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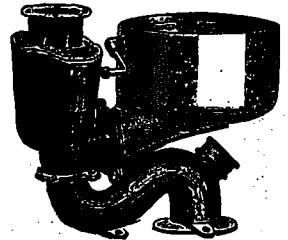
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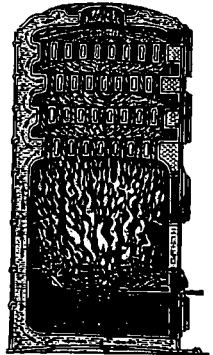
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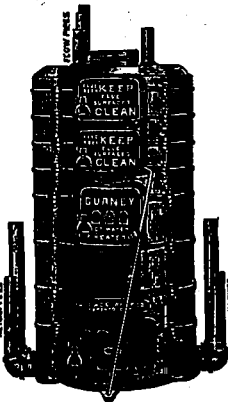
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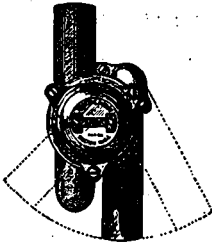
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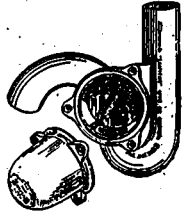
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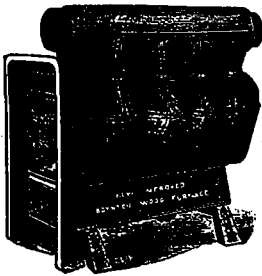
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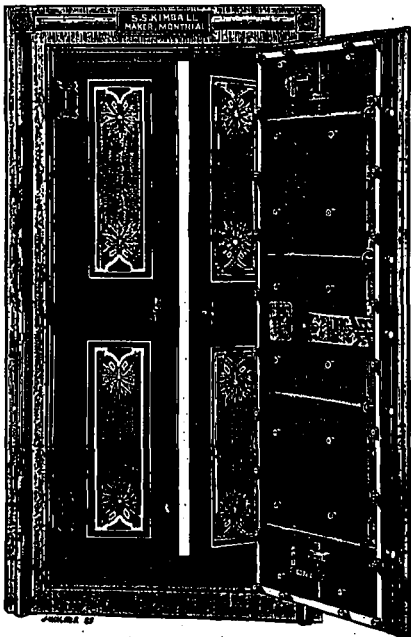
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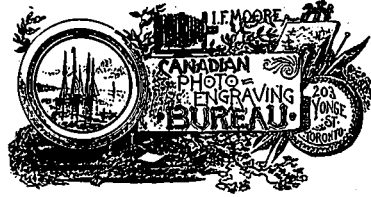
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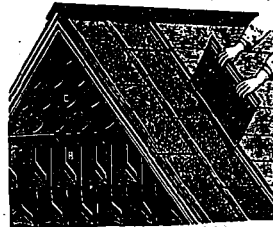
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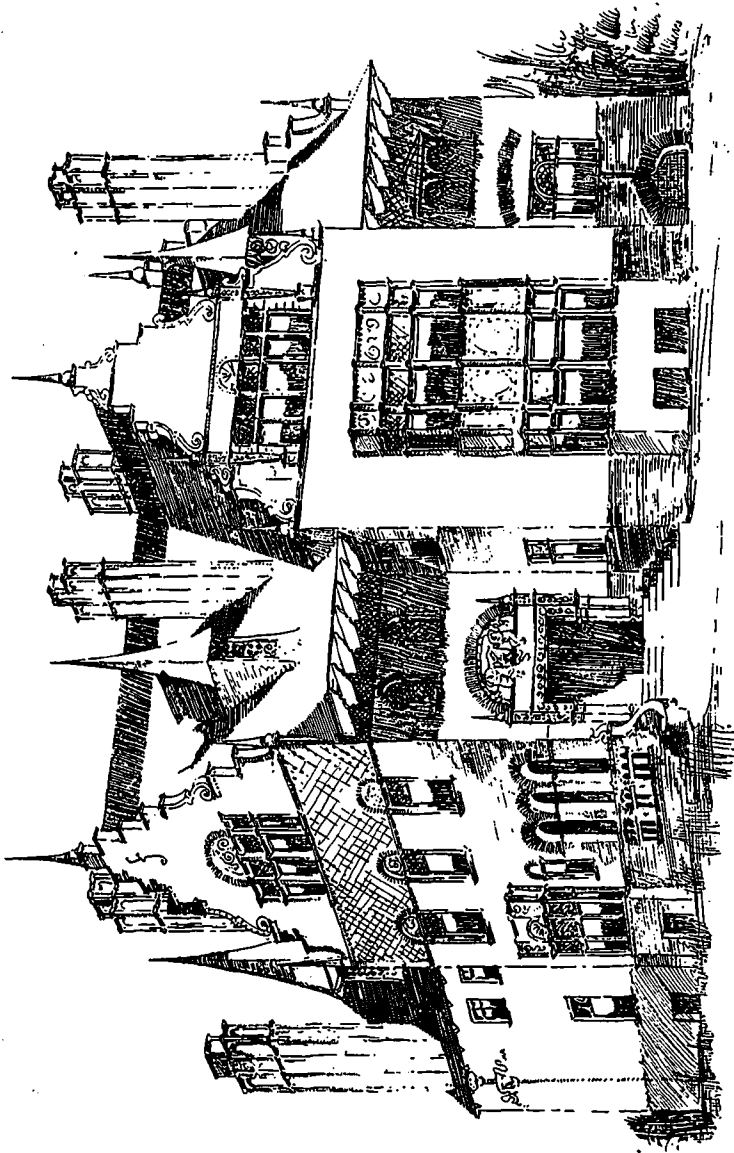
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VOL. I.—No. XII.

TORONTO, CANADA, DECEMBER, 1888.

(PRICE 20 CENTS
\$2.00 PER YEAR.)

Canadian Architect and Builder

A JOURNAL OF MODERN CONSTRUCTION METHODS,

PUBLISHED MONTHLY IN THE INTEREST OF
ARCHITECTS, CIVIL AND SANITARY ENGINEERS, PLUM-
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C. H. MORTIMER, Publisher,

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"A WORD TO THE WISE," ETC.

Barnum Wire & Iron Works,
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C. H. Mortimer, Esq.,
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Dear Sir,— You will please renew our contract with you for advertising for the ensuing year. We will send change of copy in time for January number. We wish to add that we have received more valuable enquiries from our advertisement with you than in any other medium where we are represented.

Yours truly,
F. S. EVANS,
Pres. and Gen. Manager.

VOLUME I. OF THE CANADIAN ARCHITECT AND BUILDER closes with the present number. It seems fitting that on the anniversary of the establishment of this new enterprise, a word or two should be said regarding the measure of success which has already been achieved, and the means to be adopted for ensuring greater and permanent success in the future. A backward glance over the past year gives no cause for discouragement. The publishers' anticipations have in many respects been more than met, and he feels encouraged to put forth renewed efforts to improve the character and value of the publication in the new year upon which it is about to enter. Sincere thanks are tendered to those who have manifested their appreciation of the aims and objects of this journal, by extending to it liberal advertising patronage, and by giving their names as subscribers.

It is a pleasure to be told by our subscribers that the CANADIAN ARCHITECT AND BUILDER has steadily improved from the first number. Our determination is, that the march of improvement shall continue as long as those whose interests we strive to serve, shall accord to us the necessary measure of support. In accordance with the expressed desire of a large number of our readers, the form of the paper, commencing with the next number, will be changed, so as to make it more convenient for binding. Improvements in the character of the illustrations and in other particulars will be introduced, and will serve to greatly increase the attractiveness and value of the publication. Our staff of contributors to all departments is steadily increasing, as a glance over the present number will show, yet there is room in our pages for the opinions of any reader who may have anything of interest to communicate.

The announcement last month of our intention to publish shortly the "Canadian Contractor's Hand-Book," as a premium to new subscribers to the CANADIAN ARCHITECT AND BUILDER, has already added largely to our subscription lists, and we feel certain that during the coming year these lists will include the names of a large majority of the contractors throughout the

Dominion. It is the intention to print in the "Canadian Contractor's Hand-Book" a classified list of all business firms having advertising contracts with the CANADIAN ARCHITECT AND BUILDER for 1889. The value of such a permanent advertisement will be readily understood. Those of our advertisers whose contracts expire with the present year, or during the first three months of 1889, and who may desire to appear in the classified list in the "Hand-Book," should send us notice of renewal of their contracts at once.

To one and all our readers we wish a very Merry Christmas and Happy New Year.

It would be interesting to know how the park area of the principal Canadian cities compares, in proportion to their population, with that of old world cities as given below: Paris, 172,000 acres; London, 22,000. Vienna, 8,000; Berlin, 5,000.

THE Builders' Associations of Canadian cities, are at present engaged in revising their forms of building contracts for the new year. It is fully time that a standard form of contract should be agreed upon for use throughout the Dominion. This is a matter that might profitably engage the attention of the proposed Association of Architects for the Province of Ontario.

WE regret that several glaring errors should have crept into the article by Mr. David B. Dick, published in our October number. The most flagrant of these occurs in the second paragraph, where, by the omission of a word in one place, and a whole line in another, the writer is apparently made to say that corrosion is caused in soil pipes by caulking the joints. Every precaution will be taken to guard against a repetition of such annoying mistakes in the future.

AN interesting letter from a Boston correspondent reached us too late for publication in this number. It will appear next month. In the January and February numbers will also appear a description of the New York Trade Schools, accompanied by illustrations showing the interior of the workshops and specimens of the pupils' work. In view of the interest which technical education is at present exciting in Canada, it is hoped that these articles will prove interesting and valuable.

WE are pleased to notice the manifested desire on the part of the architects of several Ontario cities for an Architectural Association for this Province. The formation of local Associations such as that organized at Ottawa the other day, is a step in the direction of the larger object. The organization of a Provincial Association, and the establishment of a course of instruction in Architecture in connection with the School of Practical Science in this city, as proposed by the Minister of Education, would secure for the profession many advantages which, under the present unsatisfactory condition of affairs, it does not possess.

A CHATHAM, Ont., reader, in sending us his subscription to the CANADIAN ARCHITECT AND BUILDER, incidentally remarks that although the paper is not in all respects what he would wish it to be, he feels bound to encourage it. We have written our candid friend for suggestions regarding the manner in which the paper might be improved. We will be grateful for any suggestions in this direction from any reader, and

for assistance given us in carrying out such of them as are considered of most value. We should not be expected to know the opinions and wants of all our readers, so if you do not get what you want, please ask for it.

A READER of this journal writing from Quebec regarding our comment upon the unbusinesslike method of keeping the record of new buildings in the city of Hamilton, says: "Please blow us up a little on this head. It will do us good to be reminded of our shortcomings." We take this to mean that in Quebec the same unsatisfactory state of affairs exists. We regret that it should be so, and would suggest that the new aldermanic brooms about to be elected make a clean sweep of building inspectors who fail to enforce compliance with the law requiring the obtaining of a permit for every new building before construction begins. Such permit should include the name of the owner of the proposed building, the location of building, the materials of which it is to be constructed, and the estimated cost.

IN this age of professional, trade and business organizations, it is somewhat singular that the master builders and contractors of this country have not in like manner associated themselves. The men in other callings have discovered that wrongs which individual effort could not remove, quickly yielded to the strength of combined effort. Is the condition of the master builder in Canada so prosperous and satisfactory as to make organization unnecessary? Numerous failures in their ranks during the past year, would seem to indicate that such is not the case. In the United States the National Association of Builders is, we believe, doing much to conserve the rights and improve the position of the master builder. It is but reasonable to suppose that like results would follow the formation of a Canadian Builders' and Contractors' Association. Let us have some opinions on the subject.

WE congratulate the City Engineer of Toronto upon the good judgment he has displayed in the nomination of assistants to perform the various duties of his Department. Mr. Chas. Rust has had a wide experience in sewer construction, has proved his ability and responsibility, and we doubt not, as assistant engineer in charge of sewers, he will discharge his duties in a manner satisfactory to the Chief of the Department and the citizens. Mr. Meadows, who is to have charge of the construction of roadways, has earned a creditable reputation in that particular field. Mr. Roden, during several years service as Secretary to the Board of Works, has shown himself a capable, painstaking and obliging official, and, relieved of the multitude of petty details belonging to his former position, will do the city good service as chief clerk of the Department. The appointment of Mr. A. H. Clarke to be Secretary of the Board of Works, is equally satisfactory. The Works Department, as thus re-organized, should hereafter perform its work in a highly efficient manner.

THE Solicitor for the city of Toronto, after looking carefully into the Statutes, is of opinion that the Ontario Legislature may grant authority to enable the City Council to compel the telephone and electric light companies to place their wires underground. In the case of telegraph companies whose lines extend beyond the bounds of the Province of Ontario, his opinion is that such authority must come from the Dominion Parliament. The Solicitor suggests that the opinion of coun-

ment counsel should be obtained as to the correctness of his interpretation of the Statutes. The decision of this question is of great importance to every city in Canada, in most of which the planting of unsightly poles and stringing of a net work of wires has not only proved to be a nuisance, but dangerous to life and property. We hope that no time will be lost in obtaining from the proper quarter the necessary legislation. In Toronto, an effort should be made to have the change effected before new pavements are put down on the leading business thoroughfares, thereby avoiding the necessity of tearing them up again.

A GREAT deal of false economy has been practised in Toronto in the matter of putting down cheap pavements. It is satisfactory to note that the citizens appear to be tiring of experiments in this direction, and show a disposition to adopt something more costly and substantial for the future. A gentleman who spent the greater part of last summer in Europe, informed the writer that asphalt pavement, such as has been put down on Bay street in this city, and on St. James street, Montreal, is largely in use on the streets of old-world cities, and has given the best satisfaction. Of course, considering the difference in climate, it does not follow that a pavement which proves successful in London, for instance, will give like satisfaction here, but there is reason to believe that where asphalt is properly laid, it makes an excellent and durable pavement. We trust that before many years shall have elapsed, the character of the pavements on the principal business thoroughfares of this city will be so improved as to avoid the necessity of constant patching and enormous expenditure for repairs, and make it possible to keep the streets in a cleanly condition.

THERE is no person who should regard with greater satisfaction, the reorganization on a business-like footing of the City Engineer's Department of this city, than Mr. Sprout himself. Up to the present, that gentleman has not been given full control of his department, but has been expected to defer to the opinions and wishes of aldermen composing the Board of Works. The result has been, that when mistakes have occurred, the aldermen who persisted in having a hand in the management of affairs, shifted the whole responsibility upon the Chief Engineer for errors which probably would not have happened had the latter relied entirely upon his own judgment. The Mayor takes the right view of the matter by insisting that under the new order of things which just about to be established, the City Engineer shall have entire control of his department, with the power to nominate and discharge his subordinates, and that when this power is given him, he shall be held responsible for the proper conduct of his department. This is the method which obtains, and has proved to be satisfactory, in large private business concerns, and we have not the least doubt that it will work equally well in the public service.

A DISCUSSION, commenced in Australia and New Zealand, is being continued in the United States, relative to the advisability of changing the system under which all the public buildings of a nation are designed by one architect employed for that purpose by the Government. The opinion seems to prevail that if the designs for public buildings were put up to competition among the architects of the nation, a greater variety of designs, and designs which would be fairly representative of the architectural talent of the country, would be secured. Such a system would certainly give encouragement and stimulus to the study of architecture. We are inclined to doubt, however, whether a system of architectural competitions for public buildings would result to the profit or elevation of the architectural profession. It would open the door for the methods of the politician to creep in, and it is to be feared that those who would condescend to practice those methods, would get most of the prizes. If some equitable plan could be hit upon of allowing the architects of the country to share in the honor and profit of designing our public buildings, the results would no doubt be much more satisfactory than at present from every point of view. We should like to hear the opinions of architects on the subject.

THE step taken by the Toronto Board of Works in deciding that henceforth sewers upwards of 12 inches in diameter shall be constructed of brick, must be regarded as a retrograde one. The fact that the City Engineer protested against the proposed change, seems to have had but little or no effect upon the minds of the aldermen. There are several particulars in which a good pipe sewer is superior to a brick sewer. One of

the most important is, that being salt glazed, it is much smoother inside than a brick sewer with its many joints can possibly be, and consequently will not so easily fill up with sewage deposit. This is especially true where the street grade is but slight. It is a well-known fact that in certain kinds of soil it is next to impossible to put down a well-constructed single ring brick sewer. The opening up for repairs of some of the brick sewers constructed years ago in this city, has revealed the presence in them of large deposits of sewage matter. There is every probability that much of this deleterious matter finds its way through the pores and broken joints of the brick into the ground, and proves a source of danger to the public health. In addition to the disadvantages mentioned, there is the further important consideration, that a brick sewer, as shown by contractors' tenders, costs from ten to fifteen per cent. more than a pipe sewer. The action of the Board of Works in this matter strongly emphasizes the need for a change in the system under which the opinion of the City Engineer may be overridden by that of aldermen possessing little or no knowledge of construction.

PRACTICAL HINTS TO CARPENTERS.

BY OWEN D. MAGINNIS.

ONE of the most important and too often neglected things, in setting jambs, is to block behind the jambs for the screws of the hinges. In rebated jambs this blocking is indispensable; so measure down about 6 inches from the head and 9 inches from the floor, and nail in a 4 inch pine block on the stud, behind the jambs, to secure the screws. Builders should watch sub-contractors in this small matter, as the screws pull out, when they have no thickness to hold to.

If the casing have a beaded or molded edge without corner blocks, the top corners should be mitred with a mitre jack made in the following simple manner:—Take a piece of 1 1/4 inch stuff an inch or so wider than the width of the casing, about 2 feet 6 inches long, nail a fence or piece of 3/4 inch strip on both edges, rising above the surface the thickness of the casing. Now take a bevel set exactly, not nearly, but exactly, to an angle of 45°, or from 3 to 5 inches on the steel square, (reverse the bevel to see if the angle be true) and mark two reverse mitres across the edges of the 3/4 strips and the surface of the bottom or wide piece and over one edge,—the edge which has the short corners of the bevels. Saw deep enough into the wide piece on this marked edge, to cut through the bead or moulding on the casing when it is placed between the fences against the one which is sawn into. After putting the casing in its place and marking the top corner with a knife, the casing is placed against the fence with the mark exactly at the saw cut, and having the saw under the mark, so as to slightly leave it on the stuff—the mitre can be readily and instantly sawn without using a level or a template, which are inaccurate and unmanageable. The bottom end must fit tightly down on the upper end of the case block; if not, the end must be scribed to the block with the compasses before mitring.

All casings ought to be level across the face, so that when a straight-edge is placed across the opening, it will touch all their surfaces. The head should also be straight with the siles, and all the mitres and joints tight and well nailed. All mouldings and back bands can be mitred and nailed on when the above is done, and the mitres will come tight.

In setting back window jambs, or on those window frames which have outside blinds with a panel back below the sill, the following is the best way to proceed: First, cut with a chisel on a straight line, the groove (where it stops against the siles) out of the frame casing, both top and bottom, on both right and left casing, and clean all the mortar and dirt out of the plying. Now take the short rebated jamb for the head, and getting upon a high loose piece with its rebated tongue on the head groove, and mark exactly, with a sharp knife, the inside corner on the left and right hand groove. Square these marks over the face and lay out a dado 3/4 wide towards each end. Dado this laying out 3/4 deep. Next take the right and left jamb and square one end of each in pairs. Lay out a tongue 3/4 wide from these square ends and 3/4 thick, glued from the faces. Cut these tongues out and run a rebate—plane shaving of the back side of the tongues of the head jamb and sides, and take an aris of the face side. This will let the tongue go easily into the grooves in the frame. Next, nail the head on the sides, keeping the front edges flush, and break off the over length of tongue on the head piece. Set the tongues of the jambs in the frame grooves, and drive the jambs in till they sound solid. Use a block, so as not to bruise the edge in driving. When they are in solid, mark the groove at the sill, and see if the jambs are not too wide for the plaster; if they are, the over-width must be sawn or planed off until they come flush with the plaster. Take the jambs down when this is done, and lay out a 3/4 dado from the groove mark. This dado is to receive the foot-head. Then take the foot-head, cut it to the length of the dados of the head, and allow 3/4 for a tongue on each end. Work these tongues on 3/4 deep, and nip the foot-head to the width of the jambs. Ease the tongue as well as the jambs, and nail the head side and foot-head together afterwards, set them up in their place, and when they are driven home, toe-nail them into the casing.

It is reported that the massive blocks of stone required for the Canadian canal at Sault Ste. Marie, will be taken from the Owen Sound quarries.

The extensive stove and furnace manufacturing establishment of the McLary Mfg. Co., at London, Ont., was almost totally destroyed by fire a fortnight ago, involving a loss of \$100,000. We understand that arrangements have been made to re-build at once. In the meantime, order is being speedily evolved out of chaos, and owing to the large stocks on hand at its branch establishments the Company is enabled to fill orders as usual.



WHAT IS TRUE ARCHITECTURE?

BY R. W. GAMBER-BODSFIELD.

ASSOCIATE OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

PROFESSOR Roger Smith, in a recent lecture to students at the University College, London, remarked: "Remember, then, that it is a great mistake to attempt to use in designing what you do not understand," and he further says that it is not necessary to go far to see endless examples of this mistake, made by professing architects of to-day. If "architects," so called, would but take this to heart, there would be better examples of our art rising every day in our streets. Particularly is the advice of this genial professor to be taken to heart by students and draughtsmen, to encourage them to look carefully into the use and meaning, as exemplified in ancient buildings, of every feature and detail they would imitate or use as a base for their design. The Romans fell into this mistake nearly 2,000 years ago. They were fond of the pillar, but forgot its use, and introduced them as "useless additions without even a pretence of utility." The Roman order consisted, not of column and entablature, but of an arrangement of pillars placed at a distance apart, bearing a very heavy cornice which, in consequence of the distance of the pillars from one another, had to be supported in the centre by an arch springing from piers. The columns were raised on pedestals, and placed in front of the piers. So the pillars formed no part of the construction; the cornice was supported quite sufficiently by the wall. The Roman was a debased style, and not true art. But the question constantly arising in the mind of the student is, "What is real or true architecture?" The simplest definition is that of the elder Pryn, who says, that it is "ornamental or ornamented construction, not constructed ornament." The Roman order is an example of this "constructed ornament," in which this style differs materially from earlier and also later styles of architecture. Directly ornament is constructed—that is to say, when simply for the purpose of ornamenting a building, ornament is applied without aim or use, and you go out of the way to construct it, you go wrong, and your work is not true architecture. Our buildings may be constructed with ornament, but the ornament must be part and parcel of the whole design, and must not be piled on without regard to the use and object of the part ornamented. A pillar should not be used unless it has something to support, and that something not a mere ornamental cornice or band, but a useful lintel or impost of an arch, or a parapet wall, or something of similar character.

There is no example to be found among the Greeks, nor indeed is there in the rude architecture of the Persians, Chaldeans and Egyptians, anything approaching "constructed ornament," although some of their work is very highly ornamented; neither is there in the later Italian, or the round or pointed Gothic. From the time that the debased Roman died out, until the time when the "imitative styles" began to be employed, we find no example of it. The Egyptian, who seldom used the arch, never did so for ornament. The Assyrians never used a buttress without giving it real duty to perform, and the Persians and Greeks always used their pillars constructively, however highly they ornamented them. So in Gothic times—the arch, the flying buttress, the pinnacle, all features adding greatly to effect, have in every instance a use and a work to do that cannot be done so well by any other means. They are ornamental construction, not constructed ornament.

What tremendously costly works are the buttresses to be seen outside every Gothic cathedral, piled up tier on tier, with flying buttresses resting on them, it may be two or even three at different levels. Nor does the buttress end when it has given an abutment to the highest flyer, but towers above and terminates in a lofty pinnacle far above the eaves of the roof or parapet wall. One might as a casual observer say, this was constructed ornament with a vengeance, and therefore, false art; where is the use of it all? But there is a deep principle, implying marvellous skill and great mechanical knowledge at work here, for the weight of the pinnacle, counterbalancing the thrust of the roof along the flying buttress, obviates the necessity of a far more cumbersome buttress, which would be necessary if it were not for the pinnacle, to ensure the stability of the structure. True art admits of making the buttress ornamental, though it utterly condemns the use of the buttress where no buttress is



RESIDENCE FOR DR. J. E. GRAHAM, TORONTO.

required. It is the same with the beautiful canopies of stone, supported sometimes by solid masonry, pierced only by a narrow light, at others by the slightest of shafts, sometimes forming a head to a window, at others without any apparent object, that stand at the bases or many spires. Their work is to counterbalance by their weight the outward thrust of the sloping sides of the spire.

As another example, take the clustered shafts supporting the nave arches of a XIII century cathedral. How slight and delicate they are, especially when compared with the heavy Norman columns, or the massive Italian piers, or early French abutments. The slender, lofty shaft, rising almost uninterruptedly from the base near the ground to the spring of the stone vaulted ceiling, bearing its portion of the load above, obtaining its lateral support from the wall against which it stands and to which it is here and there attached—those marvellous pendants from the fan-vaulting of the XV century, of which a well known example is in the roof of Henry VII's chapel at Westminster, constructed with such extraordinary ingenuity—are not mere ornamental "drops," but perform a very serious and important duty, forming actual abutments to the downward curved surfaces of the fan-vaulting from which they actually hang. Such construction is a marvel now, even though we have the detail of every stone employed; much more was it a mystery in years when the knowledge of the art had first died out, which it soon did, under the influence of the Reformation. These hanging masses of stone looked very threatening over the heads of the devout worshippers, no doubt, but they have hung for over 350 years, and except an earthquake rent the vault, they cannot fall. Sir Christopher Wren, the great apostle of the imitative styles, when asked about them, shook his head, as at a problem far too deep for him to solve, and replied to his querist: "If you will tell me how they are constructed, I will go and do likewise." The key to the answer must be found in their use and object. Sir Christopher Wren could not comprehend this, and therefore he was not ashamed to say he knew nothing about them. Understanding what duty they perform, it is not a difficult matter to get at their construction. And thus it is, with every feature, and it behoves us as the expounders to the rest of the world of the art of Architecture, to look into these matters, and if we profess to be architects, to act accordingly.

Students and draughtsmen must beware of the easily acquired, but none the less barbarous habit, of introducing details and features they do not comprehend. If a man wishes to be ever anything but a mere copyist, he must apply himself to this study. It will repay him well, and give him a great interest in his work, such as he perhaps never dreamt of before, and his ultimate designs will be free from the insipid, childish details, stuck on without rhyme or reason, that are to be met with side by side with the works of men who know what they are doing. Some men call themselves architects, that is, expounders and practicers of the art of Architecture, when they do not know the A B C of the art.

UNFAIR PRACTICE.

Editor CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—I want to call your attention to a piece of very unfair practice on the part of some men practising as architects. "Architects," so called, appear to forget that it is their duty to stand between the proprietor and the contractor and see that the one is fairly dealt with by the other. I find it is the custom of some men not well up in estimating their designs, to ask builders to tender as if the work had been definitely ordered by the client. The builder spends valuable time and trouble on preparing a tender, believing the work to be going on if tenders are satisfactory, not knowing that the chances are that nothing further will be done, that is to say, that the client has not yet made up his mind that he will proceed with the work because he has not had an estimate of the cost. An architect has no right to treat contractors so. He should be able to prepare himself a good estimate of the cost, and then, if the amount meets with the client's approval, to obtain tenders on the understanding that the works are to proceed if the tenders are satisfactory. My attention was called to this method of procedure by a client of mine informing me he had found it the custom with some "architects" he had employed, and told me he would not trust any architect's estimate unless based on actual tenders. He expected me to prepare working drawings, details, rough) and specifications, get contractors to tender, and let him know the result, all on the chance of its coming within a figure he had in his mind. He said he had had a great deal to do with building, and this was the invariable way he had proceeded. I remonstrated with him in vain, and told him flatly no architect would do such a thing. The result was, he took the whole matter out

of my hands, and, I dare say, went back to his "architects" so called. My blessing went with him. Those kind of men are not the clients for architects proper.

Yours truly,
"AN ARCHITECT."

MASONRY AND STONE CUTTING.

By JOHN A. PEARSON.

A VERY interesting and instructive address on the above subject was given before the members of the Toronto Architectural Draughtsmen's Association, Nov. 20th, by Mr. John A. Pearson, recently from England, now of this city. The subject was introduced with a few useful hints to be observed in the preparation of foundations to receive footings, and the best methods of laying drain pipes, the points to be observed and avoided, the composition of mortars and cements, and the best manner of testing their respective qualities.

FOUNDATION WALLS.—In laying footing courses, the broadest bed should be placed down. When a large quantity is required, there is sometimes a difficulty experienced in obtaining them all of an equal thickness. They generally run off from the six inches specified, to three or four inches, and if the architect is not watchful, the wane side is placed against the bank and packed up level with a spall, and the full six inches thick exposed to view. In foundation walls, there is always a tendency to make the inner face strongest, for the reason that it is the line face, and always exposed. The mason sets up his inner face first, thus securing the first place on the wall, and naturally selects the best stone to make a presentable face (especially if it is to be pointed for lime whitening). The bank side is next walled with the stones that have been picked over, and, in some cases, knocked off to suit the tailers of the inner face. Less care and time is thus expended on the bank side. Wallers are never constantly in the employ of one builder; as soon as the foundations are in they are stopped, and must seek employment elsewhere. Being so migratory, they are not over scrupulous, and it cannot be expected they would place the good stone against bank, and the wane footing exposed, to be condemned by the architect, who is always satisfied with a strong looking job.

The reveals to door and window openings are generally allowed to be built in brick to save labor cutting, the brick tied into the rubble, and the lintel thrown across, which has a bearing never more than nine inches—the whole thus forming a kind of loose case. This is not desirable if it is to be built in brick; the rubble should run through every four or five courses to tie the work, not the brick, for 6½ inches is as long a tie as can be obtained in brick work. The rubble which forms the body of the wall should form the tie.

After minutely describing the different kinds of wall stones and walling, particularly sneek walling (so often aimed at but seldom attained), which depended chiefly upon the setting up of the lades, and the arrangement of the stones in the wall, the speaker went on to say:—Wallers should always work opposite to each other. Never allow one man to build a wall alone. Walling is different to brick work, it being possible to raise only one face to the height of the "lade" (which should never be more than 15 inches) at a time, the stones must necessarily become narrower on the bed, whereas, if two were employed, they could overlap or tie on to each other's work, in the height of the line. A foolish mistake with some architects is to insist upon the stone being squared back full five or six inches on the joint. Three or four inches is ample, the stone then tapering off, enabling the opposite stone to indent with it, and the fillers being placed diagonally or straight across. All wall stones should be placed on their natural bed; if reversed they will drink the water more freely. Guard against walling in "bleeders," the presence of the iron in them is generally detected by a blue, yellow or purple tint in different kinds of stone. Turning the stone so that the bed forms the face, should be condemned.

In ogee or circular walls, after the first two courses have been set to the trammel or template, pegs are driven in 2 ft. 6 in. or 3 ft. apart, to project sufficiently to clear the rock for plumbing, and from these points the "lades" are set up and walled in between. Where sills occur, they should be set on "throughs" and ties thrown immediately across door and window heads. All walls should be weather pointed, not jointed, for in jointing, on either side of the impress of the tool is left a narrow band of mortar untouched by the steel, left raw and porous, which absorbs the water freely.

TESTING THE WORK.—If there is any doubt as to the fillers being properly bedded, pull out here and there in the wall, and hold a lighted candle in the aperture. If dry, the flame will be disturbed by the current of air which will play inside the wall. Take a flexible cane, and walk over the work; if the stones rise under

the feet, you may be sure they are not properly bedded, and by forcing the cane down into the wall in different places, you can gain a fair idea as to the number of throughs.

STONE CUTTING.—After describing the numerous tools and uses of some employed in stone cutting, a description was given of rock, punched, rowed, inch-tooled, scouted, bush hammered, boasted, tooled, and cleansed faces, and the method by which a mason would bring a stone to a plane surface—the sinking, squaring back, and trammelling required in running moulded work in arch stones, and how arch stones were often worked slack to the square on the joints. The different throats, water joints, dowelling, joggles for coping, projecting string courses, cornices and arch stones were fully explained; also what "banker marks" were, which, in very old buildings, were cut on the face of the stone, and by the comparison of which the date of different buildings could be arrived at. The speaker pointed out the way to detect the bed of a stone, and the presence of "drys," explained the way in which stones were "lewis'd" to be raised, and the setting of ashlar and moulded work, and concluded by exposing a few of the frauds that are practised in the trade in worked stone, where to look for such, and the best way to detect them.

A STUDENT'S REPLY TO "ABACUS."

EDITOR CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—After reading "Notes of a Trip to the West" in the last number of the CANADIAN ARCHITECT AND BUILDER, I was much disappointed, as I could see in them no information of a practical kind, nor anything but a wholesale condemnation, on the one hand, of architecture as seen in Chicago and the States, and on the other, about as general a compliment for Toronto architecture, all in such sweeping terms as to make one doubt if any part of the article referred to is entitled to any consideration whatever.

As a student, I feel the need of help to make proper comparisons and to form correct opinions as to the merits of different works, but it certainly will not tend to my improvement if I am satisfied to stop with the conclusion that this or that is good because I like it, and that another is bad because it is not satisfactory to me, without attempting to go into some analysis to establish a reason for my opinion.

I have many times wished that in such articles as the one mentioned, by "Abacus," we might find more definiteness. If a piece of architecture is condemned, the reason might be shown in detail, even introducing some sketching, if necessary, in order to show what would remedy the fault found and make the work good instead of bad.

I am willing to agree with "Abacus" that there are many vulgar, inartistic and ridiculous examples of architectural failures in Chicago, and also that there are many buildings in Toronto worthy of admiration, study and pride, but in all fairness, is not the reverse of this equally true?

Some parts of "Abacus" notes strike me as being somewhat inconsistent, and other parts so extravagant in language as to be ridiculous. He says of the house by Richardson, on Prairie Avenue: "It is the most artistic house which we have yet had the pleasure of seeing—it is dignified, quiet, unobtrusive, yet refined and homelike. Unless the *Man* of this house was *known* to the beholder, he would be inclined to look upon it as retiring and gloomy in the extreme." So in the case of "this most artistic house," whether a beholder would regard it as "refined and homelike," or "retiring and gloomy in the extreme," would depend on whether or not he "knew the plan." On this ground, perhaps, if "Abacus" had "known the plans" of all the other houses, some might have found more favor in his judgment.

I should like to notice some of the public buildings both in Chicago and Toronto which are mentioned by "Abacus," but do not wish to trespass too much on your valuable space. If, with all the architects in Chicago, and the immense amount of expenditure under their direction, the sum total of their productions is, as stated by "Abacus," "a few, indeed, of artistic houses," one wholesale store building "artistically worth more than all its other buildings," and churches, "the best of which have so much that is bad about them, that one cannot speak even a single word in praise," where, oh, where, is the encouragement to study, with a hope of producing anything artistic enough to earn the good opinion of such critics as "Abacus."

Would it not be more valuable to both architects and students to have an analysis or criticism of one or a few examples, with reasons for conclusions drawn, and suggestions of remedies for defects?

Give us something more definite.

STUDENT.

OUR ILLUSTRATIONS.

RESIDENCE FOR GEO. G. BOOTH, ESQ., DETROIT, MICH.—MASON & RICE, ARCHITECTS.

THIS house is situated on Trumbull Ave., and is constructed of stone and red brick. The front and side bay windows are entirely of bronze, with richly wrought frames of the same metal. The roof is of red slate, with ridge of copper. The entrance is of red stone, beautifully carved. The owner is Mr. Geo. G. Booth, manager of the Detroit Evening News, formerly President of the Barnum Wire and Iron Works, Windsor, Ont. Messrs. Mason & Rice, Detroit, are the architects.

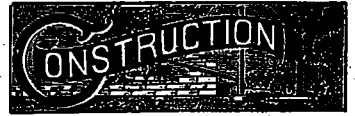
RESIDENCE FOR DR. J. E. GRAHAM, TORONTO.—E. J. LENNOX, ARCHITECT.

The frontage of this residence is 25 feet, and the depth 65 feet. The plinth and sills are of Credit Valley stone. The pillars, frieze and dormer, are of terra cotta. The roof is covered with red tiles and red slate. The cornice and conductors are of copper. The entrance steps are built of Credit Valley stone and brick. The cost of this residence was about \$8,000.

of the house, except for floors and roof. The vestibule is not satisfactory, and has three exposed sides. The verandah is well placed, and would be serviceable. The bedroom floor plan is very good. The bath-room fixtures should be arranged to allow of a window to the east, and not to the north. The attic plan is weak, in that all the bedrooms are made to open out of a store-room. The elevations are fairly good, with the exception of the awkward roofing of the main hall projection.

"CANADIAN ARCHITECT AND BUILDER" PRIZE COMPETITION.

A NUMBER of very creditable designs for a new heading for this journal have been received in response to the competition announced in our October issue. As none of the designs are entirely satisfactory in every particular, it has been decided to divide the prize of \$1500 between the authors of the two which come the nearest to fulfilling the requirements. The selected designs, in the order of merit, are by "JOHN" (L. Fleming Taylor, Ottawa, Ont.), and "Manipulator," (Ernest Wilby, Toronto). To the first named author \$10 is awarded, and to the second, \$5.



Architects, Engineers, Builders, Contractors and others are invited to contribute to this department of their experience regarding methods of construction. Also particulars—such as location, character, cost and name of owner, etc.—of any works of construction in progress.

OH'ER SOUND.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

D. R. G. S. PATERSON, is building a four story brick hotel on the site of the old frame "City Hotel," Poulton street. The new building will have a frontage of 102 ft. by a depth of 54 ft., and two wings at the rear, each 25 ft. x 72 ft., two stories high. A passenger elevator will run to the top story from the office hall on ground floor. The building will be heated by steam, will have electric bells to all rooms, and will be otherwise fitted out with all modern conveniences. The building when completed will cost about \$16,000. Contracts let as follows:—R. Mallow, masonry, brick and cut stone, \$4,600; Chas. Gordon, carpenter work, \$4,950; R. P. Butchart & Bro., plumbing and galvanized iron work, roofing, gas piping and steam heating, \$2,875; W. McClelland,



SOUTH ELEVATION



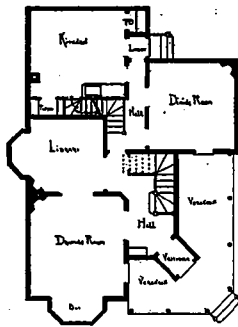
EAST ELEVATION



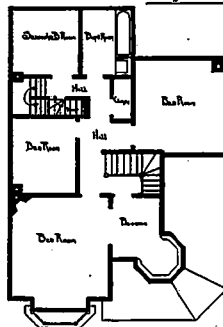
WEST ELEVATION



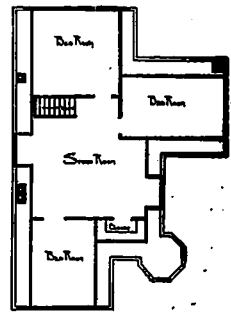
DESIGN FOR A \$2500 HOUSE



GROUND FLOOR



FIRST FLOOR



ATTIC

"CANADIAN ARCHITECT AND BUILDER" COMPETITION FOR A \$2,500 TOWN HOUSE—DESIGN BY "DEUX MILLE CINQ CENT."

This design is not an easy one to criticize. It is in some respects a good plan, and yet very deficient. The living room cannot be gained except through the back hall, and even then, one must pass under the main staircase. There is no serving pantry to the dining room. The kitchen is of good size, but there is an overabundance of doors and windows, thus reducing the available space. The kitchen entrance is well arranged, and the passage to the main hall is very good, but not worth the loss of room. It may be good planning to place the fire places in the angles of the rooms, but there is such a thing as having too many of them. The dining room fire-place should have been in the centre of the north wall space. The dining room is well placed, but requires space devoted to passage to make it the proper size. The library we do not like, as it is on the west side, and the bay window would make it very cold in winter. A library or sitting room should have a south or east exposure. The hall is unnecessarily narrow and crowded; the outside wall could have been two feet east of its present position, without increasing the cost

INFORMATION WANTED.

CITY HALL, QUEBEC, NOV. 26th, 1888.

Editor CANADIAN ARCHITECT AND BUILDER.

SIR,—Can any of your readers inform me how a four feet square drawing, or other board, can be made say from 1/4 to 1 inch thick, which will not warp? It must be of some kind of soft wood, as pine, basswood, butternut, in which brass tacks may be driven representative of the relative position of the city electric lights, whereon, by not quite homing the little nails, all the electric circuits wires, single or double, may be represented by delicate wires or twine of different colours, by threading along and around the projecting heads of the nails or pins. I am thus explanatory, that other cities may avail themselves of the idea of so representing their streets, lights, and circuits on printed or lithographed copy of their respective city maps, mounted on blocks as aforesaid.

The question is, how can the board be made so as not to warp, and thus throw the plan into kinks and wrinkles? Will two 1/4 or 3/4 inch thicknesses laid crossways of each other and glued together, answer the purpose? Would it suit to lay the boards alternately with the grain in opposite directions? or what other mode can be adopted to prevent warping, or get the board out of winding, than that of screwing or fixing it to a wall or partition, which prevents it from being easily removed therefrom and put on a table when required for alterations, additions or extensions. A solution will oblige.

Yours truly,

C. BAILLARGE, City Engineer, Quebec.

[Referred to our readers.]

ing and plastering, \$1,775; Alex. Hill, painting and glazing, \$500.

The widening of the harbor it to be proceeded with at once. The west bank of the river will be dredged away for a distance of 2,500 ft., and averaging about 300 ft. from present water line back, taking away several buildings, including Lemon's pottery and Griffith's tannery. Total cost of the work will be in the neighborhood of \$60,000.

The new steel steamer being built for the C. P. R., at the Polson ship-yard, is fast being brought to completion, as far as the hull is concerned. The Polson works have also got the contract for the cabin work.

QUEBEC.

(CORRESPONDENCE OF THE CANADIAN ARCHITECT AND BUILDER.)

CORRECTIONS in last month's report: The cost of Dr Cosgrain's house should read, \$6,000, instead of \$500; the weight of S. Matthew's Church bells should be 6,000 lbs, instead of 600 lbs, and that of the Cathedral bells 8,000, instead of 800; the words "unfrequent erection" should read "unfrequent event," (used in connection with the hanging of S. Matthew's bells).

The site of the present skating rink being required by the Government to complete the open area in front of the new parliament buildings, arrangements have been concluded whereby the skating club undertake to demolish and remove the present rink next April. It is to be rebuilt on the opposite side of Grande Allee, on a modified plan, using the present timber arches to span the gap

space and platforms as at present. In other respects the building will differ materially from the present one; one new feature being the erection of a bowling alley in connection with the rink. The same ice space will be maintained, that is, 17,672 sq. feet. Provision has been made for dressing rooms, secretary's office, caretaker's apartments, accommodation being also secured for the various snow-shoe clubs, including a large supper room, with windows overlooking the ice. The contract has been let to Mr. George Boleau for about \$71,000. The work is in charge of Mr. H. Staveley, architect.

Mr. Valliere, furniture manufacturer, is having a handsome store dwelling erected on St. Augustin street, for occupation next May. Mr. Edward Cote is the contractor; Mr. J. F. Peacky, architect.

The St. Patrick's Literary Institute, whose hall on St. Anne street was almost entirely destroyed by fire last February, have entered into a contract with Charles A. O'Leary to rebuild it at a cost of about \$6,000. The hall will have a seating capacity of about 800. It will be furnished in an inexpensive manner, but will form a neat, cosy room for lectures, society meetings, etc. Mr. H. Staveley, architect.

OTTAWA.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

A clear open winter up to the present time has been a blessing to the builders of this city. As there has been no snow yet, contractors have been enabled to continue outside operations, and a few weeks more of the present weather will see buildings now under way properly enclosed for the winter.

The building by-law referred to in my last, has been before the city council, and as only ten clauses have been deposited of it, it will take several meetings to complete it. The general impression is, that if not knocked in the head altogether, it will be considerably modified, as the majority of the aldermen consider the by-law in its present form too stringent for the city at the present time, and that it would materially interfere with building operations. Until the by-law is adopted and an inspector appointed, it will be impossible to keep a correct record of building operations.

A preliminary meeting was held on Saturday, the 1st inst., at the office of Mr. G. F. Stalker, of those interested in the formation of an Architectural Association for Ottawa. The matter had been talked of for some time, and the necessity for the existence of such a society was generally recognized. At the meeting on Saturday, a general discussion took place on the situation, which had the effect of clearing the ground, and a few resolutions were adopted upon which it was hoped an Architectural Institute for Ottawa would be established. An adjourned meeting was called for Wednesday afternoon, the 5th inst., at W. Arnold's office, which was well attended. The resolutions adopted at the preliminary meeting were sustained and signed by all present. An Architectural Institute for Ottawa was formed, and a committee appointed to draw up by-laws, and submit the same at a future meeting of the Institute. The officers of the Institute will then be appointed, and the by-laws finally considered and adopted, with such changes as may be found necessary. In the meantime, Mr. G. F. Stalker has been appointed Secretary pro tem. It is to be hoped that the architects of other cities will follow this example, and before many months a convention of Ontario architects will be called with the object of forming an Ontario Association. Judging from the great benefits derived by the members of the American Association, I would imagine that the Ontario architects would be unanimous on this point.

The many friends of Chief Government Architect Fuller will be pleased to hear that he is improving rapidly, but will not be able to resume his duties for several weeks.

Very little building operations are spoken of for next year. It is supposed they will fall far short of this year, as this has been an exceptional season.

OTTAWA, ONT.—Following is a report of the building operation for 1888.—Architect F. J. Alexander reports: Union Bank building, cost \$20,000; 6 residences, total cost \$27,800; school house in Stewartstown, cost \$1,000; school house in Hintonburgh, cost \$4,500. Architect G. F. Stalker reports: 3 brick stores, cost \$71,000; 7 residences, total cost \$71,500; organ gallery, Dominion Methodist Church, \$1,000. Architect James R. Bowers reports: 4 separate schools, total cost \$24,700; central police station, cost \$14,000; Congregational Church, cost \$20,500; tenements, total cost \$15,500; 2 brick residences, total cost \$7,700; addition to Harris & Campbell's factory, cost \$5,000; 9 brick cottages, cost \$26,000; interior improvements to St. Patrick's Church, cost \$3,500; Rideau skating and curling rink, cost \$10,600; St. Bridget's Church, \$75,000; R. C. Church, Jettville, cost \$3,000; Church at Vinton, \$14,000. Architect James Mather reports: Y. M. C. A. building, cost \$18,000; British American Bank Note building, cost \$30,000; Presbyterian Church, cost \$6,000; a brick residences, total cost \$15,000; 5 stores, cost \$8,000. General—9 private residences, total cost \$45,600; stores, total cost \$29,000; Orange Hall, cost \$7,000; Government Printing Bureau, cost \$100,000; tenements, \$14,600; German Lutheran Church, cost \$12,000.

It would be safe to estimate the value of other buildings not included in the above at \$50,000. Not a bad showing for Ottawa for 1888.

The Government has expended a large amount of money paying Wellington st. in front of the Parliament Buildings, and a great deal of work has been done on the new Departmental Building. The building has been roofed the past season, and the interior work is now being done. When completed, it will cost \$750,000, and is considered to be the most prepossessing and substantial building in the Dominion, and a lasting monument to Chief Architect Fuller.

Every contractor should have a copy of "The Canadian Contractor's Hand-Book" to be published shortly. Send \$2 for the book and the "Canadian Architect and Builder" for 2 year.

BROOKVILLE.

BROOKVILLE, Nov. 21st, 1888.

EDITOR CANADIAN ARCHITECT AND BUILDER.
DEAR SIR,—I have been in receipt of the last five numbers of your publication, and must say that I am well pleased with same, and trust that you will receive the hearty support of every architect and person interested in building in Canada, so that you may be enabled to steadily improve the standing of your Journal, that it may stand at the head of all such publications in the near future. I see in the columns of your last issue, several references made by your contributors to the importance of forming an Architectural Association in Canada, and regret that the Toronto architects, who should take the lead in all such matters, do not make some decisive move in that direction and form an Association at once, so that they may be able to hold several meetings during the winter months, and have the Association placed on a firm footing.

Building operations have not been very brisk this season, though several important buildings are now in the course of erection, from which I select the following as being the most important: Addition to the Leeds and Grenville County Court House, Craik & Mix, contractors, probable cost \$22,000; Geo. A. Allan, architect. Fulford building, a large four story building divided into stores and offices and containing the store and work rooms of Messrs. Fulford & Co., constructed of lime-stone with brown Credit Valley free stone dressings. This building is being erected by day work under the able supervision of John Mix; probable cost \$18,500; Geo. A. Allan, architect. Brockville High School, a two story building constructed of lime stone with Scotch sand stone dressing, heated and ventilated by Messrs. Smead & Dowd's system, Messrs. Logan, Price & Hagerly, contractors, probable cost \$16,000; John McMillen, building superintendent. Galena building, a three story brick building containing stores, billiard saloon and dwellings, probable cost \$6,500; O. E. Liston, architect. Masonic Hall, owned by Thomas Tompkins, a large three story building containing stores, offices and Masonic lodge rooms, constructed of brown Credit Valley free stone and Scotch sand stone, is being built by the day under Wm. Tompkins, foreman, probable cost \$18,000; Geo. A. Allan, architect. General Hospital, a two story brick building, heated and ventilated by the Smead & Dowd system; John D. Warwick, contractor, probable cost \$8,200; Geo. A. Allan, architect. We are now having constructed a complete sewer system under the able supervision of Willis Chipman, C. E., which, when completed, will be one of the best, if not the best, of its kind in Canada. Mr. Chipman attends to and strictly enforces the rules and regulations which govern plumbing in Brockville, and which places all plumbing done in this town at the head, as regards safety and durability. I enclose, my subscription to the CANADIAN ARCHITECT AND BUILDER up to July, 1889. Trusting that you may have every success in your undertaking, I remain,

Yours truly,

GEO. A. ALLAN.

CANADIAN SOCIETY OF CIVIL ENGINEERS BALLOT LIST.

THE Nominating Committee having recommended the following list of officers and members of Council for the year 1889, the Council now submits the same to ballot:—For President, C. S. Gzowski, Toronto, For Vice-Presidents, E. P. Hunnaford, Montreal; H. F. Perley, Ottawa; P. S. Peterson, Montreal. For Treasurer, H. Wallis, Montreal, For Secretary, H. T. Bovey, Montreal. For Librarian, F. Chadwick, Montreal. For Members of Council, G. F. Billinge, Ottawa, O.; J. D. Rarnett, Strimford, O.; St. G. Boswell, Quebec, Q.; T. R. F. Brown, Montreal, Q.; G. C. Cunningham, Sherbrooke, Q.; E. Gilpin, Jr., Bedford, U.S.; F. U. G. Osborne, Ottawa, O.; W. J. Jennings, Toronto, O.; G. A. Keefer, Vancouver, B.C.; J. Kennedy, Montreal, Q.; B. D. McCConnell, Montreal, Q.; M. Murphy, Halifax, N. S.; J. E. Vanier, Montreal, Q.; E. Wazge, Toronto, O. We regret to learn that certain of the members have issued, in opposition to the "house list," an anonymous list, and seemingly in misunderstanding of the first mentioned list, which provides for the insertion of other names where the voter desires. Mr. Allan Macdougall, who is nominated on the anonymous list, has declared his intention of supporting the house-list, and has made the request to the members that they neither vote for him nor do anything to destroy the existing harmony the Society enjoys.

ST. STEPHEN, N. B., Nov. 23, 1888.

EDITOR CANADIAN ARCHITECT AND BUILDER.
DEAR SIR,—We have been interested in the articles in your last two issues regarding Canadian and imported sewer pipe. We have no quarrel with the statement made by you in the October number of your paper, as it evidently referred only to vitrified pipe, but would like to call your attention to the fact that we manufacture here a sewer pipe which is second to no vitrified pipe either Canadian or imported. In point of durability, and in some other respects it has much superior. Our pipe is not an ordinary cement pipe, but goes through a process of carbonizing which greatly increases its strength and hardness, and makes it nearly like a piece of natural stone. Ours is the only factory of the kind in Canada, and this is only the second season for us; but our pipe is getting now well into the market and making a way for itself. In this town and some neighboring towns, it is exclusively used for both public and private sewers, and it is no mere experiment, as the same article has been used in some parts of the United States for many years, and in some of the large Western cities has entirely supplanted vitrified pipe.

Respectfully yours,

C. N. VROOM & CO.

A French exchange gives us a new plan for deadening floors without loading the planks. Fill the empty parts between the joist works with liquid lime thickened with chloride of zinc. This will prevent noise, fire, vermin, and the house will be rendered healthy. Workmen using this preparation should wear guarded spectacles, and wash their hands well after the work is completed.



Architects, Engineers, Builders, Owners and others are invited to send descriptions of all kinds of construction work for consideration, for publication in this department. Please state location, character and cost, and names of person or persons controlling the work.

LONDON, ONT.—A \$1,000 extension to the hospital will be built this fall.

STRATHROY, ONT.—The site for a new post office has been selected.

BRANTFORD, ONT.—The Public School Board has decided to erect two new school buildings.

WINNIPEG, MAN.—A handsome market will probably be erected here, costing between \$30,000 and \$40,000.

NORWOOD, ONT.—A new church to cost between \$15,000 and \$20,000 is to be erected here by the Methodists.

BELLEVILLE, ONT.—The Bay Bridge Company is being organized and tenders will soon be asked for the construction of the bridge.

GUELPH, ONT.—A vote will be taken on the 7th of Jan. on a by-law to grant \$15,000, for the extension of the water-works system.

OTTAWA, ONT.—The Marine Department asks tenders for the erection of a lighthouse and buildings at Gargantua harbor, north shore of Lake Superior.

CALGARY, N. W. T.—Mr. T. C. Keefer, C. E., Ottawa, is preparing plans for a water works system for this place. It is proposed to adopt the Holly direct pressure system. Work will begin early in the spring.

VANCOUVER, B. C.—It is understood that the sum of \$50,000 has been set aside by the directors of the Bank of Montreal, for the erection of a handsome building in this city.—A site for a new Anglican Church has been selected.

TORONTO, ONT.—It has been decided to expend \$90,000 in extending the city water-works system.—Tenders are asked until the 21st inst. for the construction of two bridges to cross Duendes street. Particulars from Aid. Crayle, Chairman Works Committee.—The Ontario Government are said to have rejected all tenders for the Upper Canada College new buildings, the lowest being about \$80,000 above the appropriation, and that new tenders will shortly be called.

BUILDING REVIEW, 1888.

GALT, ONT.—\$172,866 worth of new buildings have been put up this year.

COMBER, ONT.—Building improvements to the amount of \$25,000 is claimed.

BLENHEIM, ONT.—Nearly \$40,000 were expended in new buildings during last season.

PERTH, ONT.—Building operations during the season just closing amounted to \$90,000.

BRANDON, MAN.—\$50,000 have been expended in building operations during the past year.

BERLIN, ONT.—\$72,825 have been spent during the past season upon 157 new buildings and additions.

ELMHURST, ONT.—This village has enjoyed quite a boom during the past season, \$21,850 have been spent in building improvements.

SMITH'S FALLS, ONT.—There has been quite a building boom this year. \$165,000 have been spent in building and improvements.

WOODSTOCK, ONT.—During the past year 238 houses were erected and a quarter of a million of dollars spent in building operations. Two-thirds of a mile of flagstone pavement has also been laid.

CARLETON PLACE, ONT.—Building operations during the past season were very brisk. Over \$175,000 were spent in the erection of new buildings and improvements to old ones. In all, eighty buildings were put up.

WINDSOR, ONT.—During the past twelve months, buildings have been erected or are in course of erection to the cost of \$280,273. The town Council has expended in sewer and other public works \$76,500, making a total of \$356,773.

MONCTON, N. B.—Over 75 new buildings have been erected here during the past season, at a cost of \$87,000. There were also some 200-225 extensions in additions to buildings, costing about \$15,000, making a total amount of \$100,000.

WHITBY, ONT.—This has been the liveliest season for some years in the building trade here. Building and rebuilding to the amount of \$75,000 are either finished or under way, and the prospects are fair for a continuance next year of the present activity.

PETERBORO', ONT.—Building operations this year amount to over \$270,000, and in the village of Ashburnham, about \$45,000, making a total for both places of over \$315,000, an increase of \$100,000 over 1887. The list includes 3 blocks of stores, the Salvation Army temple two hotels, a woolen factory, and a large number of residences. In addition to these, there is the Nicholls Hospital, in course of erection, the cost of which will be \$25,000.

TORONTO, ONT.—The cost of new buildings erected in Toronto during the past year, aggregates in round numbers about \$4,000,000, nearly half (\$2,283,000) this sum was spent in the erection of dwellings; stores, \$330,000; churches, \$220,000; warehouses, \$104,000; Gas Company's buildings, \$60,000; hotels and clubs, \$68,000; city buildings, \$161,000; schools, \$20,000; elevators, \$25,000; stables, etc., \$30,000; charitable institutions, \$36,000; riaks, \$38,000; factories and shops, \$42,000.



SUGGESTIONS FOR DECORATORS.

CONCERNING that very essential property in ornamental art, beauty, writes Mr. James Ward, Head Master of the School of Art, Macclesfield, Eng., in the *Painters' Magazine*, it may be said that to lay down any laws or rules for its application in design, would be a very difficult task. It has really so many rules as to be almost past definition, for in nature its prime qualities or very essence appeals to the intellect, and is in a sort of way felt and is quite inexpressible in art. It is, however, generally admitted that the highest form of beauty in ornament consists in the perfection of fitness. For example, you cannot decorate to any extent, if at all, a column of a severe, or indeed any order of architecture (except the head or capital), without weakening the appearance of it. It is already beautiful in its outlines and perfect in design for its position in the building, and wants little or no decoration to make it any more beautiful.

A safe rule to observe in the decoration of almost anything, from a temple or a house to a vase or a coal scuttle, is to take the lesson that nature teaches in the distribution of color and form; she carefully avoids on the plumes of bird's feathers, and on plants, animals, and many other things, any wealth of color or decoration on what may be called the working parts; it is the tips of the feathers, the crests and ends of the plumes, the upper surfaces of wings in butterflies, and wing cases in beetles, the spots on the backs of the tigers and leopards and of most fish and shellfish. The tips and upper ends of plants bear their cups, their spikes, and waving plumes of gay flower heads; in short, wherever strength and work reside in nature, you will not find any lavish expenditure of decoration. What beauty it may possess will be the beauty of fitness; the trunk, the stems and the roots of plants. The quill ends of the feathers of birds possess alone the beauty of strength and constructive utility. In unison with these laws the savage carves his weapons of war. He will only carve and decorate the part that does not interfere with his handling of them—he leaves all the working parts plain. It is wrong, therefore, to overload the mouldings and framework of doors and cabinets, or any other constructive parts, with carving or decoration. The part that folds over the edge of the table in an embroidered cloth should be left plain. So in beams, arches, groups of mouldings, or borders around panels, give as much constructive beauty as you like, but otherwise let them be simple in color, or leave them severely alone. It is on the panel or field, such as the ceiling, the wall, the carpet, or hangings that you can be lavish in your decorations, at the same time avoiding anything that would disturb the repose of such surfaces, either in form or color.

The master painter of to-day is said to have control of 15,000 different shades of color.

A strong application of ordinary spirits of camphor will remove almost any kind of polish or varnish; so also will the solution of potash.

A convenient preparation for rebrowning gas fixtures is made by mixing bronze powder with any transparent varnish, say amber, gum damar or copal. Do not mix more than you are going to use at once, because most bronze powders act as powerful dyes, and what you have left of the mixture soon becomes hard and useless. It is best to put a little of the varnish in a small flat saucer and some of the loose powder next to it, and mix with the brush while you are using it, as a painter mixes colors on his palette.

A report of the Toronto Plumbers' banquet, at which speeches were made by Messrs. W. J. Burroughes, J. J. Withrow and others, in favor of the establishment of trade schools, is unavoidably crowded out of this paper.

The sanitary condition of the city of Winnipeg is said to be far from satisfactory. The daily papers charge that the sewers were not flushed once during the past summer, and that lanes, back yards and alleys, cause foul odors to assail the pedestrian at every turn. The Health Department of the city of Winnipeg would seem to be far more ornamental than useful.

Send \$2 and receive the "Canadian Architect and Builder" for one year and a copy of the "Canadian Contractor's Hand-Book."



THE SEWERAGE OF SMALL CITIES AND TOWNS.

By WILLIS CHIPMAN, B.A., C.E.

SEWAGE removal by water carriage has been in use for centuries. When the sewers are designed to carry not only the sewage proper, but the rainfall as well, the system is known as the *combined system*; when the storm water is excluded, the *separate system*; when part of the rainfall is allowed to enter the sewer, the *restricted system*.

From a sanitary standpoint there is no doubt in the mind of the writer that the separate system is one to be preferred. This opinion is based upon the following reasons:

1st. Except in the large cities the conduits can all be made of vitrified glazed pipe, which is impervious to liquids and gases under ordinary pressures and offers a smoother surface than any brick or cement surface.

Brick work is not impervious, and any brick or cement surface presents many small projections which collect matters in suspension, thus impeding the current. Fresh running dilute sewage is not dangerous, not even offensive. Not until it becomes stagnant and putrefaction commences, is it dangerous. The pipe sewer therefore has a great advantage over any brick or cement sewer.

2nd. In the combined system the sewers are made large enough to carry the maximum rainfall, at which time they run full, while the flow of the sewage only is but a small fraction of the rainfall, so small indeed as to be wholly disregarded in designing the sizes of the sewers.

It therefore follows that these large sewers of the combined system cannot be fully flushed, except during a maximum rainfall, perhaps once or twice a year, consequently the sewer air must become foul, especially in the small branch sewers, during the dry seasons, the flow of sewerage proper being but a small, putrid, thickening stream. Only when a sewer becomes offensive is it thought necessary to flush it from a hydrant or tank.

In the separate system the flow in the pipes is comparatively a constant one, the maximum flow being but a few times greater than the minimum flow. To flush the system a flush tank should be placed at the end of every sewer. These tanks work automatically, flushing the sewers copiously with water. They can be controlled to flush as often as necessary, and work in winter or summer, rain or shine. Where the flow of sewage is least the flush is greatest.

As you follow upward the current in the sewers of the combined system the sewer air must become more foul, while in a separate system it becomes less foul.

3rd. In the separate system less ventilation is required, the sewers being less foul, and this ventilation is easier accomplished.

The city engineers of the present day are still at work devising methods of ventilation for their sewers. Everything has been tried, and nothing is quite satisfactory. Ventilation through catch-basins caused nuisances at those points close to the buildings. Ventilation through flues, chimneys, etc., were imperfect, only ventilating the sewer which was connected with the flue. Charcoal filters have been used, sulphurous acid and chlorine gas have been tried, to deodorize the effluvia arising from sewer openings.

Perforated manhole covers are now extensively used and generally recommended as a great aid to ventilation of a combined system of sewers. In Ontario during our four months of snow and ice, perforated manhole covers are next to useless as ventilators, but no doubt this is the least objectionable method of ventilating during the remainder of the year. They should also be used as an aid to ventilation in the separate system.

In the combined system the dangers arising from effluvia from sewer openings are great, and the ingenuity of the health officer and engineer has been taxed to invent traps and ventilating pipes to keep "sewer gas," so-called, from finding an entrance into our houses.

The more pipes and traps any system of house drainage has, the less efficient must the ventilation be. The Public Health Act of 1884, gives a fair sample of one of these most ingenious, cumbersome, expensive and inefficient methods of ventilation.

In the separate system there is little or nothing to guard against, especially in the upper portions of the system, where the flush is frequent and regular, the flow of clean water displacing any foul air that may be formed

and forcing it out at places of least resistance. The sewers in this system can therefore be ventilated safely and effectually by the main soil pipes being carried through the buildings and above the roof, without placing anywhere in their courses any trap or obstruction to the free passage of air from or to the sewers. This simple method of ventilation also reduces the cost of house plumbing materially.

4th. In the separate system the cellars and basements have no direct communication with the sewers. If a stoppage should take place in any sewer the sewage "backing up" in sewer would probably gain sufficient head to overcome the obstruction, or would flow out on surface from some manhole before finding an entrance into any building through any fixture. This is an important matter and one seldom considered. In the combined system generally a drain leads from the cellar or basement to the street sewer, often of sufficient size to convey the sewage of a town of 5,000 people. This pipe or drain has a float reservoir placed in its course called a trap, supposed to keep out gases from the sewer. During the summer months the water in this trap is probably evaporated and the sewer air has free, uninterrupted passage into the building. During storms the sudden flushing of sewer may force the trap. A trap on a cellar drain can never be depended on.

In the separate system cellar drainage is provided for by laying porous agricultural drain tile from the building to the street sewer, and alongside the street sewer is laid a line of agricultural tile drain which carries subsoil and cellar water only. The water in these drain tiles being clean can be given an outlet at the surface either into existing deep drains or into a natural water course.

These drain tiles will lower the subsoil water, an important matter in our climate, where in the winter season the heat in the interior of our houses tends to draw in the damp ground air.

5th. Where the disposal of sewage by pumping, irrigation, precipitation or filtration is necessary the separate system has every advantage over the combined system, owing to the small volume to be considered.

COST.

In the family the child naturally tends to imitate the parent or elder children, whether for good or for evil. In the same way a small city or town contemplating sewerage looks to the larger cities for a model. When they find these large cities expending on their costly subterranean water courses, which they call sewers, sums that would deter a smaller corporation, it is not surprising that these smaller places postpone the construction of a system of sewerage.

It is a great mistake to look to the larger cities for model sewerage. Within the last twenty, within the last ten years, even within the last five years, sanitary engineering has taken gigantic strides, and the best, safest, and cheapest systems of sewerage are those that have been commenced and completed in the smaller cities within the last five years.

In the United States the following towns and cities have constructed sewerage systems since 1880—Adopting in each case the separate system: Memphis, Tenn.; Keene, N. H.; Norfolk, Va.; Pullman, Ill.; Stamford, Conn.; Chelsea, Mass., (in part); Kalamazoo, Mich.; Omaha, Neb., (in part); Little Rock, Ark.; Birmingham, Ala.; Pittsfield, Mass.; Leavenworth, Kan.; Schenectady, N. Y.; Amsterdam, N. Y.; Green Island, N. Y.; West Troy, N. Y.

In Canada the town of Brockville is now constructing a complete system of sewers, and the town of Cornwall has made a commencement. Both of the towns have also adopted the separate system.

In the small cities, towns and villages the element of cost is often a controlling factor. The writer has given his reasons why he considers the separate system better than the combined system from a sanitary standpoint, and as a system of sewers designed to carry the rainfall will cost from twice to five times as much as a system to carry sewage only; there are few valid reasons for adopting a combined system.

It is often objected against the separate system that additional sewers are necessary to carry the rainfall. This may be true in large cities with large roof area, paved courts and streets, where storm water would do injury if not immediately carried off, but in the majority of towns and cities in Ontario the surface gutters and present drains are quite sufficient to carry the rainfall. In special cases it may be advisable to allow a limited amount of roof water, or even street water in the sewers; all depends upon local conditions.

In moderate earth excavation the average cost of a completed system of sewers built on the separate system should not exceed \$1.50 per lineal foot of sewer constructed. This is a sum that any town not already

bankrupt, can afford, being at the rate of \$7,500 per mile approximately.

In the system of sewerage designed for the town of Cornwall by the writer, any sewage entering the system at the greatest distances from the outlet will be discharged in less than ninety minutes. In the Brockville system, now under construction, the time required to discharge at the main outlet from buildings farthest removed from the outlet along the line of sewer is also less than ninety minutes. The main outlet at Brockville is a submerged iron pipe 923 feet long extending from short line out into the River St. Lawrence, the outer end being in 45 feet of water.

PLUMBING.

It is a fact well understood among sanitary engineers that the greater amount of the dangerous sewer air that invades our dwellings is "home-made"—manufactured on the premises—that is, it comes from putrescent matter lodged in the traps, pipes and fixtures in the building itself. It is human nature to remove the cause of a wrong as far as possible, and there is but little doubt that the public street sewer, built by a conscienceless corporation, is blamed for many foul emanations that come from defective plumbing.

The science of plumbing, depending as it does upon a knowledge of some of the laws of physics, hydrostatics, hydraulics and pneumatics, is but little understood by the average citizen, and the ordinary plumber has not kept pace with the requirements of his calling during the last decade of advancement and improvement.

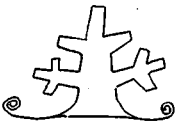
For these reasons all plumbing should therefore be under the control and supervision of the city or town engineer.

In conclusion, the writer is of the opinion that the time has arrived when those *twin relics of ignorance and barbarism*, the "privy vault" and "cesspool," should be abolished in all cities and towns and some system of direct removal substituted temporarily until a complete system of removal by water carriage is constructed. These nuisances are only tolerated from familiarity, and should be stamped out by sanitary officers totally out of reach of local prejudice or political influence.

A CANADIAN PLUMBER ABROAD.

THE following extract from a letter written by a young Canadian plumber, now working in England, to a friend in the same line of business, in Toronto, has been handed to the CANADIAN ARCHITECT AND BUILDER for publication, with the idea that it may prove instructive to some of our readers:

"You will see from my changed address that I have moved since I last wrote you. I came down here last April and have been busy ever since, for — & Co., No. —, Fulham Road, London. When Archie was here, he saw a piece of lead work in their window, which he thought could not possibly be "bossed"; but it was, and they have a still more wonderful piece which took two weeks to work out, and during that time many plumbers, builders, reporters, etc., availed themselves of the opportunity of watching the process. It looks something like the accompanying design and is worked entirely out of one piece of sheet lead, the remainder of which is rolled up as per sketch. I think it was 30 feet



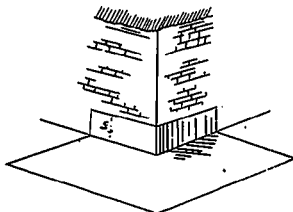
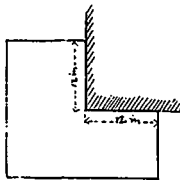
long by 3 ft. 6 in. wide. Since coming down here I have run two 20 ft. stacks of lead soil-pipe, and one 30 ft. stack; and in two cases had rather difficult bending to do, but got over it creditably, and think I may now call myself a decent workman. I have had two plumbers working subject to my instructions part of the summer, but have only one now. I am in hopes of getting the job to line two cisterns of 2,000 gallons capacity each, with lead, at the baths. I can now, with my mate, make a 4 inch lead bend as cheaply as I can buy a stock Dubois ditto, and guarantee the back of bend to be thicker than any normal part of the pipe used; and by taking more time could make the back twice as thick as the throat, and not use a bit of solder in either case, but simply bend them with aid of bobbins, dummies, dresser, etc. I do not mean that I am more clever than other London plumbers, as many could do what I have spoken of, but many could not. In a discussion about a 4 inch Strap, at — & —, I once heard someone say it would be impossible to make one out of pipe as described, but now I believe it could be done. The same man that made the before mentioned piece

of sheet-lead work, also made a 4 inch bend as follows:



And if that can be done, I do not see why he could not make a 4 inch trap. If you look in the *Plumber & Decorator* for September, page 428, you will see my name in connection with Exams. I got a first-class certificate in elementary grade in 1887, and I expect that will give me a second class honors certificate. Could not attend practical Exam, for 1888, and I failed in 1887 because after the "bossing" was finished, I had only half an hour left for wiping, so gave up. Although I made a decent job of the "bossing" I really think it was too difficult, as if worked out to the letter, it would be extremely difficult even for an old "bossor." We were only allowed 2 ft. 6 in. squares of lead ready cut, and you will notice from the enclosed slip, there is only just enough lead in area to make the break and a little must be cut from the corner to start working from:

"1. Boss up a break in a piece of 7 lbs. lead, 2 ft. 6 in. by 2 ft. 6 in., suitable for fixing against the angle of a square chimney, as shown in following sketches:



2. Join two 12-inch lengths of 4 in. 7 lbs. lead pipe by an underhand wiped soldered joint, the pipes being fixed at an inclination of about three inches in 1 foot, and the lowest end 3 inches above the floor.

3. Join two 12-inch lengths of 1/2-inch lead pipe by an underhand wiped soldered joint."

Four hours were allowed for the above test.

New experiments in lighting cars by electricity are being tried by the Erie railroad, and trial trips of cars equipped with a new system are now being run from Jersey City to Buffalo. The system used is known as the Camille Faure system of storing electricity. Six crates of twenty-three candle battery, each sixteen inches square, and containing a layer of twelve negative and eleven positive plates, are filled with acid, and four hours is occupied in charging them with a dynamo. Cars 375 and 379 are being lighted in this way and run through to Buffalo and return on the night express, sufficient power being furnished by the crates to give light during the eighteen hours it takes to make the round trip.

THICKNESS OF SEWER PIPE.

IN the opinion of Mr. Chas. Rust, C. E., of the Toronto City Engineer's department, the thickness required for 12, 15 and 18 inch sewer pipe, should be one-twelfth of the diameter. The American pipe at present in use in Toronto is hardly up to this standard. Scotch and English pipe is of the thickness mentioned. The thickness of 6 and 9 inch pipe, Mr. Rust thinks, should be 1/2 and 3/4 respectively.

The Vancouver, (B. C.) Lime Co., have just put in operation the largest lime kilns on the Pacific Coast, with a daily capacity of 150 barrels.

Mr. T. J. Heard, of London, Ont., has purchased the necessary machinery and intends cutting the stone instead of importing it. The breaking of the marble combine has tended to make this possible.

J. H. Eveleigh, of Greenville, Me., is reported to be plastering his house with mortar, in which spruce sawdust takes the place of sand. It adheres well to the lath, and promises to be a success in the way of utilizing a material which has hitherto been wasted.

See list of contents of "Canadian Contractor's Hand-Book" in advertising columns.



SEWER-PIPE MANUFACTURING IN CANADA.

EDITOR CANADIAN ARCHITECT AND BUILDER.

SIR.—On reading the October number of your valuable paper, I noticed your paragraph about a letter received by you from an American gentleman who has in contemplation the establishment in Canada of a sewer tile manufactory, and before doing so, wants to get certain information respecting the market for those articles, production and demand, etc., and says further that he understands that the largest size at present manufactured in Canada is six inch. You made enquiries in order to give your correspondent the required information, and I now beg a small space in your paper to supplement the same.

The only sewer pipe manufactory in the Province of Quebec, is in St. Johns, P. Q. It is known and operated as the Standard Drain Pipe Co. The capital is presently \$50,000, and application is to be made at the coming session of the Legislature to increase it to \$150,000. The demand is far ahead of the production, and it is the intention of the present company to extend their buildings and kilns so as to cope with the large demand for goods in their line. They manufacture sewer tiles of 4, 6, 9, 12, 15 and 18 inch diameter, also syphon bends, cesspools, traps, culvert pipes, chimney pipes, etc., etc., and their goods can sustain the comparison with any foreign ones, as the following certificate will show:

"MONTREAL SANITARY ASSOCIATION.

"10th May, 1888.

"To the Manager of the Standard Drain Pipe Co., St. Johns, P. Q.

"DEAR SIR: I have pleasure in testifying that I have tested specimens of your vitrified drain, both as regards crushing strength and freedom from kiln cracks and other defects, and found them highly satisfactory in these respects.

"A drain consisting of eight lengths of straight pipe and three junction pieces, was submitted to the crucial smoke test, which the pipes withstood in a most satisfactory manner; while a second drain of inferior pipes from a Scotch factory, when submitted to the same test, showed numerous defects in the pipes, through which the smoke escaped in large quantities.

I am sir, yours very truly,

(Signed) RICHARD G. FLEMING,

M. Can. Soc. C. Engineers.

This is conclusive evidence, Mr. Editor, of the quality of the goods made here, and the comparison they can bear with imported ones. If the city of Toronto refused the right of using the native article and a dealer had to import over 300 car loads of foreign goods last year, I must say that it is a peculiar whim, considering that the city of Montreal takes for municipal requirements all the tiles, etc., from here, and every contractor of any importance from Montreal orders here, besides all the orders coming from all parts of Canada, the result being as I said before, the increase in capital and capacity being sought for by the Standard Drain Pipe Co.

My aim, Mr. Editor, is in unison with yours, viz., "A duty to encourage the establishment in Canada of manufactures whenever there appears to be a profitable opening for the same," but my duty is more particularly suited to my town, known as the "pottery town" of Canada, where two large chinaware factories are now in full blast, and four more could be started on short notice. And now that this sewer pipe industry is an assured success, why not concentrate this business in St. Johns? where the soil is to a certain part of its limits most propitious, the clay found being utilized to a large extent, a small proportion only of imported clay being required; where the facilities of transportation are unequalled, being intersected by the two largest railway corporations in Canada, viz., the Grand Trunk and Canadian Pacific railways; where the water communications are unsurpassed, thereby, during the season of navigation, reducing the cost in freight rates; where labor is plenty and cheap, land also; and finally, where the municipal council exempts from taxes for 10 years all industries coming within the limits of the town.

I am, sir,

Yours very truly,

CHAS. ARPIN,

Pro Mayor, St. Johns.

CANADIAN VS. IMPORTED SEWER PIPE.

ST. JOHNS, P. Q., Nov. 23rd, 1888.

EDITOR CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—I have read the correspondence in your November issue respecting Canadian versus Imported Sewer Pipe. There are three opinions expressed, (by engineers of Ottawa, Kingston, and Montreal,) which only could have reference to St. Johns pipes, as they are within competing radius of our works.

As regards Montreal, our pipes are accepted on their merits, but in Ottawa the city engineer states that the corporation "does not permit any other brand than Scotch," i.e. boycotts home manufactures without reference to quality. In this decision there is, no doubt, individual local influence and prejudice, as with fair opportunity and prejudice aside, we could prove that we can supply a better and stronger pipe than the pipe now being used there, which is under the standard of thickness, and is not salt glazed throughout.

As regards Kingston, I am informed that the tender was not open to public competition, and we were not allowed the privilege of tendering. If we had been, we should have been able to satisfy the corporation as to quality.

It is a regrettable fact that, as a rule, Canadians are too apt to ignore home manufactured goods. This feeling we have had to combat, and it has been an obstacle in our way. So long as a

pipe is called "Scotch," it will pass, no matter how inferior in quality—in fact, the magic name of "Scotch" renders it unnecessary to inspect the pipe. Scotch pipes are being largely used in Toronto this year, and are to be seen at most street corners. I would say to any of your readers to examine the first batch of these pipes that you see. The outside of the pipe is salt glazed undoubtedly, but how about the inside? In the case of perhaps 50 per cent., the glaze inside the pipe is put on with a sponge or a brush, and great care is not taken to cover the whole surface and the glaze is streaked on. I don't say what that glaze is, whether varnish, paint, or a slip, but I do say it is not salt glaze, because salt glaze is not put on with a brush or a sponge, but is the chemical action of chloride of sodium (in a volatilized condition) on the silicate and alumina contained in the clay, and the pipes are subjected to this process when at a temperature of about 2700° Fahr.

The inference is, that these pipes are not first quality, but that the exigencies of competition against the growing industry in this country, has made it necessary for dealers to buy a cheap pipe; and this idea is borne out by the fact that importers of Scotch pipes are entering them at customs at the following prices:—4 inch pipes per yard, 4d.; 8 inch, 6d.; 9 inch, 6d.; 12 inch, 1s. It is reasonable to suppose that a good article could be delivered from 10 to 15 miles from the works, alongside ship in Glasgow at these figures?

The facilities for manufacturing on the Ohio River are equal or superior to Scotland, but in face of the severe competition in the United States, the prices are at 80 per cent. off the list:—4 inch, 12c. = 6d.; 6 inch, 18c. = 9d.; 9 inch, 33c. = 1s. 4½d.; 12 inch, 51c. = 2s. 1½d., = from 50 to 100 per cent. higher than Scotch.

I consider the Ohio pipe far superior to the Scotch, being well glazed and of a denser body, and better calculated to resist absorption and the action of acids, but they are not up to the standard of thickness—in fact, they are in some sizes 25 per cent. below it. This is probably occasioned by the necessity of saving freight in shipment, but the standard—1 inch in thickness to 12 inches in diameter, is quite thin enough to bear the superincumbent weight of earth, and should be insisted upon by engineers.

Scotch pipes of some brands do not come up to the standard of thickness, and the change to a lighter pipe has been noticeable during the last three years, the same object being in view, viz., to lessen the freight at the expense of utility.

In reference to the pipe made at St. Johns, we would say, that it is the strongest pipe in the market, well glazed, of dense body, and thoroughly vitrified, and we think we cannot offer a fairer way of settling the question of their being equal or superior to any pipe imported into Canada, than by offering to meet in open and public competition, any other brand—the pipes to be tested by any means suggested by an engineer named by us, and one named by the representative of any imported brand, said two engineers nominating a third. All the writing in the world would not remove the inherent prejudice in some men's minds, but an ocular demonstration might, and we invite all importers to take up this challenge, which we will attend to very promptly.

Yours very truly,

W. C. TROTTER,
President.

The Standard Drain Pipe Co.,
of St. Johns, P. Q. (Lim.)



Notice to Contractors.

TENDERS will be received, by registered post, addressed to the Committee of Works up to 2 o'clock p. m. of the 23rd day of December, 1888, for the construction of the

**DUNDAS-STREET BRIDGES,
Both Masonry and Steel Superstructure.**

Specifications, plans and forms of tender, can be obtained at the City Engineer's Office, on and after the 10th inst. A deposit in the form of a marked cheque, payable to the order of the City Treasurer, for the sum of 2½ per cent. on the value of the work tendered for, must accompany each and every tender, otherwise it will not be entertained. All tenders must bear the bona fide signatures of the contractors or contractor, and their or his sureties, (see specification) or they or he will be ruled out as informal. The Committee does not bind itself to accept the lowest or any tender.

(Signed), WM. CARLYLE,
Chairman Committee on Works,
Committee Room,
Toronto, Dec. 1st, 1888.

BUILDING MATERIALS.

CUMBER.	
CAR OR LOGS.	
1½ and thicker clear picks, Am. int.	\$30 00/32 00
1½ and thicker, three upper, Am. int.	27 00
1½ and thicker, pickings, Am. int.	15 00
1½ to and 12 dressing and better.	90 00 25 00
1½ to and 12 mill run.	15 00 16 00
1½ to and 12 dressing.	15 00 16 00
1½ to and 12 mill run.	15 00 13 00
1½ to and 12 maple culls.	9 00
1 inch siding, mill run.	21 00 20 00
1 inch siding, better.	18 00 20 00
1 inch siding, mill run.	13 00 15 00
1 inch siding, common.	12 00 13 00
1 inch siding, ship culls.	10 00 11 00
1 inch siding, mill culls.	8 00 9 00
1½ and thicker cutting up plank.	21 00 25 00
1½ inch strips, 4 in. to 8 in. mill run.	14 00 16 00
1½ inch strips, common.	11 00 12 00
1½ inch flooring.	15 00
1½ inch flooring, better.	16 00
X X shingles, sawn.	\$3 40/2 50
X X shingles, passed.	1 30 1 50
Castlake passed iron shingles, per square.	4 50
Castlake genuine galvanized iron shingles, per square.	7 00
Imitation brick siding, per square.	3 50
Special siding, per square.	3 50
Lath, sawn.	1 50
YARD QUOTATIONS.	
Mill cut boards and scantling.	10 00
Shipping cut boards, promiscuous widths.	12 00
Shipping cut boards, stock.	13 00
Scantling and joint, up to 16 ft.	14 00
" " " " " " " "	15 00
" " " " " " " "	16 00
" " " " " " " "	17 00
" " " " " " " "	18 00
" " " " " " " "	19 00
" " " " " " " "	20 00
" " " " " " " "	21 00
" " " " " " " "	22 00
" " " " " " " "	23 00
" " " " " " " "	24 00
" " " " " " " "	25 00
" " " " " " " "	26 00
" " " " " " " "	27 00
" " " " " " " "	28 00
" " " " " " " "	29 00
" " " " " " " "	30 00
" " " " " " " "	31 00
" " " " " " " "	32 00
Cutting up planks, 1½ and thicker, dry	25 00 26 00
" " " " " " " " board.	18 00 20 00
Dressing stocks.	10 00
Picks, American inspection.	40 00
Three uppers, American inspection.	30 00
Center for block paving, per cord.	5 00
Cedar for kerbing, 4 ft. per M.	12 00

D. M.	
1½ inch flooring, dressed.	25 00 30 00
1½ inch flooring, rough.	14 00 15 00
" " " " " " " "	23 00 25 00
" " " " " " " "	16 00 20 00
" " " " " " " "	18 00 14 00
" " " " " " " "	18 00 20 00
" " " " " " " "	27 50 2 00
" " " " " " " "	7 25 2 00
" " " " " " " "	30 00 30 00
" " " " " " " "	50 00 60 00
" " " " " " " "	25 00 35 00
" " " " " " " "	30 00 30 00

HARDWARE.	
Put Nails:	
American Pattern, 1½ inch, per keg.	4 25
" " " " " " " "	3 60
" " " " " " " "	3 85
Canadian Pattern, 1½ inch, per keg.	3 85
" " " " " " " "	3 85
" " " " " " " "	3 35
" " " " " " " "	3 10
" " " " " " " "	5 85
Steel nails, soc. per keg extra.	6 00
Finishing nails, 1½ inch, per keg.	5 25
" " " " " " " "	5 05

ORMENT, LEAK, etc.	
Lime, Per Barrel of 2 bushels, Grey.	40
" " " " " " " " White	30
Plaster, Calcined, New Brunswick.	2 50
" " " " " " " " Nova Scotia.	3 10
Hair, Plasterers', per bag.	1 00
Cement, Portland, per barrel.	3 00
" " " " " " " " Thorold.	1 50
" " " " " " " " Queenston.	1 10

J. H. WALKER
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Forestry Chambers,
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Tables showing at a glance the amount of a workman's wages for any number of hours, from 1 to 120, (a fortnight's work), at any given number of cents or half cents per hour;

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Tables for Estimating on different kinds of work;
Tables showing the strength and weights of materials used in construction;

Useful Hints to Contractors;

Names of officers, and place and time of regular meetings, of Contractors' Associations in the various Canadian cities;

List of Architects in Canada;

List of Manufacturers and Dealers in Building Materials;

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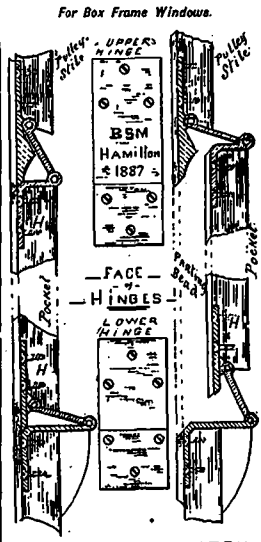
BUILDING MATERIALS.

MONTREAL PRICES.

Table listing various building materials such as lumber, iron, and cement with their respective prices. Includes sub-sections for 'Lumber', 'Iron', and 'Cement'.

Table listing materials like anchors, chain cables, rigging chains, galvanized iron roofing, and nails with prices.

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Text describing the hinge mechanism: 'WITH the above hinges the ordinary double hung window sashes can be taken out of the frames for cleaning, etc., without disturbing the stops or parting beads, and are the result of long experience...'.

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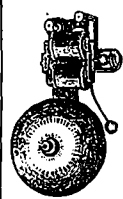
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References on application, 81 COLBORNE ST. TORONTO.

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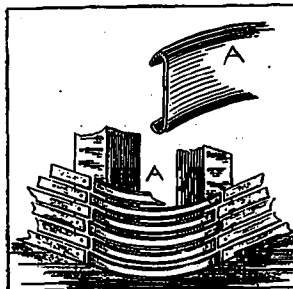
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METALLIC LATH.



THE object of this invention is to form circular corners on stud partitions, both outside and inside, when required, or only on the outside. This has hitherto been done by making the grounds with coopers laths, which, owing to shrinkage, caused the plaster to crack—but curves of any required radius may be made with these Metallic Laths, and which will form a strong and firm ground in line with the wooden lathing for plastering on, and as shown in cut A, the laths are keyed top and bottom, thus forming a double key.

The attention of Architects and Plasterers is called to this invention. Give them a trial and be convinced. Send for Circulars and Price List.

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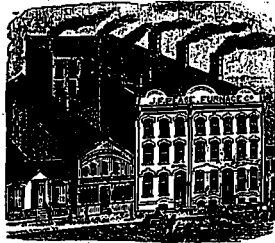
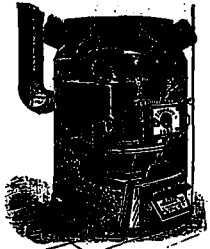
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Quick Circulation; Easily Repaired; Its Capacity Increased at very Little Extra Cost; does not need a Fancy Cast Iron Top or Marble Slab; in fact, Just the Radiator that Suits the Requirements of the Market.

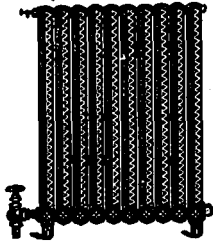
By the construction of this Radiator, each section has (entirely distinct from each other) a separate and positive circulation within itself, producing not one slow sluggish, continuous circulation, but as many sharp and constant circulations as there are sections composing the Radiator, thereby maintaining a greater heat from a given surface. It has another advantage that will be appreciated by the Trade: the inlet and outlet are both at the same end, and has been arranged that it may be used for Hot Water or Steam without making any changes to the connections, or any alterations whatever—a feature possessed by no other Radiator that we are aware of. We also claim that with this Radiator any person in the Trade can replace a section, or add sections to increase its capacity, without returning it to the manufacturer. This alone is an advantage, particularly in cases outside the City in which it is manufactured. These Radiators are now fitted up in the following buildings, V.L. Hull Post Office, Peterborough Post Office, Picton Custom House, N.S.; Picton Marine Hospital, N. S.; Winnipeg Custom House, Kingston Custom House, Three Rivers Custom House, and many other private dwellings.

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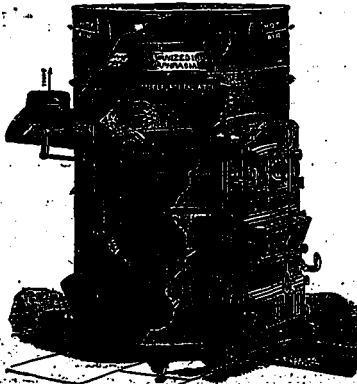
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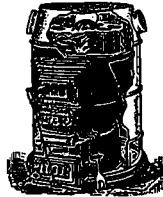
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