acid	6.45%
Carbon Dioxide	39.66%
	59.01%

Leaving a balance of 41% which on analysis proved to be largely a soda compound. This would, in the deposit, be combined with the carbon dioxide iu the form of sodium carbonate to the extent of 70% of the total.

The above analysis shows conclusively that the deposit is nearly all sodium carbonate with a small percentage of a sulphur compound, very probably calcium sulphate, as this substance is often added to a cement, in manufacture, to make it slow setting. The Silica, Iron Oxide, Alumina, Lime and Magnesia, in all probability has been in the small quantity of cement that was scraped from the concrete block while sampling.

Now after treating the cement in the manner you suggested, and collecting the scum that appeared on the surface of the

water and also the surplus water, I find that the scum is composed of:

Silica	19.45%
Alumina and Iron Oxide	6.50%
Lime	47.94%
Anhydrous Sulphuric Acid	4.48%
Magnesia	2.08%
Carbon Dioxide	16.73%
	97.19%

The low percentage of lime, with the high percentage of carbon dioxide indicates, to my mind, that the fine underburned particles of cement rise during the manipulation and with, of course, a large proportion of cement form a scum. In this scum is a considerable quantity of sulphuric acid. This scum weighs only a small fraction of one per cent. of the total cement used.

The analysis of the surplus water disclosed the fact that the objectionable sodium carbonate was in solution. In fact from 800 grains of cement 3.563 grains of sodium carbonate was obtained or nearly 0.5%.

An analysis of the cement in the first place showed alkalies (or sodium oxide and potassium oxide) 0.82%. Now assuming that 3/5 of this 0.82% or about 0.5% of the cement, is sodium oxide, we can have 0.8% sodium carbonate, in other words there is only enough sodium in the cement to make 0.8% sodium carbonate. We have removed nearly 0.5% by our treatment and as some of the sodium must be intimately combined with the cement, there cannot, in my opinion, be enough left to cause an appearance of the white surface deposit.

A test made of the cement, after the treatment, shows that the strength in a few days is considerably increased. The following is the result of the test:—

Tensile Strength	3 (sand) to 1 (cement)
24 hours	41 pds. per sq. in.
4 days	162 " " " "
7 days	215 " " " "

Referring to the test of the cement before treatment, you will see that the tensile strength 3 to 1 was

for 24 hours	63 pounds per sq. in.
for 7 days	178 " " " "

or after treatment, to remove sodium carbonate, the strength of the 3 to 1 mortar was in 24 hours 35% lower than when not treated, due entirely to the fact that a large percentage of water was of necessity used in mixing, and when such is the case, the hardening is more gradual than when mixed drier. In 7 days, however, it was, as shown by the above, 21% higher than in the ordinary test.

These tests will be carried on up to three months so as to be sure that the increase is not only temporary.

The above analysis and figures give convincing proof, in my opinion, that your treatment not only gets rid of the objectionable sodium carbonate, the cause of the white surface deposit, but also increases the strength of the stone.

Yours respectfully,

J. C. JOHNSTON, Analyst.

II.—COARSE AND FINE SCREENING.

Mr. Jarvis has given us also a report, made to him by Mr. Johnston, of a test to establish the relative values of aggregate with and without dust. The result ot the tests is to establish in every case greater strength for the mortar which included the dust.

REPORT.

Date.	No.	1 Part Lehigh Cement with 3 Parts of	Tensile Strength (pds. per sq. in.) 7 days.	
Sept. 30th	1.	Unscreened limestone	365 376 368 353	Average 366
Oct. 2nd	2.	Limestone retained on No. 100 sieve (without fine powder)	340 349 340 343	Average 343
Sept. 30th	3.	Limestone that passes No. 6 sieve	402 396 417 426	Aaerage 410
Sept. 30th	4.	Limestone that passes No. 6 sieve and is retained on No. 100 sieve (i. e. without powder)	380 406 370 367	Average 381
Sept. 30th	5.	Limestone that passes No. 8 sieve	348 369 350 373	Average 360
Sept. 30th	6.	Limestone that passes No. 8 sieve and is retained on No. 100 sieve (i. e. without powder)	375 346 35 352	Average 356
Oct. 2nd	7.	Limestone that passes No. 10 sieve	352 322 362 321	Average 339
Oct. 2nd	8.	Limestone that passes No. 10 sieve and is retained on No. 100 sieve (i. e. without powder)	326 298 283 274	Average 295
Oct. 2nd	9.	Lake sand (Sand & Dredging Co.)	280 280 258 261	Average 270
Oct. 2nd	10.	Standard quartz sand	192 189 185 197	Average 191
Oct. 15th	11.	Limestone dust (i.e. what passes No. 100 sieve)	19 190 205 214	Average 202

J. C. JOHNSTON.

SKY SCRAPER CHURCHES.

The Broadway Tabernacle of New York, an historic Congregational church, originally situated down town, moved in 1859 to a site on the corner of Sixth Avenue and 34th Street, which cost them $62,500. This property was sold in 1902 for $1,300,000. The church has therefore money, not exactly to burn but for building fireproof. It has built an eight storey building which contains many other things besides a hall for preaching in. The accommodation begins, in the basement, with the social hall and accompanying kitchen and pantry service. It is not only evening gatherings that this department is expected to serve; but, in order to facilitate the various kinds of work that go on in the daytime, luncheons must be provided for the workers.

The ground floor, (which in design appears to serve the function of a basement to the auditorium or principal floor above,) contains a hall called Pilgrim Hall, to seat 600 people. This hall is to have a stage, with footlights, curtain, dressing rooms and all regular requirements of the theatre, including private boxes. The purpose of the hall is not for a dramatic department of the church, but to lend a hand to causes that should be heard, by supplying at a nominal charge a place for their hearing. On this floor also appears to be the prayer meeting room.

The principal floor contains the auditorium, which is much like other auditoriums, and has a small chapel adjacent, for weddings and small gatherings.

Above the auditorium floor—or properly speaking floors, for there are galleries—is a Sunday School consisting of a two-storey hall with two storeys of class rooms, with movable fronts, opening upon it.

Above this again are a floor of women's parlours; next a floor of men's parlours; next the administration floor, with the pastors study, office and waiting room, and rooms for his various assistants; and, at the top is the sexton's dwelling. It is proposed to add, some day, two floors for a museum.

The Baptists of Cleveland, or at any rate the Rev. Charles Eaton of that denomination, have a project for a building still higher, (reaching 12 storeys,) and more comprehensive, (as it will include sleeping accommodation.) There will be an auditorium in the same position as that in the Broadway Tabernacle, occupying the first and second floors, (or, as Dr. Eaton would call, it the second and third) and approached by a grand staircase; but the rest of the building will be a

sort of home, intended to ameliorate down-town social conditions. The ground floor will contain reading-rooms, libraries and rest rooms, and will be open to every one who has no home. On the upper floors there will be provision made for games, to attract street urchins from the slums ; and there will be dining rooms and sleeping rooms. "Among churches" Dr. Eaton says "it will be unique, for it will be the outgrowth of our own experience." (He means unique as the outgrowth of unique experience. Other churches try to meet their experience.) "Continually," he adds, "we are turning hundreds of people from our doors."

A PERFECT SEWERAGE SYSTEM FOR RURAL HOMES, SCHOOLS AND FACTORIES.

M. J. QUINN, Provincial Mechanical Superintendent.

It is perhaps no exaggeration to say that, having regard to the frequency with which it comes up for consideration, and many other circumstances, the question of properly disposing of sewerage is one of the most important matters with which the health authorities throughout the country have to deal, and yet it is a remarkable fact that in these days of popular education, when the people enjoy the benefit of free literature and lectures on fruit growing, dairying, domestic science, etc., that a knowledge of so important a subject, and one so closely allied to their physical and moral welfare is confined to a limited number.

True a vast amount of experimenting has been done during recent years, and the matter has received a great deal of attention from scientific men, the results of whose labors have been freely discussed at medical conventions and reported in Medical Journals, but the valuable information so obtained has not reached the great mass of the people at all.

In the matter of public sanitation, the question of disposing of sewage in small towns and villages as well as in less populated districts, where by reason of its great cost a general system of sewerage is impossible, is daily becoming of greater importance, and as the title of my paper would indicate, that is the phase of the question with which I propose to deal. The system to which I intend to refer is known as the sceptic tank system, and I believe that nearly all who have studied

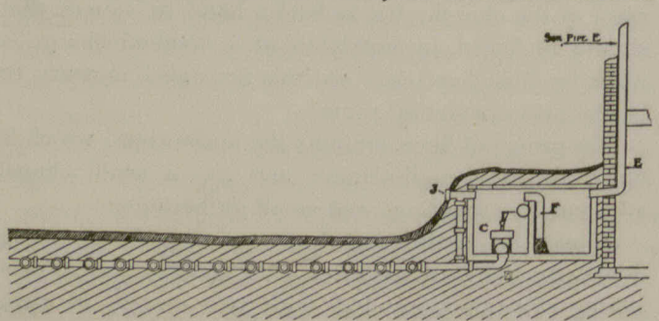


FIG. 1.

it are agreed that it is at once the most natural, most scientific, simple and economical system in use to-day, and speaking from a personal knowledge of scores of the systems, I am in a position to say that it is worthy of all the good things that are said of it. . .

It is a matter of common knowledge that living earth— or top soil,—is a powerful purifying agent, but comparatively few are aware that the presence in it of countless numbers of bacteria, or microbes, is alone responsible for the chemical changes brought about in waste matter placed beneath its surface, and that these bacteria, not only through their action remove and destroy the dangerous properties of such waste matter but actually convert them into plant food, which being taken up by the vegetation is again consumed for the sustenance of life. Pasteur divided these microbes into two classes, viz:—anerobes, or those which lived apart from air, or derived their oxygen from decaying compounds, and aerobes, or those which require plenty of fresh air for their development, and as both classes are considered necessary for the complete reduction of waste matter, it will be seen that if sewage is placed too deep in the earth, as for instance in a cesspool, where, owing to the absence of air, the necessary aerobic bacteria cannot exist; it may pass down deeper in a putrid state, and, finding its way in the water supply, not unfrequently results in an outbreak of typhoid fever or some intestinal disease.

The two classes of microbes referred to, have properties somewhat differing from each other, but the net

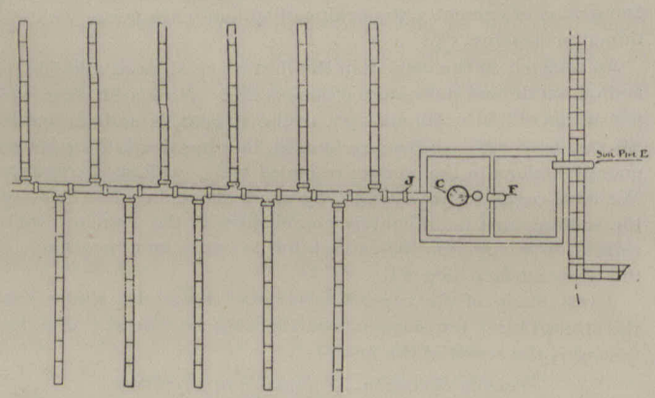


FIG. 2.

result of their work under proper conditions is the breaking down of the solid matter in the sewage, the disintegrating of its constituents and the conversion of the whole into liquids and gases, in which form it leaves the septic tank, the former to be distributed under the suface of the earth, where, by reason of its contact with free oxygen, bacterial life is most active, there to be still further reduced and finally converted into nitrates which are readily taken up by the vegetation on the surface, and the latter passing up high into the air, as hereafter described.

With this brief reference then, to the principles which underlie what is conceded to be a most efficient system for the disposal of sewage, I propose to indicate how it should be constructed; and in order that I may the more readily make myself plain, I have drawn for your inspection a number of diagrams which I trust will accomplish the desired result.

In fig. 1 is shown a section of a complete system built on level ground, with the tank placed close to the wall of the building,—where in fact the large majority of those now in use are located.

The tank should be built of brick or stone, laid in and lined with cement, or of solid concrete, the main object being to have it impervious to moisture.

It will be noticed that the tank is divided into two compartments, an over-flow pipe "F" being built into the dividing wall, the mouth of the said overflow being within seven or eight inches of the bottom of the tank, and being covered with a wire screen about the size of an ordinary pail, the mesh of said screen not exceeding three-quarters of an inch.

The main soil pipe is represented by "E" and should be directly connected with the closet, bath, sink, etc. It extends from the same compartment in which the overflow is placed to a point two or three feet above the roof, said pipe acting not only as a conductor of sewage to the tank, but also as a channel by which any gases in excess of those in solution, may pass out to the atmosphere at a height that renders it impossible for them to inconvenience the occupants of the building.

"J" in the second compartment admits fresh air, which passes freely over the centre partition,—spaces being left in the top of the latter for the purpose,—and up through the soil pipe to the roof.

*From the Sanitary Journal of the Provincial Board of Healthof Ontario.

In the centre of the second compartment is placed an automatic valve "C," the said valve is caulked into a four-inch cast iron bend, as ordinarily used by plumbers, and which is securely built into the bottom of the tank during its construction. The top of the hub of the bend is usually left slightly lower than the level of the floor of the tank.

From the said iron bend is run a line of glazed tile pipe, four inches in diameter, having a connection with the fresh air pipe, for the purpose of ventilation, and a number of openings placed at intervals of two feet or more from which are run branches of four-inch field tile with loosely butted joints.

Fig. 2 shows a plan of the whole system and illus-

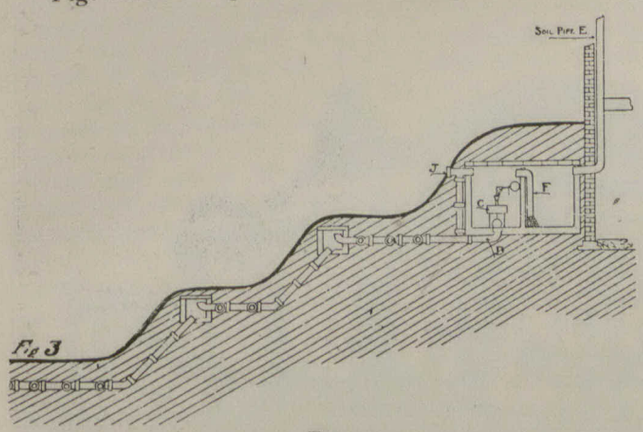


FIG. 3.

trates one way in which the tile may be laid, though, as will be manifest, they would do equally well if all laid in one side of the main carrier in any number of branches, of any length, providing a sufficient number in the aggregate are laid, and the rows are not placed closer together than two feet in light soil, and a somewhat greater distance in heavy soil.

The field tile should not be placed more than one foot below the surface, and must be perfectly level, for the reason that if given a fall the earth surrounding the low ends of the system would receive more than its share of liquid sewage, and might in time become fouled. While if level, the earth surrounding every tile has an equal amount of work to do, and will produce most satisfactory results.

Briefly then, the operation of the system is as follows:

The sewage from the building enters through soil pipe "E", filling the first compartment in which all solid matter is retained until it is reduced by the contained bacteria which multiply and develop very rapidly. In a liquid form it is allowed to enter the second compartment through overflow "F" which is turned down because of the presence of the bulk of the organic matter in suspension on or near the surface.

When the liquid has risen in the second compartment to the height at which the unlocking float on the valve has been set, the valve automatically opens, and discharges the contents of that compartment, be it fifty or a thousand gallons, into the system of field tiles, through which it percolates into the surrounding earth, to be taken care of by nature as already described.

As the tank takes from twelve to twenty-four hours to fill, it will be obvious that there will be abundance of time in which the water in the tiles may soak away before it again discharges.

To prevent the gases of decomposition escaping through other than the proper channel the tank must be covered first with rough plank and then with five or six inches of earth, which in turn, if desired, may be sodded over.

In figuring out the size of tank necessary, the following may be taken as a safe rule, viz':—for every occupant of a private house or hotel, allow three cubic feet of space in each compartment, while for a school or factory, where, as in the case of a house, nothing but domestic sewerage is to be treated, one-third less space will be sufficiant ,and for every cubic foot in one compartment (or one half the tank),lay thirteen feet of four-inch field tile.

It will be obvious that, as in the case of ordinary stable manure,; human excreta, if deposited in its solid state just below the surface of the earth, would entirely disappear in a very short time, and the system just described is merely a most convenient and sanitary way of automatically accomplishing that very desirable result, with the accompanying advantage of not only depositing it in the earth partially treated, but in a much more favorable condition to receive final treatment than could possibly obtain if the former method were adopted.

Anticipating the difficulty which will be encountered where there is a considerable fall in the ground surrounding the building to be drained, I would refer you to fig. 3 which shews a number of terraces each receiving a portion of the effluent from the tank.

It will be noticed that the end of the glazed tile is turned up a few inches on the brow of each terrace, the obvious result of which is that all the field tiles at that level must fill before the sewage can rise and overflow to the tiles on the next lower level, where the same operation takes place, and so on for any number of terraces, and as will be apparent, the sewage passing into the the tiles on a high level cannot possibly escape to those lower down, so that the earth surrounding every tile will have its full complement of work to perform.

Fig. 4, the horizontal scale of which is somewhat exaggerated, shews the proper relative position of the tank to the house where the field tiles have to be placed on a level considerably below that on which the building stands. In such a case it will be evident that were the tank placed on the high level, the discharge would come down with sufficient velocity to wash out both earth and tiles, while the discharge from the house to the tank as shown will not have any injurious effect on the latter.

In answer to a question which arises in the minds of most people I may say it will not freeze in winter, even when the frost penetrates the ground for several feet everywhere except where the tiles are laid, and as may be expected, splendid results may be obtained in vegetables or flowers if the tiles are laid under a garden.

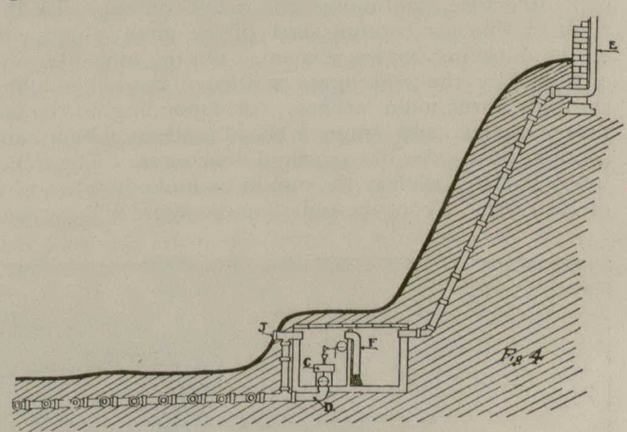


FIG. 4.

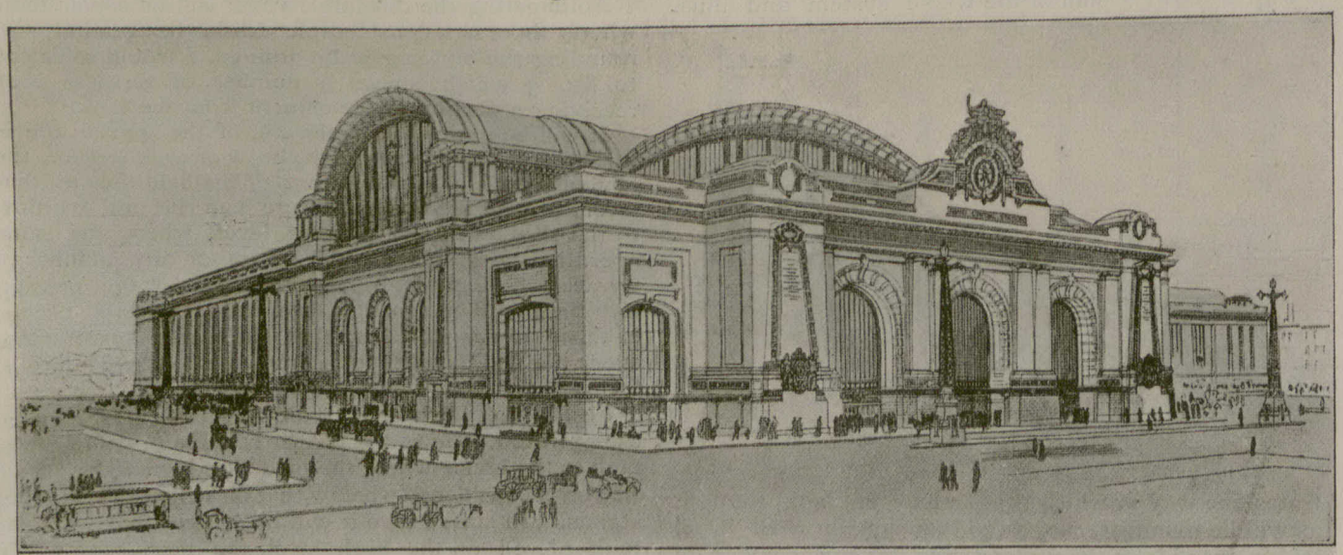
In conclusion I would simply refer to a few of the principal points which should be kept in mind in constructing such a system, viz:—

Have the tank covered with a few inches of earth, to prevent the escape of gases except through the soil pipe stack. See that the valve discharges at least once before the tank is covered in. See that no trap is placed on the main soil pipe to prevent the free passage of air across the tank and up to the roof, and that the necessary space for the air is left in the top of the centre partition, and finally take care that no disinfectants or chemicals of any kind are allowed to enter the tank, if the life of the bacteria, upon which the system depends for its success, is to be preserved.

THE NEW GRAND CENTRAL STATION, NEW YORK.

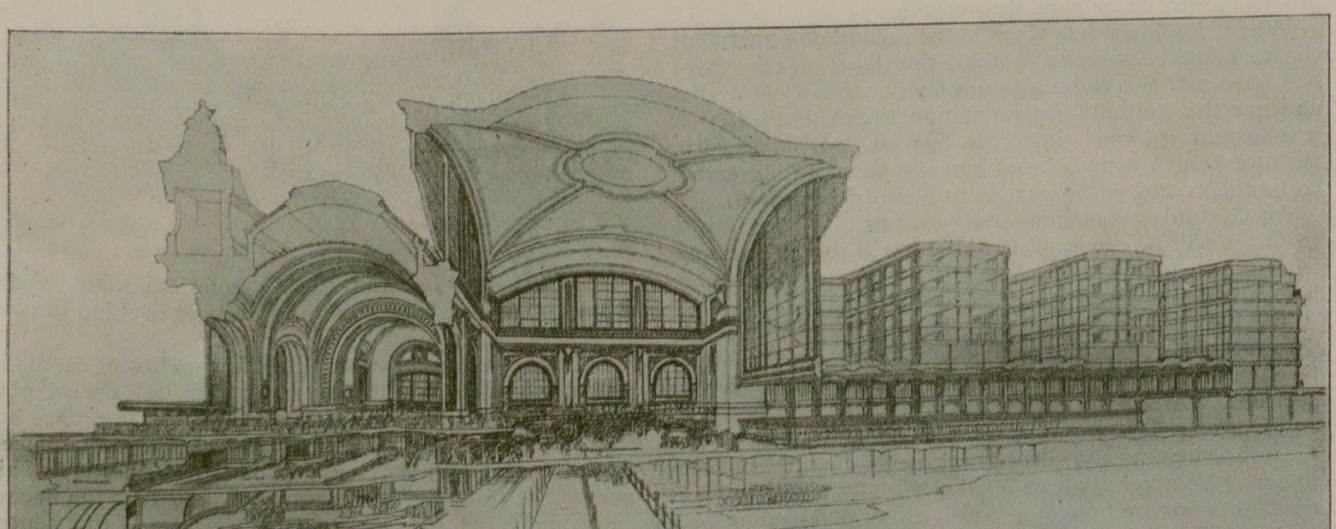
IN the views presented herewith are shown the architects' sketches for this great building, one showing the exterior, the other a sectional view of the interior and the station platforms on different levels.

This building, which includes the station proper, offices of the company, post office and express office, will cover the blocks lying between Vanderbilt and Lexington avenues from Forty-fifth to Forty-third street, inclusive, and the block fronting on Forty-second street between Vanderbilt avenue and Depew Place. The main architectural features are governed strictly by the ground plan, the dominant architectural elements being determined in every case by the structural engineering necessities of the station. The southerly facade will stretch for 300 feet on Forty-second street, and the westerly facade will reach for 680 feet on Vanderbilt avenue. The building will extend 625 feet on Forty-fifth street, 400 feet on Lexington avenue, 275 feet on Forty-fourth street, and 260 feet on Depew Place. The southerly half of the building encloses the station proper, this portion extending as far north as the northerly side of the great arched roof, seen in the perspective view. The northerly part of the building is given up to the offices of the company.



THE NEW GRAND CENTRAL STATION.
(View Showing the Corner of 42d Street and Vanderbilt Avenue.)
Warren & Wetmore and Reed & Stem, Architects.

THE imposing main entrance to the station on Forty-second street is composed architecturally of three massive arches, each 33 feet wide and 60 feet in height. On entering, the passenger will find himself in a vast ticket lobby, 90 feet in width by 300 feet in length. In the centre of this building will be a long oval structure, containing the ticket offices. To the right of this and forming part of the main lobby, will be the outgoing baggage room. On the opposite side of the lobby the passengers will leave the ticket lobby through three main arches, corresponding to the entrance arches, and enter a broad gallery, which runs around three sides of the grand concourse. The ticket lobby and this gallery, it should be understood, are at street level. From the gallery passengers will descend by four broad staircases, each 25 feet in width, to the floor of the grand concourse, which, by the way, is considerably the largest of its kind in the world. Its width is 160 feet, its length 476 feet, and the height from the floor to the top of the domed roof is 150 feet. The noble arched and domed roof of the concourse will extend entirely across the full width of the station building, a distance of 300 feet, or from Vanderbilt avenue to Depew Place; but the concourse floor will be carried westerly under Vanderbilt avenue for a distance of 170 feet. Back of the concourse, and located under the ticket lobby, will be the main waiting room, which will have twice the area of the waiting room of the present ststion. Surrounding it will be several retiring rooms, telephone and telegraph booths, and



LONGITUDINAL SECTION THROUGH THE NEW GRAND CENTRAL STATION, NEW YORK, SHOWING THE TWO TIERS OF TRACKS.
Warren & Wetmore and Reed & Stem, Architects.

the various other conveniences of a modern station. Back of the waiting room will be a large restaurant, located beneath the broad approach to the station. Across the northerly end of the concourse will extend the customary line of gates admitting to the express platforms. Beyond the gates will be located no less than thirty-four stub tracks, with broad platforms between them, the average width being about 16 feet, extra space being provided, in order to avoid the crowding which is such a troublesome feature under existing conditions. Of these thirty-four tracks the westerly eight or ten will be reserved preferably for incoming trains, and the arriving passenger, on passing through the gates on to the concourse, will find himself opposite a large cab stand, with conveniences right at hand for securing his trunk and driving away with as little delay as possible. In addition to leaving directly by cab, he has the choice of four other means of exit from the station ; for he may pass by a covered walk directly to the Subway, or by a 25 foot stairway to the concourse gallery and so into the main ticket lobby, or he can pass out to Madison avenue and Forty-third street by a covered subway, or crossing the concourse, he may leave by another covered subway to Lexington avenue. It will be understood, of course, that the thirty-four tracks extend the full width of the concourse, the most easterly track abutting on Depew Place and the most westerly on Vanderbilt avenue, and this, of course, necessitated some careful engineering work in supporting above these tracks the immense weight of the northerly half of the station building, containing the company's offices. Care has been taken to so arrange the supporting columns that none of them shall interfere with the passenger platforms. To recapitulate, it should be explained that the ticket lobby and the gallery are at street level, and the express tracks, the main concourse, the express waiting rooms, and the restaurant are at a level 15 feet lower than that of the street.

The plans for the new station involved, as an absolute prerequisite to success, that the suburban travel should be entirely separated from the express ; and it was considered that the best way to insure this was to place the suburban tracks below the express tracks and provide a suburban concourse, waiting rooms, and other conveniences on this lower level. Moreover, it was decided that, with a view to further separating the two classes of travel, separate entrances and exits should be provided, so that the suburban passengers could enter or leave the lower level from the street or the Subway without meeting the long-distance travel. Access to the suburban tracks and station is obtained by gradually depressing the two outside tracks in the entrance tunnel below Park avenue until they reach the lower level. In the rush hours the suburban trains will pass into the station and around a loop which will extend beneath the restaurant on the express level, the trains passing out again without breaking bulk. Toward the close of the rush hours, alternate trains will discharge their passengers from the series of seven stub tracks, which occupy the train space within the loop and in front of the suburban concourse. Trains will be stored here and in the station yard until the evening rush hour, when they will be switched out into service again. Provision is made at the inner end of the loop for connection direct to the tracks of the Rapid Transit Subway below Fourth avenue ; and it is a fortunate circumstance that Mr. Parsons, the chief engineer of the Subway, by moving the two tunnels below Park avenue over toward the curb line, made provision for this connection with the New York Central system, although, at that time, the New York Central Company was not disposed to consider any such connection.

The suburban station is provided with a broad concourse and with the necessary waiting room and other conveniences, all arranged on the lower level, and with separate exits both to the Subway and to the street. This station is, to all intents and purposes, absolutely independent of the express station above ; although provision is made by means of staircases for communication direct from the ticket lobby and the main concourse to the suburban station.

In conclusion, it should be mentioned that the capacity of the Park avenue tunnel has been increased at least one hundred per cent. by the great enlargement of the station yard. One of the most serious obstacles to a further increase in the number of passenger trains under existing conditions, is the fact that the storage yard for express trains is at present located at Mott Haven, and every express train that enters New York has to make the trip through the tunnel four times, twice in entering and leaving the station with passengers, and twice in making the round trip to the yard for cleaning purposes. With the enlarged area of yard provided in the new arrangement, the storage of express trains will take place at Forty-second street, and the tunnel will be relieved proportionately.

The whole of the station yard will be operated electrically, as will also the suburban trains on the New York Central, the Harlem, and the New Haven Railroads. Suburban trains will be operated on the multiple-unit control system with motors on the car axles, and shorter trains will be run at more frequent intervals. Tne long-distance expresses will be hauled as far as Croton on the main line, White Plains on the Harlem Division, and Portchester on the New Haven Road, by electric locomotives. It is expected that the local service will be in operation in from two to three years' time, and that the whole scheme will be completed about a year later if labor troubles do not interrupt the process of construction.—*Architects' & Builders' Magazine.*

A NOTE ON DECORATION.

My house is mainly right in its decorative scheme, because the beginnings were right. Unless one rightly begins it is impossible for him to escape going wrong or reaching a wrong consummation. One often sees the walls of a room frescoed with elaborate designs and in bright colors, or hung with paper of brilliant patterns. Now, it is impossible to furnish a room harmoniouslv in which this cardinal error exists. Beginning with bright colors, there is no ground against which color can be placed, and, consequently, every bit of color brought into the room, and every object added that is at all decorative in character, is almost certain to be in conflict with the decorative colors permanently there. In such a room, as objects multiply, the inevitable result is incongruity, unrest and distraction.

The walls of our rooms, it must be remembered, are to act as foils of our paintings, of our tapestry, of our upholstery, of our vases and bronzes, of whatever decorative object we may place there. How are we to hang our much cherished flower-piece by Lafarge on a wall overflowing with the flower designs of the decorator ? How are we to place our vase of Chinese blue against a wall rioting in blues and greens ? When we turn a decorator into a room in this way, the decorator turns us and our art gems out of the room finally and forever. When the walls of a room are low in tone, everything else appears at its best. The paintings have full value ; the rich tints in the draperies are made richer ; the blue and the red in the vases become sparkling foci of color ; and the eye is delighted with the harmonious ensemble.

Painted walls are stately, cold, and distant ; they do not give a room that sense of cosiness and comfort which is so desirable ; and they do not adapt themselves so readily as paper does to various objects. This is probably due to the texture and character of the surface. When a wall painted in a flat tint is varnished, it is fairly impossible to hang a picture upon it with an agreeable result. Even if you nearly cover the wall with pictures, every uncovered part of the surface thrusts itself inharmoniously forward, and leaves the result unsatisfactory.— *My House, by Oliver Bunce.*

A UTOPIAN HOTEL BEDROOM.

A writer in the *County Gentleman* has a good deal to say about Mr. H. G. Wells' "Utopia" and its conceptions of improvement in social affairs. The only part of the article that concerns our purpose is the description of a bedroom in a hotel, which is as follows :—

"A cake of soap drops out of a store machine on the turn of a handle, and when you have done with it, you drop that and your soiled towels and so forth, which also are given you by machines, into a little box, through the bottom of which they drop at once, and sail down a smooth shaft. A little notice tells you the price of your room, and you gather the price is doubled if you do not leave the toilette as you found it. Beside the bed, and to be lit at night by a handy switch over the pillow, is a little clock, its face flush with the wall. The room has no corners to gather dirt, wall meets floor with a gentle curve, and the apartment could be swept out effectually by a few strokes of a mechanical sweeper. The door frames and window frames are of metal, rounded and impervious to draught. You are politely requested to turn a handle at the foot of your bed before leaving the room, and forthwith the frame turns up into a vertical position, and the bedclothes hang airing. You stand at the doorway, and realise that there remains not a minute's work for anyone to do. Memories of the fœtid disorder of many an earthly bedroom after a night's use float across your mind."

The writer of the article comments :—

"Would this kind of life, really, lead to happiness? If simplicity means happiness, is this simple? Is it not hatefully complex? And it is only one tiny picture—Mr. Wells's ideal bedroom."

He seems himself to have a lingering longing for "Alan Breck's bed in the moss-hags." And so have we all. But in a hotel we want cleanness first, and sanitary ugliness has a sort of attractiveness. But some one else may turn the handles.

THE NEW YORK BUILDING FAILURES.

The committee appointed to investigate the causes of these failures has reported. The failures occurring on the first warm day of spring, and all on the same day, were obviously caused immediately by thaw, and were generally supposed to be entirely due to building in freezing weather. This condition appears however to have been added to other bad conditions. The report reads :—

From our investigation we conclude that in every case the collapse or the partial destruction of these buildings was directly due to the failure of their foundation walls.

We found these walls full of voids, built of irregular and undersized stone, improperly bonded and imperfectly bedded. The mortar used was of an inferior quality and improperly mixed. Both the materials and workmanship were in flagrant violation of Section 26 of the Building Code.

Although the sudden change in temperature which occurred on the night of March 18 may have contributed to the failure of the stone foundation walls in these various buildings, it is, nevertheless, a fact that these walls were of such inferior workmanship and materials as to make them insufficient to sustain with safety at any time the superimposed loads.

Our inspection revealed many violations of the Building Code, which, while not contributory to the destruction of the buildings, were in themselves a distinct menace to their permanency, inasmuch as they eliminated or reduced the factors of safety which the code provides.

Our comparison of the approved plans with the buildings showed that the corrections and amendments required by the Bureau of Buildings, as a prerequisite for the issuing of the permits, were generally disregarded in construction, although consented to in writing by the applicants in their desire to secure such permits. The work of the engineering staff of the Bureau of Buildings was, therefore, completely nullified.

The applications relating to the above mentioned buildings showed that in only one case was the architect of record to superintend the construction. In no case was the name of the builder stated. These omissions left in question the competency of those who were to supervise and the character of the contractors who might be selected to erect the buildings.

We can, therefore, only conclude that these buildings were erected without proper supervision, under inefficient inspection and by incompetent contractors ; that the provisions of the Building Code were generally disregarded and that a very low standard of work is typical in this class of buildings.

In further compliance with your request and in view of these facts, we submit for your earnest consideration the following recommendations :

1. Architects should be required by law to supervise the construction of buildings for which they furnish plans.

2. A person before being allowed to practice as an architect should hold a diploma from some institution of learning or from a recognized board to be created hereafter. The personnel of this board and the methods of its operation should be left to a commission composed of representatives of the various architectural associations and members prominent in that profession.

3. A register of those authorized to practice architecture should be kept by the Bureau of Buildings, and permits for the erection or alteration of buildings should be issued by the superintendent of buildings only to those so registered.

4. All contractors for mason work or structural steel work should be licensed. The co-operation of the recognized organizations in these trades should be sought in the establishment of such board or bureau.

5. It shall be unlawful to permit the building of mason work or the erection of structural iron work by persons not so licensed.

The substance of these recommendations enacted into law would make the recurrence of similar accidents practically impossible, as such enactments would secure competent architectural supervision and capable contractors for all classes of building operations. The rigid, conscientious inspection of work in progress, which the Bureau of Buildings has failed to secure in these cases, is then a matter of secondary importance.

The intention is evidently to establish by law such conditions of good building that the least possible dependence need be placed on official inspection.

MOVING PLATFORM SUBWAY.

The current issue of the Scientific American devotes a considerable portion of its space to the discussion of the moving platform subway to be constructed in New York, and summarizes in a leading article the evidence given by Mr. Stillwell, the electrical expert of the Interurban Railroad Company, in which he showed the great economic advantage possessed by the moving platform over the electric-car system for city transportation. "It seems," states the Scientific American, "in the first place, that the moving platform has a great advantage in respect of the dead weight carried per passenger ; for whereas in the local subway service 1,241lb. of dead weight must be carried for each seat provided, and in the Manhattan six-car local service 790lb. per seat, in the case of the moving platform the dead weight will amount to only 437lb. per seat, or one-third of what it is in case of the subway. There is, moreover, a large saving of energy resulting from the fact that the moving platform does not stop at stations. In the local service of the subway over two-thirds of the energy supplied to the cars is dissipated in braking. In other words, if the cars moved at uniform speed and never stopped at stations it would require only one-third of the power plant to keep the whole system in operation. A comparison of the power required to move the trains and to move the platform shows that the Manhattan Elevated cars require at the power house 30 kilowatts per car, and subway cars require, at equal speed, about 50 kilowatts per car. In the case of the subway the energy required is practically 1 kilowatt per seated passenger ; that is to say, 10 kilowatts at the power house are required to transport ten seated passengers in the subway. Estimating the rolling friction of the platform at about 6lb. per ton Mr. Stillwell estimates that 10 kilowatts, instead of moving, as in the case of the subway, ten passengers, would move 260 passengers if they were seated on the moving platform. This great difference of 1 to 26 is due to the small dead load, to the absence of stopping, and to the fact that the rolling friction per ton is very much less. It has been charged against the moving platform that the speed, 9 miles per hour, is low ; but it was shown by Mr. Stillwell, and endorsed by Mr. Stuyvesant Fish, that, because of the frequent stops, say on the local elevated or subway trains, and of the great delay at stations in rush hours due to insufficient means of ingress and egress to and from the cars, the higher speed of the elevated and subway trains between stops is brought down if the stops be included, to an average speed of 9.67 miles per hour, which is only a little over one-half mile per hour greater than that of the platform which maintains its 9 mile an hour continuously." The carrying capacity of the moving platform is stated to be vastly greater than a four-line system of electric cars.—*Times Engineering Supplement.*

HIS UNUSUAL CURIOSITY.

An East End resident who had considerable business with plumbers, carpenters, brickmasons and artizans generally in the construction of a new home finally engaged a painter. His wife had been urging him to hurry the work on the house, and had planned a reception for its opening day.

"Yes, sir," said the painter. I can promise to have your house finished in two weeks."

"Yes, but," said the owner anxiously, "that isn't the point."

"Then, what is ?"

"I want to know how long it is going to take you."—Duluth News-Tribune.

MONTREAL NOTES.

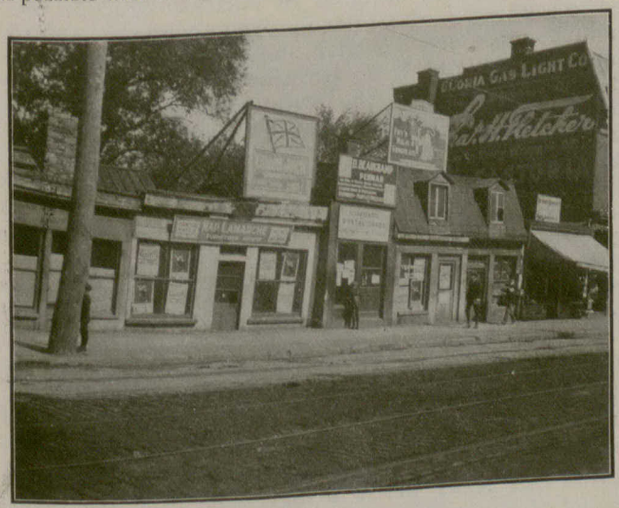
In all directions there continues to be great increase in the volume of work being done in the building world of Montreal. Besides the large apartment houses in the neighborhood of Sherbrooke street—the "New Sherbrooke" and the "Grosvenor", both now well under way, and the "Hampton Court" apartments in Mountain street—a great deal is being done to meet the pressing demand for residences of all sorts and grades. As noted in former issues a great number of Banks are erecting branches wherever customers are likely to be attracted, others are vying with one another in offering all sorts of conveniences to their clientéles.

In another sphere, well over a million dollars is being spent on various projects of the Roman Catholic church. The Notre Dame Hospital, now well advanced, will cost, when complete, probably about $160,000. The "Maison-Mére" of the Sisters of the Congregation de Notre Dame, which is just being commenced, is estimated to cost $800,000. This is to be built on the south side of Sherbrooke street, near the head of Atwater avenue, a building of grey pressed brick and Gray Canton sandstone, including a chapel to seat 1000 persons which forms the central feature of the design. The same firm of Architects, Messrs. Marchand & Haskell, have also designed the Parish Church of St. Cunegonde now being built to replace the old one which was destroyed by fire.

For St. James's Church, at the corner of St. Denis street and St. Catherine street, a new Presbytery is projected, to cost about $32,000. The corner stone has been laid of the new Church of St. Agnes, for English-speaking Roman Catholics, at the corner of St. Denis street and Duluth avenue, of which Alphonse Piche is the architect. It is estimated to cost $25,000. The sum of $40,000 is to be spent on a four-storey school for the Congregation Ste. Croix de St. Laurent in Papineau avenue, and $25,000 on a Home for the Oblat Fathers in Panet street, near St. Rose.

Of a more commercial character, the largest project recently announced is the proposed new building of the Crèdit Foncier, Franco-Canadian, to cost about $500,000. The site purchased for this building is that at the north-east corner of St. James street and Cote St. Lambert, measuring 98 feet by 82 and extending to Fortification Lane. It is proposed to erect the new building to a height of 132 feet, in ten stories. The ground floor will be occupied by the Crédit Foncier and the upper floors will be let as offices. Gray Canyon sandstone is to be employed for the facings. The Leurs Building in Bleury street is now completed externally and is being got ready for occupation. Farther up-town, in the south-east corner of Philip's square, the erection has commenced of a four-storey building from the designs of Messrs. Edward & W. S. Maxwell. The upper stories of this building are to be faced with pressed sand brick trimmed with sandstone, somewhat of an experiment apparently.

The Bell Telephone Co. has arranged to build a new up-town exchange in the upper part of Mountain street—which it is expected to have running next summer—This being placed in a residential street, the design has been made to accord as much as possible with ts surroundings.



Many changes in St. Catherine street are promised for the near future, but the only large work at present in progress is the Lindsay Building on the south side of the street a little west or Peel reet. There is little of this showing as yet but the work has commenced. The accompanying view of a portion of St. Catherine street, not far from the centre of its length, between Bleury street and Alexander street, shows a remnant of the old style. These buildings seem strangely out of place now, and they illustrate how rapid the development of this street has been. The street cars now race along in front of these shops at an average of one minute intervals day and night; but this is not done for such as these, and their days are numbered.

CONCORDIA SALUS.

UTILIZATION OF SKYSCAPER ROOFS.

While the tops of the skyscraper buildings would be fine launching places for aerial ships and flying machines, the record is still a blank regarding any utilization of the lofty spots for such a purpose. Thus far the inventors have sought out perches closer to the ground for their ambitious trial trips. Summer gardens, of the music hall sort and also for the private use of the occupants, are no new thing on the tops of the tall buildings, and it is also well known that the janitors of such buildings often utilize the roof space for kitchen gardens. The latest use of the roofs is as recreation grounds.

On top of one fifth avenue apartment house is a perfectly fitted up squash racquet court, for use in common by the tenants. The building is of wood, with a pitched roof lighted by glass windows, the play court being of the usual size and the building also containing a gallery for spectators. The small space needed for a squash court, approximately 35 × 16 feet, makes it an easy matter to find room for such a building on a roof, and there are several of them in use in the city close to the skyline. The courts are almost invariably enclosed by walls, and at an upper West Side apartment house the space is used for a lawn tennis court in summer and for ice skating in midwinter.

There is no better location possible for pigeon lofts, especially if working homers are kept, than the roof of such a building, and, as the Pigeon and Poultry Breeders' Association demonstrated during their show in Herald Square Hall, the location high in air is an excellent starting place for a distant flight. There are several skyscraper pigeon lofts in town, and at least one amateur fancier of show rabbits keeps his stock on such a roof.

A sporting utilization of another roof in midair is as a kennel. The dogs that have their home there are not toys, or of the small sort at all, but, instead, the inmates are a collection of English bulldogs as well known as winners at the bench shows as any in the country. The kennel is a favorite meeting place of dog owners from out of town, especially when a dog show is on, and through its popularity in this way fulfills the place of a club for the amateurs who take delight in calling themselves "Brothers of the Fancy."

When the elevator reaches its high-water mark in this skyscraper the visitor has two short flights of stairs to climb to gain the iron door that opens on the roof. As the stranger passes through the door and closes it behind him, he shuts out all that suggests city life, tall buildings, or whatever of the moil and toil of town existence may have dogged his steps thus far. He finds himself within a square of brick walls, such as they train fruits to grow on in England, and before him is a brick stable, with peaked roof and gilt weathervane, the duplicate of the carriage house of any detached suburban residence. He stands on clay soil and overhead is the blue sky, while the air is pure and as inspiriting as wine. It is like a clearing on a mountain top, and it would not be a surprise to see the tops of trees waving above the brick walls.

Inside the buildings are kennels arranged in double tiers, and fifty dogs may be kept there in comfort. On the walls are some photographs of notable winners for the kennel, and a frieze of sporting cuts. A great collection of blue ribbons and cups won at bench shows fills a glass case, and there are plenty of chairs to lounge on while the dogs are trotted out for inspection. The dogs thrive in the high location, and the only detail that

has required special thought is a machine on which they take walking exercise.

Manifestly, it would be a nuisance to take the dogs all the way down to the street for their walks, and if turned out on the roof they would do more sleeping than walking. The machine is merely a treadmill, such as dogs may often be seen working to furnish power for churns or small cider presses, and it is usually regulated so that 50 minutes of the machine is equal to a walk of a mile. Each dog, however, only gets 20 minutes on the treadmill a day and, besides, the walking exercise, the work is deemed good to square the shoulders and broaden the chests of the bulldogs. The dogs do their stint of work cheerfully and as though they liked it; in fact, they would much prefer to jog along on the machine than be shut up in their boxes. —*Architect and Builder's Journal.*

THE UNDERWRITERS' VIEW OF SOME FAILURES OF CONSTRUCTION.

In presenting to you the problem of this evening's talk I shall not try to touch upon every point in which construction may be said to have failed and the point-of-view is perhaps more correctly described as that of the insurance-engineer than that of underwriter. I should have chosen the term "insurance-engineer" rather than "underwriter" were it not for the fact that the insurance-engineer as a factor in our improved knowledge of construction is comparatively new, and that to most people, the term fire underwriter expresses more definitely the idea I am here to represent.

Of the types of construction which have been most prominent of late in the minds of the public there are two which probably are to-day better known than others. These are "mill" construction—so-called because it was supposed at least to be patterned on the standard of the best types of construction for manufacturing-plants—and the so-called "fireproof" construction.

Both of these types have been presented to the public as panaceas for the enormous fire-loss of this country (a destruction of property which is as truly a loss as if the money value represented by it had been thrown into the sea), and both of them have, in some forms of their development, failed entirely to prevent this loss.

The reasons for these failures are matters of careful study by active-minded men, trained for the purpose, and once understood will be as surely overcome as other engineering problems have been.

In the case of the so-called "mill" construction the error seems to have been two-fold: First, in the application of this construction to work for which it was not intended; and secondly, in a failure to carry out fully and properly the principles upon which this form of construction was based.

This type of building was originally designed to cover in and protect from the weather large manufacturing establishments in which strength not beauty was the leading requisite. It was designed to remedy certain defects which had appeared in the earlier type of building used for manufacturing purposes, such as concealed hollows in walls and floors, unduly combustible roofs and passages for fire, but not for firemen, from one part of the building to another; and it did overcome such difficulties to a very reasonable extent. It also improved the lighting, heating and ventilation of buildings for such work, and, in combination with the probable contents and the very excellent fire-fighting apparatus which was provided, succeeded largely in furnishing a satisfactory substitute (*for mill building*) for the "combustible architecture" which has preceded it. It must, however, be kept in mind that compared to the city building to be used for the "storage and sale of merchandise" the mill, even the cotton-mill, contains but little combustible contents and that the mill though often containing large unbroken floor-areas is of comparatively slight height.

When, therefore, the success of this construction (which was really the first work of the insurance-engineer) in reducing the fire-loss in mills brought it to public notice, and the attempt was made to adapt it for use in stores and warehouses, no adequate provision was made for the changed conditions. The requirements of trade called for offices and counting-rooms; they were partitioned off with hard-pine sheathing. The shape and size of city lots made it difficult to put the stairways and elevator-shafts in separate brick towers, as they are in the best built mills, so the stairways and elevators were put inside the main walls of the building and were left unenclosed or only partially cut off. The desire to have attractive salerooms led to the use of varnish in place of plain wood, or better still, well whitewashed surfaces. The necessary crowding together of buildings in cities makes thorough protection of outside openings most important. But shutters interfere with light, and require attention which, without mill discipline, was not easily secured, so shutters were neglected or often omitted.

The use of such buildings to house several tenants under one roof made the mill discipline impossible and increased materially the danger of fire from rubbish, from careless use of matches, from many other well-known causes. The lack of skilled mechanics as a part of the working force of such a building was no doubt a reason that proper fire-fighting facilities, as a part of the equipment of the building, were not more commonly provided. In short, there was an attempt to use "mill" construction for warehouses and stores without keeping in mind its essential features, which briefly are: No "vertical openings," no "concealed spaces," the minimum of "combustible finish," with ample facilities for extinguishing fire at its discovery, and ample protection from outside exposure. Under these circumstances it is not surprising that "mill" construction did not for city warehouses fulfill all expectations. Yet I do not feel that the construction was to blame, but the use made of it. Railroad semaphores are a necessary part of railroad equipment, and especially so in these days of fast trains, yet I once heard a first-class engine-driver say that "they got in the way like thunder when you wanted to make time," and I fear that this is the feeling of many merchants and owners of buildings as to the essentials of mill construction.

In the case of "fireproof" construction, difficulty seems to have come from a different cause. As in many other matters, the American tendency to go to extremes has resulted in undertaking the construction of enormous buildings, limited only by the strength of materials as to height and by the ground available as to area. In constructing such vast buildings, it has been assumed that because a material would not, under ordinary conditions burn, it was therefore "fireproof" or at least reasonably "fire-resisting." The enormous expense required by such construction has led to economies which have proved dangerous and to methods which fire has tried and found wanting. No one who saw the U.S. Government Warehouse, at Baltimore, soon after the awful conflagration of last year, can have any doubt that it is possible to build a warehouse of reasonable size which would even under the terrible strain of such a fire as that, be a protection to the merchandise within its walls. If it had not been for the alteration in its original form made necessary by the introduction of a modern elevator, I doubt whether the expense of repairing that building would have been more than the cost of glass for the windows and a little paint and putty.

It may be said that this building was not exposed to the extreme test of those awful hours. Yet buildings all round it were totally wrecked, and it stands to-day in practically its original form, except in the substitution of brick for granite for its interior columns.

And this leads me to a digression from the main thread of my argument. For thirty years every engineer, every architect, every builder of repute, has known that stone, especially granite and marble, while not in themselves combustible, are destroyed by fire

* A paper by Mr. F. Elliott Cabot, Assistant Secretary of the Boston Board of Fire Underwriters, read before the Boston Society of Architects.

almost as readily as wood. If any one had doubted it before last winter, the Baltimore fire proved it beyond any doubt. Yet I venture to say that there is not today a large city in this country in which there will not be during the year 1905 a large amount of marble or granite used in fireproof buildings, and in parts of such buildings so high above the street that the use of water to protect them from fire will be, so far as fire-departments are concerned, physically impossible.

Is it possible that the American brain, so fertile in every other direction, is unable to cope with the problem of designing and erecting an attractive and suitable exterior for a building which is *designed* to resist fire?

And now let us return for a moment to the false economies which so often confront the underwriter who, from the business point-of-view, is endeavoring to fix a proper price for the indemnity which he has for sale.

One of the commoner forms is the slighting or the deliberate reduction of the protection for the steel framing which is the skeleton of all these great buildings. The records of the cost of construction of some of the larger office-buildings destroyed in the Baltimore fire show that the marble wainscoting and flooring of the halls in these buildings cost more than the protection of the steel frames, and we know that in one building at least, a form of floor construction which was proved to be satisfactory was given up and a cheaper one, as it proved, entirely unreliable form submitted at a saving of one or two per cent. of the cost of the building.

We are asking these steel frames to carry enormous loads, to withstand great strains, and yet we grudge them the slight additional cost of a reasonable protection against fire, not only against conflagation but against such fires as have and will occur within the building or its immediate neighbors, and we spend twice the money which the proper protection would cost on decoration which may or may not be good art.

Again, it is a common practice to set interior partitions on top of combustible wooden floors, even when the partitions are made wholly of incombustible material, and as a result, a slight damage to the wooden floor wrecks twice its value in partitions and their finish.

We use iron face-plates on the fronts of these buildings and let the adjoining brickwork rest upon them so that a slight expansion of the iron displaces many feet of brick facing. Does it pay? Is it good work? Does the result justify it? Surely not.

In the fireproof building, too, we seem to depart from the construction which is justifiable for such work by the great expanse of unprotected windows.

Of course, light and air are most desirable, but from the underwriter's point-of-view it is fair to expect protection from more than the weather in the best type of building.

Vertical openings, too, have been quite a factor in the destruction of several buildings of this type, especially in those of a great height, as they almost invariably act as a flue to draw the fire from one story to another. If a large office-building is to be regarded simply as a stove which will from time to time be burnt out, it is perhaps sufficient to provide for protection to the building itself, but if it is to provide protection for its contents, then the vertical openings and the exposed windows need protection.

I have tried briefly to state why these forms of construction have not been as successful as they ought to have been, and I will endeavor briefly to give the insurance-engineer's hope of what may be done to overcome these difficulties.

Considering first the "mill" form of construction, I believe the automatic sprinkler, the fire-door and the fire-shutter, with a restricted use of combustible ni sh,, will solve most if not all of our difficulties in this direction, I wish architects and engineers would make themselves more familiar with the use of sprinklers, because so much may be done in the construction of the building to make sprinklers thoroughly effective. A smooth ceiling or one with panels approximately 10 x 10 ft. or 5 x 10 ft. will give sprinklers the best chance to distribute the water to the best advantage.

For the "fireproof" building I must, at the risk of being called a crank, urge the use of "wire-glass" in metal frames, both for exterior use and where it is necessary to light stair and elevator wells.

Cut off the vertical openings, protect the steel frames everywhere and protect exposed windows, then "fireproof" buildings will come nearer to deserving their name.

THE ROWTON HOUSES.

The late Lord Rowton, who was Lord Beaconsfield's private secretary, devoted himself, after Lord Beaconsfield's death, to the philanthropic work of getting wholesome and comfortable tenements built for the poor of London. He organized companies for this purpose and they produced a type of apartment house which has since been repeated (though perhaps not as a copy) in the Mills hotels of New York. Lord Rowton had no architectural training but supplied its want by zeal in the humble department of comfort. His method was the unscientific one of "cut and try," but he cut and tried until he had succeeded in his aims, which were of the practical kind, that rooms should have sufficient room in them though small, that beds should be comfortable though simple, that washing apparatus should be of the right kind and such as would make life easy. To attain these ends he had actual models constructed and used them ; slept in the beds and washed in the washing apparatus until they were right. With this kind of care he got good work done, and with this spirit he succeeded in inspiring others so that his companies carried out their work with an effect that at once produced a demand for more of the same kind. Several were erected before Lord Rowton's death a couple of years ago ; and though his organization ceased the municipalities have got the idea.

A NEW STYLE OF STOVE.

A new type of stove, the object of which is the abolition of smoke, no matter what fuel is employed, has been demonstrated in London. The invention comprises a screen of tubular fire bsicks, made of special material, built up in the furnace in such a position that all the products of the fire pass through the screen, the latter quickly becomes incandescent, and flashes the gases as they pass through, thus preventinn formation of carbon. Bp the aid of this device coal of the worst description can be burned in the ordinary boiler with practically no smoke, and with a considerable saving in cost. For the purpose of demonstration cheap, damp coal dust was burned. The only result was a light gray cioud at the top of the chimney stack, which cleared away ln a few seconds.

PROFITABLE TREATMENT OF SEWAGE.

Sewage sludge is being treated experimentally at Bradford, England, under the direction of Dr. J. Grossman, to determine definitely whether any commercial fats can be recovered from it. The plant has a capacity of about 16 tons of sludge daily and is said to work without objectionable odor. It yields about 7 tons of manurial residue daily "containing besides free carbon 2 per cent. of nitrogen and 2½ per cent. of phosphate of lime." The distillation process is used and the value of the residue and the grease recovered is said to be greater than the working expenses.—*Engineering Record.*

Mr. J. J. O'Hearn, house, sign and ornamental painter and decorater, Toronto, has recently taken his son into partnership and the business is now carried on under the name of O'Hearn & Son. They have purchased the building they now occupy at 249 Queen street west, where they have one of the most commodious and up-to-date paint shops in the city and carry a large stock of paints, oils, varnishes, etc.

—THE—

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PERSONAL.

Mr. G. A. Allan, architect, has recently opened an office at Brockville, where he was formerly in practice for a number of years. He will be pleased to receive manufacturer's catalogues, circulars, etc.

Mr. C. K. Shand, architect, formerly of Seattle and Chicago, and Mr. J. S. Pearce, architect, of Vancouver and Victoria, have formed a partnership, with offices in the Hadden Building, corner Hastings and Granville streets, Vancouver.

Messrs. Hooper & Watkins, architects of Victoria, B.C., have recently established an office in Vancouver over Robt. Wards & Co., in the Metropolitan Building. Mr. Hooper who is a brother of Mr. Sam. Hooper, Provincial Architect for Manitoba was formerly located in Vancouver, and comes back to take charge of the firm work on the mainland. They have plans in preparation for new brick block in Vanconver.

No. 500 Wilbrod Street, Ottawa.

J. W. H. Watts, R.C.A., Architect.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JUNE, 1905

No. 500 Wilbrod Street, Ottawa—Main Stair.

J. W. H. Watts, R.C.A., Architect.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
JUNE, 1905

No. 500 Wilbrod Street, Ottawa—Hall.

J. W. H. Watts, R.C.A., Architect.

SUPPLEMENT TO
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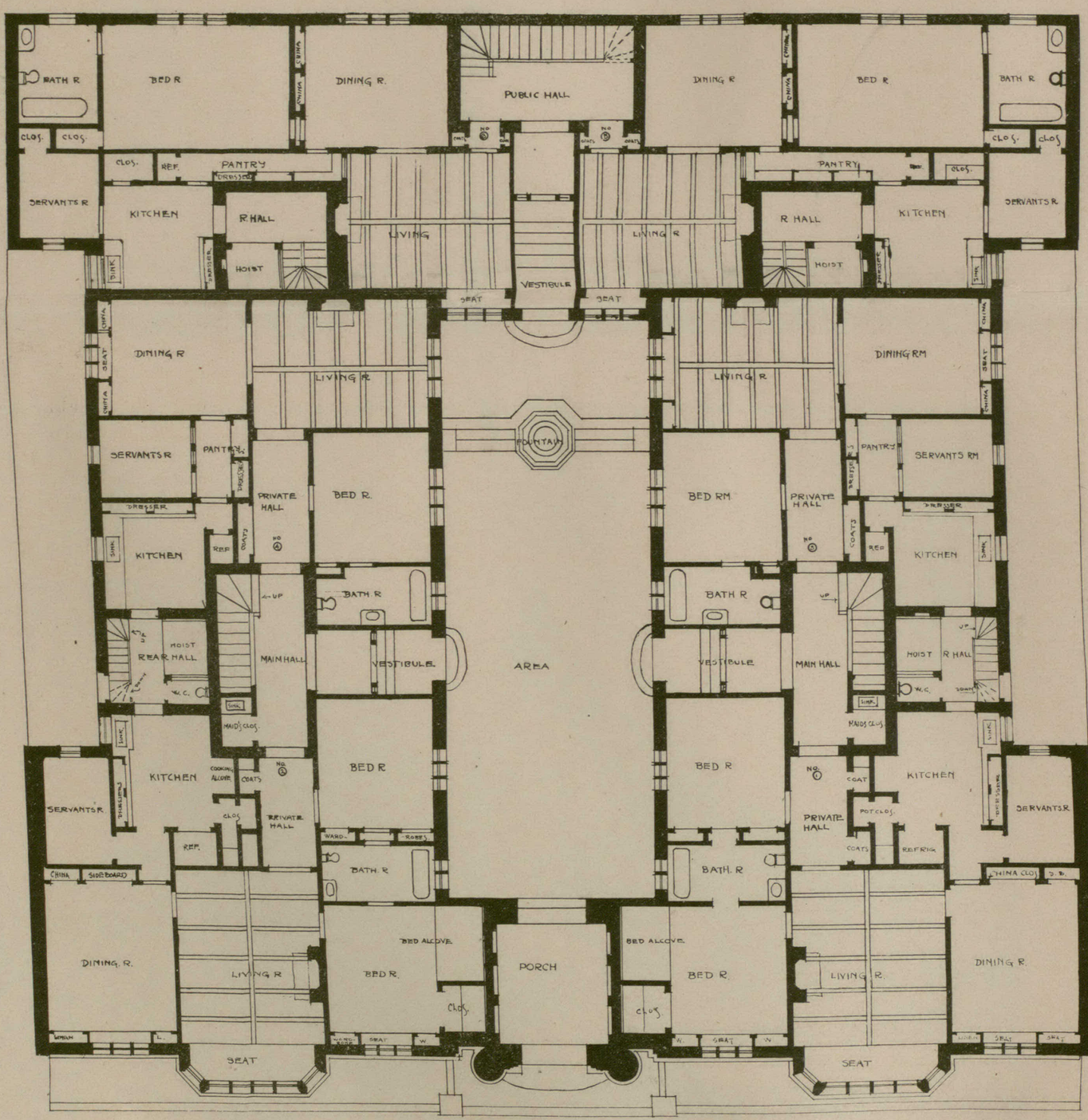
JUNE, 1905

PERSPECTIVE OF FRONT



GROUND FLOOR PLAN.

BISHOP'S COURT APARTMENT BUILDING, MONTREAL.

MESSRS. SAXE & ARCHIBALD, ARCHITECTS.

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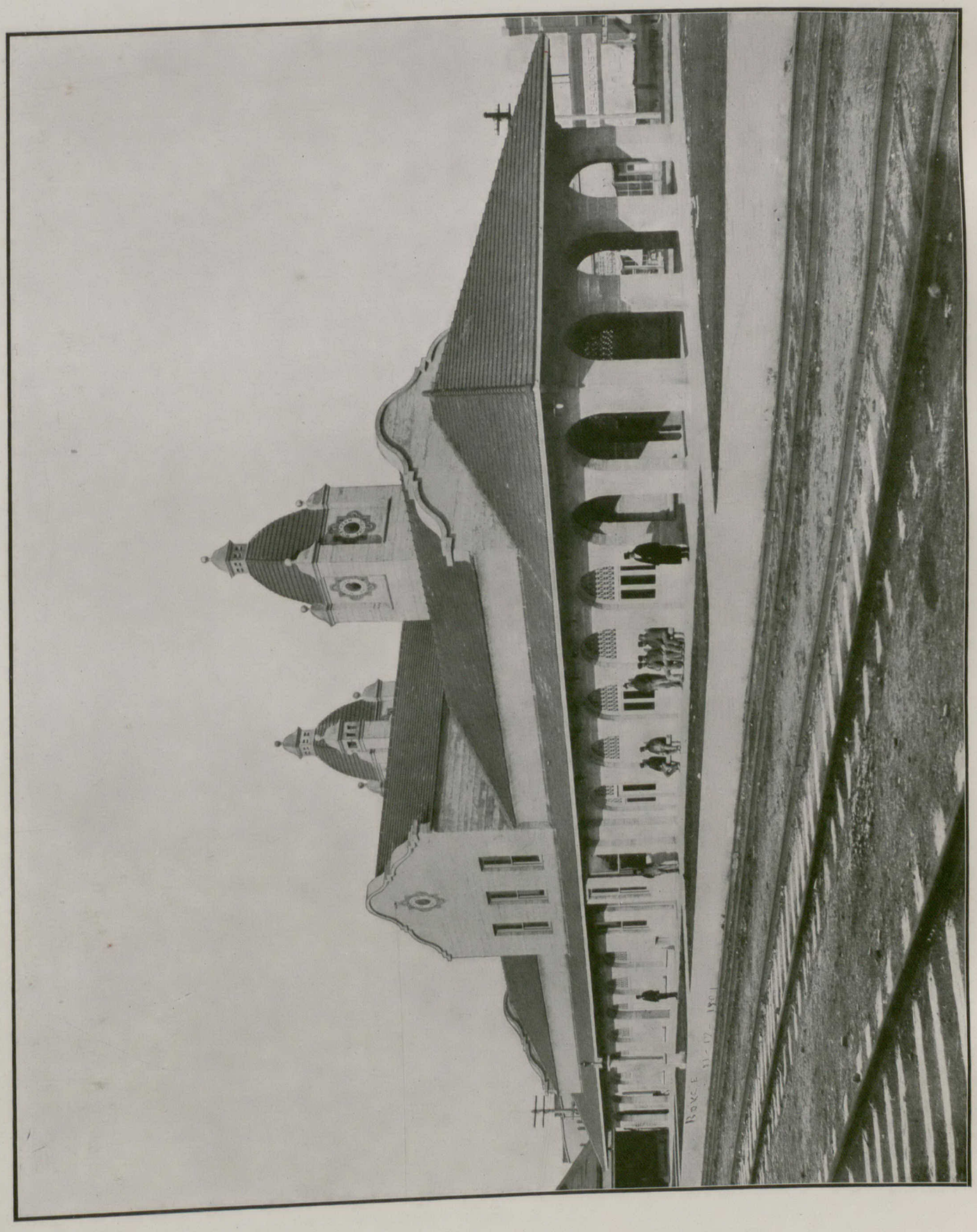

PASSENGER STATION, NORTHERN PACIFIC R. R., BISMARCK, N. DAKOTA.

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