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# CANADIAN ARCHITECT AND BUILDER.

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—THE—

TO ADVERTISERS.

## CANADIAN ARCHITECT AND BUILDER, A Monthly Journal of Modern Constructive Methods.

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The movement for a Dominion organization of Canadian Master Plumbers is still being pushed forward, the Montreal and Ottawa local associations being the prime movers. The plumbers throughout Ontario and the maritime provinces have been invited to consider the question, and an effort will be made to hold a preliminary meeting for organization in the near future. The Montreal association at least appear to be desirous that the proposed Canadian Association should affiliate with the National Plumbers' Association of the United States. To what extent this feeling is shared by the local associations in Toronto, St. John, and elsewhere, has not been learned.

REFERRING to the article on another page concerning tests of fire-proofing material made recently at Deseronto, somewhat similar tests took place recently in Boston of several kinds of wood which had been rendered fire-proof by the injection of fire-proofing compounds. The process consists of forcing by hydraulic pressure a chemical solution into the substance of the wood or other material. A structure built of wood thus chemically prepared was blackened and carbonized to a depth of one-half or three-quarters of an inch, but otherwise remained unimpaired under the action of heat so intense as to melt the window glass. There appears to be no doubt that wood thus prepared will resist the action of fire, but the fact that its preparation costs from twenty-five to thirty dollars per thousand feet, is sufficient to prevent the process from coming largely into use. Porous terra cotta, on the other hand, is not only equally capable of resisting fire, but is likewise very moderate in cost, and has other properties which commend its use in building construction even where it is not required as a fire-proof material.

The collapse of several large buildings in New York city recently, resulting in the killing of a number of persons, has drawn public attention to the necessity for the proper education of architects. In the case of one of the buildings referred to, a tenement-house on Orchard street, the jury found the owner, the contractor and the building inspector to be criminally negligent in having used and allowed inferior material and workmanship. The plans also were found to be seriously defective, brick piers in the basement being loaded to the extent of ninety tons to the square foot, while the limit allowed by law was but eight tons to the foot. The architect of the building was practically unknown in the profession. The jury who investigated the circumstances in connection with the collapse of the building close their report as follows: "The most efficient check which could be placed upon practices of the kind which have led to this disaster, would be the licensing of all architects, who should be required to undergo a thorough examination as to their qualifications to practise an art upon which the lives of so many people depend." Legislation of this character the Ontario Association of Architects have been endeavoring for several years past to have placed on the statute books of the Province of Ontario, and it is to be hoped that their petition will be granted before disasters similar to those which have occurred in New York shall be witnessed in this country.

IN reply to a letter from Mr. Jas. Robertson, of Montreal, concerning the use of galvanized pipe for conducting water into buildings for drinking and culinary purposes, Prof. J. T. Ronald, of Bishop's College, writes as follows: "Certainly it is unwise to use such pipes for the distribution of water for domestic use; some waters would in all probability have very little effect on the zinc, others again might dissolve notable quantities of this metal, and all compounds of zinc which are soluble are poisonous. It therefore follows that in some cases no trouble would arise from the use of galvanized pipe, whilst in other cases such pipe might be the means of introducing into the water a larger or smaller quantity of a corrosive zinc compound. It would be safer not to use such pipe."

THE second appeal of Mr. Neelon, the contractor for the Toronto City buildings, from the decision of the lower courts, refusing him an injunction to restrain Mr. Lennox, the architect of the building, from interfering with or preventing him from carrying on the work on the building under his contract with the corporation, and to compel the defendants to deliver up possession of the works and for other relief, has been dismissed by the Court of Appeal, with costs against the plaintiff. The ground on which the trial judge refused the petition of the plaintiff was that under the contract the architect had power to dismiss the plaintiff without the consent of the court house committee of the City Council. It has not been learned whether it is the intention of the plaintiff to carry the appeal further.

A REAL estate boom similar to the one experienced by Toronto a few years ago, appears to be setting in at Buffalo, and speculation in land and building in that city, is at present unusually brisk. Several Toronto real estate men are said to be operating at Buffalo, neglectful of the experience which many of their class received in Toronto so recently. As mentioned elsewhere, a number of Canadian contractors have also gone to Buffalo in view of the extensive building operations which are in progress in that city this year. It is believed that the Buffalo boom is on a somewhat more solid foundation than the one through which Toronto passed. The location of the city is such that it is believed to be certain to become one of the greatest commercial and manufacturing centers of the United States.

In our Montreal correspondence we print a petition which has recently been presented to the City Council of Montreal, by the Council of the Province of Quebec Association of Architects, asking that a committee be appointed to supervise the erection of public monuments, the laying out of parks, etc., in that city. We are pleased to see this action taken, and trust that the example of the Province of Quebec Association will be followed by the Ontario Association of Architects, so that if possible the appointment of committees of this character may be secured in the leading Canadian cities. The need of some properly qualified authority to govern the erection of public monuments is apparent in Toronto at the present time. Had such a committee been in existence, the Volunteer Monument now in the course of erection in Queen's Park would probably have occupied a different site. The proper place for monuments of this character would be in the rear of the Parliament buildings. The space in front of the buildings should be reserved for statues, and the mixing up of statues and public monuments of the character of the one mentioned should not be permitted.

No understanding has yet been arrived at between the Builders' Exchange, representing the master builders of Toronto, and the bricklayers' and stone masons' unions, for the renewal of an agreement to govern the rate of wages to be paid the workmen in these trades. The only union with which an understanding has been reached is that of the labourers. The other trades are apparently not satisfied to accept the reduction of about 20 per cent. agreed to by the labourers' union, and we feel quite safe in saying that these are the best terms which they will be able to make. In an article elsewhere in this paper, the fact is mentioned that contracts are being taken to-day at one-half the figures obtained twenty years ago, and that never before in the history of Canada were prices so low as at present. Under these circumstances it is folly in the extreme for the trades

unions to demand or expect to be paid the same rate of wages as they have been accustomed to receive hitherto. We are informed that owing to the refusal of the unions to moderate their demands, a number of their members are deserting their ranks and are making their own terms with the employers, whilst others are being expelled owing to their inability to pay their dues. From these two causes the strength of the unions is being sapped, and they have everything to gain by endeavoring to come to an early understanding with the employers.

THE information comes from London that electric radiators have been successfully employed as a means of temporarily heating the Vaudeville theatre in that city, and that in consequence electric heating is likely to come into use in a number of public buildings in that city. The advantages of the electric system are that radiators can be placed in out of the way corners which would be difficult to heat by steam pipes, and that they can be stored away when not required for use. While the system is undoubtedly more expensive than steam while in operation, yet less than half the time is required to bring the temperature of a public building up to the required standard of comfort than when steam is used: thus the extra cost while in operation is offset by the shorter time in which it performs its work. Another advantage is, that the temperature can be perfectly regulated to suit the requirements, and the employment of skilled attendants is to a large extent avoided. The question as to what heating methods will be employed in the future is an interesting one. One thing is absolutely certain, viz., that the use of coal as a means of generating heat is not likely to be continued much longer. The manner in which gas is superseding coal for cooking purposes shows clearly the trend of public opinion. The coal stove is being banished from the kitchen, and it is safe to say that the coal furnace will soon follow.

WHILE a fair amount of building is being done throughout Canada this season, contracts are being taken at figures lower than ever before, and consequently there is little profit in the work. A warehouse building which was destroyed in the recent Toronto fires is being rebuilt at exactly one-half its original cost. In other words, a building which twenty-one years ago cost \$12,000, is now being put up for \$6,000. At the time it was originally built, the brickwork cost \$15.00 per thousand, as against \$11.00 per thousand to-day. Prices of material have also gone down, but it cannot be said that the cost of manufacture, in the case of brick, for instance, has been reduced in like proportion. It is true that by means of improved machinery the cost of making brick has been considerably reduced, but on the other hand the cost of burning has increased by about \$1.00 per thousand as the result of the increased cost of fuel. Apparently, the keenness of competition has served to reduce tenders in other cities as well as Toronto. As an illustration of this, the contract for one of the new churches to be erected in London, is said to have been let at about \$10,000 below the architect's estimate. The majority of contractors have been so long without employment that now an improvement has set in, they are willing to tender at ridiculously low figures in the hope of securing work. The result of such a state of affairs is by no means satisfactory. It tends towards inferior work both on the part of the contractor and the architect, as the latter is affected by low prices in the same way as the former. Cheap work by contractors means additional worry for the architect and reduced commissions. We learn that quite a number of contractors have recently gone to Buffalo and other American cities where building operations are brisk, and this will no doubt tend in some measure to improve the condition of things in this country.

News comes from New Brunswick that the St. George Red Granite Works have ceased operations because of the refusal of the employees to accept a decrease in wages, demanded of them because of the competition of Scotch granite in Western Canada.

Mr. Charles T. Cote, inspector of factories for the City of Quebec, and Mr. Joseph Lessard, inspector of factories for the Montreal district, have been appointed inspectors of religious institutions for their districts, to enforce the new Provincial laws respecting the safety of those buildings.

## SURVEY OF THE BUILDING SEASON.

Is work looking up? This is a question asked by most men engaged in the building trades, and with midsummer well nigh reached, it ought to be possible to provide an intelligent answer. In Toronto, as an outcome of the great fires the early part of the year, a number of large buildings are under construction. Permits have been issued for the erection of the new store for R. Simpson, the Globe office, McKinnon's wholesale warehouse, Rooney & Co.'s warehouse and several other structures in the business districts of the city. The new Foresters' building is also a work of some magnitude, and it is being pushed forward with energy. These taken altogether will run the permits of 1895 into large figures. This work, however, acceptable as it is, is yet abnormal, and cannot be taken as representing a genuine revival in the building trades. Go outside of these contracts and the figures in Toronto will not total up very large. Few contracts have been let for house building. Drawings are completed for a number of private residences, and in some cases permits have been issued and the work commenced, but these are not sufficiently numerous to cut a large figure in any estimate of the building operations of the season. Briefly stated, it has to be admitted that the depression in the building trades that has been a feature for several years, since the days of the breaking of the real estate boom, still continues.

Some factors that enter into building operations, if not new, are deserving of consideration. The recklessness that characterizes tendering for work this year is fully as manifest as in some of the worst years of the recent past. A study of the tenders that come in for almost any class of work, whether on a small scale, or some of the more extensive operations, is full of interest. On a contract running into a few thousand dollars, there will be sufficient difference between the highest and lowest tenders to indicate that good judgment, much less business commonsense, has had little to do in the calculations. This is a condition that reacts upon everyone associated with building operations. The man who contracts to do a job at 25 per cent. less than a profitable price must even go somewhere, or else the time will speedily come when he will count out, and creditors will suffer. As it is, building supply men have prices forced down to a figure that means no profit to them, and necessarily, wages must come down with other values. The architect suffers, for with every decrease in the estimated cost of building, his percentage experiences a decline. Of course, the argument is that if one man does not tender low, his neighbor will do so, and get the job. This explanation does not remedy the evil, and emphasizes the great need there is for men engaged in the building trades arriving at something like a sensible policy in placing tenders.

There is a lot of nonsense talked about the benefits that come to the masses when low values prevail. A study of economic laws and the lesson of careful observation is, that business thrives when prices are reasonably high, and it is when values have the life squeezed out of them, so to speak, that every individual in the commonwealth is a sufferer. Wheat at 50c a bushel may seem to mean cheap flour for the masses, but the past year's history of wheat in Canada runs parallel with a season of depression in which all classes have suffered. With this important article of consumption now doubled in value word comes that business is on the turn, values hardening in all important lines, wages being advanced, and good times returning. This hardening of values, that is reported in iron, steel, hides, wheat, and other products, unfortunately, does not find any immediate placement in the building trades of Canada, though there is reason to believe, that in the near future, conditions will change here, as they are changing in the country to the south of us.

Prices for building material have seldom been more depressed than this season. To quote the words of a leading Toronto architect: "Bricks can be bought almost at one's own price, stone is simply not in the calculation, so demoralized is trade in this line, Portland cements are certainly away down, sewer pipe is cheap enough to suit anyone, lumber is showing some tendency to advance, though current prices here have not changed much, iron and steel, being the only supplies that enter into building construction where prices are hardening."

The conditions that prevail in Toronto are in the main illustrative of the situation generally throughout the province, and other parts of the Dominion. London has been helped, as To-

ronto, by fire, and two leading churches, that were destroyed this year, are being replaced by new and handsome structures. With this exception, there is no building boom in the Forest City. Steady progress is being made in building lines in Hamilton, and the people of that city are satisfied with this growth, but no great things are to be reported from there. And so one might run through the leading cities and larger towns throughout the Dominion.

Building in Toronto will be helped later when the demand for habitable houses more nearly reaches the supply, and with a revival in general business, this day will not be very long postponed. In country towns and rural districts building this season is fully up to, and probably, ahead of late years, many important buildings in the line of school houses, and other public institutions being in course of erection. Taking the Dominion over the season will, on the whole, maintain the average of recent years, with the outlook for the future improving.

## WATER HAMMER IN STEAM PIPES.

Recently numerous explosions of high-pressure steam pipes led a German engineer to call special attention to the great danger from water hammer. To prove this experiments were undertaken to show the high pressure in a pipe when water hammer occurs. A pipe 12 inches in diameter,  $\frac{1}{4}$ -inch thick and 21 feet long, blank-flanged at one end, was partially filled with water, and at the other end steam supplied through a three-inch pipe. Three pressure gauges at equal distances were screwed to the pipe and one in the blank flange. When steam of five atmospheres, 73 pounds per square inch, was admitted suddenly above the water, the pressure gauges indicated respectively pressures of 426 pounds, 114 pounds, 199 pounds and 114 pounds per square inch, or nearly 30, 8, 14 and 8 atmospheres. When steam entered slowly again above the water, hardly any concussions and abnormal pressures were noticed. Steam was then admitted through a valve 2 inches in diameter, and the steam, at a pressure of 5 atmospheres, now entered below the water. The concussion was so violent that the threads of four of the nuts were shorn off, the fourth gauge placed there was crushed, though the gauges were designed for a maximum pressure of 2,133 pounds per square inch, while the other gauges indicated pressures of 483, 385 and 923 pounds per square inch. The end of the pipe bulged considerably. On a new trial the first three gauges registered 313 pounds, 185 pounds and 853 pounds per square inch, the fourth, refitted, over 2,130 pounds; a rent of eight inches in length formed, starting about four inches from the far end. This damaged part was then cut off, the pipe closed again, and the water level lowered to 6 $\frac{3}{4}$  inches; pressures of 498 pounds, 498 pounds and 853 pounds per square inch were then observed. The water level was then raised to 10 inches and steam turned on again; this time two bolts broke in the end plate, and fissures formed near the middle of the pipe. In all cases air and water were thrown out through the air and water outlets. This occurred always in sudden rushes, after an interval of 15 seconds, when steam was turned on fully, and of several up to four minutes, when the valve was only partially opened, to one-fifth in the last instance. Only part of the water was forced out; a minimum of 3 inches always remained in the pipe. The experiments prove that the blow did not begin before the steam had condensed and the water had acquired the respective temperature. The different indications of the gauges seem to show that the blow was propagated in waves, which affected the pressure gauges according to their positions. The maximum pressure observed was 30 times higher than that of the steam which caused the concussion. If we consider that the steam inlet had only one-thirtieth of the area of the steam pipe, that steam pressures of three times the intensity of those experimented with are actually used on shipboard, and that part of a pipe might, under circumstances, be entirely filled with water, we must admit that these lodgments of water may lead to most disastrous consequences. Engineer and Iron Trades Advertiser.

The corner stone of a new Catholic church at Coboueg, Ont., was laid on the 9th inst.

The Standard Drain Pipe Company, of St. Johns, Que., have elected the following officers: President, W. C. Trotter; Vice-President, Capt. Chas. Coursol; Directors, G. H. Balfour, T. H. Dunn, F. C. Henshaw, and J. T. Ross.



## PROPOSED PALACE HOTEL FOR TORONTO.

THE project, considerably talked of in recent years, to build a hotel on a palatial scale in Toronto, seems likely to develop, shortly, into a reality. A fortnight ago, Mr. James Rothschild, of New York, a large capitalist and owner of the new Majestic hotel in that city, visited Toronto, for the purpose of considering the advisability of building a hotel on a similar plan here. He is reported to have been well pleased with the outlook and intimated his willingness to put \$400,000 into the project, providing certain local conditions are complied with.

Mr. G. W. Yarker, the well-known banker, is representing local interests in the project. A representative of the CANADIAN ARCHITECT AND BUILDER had an interview with this gentleman some days ago. Whilst not prepared to say that the project is an absolute certainty, he intimated that everything was developing favorably, and that it was likely to take practical shape at an early date. Mr. Rothschild had gone carefully into the matter, studying the local situation, and was satisfied that the investment would prove a profitable one. The Ontario government has given Mr. Yarker the necessary assurance that the site, which has been selected, namely, the old Upper Canada College grounds, could be secured on conditions agreeable to Mr. Rothschild. It is expected that \$200,000 of local capital would be subscribed, and that the city will grant certain privileges in the way of a favorable rate of taxation and low water rates.

The proposed building will be modelled after the Majestic, of New York. It is a twelve storey building, with six hundred rooms and two hundred and forty-five bath rooms. The Toronto hotel would be eight stories high, though covering a wider area of ground, with three hundred rooms and nearly two hundred bath rooms. In many respects, the Majestic is planned on new and attractive lines. The rooms on each floor are arranged in suits, as well as single rooms. The idea is to cultivate, especially in the winter season, a family clientage. According to the plan proposed, a family may have its own suit of rooms, which will either be furnished by the hotel, or the guests themselves, and these are so arranged, as will be seen from an illustration of one floor of the Majestic, issued with this number of the ARCHITECT AND BUILDER, so that the utmost privacy and home-like features are secured, even to the private hall.

In Continental cities, particularly in France, it has become the custom with many of the better class of families to reside at hotels conducted on the plan of the Majestic, rather than keep house. And this custom has been taking a good foothold lately in United States cities, as is witnessed by the success of that now famous hostelry, the Waldorf, in New York, built by the Astors, and the large share of business that has come to its latest rival, the Majestic, since its opening in October, 1894. What may be the result of any extensive change in the domestic life of Toronto, and its possible bearings on residential property, is, perhaps, a question that would come into consideration here. Mr. Yarker believes that the business the proposed hotel would gather around it would be very largely of its own creation and not interfere, to any material extent, with existing conditions. He said that the projectors would not look for business that would, at the present time, be going to other hotels, though he had to admit, that naturally, what might be termed the better class of guests would prefer a hotel such as that now under consideration, were it placed at their disposal.

The expectation is, that the new hotel would draw to Toronto tourists who to-day pass it by. With other citizens, Mr. Yarker believes, there are few more attractive summer resorts than Toronto. "If," said he, "American families in large numbers will spend a month or more at a time at the Arlington at Cobourg, might we not expect a very marked influx of this kind of business to Toronto, with a hotel here built like the Majestic of New York?"

The appointments of the proposed hotel throughout would be very attractive. There would be a banqueting hall on a scale of considerable magnificence and equal to every likely requirement of the largest conventions and public gatherings. A winter garden is a novel and beautiful feature of the Majestic, and this idea would be carried out in the new hotel. A garden in the courts and on the roof of the hotel would be another novelty. Here guests and their friends are supposed, when so inclined, to spend the evening and sit and sip at ice and enjoy the cool breezes of the lake, as in New York they do those of the Hudson or Central Park.

In answer to the enquiry, when it might be expected the new hotel would be completed, Mr. Yarker said it was hoped that arrangements would reach a point to permit of it being in readiness to receive the guests of the British Association for the Advancement of Science, which is to convene in Toronto in 1897. This would mean that arrangements would be well developed by the fall, so that plans could be prepared and building operations commenced in the early spring of 1896, if not before.

Mr. Yarker intimated that the drawings would probably be prepared by an American architect, and the work of construction placed under the superintendence of some well-known member of the profession in Canada. With an American capitalist largely interested in the project, and the new hotel to be modelled after an existing hostelry in New York, it is not unnatural that the employment of an American architect should be suggested. But there is another side to this matter. The proposed hotel is to be erected in a Canadian city. Substantial assistance is to be given by the provincial government, and favors are expected of the City Council, besides which not less than \$200,000 of Canadian capital is likely to be subscribed. The work performed by Canadian architects is evidence that they are equal to the designing of such a building as that proposed; this being the case and all other things being equal, they should have the preference, and certainly an opportunity to prepare designs, if so desired. Another important consideration that should weigh in giving preference to Canadian architects, is the recommendations that are made as to the character of material that shall be used in the construction of the building. Canadian interests were prejudiced when an American architect was chosen to prepare designs for the Parliament buildings of the province. Within our own country will be found the men and the material, with few exceptions, to meet every requirement that will be called for in the proposed hotel project. We would not want to take narrow ground in this matter, but knowing what has been done in the past by Canadians, and the high position they hold in the architectural profession, what is asked is only fair and equitable.

## CARLETON PLACE TOWN HALL COMPETITION.

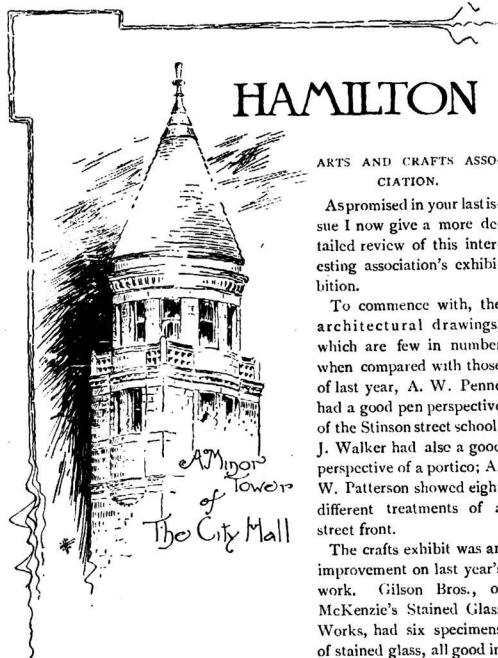
Concerning the above competition, a correspondent writes the ARCHITECT AND BUILDER as follows:—"An article stating that the tenders for the proposed new town hall and fire hall at Carleton Place all proved too high, that new tenders will likely be called for, has been going the rounds of the technical journals for the last two months or more. It has occurred to me that a statement of what has actually been done would be interesting to you and to the architects who sent in plans in competitions.

"In May 1894 an advertisement appeared in the CONTRACT RECORD calling for plans for a "town hall and engine house", apply to the town Clerk for particulars. Those who applied were told they wanted a building of a certain size and kind, to cost from \$15,000 to \$18,000. In all fourteen plans were received. The Council accepted G. W. King's plan with an estimate of \$19,500, and when tenders were called for, the lowest one was \$23,700. All tenders were rejected, as were also the plans. The Council then instructed Mr. King to prepare new plans on the lines of the former ones, but to cost not more than \$18,000. These plans were received about a month ago, the estimate of cost being \$18,000. At a meeting of the Council held a few days later the Council, in committee of the whole, rejected the plans. At a special meeting held about ten days later they acted as stated in the enclosed clipping.

"I would like the other twelve men who sent in plans to know the treatment they got at the hands of the Council."

The clipping enclosed in our correspondent's letter contains a report of a meeting of the Town Council of Carleton Place to consider the Town Hall project, at which the following resolution was adopted:—

"Moved by Councillor McNie, seconded by Deputy-Reeve Moffat, that the clerk be, and is hereby authorized to return the sketch plans and specifications now before the Council to the architect, Geo. W. King, Toronto, instructing him to prepare the finished plans and specifications, which this Council will accept for tenders, as per agreement with architect, after the architect has made the following changes in the sketch plans and specifications: The external walls of building to be of stone throughout, and to be built three feet higher than called for on plans; these walls to be built below high water mark with large dimension stones full thickness of wall laid in cement. The main hall to have an elevated floor. The interior finish of ground floor hall, main hall and staircase, first floor, Mayor's room, committee room and clerk's office to be of black ash, instead of pine, as specified. And that the architect be asked to have these finished plans in the hands of the Council as soon as possible, so that tenders may be called for without much more delay."



## ARTS AND CRAFTS ASSOCIATION.

As promised in your last issue I now give a more detailed review of this interesting association's exhibition.

To commence with, the architectural drawings, which are few in number when compared with those of last year, A. W. Penne had a good pen perspective of the Stinson street school; J. Walker had also a good perspective of a portico; A. W. Patterson showed eight different treatments of a street front.

The crafts exhibit was an improvement on last year's work. Gilson Bros., of McKenzie's Stained Glass Works, had six specimens of stained glass, all good in

design and color. A bedroom suite in bird's-eye maple, designed by J. Burton, carved by A. Burton, and cabinet work by W. D. Taylor, employees of Hoodless & Son, was well worthy of close inspection. S. Boggs, employed by Malcolm & Soutes, had two daintily upholstered chairs. Chadwick Bros. had several specimens of spun brass work, which in point of finish and artistic turning, would compare favorably with the best work from Birmingham. A Venator had a spool holder made of different woods glued up and then turned. A photo cabinet by J. Jeffrey is a first-class bit of cabinet work, carved, veneered and inlaid. L. Bailey exhibited a pair of brass dragon candle-sticks, very quaint in design. W. Ennis exhibited a piano made especially for this exhibition, the style and tone of which is good. P. L. Scriven gives examples of wood engraving.

The artistic needlework forms a good exhibit—no doubt from the fact that Mrs. Wright, late superintendent of the Royal School of Art Needlework, London, England, has a class in the Hamilton Art School. The sofa cushion by Mabel S. Ireland is very rich in color. Kate Saunders has a chair, silk embroidery on white velvet, which for excellence of work takes us back to the 16th century. Mrs. Wright had several specimens of her work: most exquisite.

The loan exhibit of M. W. Devine, who has resided in India for 23 years, and during which time he has made a collection, is superb. Many a "pointer" has been obtained by Hamilton craftsmen from this collection. A. S. Wood and W. Marshall also contributed largely, both in the pictorial and crafts sections. Some designs for cotton prints by M. Sheed and M. Jackson are quite dainty, and show the outcome of the practical work of Hamilton Art School.

Among the local picture exhibits, those of Miss Knott were noticed. Her fruit pieces showed good handling. Mrs. Ireland had a triplet of sketches, in one frame, full of light and having a touch of nature in them. Miss Nellie Weylie had two subjects, one in oil, "My Kitchen Table," and one in water color, "Harmony," with the secondaries. The latter is a triple composition of green mignonette, orange marigolds and purple cinerarias. Miss Baine, the Secretary of the Association, has five water colors of local bits. We expect to see in the near future some strong, telling work by this artist. Miss Ottelee Palin, too, has some carnations which bespeak excellent work at no distant date. Mr. S. J. Ireland, President of this Association and Principal of the Art School, has three oil pictures and five water colors—all painted from nature and not retouched in the studio, consequently very faithful bits of landscape.

To make art handicraft better understood and appreciated, while the Exhibition was on, the following crafts were particularly demonstrated: Stained glass, pottery, lithography, engraving, metal-spinning, wood-turning, wood-carving, etc. The exhibitors of these different crafts each gave one evening to practical work. Lathes and other heavy tools were brought in, and when power was required a 2 H. P. Kay electric motor supplied it. About 5,000 people visited the Exhibition and some sales were made.

In your last issue I inadvertently confused the Arts and Crafts Association with the Hamilton Art School. They are distinct societies, the former having come into existence through the latter training young students to take a place with practical workers. A small error like this is perhaps excusable, as Mr. S. J. Ireland, Principal of the Art School, is also President of the Arts and Crafts Association.

## CORRESPONDENCE.

[Letters are invited to this department on subjects relating to the building interests. To secure insertion, all communications must be accompanied by the name and address of the author, not necessarily for publication. The publisher will not assume responsibility for the opinions of correspondents.]

## ESCAPE IN CASE OF FIRE.

EDITOR CANADIAN ARCHITECT AND BUILDER.

SIR,—The destruction by fire of the McDonald factory, Montreal, with the loss of several lives, is another example of the absolute sinfulness, both of the proprietors themselves for not providing for escape, and of the government in not forcing them to comply with the provisions of the law relating thereto.

What mockery to tell us of the central tower for the escape of inmates, when, as proven in this case, for the hundredth time, this very tower, as with any elevator shaft or stairway communicating by doors from each floor or storey with the interior, is the immediate cause, if it be built of wood, of spreading the fire throughout the building, or at any rate of causing the smoke and asphyxiating gases simultaneously to invade the entire edifice.

How can it be necessary to repeat again and again—how can it not be seen or understood that any tower or stairway of the kind, or elevator, must have absolutely no communication whatever with the interior of the building? For, that even if it is incombustible or fire-proof, as must be an iron staircase surrounded by a brick wall, still can it offer no chance of escape, since it must and always does act as the flue of a chimney or ventilator shaft, by giving access to the smoke and heated air, thereby stifling anyone attempting to escape thereby.

No! the escape stairway must have absolutely no communication with the interior, but, as shown by the writer in a paper read by him before the Royal Society at Ottawa in 1888, and again before the Province of Quebec Association of Architects at Montreal in 1892, and in an illustrated article published in the CANADIAN ARCHITECT AND BUILDER for December of that year, (page 122), the inmates should be able to pass out simultaneously and instantaneously by the windows on to iron galleries or balconies running along each storey of the building and opening on to the stairway; so that, there being no direct communication between the building and the escape way, no draft can take place therein capable of sucking up the smoke and heated gases from a lower level.

In the case of a manufactory like McDonald's, where none but able-bodied persons are employed, iron ladders well out from the wall, to give a good foothold, and facing on a lane or courtyard, with iron balconies to reach them from every floor, through a window on each side thereof; (and these balconies need not be continuous where large apartments allow of the inmates flocking to the escape windows at some one point thereof) I say such ladders and balconies may amply suffice, and I am glad to say that Montreal already has many such humanitarian contrivances, as anyone can see by visiting the lane-way in rear of the St. Lawrence Hall, or between St. James and Craig streets, and elsewhere; and it is pleasing to me here to chronicle to the world the existence of such careful forethought.

Why then was the McDonald factory without these balconies and stairs or ladders, if compulsory by law to have them, and if not compulsory, why not immediately make it so?

My recurring again to this matter of the McDonald fire, is forced on me from seeing it asserted in the finding of the jury or by some of the witnesses that "had there been no panic there would have been no loss of life."

Precisely so, but neither would there have been a panic, nor would there ever be a panic in any case, where means of escape were provided and made known in advance to the inmates, who should moreover be once in a while practised at using them, as in case of fire they would have to do.

I wrote the Montreal Star at the time of the McDonald fatality somewhat in the same strain, and it is to be regretted that a paper of such circulation should have allowed its readers to remain in ignorance of the true nature of a reliable fire-escape for fear of hurting Mr. McDonald's feelings or of jeopardizing his case before the jury of inquiry.

CHAS. BAILLARGÉ,  
Architect, Engineer, Etc.

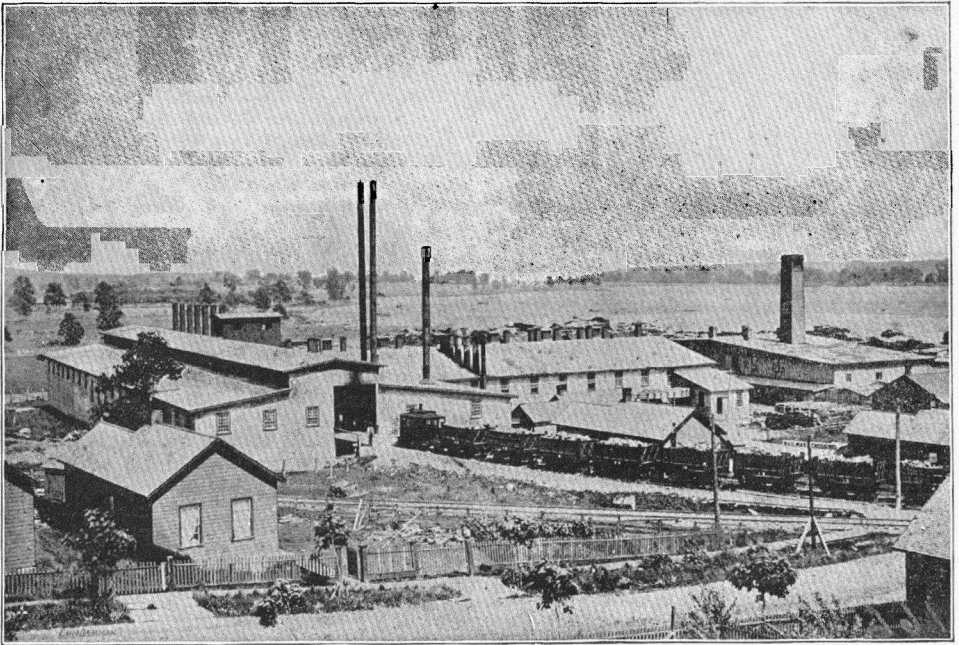
QUEBEC, June 10th, 1895.

## TESTS OF FIRE-PROOFING MATERIAL.

By invitation of The Rathbun Company, a number of architects, principally from Toronto, paid a visit on May 23rd to Deseronto, for the purpose of witnessing a series of tests of porous terra-cotta fire-proofing material, manufactured at the Rathbun works. In addition to witnessing these tests the visitors were invited to inspect the various departments of the Company's extensive business, but a single day was found to be insufficient for this purpose. The inspection was therefore confined to the wood-working shops, the terra-cotta and brick manufactory, and the Portland cement manufactory at Napanee Mills.

The wood-working factory was first visited, and awakened a great deal of interest. The principal product of this factory is sashes and doors, in addition to all kinds of interior finish. An extensive and growing export business is being done. It is noteworthy that the doors manufactured to meet the requirements of the English market are much inferior in workmanship and material to those manufactured for the home market. It is thus possible for the manufacturers to utilize to advantage in their foreign trade, material which would not be acceptable for the home market. The factory is equipped with the

the porous terra-cotta is made is mixed with an equal part of saw-dust, the two materials being thoroughly ground together and afterwards passed down into the press. From one end of this machine is turned out porous terra-cotta arches, and from the other porous terra-cotta lining brick. The latter is dried quickly by means of a hot blast, while the former is elevated to the upper floors and air-dried to prevent cracking. This drying takes place in a temperature of 80 degrees, the temperature being maintained by the air passing over steam coils in the lower part of the building. Upwards of a mile of steam piping is in use for this purpose. The drying process occupies from ten days to two weeks. From these drying floors the material goes to the kilns to be burned. In the kilns the saw-dust is burned out, leaving the remaining material porous and very light in weight. The combined capacity of the several kilns is 300,000 pieces. These kilns are constructed on the down-draft principle, and are fed from a number of small openings in the top. It is a rather remarkable fact that one of these kilns, constructed of common white brick, has stood unimpaired for nine years the tremendous heat which is employed for hardening the fire-proofing material. Its durability is supposed to be due



THE RATHBUN BRICK AND TERRA COTTA WORKS, DESERONTO, ONT.

latest labor-saving machinery, and every device that would reduce the cost of production appears to have been utilized. On this point the remark of an architect may be mentioned, that labor-saving machinery is not only an important agent in reducing the cost of building, but also in curtailing architects' commissions. It was noticeable that notwithstanding the variety of work being turned out, there was only one piece of work which was being manufactured by hand. This one exception consisted of a stair-rail of special design, which, of course, could not be made by machinery. In process of manufacture were some interior fittings for the Congregational Church at St. John's, Newfoundland. The interior of the factory was entirely free from dust, notwithstanding the large number of machines in operation. The dust from these machines is collected by fans and conveyed to the boiler room, where it is utilized as fuel.

The terra-cotta works, which were to be the scene of the tests, were next visited under the direction of Mr. Rathbun, Jr., Mr. M. J. Hynes, superintendent of the works, and Mr. M. J. Butler, the company's engineer. The building is 390 feet in length, with a wing 190 feet long, and contains 200,000 feet of drying floor surface. The products of this manufactory are porous terra-cotta for fire-proofing purposes, terra-cotta for ornamental purposes, and dry pressed brick. The clay from which

largely to the presence of fire-clay material in the brick. The process of burning in these kilns is such that a quantity of the material is constantly being perfected and removed, its place being taken by the unfinished product. The company keep constantly on hand a considerable quantity of material, so as to be in a position to fill orders promptly.

In another part of the building the visitors were shown the dry pressed brick in process of manufacture. The clay beds from which the brick is manufactured are located at Napanee. The clay, after being dried out and then ground to dust, so fine as to be capable of passing through the finest sieve, is conducted to the press, where it is subjected to a pressure of 100 tons. The capacity of this department is 11,000 bricks per day. This department of the business, which was established only a year ago, is meeting with encouraging success.

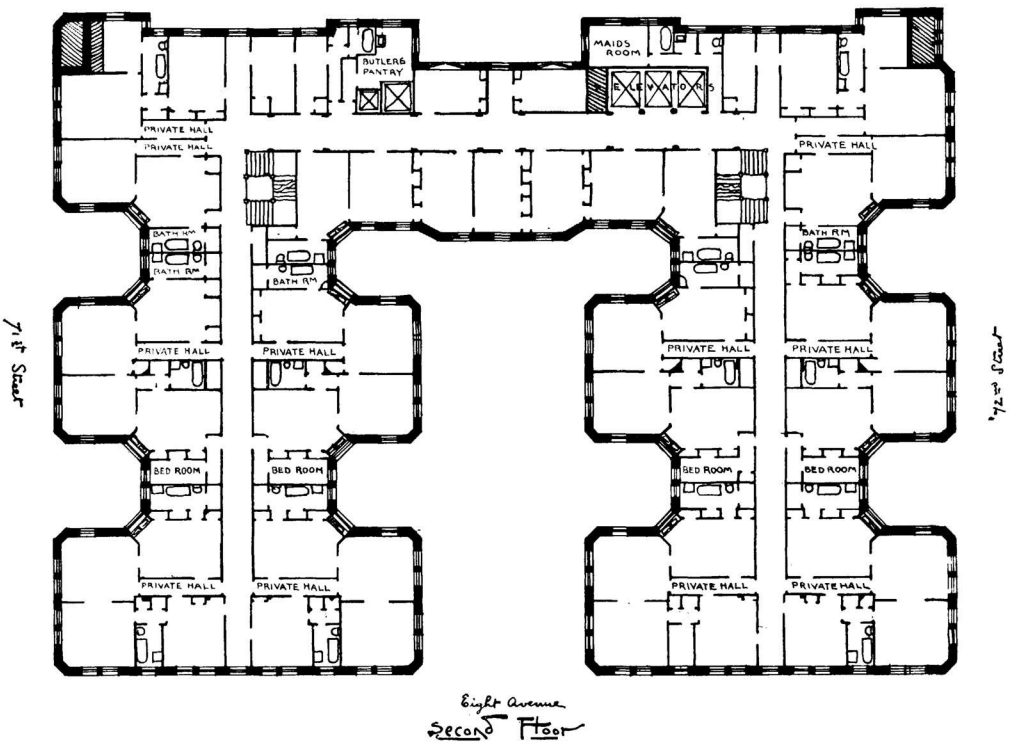
The tests of the porous terra-cotta fire-proofing for which the visitors had been invited, took place in the open yard of the works. A number of terra-cotta arches of various spans had been loaded with pressed brick for the occasion. It was the intention to add to these loads until the breaking strain should be reached, but it was found that time would not permit, and therefore the additional loading was confined to one arch of six inch end construction, having a span of five feet, and a distributed





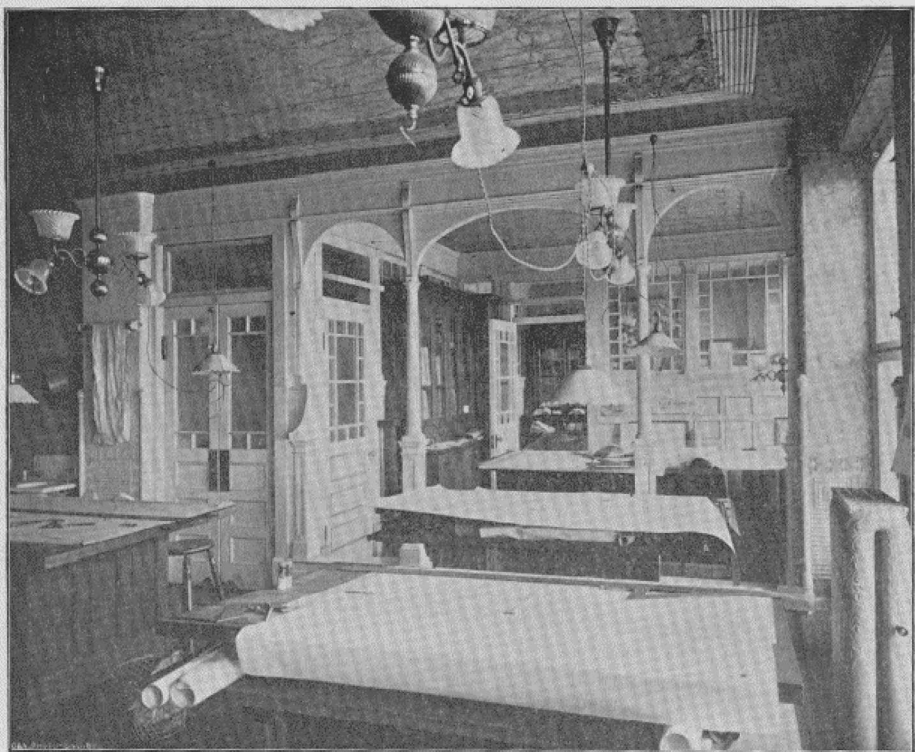
NEW BUILDING FOR THE INDEPENDENT ORDER OF FORESTERS, TORONTO.

G. W. GOUINLOCK, ARCHITECT, TORONTO.



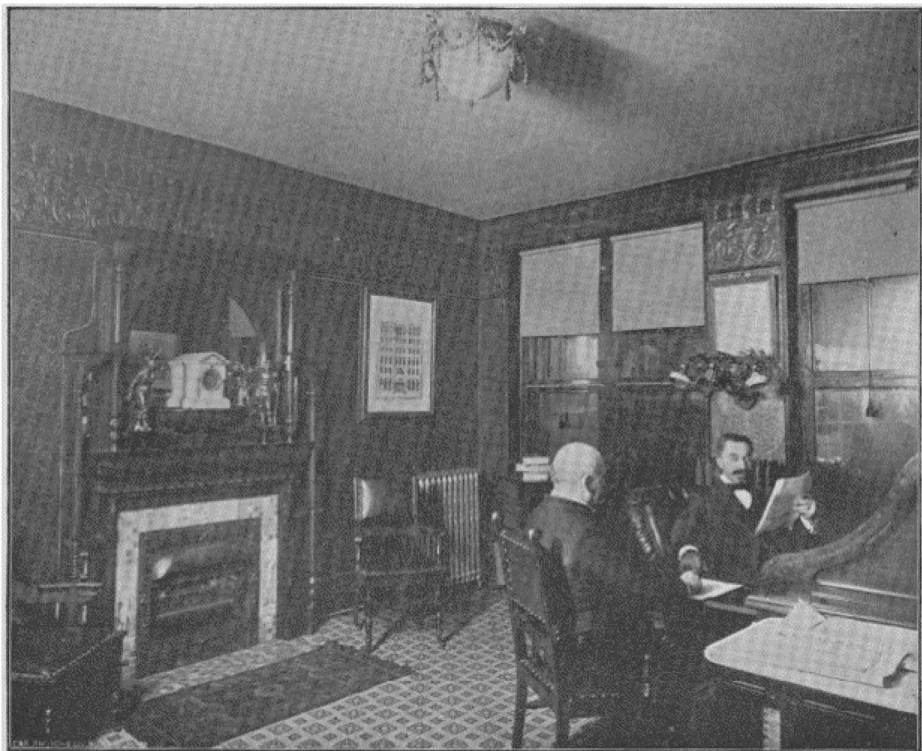
PLAN OF SECOND FLOOR OF HOTEL MAJESTIC, NEW YORK.  
 (Illustrating Article on Proposed Palace Hotel, Toronto, in this Number).





OFFICES OF MESSRS. PERRAULT, MESNARD & VENNE, ARCHITECTS, MONTREAL.

(GENERAL DRAUGHTING ROOM, LOOKING INTO MR. J. VENNE'S OFFICE.)



OFFICES OF MESSRS. PERRAULT, MESNARD & VENNE, ARCHITECTS, MONTREAL.

(VIEW IN MR. M. PERRAULT'S OFFICE).



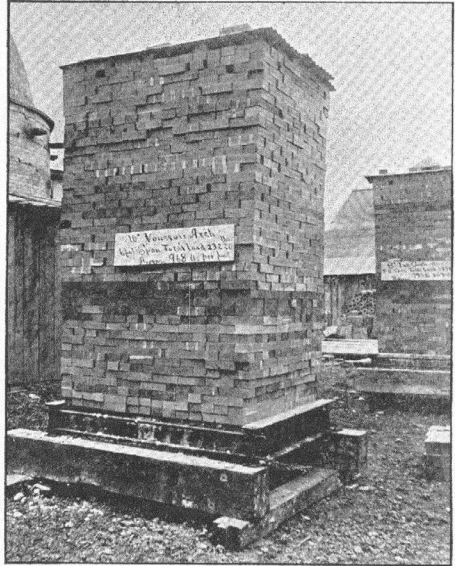
load to begin with of 630 pounds to the square foot. About an hour was occupied in loading up this arch, the visitors watching the proceeding with much interest, expecting as each additional layer of brick was placed on the arch that a deflection would be noticeable. Examinations were made at repeated intervals, but no deflection took place. After the load had reached 1,000 pounds to the square foot, with no more sign of breaking than at the commencement, the test was considered sufficient, and was not carried further. Details of the tests are as follows :

- 10 inch Vousoir, 6 ft. span, distributed load, per sq. foot, 968 pounds.
- 9 inch End Construction, 6 ft. 6 in. span, distributed load, per sq. foot, 633 pounds.
- 8 inch Vousoir, 5 ft. 6 in. span, distributed load, per sq. foot, 666 pounds.
- 8 inch End Construction, 5 ft. 6 in. span, distributed load, per sq. foot, 799 pounds.
- 6 inch Vousoir, 5 ft. span, distributed load, per sq. foot, 612 pounds.
- 6 inch End Construction, 5 ft. span, distributed load, 612 pounds per sq. foot, 1000 pounds final load.

Since the date of the tests, the loads on the arches have been increased from 500 to 600 pounds to the foot, and are still standing under that strain.

While this test was going on, another of a different character was being carried out a few yards distant. A building, 6 feet 9 inches by 4 feet 2 inches, by 4 feet 7 inches high, constructed of one-inch boards and lined with one and a half inch porous terra cotta, had been filled with combustible material, saturated with coal oil, and set on fire. The fire burned furiously for fifty minutes without injuring in any way the covering of the building. At the end of that time the fire was extinguished, and some pieces of the porous terra cotta were taken out and immersed in cold water. To the surprise of those who witnessed the test, these pieces of material did not show the slightest crack as the result of contact with the cold water, and nails were driven into them with the same result. It is estimated that a

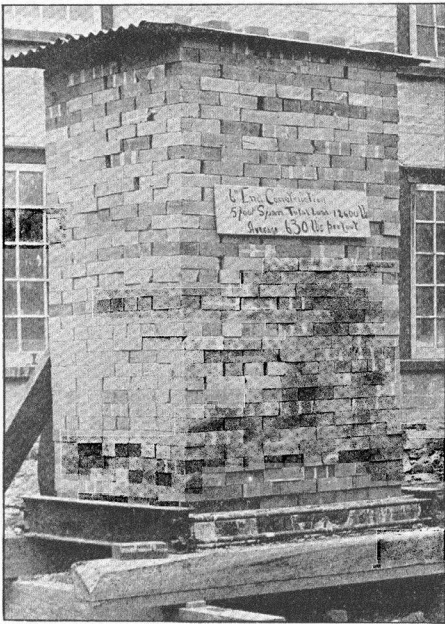
special car on the line of railway owned and operated by the Company, and were conveyed to Napanee Mills, where the cement works are situated. These works occupy two large stone buildings about 600 feet apart. They are operated by a 250 h. p. Wheelock engine. By means of a rope transmission device installed by the Dodge Pulley Co. of Toronto, 150 h. p. from this engine is transmitted to the other building, a distance, as already stated, of 600 feet. By means of this device a great saving in power is accomplished. Near these works are located the deposits of clay and marl from which the Portland



cement is manufactured. The clay is peculiarly adapted for the purpose, being free from sand, while the only foreign ingredient in the marl consists of organic matter. The two materials are mixed in the proportion of one of clay to three of marl. They are thoroughly ground together into a homogeneous mass by means of a wet pan mixer. A sample of each lot of material is analyzed before leaving the mixer, to see that the proper proportions of materials are being maintained. Thus every ten barrels manufactured is checked, so that there is little opportunity for variation in quality of the manufactured product. From the mixer the material is carried up by a belt into the pug machine and from thence is loaded on cars and passes into the drying room, where it remains for twenty-four hours. From the drying room it goes to the kiln, and is subjected to a gradually increasing heat, culminating in a temperature of 300 degrees Fahr. The resulting clinker has a specific gravity of 3.13. The material next passes through grinders and three or four pairs of rolls, and is finished on French buhr millstones, which give it a granular finish. The finished material leaves only one to two per cent. residue on a 10,000 mesh sieve. The material thus finished is put into barrels, being weighed separately from the barrel. 350 pounds of material is put in each barrel, so that a uniform quantity of cement is contained in each barrel irrespective of the weight of the barrel.

In connection with the works there is a testing laboratory. The cement is tested by being made into pats on glass, then put in damp air for three hours, then immersed in water for twenty-four hours at a temperature of 130 degrees Fahr. If no signs of blowing are apparent as the result of this test, the material is considered to be of satisfactory quality. Should defects show themselves, it is put back into the bin and allowed to slake off free lime. A briquette made two months previously was broken on the testing machine in the presence of the visitors at 620 pounds, and another, one month old, broke at 450 pounds to the square inch.

The company experienced a great deal of difficulty in the early stages of this enterprise, but have succeeded in so mastering the process of manufacture as to insure a uniformly satisfactory product. The superintendent of the works is Mr. F. G. B. Allan. The works have a capacity of 150 barrels per day.



building lined with this material would prevent fire from spreading for at least twenty minutes, and usually this time would be sufficient to enable the firemen to obtain control.

Several of the architects who witnessed these tests and who had an opportunity of seeing the process of manufacture, expressed their regret that they had not known earlier the character of this material, as they had been importing more expensive and less efficient material for some of their buildings during the past two years.

After having partaken of luncheon, the company entered a



(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

THE last of the monthly dinners for the season of 1894-5 of the Province of Quebec Association of Architects was held in the Queen's Hotel on the 4th inst. This dinner was made on the occasion of welcoming back to the city Mr. A. C. Hutchison, 1st Vice-President, after a four months tour in Europe. There was present Mr. F. X. Berlinquet, ex-President from Quebec, and a number of the members. After the dinner Mr. Hutchison gave a brief outline of his trip, dwelling more particularly upon his impressions of the Ancient Greek, Byzantine and Mediaeval styles, as illustrated by buildings in Sicily. He also gave an account of revelations made by late excavations in the arena of the Colosseum and on the Palatine Hill in Rome.

At the last meeting of the Council, held on the 11th instant, it was decided to hold the semi-annual examinations in Montreal on the 25th, 26th and 27th of July. Thirty days' notice will be required to be given the Secretary by intending candidates.

The following petition has been sent by the Council of the Association to the City Council:

"We, the Council and Members of the Province of Quebec Association of Architects, residents of this city, humbly beg to memorialize the Mayor and City Council, to appoint an Art Standing Committee, to whom all matters relating to the beautifying and embellishment of our city would be referred for their consideration and opinion.

"At present, we believe, there is no special committee delegated to look after this particular object, and accordingly, monuments, statues and other erections are and have been permitted to be put up in our public squares, streets and gardens, that are neither beautiful or a credit to the city.

"Other cities have taken such a step, notably New York and Boston, and have appointed Art Standing Committees of men of acknowledged artistic experience to advise them in such matters.

"Recognizing that taste and a wide knowledge of art requires a special and long training, which it is not in the power of everyone to command, we feel that such an advisory committee would be of great assistance, not only to the city and citizens, but also to the Council as a body.

"If this meets with approval, we would take the liberty of suggesting for your consideration, that this committee should consist of six members, all residents in the city of Montreal, and should include the Mayor and the City Surveyor or Engineer, and a representative from the following Associations:—The Royal Canadian Academy; the Art Association of Montreal; the Association of Architects of the Province of Quebec and the Council of Arts and Manufactures, or such other recognized artistic body as may be selected.

"It is intended that these appointments be purely honorary and with no emoluments attached."

A new granite firm recently formed in St. George, N. B., is composed of Stephen Conley, Owen F. Bogue, James H. Frawley, Caleb Hennessey, James R. O'Brien, Henry F. McDougall and Charles H. Lynott.

The Winnipeg Public School Board propose introducing the best known system of heating and ventilation in several new schools to be erected, and with that object in view invite correspondence from parties dealing in same.

Messrs. Kelley and McCutcheon, two local contractors, have submitted a proposition to the Winnipeg City Council to put in a plant for the manufacture of vitrified brick for paving purposes. A clay suitable for making bricks has been discovered within 150 miles of the city.

## STUDENTS' DEPARTMENT.

### USEFUL HINTS.

IN some experiments conducted by the German government on steel and iron girders, the soft steel girder proved twenty-two per cent stronger than the iron girder. The strength of steel girders appeared to be about the same for the two flanges, if made alike in sections.

For filling up the pores of the wood before commencing to polish. For white wood, equal portions of whiting and plaster of Paris, thinned to a paste with turpentine and well into the grain of the wood. If for mahogany, add rose pink, or whatever the color of the wood is, and dry color to match up to same.

The following is recipe for paint for ships' bottoms: 8 lbs. of resin, 1½ lb. of "Cologne brown dry color," 15 oz. of shellac, 25 gills of spirits of wine, 6 gills of benzene, ¼ gill of toulouene, and 10 drops of pyridine. As a finishing coat, a mixture of paraffin wax and white lead "boiled together" is applied hot.

To make plaster medallions look like marble, take pure sweet milk, boil it, and skim it two or three times; put it on the face of the cast, and blow it evenly on all parts, taking care that it does not get on the edge or back; put it aside for two or three days, then put it in a shallow dish face up, and pour in oil of sweet almonds until it comes up to half or two-thirds of the edge of the cast. Be careful that none gets on the face. As the cast absorbs the oil, put in more, until it is saturated. This makes the plaster perfectly transparent and of a beautiful colour. The milk forms a coat on the surface, which will bear washing.

The utilising of waste materials in buildings is not always safe. According to the report of the Chief Inspector on Alkali Works in Scotland, one fatal accident has occurred at an alkali work at Irvine, owing to the use of tank-waste as a foundation or flooring, over which had been erected tanks for the condensation and storage of muriatic acid. This material consolidates into a hard mass, and is not infrequently used in alkali works for filling up hollow places and making good the ground level. It is hoped that the use of this material will be avoided in future in places where it is possible that acid liquors may come in contact with it. In the Irvine case a bricklayer, having to effect some repairs to pipes connected with the acid tanks, was overcome by a rush of sulphuretted hydrogen gas caused by an overflow of the muriatic acid on the bed of tank waste below. The bricklayer fell to the ground insensible and could not be restored.

Yellow pine can be stained to resemble oak in color by very simple means, but if it is intended that the figure should also be imitated, this will be found a more difficult task. A rich dark color can be gained by dissolving 2 lb. of patent size in one pint of water, add some brown umber to give a brown shade, apply while still hot with a brush, and wipe all surplus with a piece of rag. When dry smooth down with a piece of canvas or coarse rag, and fill up all nail holes, &c., with putty colored to match, then wipe over asphaltum dissolved in turps to gain the rich brown (¼ lb. of asphaltum to 1 pint of turps). Allow this to stand till the next day to harden, then varnish with a good quality church varnish. Should it be desired to imitate the figure or grain as well as the color, satisfactory results may be attained by using sizes and ochre instead of umber, and when applying the asphaltum passing a steel graining comb when nearly set and picking out a few light places with a piece of rag slightly wet with turps and held in position over the thumb of the right hand.

It would appear that the external surface of concrete walls will be affected by the character of the timber employed for the temporary framing. In some military works by the United States engineers the plan originally followed was to build all the concrete work with frames of undressed spruce lumber, and then, on removal of the frames, to plaster the exposed surface with cement. This coat of plaster could not be made to adhere to the older work, which rapidly absorbed its moisture, weakening the bond between the two, which was destroyed by the first cold weather, when the coating cracked and dropped off, much to the detriment of the appearance of the work. There was, besides, no economy in the use of spruce lumber, which warped out of shape when subjected to the moisture of the concrete, and could seldom be used more than once, and the plastering was very expensive. It was, therefore, decided to substitute framing made of first quality dressed white pine, grooved on both edges, and united by loose tongues of yellow pine, and to construct the masonry differently. That portion of the concrete next to the frame, 4 inches thick, was laid, and on the frames being removed, a rubbing with a float was sufficient to give a smooth surface to the face. The work was found to resist changes of temperature without scaling or cracking.

The new Wesley College building in Winnipeg is approaching completion, the exterior work being sufficiently advanced to give some idea of its architectural beauty.



ILLUSTRATIONS.

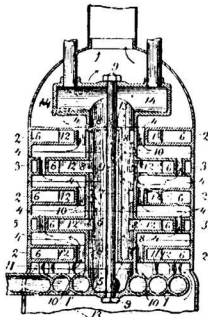
OFFICES OF MESSRS. PERRAULT, MESNARD & VENNE, ARCHITECTS, MONTREAL.

PLAN OF SECOND FLOOR OF HOTEL MAJESTIC, NEW YORK. FORESTERS' TEMPLE, CORNER BAY AND RICHMOND STREETS. —GEO. W. GOUINLOCK, ARCHITECT.

THE above building, the corner stone of which was laid on the 31st of May, by His Excellency the Earl of Aberdeen, is to be known as the Foresters' Temple, and will be one of the finest headquarters of any fraternal society in the world. The building will be L shaped, with a frontage of 40 ft. on Bay street and 132 ft. on Richmond st., and with a depth north of 108 ft. It will be nine storeys in height, exclusive of a sub-basement, and will cost \$300,000.00. The fifth and sixth flats will be occupied throughout by the staff of the I.O.F. The seventh and eighth flats will be fitted up as Assembly Rooms, etc., and a suite of rooms for commercial purposes. The building will be of Credit Valley brown stone and brick and stone facings, and will be absolutely fire-proof; the interior being constructed of steel girders and columns, protected by terra-cotta fire-proofing.

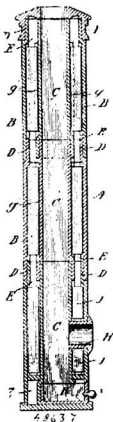
RECENT CANADIAN PATENTS.

No. 48,593, for a hot water heater, to Thomas Stubbs Bayles, Toronto, Ont. The accompanying illustration and statement of claim explain the invention:



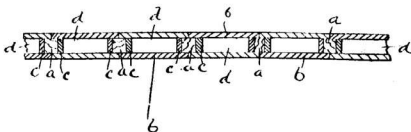
In a water heater, the combination of a spiral hollow section having a well at its centre, a flanged hollow section adapted to fit in close contact with said spiral section and having a well at centre and having a cross wall therein and flues, ports and walls as specified, and a distributing section as specified, adapted to receive a number of pipes therein.

No. 48,637, for a sectional chimney, to William Rollin Wilson and Merton James Bell, assignees of William James Culnan, all of Brule, Wisconsin. The accompanying illustration and statement of claim will explain the invention:



In a sectional chimney, the combination of two or more jointed sections, each section comprising an outer casing and concentrically arranged inner flue, vertical guiding holding beads and removable spacing and holding ribs inserted in the air-space between the inner and outer casing, one end of the outer casing being provided with a joint shoulder and reduced to enter the air-space formed between the inner flue, and the outer casing of an adjoining section and the outer casing provided on its inner surface near its reduced end, with a shoulder which prevents the inner casing from being pushed in too far, and one end of the inner flue being formed with a joint shoulder and enlarged to receive the smaller end of the inner flue, whereby, when one or more sections of the chimney are united, continuous gas tight joints are formed between the adjoining ends of the sections of the inner flue and the connecting ends of the sections of the outer casing.

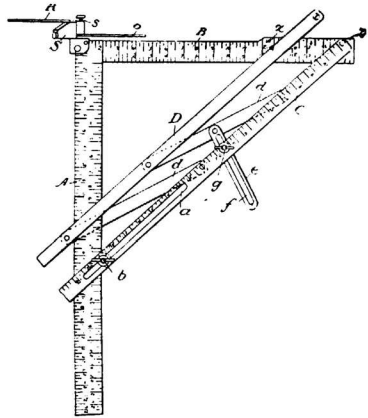
No. 48,655, for a fire resisting material, to James Day Baker, Montreal, Que. The accompanying illustration and statement of claim explain the invention:



As a means of preventing the spread of fire through buildings having hol-

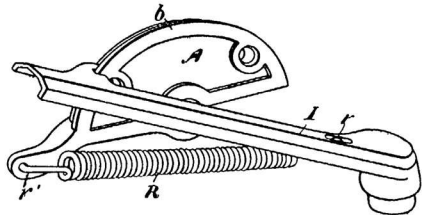
low walls, the combination with the combustible vertical studding thereof, of the vertical lengths, e, and the transverse lengths, d, of fire-resisting material with their meeting edges formed to interlock, for the purpose set forth.

No. 48,706, for a roof-framing tool, to John Parkhill, Rochester, Minn. The accompanying illustration and statement of claim explain the invention:



A device for indicating the side cut of rafters comprising a rule or bar adapted to have its edge placed on the plumb cut of the rafter, as indicator plate pivoted to the said bar, to swing at right angles to its length, the said plate having indicating lines marked from a common centre thereof, and fingers pivotally connected with the said plate at opposite sides of the pivotal point and adapted to swing in a plane at right angles to the said plate.

No. 48,743, for a door check, to Henry T. LePage, Toronto, Ont. The accompanying illustration and statement of claim explain the invention:



A door-check consisting of a pivotal plate, the upper edge of which is arc-shaped, a bearing formed in the pivotal plate, a lever, a pivotal pin for the lever working in the said bearing, a pocket in one end of the said lever, a bar connected to the under side of the said lever at or near the said pocket, a guide connected to the said lever at or near the said pocket, a guide connected to the said lever at or near its opposite end working on the upper end of the said plate. A spring having a hook-shaped end encircling the said bar, the opposite end of the spring hook-shaped, and held by the said pivotal plate as specified.

PERSONAL.

Mr. Jos. Lamarche, President of the Montreal Master Plumbers' Association, had the misfortune to break his leg while stepping out of his buggy a few weeks ago.

Messrs. R. W. Thomson, B. A., Sc., and Edgar J. Laschinger, B. A., Sc., graduates of the School of Practical Science, Toronto, have gone to South Africa, where they expect to find promising openings for their energies and abilities.

We observe that Mr. Chas. Baillairge, the talented City Engineer of Quebec, and President of the Province of Quebec Association of Architects, has made request for an increase of salary. It is to be hoped the Council will recognize Mr. Baillairge's able and faithful services to the city during the 29 years he has occupied his present position, by acceding to his request. Such versatility of talents as he possesses are rarely combined in one individual, and at one time or another the City of Quebec has received the benefit of them all.

The death is reported in New York City, on May 16th, of Mr. A. M. Wellington, one of the editors of the Engineering News, and a consulting engineer of great ability and wide reputation. It will be remembered that Mr. Wellington was employed as consulting engineer in connection with the project to elevate the railroad tracks on the Esplanade in the city of Toronto, when the Esplanade improvement scheme was before the Council a few years ago. Mr. Wellington was the author of a number of valuable books on engineering.

## BRICKS AND BRICKWORK.\*

THE characteristics of a good brick are: 1. Regularity of shape, so that when built into a wall the pressure is equal over its surface. 2. Toughness as opposed to brittleness, *i. e.*, it ought not to snap when broken, but should require two or three hard blows. 3. Clearness of ring when gently knocked against another brick, and not a dull, heavy thud. 4. Homogeneity of surface and texture in the interior, and, above all, absence of small stones or pebbles or lumps of chalk; and 5. Nonporosity, *i. e.*, slowness in absorbing water. I am very much disposed to think the latter quality the most important, and one that is perhaps the least attended to. I mean, of course, with facing bricks. The rate at which a brick—or, for that matter, stone either—absorbs water is a more important element in its goodness than its total absorptive power, because when built in a wall the bricks are exposed only to intermittent wettings, and if in testing two samples of brick I were to find that one absorbed 15 per cent. of its volume of water in the course of an hour, while another absorbed 20 per cent., but took four hours to do it, I should prefer the latter. The crushing strength of a brick is an interesting subject of inquiry, but practically you will find it very rare indeed for bricks to be exposed in walls to anything approaching this crushing strain. Professor Unwin, at the Central Institution, Kensington, kindly tested some bricks for me a few months ago, and it was found that a Leicester brick was crushed with a load of 245 tons per square foot, a Coventry brick at 217 tons, and a London stock at 125 tons, while a blue Staffordshire brick only crushed under a load of 385 tons per square foot, and could not be broken by the machine. A two-brick wall carried up 102 feet high, which is, of course, much higher than would ever be done in practice, would exercise a pressure of five tons per square foot on the lowest course, and this will show you how small is the chance of a brick itself being crushed; but a brick and brickwork are two very different things, the intervention of the mortar joints introducing an entirely new element. Brick piers are very awkward things to experiment upon, and require very special machinery; but some practical experiments upon them have been made in the United States, and you may take it that three tons per square foot in mortar, and five tons in cement, are about the safe loads that should be placed on brickwork.

The reason why some bricks in a clamp or kiln are good and others bad—irrespective of their position—is very difficult to understand even by practical brickmakers, but the most eminent firms are quite willing to admit that they do get a number of bad bricks, and one gentleman told me that out of a very large number of burnings his experience would lead him to the conclusion that 30 per cent. on an average were of an inferior quality. One practical point is never to be guided in choice of a brick by color alone, as it may frequently happen that what looks like an excellent brick may really be as bad as they make them. Knock them together and see how they ring; a bad brick will never ring well, and then break the brick and see its interior. If you see pebbles, or find the interior soft and not of close texture, you may safely condemn the bricks.

Underburning is, I believe, a fruitful cause of inferiority in bricks, as they are then soft and friable; and from my own observation I should say that, if you notice a load of bricks coming on to a job, with a large number of broken ones among them, the chances are that the bulk of the bricks are bad ones, and they should be rejected. This is altogether apart from the risk to the work owing to the temptation to the men to use snap heaters. To revert for a moment to the question of porosity. I believe if in an ordinary wall you were to pour water on the face at a level of about 6 ft. from the ground, none of it would run down as far as the ground; the water would get absorbed before it reached so far; and this with very fair bricks. It may be of interest to you to know of an easy method of rendering a brick wall almost, if not quite, impervious to water. Wash the surface over with a solution of soft soap and water, about half a pound to a gallon, laid on with a soft brush; and, when that has dried in, apply a solution of alum and water, mixed in the same proportions, and the result will be that you have waterproofed the wall. I am indebted to Mr. Rowland Plumb for this recipe.

It goes without saying that however good your bricks may be, you will never get good brickwork unless good mortar is used, and anyone who is in the habit of inspecting old houses will have noticed that in nineteen cases out of twenty it is the mortar which has perished, and not the bricks. In fact, I believe a good brick is just as good after one hundred years' use as when it was new. I am sure the difficulty which public officers have with the speculating builder lies more frequently with the composition of this than with the bricks. The stuff which the 'highly respectable building-man' will try to pass off as sand is of a fearful and wonderful nature. Sometimes he will use sand, but of such a soft, sugary texture, with no sharpness about it, that it is impossible for it to make good mortar. This you can test for yourselves by trying it between your fingers. But I should strongly advise you to look with the greatest suspicion on a heap of brownish grey stuff, which the builder will tell you is road sweepings. I am not saying that in country districts where the roads are mended with granite, if the road-siftings lie in heaps for some months and are carefully washed, you may not obtain a very good building material, but as a rule there is much organic matter in road sweepings, and it is very easy to mix garden loam with it, which is, of course, utterly unsuitable for mortar. Another thing that men will often try to use for mortar, especially in a building which is to take the place of one recently pulled down, is the siftings of the old lime mortar and plaster which has come from the debris of the old houses. Sometimes you may spot this unmistakably by the smell, as I myself once did, a heap smelling very strongly of stale smoke from chimneys. As to lime, it is utterly impossible to discuss this question at the far-end of what I fear has been a terribly long infliction on you—it would take an evening to itself. I can only say I much wish it were more frequently the practice to build with cement-mortar. I am sure that cement and good sand mixed with 5 and 1 would make better work than ordinary lime and sand mixed 3 and 1, and the latter cost would not be very great. There is one thing that you should be on your guard against in country districts—never allow any brickwork to be built in chalk-lime mortar. It never sets in the interior of the joints. As to the joints, except in winter, I should always prefer to have the joints struck as the work goes up, rather than raking them out and pointing afterwards. There is always the risk of not raking the joints out far enough, and the chances are that the pointing will not adhere to the mortar in which the bricks are laid. Whether you have a struck joint or a pointed one, insist upon having it cut in at the top of the joint, and not at the bottom. The men will always do this if they are explicitly told to, but if not they will always cut it in at the bottom—why, I have never been able to understand—giving a lip on which the water collects. In hot weather you must be careful to dip the bricks in water before laying them, or they will absorb the water far too quickly, and prevent it setting properly.

In this country it can very rarely fall to our lot to be allowed to carry out a commission on those ideal conditions which Mr. Brydon so humorously alluded to in this room, when criticizing the students' work at the Institute, *viz.*, where cost is no object. Economy and utilitarianism are the conditions under which much of our work has to be carried out. We must often, therefore, be compelled to give up the use of stone and fall back on brick. But do not let us on that account despise our material. It is a good honest material, which lends itself to an inexpensive decorative treatment of a perfectly legitimate kind, and I can only hope that in this short paper—the deficiencies of which I am fully conscious of—I may have given you some reasons for not neglecting the study of the history of brick in the past, and I am confident that such a study will be productive of nothing but good in its results on the brick architecture which you will have to construct in the future.

THE Port Credit Pressed Brick and Terra Cotta Co. have removed their Toronto office from 52 Colborne street to No. 28 Victoria street.

The Ryan estate, Coldwater, Ont., is constructing a new residence. Mr. Croker, of Orillia, is the architect, and the work is being done by Mr. Eaton, of Orillia.

In the town of Barric, Ont., W. A. Boys, Dr. Richardson and Geo. Overs are each erecting new residences. Their respective cost will be \$3,500, \$2,500 and \$1,500.

\* Abstract of paper read by Mr. John Slater before the Architectural Association, London, England.

**PAGES**

**MISSING**