

hanging at the south. It came down again when water was admitted, but the bolts and debris prevented a closer fit than 8 in. In this emergency a pneumatic caisson, 29 3/4 ft. in size was used to secure a bearing on the solid part of the foundation, and as a consequence the masonry was started 2 ft. below high water.

The Union Bridge Co. was thus compelled to sink a coffer-dam, 48 3/4 ft. around the old caisson and masonry, and resting on the old crib at a point where its dimensions were 50 x 100 ft. This coffer-dam was made of two walls of 12 x 12 in. timbers with verticals of the same size between, and the pockets thus formed were filled with concrete for 16 ft. in height and finished out with clay. Mr. O'Rourke says this last was a mistake, as it could not be rammed, and gave them trouble from leakage. The bottom of the dam was filled, by the assistance of the divers, with concrete, made with a parts of cement, 3 of sand and 6 of screened gravel. The masonry of the present pier is erected within the limits of the old pneumatic caisson, excepting only two end sections which carry no weight, and the old 8 in. rupture was hoisted up lightly and Portland cement was injected through six 3 in. standpipes left for that purpose.

At pier 3, all rotten timber in the outer courses was replaced by sound sticks, and the dredging recommenced until its bottom was 12 1/2 ft. below high water. The center of the crib was found to be 5 ft. east of its proper position, but as the crib is 60 ft. wide and the masonry only 25 ft. wide, this fact gave no trouble.

Piers 4 and 5 were entirely new and in mid-channel, and it was found to be a very difficult feat, at first, to hold them to their outside, before grounding. Commencing with pier 4, we have a weight to handle of about 5,000 tons, in an unsteady force, and preventing an outside current to the river current of 17,000 sq. ft. with several thousand additional square feet in the inside walls. The crib drew 32 ft. of water, and it was at first proposed to hold it by three up and three down stream anchors, but it was found necessary to employ 8 up streams 8 down streams and 6 side anchors.

The following extract from a letter of Mr. O'Rourke, engineer in charge, gives the present status of the work:

"The two shore arms were first erected on an ordinary false-work. Spans 2 and 3 were next erected on a false work, a part of which is shown in the accompanying figure, by means of a traveler, also shown in same. The false work consists of 26 bents, 25 resting on 24 piles each and 4 resting on the masonry. Of the latter 2, the outer ones rest on the piers, and the remaining two on the concrete in the bottom of the caissons. The two cantilever arms and 218 suspended spans between them, were next put in place, without falsework by means of the two travelers shown in the cut. The accuracy of the work done is testified to by the fact that the last pieces fitted exactly in their places.

Meanwhile the falsework under 2 and 3 was removed and the foundation piling pulled up for use next season.

This closes the river work for the winter. Until spring, work will be confined to the erection of the viaducts for which nearly all the pony piers have been built."

The Chief Engineer for the Union Bridge Co. and the one in charge of the works is Mr. J. F. O'Rourke, while Mr. P. P. Dickson still represents the old Poughkeepsie Bridge Co., and Mr. A. B. Paine is Chief Engineer of the Manhattan Bridge Co.

LONDON.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

I HAVE forwarded you a copy of a new contract agreed upon by architects and builders of this city, and under which contracts for the coming season will be performed. I also send you a copy of the old contract in order that you may institute comparison between them. A careful perusal will show great differences between the two. The revised contract calls for all plans and details to be prepared before tenders are submitted, whereas formerly the details were given as the work progressed. Under the old contract it was customary to pay 75 per cent. as the work advanced, and the balance in 60 days. Under the new contract 80 per cent. is payable as the work advances and the balance in 30 days. The principal change, however, is that, whereas formerly the contractor was bound by the decision of the architect on any matter in dispute, except deductions, now he has the right to appeal from any decision. These are the principal points of difference between the old and new contracts.

We do not anticipate any trouble here, and see no cause for it. There will not be a great deal of work offered this season, owing to the depression in trade, but we expect better things for the fall.

MONTREAL.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

THE following building permits were issued from the office of the Building Inspector, Mr. Lacroix, Montreal, during the month of February:—Jos. Vezina, 1 dwelling, Berri street, cost \$1,800; F. Mandeville, 2 dwellings, Cadieux street, cost \$1,500; Jos. Belanger, 2 dwellings, Papineau road, cost \$3,600; L. E. Philibert, 1 dwelling, Charbonnet street, cost \$1,500; J. A. Vanboegren, 1 dwelling, Drolet street, cost \$1,500; M. Galarneau, 1 dwelling, Dufrain street, cost \$800; M. Dinning, 4 dwellings, frame, cost \$3,600; F. X. Monette, 2 dwellings, Fulton street, cost \$2,400; M. Gaudet, 1 dwelling, St. Lawrence street, cost \$900; J. Lamarque, 1 shop, Joseph street, cost \$1,000; F. X. Charbonnet, 1 dwelling, Maple street, cost \$1,500; G. Chaboussier, 1 dwelling, Maple street, cost \$1,800; Jos. Charrier, 1 dwelling, Montcalm street, cost \$1,300; Lapierre & Pagnette, 1 factory, Notre Dame street, cost \$3,600; G. A. Chevalier, 1 3-story dwelling, Ontario street, cost \$1,500; Chas. Laberge, 2 dwellings, Ontario street, cost \$3,600; Patrick Stanford, 1 dwelling, Rivard street, cost \$1,800; J. B. Dumand, 4 dwellings, Ray street, cost \$6,000; Zephirin Charost, 1 dwelling, Rachel street, cost \$1,800; A. Dumoulin, 1 dwelling, Rivard street, cost \$1,000; Richard Kendall, 1 dwelling, Richmond street, cost \$1,200; P. Caulainet, 1 dwelling, Rivard street, cost \$1,000; C. Roussin, 1 dwelling, St. Lawrence street, cost \$800; F. Davis, 1 dwelling, St. Denis street, cost \$2,500; E. Carpentier, 2 dwellings, St. Dominique street, cost \$2,500; N. Paquette, 1 dwelling, St. George street, cost \$2,500; Jos. Sarrazini, 1 dwelling, William street, cost \$1,000; M. J. Cummings, 2 dwellings, Wolf street, cost \$3,600.

WINNIPEG.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

THE outlook for the building trade in this city is not of the most encouraging character. In fact, as far as public information has been given, there are few new buildings of any importance as yet projected. Messrs. Timewell & Son, architects, have just taken tenders for the erection of an addition to the general hospital which will cost about \$20,000, and are preparing plans for a new maternity hospital and small theatre and operating room for the hospital. These are about the only works actually decided upon, though it is just possible that if the railroad negotiations at Ottawa result successfully there may be some change in the situation. There are a number of firms in Winnipeg that occupy business premises that are inadequate in character, and a number of citizens that have in contemplation the erection of residences in which to establish their homes. These two classes, although in many instances having plans prepared, have been holding back, awaiting the turn of events and the wisdom of making investments.

The Contractor's Association at present is in statu quo from almost the same reason as given above, viz., the almost stagnation of business generally. There will be a great demand during the summer for carpenters, as there will be a great number of grain elevators built throughout the province.

HAMILTON.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

I DID intend forwarding a list of the buildings to be erected in Hamilton as shown by the Building Inspector's book, but I was sorry to find that this book was no criterion to go by as to the building prospects. On the contrary, I discovered that notwithstanding the fact passed in Council "that no person shall commence the erection of any building within the fire limits of the city of Hamilton until he shall have lodged with the Inspector of Buildings a notice thereof, to be entered in a book kept for that purpose," one half at least of the buildings erected last year were not so entered, and only a few of a large number of buildings that I know are in contemplation for erection on the opening of the season, are recorded up to the 7th instant. This state of things must not exist. The by-law must be enforced, and a recent complaint laid before the Council will no doubt straighten the matter out effectually.

From all reliable accounts the building prospects for the season are good, but already promise to be ruined by the unwise action of the bricklayers' union; which is already letting its thunder be heard. As can be seen in the daily papers, the union leaders seem strangely incapable of the ordinary things they are doing to their own members by their ill-handled dealings with their prospective patrons. If in this connection the leaders alone were the parties that would suffer, the means would be of little consequence, but such is not the case. Men must be taken in the interest of the Building Committee and the mechanics themselves to counteract the paid efforts of these creatures of discord.

In the last issue of your Journal I notice a very comprehensive article headed "An Appeal for Organization," in which reference is made to a letter in a previous issue. "Consans Fides" urges the revival of the Canadian Institute of Architects. That Institute was organized with the purest and best of motives, as a means of uniting its members in friendly intercourse for social and professional improvement, and its revival would certainly be productive of much good. The Architectural Club of Toronto, is a brilliant effort in a local direction, and promises to attain the object sought by developing into an important association of architects, and there is little doubt that with the urgent pressure and claims of the rising generation of architects, whose eyes are open to the myopia of their predecessors, such an institution can and will be incorporated, but this incorporation will not certainly be the desired attachment unless the architectural name and profession is thereby protected against the usurpation of quacks to the same extent, at least, as the other learned professions. This is certainly the main question at issue, and now is the time to push the matter with united efforts to final success. I am glad to see that the growing interest taken in this journal is being evinced by the useful contributions made to its columns. In this connection all have a duty to perform in upholding a work of such real merit. Let the architect and engineer of long practice add to its pages with useful essays from their fountains of knowledge; for the benefit of those less favored, and juvenile brethren, and then feed the gratification of having secured themselves of the best possible medium for imparting a share of their knowledge and experience to those by whom it will be most appreciated. The elements of architecture afford a wide field for commentary, and lucid essays on acoustics and other kindred subjects would certainly be valuable matter for discussion, especially for the students, who would improve on the opportunity of entering the arena themselves and submitting their individual ideas and questions.

There is another matter that has engaged the attention of architects, and is deserving of comment, that is the prevailing practice, among Canadian architects especially, of advertising for tenders. Some architects uphold the practice on the principal of right and justice to their clients, in providing them with a number of offers to select from. Others look favorably on the practice as a direct means of advertising the amount of work entrusted to them. But apart from any selfish motive whatever, it is a question at issue as to whether it is to the interest of the proprietor to advertise for tenders or not. For public works, of course, it must be done, for well understood reasons, but any architect in good practice must have a record of a sufficient number of contractors whom he can recommend for character and ability, and that he can invite to compete for the proposed work, with full assurance of all that is essentially fair and just to both his client and himself. This has always been the general mode of procedure by architects in Great Britain. However, circumstances alter cases, and much may be said for and against this subject, and as it is a significant one, it is very desirable to have the opinion of those most concerned, and for the mutual benefit of all. Your next issue will be usually looked for in reply to this question.

Concerning the new form of contract which has been adopted by the contractors in this city, a correspondent writes: "The

"Equitable Contract" passed by the Builders', Contractors' and Dealers' Exchange, has been passed in consequence of the great injustice they have repeatedly suffered through certain architects withdrawing the certificates given them in good faith, and putting the contractors to great loss, and forcing them into suits of law where the richer man can keep the contractor out of his justly earned money. The architects are perhaps not aware that the law on contracts specifically states that the proprietor and architect or engineer can be subjected to punishment for collusion to keep the contractor or contractors out of their money. This has been done, so the contractors have stated.

ASOS.

IMPORTANCE OF CARPENTRY.

THE carpenter has more to do with the construction of a building than any other person employed by the architect. Whether a building is to be erected of brick or stone, still it is the carpenter who forms all the patterns and guides for the bricklayer or the mason to work from. Nay, even if a cottage is to be built of wood, the first step is to procure boards adapted by the carpenter for forming moulds, by which this mud is brought into the required form; or, even if the mud is heaped up with forks, as in the cob walls of Dorsetshire and Wiltshire, the carpenter is required to supply what are called wooden bricks to be built into the walls for attaching, at a future period, the internal fittings.

In the interior of the house everything depends on the carpenter, and most things are, indeed, done by him. The floors and doors and windows are almost entirely his work, and he forms mouldings for the cornices which are put up by the plasterer. If, therefore, we could improve the taste of the rising generation of carpenters, we should have no fear of operating, through them, on all the various artisans employed in the construction of houses, and ultimately, on the general taste of the whole community.—J. C. London.

ENGINEERING NOTES.

FROM the address of President Thos. C. Keefer, C. M. E., at the annual meeting of the Canadian Society of Civil Engineers, we make the following extracts:

If, as Engineers, our foresight were as good as our back-sight, we would plan locks to suit the vessel of the future, instead of having to build vessels to suit the locks. It should be mentioned, however, that the dimensions of our locks were established by a commission representing the trade, of which commission the late Sir Hugh Allan was chairman.

We are about to start the Sault Ste. Marie canal, which, since Lake Superior has become an important entrepot of Canadian commerce is necessary to complete the Canadian system. It will, no doubt, be upon a much larger scale than any other Canadian canal, and, if so, will, I think, soon raise the question of a further enlargement of the Welland Canal, so that vessels which can now reach Buffalo may extend their voyages to Prescott, within a little over two miles from the ocean steamer.

The Pennsylvania Railroad is substituting stone arches for iron bridges where practicable, and the same question is attracting attention in England. The centralizing system by which bridge plans have been decided at the head office from profiles of the crossings has no doubt been responsible for many cases in Canada where iron girders and abutments have cost as much as an arch. The girder is always a bridge with all its deficiencies; while the arch, where it can be depended upon, practically abolishes the crossing, and substitutes a causeway for a bridge.

Of future engineering works I can say but little. Our railway system penetrates all parts of the Dominion, and will extend itself wherever and as soon as required. The only remaining national railway not yet accomplished is the one projected to reach Hudson's Bay. I do not believe this will become an exporting route in competition with the St. Lawrence, nor that 500 or 600 miles of railway without local traffic or through connection, can be sustained by a few months ocean navigation in Arctic waters. The crop of the Northwest cannot be exported before navigation closes, and the railway will have little traffic to keep open all time during winter, because grain will rarely be sent to cool off for six months or more in elevators on Hudson's Bay. Our eastern trunk lines, with the advantage of a head wind, though our richest territory, cannot hyperbate at Montreal and Quebec, but have been obliged to push on to the open sea.

I believe, however, that as a nation we should put Hudson Bay at the bottom, in James Bay, where it approaches within a few hundred miles of our railway system in the Ottawa Valley. I believe the valuable fisheries, furs and other Arctic exports from an enormous coast line would gravitate southward to such a railway, and that its terminus would be the depot for a fishing fleet, which would compete with the whalers of the United States.

In bridges Canada has the finest samples of the various types, and the only tubular ones on this continent. While there is undoubtedly a surplus of iron in the Victoria Bridge, I do not think there is an unnecessary amount of masonry work in the piers. Its location and exposure to the sea shows respect more massive piers than bridges where only running ice has to be encountered. Moreover, the liberal dimensions with the stream are sufficient for a second line of rails.

We have a bridge project, which when carried out will in length of span be second only to the Forth which is 1661 feet. This is the proposed cantilever at Quebec. The car traffic of the Canada Atlantic has warranted that road in deciding to supersede a costly ferry system by a bridge, and let us hope that a similar case may soon be made out for Quebec.

The Railway Bridge over the St. Lawrence at Lacolle recently completed by the Canada Pacific Railway is an example of rapid construction of the best masonry in a difficult situation, which has not I believe been equaled anywhere before—the work being done between the leaving and the taking of the ice in the same year. The tunnel or subway to give railway connection with Prince Edward Island is another of the great engineering works now proposed. It is difficult at present to say whether the physical or