

PAGES

MISSING

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TO ADVERTISERS.

For the benefit of Advertisers, a copy of this Journal is mailed each week to persons mentioned in the CONTRACT RECORD reports as intending to build, with a request to consult our advertisement pages and write advertisers for material, machinery, etc.

THE eighth year of publication of the CANADIAN ARCHITECT AND BUILDER comes to a close with the present number. An index to the contents of this volume is presented herewith. At the commencement of a new volume and a new year, we may have a few words to say with regard to the progress achieved. Meanwhile, we heartily extend to every reader best wishes for a Happy and Prosperous New Year.

THE old Upper Canada College Buildings, Toronto, which it was proposed a year or two ago to use as a public museum and art gallery, are now occupied as a manufactory of tinware. "To what base uses do we come."

MONTREAL is to lose its distinction of having the largest bell on the continent of America. A Cincinnati foundry is about to cast what will be the largest swinging bell in the world for a church in that city. Its tongue will weigh 640 lbs.

THE Architectural Sketch Club, of Toronto, has been re-organized as the Toronto Sketch Club, and will, we trust, do much to encourage good work among its membership, which embraces the students in the various architects' offices in the city. The organization is informal in its character and is intended to cultivate the social as well as the professional element among its members. There will be competitions for designs and at each meeting a critic chosen from among the architects.

THE new Jamieson building at the north-west corner of Yonge and Queen Streets, Toronto, shows a rounded corner at the street junction, and serves to emphasize the great advantage which would have been secured by rounding in a like manner the corner of the new Simpson building. The opportunity is now past, so far as this building is concerned. Immediate action should be taken, however, to ensure, at least, the rounding of the north-east corner, on which stands at present an old and inferior building such as cannot much longer be allowed to occupy so valuable a site. While the opportunity of greatly improving the appearance of the city which existed by reason of the destruction of the former Simpson building has gone by, the importance of providing means of relieving the street traffic at this point should now be estimated at its proper value.

THE Art Student's League, of Toronto, is holding its annual exhibition at Roberts' gallery, on King street. There is some very creditable work on exhibition, showing that the League is doing good work. The exhibition is well worth a visit.

AN important step has been taken towards the building of the proposed bridge over the Hudson at New York. The general plans of the bridge have been approved by the War Department. The next step is the fixing of the exact location, when the detail plans can be completed, and then the projectors will be in a position to make their financial arrangements and go on with the construction of the bridge.

UP to 1st October buildings were erected or altered in New York this year to the number of 5,254, of which 86 cost \$100,000 or over each. The total cost of these 86 buildings was \$20,000,000. Of the entire number of buildings 2,067 were tenements or flats, and houses for residential purposes. New York seems to grow, but we fancy it will be some time before it ranks as the third city in the world as to size, notwithstanding the placing of it there by some of the United States journals.

M. L. WUARIN, a Frenchman who writes in the *Revue Scientifique*, on "Buildings in the United States," gives the latter nation much praise for the way they plan their houses and their household management. Among the things he commends are the interior drainage, free use of water, hygienic plumbing, heating (hot water heating), cooling methods, including the mechanical fan, distribution of hot water, laundry arrangements, methods of putting in coal, and last but not least, the district telegraph system. Old nations can sometimes learn a great deal from the new.

WE hear occasional complaints of the working of the lien law in Ontario, one being that a person who supplies building material may, by the collusion of the party who sells the land and the builder, be done out of his just rights. It is impossible to frame a law to meet every possible case, and if parties make up their minds to act dishonestly they can always find means to do so. We understand that since the lien law was amended in 1893 it has proved much more satisfactory than formerly.

A DEPUTATION of commercial travellers recently waited upon Hon. R. Harcourt, who has charge of the license branch in the Ontario government, and complained of the unsanitary conditions which prevail in country hotels, urging that steps should be taken to remedy this state of affairs, by the appointment of an inspector, or otherwise. Unfortunately there is good reason for the complaint, but the conditions referred to exist chiefly where there is no proper water supply or drainage system. It is probable the coming session will witness legislation to remove the cause of complaint.

A PROPOSAL to pull down the old court house in New Orleans, to make way for a more modern building, is meeting with much opposition, and justly so. The old building was the government house in the days of French and Spanish rule in America, and more history and romance cluster around it than perhaps any other building on the continent. If New Orleans wants a new

court house let it be built on another site, and preserve the old building as a museum or art gallery, or something of that sort. There is too much of a tendency to remove the ancient landmarks. Boston is perhaps an exception to this rule.

THE Carmelite Monastery at Niagara Falls, Ont., is trying an experiment in heating by electricity, which will be watched with interest. The whole building will not be so heated, but having arranged for a fixed amount of power, all of which is not required for other purposes, the surplus is to be employed for heating. Electricity is not an economical agent for heating so far, and is used on street cars on account of its convenience, and because the current cuts no figure in the railway's expense account. But it will be employed at the monastery under favourable conditions, and the result will be of service in arriving at the relative cost as compared with other methods.

GREAT apprehension is felt lest the Church of England body in Toronto should lose St. Albans Cathedral, or rather the portion of it already built, the building and the land on which it stands being heavily mortgaged, without any money to meet the indebtedness. The hard times have, in common with many other institutions, seriously affected their revenue. Some time ago an appeal was made, but it met with a very small response, and now another request is made to save the property. A contribution of one dollar per member is asked for. It would be unfortunate if the building passed out of the hands of the church, as a large expenditure has already been made upon it.

WHILE it is unquestionably the duty of every architect to guard the financial interests of his clients, he should be equally careful to do justice also to the rights of contractors. Bitter complaints are sometimes heard of the manner in which architects, in the employ of wealthy clients, are accustomed to exact from their contractors an unnecessary amount of work, and put them to so much needless expense that on the completion of their contracts everything in the shape of profits is found to have been wiped out. In some cases the wealthy client instead of the contractor should have been called upon to pay the cost of the extra work required. We know of instances in which contractors, who faithfully tried to carry out their work in the best manner, became discouraged by the penuriousness and lack of consideration of the architects by whom they were employed. Such contractors are none too plentiful, and it is a pity that they should be forced into the belief that work skilfully and faithfully performed will bring no greater reward than if done in an inferior manner. We constantly hear comparisons made between the ancient skilled artisan and the artisan of to-day, and the desire expressed that it might be possible to obtain at the present time work equal in quality to that of former centuries. Yet how often does it happen that the skillful workman is put on a par with the inferior workman as regards the price which he shall receive for his work. If he is not willing to bring his price down to meet the tender of a man of inferior ability, in the majority of cases he loses the work. This is a poor method of encouraging a high standard of skill and honesty on the part of contractors, and we trust that this reference to

the subject will cause architects who may have done injustice to contractors to extend to them a greater amount of consideration in the future.

THE purposes to which paper is now applied are almost numberless and cover every variety of industry. One of the most recent, in connection with the building trade, is for plastering. Two factories are in operation in the United States, one at Buffalo and one at Toledo, for the manufacture of paper plaster, and a third is about to go into operation at Fulton, West Virginia. About fifty men will be employed at the latter. The new plaster is practically fire proof, it can be put on in the coldest weather and will not crack, it is one fifth lighter than the old plaster and almost indestructible, and it can be used for roofing purposes also.

RATHER an odd suit came before Judge Morson at Toronto recently, in the Division Court. It will be remembered that Mrs. Dr. Oldright some time ago recovered \$3,600 damages from the Grand Trunk, for injuries received by stepping into a hole at the new Union Station. At the trial Mr. Wm. Laidlaw, Q. C., who was her solicitor, used a plan of the station, which was produced by the G. T. R. and put in as an exhibit. The plan was made by Messrs. Strickland & Symons, architects for the G. T. R., and they now sue Mr. Laidlaw for \$25, the price of the plan, saying that he ordered it. Mr. Laidlaw, on the other hand, alleges that the Grand Trunk had it made.

THE Southern Architect makes a strong plea for training the public taste in architecture and offers a suggestion as to how it can be done. The papers print a great deal of what is known as boiler-plate matter, that is, miscellaneous articles which are furnished in the form of stereotype plates, some of it good and some very inferior. The Architect suggests that articles should be prepared under the direction of the various associations of architects, stereotyped, and furnished to the papers at low cost, when they would no doubt gladly be published. It points out that at present architects are endeavoring to teach the public by an occasional artistic building, and that the process is very slow. It further advocates, by this means, the development of a style of architecture adapted to its own locality—the South—which in time would grow into a renaissance. In the latter is there not a suggestion for Canada? Why not have a Canadian order of architecture? It would be of slow growth, it is true, but it will never come if a beginning is not made.

A DISTINGUISHING feature of modern house planning is the wide portiere entrance between apartments on the ground floor—which apartments open into a square hall. Heating contractors complain that this kind of plan renders exceedingly difficult the proper heating of the house. It is claimed that if the radiating surface in a house of this description is evenly proportioned as between up and down stair apartments, the latter will be very inefficiently warmed, while the temperature of the former will be uncomfortably high. A heating contractor told the writer that he got over the difficulty by giving to the down stair apartments 75 per cent. more radiating surface than was called for by the rules of the heating authorities, and deducting in equal ratio from the up stair rooms. This arrangement is said to have

worked satisfactorily. Presuming these statements to be substantially correct, it is clearly apparent that satisfactory results cannot be achieved by following any hard and fast rules on the subject, but that methods must be varied to fit the conditions.

THE ruinous competition amongst contractors in the smaller towns and villages is due in a great measure to the fact that workmen, when out of employment, become ready to snap at anything that gives promise of remuneration of any kind. Men who may be good mechanics in their several callings, but who know little or nothing of estimating, and less of the management of men or work, put in bids for contracts that are either away above the mark or ridiculously low. The former does little harm, as the overgrown tender is never considered, but the low tender injects its poison into the whole transaction, and leads the owner to believe that the legitimate tenders are much too high and that an attempt to take advantage is being made. This state of affairs generally ends in either awarding the contract to the incompetent low bidder or a second call for tenders. If the first, the contractor usually bungles the whole matter, partly from lack of knowledge and partly from the fact that he soon discovers there is no money in the job for him; then comes a series of schemes and efforts to slight the work and cram in inferior material, against which the architect or inspector "kicks," with the result that the contractor gets deeper and deeper in the mire, until at last, in despair, he either throws up the work or lowers his head to the inevitable, which is often ruin to himself and family. If new tenders are called for, the legitimate contractors, in their effort to keep out the "workman," will cut down their estimates to starvation rates, while the "incompetent" in his eagerness to get work, makes further reductions in his tender, thus dropping into the "trap" prepared for him by the regulars, and as a rule, his low figures catch the owner, in spite of the advice or protests of the architect, and the result is trouble and confusion all round, and oftentimes severe loss to the owner. This is a sad and injurious condition, but it exists in every town in Canada, and should be brought to an end. Can it be controlled? With proper management we think it can.

SHOULD ARCHITECTS BE LICENSED.

IT is probable the next session of the Ontario legislature will witness the passage of an act restricting the use of the title "Architect" to those who have taken a course of study and undergone an examination on the subjects comprised therein. Such a bill was introduced last session, but it did not reach its final stages before the house was prorogued. Some opposition was offered on the part of the Patrons, but when the matter was presented to them in its true light they withdrew their objections and agreed to allow it to pass. There seems to be nothing now in the way to prevent such a measure being placed on the statute book.

We do not know that there is any necessity for us to urge such a measure at length. The matter has already been fully discussed in our columns, and our views expressed. If it is necessary in the public interest to license medical men, who have to do with the lives of the people, and the legal profession, who have the welfare of their property in charge, why should it not also be required in the case of architects, upon whose work the safety of both life and property depends? It seems

strange that a surveyor, who lays out a piece of property upon which a building is to be erected, should have to undergo a course of training and pass an examination before he can do so, while the architect, who plans and superintends the erection of the building, the most valuable and important part of the property, involving considerations of comfort, safety and the pocket, may be a man utterly incompetent for the work which he undertakes to perform. The evil results of such incompetence is seen in a disaster like that of the collapse of the Ireland building in New York, which involved not only great destruction of property but the loss of fifteen lives.

But apart from this view of the matter, we should aim at improving our style of architecture. Why should our streets be lined with architectural monstrosities, when for the same money a building might be erected, which would be a thing of beauty and a joy forever? Architects should be artists as well as engineers and expert builders, and it is only by education that their tastes can be cultivated, and they become qualified to design buildings in which beauty may be combined with utility.

The great objection urged against a measure such as that referred to, and it has been brought against the medical and other similar licensing acts, is that it creates a close corporation, and that the examining and licensing body, composed necessarily of experts, is disposed to lay down such restrictions as to create a monopoly for its own benefit. While we admit that there is some force in the objection, such an evil can be guarded against by having the rules for admission, and tariffs of charges, made subject to approval by the lieutenant-governor in council, or some other competent authority, who would see that all interests were properly guarded.

It is not the intention of the proposed act to interfere with the right of any person to plan his own building, or to employ anyone else, no matter who, to prepare his plans. It is proposed only to restrict the right of using the term "Architect" to those now practising, and to such persons as in the future shall take a proper course of study and undergo the prescribed examinations. Under the act of 1890, incorporating the Ontario Associations of Architects, the title "Registered Architect" is given to such as have or may qualify, but the distinction between "Architect" and "Registered Architect" is too fine for the general public to understand, and the provisions of the present law have, therefore, failed in their purpose, and the public have not received the protection which it was designed to give. The proposed act is, we consider, one which may well be enacted in the interests of the people.

A number of states in the American union are likely to pass similar measures. In New York such a bill was before the legislature at its last session, but did not pass. It will probably come up again at an early day, and Illinois and California, with no doubt others, will soon have such laws.

Mr. R. M. Fripp, architect, of Vancouver, recently gave a lecture on "Simplicity in Architecture."

Mr. A. C. Hutchison, the well known architect of Montreal, is announced to give a lecture on Rome, illustrated with stereopticon views, in St. James Square church, Toronto, on the 20th of December. Mr. Hutchison has recently returned from a trip to Europe, and his lecture will doubtless be full of interest.

ABOUT PAVING MATERIALS.

ALTHOUGH asphalt has come into pretty general use for street paving, there are some serious objections to it, and it is evident that we have yet to discover something which will be better adapted for street paving than anything now in use. Asphalt is expensive, and in damp weather, or a moist climate, is so slippery as to be unsafe. As a test on the latter point a record was kept by the city engineer of London, England, of the accidents arising from the condition of the streets, for fifty days, with the following result: Asphalt 1066; granite 719, wood 542. These figures indicate a serious objection to asphalt in such a climate as that of England.

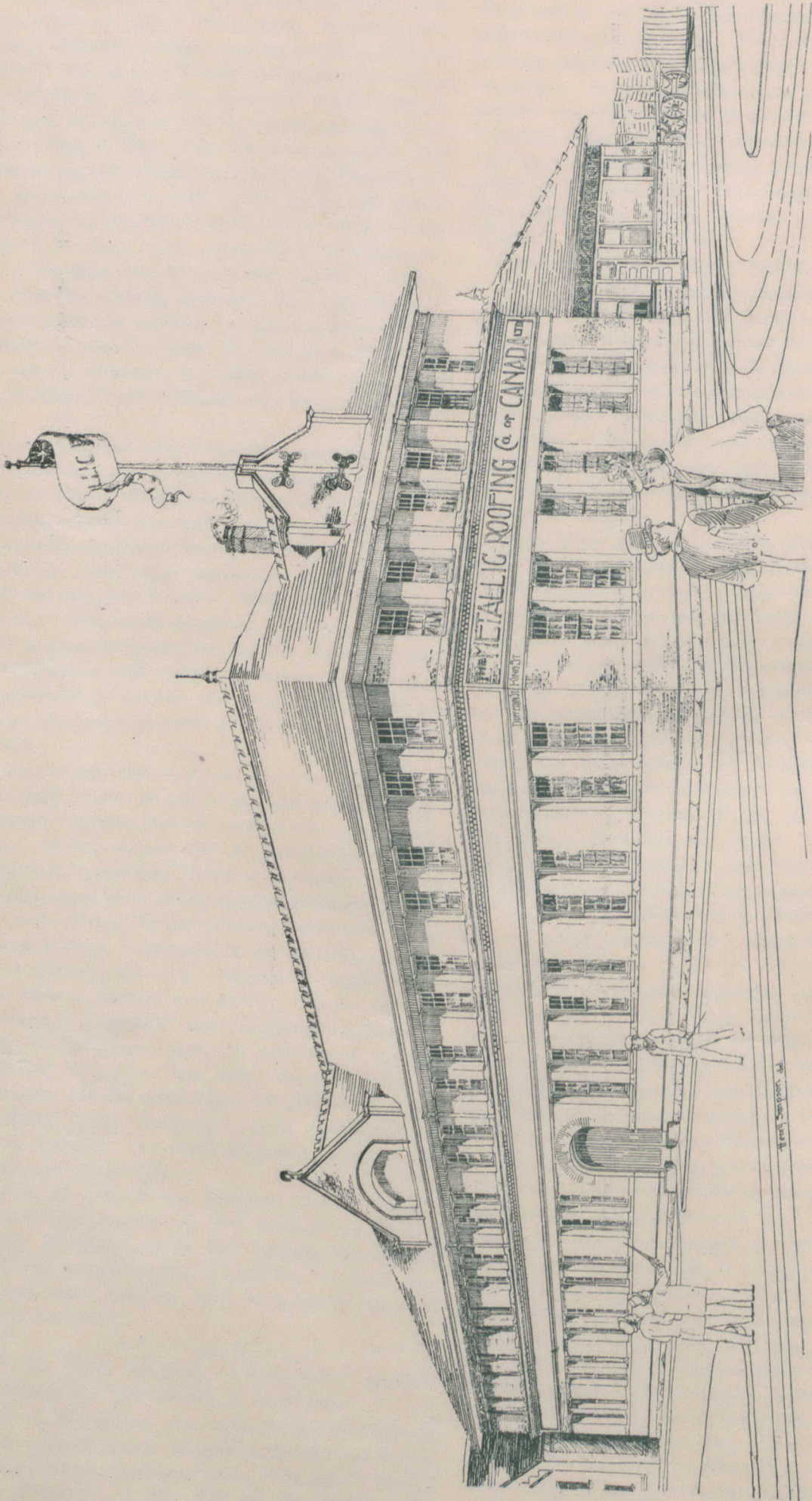
The city of Halifax, Nova Scotia, has been making some experiments in paving materials for sidewalks, and the city engineer, in his report, recommends concrete on level streets, and asphalt for hills and less important streets. The cost of the former averaged \$1.83 per square yard, while the latter cost only 70 cents, and under ordinary conditions could be put down for considerably less. The kind of asphalt pavement used is not specified, but from the low cost we infer that it is not such as would be suitable for roadways. This, however, by the way.

Wood block pavements have much to recommend them, but a great deal depends on the variety of wood and the way they are laid. Cedar blocks, so extensively introduced in Toronto and other cities in America some years ago, have not been a success. They will not stand heavy traffic and have been pronounced unsanitary. Hardwood is now being tried, and the Timber Trades Journal declares that in the near future the whole of London will be surfaced with wood. The variety now being used is the Australian jarrah, which has been tested in the metropolis, on some of the Paris boulevards, and in some of the provincial towns, in every case with satisfactory results. It has supplanted everything except Baltic fir, and is gradually but surely displacing that. If blocks four inches deep will answer, and they are now being tried, it will bring the cost down almost to that of Baltic fir, which has to be laid six inches thick.

Jarrah is the hardest and most durable of all Australian woods, and it is stated it will resist the wear and tear of London street traffic as long as granite. It is free from knots and does not shrink to any appreciable degree, the grain is close and tenacious, and it resists the influence of damp and moisture, in fact, being of the eucalyptus family, it is a valuable antiseptic, rendering it valuable from a sanitary point of view. It affords a good foothold for horses without being slippery. What more need be said in its favor?

Other Australian hardwoods are being tried in Great Britain, one known as karri being apparently second only to jarrah, and Tasmanian blue-gum is to be tested in Glasgow. It is, of course, too much to expect that any of these foreign woods will come into use in Canada, where we have so much wood of our own. Vitri-fied brick, if it can be brought down to a reasonable price, will probably be the pavement of the future in Canadian and American cities. Trap rock, referred to by us in the November number, may supplant the ordinary macadam for boulevards and park drives, but it would probably be too dusty for business streets and could hardly withstand heavy traffic.

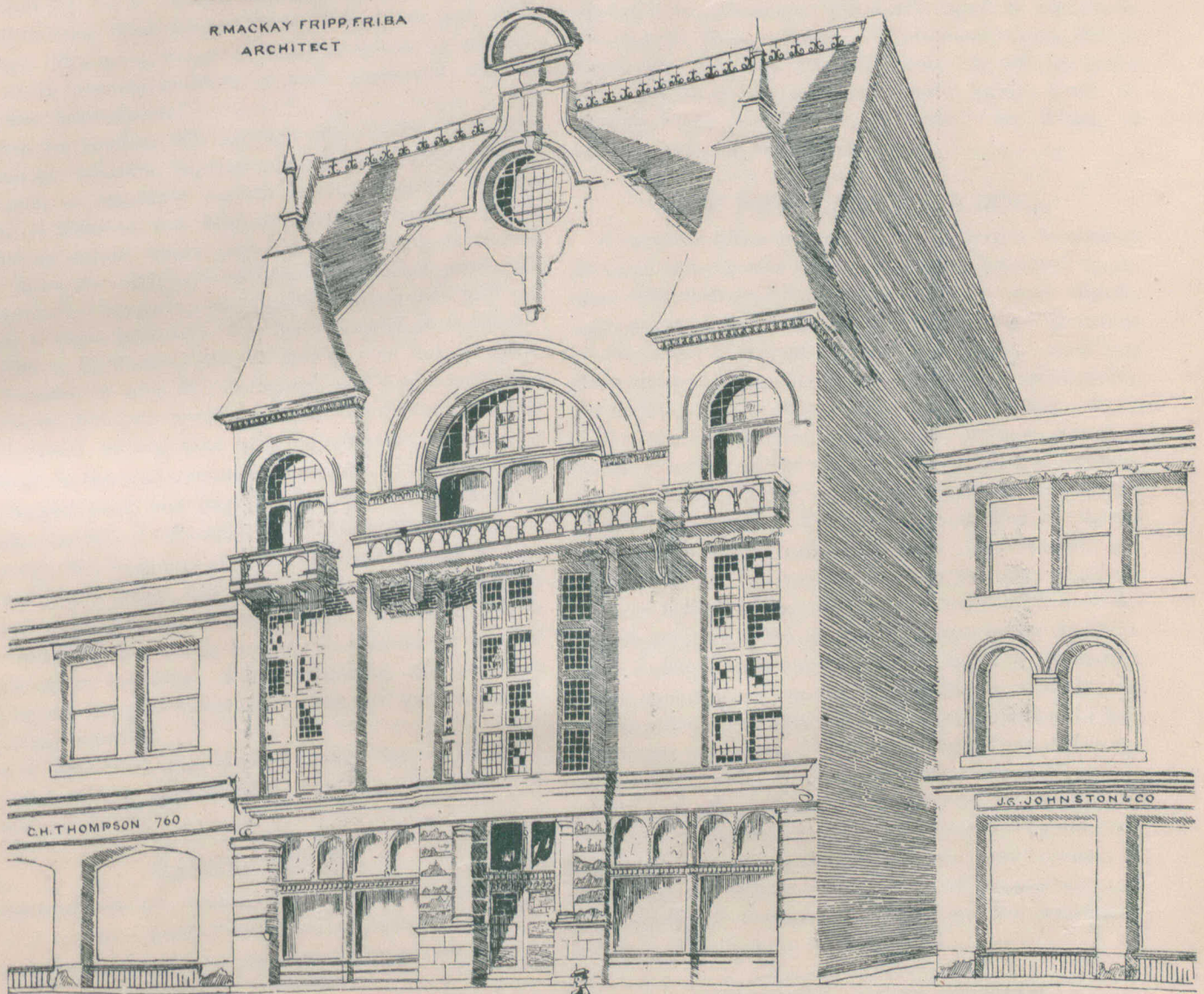
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been introduced anywhere is described in the Manufacturers' Record. At Norfolk, Virginia, a plant has been set in operation for making paving blocks out of the grass which grows on salt water marshes. The grass is subjected to heavy pressure, which forms it into large blocks, which are cut by circular saws into smaller blocks, $5\frac{1}{2}$ inches thick, provided with strong wires, which run lengthwise. These blocks are then subjected to a bath in three tanks of different kinds of oil, which renders the fibre supple. A pavement of this material has been tested for over a year in Philadelphia, on one of the busiest streets near the stockyards, and with satisfactory results. It is smooth, noiseless, and horses cannot slip on it. Large contracts for these blocks are said to have been secured from New York and Pittsburgh. We must, however, class ourselves as doubters as to the wearing qualities of such a material, without further information.

But our readers will perhaps smile with incredulity when we mention another material for paving, which, if such a reputable journal as the Literary Digest is to be believed, has been successfully tested. In the southern states, where sugar manufacturing is carried on, there are millions of gallons of molasses produced, which, after supplying the market, remain over and become a waste product. The head chemist of a refinery at Chino, California, Mr. E. Turke, was led to make an experiment with this molasses, and had a walk one thousand feet long made between the factory and the main street, mixing sand with the molasses and putting it down in the same manner as asphalt. It dried quickly, became hard and remained so, the sun making it harder instead of softening it. A block of the composition two feet long and one foot wide was subjected to severe tests, being laid with its ends resting only an inch or two at each end on supports. When struck in the middle with a heavy hammer it showed no sign of cracking or bending. Notwithstanding this test, we can hardly imagine molasses coming into general use as a paving material.

It is clear from what we have stated that we have not yet passed the experimental stage in the matter of pavements.

ILLUSTRATIONS.

RESIDENCE, BISHOP STREET, MONTREAL, FOR DR. D. F. GURD—ROBERT FINDLAY, ARCHITECT.

FACTORY BUILDING FOR THE METALLIC ROOFING CO., TORONTO—HENRY SIMPSON, ARCHITECT.

PROPOSED BUSINESS PREMISES, VANCOUVER, B. C.—R. MACKAY FRIPP, F.R.I.B.A., ARCHITECT.

TOWN HALL, CARLETON PLACE, ONT.—G. W. KING, ARCHITECT, TORONTO.

The town of Carleton Place, Ont., is to have a town and fire hall, which will be erected on Bridge street, the main business street of the town, at the south end of the iron bridge across the Mississippi river. The size of the building will be 61.6 x 104 ft., without projections. The north-west corner is cut off by the river, making the Bridge street frontage only 52 feet.

The material will be limestone, in random rubble masonry, with Beckwith freestone trimmings, slate roof and galvanized iron cornices. The wall fronting on the river will be concrete to ordinary water line, dimension stone in cement to one foot above high water mark, which is the underside of the basement floor. The floors will be of slow burning construction, metal ceilings

throughout, divided into panels by wood mouldings. Basement will contain caretaker's rooms with separate entrance, cells for male and female prisoners, with separate staircase to court room and entrance. Also pump room, boiler room, furnace and coal room. On the ground floor is clerk's office, with vault, having outside light, mayor's room, committee rooms, council and court room combined, public library with reading and smoking rooms, separate entrance to hall staircase and ticket office. In rear is an engine house 26x65' inside, with Mezzanine flat under stage containing firemen's recreation room, gymnasium, and lavatory with shower bath. On the first floor will be the public hall, seating 800, with gallery seating 250, stage 31x65, fitted with the latest improvements and nearly equal in equipment to a regular theatre stage. All principal rooms will be finished in oak, the others in pine. It will be steam heated, with electric bells and electric light. Cost, including river foundations, \$25,000. M. Ryan, of Smith's Falls, is the contractor.

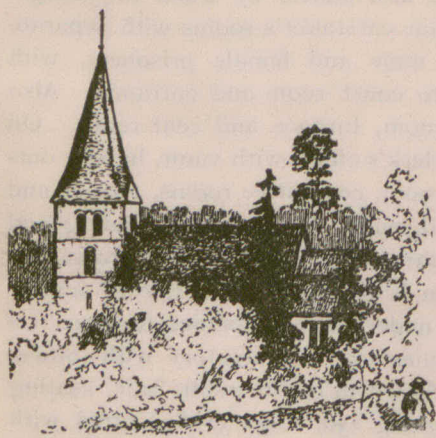
THE NEW GLOBE BUILDING.

A PRINTING office is generally considered a hazardous fire risk, but the new Globe building in Toronto, to replace that destroyed by fire last January, now rapidly approaching completion, will be fire resisting. It stands on the corner of Yonge and Melinda streets, upon the same site and occupying precisely the same space as the old building, but is very much more substantial. It is of skeleton construction, similar to the new Simpson building further up the same street, but all the columns are built into the brick walls, and the floor beams are encased in concrete. The interior is finished in plaster instead of metal sheeting as before. The interior arrangements are much the same as in the old building, the only feature of essential difference which will strike one on entering being an iron stair-case in the business office leading to the upper storeys. Some of the mechanical departments, however, such as the stereotyping room, will be shut off so as to prevent the spread of fire, should one break out. Only the Yonge street end is designed to be fire proof, the part fronting on Jordan street, which is cut off by a lane arched overhead, and which will be rented, being of ordinary construction. The building is so planned that two additional storeys may be added in the future. It will be one of the most convenient and best equipped newspaper offices on the continent. Burke & Horwood are the architects.

A HAMILTON BOY'S SUCCESS.

ARCHIE Rigg, a Hamilton boy and resident of that city up to a short time ago, has made himself prominent in St. Louis in recent architectural competitions. He prepared plans for five competitions and was successful in winning one first and one second, while dozens of the leading architects of St. Louis failed to get a place. His plans for a \$25,000 residence were considered the best and were accepted, winning for him the cash prize of \$100, in addition to which the firm he is with gets the superintendence of the work. In a competition for an \$85,000 office building he won second prize, capturing the St. Louis Competition Club's bronze medal. J. L. D. McCarthy, architect, and F. J. W. Hirst, engineer, as chairman and secretary of the Competition Club, write saying that Rigg's work cannot be given too great praise. As Archie is but a boy yet, a brilliant future seems to be in store for him.

DEFECTS OF THE ONTARIO LIEN LAW.



IN pursuance of a conversation which the writer had recently with a well-known dealer in builders' materials at Toronto, the latter has contributed from his own experience the following facts relative to the inadequate protection afforded the material dealer by the present Lien Laws of Ontario :

A contractor two and a half years ago came to me and requested materials for building four houses on Charles street, Toronto. He stated that he had purchased the property from the Westminster Presbyterian church authorities, and had secured through a firm of lawyers a loan sufficient to complete the buildings, and that the mortgage was completed and he would be able to pay me within thirty days after delivery. Enquiry of the proper parties showed the contractor's statements to be substantially correct. About the time when payment should have been made me, the contractor came to see me and said that he had just had differences with the lawyers and that he had recalled his mortgage as the lawyers refused to give him the amount of money he was entitled to. To protect myself as regards filing a lien and also with the view of not hindering the contractor from getting a loan, I continued to supply him with material for six months longer. He was not successful, however, in getting his loan, and I filed my lien, which in due course was established.

Another period elapsed, and then the mortgagees of the land called upon the church people to pay off the mortgage. The church people requested the mortgagees to sell the property, and the same was offered for sale but not sold. This action was undoubtedly taken to freeze out the liens on the property, and which I understand legally was done. About two months after the sale, certain parties connected with the church suggested that as I was the principal lien holder, my claim amounting to about \$600 for simply materials supplied—that I should take the property over and complete the fresh pair of houses, which were partly built.

I considered the matter, and spent considerable time in arranging matters, and then made the church people an offer, and the church committee appointed three of their number to confer with me and to report at their next meeting. The interview took place and was satisfactory to two of the sub-committee, but the third member of said committee opposed the acceptance of my offer, and carried his point, with the result that he with others on the committee took hold of the property, completed two of the houses, never offered in any way to recompense me for all my materials supplied in good faith, and as far as I know, the church is reaping the benefit of the advantage afforded them by the law of grabbing everything in sight.

Another case is that of a contractor who bought a piece of property, and stated at the time of ordering material from me that the loan had been arranged, gave me the name of the lender, whom I found to be a monied

man and who informed me that he intended to loan the money. When the goods had been delivered and the first payment should have been made, the lender backed down. It was only then that I discovered that there was an agreement referred to in the Registry office between the original owner of the land and the contractor. This agreement at first was not to be found, but afterwards through my promising to assist in trying to obtain a loan, it turned up. It then appeared that under this agreement if the contractor did not pay down the whole of the purchase money within a short period that he forfeited all interest in the property. My lien was registered and carried into court, and I closed the case. The original owner of the land stepped in, completed the houses, and the labourers and material men lost everything.

In another case a contractor bought material from me to the amount of \$700 on the strength of the statement that his mortgage was arranged. At the time he gave me his contract for stone, he promised me the contract for bricks, lumber, lime and cement. I confirmed the stone contract by letter the next day, some days later secured the brick contract and confirmed this by letter, and later on I also secured the lumber contract.

No money was forthcoming when promised and to protect myself I filed a lien. The case came up at Osgoode Hall, and then it became known that a well-known gentleman of Toronto was at the contractor's back, and much to my surprise the defence was that as the contracts were made at different times it was not a general contract, and that I was only entitled to about \$5 for a load of lime delivered within the statutory time for filing liens. The case was adjourned to allow us time to bring witnesses, and as the contractor appeared to be completely under the thumb of his backer, I considered it necessary, notwithstanding he was defendant to the suit, to subpoena him, lest he might not be on hand when the case was called. I personally went with the serving party to the contractor's house. At the interview in the presence of the third party, the contractor, (I believe thoughtlessly) corroborated my convictions that it was a general contract and not individual ones. I then had to arrange, at his wish, to keep him clear of his backer until the case was called, and which I did. The case was called and the solicitor for the gentleman at the back of the contractor called his nominal client (the contractor) as a witness. The latter, much to his backer's surprise, confirmed my statements. After this, the decision of the court was given in my favor. On appeal it was given against me. On further appeal the case was going decidedly in my favor when the contractor's backer compromised in court by paying me \$475. The contractor agreeing in the sweet bye and bye to pay me the balance, which balance has not so far materialized.

PERSONAL.

Mr. H. W. Worrall, architect, has opened an office at New Westminster, B.C.

Mr. Thomas Webber, one of five brothers in business as contractors in Hamilton, is dead.

John Strickland, the well-known builder and contractor, of Brantford, is dead, aged 63 years. It was he who built the asylum for the blind at Brantford.

The "New Books" department of the December Review of Reviews is crowded by the holiday publications, but contains brief reviews of the best literature of the season. The department is fully illustrated,

MONTREAL.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)
PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

THE series of monthly dinners and course of lectures for the winter were inaugurated on the 10th December. A number of the members dined together at the St. Lawrence Hall and afterwards adjourned to the rooms of the Association, New York Life Building, when a lecture was given by the president, Mr. A. C. Hutchison, on "Ancient Rome," illustrated by a large number of excellent lime light views. The lecturer began by making an analysis of the history of Rome, and fully explained each view as it passed on the curtain in a clear and interesting manner. Mr. Hutchison having passed the greater part of last winter in Italy and Sicily studying the ancient monuments, proved to his audience, who thoroughly enjoyed his lecture, to be very well acquainted with his subject. Mr. A. T. Taylor, vice-president, was in the chair, and there was a good attendance of members and students. On motion of Mr. J. Venne, seconded by Mr. Theo. Daoust, a vote of thanks was accorded the lecturer for his paper.

Future gatherings have been arranged for the second Tuesday of the month during this season, with the following program: Jan. 14, Mr. R. Findlay, "Old Colonial Architecture" (with illustrations); March 10th, Mr. J. Venne, "The Making of Plans for a Building" (with illustrations); April 14th, Mr. W. E. Doran, "Truth in Architecture." The February meeting has not yet been definitely arranged for.

The following examiners have been appointed for the examinations to be held during the coming year: For Montreal, Messrs. A. C. Hutchison, A. T. Taylor and J. Venne; for Quebec, Messrs. J. F. Peachy, H. Staveley and C. Baillaigé. Examinations will take place this winter in Quebec for admission to study and registration on the 29th, 30th and 31st January. One month's notice is required to be given the secretary by intending candidates.

The Association has petitioned the Attorney-General for the repeal of the law known as the Augér Bill, and for substituting for it the law which was in force before the Augér law was known; or that in default of its repeal, that the following amendments be made to it: 1st. That the rights of the lenders remain privileged and free of all proceedings which would tend to delay their recovering the amount of their loan. 2nd. That no discrimination be made in this law for anybody except for the laborer. 3rd. That the time when a building can be legally termed completed be clearly defined.

The proposed building by-laws which were prepared in English by a committee composed of members of the Association appointed by the Council at the request of the municipal authorities, have been translated into French by the latter and returned to the Association for comparison and further revision, which has just been completed. It is hoped that this by-law will be passed without amendment at an early date, as the remedy is greatly needed, and Montreal could then be classed among the best governed cities as regards the erection of its buildings.

A PROTEST.

TORONTO, Dec. 3rd, 1895.

To the Editor of the CANADIAN ARCHITECT AND BUILDER.

SIR: Will you kindly favor me with space in your paper to cite a prevailing grievance, which is as time advances becoming more and more pronounced. It is the practice of government employees, with a permanent salary, to compete against architects who have only their profession. Men holding positions in the government service are frequently employed as architects by some of our largest corporations, and others.

Now is this fair, is this just to the architect, the government and the public? I and others think not, and know that if the matter was brought to the notice of the Minister of Public Works he would not countenance it, for if I am correctly informed, employees of the Department are not at liberty to carry on a private business. It is in reason that such should be the case, for it is impossible for any one man to attend to two separate businesses at the same time, and it is self-evident that a man carrying on a personal business cannot keep his mind from dwelling on it at all times, which would in this case interfere with the successful discharge of the government business. It is not improbable that during some part of the day he will require to be on the works to give a decision on a critical point of construction which is not understood by the contractor. This cannot wait until he is liberated from business; when and where is it done if not on the works, directly after it is discovered? It is also a known fact that

plans prepared by one of these men have been figured on by contractors in the government office. Their methods of getting patronage are not just to the profession to which they imagine they have a right to belong. They make capital of the fact that they do it after hours, have no office expenses, and must have constructional ability or they could not hold their present situations. I have never heard what claim they make to be designers; they are wise if they do not lay stress on that.

These methods of doing business are highly detrimental to the profession, to say nothing of the effect on the character of the men who resort to them. I cannot longer withhold my protest at seeing the profession pulled down from its hitherto high standard as the highest and noblest art in the universe, by such men, for a mere monetary consideration, for I have no doubt that if they could not add to their munificent salaries they would not do the work at all. If they would even have the decency to maintain the recognized schedule of professional charges, it would place us on an equal footing in an unequal race. Then the public would probably give their commissions to architects who could devote their whole time to their client's interests, which would necessarily mean architects whose time is their own.

Very truly yours,

CONN.

TORONTO SKETCH CLUB.

A meeting was held in the office of Messrs. Darling, Sproatt & Pearson, on Tuesday evening, Nov. 19, when a Sketch Club was organized for the purpose of studying design. This club differs from the old architectural clubs to a great extent. In the preceding clubs, lectures, classes, etc., were of the first importance, while design was considered a secondary matter. The relative merits of classes for lectures and design were fully discussed at this meeting and it was resolved that design was the most necessary function of an architect and more attention should be paid to this subject than is usually taken by students. The study of construction can be carried on privately as books give all the information necessary to make an architect expert in that line. With design it is different. A design may be prepared at home, but it is absolutely necessary, if the student is to advance, that his design be criticized by some one competent to do so. A designing club of some kind is, therefore, what a student should attend, so that the faults or merits of his design may be pointed out. It was decided to have the meetings as informal as possible and any point about a design openly discussed. In order to obviate the expense of running the Club, it was decided to hold the meetings in the offices of the numerous architects who would favor the Club in this particular. The architect at whose office the meeting is held will act as critic on the occasion. After the criticism is over, the members cast ballots for the designs they consider entitled to 1st and 2nd place.

The first regular meeting was held in the office of Messrs. Strickland & Symons. Mr. Symons acted as critic. The subject was "An Entrance." It is the intention to have the subject only chosen and the members design in any style they wish.

A meeting was held at the office of Mr. E. B. Jarvis, on the evening of the 19th inst. The subject on that occasion was "A Gable." The next meeting will be held in the offices of Messrs. Darling, Sproatt & Pearson, when Mr. Darling will act as critic. Reports of these and all subsequent meetings will appear in the CANADIAN ARCHITECT AND BUILDER. It is also the intention to publish such of the sketches as shall possess sufficient merit for that purpose.

THE FORESTERS' TEMPLE.

SOME time ago we published an illustration of the temple being erected on the corner of Richmond and Bay streets, Toronto, for the Independent Order of Foresters. The charter of that organization authorizes them to hold real estate only to the value of \$100,000, whereas the building, including the site, is expected to cost about \$260,000. It has just come out how this provision has been avoided. Oronhyatekha, the supreme head of the order, has an amanuensis named Jessie Brayley, and this lady suddenly finds herself possessed of considerable wealth (on paper), the property above referred to being in her name. The site was deeded to her, and she gives mortgages to the trustees covering the value of the property. By this means the limitation imposed on the Order is avoided. The registration of the papers gave publicity to the facts,

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.]

FIRE PROOF MATERIALS.

MONTREAL, December 3rd, 1895.

To the Editor of the CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—I beg leave to question your views on fire proofing. Judging by several articles which have at different times appeared in the CANADIAN ARCHITECT AND BUILDER advocating the use of concretes for fire proofing, I think you have overestimated the value of that material for that purpose, and I consider that the letter signed "An Architect" is to the point and ought to appeal to the unbiased judgment of anyone having only public interest in view.

That concrete business is as old as the hills and has been pushed for all it is worth in every imaginable shape, and up to this day there is not a single instance where its most sanguine advocates have been able to prove its superiority over porous terra cotta. There is one thing we all know, and that is that at the Denver tests it was shown conclusively that porous terra cotta was the only material that stood all the tests. We all know that porous terra cotta is absolutely fire proof and that we have never heard of a building fire-proofed with porous terra cotta ever having been destroyed by fire. Does it not then stand to reason that it is safer to use a material that we know is fire proof, rather than run the risk of adopting what we only consider as good, but of which we only have opinions and no positive facts? Is it not better to leave well enough alone?

Yours truly,
N. T. GAGNON.

[NOTE.—Mr. Gagnon is mistaken in saying that we advocated the use of concrete for fire proofing. We only gave the facts as they were presented to us, and did not express an opinion of our own as to the relative merits of concrete and terra cotta.—EDITOR C. A. & B.]

SAFETY OF HOT WATER HEATING SYSTEMS.

Editor CANADIAN ARCHITECT AND BUILDER.

SIR,—The prevalence of accidents to hot water heating systems at this season of the year entitles practical engineers to enquire into cause and effect.

This system of heating is annually becoming more generally used both in public buildings and private dwellings, and the amount of ignorance displayed as to the requirements of safety is remarkable. When we consider that nearly every plumber has developed into a "practical steamfitter" (so-called), who will undertake the erection of the most intricate systems of heating apparatus, and considers himself fully competent of doing so as soon as he is able to run a straight thread and cut a piece of pipe—notwithstanding that the theory of expansion and contraction is an almost unknown thing to him. When we examine some of the arrangements laid out by these men we wonder that some of the explosions ("break-downs" they call them) that have followed their experiments have not resulted in a serious loss of life. Thus, so far, Dame Fortune seems to have been kind to them in this respect.

A very large number of business blocks are now heated by this system, and the usual class of labor employed is a fireman who has not the slightest knowledge

regarding the nature of the plant under his charge. It is therefore especially necessary that all systems should be properly examined before being passed over to this class of help.

It has been my lot to have to look into several more or less serious "break-downs" of hot water furnaces, to ascertain the cause, and in every case the cause of the whole trouble was traced to want of expansion. One instance will suffice. A pair of twin boilers blew up some time ago in a manufactory here, and made things exceedingly interesting around the establishment. The boilers were set side by side and were so arranged that either one or both boilers could be used for the whole system as occasion demanded. Boilers were attached to separate headers as shown in diagram. For convenience we will discuss arrangement of pipes under separate heads. For the information of any of your readers who are not well versed in this method of heating, I wish to point out that the whole efficiency of the system depends on a proper and systematic arrangement of mains and their accessories.

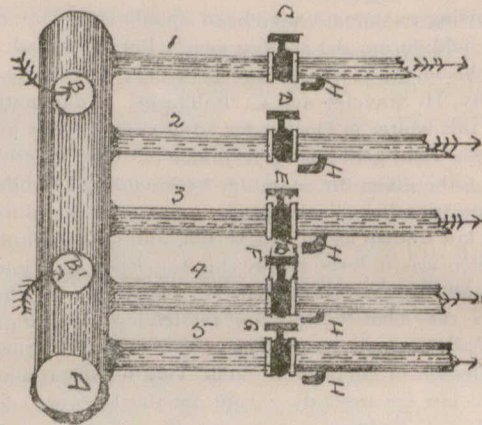


DIAGRAM NO. 1.

Diagram No. 1 represents "flow" header, designated A, fed from boilers at B, B' mains shown at 1, 2, 3, 4, 5, distributing hot water to several radiators throughout the building.

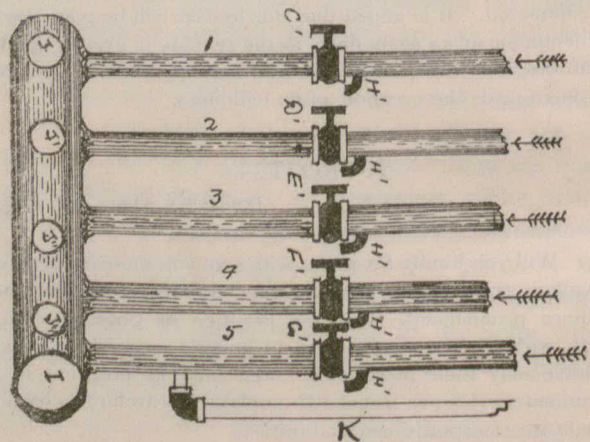


DIAGRAM NO. 2.

Diagram No. 2 represents return header, designated I, return from header to boiler being effected at pipe J, J', J'', J'''—pipes from the radiators being arranged as 1, 2, 3, 4, 5.

Boilers were each provided with shut-off valves between header and boiler on each pipe. As water is heated it flows in direction indicated by arrows. My object, however, is not to discuss action and circulation of water so much as arrangement of mains, etc.

By diagrams it will be noticed that each line of main is provided with valves, as at C, C', D, D', E, E', F, F', G, G', and drip valves as at H, H', thus enabling any



TOWN HALL, CARLETON PLACE, ONT.

G. W. KING, ARCHITECT, TORONTO.

LONDON.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

MR. PEELE, stone carver, has started a private school for the teaching of architectural and model drawing.

Herbert Matthews, architect, will move into new offices in the Albion block at Christmas.

The erection of the G. T. R. car shops will increase the population and give an impetus to the building trade. There is scarcely an empty house in the city at present.

Many of the large buildings that have gone up this year are not yet completed, the Y. M. C. A. being one of them. London has now some of the finest public buildings in the country.

The London Waterworks Commissioners control the water supply, and have been running the plant so economically that they were enabled to turn over more than \$20,000 to the city. They own about 250 acres at Springbank, where the waterworks plant is situated, and the value of the property has been enhanced by the advantages it possesses of having fine sites for summer cottages, as the electric street railway will run down there next summer.

HAMILTON ART SCHOOL.

THE directors of the Hamilton Art School have been considering a scheme of the principal, Mr. Ireland, by which the work of the classes may be rendered more efficient, and the students encouraged, after they have completed their elementary course of instruction, to keep in touch with the school. With these objects in view it was resolved at a late meeting

- (1) That any student, male or female, who has paid fees for the full term of three years, may attend the evening classes free, by becoming an annual member, which will cost only \$1 a year. By granting this liberal concession it is expected that students will avail themselves of the three years' course more generally than has been the case in the past, instead of from two to two and a half years on the average only, and thereby avail themselves of a life-long privilege. Hitherto students, after leaving the school, have not cared to trespass on Mr. Ireland's time for some occasional help which they needed, and did not feel disposed to pay a year's fees for the same. In the future they will be able to get this, as an ex-student member's privilege.
- (2) That students attending the all-day classes may attend the Tuesday and Friday evening classes free.
- (3) That pupils over 14 years of age who are attending the Saturday morning classes be also allowed to attend the Tuesday and Friday evening classes free.
- (4) The rule that students must join the school either at the commencement of the term or half term is amended; they can now pay fees in advance for the unexpired portion of a term.

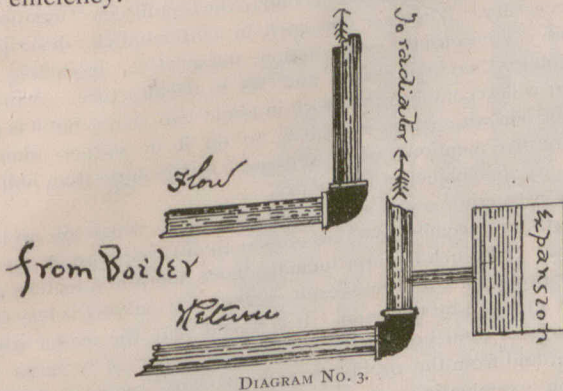
The extent to which a chimney can poison the atmosphere has been scientifically determined by a test made in Berlin. The soot which comes out of the chimney of a single sugar refinery was gathered for six days and was found to weigh 6,800 pounds.

Some years ago the old Nova Scotia Penitentiary was sold to the Church of England Building Committee. It was proposed to use the stone for a new cathedral, but the project fell through. The building has now been sold to the People's Heat & Light Co., to be used for gas works. It cost the committee \$10,000 and they sold it for \$22,000.

The specifications of the engineers' department of Toronto contain a provision to distribute moneys due to defaulting contractors among persons who supply material, after the claims of workmen have been paid in full. As the provisions might be taken advantage of for the purpose of filing fictitious claims, the advisability of eliminating it altogether is being considered.

A deputation of the Toronto Builders' Exchange appeared before the Water Rates' sub-committee of the Executive to complain of a clause compelling the payment in advance of a charge for water of 5 cents a thousand on brick, 2½ cents a ton on stone, and 2¼ cents a barrel on lime. It was also urged that such charges were unfair, and that the charge should be made on lime alone. Ald. McMurrich, chairman of the committee, suggested that it would be a move in the interests of the city if builders were permitted to use the city water free for building purposes. The revenue, as shown by the Treasurer's statement, was small, and under almost any system the honest man would pay and the dishonest man would not. The suggestion of the chairman was adopted.

particular line of main to be operated singly or in conjunction—a very well arranged system and an arrangement that will recommend itself to any engineer for various reasons: (1) Because either one or both boilers can be used; (2) because any one line of main can be used; (3) Because in case of accident occurring to one of the boilers or any radiator, repairs can be effected without disabling the whole system; all of which tends to show that the person who laid the arrangement of pipes and mains had given some thought to economy and efficiency.



By referring, however, to diagram No. 3, we find what may almost be called a fatal error. This diagram represents arrangements made for expansion. Main 5, 5, leads to a small set of radiators in upper storey of building, and expansion tank had of necessity to be higher than this. The reader will observe that expansion is taken from the highest point on return main 5. By tracing out main 5 in diagrams 1 and 2, it will be noticed that these mains are each provided with valves and drips the same as the others, plainly signifying that they were intended for same purpose. Practical engineers can easily imagine what would happen in case these valves were closed; there would be a gradual expansion and increase in pressure until strength of material had been reached, and then! Well, an enquiry if not an inquest.

Just what happened in the case in question was this: The weather was mild and main B was not required; a good fire was built under the boilers, resulting shortly after in a wreck, and the enquiry, "How did it happen?" etc.

In this as in many other cases the steamfitter seems to have had a fairly good idea of how to lay out and run mains, but no idea whatever as to what was required to prevent disaster by over pressure, and consequently the whole of his good work was negated by want of knowledge on this point.

In diagram 2, attached to return main 5 is shown a small pipe in outline. To prevent possibility of accident through any of the valves in the mains being closed, this should be continued to expansion tank in upper storey. And in addition to this, each of the boilers in question should have been provided with a safety valve, set for required pressure, as an extra precaution. There is not the slightest doubt but that this class of boiler is just as liable to explosion as any steam boiler, and the sooner architects and others realize this fact, the better will be the reputation of this class of heating.

Yours truly,
ENGINEER.

A portion of the geological museum building at Ottawa has been declared unsafe and the specimens have been removed from it. A new building for the museum and a new custom house are said to be in prospect.

STUDENTS' DEPARTMENT.

C. A. AND B. COMPETITION.

THE Judges in the CANADIAN ARCHITECT AND BUILDER'S competition for a City Store Front have carefully examined each of the designs submitted, and have made their report thereon, as follows:

"This draughtman's competition is very much in advance of the average—all the designs submitted having some points of merit—making it rather more difficult than usual to make a selection. As usual there is strong evidence of the tendency to sacrifice the study of the planning and construction in favor of a pretty elevation. In view of this, it is not surprising that we should have awarded the first position to one who has certainly a commonplace elevation, but the best all round grasp of the situation.

The first three places have been awarded to: 1st, "Romanesque;" 2nd, "Penny;" 3rd, "Arrius."

"Romanesque" shows the proper spirit in which to enter such a competition as this. In the style chosen, whatever opinion may be in regard to a style which has for one of its main characteristics the use of small openings in large wall space, the author has handled it well, though the proportion of storeys is not good, the upper storeys being too high for the ground floor, which makes the scale of the latter detail too fine in proportion. The plan shows very little accommodation on either floor for such an expensive building, though the parts are well arranged, with the exception of elevator and entrance. The small area at back has hardly sufficient light for a main office.

In "Penny's" design the general grouping of storeys, with the exception of excessive height of ground floor, is good; the proportion of voids and solids is satisfactory; the main cornice is not well studied. His arrangement of plans shows insufficient lighting of ground and upper storeys. The planning of office flat for such a large building gives too small a number and an unsatisfactory arrangement of offices. The elevator and stair arrangements on ground floor are extravagant. The stone piers each side of shop window are rather small to carry weight above, and no other construction is shown either for carrying front or floors of building.

"Arrius," like "Romanesque," shows a good grasp of the situation. The elevation up to main cornice, with the exception of archevolt over shop window, is good. The storey over main cornice is too high in effect. The window in gable suggests a pitched roof. The value of the design of gable depends entirely on how the roof is to be constructed, which he has in no way indicated. His plan shows good construction. The light is deficient and entrance hall not very good.

"Grad." He has spent too much time on his iron construction, which could not be taken into consideration, though carefully shown. His elevation is good, but he has sacrificed the lighting of his top office to exterior effect. His office plan is not well arranged. It would have been better to arrange his office vaults over ground floor vaults. No private stair to basement is shown. He deserves great credit for his construction all through.

"Bon-ton" has one of the best elevations sent in. His office entrance is good, but a little extravagant. The position of vault spoils an otherwise well planned store. His office arrangements are fairly good.

"Wreath" has a good plan, though bad entrance to office—2 ft., 6 in.—hardly wide enough for main stairs. His elevation is too affected. Such a mass of masonry over his shop window is not good. His first floor windows are altogether too small.

"Erectheus" has placed himself out of the competition by his style of rendering, which does not conform to conditions. He shows no plan or construction.

"Bluenose"—Plan too small, though not bad. Elevation not badly grouped; rather commonplace.

"Boreas"—Store too small; vault badly placed; side entrance too wide; shop front too small; office plan too much passage; rooms too small. This elevation shows a feeling of English Renaissance, though unstudied in detail and indicating lack of knowledge.

"Doric" wants a little more study.

EDEN SMITH.
FRANK WICKSON.
J. GEMMELL.

[The names of the successful competitors are: 1. "Romanesque," (Mr. Melville P. White), Toronto; 2. "Penny," (Mr. Charles P. Band), Toronto; 3. "Arrius," (Mr. Elmer H. Russell), Toronto. The successful designs will be published in the New

Year number of the CANADIAN ARCHITECT AND BUILDER.—THE EDITOR.]

MATHEMATICS AND CONSTRUCTION IN THE ECOLE DES BEAUX ARTS.*

THE reputation of the architectural department of the Ecole des Beaux-Arts of Paris is based almost wholly on its strength in design. The curriculum, however, necessarily includes a fairly thorough course in mathematics and construction, because graduates of the school are granted diplomas permitting them to practice architecture. Nominally they are also required to have had two years of office practice, but in reality a few weeks suffice.

The students are divided into two classes, known as first and second, and to pass from the second to the first fifteen "mentions" are necessary. They are one each in mathematics, descriptive geometry, stereotomy, construction, perspective, modelling and archaeology, two in drawing and six in architecture. A bright student will accomplish this work in about two years, but it is possible for one who enters in March to do it in sixteen months. The first five mentions, which represent rather more than half the work, are the subject of this paper.

The instruction is given entirely by lectures, which are an hour in length, and usually come no oftener than twice a week on any subject. A French lecturer includes much more in a lecture than do our professors, and the result is that the subject is less thoroughly grasped by the pupil. It is hoped that the reader will be able to form some conception from the number of lectures in a course, and from the problems and drawings required during it and on examination, of how carefully the ground is covered. The examinations will serve as the best criterion of the thoroughness attained. Merely outlines of the problems are given, and without the details the reader will be apt to conceive them as simpler than they really are.

Of course, any wording offers considerable opportunity for different interpretations of the amount of work expected, but there is such a spirit of competition pervading the school that the fullest interpretation usually results. In forming an opinion of the course the reader must bear in mind that all subjects are taught from the standpoint of their application to the study or practice of architecture, and everything not having a direct bearing on the subject has been eliminated from the curriculum.

The examinations are oral, but are supplemented by problems worked en loge, which means that the student is assigned to an alcove and required to work out a problem in a specified time, varying usually from six to twelve hours.

The course in mathematics comprises about thirty-six lectures, and includes the subjects of algebra, trigonometry, conic sections, analytical geometry and mechanics. The algebra includes equations as far as the solution by successive approximations of numerical equations of the third degree, decreasing geometrical progression, logarithms and interest.

Trigonometry includes the solution of plane triangles in general, the calculation of triangles by logarithms and the relation between a plane in space and its projection.

Conic sections receive much more attention than the two preceding branches. Quite a careful study is made of the curves, resulting from the intersection of the cone and cylinder by a plane, and of practical methods of drawing them and tangents to them; also of methods of measuring surfaces and volumes frequently met with in construction.

Analytical geometry is only touched upon, and is taught mainly for its application to the curves of flexure of beams. It includes the curves of the second degree except the hyperbola, equations of the line and circle referred to polar co-ordinates and in geometry in space, the equation of the line and plane and the angle between two planes.

Mechanics includes only statics and simple machines. Under the first are considered parallel and concurrent forces, composition of forces, parallelogram of forces, couples, moments, general equations for equilibrium, centres of gravity and resolution of forces; under the second, the lever, balance, pulley, tackle, windlass, gears, inclined planes, the wedge, screw and various applications.

The examination on this course in mathematics and mechanics is both written and oral. The written one usually consists of two questions, one of which is almost always the solution of a triangle and the other on mechanics. The oral is about three questions chosen at random.

As a course in mathematics it is certainly very incomplete;

*A paper by James M. White, Assistant Professor of Architecture in the University of Illinois, published in the Technograph.



RESIDENCE, BISHOP STREET, MONTREAL, FOR DR. F. GURD.

ROBERT FINDLAY, ARCHITECT.

whether as a course specially designed for students of architecture it is also incomplete is a subject affording ample opportunity for discussion. Enough is included to suffice for the courses which are to follow, and the deficiency seems to be more in drill than in subject matter. Though the French seem to have found it sufficient to answer the actual needs of an architect, the American practice of adding a little more for the sake of the mental drill is a most excellent one.

In contrast with it is the course in descriptive geometry, which is very thorough, being the principal basis of stereotomy and perspective. The course includes fifty or sixty lectures, of which about ten are a review of the part required for entrance and ten on the finding of the most common shadows.

The best conception of the course is to be obtained from the examination questions, a list of which, divided into six series, is furnished to the students. The oral examination, part of which comes at the middle of the course, is on questions from the list, one being chosen at random from each series. The first series contains about twenty-five questions on the line and plane; the second, thirty on the sphere, cone and cylinder of revolution, problems of angles, the solution of trihedral angles and regular polyhedrons; the third, thirty on cones, cylinders, pyramids and prisms; the fourth, twenty-two questions on surfaces of revolution; the fifth, twenty-five on ruled and helicoidal surfaces, and the sixth, twenty-five on shadows.

Twenty-two plates of about forty of these problems must be drawn, and constitute part of the examination. The problems on the first six plates are to be chosen from the first two series, on the second six plates from series three, four and five, and the remaining ten on shadows.

One problem must be drawn en loge, for which six hours is allowed. The problem given last year was: A cube stands with its diagonal vertical; a second cube of the same size has its diagonal coinciding with the first, but is turned through an angle of $22\frac{1}{2}$ degrees. Draw in plan and elevation the intersecting cubes, and find the shadows at 45 degrees on the solid and on the plane of projection. Pillet's text-book on "Descriptive Geometry" is closely followed in the lectures.

The course in stereotomy is also a thorough one, and includes all of Pillet's text-book except the skew-arch. Under the division of masonry the lecturer treats of the methods and instruments used in stone-cutting, the principles of jointing, and of vaults, niches, domes and cupolas; the arranging and proportioning of treads of stairs, also vaulted and suspended stairs. Under the division of wood-work, the general rules of framing are considered, the methods of assembling pieces, general principles of roofs and the special ironwork of carpentry. This course also includes the methods of finding patterns of stonework and bevels of rafters, and two problems are given, the one in wood and the other in stone construction. Of those given last year the first was a small railway station, which involved the design of the building, the framing plan of the roof and the principal bevels, also the framing of the stair and the patterns for the front string; the second was a building entirely in stone, to be erected in a public market square and to contain a fountain and other sources of water supply for the market. It was to be a vaulted structure, with the vaulting visible both inside and out, and a decorative motive based upon the structural form of the vaults. In the centre was to be a large stone basin, and around the walls small basins supplied with both warm and cold water for washing purposes. Outside were to be troughs for the watering of animals. The basement was to be used for storerooms, and was also to contain the apparatus for heating the water; a stone stairway was to serve as a means of communication with it. Drawings were required of the plan, facade and section, showing the jointing of the stonework, besides patterns of three voussours, one of which was to be from the vaulting of the stairway. A course in surveying, consisting of six or seven lectures and three days' practical field work, is appended to the above course.

The work in construction comprises twenty lectures on theoretical and thirty on technical construction. Burn's text on "Construction" is followed in outline, but in a condensed form, and the formulæ which are given are demonstrated whenever possible by means of the mathematics already enumerated. The following outline is very general and the reader is expected to supply many headings which are necessarily preparatory to some of those enumerated. The lectures include internal and external forces acting on beams, application of formulæ to all usual cases, beams of equal resistance, also beams subject to inclined pressures, columns, lattice girders, roofs, calculation of strains and

deformations, curved roofs, metal ribbed vaults, expansion, friction, effect of wind, stability of masses and distribution of pressures, retaining walls, problems of stability, applications to foundations in general, reservoir walls, stability of vaults and their supports, curve of the centre of pressure and its application to vaulting.

The technical part includes a description of the materials of construction, methods of handling and transporting them, foundations, rules for masonry work, walls subject to thrust, buttressing, shoeing, piers and columns. Vaults are treated first historically, after which follow descriptions of different kinds, methods of construction, centrings, piers, abutments and buttresses, stone stairs, paving with flagstone, brick and asphalt, and the draining of rain water. The lectures on wood-working include descriptions of woods, methods of preservation, general principles of wood-working, assemblages, walls, floors, scaffolding, roofs, dormers, spires, towers, effect of wind and snow, roof coverings, stairs, joinery and special iron-work. This is followed by lectures on metal work, descriptions of the useful metals, commercial shapes, iron walls and floors, masonry work of floors, roofs, trusses, arches, awnings, glazed roofs, water pipes, gutters, iron blinds and shutters, elevators, grilles, balconies, hardware, plumbing and gas-fitting, heating and ventilating, electric bells and lighting conductors.

Three problems are worked en loge during the lectures on theory, and three general problems are required during the latter part of the course. Besides these problems there is an oral examination on each of the two parts of the course of about three questions. The nature of the problem to be worked en loge is known beforehand, so the student may be supplied with whatever data and formulæ may be necessary. One of these problems called for the design of a lattice I-girder of equal resistance throughout and to maintain a uniformly distributed load and two concentrated loads at equal distances from the end. Given the size of the angle irons, height of web, width and thickness of cover plates and diameter of rivets, calculate the number of cover plates required at the centre and at what points they may be successively discontinued, also the spacing of the rivets for the cover plates and the lattice bars. Another problem was the design of a six panel triangular truss, sustaining dead load only, by both analytical and graphical methods.

The three required during the lectures on technical construction involve design as well as construction. The first usually includes the investigation of a vault, such as: Design a grand stairway leading up to a terrace, the principal landing of the stair being vaulted. Calculate the vault and its buttresses. The second in one case called for the design of one bay of a riding school, the walls to be of half-timbered work, trusses 38 metres centres and 20 metres span. Submit plan, elevation, details of framing, and the calculation of the principal parts. The third is called the general problem, and includes about all the ordinary problems of construction which can be centred in one building. The following one will serve as a sample: Design a museum building, consisting of central glass-covered court, surrounded by galleries, three stories and basement high. On the third floor is to be a library. The basement ceiling is to be vaulted, the other floors to be of iron and masonry, the roof of the court to be of iron and glass, while that of the galleries is to be of wood and metal. There are required complete general drawings, problems of the stability of the vaults, and notes on the calculations. These drawings are quite elaborately worked out and rendered in color, even the construction details having the shadows all cast at 45 deg. The feature of design enters every problem that requires drawing, no matter what the study.

The course in perspective consists of twenty lectures, and is very thorough. Three problems are required besides one en loge. The following may be considered as samples: Design a pedestal bearing a statue, the base to be about 1.5 metres across and either square or circular. Make a drawing of a public place, surrounded by arcades and with a monumental fountain in the centre. No side of the square is to be parallel to the picture plane.

Make a drawing from nature of an ensemble or architectural detail, the drawing to be at least 0.25×0.35 metres. The problem given to be drawn en loge last year was the capital, architrave and frieze of the Greek Doric order, without triglyphs. The shadows were also required.

The above is, I believe, a fair representation of the work of the school not classed under the head of design, except the diploma drawing, which is a thesis design and involves details of construction and specifications. A candidate for a diploma is also required to pass quite elementary examinations in physics, chemistry and building law.

The usual problems in design do not include any calculations of construction, as no construction is expected to be shown on the drawings.

POINTS ON PLASTERING.

By "PLASTERER."



PERHAPS some information on the general practice of lathing and plastering will be interesting. There is undoubtedly much bad plastering, and in every case the mortar and plastering material is blamed. This is not just.

The first essential of good plastering is good preparation to receive it. For plastering on brick or terra cotta, have your work straight and true, the joints rough. Don't use dry press brick, nor terra cotta with smooth face. If your walls are not straight don't expect to get a straight wall in two-coat work—lime mortar cannot be made that is equally good when used half an inch thick and two inches thick in the same wall.

Don't plaster with cement made from gypsum or similar compounds, such as acme, royal, agatite, etc., on Columbian fire proofing, or on Portland cement, unless you have them dry enough to prevent sweating or condensation. Portland or native cements, or even lime mortar is preferable in such work. Don't allow mortar to go on thicker than $\frac{3}{4}$ of an inch at one time, and have your brick or cement free from dust or dirt. Don't plaster on smoked bricks or old bricks from chimneys; they will stain badly.

In preparing for lathing have your joisting, trimmers, etc., heavy enough to prevent vibration, and strap all large ceilings, using 2" x 2" strapping on 16" centers. If you don't strap, at least have all joisting and studding sized; very much crooked work would be avoided by enforcing this rule. Have all angles made solid. See to this yourself and don't rely on lathers who work by the piece to inform you of the carpenter's defects, and have trouble with him in consequence.

Use white pine lath, seasoned but not too dry. 1 3/8" x 3/8" lath are light enough; 1" x 3/8" lath are only fit for use on joisting or studding at 12" centers. 18" breaks are frequent enough, but don't allow lath to break at door posts; the slamming of door or even the nailing of trim will cause a crack here. Don't blame the plasterer for this when you have allowed the carpenter to center his work so as to cause waste of time and lath to avoid it. Don't be unreasonable. Contractors are working at close figures for a living. Blame the right party. When you see a crack at an internal angle just above base, you did not have that angle made solid, and nailing the base caused it to crack.

Lath stains cannot be avoided in two-coat work, and are even more liable to appear when patent plasters are used, as the first coat is put on much thinner to save cost. Two-coat work is also liable to have every lath and joist show through when work gets old—you can count them through the plaster.

Lime mortar properly made makes good work, but you can't make a poor plasterer do it. Mortar made and used at once will get as hard if not harder than what is allowed to age. There is of course more danger from lime pitting; there is also a greater danger from the shorter nature of the material that the key will fall from all wall work. These objections are enough to condemn its use, but it is both unnecessary and im-

practicable to ask that it be made two or three weeks before using. Very sharp sand is not best for ordinary mortar; a good clean sand of sharp grain or a mixture of soft and sharp is better; it requires the strength of cement to bind coarse sharp sand.

Don't allow mortar on lath to be used too soft—you will have no key. Don't have it too rich with lime for same reason. See that it is of proper consistency to require some force to apply it. If too poor (too much sand) key will fall off on wall work. Mortar of proper consistency for good work will crack badly in very hot weather, or if dried too quickly. For second coat on lath or for brick work one-third more sand may be used.

The term "hard white finish" is a misnomer; the hardest lime finish is made with sand. If enough sand is used to avoid use of calcined plaster, work will be uneven in color when dry. Don't allow finishing before base coats are dry—you are in greater danger of lath stains, cracks, lime pits, etc.

These remarks might be continued indefinitely. If they prove interesting I will be happy to give you some more.

THE QUEBEC CASTLE.

IN describing the antique castle, several writers have mixed up dates and incidents referring to the Fort St. Louis begun in 1620, with those relating to the Chateau St. Louis, which, after several changes and transformations, assumed that name only in 1647, under Governor de Montmagny. Hawkins is quite correct in saying that "The Castle of St. Louis was in early times rather a stronghold of defence than an embellished ornament of royalty. Seated on a tremendous precipice—

On a rock whose haughty brow
Frown'd o'er St. Lawrence's foaming tide.

and looking defiance to the utmost boldness of the assailant, nature lent her aid to the security of the position. The cliff on which it stood rises nearly two hundred feet in perpendicular height above the river. The castle thus commanded on every side a most extensive prospect, and until the occupation of the higher ground to the south-west, afterwards called Cape Diamond, must have been the principal object among the buildings of the city.

"When Champlain first laid the foundation of the Fort, in 1620, to which he gave the name of St. Louis, it is evident that he was actuated by views of a political, not of a commercial character. His mind was in better keeping with warlike enterprises than the acquirement of wealth. He was perfectly disinterested in all his proceedings. Foreseeing that Quebec would become the seat of dominion and invite a struggle for its future possession, he knew the necessity of a stronghold, and determined to erect one in opposition to the wishes of the Company of Merchants." The building was commenced in July, 1620.—J. M. LeMoine in the December Canadian Magazine.

WATER CURTAIN PROTECTION.

A SOMEWHAT novel system of fire protection has been tried at Boston to save a building from being ignited from adjacent premises. The chief fire station is in a dangerous lumber district, and a five-inch stand pipe has been erected, with connecting perforated pipes running along the front and side of the building near the top. There are also a number of spraying nozzles. By this means a complete water curtain is formed, affording perfect protection. At the trial 1,000 gallons of water per minute was used.

TESTING OF CEMENT.

THE Master Builders' Exchange of Philadelphia having reported on standard specifications for cement, basing its clauses largely on those of the American Society of Civil Engineers, Mr. Cecil Smith, of McGill College, Montreal, criticises them in the Brickmaker in the following terms:

1. SPECIFIC GRAVITY.—During the last three years I have tested very carefully about forty brands of Danish, German, Belgian, English and Canadian Portland cements and not one of them has gone as low as 3.00 in specific gravity; therefore, I consider a clause demanding a value of 3.00 for specific gravity is of no value whatever to prevent under-burnt products. Natural cements, also, usually range from 2.90 to 3.05; therefore, there is little use in specifying a minimum of 2.50 for natural cements. A specific gravity of about 3.09 for Portlands and 2.90 for naturals would really obtain what was intended,—nameiy, well-burnt products.

2. FINENESS.—Why should there be two classes of tests? Surely any two persons can sift cement the same, whether in a laboratory or in a contractor's shanty. What should be specified is that a certain amount of cement should be used in sifting, and that the sifting should be continuous such a number of minutes; then uniformity will be obtained. For myself, if I use 10 ozs. of cement, and sift two and one half minutes on a No. 120 sieve, then sift the residue one minute on a No. 100 sieve, then the residue three fourths of a minute on a No. 80 sieve, then the residue one half minute on a No. 50 sieve, I find the residues are about uniform in size and color. I obtain close uniformity. If only a No. 100 and No. 50 sieve are used, the same method could be employed.

Regarding the actual amount of residue demanded, that is entirely a matter of dollars. Fine grinding must be paid for, but the clause, as set forth in the specifications being dealt with, is so lax as to call forth a protest.

Any natural cement having more than 15 per cent. residue on a No. 100 sieve should be certainly rejected, because they are so lightly burnt as to make it very easy to grind them finely. It is quite easy to obtain Portlands and naturals with only 10 per cent. residue on a No. 100 sieve, and this is the requirement of the standards of Canadian Society of Civil Engineers, formulated in 1894.

3. CHECKING OR CRACKING.—No checking when exposed in air or water! How long are we supposed to wait? The report does not say, but from a great number of experiments I have made I would say that cements with a slight amount of free lime in them will stay solid in cold water for several months, but finally crack. The only way to develop "blowing" in a short time is to subject the cement pats to hot air or hot water.

4. STRENGTH.—With ordinary care, neat cement briquettes made in the ordinary way, by using sufficient water to make a plastic mortar, then putting the mortar into the molds with a trowel, and shaking the molds well to drive out air bubbles, will give fairly uniform results; but in making sand tests the method of putting the mortar into the molds is the whole matter; a one week test, three to one, can be made to vary all the way from 25 to 150 or even 225 lbs., depending entirely on the manner of placing the mortar in the molds. Therefore, a clause not stating how this is done is of no value whatever, even if the clause stated that the mortar should be rammed into the molds. There are as many ways of ramming as there are operators, and the result might vary by at least 100 per cent.

Personally, I consider sand tests are of little value, because if the clauses of specific gravity, fineness, blowing (or checking), and neat tensile strength have been sacrificed, then one can predict the comparative sand test value; but if sand tests are wanted, then I believe firmly that there is only one way to make them strictly comparable, and that is to put the mortar into the molds in a soft, plastic, condition, such as is used by masons, and let it be forced into the mold under a uniform dead pressure. This method I have used for over a year, and I feel I can determine accurately the desired knowledge of the actual cementing strength of sand mixtures as used in practice.

The city hall at Chicago threatens to collapse. An official inspection shows that the two ends are settling, and pulling the building apart, which is shown by large cracks through the centre. Immediate repairs are necessary.

GOOD ADVERTISING METHODS.

MR. Chas. Austin Bates, in his department of criticism of advertising methods in *Printers' Ink*, says:—

Gara, McGinley & Co., of Philadelphia, have been successful advertisers in a line little advertised. They are roofers and makers of architectural decorations in metal. They make metal ceilings, skylights and store fronts. The inexperienced or unposted observer would say, from looking at the mass of advertising matter that they send out, that they were spending more money than the business would justify. That this is not true is proven by the fact that the business becomes bigger and more profitable every year. And apparently the more money the firm spends in advertising, the more money they have to spend. They have made quite a feature of advertising what I believe to be a very insignificant part of their business. That is the repairing of roofs.

One of the best phrases I ever saw in an advertisement is one of theirs, which says: "We do one thing well. We mend roofs." Another phrase is: "We are leak finders." One ad that they have used has stuck to me, and amuses me every time I think of it. It is a funny ad, and is the exceptional funny ad that proves the rule that all funny ads are bad. It is: "How much better it is to sit by a cosy fireside, and think how much better it is to sit by a cosy fireside than to be on the roof cleaning the snow off, thinking how much better it is to be sitting by a cosy fireside than cleaning the snow off the roof. We are snow removers and leak finders. Gara, McGinley & Co."

The last smart thing the firm has done was to get out a handsome little booklet entitled, "Pointed Suggestions." I think it would have been better to call the booklet "Pointed Suggestions to House Owners," or "Points on Roofs," or something of that sort, letting a man see immediately what the book was about.

It is liberally and suitably illustrated with half-tones of wash drawings. From a mechanical standpoint, there are only a few criticisms to be made. One is that on some pages the matter is arranged in a spotty sort of way. It is broken up too much and isn't sufficiently cohesive. The best thing in the whole book is a thing that certainly deserves praise as a plain and convincing piece of advertising. It is a series of half-tone pictures of Gara, McGinley & Co.'s office as it was and as it is. First there is a picture of an old-fashioned, three-storey brick house, in the architectural style of sixty or seventy-five years ago. The next picture shows this house in process of demolition. The third picture shows the addition of another storey. The fourth picture shows a part of the building covered with rock-faced metal plates. The other part is uncovered, giving the idea of the method of applying the plates. The fifth picture is the finished building, a stately, dignified, artistic piece of architecture, which no one who is not admitted to the secret would ever suppose to be the same house as was portrayed in the first picture. This is a practical illustration of what Gara, McGinley & Co. are prepared to do with other old houses.

Mr. Joseph Bourque, of Hull, Que., is taking action to compel settlement of balance of account of the court house and jail contract, which has been standing for two years.

As a result of a recent accident in Ottawa, a scaffold inspector for that city will probably be appointed. It is proposed to have all contractor's plant inspected and branded, and to insist on its being placed under cover during the winter.

NEW CANADIAN PATENTS.

AMONG the new patents granted in Canada as announced in the last Patent Record are the following relating to the building trade:—

- Cleaner for Cisterns—Charles A. Butterfield, Dewitt, Iowa.
- Window Fastener—Ernest Peters, Tompkins, Mich.
- Door Fastener—M. P. Pirtle and J. W. Miller, Louisville, Kentucky.
- Fastening for Window Sashes and Slide Doors—D. A. Crichton, Los Angeles, California.
- Fancy Brick, Etc.—The National Opalite Glazed Brick and Tile Syndicate, London, England.
- Fire Escape—Wilbrod Bourdon, Valleyfield, Que.
- Hasp—Wm. Firfield, Perth Amboy, N.J.
- Weather Strip—Chas. M. Becker, Port Rowan, Ont.
- Chimney Cowl—Cyrus N. Shannon, St. Cloud, Minn.
- Building Brick—Geo. S. Balsley, Detroit, Mich.
- Hot Air Flue—Wm. H. Brinker, Pittsburg, Penn.
- Sash Cord Catch—John Wheatly, Hamilton, Ont.
- Heating Drum—Thos. H. Wilson and Robt. Humphreys, Logansport, Indiana.
- Indicator Door Bolt—Wm. S. Burgess, Three Rivers, Que.
- Heating and Ventilation System—Wm. Bruce, Leeds, England.
- Heating Furnaces by means of Liquid Hydrocarbon—La Compagnie Internationale pour l'Exploitation des Procédés, Lyons, France.
- Window Fastener—Laura Hofheimer, Brooklyn, N.Y.
- Double Flushing Water Closet—Philip Nicoll, Toronto.
- Bath Tub—Robt. M. Wilson, Rome, N. Y.
- Brick Kiln—Geo. S. M. Rutter, Canton, Ohio.
- Stench Trap—Geo. Dunstan, Lorain, Ohio.
- Window—J. A. Cleveland, Duluth, Minn.
- Metallic Roof—L. S. Flutan, Dallas, Texas.
- Hot Air and Steam Bath Apparatus—Salli Maschke, Berlin, Prussia.

The Laughlin-Hough Drawing Table Co., of Guelph, have received an order from Ottawa for six of their large size tables.

Electricity is being used to operate the large stone saws at the government buildings at Victoria, B. C., now in course of construction.

Mr. J. R. Booth, of Ottawa, has purchased the Reefer stone quarry in Nepean, from which stone will be taken for the new central depot to be erected at the capital.

The contract for 30,000 tons of cast iron pipe for the waterworks at Yokohama, Japan, was awarded to an Alabama iron company. It is said to be the largest order ever given for American iron for foreign shipment.

MANUFACTURES AND MATERIALS

A mortar composed of brick powder mixed with quicklime is largely used in France.

The Maritime Nail Co., with an authorized capital of \$50,000, has been organized at St. John, N. B.

The Northumberland Stone Co. has been formed, with a capital of \$10,000. The incorporators live in Shediac, Sackville and Botsford, N. B.

Mr. H. Horskin and Mr. Hurlburt have entered into partnership at Bedford, Que., for the manufacture of sanitary ware, general plumbing goods, etc.

Arrangements are about completed whereby the partners formerly interested in the British Columbia Pottery & Terra Cotta Co. will regain the ownership.

The Brockville Pressed Brick Co. are building railway sidings, arranging for the purchase of bush land for fuel supply, and otherwise improving their facilities.

The Union Bank has sold the C. B. Wright brick yard near Hull to Messrs. Arthur, Walter and Thomas Farley for \$20,000. The new firm will put in new machinery and operate the yard.

Attention is being directed to large deposits of asphalt which exist on the Athabaska River, N. W. T. Tests made of specimens collected by members of the geological survey show it to be well adapted for the construction of roads, footpaths, courtyards, granary and warehouse floors, and also for roofing.

The Whitton Granite Quarry Co. has been incorporated, with capital of \$50,000. The incorporators are: Senator Bolduc, Mr. Rufus H. Pope, M.P.; Mr. Louis Israel Frechette, M.P.; Dr. G. H. Lacourciere, of St. Victor de Tring; Mr. Wilfred Trudeau, of Fall River, and Mr. D. Alfred Roy, merchant, New Bedford, Mass.

A company has been formed in the United States to supply contractors and builders with ready-made mortar. Their buildings at Pittsburg will be seven storeys high, and the mortar will be mixed on the top floor, and when it reaches the ground will be ready for use. It is claimed a better quality of mortar can be thus supplied.

The announcement recently published that a deposit of the finest quality of roofing slate had been discovered in the township of Euphemia, Lambton county, Ont., proves not to have been well founded. Mr. Archibald Blue, Director of Mines for Ontario, has lately visited the locality and found the deposit to consist of ordinary bedded shale.

INTERIOR WORK

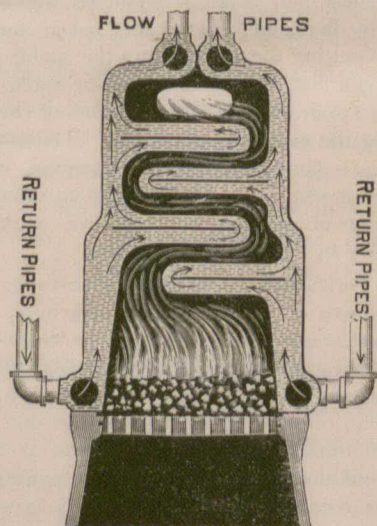
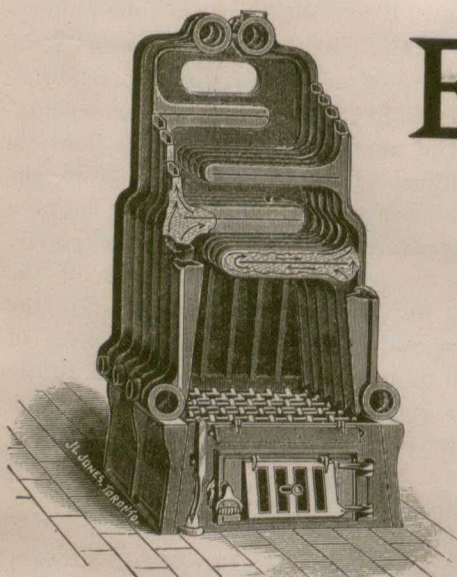
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