Regular Edition

THE CANADIAN ARCHITECT AND BUILDER

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The Canadian Architect and Builder

VOL. XVII.—NO. 203. NOVEMBER, 1904.

ILLUSTRATIONS ON SHEETS.

First Christian Church, Bathurst Street, Toronto.—S. H. Townsend, R. C. A., Architects.
Palace Pompei Verona—Measured and Drawn by Cecil A. Burgess. A.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Views of St. James Cathedral, Toronto—Cumberland & Storm, Architects.
Design for New Post Office Building at Winnipeg—Darling, Pearson & Over, Architects.

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SPECIAL CONTRIBUTORS.

MR. W. A. LANGTON, Architect, Toronto.
" EDMUND BURKE, " Toronto.
" S. H. TOWNSEND, " "
" Prof. Percy E. Nobbs, Montreal.
" FREDERICK G. TODD, Landscape Architect, Montreal
" W. H. ELLIOTT, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal.
" FRED. T. HODGSON, Architect, Collingwood, Ont.

The Duty on Architectural Plans.

The Ontario Association of Architects are endeavoring to have changed the present customs regulation fixing the amount of duty to be paid on plans brought in from other countries. Until a few years ago, duty was charged not, as at present, on the value of the plans only, but on the total value of the completed building erected from the plans. In some way the regulation was changed so that duty has to be paid on the value of the plans only. The regulation in its present form is felt to be unfair to Canadian architects, and an effort will be made to induce the Government to revert to the former regulation.

Power From Refuse.

Perfection in municipal arrangements is to be found in Great Britain rather than on this side of the Atlantic. They have crowded cities over there that must be well run if they are to be run at all to suit the English taste for having things in good order. It would do us good to cultivate the same taste and, even at some little cost, to qualify the prevailing shabbiness of our towns. But it is not cost so much as economy that would result from a study of English municipal methods. Administration is the forte of the English and they are making their municipal works pay in many ways. In the matter of refuse destructors, there are said to be one hundred now in operation which supply power for electrical purposes, sewage pumping or water pumping, equivalent to the use annually of 150,000 tons of the best steam coal. An average annual saving of 1500 tons of coal wherever one of these destructors is used must offset the working cost considerably, but there is another point worth considering—that combined works of this kind are better worth having than works where the power is not utilized, inasmuch as the high temperatures which are essential for satisfactory power production are at the same time a guarantee against nuisance.

Concrete Piles

For wet and dry conditions in a piled foundation concrete piles have recently been used successfully as reported in the Engineering Record, in building the Dittman factory, on the canal in Cincinnati, Ohio. The piles ranged from 8 to 22 ft. in length. They were square in cross-section, with a 2 in. bevel on the edges, and tapered 2 inches in 16 feet; being 10 in. square at the point end and 14 in. at the upper end of a 16 ft. length. The piles were reinforced with ¾ in. twisted bars, one in each corner, and these were bound together with ¼ in. hoops, 12 in. apart on centres. These bars turned in at the bottom into a cast iron shoe weighing 50⅔ lb. As it was desired to drive them as soon as possible after being made, a 1 : 2 : 4 mix was used. The piles were aged at least four weeks before being driven. In order to keep the top of the pile from fracture a special cap was used, which was stuffed with rubber from old hose. The hammer used was two tons, and the drop averaged from 4 to 6 ft. Higher drops were used but the record was against them. The cost of the piles is only stated as "considerably more than the cost of

wooden piles per lineal foot," but it is added that "one concrete pile was as effective as two or more wooden piles would have been.

Bad Scaffolding

Mr. R. J. Fleming, Commissioner of Assessment and Property in Toronto, has given his opinion that scaffolding cannot be efficiently inspected by city officials. It would require an army of them, he says. As scaffolds are often put up only for a few hours, it would be quite possible for a scaffold to be erected, to break down, and the workmen who tried to use it to be dead, within an hour ; while the department was still in ignorance of it being erected. The matter, Mr. Fleming thinks, should be dealt with by the workmen. If, he says in effect, through their organizations, they can decide how many hours they shall work, how much they shall be paid for their work in those hours and beyond them, how many hod carriers a bricklayer can keep going, how many lads ought to learn the trade—if they can do all this, surely they can decide the character of any scaffolding upon which they have to work. He might have added that, if work is to get on without continual delays, there must be some more concurrent way of assuring the safety of a scaffolding than by depending upon a visit from a City Hall official.

Clay vs. Iron Drain Pipes.

Modern building by-laws in Canadian citres require that nothing but iron pipe shall be used for drains within the walls of buildings. Outside the walls vitrified clay may be and is frequently employed. In England, however, there appears to still exist a diversity of opinion regarding the relative merits of the two materials. Mr. Samuel Smith in a paper presented at the recent Glasgow Congress of the Sanitary Institute argued strongly in favor of the use of vitrified clay-pipe as against iron-pipe for this purpose. He advanced the opinion that clay-pipe would withstand the action of acids which would cause corrosion in iron pipes.

As a proof of the ability of clay-pipe to withstand hydraulic pressure, he pointed to tests made to determine this question, showing that a 4 inch diameter fire-clay pipe was tested up to a pressure of 45 lbs. per square inch without showing signs of porosity. Another test was made to find the exact pressure that a pipe would stand and still be air-tight. The pressure was gradually increased at intervals of ten minutes from .5 lbs. till a pressure of 3.3 lbs. was reached, and the mercury in the manometer remained steady at that pressure for twenty-four hours. From this test it was concluded that the pipe was capable of standing a pressure of 3 lbs. per square inch, or twenty times the pressure required to break a three-inch seal of a wash-down closet. Fire-clay pipes were also submitted to a hydraulic pressure of 250 lbs. per square inch without showing signs of fracture, but under this pressure there were signs of porosity in one pipe at 60 lbs. presure and in another at 100 lbs.

Mr. Smith admits that clay pipes are liable to fracture if not carefully and evenly bedded, and also that great care is required to insure tight joints. To overcome the former difficulty he recommends the laying of a bed or layer of concrete underneath the pipes, and if the ground is very soft or unequal, the use of ferro-concrete. For joints he recommends that nothing be used but slow setting cement thoroughly cooled and and aerated and well staved into the joints so that all the air from the cement is forced out. To prevent breaking of pipes by reason of the settlement of the building, it is recommended that the openings be ample in size and linteled over with a space between the lintel and the pipe.

Mr. Smith's paper has been severely criticized by Mr. W. R. Purchase, building inspector of a Borough Council, who was formerly Superintendent of a large pottery where drain pipes were chiefly made. Mr. Purchase regards the advocacy of clay pipes as a retrograde step, and contends that porcelain iron pipes are the best material to be obtained at the present time for drains, their points of superiority being strength and capability of resisting fracture, reduction in the number of joints (6 ft. and 9 ft. lengths compared with 2 ft. and 3 ft. lengths of clay-pipe) and the greater security of the joints, which are run in molten lead. The weak points in clay pipes he declares to be porosity and weakness in the material, expansion and contraction of the cement in the joints, uneven expansion of concrete, careless filling in of trench by ramming, etc. In this writer's opinion the drain of the future will be laid in a brick or concrete culvert with stone cover and chambers for access (sufficiently large to admit a man) for the purpose of periodical inspection, the drain to be laid on blocks about 9 inches above the floor of culvert and at intervals of about 3 feet apart. These culverts might also be used for laying the water, gas and electrical mains.

Architects for City Improvements.

The address of Mr. E. Guy Dawber to the Architectural Association of London, from which extracts are quoted in another column, treats at some length, in an address to students of architecture, upon street character as a matter for consideration by architects when building, and implies that street planning should come within the scope of their studies. Mr. Aston Webb, in commenting upon the address, goes a step further and gives it as his opinion that architects should be consulted about " the formation of new streets." As a matter of fact the rearrangement of the approach to Buckingham Palace, made in connection with Mr. Aston Webb's Memorial to Queen Victoria in front of the Palace, is so well done that, though it replaces the old rurality of the Mall, cherished and regretted by Londoners, there is no one who does not accept the improvement with satisfaction. The simplicity and serviceableness of the changes are remarkable ; the place looks as if it had grown that way ; yet the total result is a dignity which makes the Mall, what it was not before, a proper approach to a palace. Anyone who can appreciate the refinement of desigu which has gone to make this result will understand also that it is in the line of an architect's training rather than an engineer's. Mr. Daniel Burnham's usefulness in this direction is recognized by the United States Government. Mr. Burnham is now engaged upon the project of transforming Manila into a modern capital at the cost of many million dollars. He is said to have declared his intention of following the plan which was originally proposed for Washington but was not carried out.

SOME NOTES ON THE QUESTION OF FIRE-PROOF CONSTRUCTION.

Among the crop of utterances upon the subject of the Baltimore fire we have one now about thicker walls and better laying. These are very simple remedies and, if Capt. Sewell, U.S.A., is right, in his inference from the appearance of fourteen inch walls, that an eighteen inch wall would have stood the heat, the demonstration is one more in the direction of proving, what is much to be desired, the unity of Science and Art. Science is truth and Art is truth, and, where they do not agree, the thing to expect is not their divorcement but a fallacy in one or the other. Mr. Wells, the writer of scientific fiction, groans over the backwardness of the age; still making walls by the slow process of setting units one upon another; still wasting time and material in a process that requires walls to be a foot thick to enable them to keep up. Why, he asks, go on with this, instead of setting up a steel cage in a four inch form and pouring in cement? These anticipations make an architect shiver. Not that he would keep back science. It is the suddenness of the change, that is all. But Mr. Wells has to be sudden or he won't sell; and Christmas book science is not as safe to lean on as that of West Point and the U.S.A. We can hardly expect any substance to resist the inroad of great heat except by sheer thickness. Capt. Sewell declares that more mass is required to resist a fire than to carry superimposed loads. So we may enjoy the satisfactory reflection that after all the eye is the best measurer of thickness; that a wall (special circumstances apart) is usually strong enough when it looks strong enough; for though science, in its most economical precision, would be content with less thickness, capacity for resisting fire requires it all.

In the mean time the new building law for Cleveland, having specified the acceptable fireproofing materials in order of merit as follows:—Brick, porous terra cotta, semi-porous terra cotta, dense terra cotta, concrete, and plastering on metal lath, proceeds to declare that the least thickness of fireproofing material that will be allowed is 2 inches. That is to say, 2 inches of plastering on metal lath is sufficient protection in a fire where a 14 inch wall will not stand. These two statements do not seem to make a very good pair.

The extraordinary thing is that there should be really any doubt about the action of fire when we have had so much experience and when it all counts—for fire never changes. What happened in one big fire will happen in the next, as far as the fire itself is concerned; and, if we are too busy during a fire to study its action, and are not able to read the records it has left behind it, there is nothing to prevent our having a laboratory conflagration and watching its progress through glass. Indeed this is done in effect by The British Fire Prevention Committee, and occasionally for the purpose of special experiment, by other bodies, on this side of the Atlantic as well as in Europe. It will be part of the work of this journal to keep track of such experiments and give practical results to its readers; but it is high time that such results were not only practical but practicable, and found their way into specifications instead of into files for future reference.

It is time to change our ways. The statement has been made, in a paper read before an English insurance society, that the recent losses to English companies by conflagrations in this country have exactly wiped out the profit to their shareholders during the last fifty years—and the vipers are going to rise the rate on us. This seems to mark a crisis. It is a hint that we are not quite within the pale of civilization. It appears that the people of the United States are in it too, but that should be no encouragement, for they are quick movers over there, and before we know it we shall be alone, marked down for burning, by people with whom probabilities are a science a trifle too exact to make it a comfortable matter to be on the list of suspects.. It is time to change our ways. The question is how to change them effectively. There is no use in talking fireproof construction; we have done that. There is no use in blaming the architects; they know all that is known about fireproof construction and would be glad to practice it. It is the architects' clients who condition the state of building and they are the people we have to deal with. The truth about the halting progress of fireproof construction in this country is that the business public do not want fireproof buildings. They would like their buildings to be fireproof well enough, especially after a big fire; but the wish dies a painful though not a very lingering death under the influence of preliminary estimates for rebuilding with fireproof construction. A conflagration is but a chance after all and the cost of fireproofing is a certainty, and it is not business to balance a certainty of cost against a problematical advantage. There is some return in the reduced cost of carrying insurance but it is not enough to even up the transaction, and there is practically "nothing doing" in fireproof building.

Then comes the cry for stiffer by-laws. Let us force them to build fire-proof; the extra cost is not a matter of choice, it is a public matter. Very well, let the public establish preferential trade with the owners of fireproof building in proportion as their buildings are fireproof and their prices therefore high. This is a perfectly fair proposition, but in view of the fluidity of cash, which flows steadily to the lowest levels, it amounts to a proposition to make water run up hill. How then is the suggestion to be carried out? It is still true that if the public have a right to say they have a right to pay. How can the public, who share in the advantage of an individual's fire-proof building, share in its extra cost? It is at any rate not to be brought about by sending the Assessment Commissioner after him to rate him for extra taxes for the public benefit on the score of his extra expenditure in building so as to benefit the public. This would not be a good thing to do, but it seems to suggest what would. If a man taxes himself for the benefit of the public it would not be fair (to him) to tax him again on the amount of his own taxation, but it would be quite fair (to other people) to remit taxes to him on the basis of that amount; and, inasmuch as taxes should be fluid also and level up all hollows in the public estate, the displaced tax should find its settlement on buildings that are below proof in the matter of fireproofing. It is for them and because of them that the firehalls are maintained, and they should pay for their maintenance. Here then is, if not a complete proposition, a suggestion of a direction in which to feel for a string which will make fireproof construction sit up. It would be interesting to figure out the relation between the extra

cost of a fireproof great-risk district and the cost of the fire halls which supply it, to see how far one can be set against the other. There is a proportion of the cost of water supply also which might fairly be charged against the people who won't provide against fire and removed from those who will. If the financial arithmetic works out the working machinery could be devised and then we should have fireproof building settled upon a commercial instead of upon a speculative basis: quod est desiderandum.

STUDENTS' COMPETITION.

Architectural students are invited to send in on or before February 1, 1905, a sketch for a house in a country town, suitable for the residence of a person whose income is $1,500 a year. The house is to be placed on a lot 70 feet wide on the street front by 110 feet deep. The lot is situate on the south side of a street. A block plan must be furnished showing the position of the house on the lot and the arrangement of the grounds. The owner may be supposed to keep no horses or other animals but to be fond of gardening. The plan of the ground floor is to be shown in full on the block plan. Other drawings required will be: 1, the plan of the first floor; 2, the rear (or south) elevation; 3, a perspective showing the front and one side; 4, an elevation of the other side. All drawings to be to a scale of 16 feet to an inch. They are to be drawn in line with India ink on smooth paper or cardboard and are to be arranged within a space in the proportion of 8 inches by 12, and, if possible, no larger than that size. The scale of the drawings is to be, not merely noted, but drawn on the paper. A brief description of the material used in the construction of the exterior must accompany the sheet of drawing. Both drawing and description to be marked by a cipher or nomme de plume, and the author's name, enclosed in a sealed envelope similarly marked, must be sent under cover addressed to the C. H. Mortimer Publishing Company, Confederation Life Building, Toronto. Judgment of the sketches will be made by a committee composed of members of the Ontario Association of Architects and of the Eighteen Club of Toronto. The following prizes are offered: First, $15.00; second, $5.00; third, one year's subscription to the CANADIAN ARCHITECT AND BUILDER, Architects' Edition.

PICTURES WITHOUT LENSES.

Pinhole photographs are obtained by means of a pinhole punched in tinfoil and made to serve the place of a lens in the camera. Excellent pictures, strange and interesting, are thus obtained, and pinhole photography is becoming one of the fads of the day. The pictures lack the extreme sharpness of those obtained by a regular photographic lens, but they have a greater softness of tone which is delighting to the eye and which is equalled only by the artist's brush. A needle serves better than a pin for punching the hole in the tinfoil. The hole must be perfectly round and smooth. Through this the light is admitted to the sensitive plate, the exposure being made in the regular manner. Mr. N. R. Briggs, who has made a study of the new-style photography says:

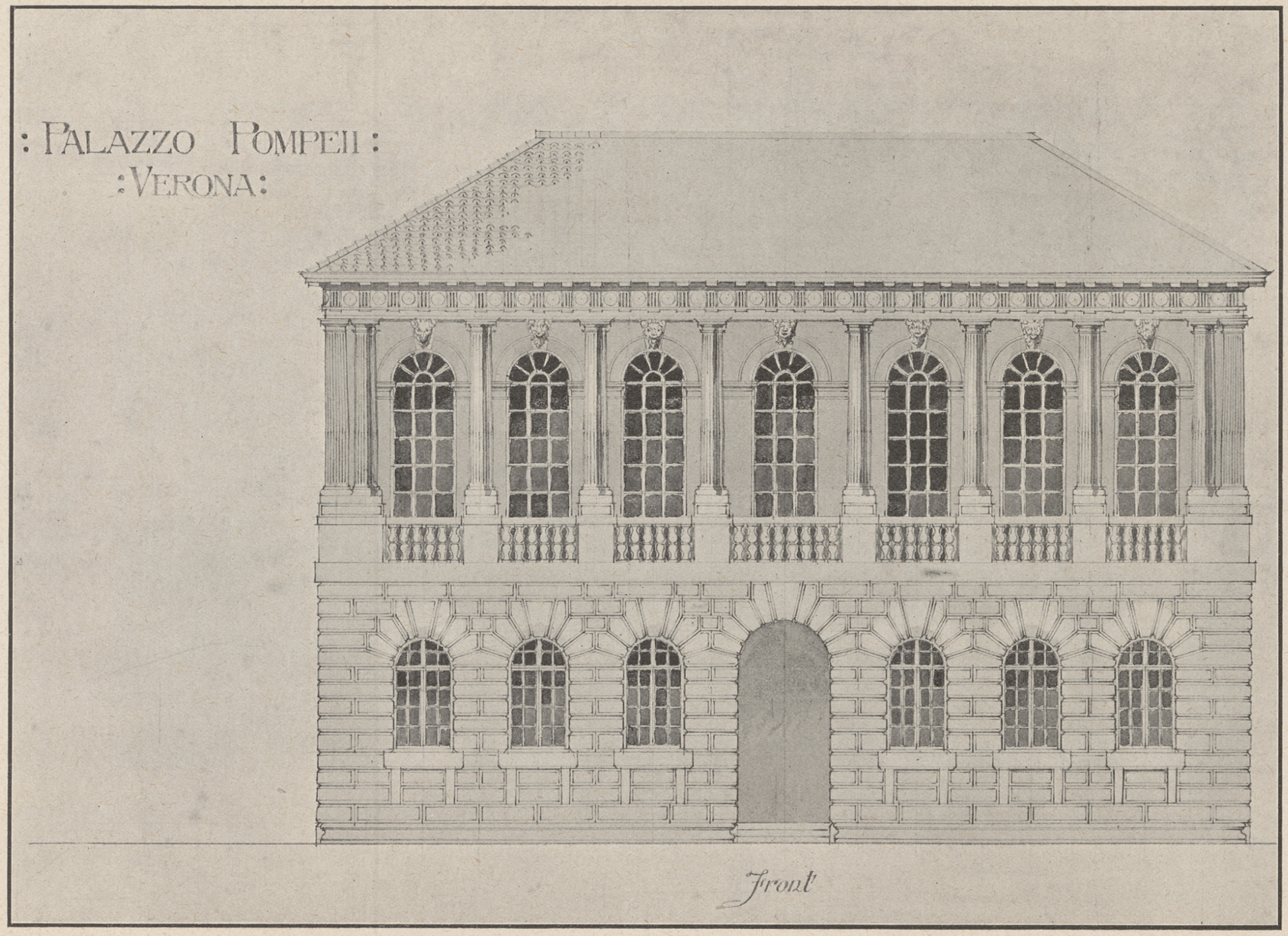
"The interest manifested in this new objective is due to the fact that it is of universal focus, the rays focusing in the stop; the perspective is true, no part of the picture being out of focus, while interior and architectural photographs are rectilinear, that is, without distortion of any kind, for the rays of light fall directly upon the plate without any interference. It is said that work requiring the sharpest definition, such as copies, reproductions documents, etc., can often be done better by the pinhole objective than with a fine lens. The reason is obvious. A lens often focuses sharper than the eye, giving a staring, unnatural effect to the resulting print."

The Scientific American says: "Another singular feature in connection with pinhole photography is that any size camera may be used. For instance, it will take a picture upon a plate three inches long or twenty inches long. Therefore, it will be seen that all one has to do is to arrange this camera for a small or large plate; and with the latter, interesting panoramic views could be secured. There is no doubt that a very cheap and satisfactory folding camera, in which to use any of the present series of roll films, could be made for special panoramic work."—The TechnicalWorld.

COST OF VENTILATION.

The cost of ventilation in several notable buildings in Great Britain was referred to in a recent paper by Mr. William Henman before the Royal Institnte of British Architects on the plenum system of ventilation. The Glasgow Art Galleries supplied with 9,050,000 cubic feet of air per hour by electric power requiring 66 horse power, costs for power about $1,450 per year per 1,000,000, cubic feet. The Manchester Technical School, supplied with 12,000,000, cubic feet per hour, providing for 3½ changes hourly and requiring 80 horse power, is charged with $1,308 per year per 1,000,000 cubic feet. The Manchester Midland Hotel, ventilated at the rate of 3 changes of air per hour, corresponding to a supply of 6,000,000 cubic feet in that time is charged with 40 horse power electrical energy at an annual cost per 1,000,000 cubic feet of $1,308. The Birmingham General Hospital, with 7 changes per hour or 13,000,000 cubic feet supplied per hour, requires 19 horse power electrical energy and costs about $287 per annum per 1,000,000 cubic feet. The Royal Victoria Hospital, at Belfast, designed by the author, provided with ventilation in turns of 7 changes corresponding to an hourly supply of 5,000,000 cubic feet, and is charged with but 5¼ horse power in a steam plant, costing $97 per 1,000,000 cubic feet per annum.—The Western Architect.

A very interesting piece of work in the way of house raising has recently been executed in Brooklyn, N. Y., in connection with public school No. 85. The structure is located in what is known as the "flooded district," the lower floor being covered with water at times to a depth of several feet whenever there are heavy rains. With a view to remedying this, the building, which is of brick and four stories in height, has just been raised nearly 3 feet. The estimated weight of the building is 7500 tons, and something like 1,000 jack screws were used in the operation of lifting it to its new level. The work was done by 75 men acting simultaneously, and after each turn of the screws the foundations of the building were thoroughly inspected in order to make sure that everything was progressing as it should. The work was done by Miller-Daybill & Co., and is regarded as more of an engineering feat than was the moving back several feet of the Brighton Beach Hotel some years ago, in order to save it from being undermined by the heavy ocean tide.



PALACE POMPEII, VERONA.

FROM A MEASURED DRAWING BY CECIL S. BURGESS.

SUPPLEMENT TO
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First Christian Church, Bathurst Street, Toronto.

S. H. Townsend A.R.C.A., Architect.

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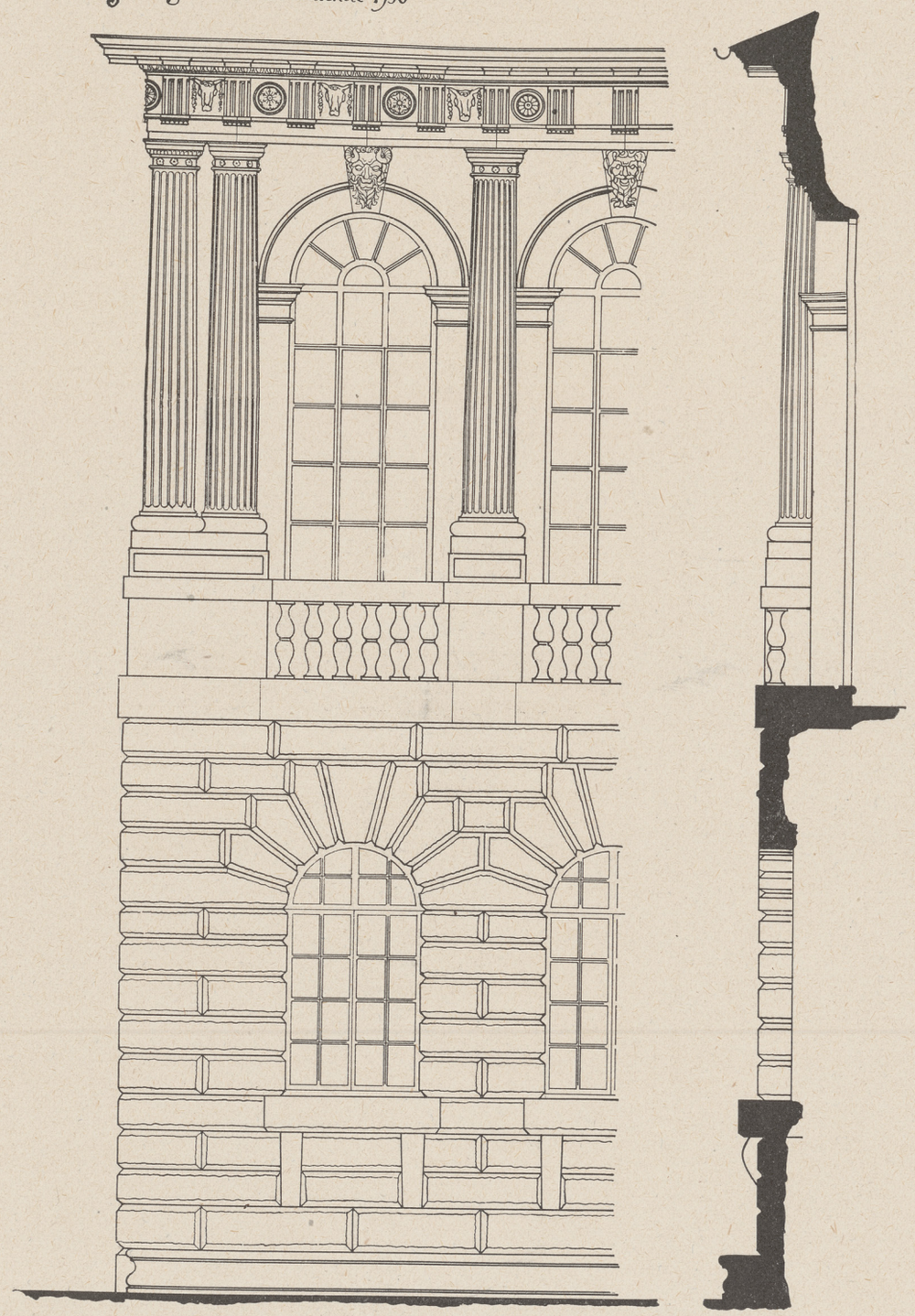
PALAZZO POMPEI, VERONA:
Designed by Michele Sanmichele 1530



PALACE POMPEII, VERONA.

MEASURED AND DRAWN BY CECIL S. BURGESS.

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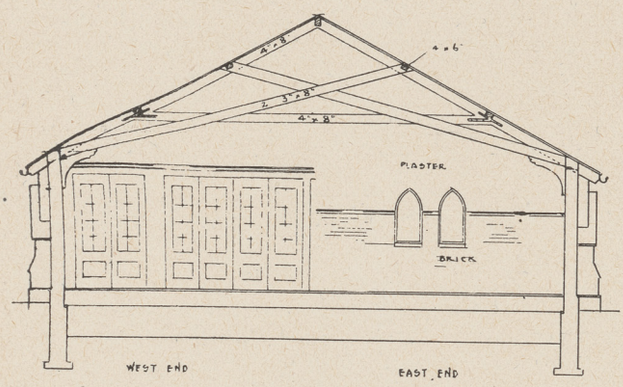

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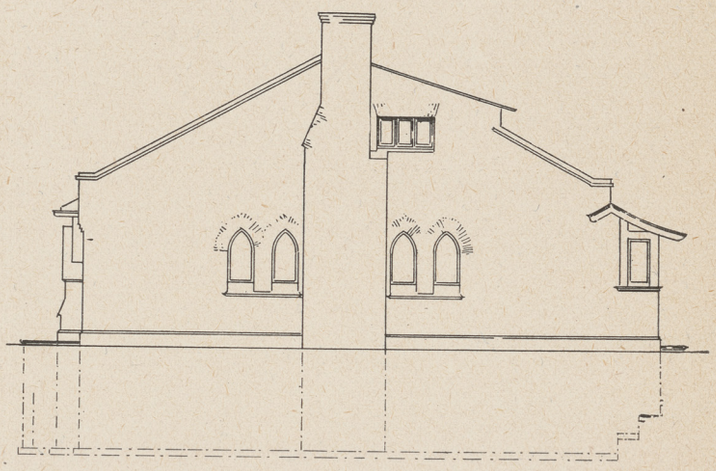
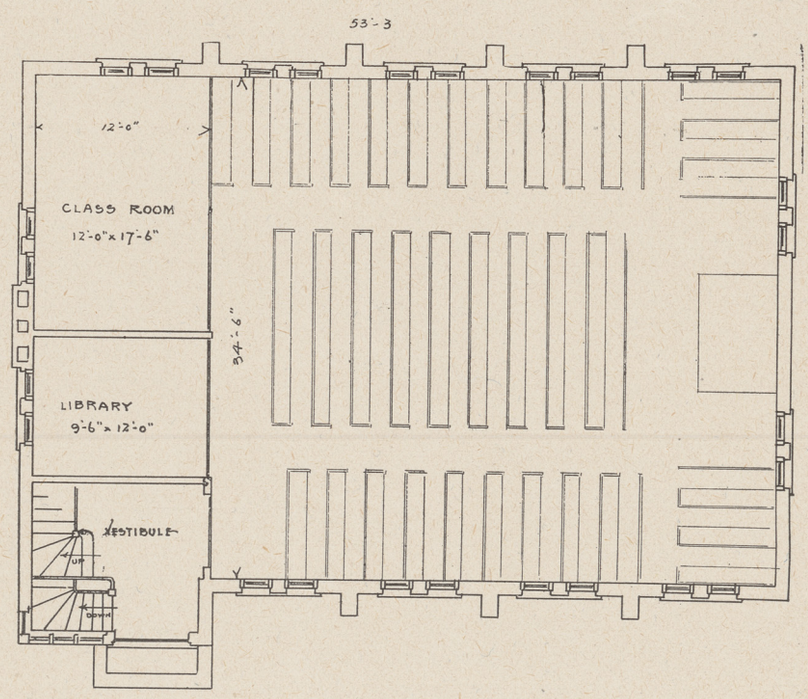


ELEVATION TO THE NORTH.



FIRST CHRISTIAN CHURCH, BATHURST STREET, TORONTO.

S. H. TOWNSEND, A.R.C.A., ARCHITECT.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
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OUR ILLUSTRATIONS.

THE PALAZZO POMPEII-VERONA.

This fine palace is built on the bank of the river Adige and is a very characteristic example of the robust architecture of Sanmicheli. He was considered the greatest military architect of his day. His fortified gates still form the entrances to the city of Verona and his domestic work shares somewhat of their severe and powerful aspect.

Earlier endeavours to apply the Roman "orders" of architecture to buildings of more than one storey, going on the idea of superposing one order upon another, generally resulted in a strongly marked horizontal division with a lack of vertical connection and unity. The method of employing the orders in an entirely subordinate manner as mere framing to windows and doorways and then crowning the whole building with a huge cornice was satisfactory in point of design but did not satisfy the desire of the Renaissance architects to see the orders glorified to the utmost.

In this Palace Sanmicheli has made the classical order a feature of dominant interest, not simply placed upon another storey of varied design but provided with a basement which seems as essential a setting for such a colonnade as the upper stage itself seems a fitting crown for such a pedestal. The bold suppression of any projecting cornice between the two parts contributes largely to this excellent unity of effect.

This is one of the earliest buildings in which a classical order is placed upon a rusticated basement—a treatment again employed by Sanmicheli in the Canossa and Bevilacqua Palaces at Verona. It became one of the most favourite motifs in the later Renaissance of England.

CECIL S. BURGESS.

POST OFFICE, WINNIPEG.—MESSRS. DARLING, PEARSON & OVER, ARCHITECTS.

In plan this building has the usual post-office arrangement—space for the public along the front and side walls, working space in the centre, and the vestibule for the reception and despatching of mails in the rear, opening on a lane. The principal public space, where are the private letter boxes, is along the front—the ground floor of our illustration—and at one end, in the pavilion on the left, are the stair and elevators.

The dimensions of the facade are 134 ft. by 70 ft. to the soffit line of the cornice. The material will be Tyndall stone throughout. The building is of skeleton steel construction, with floors of terra cotta arching covered with four inches of cement and a hardwood flooring. The stairs are of cast iron. The flooring and the doors are the only structural wood. The window frames are of metal and are glazed with wired plate glass. The windows have also iron shutters. To deal with fire within the building, five stand pipes are arranged.

Provision has been made in the basement for establishing the plant necessary for a pneumatic tube system.

Examination of the design shows a simple arrangement of five bays and two pavilions, kept broad by due distinction between the bays and the central portion of the facade, and by subordination of the horizontal lines of all windows between the basement and the cornice, and harmonized by a balance between the scale of the three storey order and the rustication of its setting. The rustication of the basement is carried up into the pavilion and these are further distinguished by the vigorous subtlety of the pedimented composition which unites the three storeys of windows. The cornice bounds the whole, and the composition up to the attic is a fine piece of rich harmony. The attic, which will, no doubt, in execution have to dispense with the support of the roof from ordinary points of view, has been given an interesting skyline by combining dormers with the balustrade. The top storey of the pavilion, being above the cornice, makes a complication difficult to treat. It partakes partly of the nature of an attic, which must be kept down, and partly of the nature of a crowning member, which should be enriched.

It is worth noting that the architects have helped their own building by accepting as far as possible the vertical heights of the existing adjacent building. Their own composition gains by treating the other as an appendage and they have certainly saved the life of the little one, and—which is a great point—helped instead of injuring the street.

THE MODERN AMERICAN HOUSE IN THE ARCHITECTURAL RECORD.

The October number of the Architectural Record is devoted to a study of the Modern American House. In a preliminary chapter the writer deplores the present state of affairs in which the decorator is independent of the architect. "One man or one firm," the Record says, "should do all the necessary designing, and the function of the professional decorator should be to carry out the architect's ideas. . . The architect, whatever his limitations, alone represents a good aesthetic tradition. The American business man and his wife have no aesthetic traditions at all. . . The professional decorator may have in his employ designers as competent as the average architect, but"—he is in short in business and his only concern with his client's state of taste is to satisfy it and take his money. "He works entirely by routine." The writer might have added that the decorator's competent designers must be very competent indeed if—especially in the time usually at their disposal—they can fall in exactly with the taste of every architect. It needs moreover a liberality of mind such as we do not find, for instance, in the distinguished foreign artist in Punch who, replying to the owner's objection that a proposed scheme of decoration will kill his high blue dado, says, "'E is a beast, your 'igh blue dado, and I veesh to keel 'im very mosh indeed."

The writer has no sympathy with the æsthetically austere and ungracious rooms which some architects seek to force on their clients. The demand for a cheerful, comfortable and homely atmosphere in a dwelling is absolutely a legitimate demand, just as the demand that the interior should be thoroughly designed is also legitimate; it is the action and reaction between these two demands which will most effectually serve to give American (and Canadian) interiors the mixture of propriety and distinction which they need. At present distinction is too often obtained at the expense of propriety and comfort, and propriety and comfort too often obtained at the expense of distinction.

In the matter of the Hall, the Record seems to be quite complacent about the treatment of the hall as a sitting room "even if by so doing the other rooms of the house on either storey are somewhat crowded or diminished in number." This surely is distinction at

the expense of propriety and comfort. The house in which the necessary accommodation has to be "somewhat crowded" in order to admit a hall large enough to be planned as a sitting room is in the category of people who aim at the distinguishing marks of those who are in a superior class. To give a small house the style of a large one and a city house the freedom of a country house is at the bottom of the feeling that prompts to made of the hall "a sitting room differing from others by the fact that it has no solid partition between it and the entrance hall." Cold comfort, one would say, and scant seclusion! The separation of the staircase from the hall is another thing and there are some suggestive illustrations of halls in which the course of the stairs is concealed or partly concealed, sheltering the stairway from draughts and the persons ascending and descending it from observation. The writer in the Record thinks "these are always dangerous to the designer, because the raking lines of the stair are always difficult to manage and produce ungainly spaces, shapes and combinations." The application of this statement is evidently to the partly screened staircase, but the illustration, which shows a good deal of the stairs, does not suggest any danger to the design from their raking lines appearing, and certainly not one one would think from their appearing less than usual. Much concealment meets the writer's approval; "the more a stair can be built in between walls generally the better thing it is."

The living room brings out no special doctrine except the general assumption of such a room, (when it is not crowded out by a hall sitting room), and its qualification by a smaller room opening off it, which qualification may take either of two directions: The small room may be a more intimate room into which to retire for greater privacy, the large room being practically a drawing room; or the small room may be a less intimate room, intended to hold strangers off so that the large room may be devoted to the family and their more intimate friends.

The illustrations of the living room are however well worth studying; but one should have a pretty strong reading glass with which to examine them, if one is not to be daunted by their apparent size. In order to receive a true impression from a photograph of a room it is necessary to get the size as nearly as possible in the position of the camera when the photograph was taken; that is to say as nearly as possible against the surface of the paper. Otherwise the room appears much larger than it is; being measured in an illusory manner by an instinctive extension of the perspective lines to a vertical plane at the position of the eye. A good reading glass, giving nearly the true point of sight, enables one to realize the design in small photographic illustrations, and when the half toning process work is not too coarse, adds greatly to the pleasure of looking at them.

The section devoted to the dining room makes one in love with the circular dining table. There is in the the first place, if not a saving of space, a better application of it. A table 5 feet in diameter is said to seat eight persons comfortably. That means a little less than two feet for each person at the table's edge. This would not do at a rectangular table, but when one reflects that the governing condition for seating space at a dining table is not plate-room but elbow-room, it is clear that the trapezoidal space occupied by a sitter at a round table favours this, for the space increases with distance from the table and elbows do not (in the first families) come to the front. Moreover an important factor in chair spacing is room for service, and this is automatically taken care of, when the table is round, by the greater separation of chairs at the back.

So the round table has points in its favour beyond the square, which is also advocated in the Record; but, as far as the room is concerned the conditions are the same; "the long room will be found much modified." The oblong room is a fine thing and we may miss it, but not in a small house. There it is a crux, and a room that is square or approaching the square will fall in much better with the rest of the house. The room need not however be square; there is other furniture, besides the table, to be provided for. The table may be placed at one end, and the attractive proposition is made (for houses in which summer is the chief consideration) to treat this end as a projecting bay which, if its windows are made to open up well, will be "almost the equivalent of a verandah."

Among the illustrations of dining rooms is one in which there is a high wainscot, finishing in line with the top of the door architraves and leaving just enough space between its shelf and the ceiling to place some oil portraits, all of the same square size. This would be fine if it were not that the portraits (no doubt in order to be seen) lean forward a little, and so come in front of the wall beam of a heavily moulded plaster ceiling. This is a pity but affords a suggestion that in rooms of moderate extent, which are finished in this way with pictures or decoration on the wall surface which remains above a high dado, that portion of the wall should lean slightly, as the portraits do in this illustration.

In the bed room section the principal point is advocacy of its arrangement so as to serve also as a sitting room, by partitioning off the toilet apparatus and (of bedroom furniture) leaving in view only the bed. The suggestion is made that we should take a hint from the hotels and place the toilet closet and the hanging closet on the inner end, leaving a vestibule to the bedroom between them. Most Canadians will require to be sunk a little deeper in civilization to come to this proposition cheerfully. The closet (with electric light or even with a window on the room side) is all right, but the proposal to light—and ventilate—the toilet room from the hall makes one's heart sink. With a rotunda down stairs in the hall and borrowed lights in the bedroom passages there would be too much hotel about the house. The writer, by the way, speaks of a fanlight over the bedroom door as if it were a recognized necessity; it is a question whether it is not more generally recognized as a nuisance. In the very plan in The Record, which is supposed to have a fanlight, the proper means of bedroom ventilation is shown, in the shape of a bay window; and unused, as one side is unlighted though there is no apparent objection to its having a window. We are too apt to stop our bay windows with the living rooms; whereas in the bed rooms, where they furnish the necessary choice of direction, to avoid much exposure in a window that will remain open while we are asleep, (or in summer to get it,) the bay window is a boon. A circular window of the kind forms an essential part of the plan which is presented to us in The Record as perfect—and perfect it is. Here the toilet compartment has a window

of its own and a door of its own : it is in fact a dressing room. The proposition therefore becomes that, if we wish to make a sitting-room of a bedroom, we must have a dressing room attached to it. The situation implied by these precautions about toilet furniture —the reception of visitors in a bedroom—is not after all a common situation. Where it occurs, the Universities offer another hint, perhaps better. A slight extension of the dressing room makes room for a single bed. The bed room and sitting room are thus made quite distinct by day while at night they become one good sized sleeping room.

The kitchen description is on a scale of such splendour—glazed tile walls, rubber tile floor and "a telephone to each bedroom, hall, drawing room and dining room"—that it almost quells practical interest. With the exception of the telephone—suggestive of a practice of eating between meals, which is to be deplored—the rooms and fittings are however only a high expression of conditions that are necessary in all kitchens, and the section, which is chiefly concerned with the usual appliances, is well worth reading.

COST PLUS A FIXED SUM CONTRACTS.

The following circular letter from Frank B. Gilbrett, general contractor, New York, has been furnished by a prominent contractor in reply to a letter from the office of the CANADIAN ARCHITECT AND BUILDER asking for an explanation of this system.

DEAR SIRS,—I would like to explain to you in detail our method of contracting for building construction on a basis of Cost-Plus-a-Fixed-Sum. In 1901 approximately 30 per cent. of our work was on this basis ; in 1902 45 per cent. ; and during the year 1903 we completed contracts amounting to several millions of dollars, 70 per cent. of which was on the above mentioned basis.

When about to contract for work on this basis, we proceed as follows :—When the general plans are ready we estimate by the cubic foot basis what the actual cash cost of the proposed construction would be to us. We figure 10 per cent. of this estimated cost, and call it the fixed sum referred to above. For example, if we estimate that a certain piece of construction will cost us $150,000, we contract with the owner or his representative to do the work for actual cash cost to us plus $15,000.

By contracting for work on this basis the following results are obtained :—

First—The owner gets the building at a minimum cost.

Second—The building is completed as rapidly as is consistent with good workmanship.

Third—The owner is insured the best workmanship.

Fourth—The construction goes on without disputes over extra work and costs of changes. The owner can have the architects change the drawings and specifications at any time, knowing that there will be no dispute or delay in the construction made necessary by adjusting compensation to contractor.

Fifth—The owner, or his authorized representative, has at all times full control of the construction.

If we consider each of these results more fully, I may be able to explain how they are obtained.

1. "The owner gets the building at a minimum cost." From an owner's standpoint the cost of the building may be divided into three parts, the cost of (a) labor ; (b) material ; (c) contractor's profit.

The labor (a) on such contracts is handled as follows : we put on to the contract as many men, and these of such trades, as we believe the conditions require. We aim to have the best possible labor, but if the owner or his representative is not satisfied he may substitute other labor or discharge any man, at any time, without giving a reason for so doing. This insures getting the best possible labor.

The materials (b) are obtained in the following manner : we carefully schedule each and every class of material required, and attach to the schedule shop drawings, when such are necessary, so that every concern estimating on materials knows exactly what is wanted. For example, the cut stone schedule has attached to it shop drawings showing every stone in such detail that the stone cutter can cut all the stone from these schedule drawings. These schedules are submitted to all concerns that we know to be reliable and equipped to furnish the materials. We are particularly well qualified to get estimates for furnishing materials ; not only because we have clerks in our employ whose constant work is that of making schedules and obtaining sub-bids, but also because we have offices in New York, Boston and Baltimore. The owner or his representative is also furnished with copies of these schedules, so that he can himself call for bids for furnishing the required materials if he so desires. The sub-estimates, being based on the same schedules, are very easily compared ; and, after considering price, time of delivery and capacity of the sub-contractors, we send them, with our recommendations, to the owner or his representative, in concise form on a blank called a quotation list, which is especially designed for this purpose. We then award the contracts in accordance with the instructions of the owner. Orders for materials are in triplicate ; one copy goes on record at our office, one copy goes to the owner's representative immediately, and the third copy remains in the order book. By this method the owner, his representative and the contractor are able to tell at any time what the itemized cost of the construction has been to date.

From the above it is obvious that the owner or his authorized representative has full knowledge of the cost of materials even before they are purchased ; and I think it is also clear that the materials are obtained at a minimum cost.

Concerning the contractor's profit, it may be said that the contractor receives only a reasonable compensation for his services. This being fixed before he starts the construction, remains unchanged. The owner should certainly expect to pay said compensation on all construction, especially when he considers that the fixed sum is not all profit to the contractor, who furnishes plant, etc., gratis. On percentage work there is sometimes a feeling that the contractor is running up the cost to increase his profit. This does not occur when work is contracted for on a basis of cost-plus-a-fixed-sum. When the profit is a fixed sum there is no incentive to the contractor to increase the cost. When work is contracted for on a lump sum basis, there is an incentive to slight the quality of the work, and to let the work drag along slowly.

This proves, I think that the contractor's profit is best dealt with by the cost-plus-a-fixed-sum method of contracting.

2. "The building is completed as rapidly as is consistent with good workmanship." Since the contractor gets no compensation for length of time, he will naturally complete the building as rapidly as possible, so as to obtain his compensation, and to have the use of his plant elsewhere at as early a date as possible. When work is being done on a percentage basis it is generally slow and costly. This is not the case when work is contracted for at cost-plus-a-fixed-sum.

3. "The owner is insured the best workmanship." This is obvious, for the reason that it will in no way be to the contractor's advantage to do any but first-class work. If he did poor work he would lose chances of getting other contracts from the same parties. This we realize to be very important, since seventy per cent. of our work last season was from owners and architects for whom we had previously completed contracts.

4. "The construction goes on without disputes over extra work and costs of changes. The owner can have the architects change the drawings and specifications at any time, knowing that there will be no dispute or delay in the construction made necessary by adjusting compensation to contractor." As charges for extra work do not affect the contractor's profit, there is no cause for dispute. The construction goes on as smoothly as if no change had been made from the original design. When work is contracted for on a lump sum basis, there are invariably disputes over the detail drawings, extra work and changes, and these often have to be adjusted at the completion of the work by a Board of Arbitration. This is always disagreeable. Such bad conditions do not exist on any work that is contracted for on a basis of cost-plus-a-fixed sum.

5. "The owner or his representative has at all times full control of the construction." This has been shown in speaking of results one to four.

You will note that by this method we have eliminated the most important of the disagreeable factors which enter into ordinary contracts and we have embodied in this method many desirable features which do not exist in lump sum or percentage contracts.

All that remains to be said in regard to Cost-Plus-a-Fixed-Sum contracts is that we are extremely well equipped to handle work on this basis.

Yours truly,

FRANK B. GILBRETH.

BY THE WAY.

The wasteful mountain torrent in California and the arid land are being brought together by the aid of long-distance transmission of electrical power. The wilderness promises to blossom as the rose; for the dessicated fertility of these lands is of long accumulation and abounds with fruit under the simple influence of water. The water is there but beneath the surface so far that horse-power is required beyond the power of horses. Mountain streams have been used to supply power to pumps as much as a hundred miles away, and the Kern river is being, or has been, harnessed for the great orchard and farming regions, 125 miles away. This, though primarily a Californian affair, has, like most things now-a-days, a bearing upon our Imperial question. What is possible in California has excited attention in India as possible for India; except that there it is paddy and jowra and bajra that propose to lift their heads; and, though it is somewhat of a leap in the dark, we may affirm that it will be a good day for India when paddy prospers and jowra and bajra are within the reach of everyone.

× × ×

Excavations of foundations for two or three large buildings in the down-town district of Chicago will be made in a novel way. Chicago's down town streets, as now is generally known, are paralleled forty-six feet below the surface with tunnels corresponding to the streets above. In order to get rid of the earth from the building foundations the Illinois Tunnel Company, owning the underground tunnels, will extend spurs from their main tunnels to a point about the center of the lots to be excavated and wells will be dug connecting these spurs with the surface. Steel cars of about 20,000 pounds capacity are being built, which will be run to a point at the bottom of the wells, and earth from the foundations will be shot down the well into these cars. An outlet for the earth thus set below ground will be provided on the lake front, where the cars with their loads of dirt will be elevated up a well and run on tracks to the dump.

× × ×

The chairman of the London County Council has, in an opening address, been reviewing the work of the Council during the fourteen years of its existence. Among bewildering thousands of persons rehoused and millions of people carried over the Council's tram lines we meet with one figure that is a recognizable achievement: the death rate has decreased by 40 per 1,000. That is something definite and a great improvement. It is attributed to the clearance of slums, the building of better houses and the opening of parks and recreation grounds. There is no doubt that this attribution is right and it is encouraging. To support the intolerable deal of preliminary talk that is necessary to get public improvements done, particularly those which affect the welfare of the classes who do not or cannot concern themselves in the matter, it is necessary to have a clear consciousness of the certainty of results; otherwise the dread of becoming a Mrs. Jellyby creeps over the promoter and makes him flabby and irresolute. Here then is evidence that cleanliness, comfort and beauty are practical matters, and that the result is not only definite but so quick in coming that effort and expenditure to get and maintain these conditions is not over-altruistic.

CAMERA IN SCULPTURE.

Charles Boesse, who recently invented a new process of photo-sculpture which, according to the scientific publications, is destined to revolutionize the photographic art, has arrived in Rome, where he intends to start his first establishment. The young inventor was born in Florence; his father was German and his mother French. He is only 25 years of age and admits that he owes his discovery to chance.

He explained the way he is able to produce in relief all sorts of pictures by a very simple process. The fundamental principle of the invention lies in the discovery that gelatin, sensitized with bicromate of ammonia, loses the property of absorbing liquids in proportion to the length of time it has been submitted to the action of light. A cake of such gelatin immersed in a special liquid under a photographic negative will after a while show relief and depressions, representing the image on the negative.

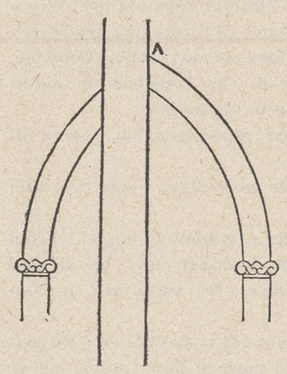
The difficulty in M. Boese's invention was to procure a negative in which the transparency would be proportioned to the degree of relief which it was desired to obtain. In order to do this the object to be photographed is placed in a dark room in front of a specially constructed camera and a special blue light, filtered through a red prism, is projected on it. Two poses are necessary, so that, having obtained the first impression, the operator rapidly reverses the negative and takes a second picture on the same plate.

This negative is developed like all photographic negatives and is copied on film, after which the two pictures are laid one on the other, and thus a negative is obtained totally different from the ordinary photographic negatives. If the cake of prepared gelatin, immersed in the special liquid, is exposed to the light under this negative in five or six hours it will reproduce the picture in relief with the utmost perfection of detail.

Mr. Boese already has given practical demonstrations before the Camera Club and the Royal Institution of London and the Urania Society in Berlin.—Toronto World.

AN OPTICAL ILLUSION.

The engraving represents a Gothic arch bisected at one side by a straight column, the apex of the arch being at A. On looking at the two sides of the arch, it will seem impossible that both can be of the same degree of curvature, or that the line of the shorter side, if extended, will join those of the longer. It can, however, be very easily proven by drawing two lines with a pencil across the straight bisecting lines, when the arch will at once appear in its proper form, although until this is done the eye refuses to perceive the fact, and the appearance of two dissimilar arches persists. This illusion is of practical importance to architects, who, in planning buildings with arches, should avoid placing columns in such a position that the arches will be unsymmetrically divided by them. — Popular Science News.



MONTREAL NOTES.

A number of new buildings are now in course of erection in the neighborhood of McGill University. The college buildings themselves are a somewhat disjointed and oddly assorted crowd, but the grounds with their grass and trees form a pleasant feature in the western part of Sherbrooke street—the only street in Montreal which one can be really proud of, and that more for its good surface and fine avenues of trees than for its architecture. There is reason to hope that in this latter respect also we may soon see some improvement. The space in the college grounds having become pretty well occupied with buildings, there now appears a tendency to expand along the farther side of Sherbrooke street. As the property here can probably only be purchased in comparatively small lots a less promiscuous and probably more severe and dignified placing of the buildings will have to be adopted. At the corner of McGill College avenue and Sherbrooke street the new McGill Y.M.C.A. building is now in course of erection from the designs of Messrs. Finley & Spence. The more important facade is of freestone, the other of brick. A little east of this at the corner of Victoria street excavations and foundations are in progress for the Students' Union Building.

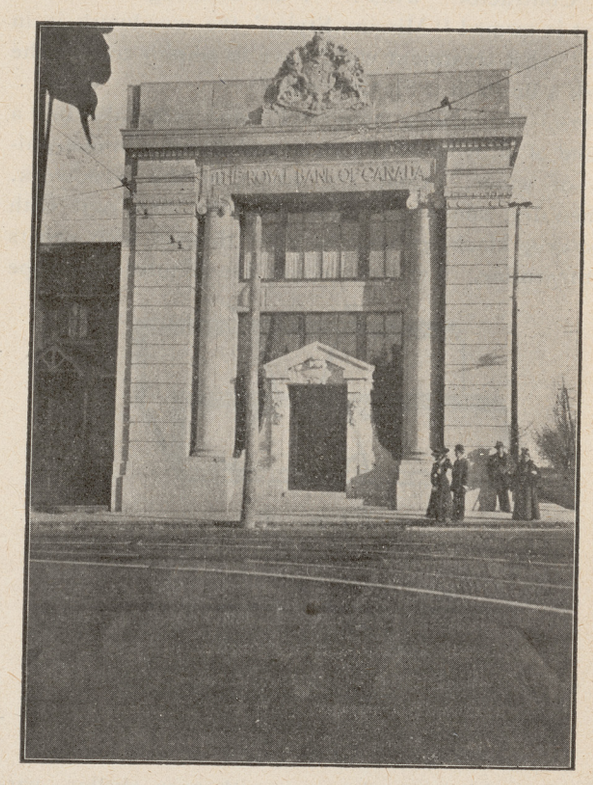
Not far from these buildings in Peel street there has just been completed the shell of the new clubhouse of the Montreal Amatuer Athletic Association from the designs of Messrs. Brown & Mitchell.

Much care and skill has obviously been brought to bear on the architectural treatment of this building. On a base of Montreal stone the walls are of brick to which the employment of irregularly scattered black headers gives a certain richness of colour. Freestone cornices and window dressings are used. A strongly Greek flavour has been given to the design generally and more especially to the details. Thus the openings are straight-headed —the ground storey is finished at top with a broad stone band with carved fret ornament; on this stand six flat and broad pilasters extending through the next two stories. A strong entablature crowns this range of pilasters and above the main cornice is a classical attic storey. The doorway in the center of the building of very simple square-headed form impresses by its size and depends for richness upon broad surrounding mouldings and simple cornice all carved with ornaments of a very pronounced Greek character.

One cannot help being a little afraid that the popular verdict on this building will be that it is a square factory-like block. Two circumstances militate against it. The first and most obvious is the tremendous extent of the wing elevations to which the treatment adopted to vivify the front has not been extended, and their huge inert masses have a deadening effect upon the whole, the more so that the street not being a very wide one the passer by takes his impression of the building from some distance along the road where one or other of the great flanks is well in view. The other circumstance referred to is the fact that the mass of the building is in brick—a material with a considerable degree of colour, therefore tending to detract from the force of a design of delicacy and intricacy because the shadows and high lights caused by slight projections and which would be obvious enough on a building all of stone become lost where the mass is of brickwork. Here, though it is somewhat beside the mark, one may recall the banded treatment of brick and stone used in many fine old buildings of Belgium and Holland—a treatment which restores to the eye the ability to follow not by the light and shade but in another and very charming way all the little "ins" and "outs" of a wall surface. In that case however the colour so far from being simplified is rather heightened and demands the adoption of architectural forms especially suited to that method of building.

Before leaving the fine building of the Montreal Amateur Athletic Association one cannot help wondering whether the jewels of Greek imagination can ever be set so as to appear a natural product of plutocratic materialistic Montreal.

At the corner of St. Catherine Street and Greene Avenue there is now almost ready for occupation the new branch of the Royal Bank of Canada designed by Messrs. Maxwell. This building has two facades of sandstone standing on a base of limestone. It is of no great size—the total height is probably less than 40 feet—but it arrests attention by its appearance of compactness and unity. Any one who finds delight in stones of generous size may contemplate this building with great pleasure. The courses of the masonry are 21 inches deep and the blocking course on the top seems about 3 feet deep. This with the general air of breadth and simplicity about the little building comes upon one like a breath of fresh air after having to fill one's eyes with so much of niggled and unwholesome tawdriness that swarms around. As might be expected from an architect with an appreciation of good stone the details, the cornices and the quaint Ionic capitals are worked out in careful and even recherche manner. The main doorway and large front window mutually



trespass on one another's domains in an audacious if picturesque way that must take the breath away from an ordinary law abiding citizen.

A little farther on in Green Avenue a small branch building of the Bank of Montreal has recently been erected by the same architects and shows the same quality and finish though not the same breadth and simplicity as the Royal Bank just described.

CONCORDIA SALUS.

Mr. W. C. Harris, A. R. C. A., architect, of Halifax, Nova Scotia, spent a few days in Toronto recently, en route to the World's Fair at St. Louis.

INTERCOMMUNICATION.

[Communications sent to this department must be addressed to the editor with the name and address of the sender attached not necessarily for publication. The editor does not hold himself responsible for the expressions or opinions of correspondents, but will, nevertheless, endeavor to secure correct replies to queries sent in. We do not guarantee answers to all queries neither do we undertake to answer questions in issue following their appearance.]

"Contractor" asks: "I am finishing a room in what is termed "Mission Style," the woodwork is in oak; what treatment will I have to employ to give the work a finish in "Flemish oak?"

ANS.—To make a stain for Flemish oak, take half a pound of bichromate of potash and dissolve in one gallon of water. Coat the whole of the woodwork. When dry, sandpaper down smooth, then coat with best drop black, ground in japan thinned with spirits of turpentine. Let stand about five minutes and wipe

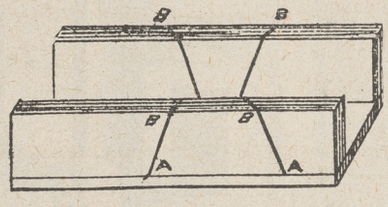


FIG 1

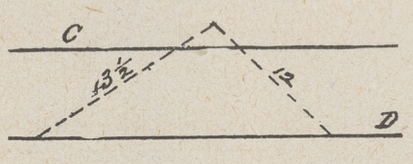


FIG 2.

off clean with a rag, then coat with pure shellac, varnish, and sandpaper with No. 0 sandpaper, then coat with a mixture of one pound of beeswax to one gallon of turpentine, to which is added a quarter of a pound of drop black all well mixed together. Wipe off clean the latter with cheesecloth before it sets, and you will have a beautiful finish and one that will stand.

A "Winnipeg Workman" asks for information as to the method of cutting "raking" mouldings by aid of a mitre-box?

ANS.—In cutting mitres that are on the rake, by using a mitre box, much depends upon the form of moulding and pitch. The raking moulding should always be made to suit the change of directions according to rules laid down by the best workmen, but of late years workmen have got into such a careless and cheap way of doing work that "spring" and raking moldings are jointed together in "any old way." The following is one of the "expediency methods" of doing the trick: If the bed mold at eaves will not work up the gable the best way is to use a mitre box, making the down cuts A. A. (see Fig. 1) the same pitch as the plumb cut on the rake. The overcuts B, B, may be arrived at as follows, for any pitch of a roof, in this example a quarter pitch, a quarter pitch is made use of. Set up one foot of the rafter, raising it six inches, which gives a quarter pitch, then the diagonal will be about 13½ inches; draw a right angled triangle whose two sides form a right angle, measure respectively 12 and 13½ inches (see Fig. 2). The lines C.D. show the top of the mitre box with the angles of the cuts. This does very well, but is after all only an "expediency." The only proper way of getting a raking moulding to mitre with a horizontal moulding without showing overwood on either, is to shape the raking moulding according to some of the methods adopted by good workmen.

From "Builder."—1. How many windows or doors should a man trim and finish in a day of nine hours?

2. Is it possible to estimate the cost of a prospective building by cubing?

3. How is the cubing system worked?

4. Are there any books published in this country that deals with estimating the cost of buildings, and describe the method of cubing?

ANS.—(1). This question has often been asked before, but never yet satisfactorily answered. Some men will trim half as many windows and doors again as other men. We have known of men fitting and hanging putting on finish, and trimming ten windows in ten hours, or one an hour, including inside sills, stops, aprons, covers and blocks; while another man in the same building handling the same kind of sashes, finish, etc., only finished six windows in the same time. In both cases the men did their best, but we are satisfied that a man who properly fits, hangs, and trims five windows in nine hours does a fair days work, and he should do this without being under pressure. A man ought to fit, hang and trim with mortise locks, from six to seven doors in nine hours if everything is handy and available. These figures, however, are not to be depended on in every case; style of finish, size of frames, thickness of sashes and doors, have much to do with the time required to complete a door or window frame. (2). Yes, an approximate cost of buildings can be ascertained by "cubing," but this requires experience and some extra knowledge. (3). It would take two or three pages of this journal to explain the whole system of cubing for estimates. (4). There are a number of books on estimating published in the United States and Canada. A very good one is "The Canadian Contractor's Hand-Book and Estimator" which may be obtained at this office.

From "Western."—I would like to ask what is the difference in cost between a first class wood building and a rough frame brick veneered house? Is the brick veneered house worth the difference?

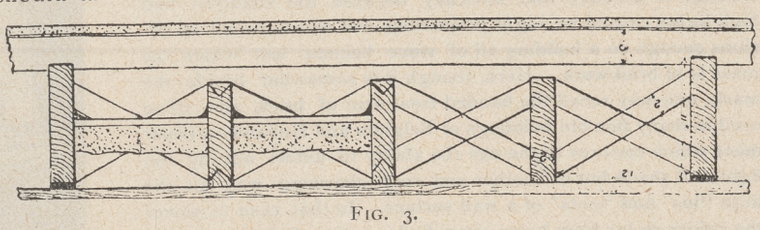


FIG. 3.

ANS.—If the veneering is made up of common bricks, the difference in cost over finishing in wood, first class finish in both cases, is about 7 to 9 per cent. If the building is cased with No. 1 pressed bricks, then the difference will be from 10 to 14 per cent., dependent somewhat on the number of openings and the kind of bricks employed. Replying to the second query, "Is the brick veneered house worth the difference?" we may say that the consensus of opinion among architects who have done much of the "veneered building" is, that it is not. It is claimed

that a solid brick wall is cheaper proportionately, and is, of course, much better. An entire wooden building has some advantages over a veneered house, and is much cheaper, besides being honest. There is a difference of opinion, however, on the foregoing subject.

From "Country Builder:" I finished a store with lodge rooms overhead some time ago, but am having some trouble with the owner, because of the noise heard in the store when any one walks or talks in the lodge room. More noise seems to come through the floor, than can be heard upstairs. How can I remedy this?

ANS.—You may effectually stop the noise from going through the floor of the lodge room, if you care to go to the expense of cutting off all connection with the lower story by building double walls below and placing double joists in floor. This, however, is expensive, so we submit the following, which you can adopt without causing great expense. The illustration Fig. 3, shows how the floor may be deafened by "pugging" between the joists with coarse mortar, and running across the joists 3x3 scantling on the under side, to which the lath for ceiling is nailed. It will be noticed that every fourth joist is an inch or so wider than the intermediate ones. This gives less chance for the conduction of sound to the ceiling below. If, before the floor is laid, a good thickness of felt be placed on the edges of the joists, it will help to prevent sound from getting through. The illustration shows a portion with, and a portion without "pugging," but is understood the whole floor must be pugged.

From "Nervous:"—A friend wants to build a one-story cottage containing nine rooms, and only wants the brick walls one brick, or nine inches thick, the walls inside to be strapped of course. Will this wall be thick enough to bear the strain of roof?

ANS.—Yes, the nine inch walls will be quite strong enough. There are many houses in Ontario that are built two and even three stories with walls all the way up only one brick thick; the method, however, is not one worthy of following.

From "Carpenter:"—I am building a drug store in a country village, and would be pleased if you would publish a design for one side of shelving from floor to ceiling. The wall space is about 22 feet long and 14 feet high. There will be a space left at each end of the shelving of about 18 inches?

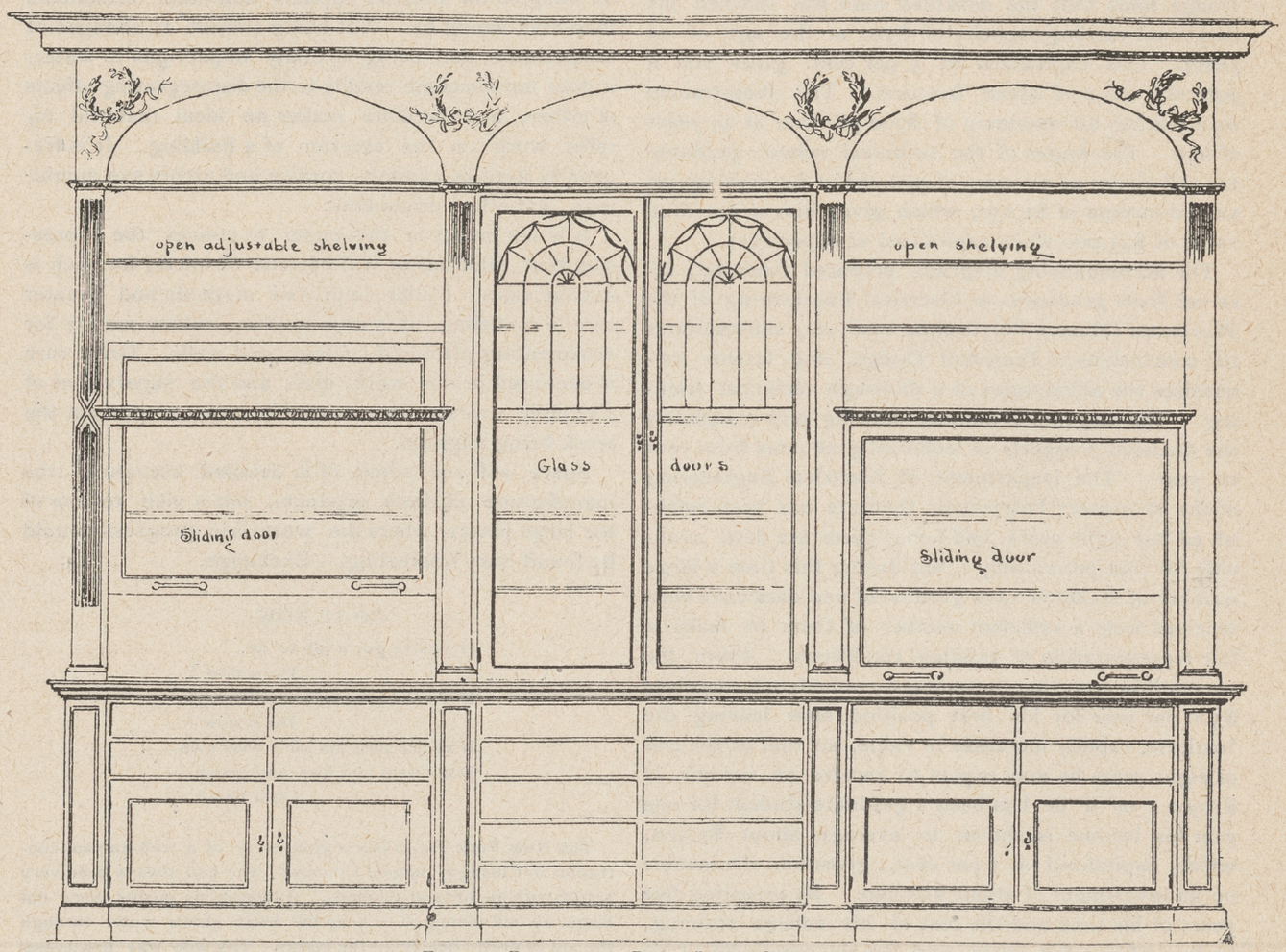


FIG. 4.—DESIGN FOR DRUG STORE SHELVING.

ANS.—The design shown at Fig. 4 was first made for a fancy goods store, and was afterwards used for a small drug store. It is very neat, handy and not expensive.

Glass bath tubs and lavatory basins have been made possible by the invention of a new process of glass blowing—a process that, instead of being handicapped by the great weight of the article blown, actually utilises that weight to facilitate the operation of blowing. The glass-workers' lungs would, of course, be quite enable to produce the volume of air necessitated by the great bulk of the article, and so recourse is had to compressed air, which is employed in the manner described at the end of this article. The system is known as the "Sievert," and has been patented, it is belived, in Germany, in the United States, and in Great Britain.

TECHNICAL TRAINING PAYS.

Technial school graduates possess an enormous advantage over their competitors in the engineering world, according to careful averages that have just been made by President Dodge of the American Society of Mechanical Engineers, showing the following annual earning capacity of the different classes of workmen :

Technical school graduate, average wages, $2,150.

Shop-trained workmen, average maximum wages $790.

Unskilled workman, average maximum wages $510.

Of course, there are unskilled workmen and shop-trained workmen who make much more than the figures indicate ; but these show truthfully the average maximum wages received by them. Further, President Dodge finds that the unskilled man has reached his maximum earning capacity of $510 at the age of 22 years. This capitalized at 5 per cent. gives him a potential value of about $10,000. The shop-trained man reaches his maximun of $790 per year at 24 years of age. The wages of the technical school graduate are still rising at 32 years of age, when he receives an annual income of $2,150, which gives him a potential value of $43,000 when capitalized at 5 per cent.

The accompanying diagram, prepared from data received from graduates in Electrical Engineering of the Worcester (Mass.) Polytechnic Institute, substantiates the conclusions of President Dodge, and further emphasizes the advantages of a thorough technical training. The diagram is unique, showing very completely the financial prospects of technical graduates from year to year. The Department of Electrical Engineering of the Worcester Polytechnic Institute has been established but eight years, and hence there are data available for that period only ; but during this time a large number of students have graduated and data have been received from a sufficient number of them to make a fair representation of existing conditions. From the curves it is seen that the average graduate who receives $500 per year for his first position after leaving the Institute, rapidly increases in value, so that at the end of eight years he may expect to receive an income of $1,900 ; or if he has been a graduate student for one year his income is shown to average about $2,500, which, capitalized at 5 per cent., gives him the income on an investment of about $50,000. By investing five years of his time and the cost of his college training, he has, after a few years, and for the remainder of his life, increased his income-earning value by not less than $40,000. That the investment is a good one goes without saying.—The Technical World.

COMPOSITION ORNAMENTS.

Since the advance in prices of building materials, the tendency of those with moderate incomes to build homes omitting adornment in the nature of carved wood or stone, has been offset to a great extent by the offering of an imitation generally known as "composition" which fills a long-felt want and at the same time embodies artistic detail with durability and insignificant cost as compared with genuine wood or stone carving.

For interior finish, in the nature of column capitals brackets, and ornaments of every description, the imitation, both in grain and color, is all that one could desire, and a natural finish can be applied to the composition the same as on the natural. The models for this class of work are carved in wood by expert artisans, and no expense is spared by reputable manufacturers in turning out a model perfect in every respect. None but the best carvers are employed, as the slightest error in the work might cause infinite trouble when the casts are applied to the wood whereon they are to remain.

This material is endorsed by the leading architects, and frequently specified by them in residences where it is desired to make such ornate and attractive when lack of adequate means precludes the use of hand-carved work.

Exterior Composition is manufactured in the same manner as staff—with which most people are familiar—but of a more lasting material, and, consequently better adapted for exterior capitals and other ornaments than staff would be. Not being subject to changes of temperature, and being virtually impervious to water, it does not succumb readily to the disintegrating effects of either, and therefore makes an ideal material for relief work on the exterior of a building. It is frequently used in capitals, cornice and architrave mouldings, and other ornaments.

It is not meant in this paper to convey the impression that staff has or will become obsolete, for such is not the case. Under improved methods and greater care in modeling, it is now used in endless variety for ornamenting plastered ceilings and walls. Great care is exercised in this work, also; and the supervision of a reliable overseer is essential in order to prevent the work being slighted.

Space will not admit of a detailed account of the manufacture of these products, but a visit to one of the large plants where the work is in progress would be found very interesting.—Exchange.

DO IT NOW.

If you've got a job to do,
Do it now !
If it's one you wish was through,
Do it now !
If you're sure the job's your own,
Don't hem and haw and groan—
Do it now !

The New York Times has a good story of a well-known contractor in Chicago, named Coleseed, who had always been very active with all sorts of schemes. Although his means were not large, he had managed to keep his head above water through the aid of pretty nearly all the banks. His wife was discussing with him the sudden death of Herman Butler, and said : "Mrs. Butler told me that her husband selected his pall-bearers before he died. I think it was so nice of him, my dear ; if you were taken before me, who would you like to have act as pall-bearers ?" Coleseed thought a moment and then said : "Well, dear, ask the presidents of the eight leading banks of Chicago. They have carried me all my life."

Southern indolence is seldom better exemplified than in the Mexican workman, who as a mechanic is imitative and slow. He does well, however, in stone, brick and mortar, for he and his fathers have worked in them for ages, yet his best efforts seldom exceed the laying of 200 bricks a day, while the American will lay five times that number. If a brick does not fit, he marks it carefully and then hacks away for five minutes, whereas his American fellow-tradesman would knock off the piece with one quick stroke. Building contractors say it is cheaper to employ Indians to dig cellars, even when the excavation is to be a large one, than to employ mules and scrapers. An Indian will easily carry two bushels and one-half of wet sand out of a hole in the ground—carry it on his back—and will work for 25 cents a day in gold. The better way to deal with him, however, is to pay him a stated sum for a stipulated task—then he will work ; otherwise he will do as little as he is allowed to.

NORTHWEST NOTES

THE UNION BANK.

Work on this building, of which an illustration was published in our October number, was commenced on the 17th of October, 1903. 21 concrete caissons used in the construction of the foundation taken down to 40 feet below the sidewalk were used. These caissons average about 5 feet 6 inches in diameter, enlarged to about 12 feet diameter at the base. The steel work was proceeded with during the winter and was completed on the 5th May. The masonry including all brick work, terra cotta, etc., was started on May 14th and was completed on July 16th. From that date the numerous other trades completed their different works and the building was ready for tenants on November 1st. The banking room quarters will be ready shortly.

The building comprises eleven stories and rises to the height of 150 feet above the sidewalk level. The front is constructed of white terra cotta and buff pressed brick. The floors and partitions throughout are built of hollow tile, the floors being finished in maple with quarter cut oak and mahogany trim. All floors for public space in banking rooms, halls and corridors are of marble.

On the ground floor are the banking room and manager's office. The former is 48 × 72 feet in size with 28 feet ceiling. The principal entrance is from Main Street.

The windows in left wall and in west wall which faces Leland Hotel, have metal frames filled with wired glass.

The building is equipped with three fast elevators and is heated with steam, with vacuum air system for radiators.

Messrs. Darling, Pearson and Over were the architects and the Thompson-Starret Co., of New York, the general contractors.

WINNIPEG BUILDERS' EXCHANGE.

The Winnipeg Builders' Exchange held its annual meeting on the 8th inst., which proved to be a well attended and successful one. The Exchange continues to prove its usefulness and find favour amongst the building fraternity of the city. Seven new names were added to the roll of members.

At this meeting many matters of interest were considered and important business for the Exchange to deal with during the coming winter was broached by the president. During the long winter evenings it was felt that the social side of the Exchange should receive more attention, without detracting in any way from its primary function of a business organization. The remarkable success in this direction of some of the exchanges to the south of the line was adduced by several speakers from personal experience. The Property Committee was asked to confer on this matter and to lay some proposals before the Exchange at its next meeting.

Notice of motion was also given that two regular meetings in each month be held in future instead of one as heretofore.

With almost a month of beautiful Indian summer weather the building outlook has improved rapidly for the coming winter. Contractors say the fall has been most favorable for finishing their work, and very few buildings are not roofed in and ready for severe winter weather, should it come suddenly. When once the roof is on the buildings can be kept warm enough for the men to continue their work. Contractors have been rushing their work to reach this point and have succeeded.

On November 1st the new Union Bank building was thrown open to tenants and already the offices are nearly all occupied. The ground floor and first storey are given up to the banking business and its officials. This part of the building is not finished yet but is being pushed as fast as possible. From the third floor to the ninth inclusive is occupied entirely by offices. There are thirteen suites on each floor, these again being divided into different compartments to suit tenants. On the tenth flat are the lavatories, janitor's quarters and rooms for the janitor's staff. All work is finished in hardwood and thoroughly up-to-date throughout.

The new Liberal Club on Portage avenue is rapidly nearing completion. This is a three-storey building with basement. The front is of Redford stone and hydraulic-pressed brick, giving a soft grayish appearance. The ground floor is for the club room. It is 42 x 70 feet and has a large plate glass front with tiled entrance. On the second floor is a large committee room and a number of bachelors' apartments with bathroom in connection. The third floor consists entirely of bachelors' apartments. It is expected to be ready for occupation early in 1905. Mr. J. Chisholm is the architect.

Pilkington Bros., of St. Helens, England, are having a large warehouse built on Market street east. This building will be 100 x 100 feet, four stories and basement. The foundations are being put in but it is undecided as to whether the work will be pushed through the winter or not. S. F. & W. A. Peters are the architects.

Another new building that has just been commenced is the Grundy block, on the corner of Portage avenue and Hargrave street. This block is to be 88 x 130 feet, four stories with basement. It is for stores, offices, etc., and will be carried on during the winter.

The new O'Connor hotel on Notre Dame street east would have been roofed in by now but that it has been decided to add another storey to it, making it five stories. It will contain about seventy-five rooms and be up-to-date in every respect. J. Cadhow is the architect and P. Burnett the contractor for the masonry.

The old Assiniboine block has undergone a great change. It has been remodelled and will now be known as the Empire Hotel. It has a frontage on Main street of 150 feet, which has been filled with large plate glass windows, 6 x 12 feet in size. As rearranged the building will contain about 200 rooms, comprising single rooms and suites, each with a bathroom in connection, and finished throughout in first-class style. A. & W. Melville are the architects for the alterations.

The new theatre is being rushed to completion, as it is the intention to open it by December 5th. This building is being done by Frank McClure, of Chicago, theatre builder. The front is of cement block, manufactured by the Canadian Petrified Stone and Brick Company. The building has the usual balcony, gallery and pit for seating and will hold about 1,200 people.

Work on the Agricultural College has been commenced, but it is not likely that more than the excavating will be done this season.

Plans for the new Normal School on William ave. and Francis street have been prepared by Mr. Hooper, government architect, but nothing will be done this season.

The Land Titles offices and the Carnegie library are both roofed in and the inside work is being pushed.

The work on the new C.P.R. station has been pushed very vigorously and the station part, baggage rooms and offices, are expected to be ready for occupation by the first of the year. These buildings will be four stories high with a basement A temporary roof has been arranged so that the lower portion for offices can be finished and the staff take possession, as the old building has to come down. Most of the plastering has been done, no lathing being required, as a plaster board has been used and the rough and smooth plaster put onto this. The radiators have been arranged in a temporary fashion so that steam may be turned on when necessary. The hotel proper is not so far advanced, but already the foundation walls have been built, the concrete bases for the steel pillars laid and a number of the pillars placed. The hotel is to be a seven-storey building with about 350 rooms, and will be the largest and most complete and up-to-date hotel in the West.

This month the Main street subway was opened to foot passengers and hundreds of people traversed it to see the work. By December 1st it is expected that the whole street will be opened and the street cars running through to the north end. This is a very fine piece of work, and, although to the eye it appears to be all concrete work, in reality there is enough steel and iron worked into it to almost carry the whole strain of traffic from the the cars. Steel trusses are run parallel with and under all the tracks, and these again are supported by iron rods running into

the concrete pillars and platforms to carry the strains from the arches. The concrete pillars have steel and iron trusses running through perpendicularly. They are built on cement and concrete piles. Cover, foundation and all the arches and pillars are held by a network of steel and iron bars. The sewer pipes, etc., in the street were all removed from the centre and re-laid on either side and the platforms and subway are thoroughly drained. Pipes carry the drainage into the Point Douglas sewer and this sewer is again drained through under the hotel into the higher sewer on Fonseca street, so that there is no danger of water backing up in the spring. The subway in the daytime is lighted by twelve sky-lights in the arches, fitted with prism glass; at night, by electric lights at the intersection of each arch. There will be 38 lights, controlled by a time-switch arranged to light up at any desired time and to run one week without being attended to. The street car track has 18 inches of concrete beneath it, and the balance of the road about six inches, surmounted with cedar block pavement.

The Bell Telephone Company's new addition on Portage ave. east has been roofed in and inside work will be done as soon as possible. When the present alterations and additions are completed the Winnipeg Telephone Exchange will have a capacity of 10,000 customers. New switchboards are to be put in as soon as the building is ready to receive them.

Quite a large number of fine residences have been built in Winnipeg this season; some costing $50,000, and quite a number ranging from $15,000 to $30,000. From time to time we hope to be able to print illustrations of a number of these houses.

The J. H. Ashdown Company, Limited, have commenced to rebuild now they have got the rubbish cleared away after the fire of last month. They intend putting up a fine retail store, but all the plans are not completed yet.

Bullman Bros., whose new block was destroyed by fire last month, have already got into their new premises—a large frame building, 100 x 120 feet, on McDermott ave. Mr. J. Bullman undertook the planning and rebuilding, and everything was done by day-labor. They intend making their own power for electric light and will run all their machinery by electricity.

The Portland Cement Company, of Manitoba, have received letters patent to manufacture Portland cement. The company is capitalized at $1,000,000. Head offices will be in Winnipeg and works at Springfield. They will have two units of machinery in operation in 1905 and will install another four units later, making a 1,000 barrel mill. The cement marl is said to be of a very high quality, and as this material is now being used for so many purposes in the building line, no doubt the company will find a large market for it through the West and will be able to put it upon the market at a reasonable figure as it is being manufactured right at the door of Winnipeg and the West, as it were.

Herbert H. New, architect, has removed his office from Main street to 928 Union Bank.

G. H. Archibald, C.E., has removed from the Merchants Bank to 820 Union Bank

Herbert R. Rugh has removed his office from 367 Main street to 927 Union Bank.

BUILT ALL IN A DAY.

The unusual feat of building a five-room cottage, including foundation, plastering and putting on one coat of paint, in a day of 10 hours, with a cost to the owner of nothing more than a chicken dinner for the workmen, outside of the material, was performed in the little hamlet of Maple Grove, near Evansville, Ind. The man for whom the cottage was built is Homer Rose, and the men who did him the kindness were fellow-employes. The work was superintended by Dee Bacher, a contracting carpenter.

Mr. Rose had had lumber and other material on the ground for months. After these were bought he discovered that he could not go on with his house for lack of means. Mr. Bacher called his men around him one evening and asked for volunteers for one day to build the Rose cottage. Many thought it would be impossible to build it in one workday, but the contractor declared that he could accomplish the feat if the men in his employ would do the work. Twenty-six carpenters, masons and painters agreed to give one day if Mr. Rose would furnish a chicken dinner, and a time was fixed when all should report at the site of the proposed building.

Every man appeared on time. The brick-masons went to work laying the foundation, while the carpenters busied themselves in cutting the joists, studding and sills. Every man was assigned to a particular part of the work, and the house began to go up in a rush. Hundreds of persons gathered about and watched the workmen. Each of the latter urged his fellows on, and when noon came the frame work was all up and the chimney had been started.

Then came the dinner. Mrs. Rose, assisted by some of her neighbors, had fried two dozen chickens. There were 10 loaves of bread, four dozen ears of boiled corn, nearly a bushel of mashed potatoes and bowl after bowl of gravy. The dessert consisted of peach cobbler and various kinds of pies. The contractor had to call off his men for fear that they would eat so much that they would not be able to finish the job.

As soon as the frames were set for the windows and doors the sashes were fitted and the lights put in. By this time, however, the laths had been put on inside, and the sheeting and weatherboarding were being placed on the outside, and the chimney was being run up by the masons, all at the same time. Before the roof was on the plasterers were at work, and exactly at 6 o'clock the cottage was finished, all but the second coat of paint and the skim coat of plaster, neither of which could be put on before the first coat had dried.

Mr. Bacher complimented his men when the job was complete. He said that while he had done some "hurry" work in his time, he had never known a house to be begun and completed in a day. The cottage contains five well-lighted rooms and a large attic. Everything, even to putting on the hinges and locks, was done before the men were called off at 6 o'clock, and Mr. Bacher declares that he could have completed the work an hour earlier had not the men eaten so freely at dinner.—Architects Builders Journal.

DYNAMITE IN GREAT FIRES.

When all other means have failed to check the progress of an extensive and destructive fire it has always been the custom to demolish buildings in its path, in order to deprive it of fuel. Of late dynamite has been used for this purpose, but we are now told by an editorial writer in Engineering News that, as a result of experience in the Baltimore and Toronto fires, this means of checking the spread of conflagrations will probably occupy a less prominent position in the future, as it is apparently not only ussless, but positively dangerous. Says the writer:

"In both cities the effect of the explosions on the ruined buildings was simply to produce a heap of wreckage which could not be mounted by the firemen, and which was scarcely less combustible than the original building, while the gap placed in the path of the flames was so narrow that it was easily leaped by the fire. The effect on the surrounding buildings, which it was the purpose of the explosion to protect, was to smash in the windows and thus destroy the only barrier that existed against the immediate penetration of the flames to the interior combustible finish and contents. In the case of some of the fireproof buildings at Baltimore there seems reason to believe that a considerable part of the damages to the walls and to the structural fireproofing was caused by the violent shocks produced in dynamiting adjacent structures. However this may be, it is certain that in many cases the dynamiting was delayed until the 'mined' building was ablaze, with the very natural result that burning brands and debris were actually hurled through broken window openings into neighboring buildings. Such happenings as this are, of course, chargeable solely to unwise direction of the work, but they are certain to occur in the excitement and panic of a losing battle against a conflagration. At best, dynamiting is a dangerous and uncertain means of fighting fire unless it has been much maligned by the experience at Baltimore and Toronto, and heads of fire departments will act wisely if they strike it off their lists of fire-fighting methods."—Architects & Builders Journal.

A Croydon builder was recently fined £2 and costs for using bats instead of bricks for the walls of two houses. In one case there were eleven whole bricks where there should have been sixty, and in another piece of work there were forty-eight bats to one stretcher.

The great man is the man who can see how things are going. How far he is also a successful man in his own generation depends upon how far he sees how things are going in his own generation. To know what will happen is no doubt great, but it is sometimes even greater to know what is happening.

SUGGESTIONS FROM NEW ZEALAND ON THEATRE PLANNING.*

The following is an abstract of a paper read by Mr. S. Hurst Seager, architect, of Christ Church, New Zealand, at the Australasian Science Congress held in January last at Dunedin. The abstract of the paper was forwarded to us along with the accompanying diagrams. The paper had special reference to the provision of exits and escapes at theatres and places of amusement. No more important problem presented

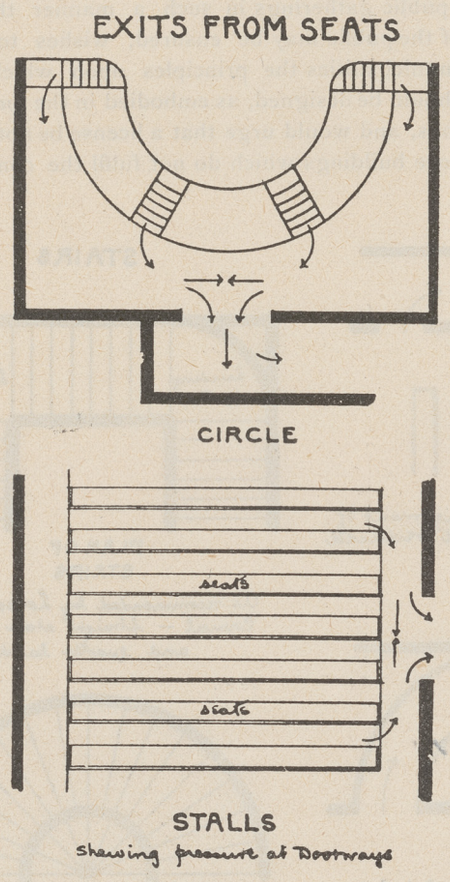


Fig. 1.

itself to the artchitect, said Mr. Seager, than this, yet there was none which he had less successfully solved. The problem was not to design a building in such a way that a an audience might leave it without discomfort under ordinary circumttances, but to design one which would be free from danger in times of panic, arising either from alarm of fire, earthquake, or other cause. It had to be borne in mind very clearly that the problem was not to be solved by demanding on the part of the audience a certain course of action under any unusual circumstances, for at that time they were incapable of thought and incapable of determining what action to take. The problem therefore was to plan a building which should be so arranged that without choice irresponsible people would be compelled to move in a certain direction, and that that direction should be absolutely free from all resistance. Without resistance there could be no pressure ; without pressure there could be no danger. It was the neglect of this fundamental principle which had been the cause of such sad loss of life in the past, and its continued neglect would be responsible for all that took place in the future. The first impulse of most of the audience at the time of imagined danger was to rush from their seats towards the entrance from which they approached (see Fig. 1). That at once made it perfectly clear that the usual entrance must in all cases be the exit, and safety did not depend at all upon any number of so-called special "escape doors." These were simple delusions, and should not be provided. There must be entrances, carefully calculated as to number and width, leading to different parts of the building, to be used both as entrance and exits for that part only, and the greatest care should be taken that each entrance should give uninterrupted communication between that portion of the building for which it was designed and the open street. It could not be too firmly insisted upon that there must never be any connexion whatever between one corridor of communication and another. Each entrance and exit should be perfectly independent of all others. To carry this principle out fully every building of entertainment should stand wholly detached with sufficient space round it to prevent any chance of blocking. Very many Continental theatres were so placed, and most decidedly no new building should be licensed which had not a perfectly free, even space on at least three sides.

These spaces should be kept free during a performance. Carriages should always be drawn up sufficiently far away to allow of a free rush of people from the exits, for a very great source of danger existed in allowing carriages to stand on the edge of the pavement directly opposite the only means of egress. Gutters just opposite and steps just outside entrances were also sources of danger which should certainly be got rid of. Special provision should always be made for those us-

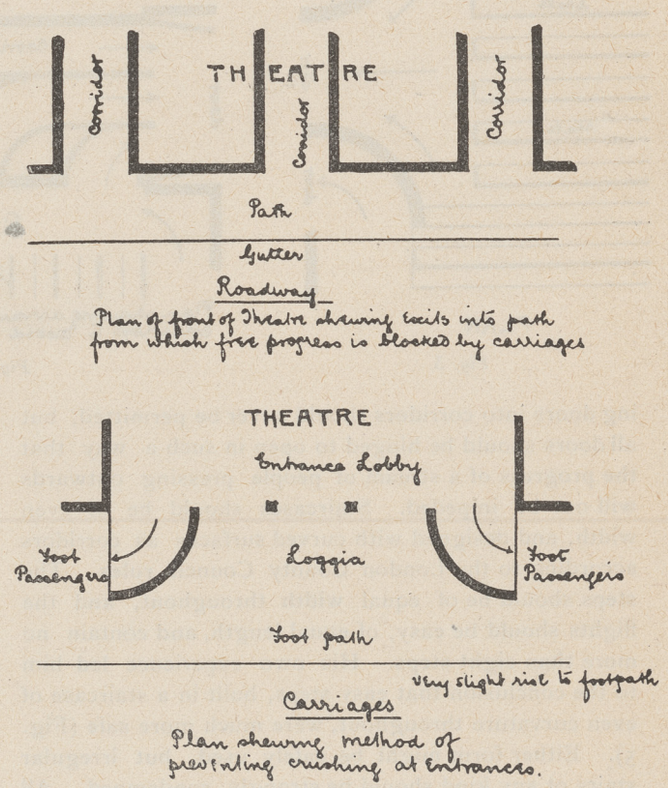


Fig. 2.

ing conveyances, so that they could reach them without interfering with the flow of foot traffic or of being inconvenienced by it (Fig. 2). In order to avoid any resistance in passing from the seats to the corridor or doorway, provision should be made so that the streams of people approaching the doorway from different directions could be directed through it without conflict with the opposing streams. This could be affected by means of curved barriers, which he had designed (Figs.

*From The Builder.

3 and 4), arranged so that any pressure exerted by the people behind would force those in front not against other people, but only more quickly out of the building. The seats should always be fixed, and the rows should be a sufficient distance apart to enable persons to walk easily between. Then the corridors should be of even width throughout, perfectly smooth, and any change in direction should be made by curved surfaces. The sum of the widths of the openings into any corridor should not be greater than the width of the corridor itself, and the stream of people entering it through any opening should be prevented by barriers from interfering with the progress of those entering it through other openings, for the greatest danger existed in allowing a stream of people to enter a corridor at right angles to the stream of people already pressing along it. Sliding doors into corridors should never be permitted, but all doors should be hinged to open in such a way that the progress of a stream of people pressing outwards will not be impeded. Staircases should be of even width, and designed with curved surfaces as corridors according to the London County Council rules. The steps should be of equal width throughout, and the flights should be easy, of equal length, and contain no more than eight steps. His own experience led him to the conclusion that easy steps, built in a staircase of even curvature throughout, were much more safe (Fig. 5). Either form might be safely used, but irregular stairs of any kind should be strongly condemned. All stairs and corridors should be of fireproof material. For the walls, steps, floor and ceilings, events had proved it much more essential to safety to scientifically design the entrances and exits that insist on fireproof construction throughout. The lecturer also drew attention to the danger of loose chairs for sitting accommodation, as they impede the traffic in leaving a public place of entertainment. In conclusion he moved :—

"That this section of the Australasian Association for the Advancement of Science is of opinion that places of entertainment and public assembly, in order to be considered safe against the dangers arising from panic, must be designed in accordance with the principles here set forth and shown in the accompanying diagram."

It was decided to refer this resolution and the following to the consideration of the General Council :—

"That the Architectural and Engineering Section of the Australasian Association for the Advancement of Science, recognising the urgent necessity for the planning of all buildings used as places of entertainment and for public gatherings in such a manner that the safety of the public may be ensured, wishes to bring before municipalities the principles upon which such works should be designed, as embodied in the foregoing resolutions, and would urge that a license be not granted to those buildings which do not fulfil the conditions stated, and that a copy of the above resolutions be forwarded to all Australasian municipalities."

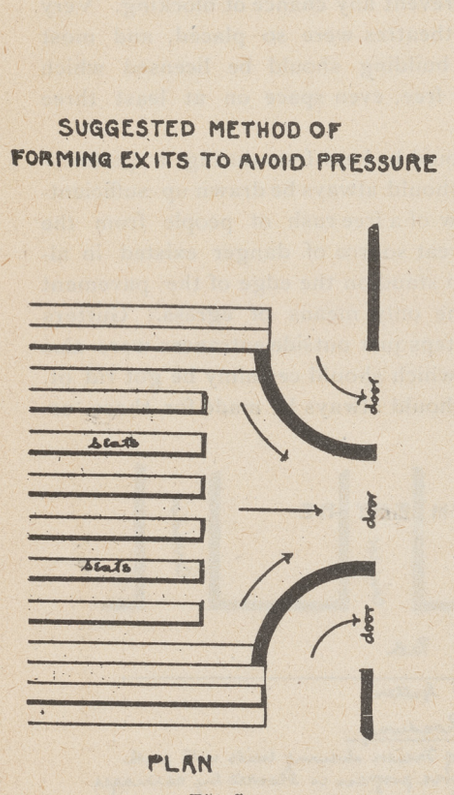


Fig. 3

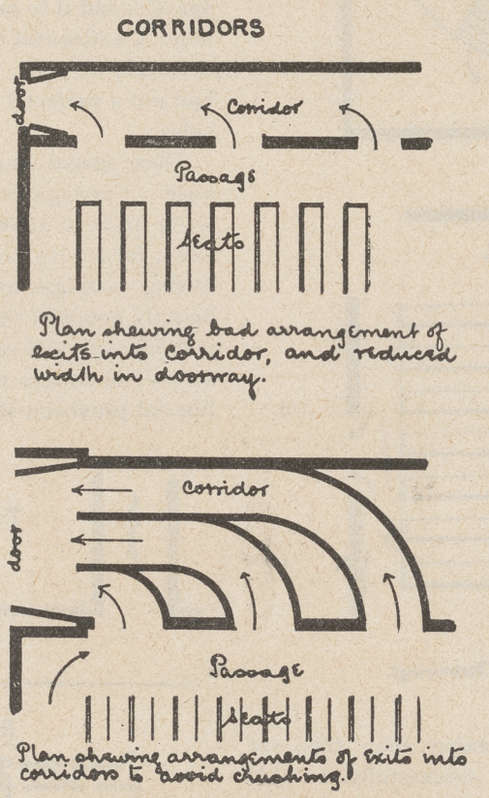


Fig. 4.

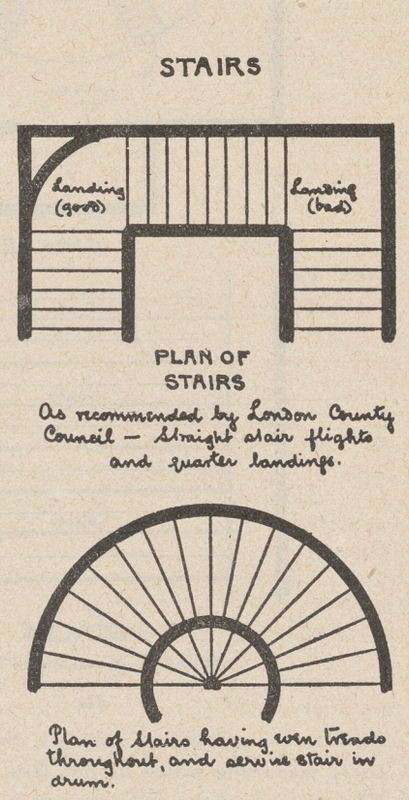


Fig. 5.

THE NORMANDIN CEMENT BLOCK MACHINE.

The hollow cement building block is fast becoming a most popular building material. Every year sees a decided increase in the number of buildings erected in concrete, and the severe fires which we have experienced have done a great deal towards the development of concrete building construction, as it is well known that concrete is to a large extent fireproof.

The Cement Building Block Company, of Winnipeg, report having used and sold over 7,000 barrels of Portland Cement in seven months. They have had five block machines at work constantly in Winnipeg and established over thirty complete block yards through the West this year.

The demand for the Normandin block machine in Ontario has been so great that the Cement Building Block Company has opened a branch office at 42 Yonge Street Arcade, Toronto, where the machine may be seen at any time, also samples of the work done upon it. We are informed by Mr. J. A. Hunter, president of the company, that the Normandin machine is now in use by the United States Government, which should be a sufficient recommendation. The work is neat and of great variety of design and shape. The machine is easily operated by hand. They are made at Walkerville, Ontario, and Jackson, Michigan.

CORRESPONDENCE

WINNIPEG'S BUILDING RECORD,

WINNIPEG, MAN., Oct. 31st, 1904.

To the Editor of the CANADIAN ARCHITECT AND BUILDER :

SIR,—In your issue for this month, in two separate places (Page 153 "Building in the West" and page 165 "Winnipeg Letter") you intimate that up to date Winnipeg beats all other cities on this continent as to its this year's building valuation. Your Winnipeg letter says :—"New York comes second and Chicago a poor third." I think your statements are entirely incorrect. The error was originated here and I believe you will find on enquiry, that the building figures for the American cities for one month were compared with 1904 total for Winnipeg at the time the error was made—tnat is several weeks since. Speaking from memory, figures for several American cities compared with Winnipeg, show that New York, Brooklyn, Philadelphia, Boston, St. Louis and Seattle were all ahead of Winnipeg. The 3½ millions, quoted by our papers here as (on the authority of our building inspector) Chicago's years total to that date' were for the month of August only.

I have probably as high opinion as to Winnipeg's legitimate growth as any one here, and I feel sure that compared as to prcsent size with other cities, Winnipeg has this year made a greater percentage of legitimate solid growth than any other city on this continent. The exaggerated, in fact entirely untrue, statement, I allude to, is calculated to do us harm, as it can be so easily seen that it is grossly untrue, and with the liability to have perfectly true accounts as to our wonderful growth taken as untrue. Neither Winnipeg as a city or our Province of Manitoba require such bolstering up. Nothing will do us more good than the dissemination of the bare actual truth. We have "the goods" all right, and if we can only get the buyers here they can easily see for themselves that we are bound to go ahead with a rapid but steady growth. Trusting you will excuse such a long letter.

I remain, yours truly,

AN ENGLISHMAN, WHO HAS BEEN HERE OVER 28 YEARS.

BUSINESS NOTES.

The Taylor-Forbes Company, of Guelph, Ont., have announced their intention to shortly commence the manufacture of steam and hot water radiators, hot water heating boilers, and a complete line of steam fitters' supplies. The president of the company, Mr. John M. Taylor, was for many years manager of the Dominion Radiator Company and is thoroughly familiar with manufacturing methods and the requirements of the market for this line of goods. He has also associated with him in his new undertaking some members of his former staff whose special knowledge should further tend to ensure success.

Builders and others will probably be interested in a patent screwless door knob that has recently been put on the market. The principle employed is the use of an ordinary square bar with a knob fitted solid on one end. The other end which is square but threaded on the corners, fits into a square hole in the other knob ; after first passing through a ferrule or sleeve which is also threaded on the inside. This sleeve—which is permitted to turn loose on the door knob—is however prevented from getting away from the knob by means of a bead. The sleeve thus acts as a checknut on the bar and by it the knob can be adjusted to the one hundreth part of an inch. The inventor claims this door knob cannot work loose by constant use, thereby doing away with the frequent loss of screws. A new company under the name of the Imperial Hardware Manufacturing Co. has been formed in Toronto, for the purpose of making this knob. They also intend manufacturing locks and other lines of builders' hardware. Their office is at 23 Adelaide Street W.

The death occurred in Paris at the age of 70, of M. Augnste Bartholdi, the sculptor, whose "Lion de Belfort" and "Liberte Eclairant le Monde" have made his fame in two continents. He began life as an architect, and his training in the principles of that art tended to give to all his work in sculpture their well-known monumental character. M. Bartholdi's master in sculpture was Soitoux, and his first exhibit at the Sa on was "A Good Samaritan," in 1853 ; but the work that first attracted attention was the "Martin Schongauer" fountain in the court of the ancient convent of the Ursulines in his native town. The colossal statue of Liberty in the harbour at New York, the largest bronze statue fn the world, he conceived in America, and to it devoted 15 years of his life.

Part of Wanamaker's new building in the block bounded by Broadway, Fourth avenue, Eighth and Ninth streets, New York, will be finished soon. Fourteen stories high, with a subway station in the basement, the building as completed will be the largest structure of its kind in the world. The total floor area will be 1,033,416 feet. The cost was $3,500,000. Fourteen thousand tons of steel have been used. The exterior masonry is Indiana limestone and semi-glazed white terra cotta, and the interior will be finished in mahogany. Twenty-one passenger elevato,s will handle shoppers, eleven will be devoted to freight, and a great central court, sixty-two feet square, will extend from the second to the eighth floors. A music-room and auditorium has been provided with a seating capacity of 1,500, a fully equipped stage and a pipe organ. Wanamaker's old store, the famous A. T. Stewart building, will be retained for women's apparel, dry goods, fancy goods, books and jewelry, while the new structure will have the dvpartments devoted to men's and children's clothing, pianos, house furnishings, furniture and carpets. The upper floors will be utilized for warerooms and manufacturing purposes.

—THE—

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

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The Peterboro Radiator and Boiler Co. has been organized with a capital of $40,000 to manufacture a heater invented and patented by Mr. R. G. Sturgeon, plumber, of that city.

Rear-Admiral Bowles, the new chief constructor, seems to be unalterably opposed to the use of fireproofed wood in the American navy. His objections to the wood are its non-durability, its tendency to sweat, and its chemical action on iron and brass in contact with it. It may be added that the British Admiralty is more than favorably disposed to the use of such wood. The question has not yet been finally decided, so far as the United States navy is concerned, and before Secretary Long takes action in the matter, it is understood that he will probably refer the subject to the Board of Construction at Washington.

KRYPTOL—A NEW SUBSTANCE FOR ELECTRIC HEATING.

In his report of September 17th to the Department of Commerce and Labor, U.S. Consul-General Mason, of Berlin, Germany, writes as follows with regard to an inportant innovation in the line of electric heating :—

Among the notable recent German inventions in the field of applied science is an electric resistance material for heating purposes, to which has been given the name "kryptol." The exact method of its preparation and the proportions of its ingredients employed are not disclosed by the specifications of its patent, but it is a mixture of graphite, carborundum, and clay so combined as to form a loose granular mass or powder of four grades or degrees of coarseness, which are severally best adapted to different heating operations.

Electric heat may be developed by two general methods : The electric circuit may be broken, so that a voltaic arc is formed, and the charge in the furnace is thus heated directly, or the current may be transmitted through a conductor that offers enough resistance to generate heat, which is imparted to other substances by contact. This is the indirect electrical heating system, of which kryptol offers the latest and most interesting example.

The two main difficulties inherent in voltaic-arc furnaces are : (1) Only very high temperatures are developed, which are difficult to modify and control, and (2) the arc consists largely of incandescent particles of (usually carbon) electrodes, which render the flame so impure as to preclude its use for many important purposes. Both of these defects are remedied by kryptol, which develops heat of any desired intensity from a gentle warmth up to 3,000° Cel., and is clean and free from dust and other impurities. Moreover, it avoids the use of platinum, nickel, and other metallic wires and foils that have been hitherto used in resistance furnaces, thereby securing important economy and avoiding the danger of short circuiting and other accidents, which is always more or less present when metallic spirals in connection with crucibles are used.

The property of kryptol, upon which its efficiency depends, is the fact that it offers to an electric current the requisite degree of resistance to generate a high degree of heat without destruction to its own substance. Consul Mason illustrates the method of its operation by means of an earthenware plate inclosed at its edges in a wooden frame and bounded at two opposite sides by carbon electrodes which rest upon the plate and are connected by insulated wire conductors with a current supply, forming, when the break between the electrodes

is closed, an electric current. Upon the earthenware plate is loosely strewn the granulated kyrptol to a depth of about an inch. This, when the kryptol is laid continuously across the plate, forms the electrical connection between the two electrodes and closes the circuit. When, however, the kyrptol is brushed or scraped aside so that an open, uncovered space is formed through the layer across the plate, the circuit is broken and the apparatus remains, so to speak, dead. If now the kryptol is brushed into the open space, so as to form a connection between the two masses lying against the electrodes on either side, the circuit is at once restored, and the kryptol forming this thin connecting layer begins to sparkle and glow, becoming in a few moments incandescent and generating a heat that will raise cold water to boiling in three or four minutes.

A peculiarity is that the incandescent action takes place only at the places where the layer of kryptol on the plate is thinnest, and it is therefore easily possible to create heat just in the place where it is wanted and not elsewhere, for in this case the thick bed of granular material on other portions of the plate remains cool and impassive and may be touched or stirred by the naked hand with entire impunity. The finer the grains of kryptol the less active is the incandescence, and it is for this reason that the four different grades or numbers of the material are made, to be used as may be required in generating different temperatures.

This extreme tractability, by which the temperature can be absolutely regulated by increasing or diminishing the strength of the current or by altering the thickness of the kryptol layer, one or both, renders it applicable to a large variety of practical uses, among which some of the more important are as follows : For heating street cars, hallways, sleeping and other rooms, and laboratories where a continuous uniform warmth is essential. The apparatus includes a simple cast-iron flanged radiator, the interior lining of which is glazed so as to insulate the kryptol mass with which it is filled. At each end is an electrode, usually of gas carbon, connected with wires carrying a current of 4 to 5 amperes and about 120 volts. Such a heater, which can be put under a car seat or beneath the floor, where it is out of sight, can easily be managed by the conductor or motorman, can generate and maintain indefinitely any desired temperature, and can be used without refilling for weeks together, would seem to solve, technically, at least, the problem of street-car heating in cold climates. The radiator is made with a close-fitting cover, for it is found that the kryptol endures unimpaired much longer in a closed chamber than in the open air. A radiator in daily use requires filling with fresh kryptol once in about three months.

This process lends itself with great convenience to all the finer smelting operations in scientific and industrial metallurgy. These operations may be carried on by means of a small crucible furnace, which consists of an iron shell with an enamel lining filled with coarse-grained kryptol, in the centre of which is hung a movable graphite crucible, in which any temperature up to 2,000° C. (3,632° F.) may be generated. With a current of 15 amperes, nickel, the smelting point of which is about 1,600°C., may be fused in about six minutes.

Some of the steel and cutlery manufacturers in Westphalia are experimenting with kryptol with a view to its employment for tempering, annealing, and case-hardening steel and iron bars, knives, scissors, and

other implements. Such processes would become thereby automatic and independent of the skill of the workman.

For chemical laboratories the new material has already been adopted by the University of Berlin, the Technical College at Aix la Chapelle, the Imperial health office at Berlin, and other State institutions. When used in ovens and heating devices of various patterns it enables the chemist to heat substances to any desired temperature and to maintain an unvarying degree of heat for an indefinite period. In elementary organic analysis it is frequently necessary to heat parts of the substance under examination to different temperatures and to leave another portion not heated at all. For this purpose a simple but effective apparatus has been devised. It consists of an iron frame on which is laid a fire brick trough or gutter, glazed inside and filled with kryptol. In this is laid the combustion pipe, which may be a glass tube, containing the material to be treated. The current being sent through the whole, even mass of kryptol, heats the tube uniformly throughout its length; but when it is desired to heat one portion to a high temperature, it is only necessary to scrape the kryptol aside and reduce the thickness of the layer under that part of the tube, when it at once begins to glow with accelerated heat, while the temperature of the other parts remains unchanged. If it is desired to withdraw or exclude the heat entirely from the central part of the tube, two copper forks, which slide along a brass conductor, are introduced into the kryptol, which take up the current and pass it by the conductor over the intervening space, leaving the kryptol and that section of the tube cold and excluded from the heating operation.

As the ingredients of kryptol will withstand any temperature up to 3,000° Cel., its use for heating up to that limit is restricted only by the nature of the material of which the furnace and crucible are composed. Being itself a poor conductor of heat, it retains its warmth for a long time, and on account of its cleanliness and absolute tractability offers a key to a new and convenient system of cooking and of warming dwellings and other buildings wherever electric currents can be cheaply generated and supplied.

The new Association of Window Glass Manufacturers and Jobbers, of Pittsburgh, are reported to have begun the fight against the American Window Glass Company by cutting the lowest prices offered by that company 2½ per cent.

A SMOKE CONSUMING DEVICE.

A Toronto firm, the Smokeless Fuel Saving System Co., hold patents for what promises to be a practical solution of the smoke consuming problem, smoke, as is generally known, is the unburnt gases, arising from the fuel, which, being very light, are swept away from the heat and up the stack, before they have got hot enough to burn. Many ways have been tried to overcome this amongst others, being the introduction of live steam over the fire, which acts as a blanket holding the gases down close to the fire till they ignite. Extra draft, either by inducing or forcing and also mechanical stokers have been used with this object in view. All these have been more or less successful in eliminating the smoke nuisance, but they are as a rule held to be expensive and wasteful of fuel. The patentees claim for this new invention is that it assists, rather than detracts from the heating power of the fire.

By the use of a little steam and a little oil, introduced into a coil or retort properly placed in the bridge wall of the furnace,—which is of course red hot—large quantities of hydrogen gas are generated. By the use of a baffle wall, all the gases coming from the fuel on the grate, are deflected in such a manner as to thoroughly mix them with the air from the draft and compel them to come in contact with the intensely heating gaseous fuel projected from the bridge wall, where they are completely consumed, this aiding rather than hindering the efficacy of the fire.

The amount of oil and steam used in the retort is very small, practically not worth considering.

A number of these fuel saving and smoke preventing devices are in operation in Toronto and are said to be giving satisfactory results.

PERSONAL.

Messrs. S. Frank Wickson and A. H. Gregg, architects, have recently entered into partnership. The new firm have opened offices in the Toronto Trust Company's building, Yonge street.

Mr. L. Anger, having completed a course in the architectural department of McGill University, has opened an office for the practice of architecture at No. 64 St. Peter St., Quebec.