

MEDICAL COUNCIL BUILDING, TORONTO.

E. J. LENNOX, ARCHITECT.



PUBLISHED MONTHLY IN THE INTERESTS OF

Architects, Civil and Sanitary Engineers, Plumbers, Decorators, Builders, Contractors, and Manufacturers of and Dealers in Building Materials and Appliances.

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## Canadian Architect and Builder

A JOURNAL OF MODERN CONSTRUCTION METHODS,

PUBLISHED MONTHLY IN THE INTEREST OF

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### SUBSCRIPTIONS.

THE CANADIAN ARCHITECT AND BUILDER will be mailed to any address in Canada or the United States for \$2.00 per year. The price to subscribers in foreign countries, is \$4.50. Subscriptions are payable in advance. The paper will be discontinued at expiration of term paid for, if so stipulated by the subscriber; but where no such understanding exists, it will be continued until instructions to discontinue are received and all arrearages are paid.

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### EDITOR'S ANNOUNCEMENTS.

Contributions of technical value to the persons in whose interests this journal is published, are cordially invited, and if found to be of sufficient merit, will be paid for. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

IN reply to numerous enquiries received at this office, the publisher will send the CANADIAN ARCHITECT AND BUILDER to clubs of six to ten subscribers at \$1.75 per year for each copy.

IT would be a matter of great satisfaction, if some manufacturer would undertake to supply the Toronto building trade with a first-class brick. The bricks which we are now obliged to use are very inferior in material, hardness and shape. A good, hard, deep-colored square brick, with sharp and well defined arrises, would command a good price for first-class work.

THE Trent Valley Canal Commission has been organized, and is about to enter upon its duties. The principal factor in leading the Commission to decide for or against the completion of the canal, must naturally be the question, will it pay? Apart from this main consideration, there should be taken into account the large sums of money already expended on the work, and the advantage to the country of having canals as competitors of the railways for the carrying trade of the Dominion.

IT speaks well for the Hamilton plumbers that they have decided to petition the Council to appoint an Inspector of Plumbing. At present, it is said, many people are willing to run all the risks incident to bad plumbing, if only they can get work done at a cheap figure. Under such circumstances, the Council should not hesitate to make the appointment, which would ensure good work being done at fair prices, and prevent the spread of disease, which must inevitably follow a continuance of the present condition of things. Every city should have its Plumbing Inspector.

PERSONS engaged in any of the various branches of construction work are invited to make free use of the columns of this journal for the purpose of expressing their opinions on any matters affecting their profession or calling. There are many wrongs that need

to be righted, and that might be righted if the nature of them was publicly explained. An instance of this came to the notice of the writer the other day. A plumber was complaining that the ideas of a certain architect on the subject of plumbing, and especially in regard to the weight of pipe which the plumber should use, were absurd, and if carried out would not serve any useful purpose. Without taking sides with either the architect or the plumber on the question in dispute, we simply desire to say, that if a wrong exists the plumber can have it righted far more speedily by publicly exposing it, than by grumbling about it privately. Let us have your opinions, gentlemen.

IN presenting to the public the second number of the CANADIAN ARCHITECT AND BUILDER, the publisher desires to state that the reception accorded to this new journal has been of the most cordial character. Much that was crude in its contents and arrangement has been generously overlooked, and words of praise and encouragement have been bestowed unstintingly. Subscriptions and requests for sample copies have come in by almost every mail. In fact the stock of papers reserved for these requirements—and which it was thought would be ample for the purpose—ran out nine or ten days ago. Persons applying since that time have been asked to wait for the present number. This is a most gratifying state of affairs, and augurs well for the future success of the enterprise. To our correspondents of the daily and weekly press we are deeply indebted for many kind references to this paper. In returning sincere thanks for the kindly greeting and support accorded to our initial number, we simply desire to add that for the future our best efforts shall be put forth to make this journal of the highest value to its readers. To attain this object, we shall require, and shall hope to receive, the active assistance of persons engaged in the various branches of construction work.

A DAILY paper, in calling for a Dominion Employers' Liability Act, says: "In outside occupations the neglect in regard to the limbs and lives of employees is not less marked. Scaffolding in Canada is as a rule flimsily constructed, and the workman has the choice of risking his life upon it or leaving the job." This statement is only partially correct. It is true that scaffolding is often put up in a flimsy manner. But who puts up the scaffolding? As a rule the workmen who are to use it, and to whose carelessness may frequently be attributed the accidents which all deplore. It is safe to say that the number of master builders who would knowingly risk the lives of their employees by compelling them to work on insecure scaffolding, is extremely small compared with the number of careless workmen who, to save themselves a little trouble, perhaps, voluntarily assume such risks. Instances have come under our personal observation where master builders in this city repeatedly warn workmen in their employ against exposing themselves to danger unnecessarily, and not unfrequently accidents are the result of a careless disregard of such warnings. In such cases, no attempt should be made to saddle the responsibility upon the employer.

IT is seldom a movement is inaugurated and brought to such a successful issue in the short period of one year, as that of the Canadian Society of Civil Engineers. Formerly the science of engineering in this country had been looked upon as one in which anybody could en-

gage. Of late years a great change has taken place—Schools of Engineering have been inaugurated in several provinces, in which education of the highest order has been imparted to their students and graduates. The fruits of this are apparent already in the magnificent works to be found in all parts of the Dominion. It is only a natural sequence that men of such high intellectual calibre, should desire to band together for mutual improvement and interchange of ideas. The gentlemen who were most deeply interested in the welfare of their calling, who occupy the highest places in the profession, have come forward freely and placed their time and talents at the disposal of the Society. The Society has been particularly fortunate in enlisting the sympathies of such eminent men as Messrs. F. C. and S. Keefer, Gzowski, Kennedy, Hannaford, Wallis, Page, Perley, Schriber and others, and in having for their first secretary such an organizer as Prof. Bovey, of Montreal. Under the constitution, branches can be formed at different points. We know of no place better suited for one than Toronto. We have not yet heard of any steps being taken to form one, and will be much disappointed if resident members do not at once avail themselves of their rights, and found a branch in this city. With a School of Engineering in our midst, it would seem a foregone conclusion that a vigorous branch should flourish here.

WE must protest against the daily newspaper giving the opinions of a man on architectural questions who is unwilling to have his name mentioned. The *Globe* the other day gave what it stated was the opinion of a "prominent architect" on the "Court House Muddle." As it did not give his name, how do we know he is as represented? Are we to take the opinion of a reporter on the standing of an architect, when the public seem to be generally unable to judge of an architect's qualifications? At any rate, if this person is so prominent an architect, and was so willing to give his opinion, he should also have been equally willing to give his name, so that we might be able to give due weight to his statement by a knowledge of the man. We think that we can speak for nearly all the prominent architects, and we have no hesitation in stating that not one of those with whom we have the honor of being acquainted would make the statements attributed to this "prominent architect." The giving by a newspaper of the opinions of Tom, Dick and Harry, on subjects of which they know nothing whatever, or of the opinion of a man who may have some general knowledge of the kinds of work involved, but who has no information of the particular work or the proposed mode of carrying it out, is unfair and unjust to the parties interested, and may be the means of doing them much injury. But when these opinions are given without the names of the parties, the action on the part of the newspaper is entitled to the strongest condemnation of all fair minded men. The opinion of no man, no matter who he may be nor how much he knows of the subject under discussion, should be given without his name. We would not prevent a writer giving information when possible, but would prevent him quoting some not to be disputed authority.

WE should like to see printed copies of a fire by-law distributed among those interested in the building trades. From what we can make out, we would not advise that the present by-law be printed before it is revised. It seems to have been drawn up

in a hap-hazard convenient sort of way, to save thought or trouble on the part of the framers. Why we should have the same restrictions placed on construction of buildings erected in the residential and thickly built districts as on those in the business and thinly built portions, we cannot understand. We wish to see all reasonable provision made to prevent the spread of fire, but can see no use in regulations which do not check the spread of fire, but do restrict the erection of artistic and home-like houses for our people. What would the residential parts of Buffalo or Detroit be like if they had a fire by-law similar to that of this city? Would you see the cheap and artistic homes which are the pride of American cities, if they had tyrannical fire by-laws which would compel them to build in brick or stone only? Where would be the tile, shingle or clapboard gables and projections, which give such pleasing relief to their homes? Where would be the neatly and artistically painted wooden dwellings, of which they are so justly proud? We have no hesitation in stating that they would not have such homes any more than we have, if their architects were unnecessarily interfered with in the designing of this work by similar fire by-laws—a fire by-law which is useless where it should be effective, and most irksome where not necessary for protecting from fire. Let us have a common sense by-law which will prevent the erection of fire traps in the business and thickly-built portions of the city, and yet will allow of safe fire-resisting construction in the dwelling house districts, although the same may not be of stone or brick or sheet iron coverings. Would some one connected with the framing of the fire by-law inform us how many dwelling houses have been burned in this city during the past ten years which would not have been burned if they had been constructed under the requirements of the present by-law?

THE erection of a suitable Court House appears to be a difficult problem for our aldermen. It seems to us that the matter has not been approached in a proper manner. It is first decided that the building is not to cost more than a certain sum—which is absurdly inadequate—without any reference to the accommodation required, or the dignity or self-respect of the city.

If we had had this question to decide, we would have gone about it in this manner: We would have first determined whether the building is a necessity. If we had decided in the affirmative, we would have then considered the accommodation required by the present wants of the city, and what further accommodation will be necessary owing to its future growth. It would be folly to erect a building of such limited capacity that the business of ten years hence could not be transacted within its walls. Having fixed upon the accommodation, we would then consider the mode of construction to be adopted. Shall it be a cheap and flimsy building, subject to rapid deterioration and requiring large annual outlays to keep in a habitable condition, or shall it be a substantial structure which will stand the wear and tear of time? Shall it be a fire-trap, or a fire-proof building where important documents may be safely kept? And lastly, we would take into consideration whether the wealth and importance of the city requires that the building shall be ornate or simple in design. A poor community, without artistic pretensions, may erect a cheap barn-like building without any loss of self-respect; but such can not be the case with a wealthy and presumably artistic people. Their wealth and love of art will justly be judged by their public buildings. It therefore becomes them to erect what will be a true and faithful reflection of their wealth and artistic perception. An artistic design does not always result from a large expenditure of money—very often the reverse—but a too limited appropriation may preclude the possibility of producing a beautiful building. Therefore, to allow of an artistic result, we would advise the expenditure of a sufficient amount, and take every precaution to obtain value for our money. To find out what is a reasonable expenditure, is the problem, and one which can only be solved by careful study, by men competent to deal with all the questions involved. It is absurd to find fault with a building in the construction of which money has not been wasted or stolen, because it is not grand enough, or large enough, and yet to complain indignantly of its cost. Many imagine that the chief duty of an architect is to produce for \$50,000, what can only be done properly for \$75,000 or \$100,000. And yet these same people will be the first to grumble at the imperfection of the cheaply-constructed building. If an architect could call to his assistance "Aladdin's Lamp," he might be able to accomplish this most

difficult feat; but as he has it not, nor is possessed of an immense fortune which will allow him to subscribe the difference between the amount placed at his disposal and that required to satisfy the ambition of his client, he fails. We are free to admit that architects are often wasteful of their clients' money, but so far as this city is concerned, they have not had many opportunities.

We would advise our City Council to take hold of this problem properly, and to that end to appoint a commission of three experienced and competent men, whose sole duties will be to make themselves acquainted with the requirements of such a building and direct its construction. A committee whose personnel is changing every year, and which is composed of men who have not the time, if they had the necessary qualifications, to acquire a thorough knowledge of all the questions involved, and thus be able to make intelligent decisions, is not a proper body to entrust with such an important work, requiring so much attention to details. An architect has sufficient duties to perform without being obliged to assume those properly belonging to his client. With a commission composed of men who thoroughly understood the questions, he could receive necessary instruction and directions, and not be obliged to proceed in the dark, hoping that what he does will meet with the approval of his clients. This commission would be able to judge of the expenditure necessary for the proper carrying out of the work, and could restrain any extravagant tendencies of the architect.

The appointment of practical men to look over the plans and specifications is a move in the right direction, but it does not go far enough. They will not be able to enter into all the questions involved. The Council should go further, and make certain that the building which is proposed is suitable in all respects, and will meet the needs of the city. To our mind it is not so much the question, at the present time, of the architect's plans and specifications being suitable from the practical point, as it is whether the information supplied to him is correct, and he has properly met the requirements. We believe that the architect is able to carry out the work satisfactorily if he is properly instructed as to the accommodation required, and definitely directed in all matters which his clients or their representatives should assume the responsibility of. The expenditure of so large a sum should not be proceeded with without full consideration. Time and money spent in carefully going over every question involved in the erection of this building before a single stone is laid, will give us much better results than one hundred or one thousand times the same outlay in either or both when the building is partly or fully constructed.

We have not the least sympathy with those who are apparently working against the architect by trying to place on his shoulders the mistakes which have been made by the building committee. He is not responsible for the difficulties of the situation, but those who, by their incapacity and lack of judgment, have let the matter drift along without any intelligent supervision. We have no doubt as to the architect having done the best that could be done under the circumstances, and therefore we urge that he should be given a fair opportunity to show what is in him, under the control and with the assistance of a competent commission. We believe that the plans are very good, and the design all that could be desired, and that if built they would reflect credit on the architect and on our city architecturally. When the architect has done so well, do not cause him to ruin his designs in bringing the expenditure within an inadequate amount for the erection of a good building, nor allow him to badly plan portions of the building under misconceptions as to the requirements. In conclusion, we would urge our aldermen not to spare money nor time in the preliminary work necessary to the erection of a court house which should be a credit to the enterprise of our citizens and a correct exponent of their appreciation and love of art.

Since the above was written, the experts appointed by the Court House Committee have reported that the plans and specifications prepared by Mr. Lennox were full and complete. They made but one recommendation, and that, the manner of specifying the stone for the foundation walls. The change suggested is not important to the construction of the building, but will render the preparation of tenders much less difficult for the contractors. It is very satisfactory to know that the architect has prepared his work thoroughly.

## DECORATING GLASS.

WHAT is sand-blasting?" asked a *Chicago Herald* writer of a man whose life has been spent in decorating glass.

"The grinding or decorating of glass with sand—a secret process, the inside facts of which we cannot disclose," replied the expert. "Come up-stairs and see a sand-blast machine." The machine suggests a cider mill in shape, or a cheese press. The glass is laid on rubber belts at the side, and is then fed into the machine. As soon as it disappears from view some rubber flaps come down and prevent the pressure in the interior from escaping. This pressure is exerted by wind and sand—a 20-horse power engine being required to raise the "blow" which drives the sand to the glass. Looking through the window in the centre of the machine a "gun" is disclosed. It has a large mouth-shaped opening, at which it is loaded with 20-horse power ammunition of wind and sand. Before the ammunition is allowed to leave the gun, the aperture narrows to about one-sixth the width of the loading point. This condenses the sand so that when it leaves the gun it strikes the glass with such force as to eat into the surface. When the glass has been exposed it passes out of the machine on rubber belts at the opposite side. This process is called grinding, and one machine will grind about 900 sq. ft. in a day.

Now for the decorative part. Suppose the sandblaster wishes to present on a square of glass a certain design. He simply covers the surface with beeswax and a certain mixture laid on over the glass in exact duplicate of the design required. The glass passes into the machine. The sand is fired from the gun, but this time it grinds only the exposed parts. The portion covered with beeswax and the secret mixture is not touched by the sand and when the plate emerges from the machine, and the wax, etc., are washed off, behold the design standing out in sharp contrast to the ground surface which the sand has scarified.

This is the A B C of sand-blasting. The process is susceptible of much elaboration, and one improvement, which was patented last year by a Chicago gentleman, is called the "amograph." The pictures are first drawn on the back of the glass by the artist with a color which will resist the action of the sand blast. It is then subjected to the stream of sand, which cuts the glass in all parts which are not covered more or less by the resistants. The resistants are then washed off clean, leaving the pictures cut into the glass. They are next silvered over, if desired, to give greater brilliancy. The effect is that of a multiplicity of colors, but no paint or coloring of any kind is used, the color being obtained by the different shades of the glass itself.

## PERSONAL.

James Russell, builder, London, Ont., is dead.

Racette & Bousquet, contractors, Montreal, have dissolved. The Toronto plumbing inspectors were last month voted an increase of salary.

Mr. A. P. Macdonald, contractor, of this city, has gone to Bermuda in the hope of restoring his health.

Mr. Wm. Gerry, builder, of London, Ont., was recently presented with a beautiful parlor lamp by his employees.

The marriage of a son of Mr. Walter Shanley, Government Engineer, to Miss J. Conroy, of Aylmer, Que., was one of the events of the past month.

The firm of J. & W. Britton, builders and contractors, Toronto, Ont., have dissolved partnership by mutual consent. J. Britton continues the business.

The sudden death is announced of Mr. E. R. Moore, proprietor of the St. John Nail and Tank Works. Mr. Moore made the first steel nails manufactured in Canada.

Architect Jos. W. Power, of Kingston, has been confined to his house by illness for some time past, but is now, we are glad to learn, able to attend to his duties again.

Ex-Ald. Joseph Hook, a well-known builder and contractor of London, Ont., assigned last month. He is said to have lost heavily by his contract for the Military School.

Mr. Gobell, Secretary of the Public Works Department, has been in poor health for some time past, and last month started on a trip with the object of recuperating strength.

Mr. W. G. Ritchie, plumber, on the occasion of his marriage last month, was presented by his father's employees with a handsome marble clock and statuary, accompanied by a kindly worded address.

Architect David B. Dick, of this city, has been suffering for several weeks from injuries received by falling from a ladder. His friends will be pleased to learn that he has so far recovered as to be able to spend an hour or two each day at his office.

The election of Mr. Thos. C. Keefer, of Ottawa, Ont., to the Presidency of the American Society of Civil Engineers is an honor bestowed upon Canada, and a well-deserved recognition of eminent services in the field of engineering, extending over a period of nearly half a century. Mr. Keefer, who is 67 years of age, is a Canadian, having been born at Thorold, Ont. He is identified with many of the largest works of construction connected with the opening up and development of this country, having had charge of such undertakings as the Erie Canal, Grt. Trunk, Montreal Waterworks, Hamilton Waterworks, and many others. He was a commissioner to the Paris Exhibition, is an officer of the Legion of Honor, and a C. M. G.



**THE ARCHITECTURAL GUILD OF TORONTO.**

A NUMBER of the architects of this city have formed themselves into an Association called the Architectural Guild of Toronto. The Guild has been formed through a feeling among the architects that there should be some means of bringing the members of the profession together in a friendly way to discuss matters of interest to themselves and their clients. The Guild has been very successful, all the members taking a deep interest in the proceedings. It meets once a month, when a dinner is partaken of before any business is transacted. After the good things provided by the host have been disposed of to the great advantage of the physical wants of the members and the producing of goodwill, general business matters are discussed in an informal manner. All sorts of questions are considered—matters in which the architects are directly interested and their clients indirectly, and also matters in which the respective positions are reversed. Five meetings have been held, at which the attendance has been good and the benefits unmistakable. The membership is now twenty-four. Mr. S. G. Curry, of Messrs. Darling & Curry, is Secretary-Treasurer. It is hoped that the Architectural Guild of Toronto will prosper until it has developed into an incorporated Association of Architects for the whole of Canada, similar to the Institute of British Architects.

**THE ARCHITECTURAL DRAUGHTSMEN'S ASSOCIATION.**

THE addresses which are being delivered before this Association at present by some of the master mechanics of the city are proving, as was expected, very instructive. The knowledge gained from the experiences of skilled mechanics in the building trades, must be of great value to the young architect, and the opportunity afforded by these addresses of acquiring valuable practical information in the different branches of building should be embraced by every student of architecture. Since our last issue the regular weekly meetings at the Canadian Institute have been spent as follows:

On Jan. 17th Mr. M. J. Hynes gave an interesting and thoughtful talk on the subject of Terra Cotta. He began by giving a short history of this material, showing how it had been employed from earliest times and by almost all nations with the most lasting results, thus proving its durability. He then gave a description of the methods of construction of the terra cotta kilns, and also described the peculiarities and uses of the various kinds of fire clays, and the different varieties of pressed bricks, encaustic tiles, etc.

On Jan. 24th a paper on "Renaissance Architecture" was read by Mr. Frank Douglas. The history and distinctive features of this style were clearly set forth, and ably criticised in the discussion by the members which followed. Mr. Douglas expects to leave shortly for Scotland, and the Association will lose a valuable member by his removal, as he has always shown a deep interest in its welfare.

January 31st formed the second of the trade nights. Mr. J. B. Vick was present and gave a very practical talk on the subject of stone dressing and setting. He described the tools employed and their uses, the different kinds of stone and their uses, the various ways of finishing and the proper method of setting work.

On February 7th there was no programme, but instead an open discussion. The most useful books for an architect's library were discussed, the different members present giving their views.

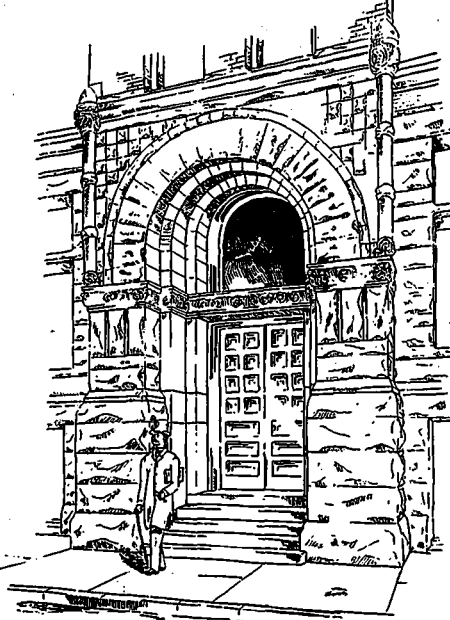
The meetings of the Association are held every Tuesday evening in the Canadian Institute, corner of Richmond and Clare streets, and a cordial invitation is extended to every one interested in the subject of architecture.

**AN APPEAL FOR ORGANIZATION.**

"BY CONSTANTIN FIDES."

NOW that your journal has been started, it will be in order to urge upon the members of the profession to at once push into existence again the apparently defunct "Canadian Institute of Architects." Permit

me to give a slight history of the past. Somewhere about 1856, I forget the exact date having lost the papers, an effort was made by a few gentlemen, amongst whom were Mr. Brown, of Kingston; Mr. Wm. Thomas, of Toronto, and some others, to start a Society of Architects for the Province of Ontario. I was invited to join, which I did after its formation. Mr. Brown was elected President, and Mr. Thomas Vice-President. By-laws were made, and a schedule of professional fees were published. After its establishment, certain parties who called themselves surveyors crept in and so ruled affairs that they caused the Society to collapse. Perhaps there are some now alive who can give the cause and reason of its short lived existence. In 1876 an advertisement was inserted in two Toronto papers calling for a gathering of the profession to discuss the advisability of forming an Institute. About nine or ten met in the Society of Arts rooms on King street, Toronto. It was decided to form a society. A secretary was named; a few meetings subsequently took place; committees were appointed, By-laws, &c., drawn out, and a tariff of fees adopted. Illness prevented the writer from attending regularly and finally illness prevented him from taking any active interest in its affairs. Since recovering his health he has several times tried to find out what has



ENTRANCE TO MEDICAL COUNCIL BUILDING, TORONTO.

become of the Institute. A note was addressed to the secretary asking to be informed what had become of the property, for property there was, several volumes having been given to the Institute. No answer has been returned to the enquiry. This is a matter of surprise and regret, as common courtesy at least should mark the conduct of members of our profession. No one of the many hundreds of my fellow students of former days in London, Paris, Rome and Berlin, had I written to them on the slightest matter in connection with the profession, but would have replied instantly and courteously. Indeed I have some pleasant contrasts to the discourtesy of which I complain in letters from old fellow students from Chicago, New York, and Baltimore.

I am aware that our profession is not held in the highest esteem by the outside public, but this is the fault of the members themselves who exhibit such jealousy of one another that it causes all this indifference to them. I am quite sure that if we could establish a "Canadian Institute of Architects," there would soon spring up a spirit of kindness and goodwill, that a strong and permanent good would be the result. I well remember what pleasant meetings we had in the days of my studentship, when we used to gather together in the evenings each bringing his sketches and memoranda of his day or week's work. These gatherings were frequently attended by professors and elders, who would offer us friendly criticism and advice. How pleasant and profitable would such meetings be, if we had an Institute of Architects where such gatherings could take place.

Let some energetic members of the profession in Toronto start the formation at once. The young students, I have no doubt, would soon join, and would find it to their mutual advantage. There would soon spring up a united body who would place the members of our noble profession on a sound foundation. Remember that architecture is the root from which all the art professions have sprung, and it is our duty to resuscitate it here in Canada to its proper and legitimate position. Such organization is necessary, not only in order that the dignity of the profession may be maintained, but also that by means of the united action which could thereby be secured, Canadian architects might protect their rights.

I see in the first number of the CANADIAN ARCHITECT AND BUILDER a letter in which it is pointed out that a Judge of one of the Courts stated that he could only allow an expert witness of the profession the fee of a mechanic (I believe it is 75 cents), for his day's attendance at the Court. I myself fought against this monstrous injustice years ago. I had been employed on an inspection of a quarry, taking levels of the waste stone used, made plans and a report. When I had done, I put in my account, including my assistant's time, chairman and other expenses. On being informed that

I could not claim more than laborer's or mechanic's pay, I refused to go into Court at all. This matter culminated in my going to Toronto and appearing before the then presiding judges, Chief Justice Draper, Judge Robinson and Judge Burns, and asking leave to address the Court, which was granted. I stated the whole case and was listened to, much to the astonishment of the barristers. The judges admitted that the tariff was unjust, and said it would be altered. I was told to bring the matter before the judge at the next assizes in Hamilton, which I did. Judge Burns presided, and recollected my having appeared before him and the other judges, and on handing up my account he at once indorsed it and I was paid. I am surprised to find that this unjust tariff at Osgoode Hall still exists. Why should lawyers or any other body make our tariff? We must take the matter in hand and help ourselves. We are now quite a numerous body, and there are clever educated young men enough in our ranks to secure for the profession the necessary Act of Parliament authorizing the profession to charge regular fees and pass such laws in our organization as will regulate all the matters complained of. If we are united as one man there is no doubt of success. I have written this more as an appeal to my fellow professionals to put aside any spirit of jealousy that may exist, unite for the common good, and our Canadian Institute of Architects will soon be a fact.

**WHAT ARCHITECTURE IS, AND WHAT IT IS NOT.**

THE President of the Western Association of Architects in his address at the annual Convention held at Cincinnati, in November, thus defined architecture:

"Architecture is not a system of incoherently uttered and illogically occurring fashions.

Architecture is not a "fad" which is respectable today because it apes the work of some great man to whose creations it is comparable only as a jackdaw is to an orator.

It is not architecture in whose name we dare erect to-day rough and brutal piles of stone, whose only merit is the roughness, and which to-morrow we will spurn from us as unskempt tramps of things.

Architecture is the material expression in stone and iron and brick, of an idea, dominating, consistent, coherent; source and inspiration of ten or a thousand thoughts, but giving character to all. As such it can afford to lose sight at no instant of one thought by its great apostles and prophets.

These traditions, which have lived for centuries, are not to be venerated for age alone, but for their truth; they are not sacred because of their age, but are old because of their truth. All architecture based upon mere caprice is less enduring in the history of art than a breath."

At the next regular meeting of the "Architectural Draughtsmen's Association of Toronto, to be held on the 21st inst., a paper will be read on "Drawing," by the President, Mr. Robt. Dawson; and at the meeting on the 28th inst., Mr. Wm. Simpson will present a paper on "Joinery."

## OUR ILLUSTRATIONS.

THE NEW YORK LIFE INSURANCE COMPANY'S  
NEW BUILDING.

THE handsome new building about to be erected on the corner of St. James Street and Place d'Armes, Montreal, for the head office of the N. Y. Life Insurance Co., forms one of our principal illustrations this month.

The building will have a basement, sub-basement and eight stories. The two fronts will be of Scotch Gatalew Bridge sandstone, and all the piers in basement and basement front are to be of Thousand Island red granite. All the brick and stone work will be set in cement. The inside finish of wood work is to be of polished cherry, and the floors will be laid with Georgia pine, and polished.

The building will be perfectly fire-proof, the stair-case to be of iron, with marble steps, and all corridors to be laid in tile. Size of building, 71 x 112 feet; architects, Messrs. Babb, Cook & Willard, of New York; contractors, Simpson & Peel, of Montreal; and the following sub-contractors: Mason work, Peter Lyall; brick work, T. W. Peel; iron work, E. Chanteloup; plastering and fire-proofing, J. McLean; painting and glazing, W. P. Scott.

## DESIGN FOR COTTAGE COSTING \$3,000.

We give in this number, in geometrical elevation, interesting views and plans of new designs for cottages.

The cottages are built of timber, framed and sheathed with 1-inch boards, and weather boarded over a lining of heavy weather-proof paper. The roofs are covered with I. X. charcoal tin, with standing seams.

Modern improvements, understood to be a bath-room, and kitchen with the usual fittings for hot and cold water supply, wash bowls, water-closet, tubs and boilers, with tank and cistern supply, are among the conveniences secured to these elegant cottages, at a moderate cost. The wood work is chiefly pine, stained and varnished to preserve the effect of the natural grain. The foundations are stone and brick, the cellars cemented, brick cisterns, and soil drains.

The cost of the two cottages, built together, is estimated at about \$5,800. To erect a single house would cost probably \$3,000.

## MEDICAL COUNCIL BUILDING.

The new Medical Council building which forms one of the leading illustrations in this number is situated on the corner of Bay and Richmond streets in this city, and is being erected for the Medical Council of Ontario from plans and under the supervision of Mr. E. J. Lennox, architect, Toronto. It is five stories in height, and has a frontage on Bay street of 88 feet by a depth on Richmond street of 95 feet. First two stories are built in heavy Credit Valley coursing stone. Top three stories are built of Carlton face brick, Credit Valley stone dressing, and relieved with ornamental cut brick and cut stone panels executed in Scotch sand stone. The roof is covered with terra cotta tiles. The entire structure is very substantially built. The interior is partially finished in hardwood. The building has all the latest improvements—first-class elevators, large hall and stairways, thoroughly ventilated and heated by direct low-pressure steam. The cost of the structure will be about \$75,000.

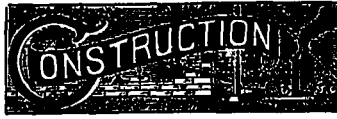
## RECESS AND FIRE PLACE FOR HALLWAY.

By Geo. G. Booth.

## VENEERS.

SOME of the finest veneers are still made, by preference, with the saw, notwithstanding the results obtained by knife machines. Woods like ebony and lignum-vitæ cannot be cut with a knife, while finely-figured and consequently close-grained mahogany is also difficult to cut by other means than the saw, the latter having to be, necessarily, very thin, and so finely adjusted that hardly the slightest variation shall be possible in the thickness of the veneers turned out. While a nicely arranged circular saw will turn out boards varying the twentieth part of an inch, which would be imperceptible, such a lack of uniformity in thin sheets would prove a damaging imperfection. The amount of steaming required by various woods to be made into veneers, differs considerably. Thus it is stated, an ordinary wood like black walnut, which has an open grain, will steam sufficiently in six hours, while the close-grained South American woods require 36 hours. Mahogany, tulip and rosewood, being hard to cut, require more and careful steaming and a knife in the best condition.

The capitol building at Albany, N. Y., which is but two-thirds finished, and upon which \$19,000,000 has been expended, is said to be in danger of tumbling down owing to the strain from unequal support.



## CIVIC ENGINEERING.

THIS is a wide field of increasing importance embracing hydraulic, mechanical, electrical, gas, railway and road engineering, that is water supply and sewerage, electric lighting and the electric railway, the elevated and the cable railway and pavements, any one of which is subject for a separate and extended essay. I can, therefore, only refer to a few questions in connection with each.

Water supply and drainage or sewerage, on account of their influence on the health, protection and comfort of the citizens, are first in importance. Every epidemic is immediately ascribed to the water supply or the sewers, although typhoid and diphtheria are often more prevalent in country districts, where no fault can be found with the water or the drainage. It is an annual plague in the Rocky Mountains as well as in the Panama or Roman marshes. This outcry has given rise to a new name in our profession, the Sanitary Engineer. The jurisdiction of the City Engineer does not extend into the houses. With the best arrangements, eternal vigilance is the price of exemption, and as we cannot tell how everything is working if not always in sight, and when soiled up by ice and snow, I believe the only safety is in providing for the worst. Wherever this gas can get in, make a way for it to get out—ventilate the exposed rooms as well as the sewers.

Undoubtedly there is much room for improvement in the drainage of our towns—both as to streets and houses—but the best systems for both assure us no guarantees against the ravages of an epidemic. The health commissioners have ascribed the recent epidemic at Ottawa, to the water, not because they discovered anything wrong in it—but because they could find no other solution of the question. We cannot even suggest a remedy until we know the cause. Experts are not agreed upon that—the drainage, the water supply, the heat, the drowth, and deficient supply of electricity in the atmosphere, have, one or more, in turn been held responsible. As all, with the same exposure, are not victims, the individual constitution must be an element in the question. If the existing cause can be located upon the term firms, engineers may be able to deal with it,—but if it is in the air we must remember that it can get there from the four quarters of the compass as well as from under our feet, from above as well as from below, and this will go on in spite of all our efforts until the last vital is poured out into the air.

Periodical outbreaks against the water are accompanied by demands for filtration at the works. Filtration has two sides, —our "hive" all the impurities in a limited space, and compel all the water to run the granules through them. Frequent cleansing of the filter beds would be necessary, and how is this to be accomplished with the thermometer 20° below zero? We cannot cover acres and heat the enclosure to handle ten millions of gallons daily. Of this ten millions, two per cent, or less may be used for drinking and culinary purposes. Filtration, therefore, like ventilation should be done in the houses by those who demand it, and they must see that, by daily cleansing, they get the water in as good condition as it comes to them.

The Insurance Companies are reminding us that fire protection should be a leading consideration in every system of water supply. In gravitation supplies like Quebec with sufficient elevation, and in pumping supplies where water power is used, as in Ottawa, this result is obtained without additional cost. But where steam power is required, as in Toronto, the best fire protection—that fire does not present from hydrants—is secured only by increased consumption of coal. The people there complain of their coal bill, but if it were less their insurance bill would be greater. They compare their consumption of coal with cities which do not lift the water half the height to which it is lifted in Toronto.

Our principal cities, Halifax, St. John, Quebec, Montreal, Ottawa, Toronto, Hamilton and London, have very efficient systems of water-supply, in respect to quality and pressure. As compared with the older systems in New York, Philadelphia and Boston, our pressure is greater and our use of steamers for fire is less. We pay more for pumping and less for fire insurance. With the exception of Winnipeg, Vancouver and Belleville, all our cities own their water-works. Quebec, Halifax, St. John, St. Catharines, Victoria and Vancouver have gravitation supplies. Montreal and London have water power supplemented by steam, with distributing reservoirs. Ottawa has water power exclusively; continuous pumping without stand pipe or reservoir since 1874, and without any failure in the supply. Both pumping power and mains are duplicated, because, with a single pump and main, in the absence of a reservoir, a break down of either suspends the delivery instantaneously, and in toto.

Brandon, Guelph and Stratford pump by steam, Peterborough, Port Hope and Lindsay by water power; the two latter for fire purposes only. Brantford has a gravitation supply. In Stratford and Port Hope the water power is used at nights for the electric light. This is also done in Victoria, where, with a gravitation system, the high levels are supplied during the day by steam from the electric light boilers. This economical arrangement is only applicable, for constant supply, where there is a reservoir and sufficient pumping capacity to keep it filled by working only during daylight.

Vancouver's gravitation supply is only commenced. The water is brought from a mountain canon—nearly ten miles distant—through steel pipes 22 and 16 in. diameter, and carried across a span of the sea in 60 feet water by a cast iron flexible jointed pipe. The fountain head is 160 feet above tide, the highest parts of the city being about 250 feet lower than the source of the supply.

There are a number of other Canadian towns and villages which

have water works. I trust we will receive a full account of them, as well as of those mentioned, through local members of this Society.

An economical and ingenious method of supplying a limited number of houses about the distributing reservoir head, has been in successful operation in Burlington, Vermont, for the last six years. An hydraulic motor is inserted in the pumping main near the reservoir, the water surface of which is 80 feet above Lake Champlain, the source of supply. Two ten-inch rising mains connect the pumps and reservoir passing through the city. The distributing pipes are fed from these mains, receiving from pumps, when in motion, and from reservoir when pumps are standing, the pressure on the motor being greater on the pump side when the latter is working, and upon the reservoir side at other times. When the reservoir is full the head is between 12 and 13 feet, and the pressure a little over 5 lbs. This motor raises the water 60 feet and delivers it through a mile of pipe into a tank having an overflow pipe into the main, so that no water is wasted. The speed of the pump worked by this motor varies from 5 or 6 strokes per minute in the night, to 25 strokes per minute in the day time. The cost of this application was under \$5,000.

Mild steel is competing successfully with cast iron for mains, rivetted for the larger sizes and lap welded for 24 inch and under. The strength and security is greater, and the cost on the whole less, because of the lighter weights, longer pipes, fewer joints, and lesser cost of transportation. Cast iron, however, maintains its supremacy for all purposes of distribution on account of the facility and economy with which connections can be made with it. Its greater durability on account of its greater thickness also checks the extension of the use of steel.

I can only direct attention to the great works going on for the further supply of New York, Liverpool, Kansas City, San Francisco, etc., and to the rapid extension of water supply to the smaller towns and villages on this continent. This last is the result of the organization of large water companies, having like the electric companies able engineers. A contract is made securing an efficient service for a stipulated annuity from the corporation.

This secures the whole or the greater part of the interest on the outlay and the companies trust to other consumers to make up any deficiency. Many towns prefer to pay an annual subsidy to undertake the works, in some cases because they are unwilling to entrust their representatives with their construction. Belleville has agreed to pay an American company 3 1/2 per cent, on an estimated cost of \$200,000, for the construction of water works.

I am not aware of the formation of any company in Canada for this purpose. If our unsupplied towns have not wisdom enough to construct and own the works which should pay them as well as it pays a company, capitalists and engineers may do a good thing for themselves and the country by showing them how it can and ought to be done.

## SEWERAGE.

The foremost question in connection with sewerage is whether the combined or separate system should be adopted for new towns or for new extensions in older ones having the combined system. For house drainage, sewers require a deeper excavation than is necessary to get rid of surface water, and are therefore very costly when large enough for both purposes. The combined system is necessarily weaker in form and therefore more exposed to damage from excessive rain fall. Much depends upon climate and surface inclination of the streets, and as well as the relation between the street grades and basement openings in the buildings. Before towns are sewerer all the water is carried off upon the surface, but with level streets and particularly in Northern towns when the snow is melting fast, there is a necessity for rapidly relieving the streets by underground drainage, in order to prevent flooding of basements. In the sewers of the combined system, the gas is diluted by contact with a larger body of air and water, and these sewers are flushed by the rain fall, but at irregular intervals which are too long in the dry season of summer and the cold one of winter. In the separate system, the pipe sewers are flushed automatically, and at frequent intervals at all seasons; but for this purpose water must be provided although comparatively little is required.

The separate system being much cheaper than the combined will doubtless be adopted in the question of cost is decisive, and surface water can be disposed of as before.

Our new city of Vancouver has adopted the separate system for which all the conditions are favorable, a mild climate, excessive rain fall for six months, and good grades for rapid removal of surface rain fall.

The needs of this city were so urgent that they could not wait for metalled roadways, or for sewer pipes from Glasgow by the long voyage around Cape Horn. They therefore have covered their roadways with plank, and made their sewer pipes of the same material, with rubber joints, for which when necessary earthenware pipes will be substituted, all man holes, etc., being made of Portland cement.

The proper disposal of sewage, is the great question in other countries, especially where the discharge causes river pollution or endangers the source of the water supply. Chicago is extending her tunnels four miles into the lake, instead of the two miles which were considered sufficient to escape the pollution of the lake shore, by her "clean machines" in the Chicago River.

Toronto is agitated over the question of sewers, pumping, and sewage farming. The utilization of sewage to diminish the cost of its diversion from the natural outlets is limited by local conditions. Clarification and irrigation both involve pumping, and the latter is only practicable where large areas of low, level and cheap land are to be obtained.

No system can surpass the discharge into large flowing rivers, or large bodies of water, and where these are the sources of the water supply, the best and cheapest course is to remove the intake of the latter to a safe distance.

The removal from the streets of garbage and rubbish, which may be washed into sewers, and the cremation of all combustible trash, is attracting deserved attention in towns where this new departure is needed. This cremation is as old as Jerusalem, where the fires in the Valley of Hinnom were never quenched.

## PAYMENTS.

The gradual approach to the old Roman method of roadway is

\*Extract from named address of President Thos. C. Keefer, C.M.E., before the Canadian Society of Civil Engineers, Montreal, Jan. 7th, 1888.

the result of increasing wealth and intelligence in our large cities. I give the precedence to wealth, as intelligence is useless without it. It is money and men with us, while with the ancients men were plentiful and a little money went a long way. In fact the men had to do the work whether the money was forthcoming or not. The knights of those days were not Knights of Labor. Our pretensions have been to render the graded surface with a shallow coating of stone or wood, as well—or otherwise (and sometimes otherwise) as the money would warrant; but, chiefly for want of a proper foundation (which is the expensive part) there was no durability. A temporary system is in fact the only one applicable to growing towns. The constant breaking up of streets for gas, water, drainage, tramways, etc., is the great drawback to a permanent system. The wooden block pavements were no sooner completed than they were chopped through for these purposes and the same quo could not be restored in the necessarily hasty refilling of the trench. There is apparently no limit to this;—larger gas and water pipes may be required, and telegraph, telephone, and electric light wires must yet go under ground, and it must go on until we can afford permanent sub-ways as in Paris, and then all connections can be made without breaking through our pavements. All street work for all purposes should be under one city control. Where two or more parties have the right to open the streets, there is no remedy for injury done but the unsatisfactory one of litigation.

TRAMWAYS.

Electricity as a means of propulsion for city railroads is making great strides in the United States to the north and west of us, where it dispenses with stables, but in our climate it is only available about seven months in the year. It is more efficient and in some cases more economical than horse power, but whether it will prove for our car season only will depend on the traffic. The horse stock and stables must be retained, and the former must either go to other work or be sent to grass.

The cable system for the same reason is shut out from Eastern Canada, but both it and the electric are available when they can be afforded on our Pacific Coast. An elevated railway is the only one upon which continuous car traffic can be maintained on our streets throughout the year. This city is forced by the mountain to extend chiefly along the river, and I think that an elevated road between Cote St. Paul and Hochelaga will become a practicable enterprise in the near future.

CANADA AND THE PANAMA CANAL.

By R. BOURNE, C. E.

NOW that De Lesseps's great work is within two years time of completion, and that all nations are witnessing, as the audience in a Roman theatre, his resolute struggle—desperate as that of any gladiator of classic times—against huge natural and financial difficulties, and preparing to take their proper parts in using an undertaking of such world-wide advantage as it is, it behooves Canada to consider carefully her relation to the scheme, and to make the needed preparations for using this notable water highway at the earliest moment.

Ever since the discovery of the two continents of America, the Isthmus of Panama has been seen to be an important commercial centre by many thoughtful observers, and efforts have been made to gain a footing there with a view to founding on it a trading emporium for the world. Situated as it is, where the continents meet together, and offering the prospect, which De Lesseps has been grasping, of shortening vastly the route for the many vessels trading between one coast of the Americas and the other, and to busy ports in Australia and the East, these attempts are not to be surprised at.

Of the latter, one of the first and most worthy of note was made by one of whom all true Scotchmen may be justly proud—well known as "Willie" Patterson, who in the reign of William of Orange tried to plant a colony of his countrymen on the Isthmus of Darien (as it has once been named) and to found the city of New Edinburgh. Having traded for some years in Central America, and been an unwillful officer of a buccannier ship for a length of time, he had become fully versed in the capabilities of the place. After being granted a charter by the King, he was much hindered by the jealousy of English and Dutch merchants; and, having made an heroic effort to hold his ground, was forced by the unwhilfulness of the site chosen by him, and other misfortunes, to abandon his enterprise. Returning by Jamaica, he was refused help for his now few disconsolate colonists, by Williams, governor of the Island—the ex-buccannier chief, Henry Morgan.

This historic digression is needed to show that, if thought of so much moment by one of the most far-seeing and able men of his time, (Patterson originated the Bank of England and the use of bank notes) the commercial use of the Isthmus deserves more earnest attention at this time, when the trade passing it, and the number of ports to be benefited by its being opened up, are so much increased. After the above effort, attention has from time to time been directed to the Isthmus (the U. S. government in particular, having through its Presidents given such projects as the present is warm support) culminating in the founding of the towns of Aspinwall and Panama, and the building of the railway crossing it.

A few points need to be touched on to prove that the Panama Canal may be a channel of profitable carriage to Canada. First, a glance at the map shows that the ports of Eastern Canada will be brought much nearer to such places as San Francisco, Valparaiso, Melbourne and Shanghai, being much farther from them than eastern ports in the United States—a few hundred miles being of great moment in trade competition now-a-days. Secondly, Canada may find it worth her advantage to gain a traffic by sea between her own eastern and western ports, particularly in articles that cannot readily be carried by the C. P. R. Thirdly, Canada's grain, superior to any other on these continents, her excellent lumber, valuable metals (either crude or turned into machinery), and various manufactures of goods needed by the people of the lands more nearly reached by the new route, may be sold, on utilizing it, to much greater advantage than they can possibly be sold now.

The next question, and that a most vital one, to be raised is: Can Canada, particularly central Canada, have a more direct and cheaper access to the canal than at present? Most undoubtedly she can, and that by a route which should have been opened up long ago, viz, by way of Lake Michigan and the Mississippi. It must be known to many of the readers of this Journal, that the subject of a water junction between the above has gained the attention of not a few thinking men in the United States for some years past, and that the different movements in favor of this project are now about being culminated by its taking a national form. One of the means for effecting this object is the cutting of a canal to join the lake with the Illinois River, a scheme which the map will show to involve no lengthened distance, and will point out a route plainly provided by nature for supplying not only the majority of the Central States, but all of Canada within reach of the great lakes, with a cheap and easy outlet to the South. And, so the people of the United States, so forward and enterprising as they usually are in such matters, should have allowed all these years to slip by without effecting this much needed purpose.

The next operation for the completion of the scheme will be the improvement of the channel of the Mississippi by removing a number of the obstacles to navigation in it, such as sandbars, snags, wrecks, &c. Of the last named, it has been proved in evidence before a Committee of the United States Senate that no less than 5000 have been sunk in the river between St. Louis and Cairo alone—a distance of from 200 to 300 miles—and seldom removed; any of the worst of the natural obstructions named have been caused by the standing of a log which the labor of a few men would have cut away in a short time. For removing these obstacles, a sum of money beyond the reach of almost any private company must be expended; but if this great enterprise be undertaken by the U. S. Government, there should be no difficulty of this sort.

Now that this undertaking, so momentous in its relations to Canada, is under way among our neighbors, it is high time that Canadian statesmen and writers should strengthen their hands, by urging on the rapid beginning of the work, and by strongly advocating it in the press of Canada.

MONTEREAL.

(Correspondence of THE CANADIAN ARCHITECT AND BUILDER.)

Montreal is at last awakening to the fact that something must be done to keep pace with the requirements of a metropolis, and much is being said and done concerning immediate improvements.

The City Improvement Association has been inaugurated by the leading business men of the city, and judging by the amount of money and influence offered, a Montreal "boom" of considerable extent is certain. Definite plans for the general improvement of the whole city are being adopted, and steps will be taken to immediately develop them.

It is the purpose of the Association to open boulevards east and west, to widen the principal thoroughfares and plant trees on residential streets, to make good roads and oven sidewalks, and to reorganize the system of drainage. These and many other needed improvements are promised and will no doubt be carried out.

Another very important matter under consideration is the enlargement of Montreal's harbor. Plans providing the enlargement ordered by the Harbour Commissioners have been prepared by the Chief Engineer. It is proposed to build a series of large pier wharves at such an angle as to afford easy access to vessels from the strong current outside. If these plans are carried out the capacity would be: Deep water wharfage, 27½ feet at low water, 45,000 feet; deep water wharfage, 20 feet at low water, 1,400 feet; shallow water wharfage, 10 to 20 feet at low water, 4,350 feet. Total, \$50,950 feet.

Railway matters, with reference to the Canadian Pacific Railway's new depot and their entrance into the west end of the city, are receiving considerable notice. It is proposed to cross the streets by handsome one-span segmental arches of stone, from which there will be no droppings, and hardly any noise.

The Mount Royal Elevated Railway Co., are about to submit full plans and specifications of their scheme to the City Council, and will ask permission to erect a double track on Craig, St. James and Notre Dame streets. They propose two columns in the middle of the road, leaving space between for the tracks of the street cars to run.

The Grand Truck Railway Co., are about to make improvements in the way of subways and bridges in this city which will cost in the neighborhood of half a million dollars.

The Governors and Committee of the new Protestant Insane Asylum have approved of the plans submitted by J. W. and G. C. Hopkins, architects. The estimated cost for a building to accommodate 200 patients, will be about \$125,000.

Mr. J. Keenan, of New York, has just completed the contract for eight magnificent new houses to be built on Sherbrooke street. The buildings will be three stories in height, with a basement, and will be finished in November. They will cost about \$100,000 each. Messrs. Hutchison & Steele are the architects.

BUILDING PROSPECTS FOR 1888 IN HAMILTON.

(Correspondence of THE CANADIAN ARCHITECT AND BUILDER.)

THE building prospects for the coming season are very good, and architects have already a fair share of work in hand in preparing plans for commencing operations. There is the new city hall to be built, which will engage a number of hands during the year, and the erection of other large buildings are also in contemplation, among which may be mentioned a new factory for the manufacture of desiccated cocoanut. Then there are quite a number of renting or tenement houses in contemplation, the plans for which are in course of preparation.

But it must be borne in mind just here—and this is the matter which most concerns architects and master builders (and the workmen as well if they can, and will only see the point)—that all the speculative works, such as houses to rent, and which are of course expected to pay a fair interest on the capital invested, may

be checked in the start, and the contemplated extent of work stayed, by any of the inopportune strikes among the workmen that are so likely to take place, and which should be so universally dreaded, more especially by the workmen themselves, who generally have the largest share in the disastrous consequences. But although there is some talk of a claim for an increase of wages in the building trades, it is hoped that the unions, profiting by past experience, will wisely order matters so as not to awaken discussion of the matter of a strike in the public prints, because, even if the parties intending to build should have their plans prepared ready for tendering on, they will surely hesitate in letting the contract, being generally under the impression that it is wise to wait until matters quiet down to their normal condition when they feel that the work may be done at a lower cost; and moreover, contractors cannot possibly make a safe estimate of work, in contemplation of a possible strike during the progress of it. It is to be hoped that those most interested will take this matter into their deep consideration, and take immediate action to prevent the difficulties of past seasons. Of course this matter concerns every city in the province as much as Hamilton, and if care is taken to prevent disputes between employers and employees, the prospects of a successful and profitable season's work are very satisfactory and at the close of the year you will have a fair record to make of the new buildings erected in this ambitious city during the year 1888.

I am glad to see that the CANADIAN ARCHITECT AND BUILDER is working its way well among the architects and building fraternity who will without doubt soon recognize and appreciate it as the best medium of profitable communication and enlightenment on all matters connected with the building interests. It is especially noteworthy that the students and apprentices are ingeniously seeing into and prospecting on the advantages to be gained by them by reading the articles that appear in this journal from time to time, and which they know they are at liberty to comment upon whenever they may feel disposed to do so.

HINTS TO BUILDERS.

DON'T enclose the sink—no place in a kitchen is so much neglected.

Porch floors should be of narrow stuff and the joints laid in white lead.

Line-water is fire-proof protection for shingles or any light wood-work.

Common brick absorb a pint of water each, and make a very damp house.

The lowest priced builder is not always the cheapest as poor work will testify.

A closet finished with red cedar shelves and drawers is death to moths and insects.

Do not locate a furnace register next to a mantle, that is, if you wish to utilize the heat.

Terra cotta tile linings are a great improvement over the old roughly plastered chimney.

For basement flooring, oak is preferred to maple because it will stand dampness better.

To properly select the colors applicable to the proper place, consult an educated painter.

A ventilating flue from the kitchen into the chimney often does away with atmospheric smells.

Stops to doors and windows should be fastened with roundhead screws, so as to be easily moved.

It is better to oil floors than to paint them—a monthly rubbing will make them as good as new.

Do not use one chimney-flue for two stove pipes—the draught of one will counteract that of the other.

Do not finish windows to the floor—the circulation across the floor is one of the causes of cold houses.

Ash pits in cellars under fire places and mantels save taking up ashes, for they may be raked down through a hopper.

Do not construct solid doors of two kinds of hard wood—the action of the atmosphere on one or the other will cause the door to warp.—California Architect and Building News.

Stimford is counting on a building boom in the spring.

Building operations will be very brisk in Exeter, Ont., next season.

Architects Kennedy & Holland are erecting a new drill shed at Barrie, Ont.

Building operations promise to be brisk at West Toronto Junction next spring.

The total cost of the new Government buildings at St. Thomas is \$56,667.30.

The building outlook for the coming season at Peterboro', Ont., is very promising.

A new public school building costing \$74,000 was opened at Wallaceburg last month.

Building operations will be conducted on an extensive scale in Milverton, Ont., and vicinity during the coming season.

The City Council of Belleville will probably take \$30,000 worth of stock in the proposed bridge across the Bay of Quinte.

The C. P. R. authorities deny that the recent railway accident near Jackfish Bay was caused by weakness of the trestle-work.

In the new G. T. R. engine shops in course of erection at Lindsay, Ont., there are 33 large double windows holding 3,500 panes of glass.

The appointment of two inspectors to superintend building operations in the interests of the Toronto Public School Board, is talked of.

Reports from London, Ont., indicate that the prospects for builders and contractors for the coming season are all that could be desired.

Since the C. P. R. reached Arr. Ont., the town has commenced to grow rapidly, and many building enterprises are projected and under way.



The estimated cost of completing the Trent Valley Canal, is \$8,664,650.

The city of Vancouver, B. C., has 13 1/2 miles of graded streets, 5 1/2 miles planned, and 1 mile gravelled, and 18 1/2 miles of broad, plank sidewalks.

The building of the new iron railway bridge at Fredericton, N. B., has just been commenced. It is proposed to complete the work before the opening of the river.

The Minister of Public Works declined to comply with the request of a deputation from Goderich asking that the specifications for improvements to the harbor at that port be changed.

A flourishing Engineering Society exists in connection with the Toronto School of Practical Science, at the meetings of which able and practical papers on engineering topics are read.

The work of constructing a ship railway across the isthmus of Chicago will be resumed next summer. Mr. H. G. C. Ketchum, of Fredericton, N. B., is the promoter of the undertaking.

Slowly but steadily the work of building the great St. Peter's Cathedral, in Montreal, progresses, although the building is still far from completion. The statement of receipts and expenditure in connection with its construction from March 31, 1885, to October, 1887, shows receipts \$69,956.54, and expenditure on building, \$72,488.93.

Contractors for city work in London, Ont., are condemning the new regulation of the Works Department which requires them to lay twenty feet of pipe before covering it up. They contend that the carrying out of this regulation will be found to be practically impossible in springy ground, will nearly double the cost of construction to the city, and endanger the lives of the workmen to a far greater extent than at present.

The arbitrators appointed to decide the proper division of profits between the members of the Company who built "Section B" of the C. P. railway, have apportioned the amounts as follows: Alex. Manning, \$49,875; G. McLaren, \$14,235; J. J. McDonald, \$48,168; J. Chester, \$9,500; A. Shields, \$38,052. The sum of \$12,500 was allowed McDonald for commission he paid into court to the credit of the suit of Shields v. McDonald. The arbitrators' fees amounted to \$3,000.

The French Minister of Works is said to be in favor of Admiral Clode's plan for bridging the English channel, and is trying to induce the British Government to assist in carrying out the gigantic scheme. It is proposed to rest the bridge on concrete piers. The height of it is to be 40 metres, thus enabling the largest vessels to pass under it, and is to be built of iron. It is to start from Craux-aux-Quais, south of Cape Griznez, and run in a straight line across the channel to Folkestone, this distance not being the smallest, but offering the least depth of water.

In most if not all American cities, work which necessitates the digging up of the roadways, ceases as soon as severe frosty weather sets in. Such is not the case in Toronto. The work of constructing sewers and private drains, and of laying gas and water pipes, has been going on uninterrupted during the present winter, in spite of the severity of the weather. Certainly the progress made is not so rapid as in summer but a means of livelihood is afforded to the laboring classes, some of whom would otherwise be a burden on public charity during at least a portion of the winter.

The amount spent by the government last year on public buildings in the various provinces is as follows:

	Amount available.	Expended in 1886-7.
Nova Scotia.....	109,974	76,714
Prince Edward Island.....	34,936	48,150
New Brunswick.....	95,150	73,980
Quebec.....	918,996	896,966
Ontario.....	879,173	718,568
Manitoba.....	166,100	109,511
Northwest Territories.....	217,815	163,237
British Columbia.....	131,253	40,818
Public buildings gen.....	17,394	13,199
Total.....	\$4,684,456	\$4,195,341

An event of more than ordinary importance was the formal opening for traffic on the 18th of January of the new international railway bridge at Sault Ste. Marie. The structure, which was built under the direction of Messrs. G. H. Massey and R. G. Reid, civil engineers, of Montreal, has ten spans, each 224 feet in length and weighing about 250 tons. There are two spans of 105 feet across the main channel. The draw is at the largest bridge in the country. The style of the bridge is a "pin truss." It is sixteen feet above the water. The trusses extend upward forty feet. The main bridge is 2,200 feet in length, is joined by 2,000 feet of trestle work across the island and then two spans of 105 feet each across the north channel. The entire length of the structure, swing, main bridge, trestle, and all from abutment to abutment on the main land on either side, is 5,400 feet. The cost of the structure was about \$700,000.

A premium of \$40,000 dollars is offered by the public of Buenos Ayres, South America, for the best design of a capital building to be erected in that country. The date for submitting drawings is set for April next.

The New York legislature at its last session, with a view to improving the standard of public school buildings as regards their adaptability for the purpose they are intended to serve, decided to offer prizes ranging from \$50 to \$150 for plans and specifications for school houses to cost from \$600 to \$10,000. Fifty-eight designs were submitted. Those accepted are said to be artistic in design, and the arrangements regarding light, heat and sanitation, show a great improvement on structures at present in use. The accepted plans have been photographed for distribution wherever there is need of such plans for school-houses to be constructed.



UNION, ONT.—S. V. Wilson will build a new woolen mill. ARTHUR, ONT.—A \$5,000 convent is to be erected here next summer.

DRAPFORD, ONT.—The Courland Carriage Co. will shortly begin to build a factory.

ELMIRA, ONT.—The Roman Catholics of this place will build a new church the coming summer.

PHILLIPSVILLE, ONT.—The Evangelical Association will build a brick church the coming spring.

CHILTEHAM, ONT.—The old Presbyterian church is to be torn down and a new one erected.

WINNEPEG, MAN.—It has been decided to make extensive alterations to the Mackenzie Hotel.

SEABOARD, ONT.—The Methodists of this place contemplate erecting a new church the coming summer.

LONDON, ONT.—City Council will probably erect a new building to serve as headquarters of the fire brigade.

RAPID CITY, MAN.—Plans have been prepared for a new Masonic hall building, 24 x 50, two stories high.

WOOLVILLE, ONT.—The Methodists have material on the ground for the building of their new church in the spring.

ORILLIA, ONT.—There will be a lot of building done here next summer, all the buildings put up last year being occupied.

PETERBORO, ONT.—The contract for the erection of the new Nickolls' Hospital has been awarded to Mr. Arthur Rutherford.

AURORA, ONT.—J. Flenny's Sons are getting material on the ground for building large additions to their works in the spring.

THOROLD, ONT.—The Council is considering the matter of erecting a new town hall. For particulars address the town clerk.

BELLEVILLE, ONT.—Architect E. J. Lennox, of Toronto, is preparing plans for improvements to John Street Presbyterian Church.

GUELPH, ONT.—Some capitalists are talking of erecting a \$20,000 opera house on the site of the recently destroyed Commercial Hotel.

KINGSTON, ONT.—Messrs. Ross & Taylor, of Exeter, are preparing plans for the new Methodist Church to cost \$5,000, to be erected here next summer.

KINGSTON, ONT.—Increased school accommodation is urgently required, and new buildings will probably be undertaken shortly. —The congregation of Chalmers' Church will either modernize their present building or erect a new church.

SARNIA, ONT.—New plans are being prepared under which it is proposed to construct the St. Clair tunnel full size. After the plans are approved by the directors of the G. T. Company, it is understood contracts will be let for the whole work.

STRATFORD, ONT.—\$6000 has already been subscribed towards the erection of a new Baptist Church, the estimated cost of which will be \$9000. —The Salvation Army propose building a barracks in the spring. —Mr. Jonathan Scarth will erect two two-story brick buildings in the spring.

ST. THOMAS, ONT.—Extensive repairs will be necessary to the city hall, which was last month badly damaged by fire. —The sum of \$10,000 has been subscribed by a joint stock company for the erection of an opera house. Stockholders propose advertising for a manager to assume the stock and contribute the additional sum necessary to erect a suitable building. —The contract for the erection of a new wing to Alma College has been let to J. M. Green at the sum of \$14,618. Contract for steam heating is still open.

MONTREAL, QUE.—The congregation of Melville Presbyterian Church contemplate enlarging their church to double its present size in the spring. —Y. M. C. A. have purchased site for a fine new building near Windsor hotel. Particulars may be had from the Secretary. —The Provincial Government intends to build a new wing to the Montreal courthouse at a cost of \$175,000. —The Governors of the Royal Victoria hospital, Montreal, have instructed Mr. Saxon Snell, the well-known hospital architect of London, to prepare plans for the new hospital. He is expected to visit Montreal shortly in connection with the work. —The Liberal Conservative Association of this city will erect a building to cost \$50,000.

TORONTO, ONT.—Plans for the new Upper Canada College building have been completed by Architect Durand, of London, and tenders for the work will be called for. Building will be E-shaped, and will have a frontage of 250 feet, sides 200 feet. —Public School Board is considering the question of erecting a new school in St. Matthew's ward, and of enlarging the Jesse Ketchum school. —The Royal Canadian Academy of Arts has purchased a site on which to erect a public picture gallery. —Water Works Committee of City Council will spend \$15,500 in completing workshop on Phoebe Street and additions to present offices of the department.

Architect E. J. Lennox reports: Spadina Ave. Methodist Church cost \$65,000; add. to Bertram's hardware store, Yonge St., cost \$4,500; two houses for W. R. Stewart, Wilcox St., cost \$7,000; house and stable, Church St., for Dr. Graham, cost \$5,500; three houses Carlton St., T. Gearing, cost \$10,000; building at Berlin for the Economy Insurance Co., cost \$20,000; residence Bloor St., West for L. Lukes, cost \$9,000; residence Selby St., for A. G. Rundle, cost \$7,000; factory on Pearl St. for J. Morrison, cost \$10,000; Sunday School Board St. Church, cost \$17,000; add. to R. & T. Watson's factory, Front St. East, cost \$6,000; three houses on St. Andrew's Square for J. Davis, cost \$14,000; church alterations at Belleville, cost \$5,000.

FIRE EXTINGUISHING EXPERIMENTS.

A SERIES of experiments of interest to fire underwriters, as well as to manufacturers of rubber goods, were lately made at the works of the Walworth Manufacturing Company in South Boston, the object primarily being to determine by actual test the behavior of the material known as rubber cement. This material is composed substantially of rubber dissolved in naphtha, and is indispensable in the manufacture of rubber goods. Both the naphtha and the cement have hitherto been dreaded by the fire insurance interest, and with good reason. It is well known that the pouring of water upon burning naphtha is worse than useless, since it not only fails to extinguish the flames, but serves to simply splash the burning oil about, thus scattering the flames; and the opinion is generally entertained that rubber cement behaves in a similar manner.

The object of the experiments above referred to, was to observe the behavior of these articles, while burning when treated to a stream of water, and particularly when subjected to the finely divided spray delivered from the so called "sprinklers," which of late have come into very general use in mills. The result of these trials demonstrated that rubber cement is by no means so hazardous as has been supposed, since it is shown that water, especially when delivered from an effective sprinkling apparatus, will quickly extinguish it. Naphtha alone, however, is shown to maintain its bad pre-eminence as a specially hazardous material.

We give below an account of these tests, with the results obtained, as recorded by the insurance editor of the Boston Commercial Bulletin. The tests were as follows:

First: A quantity of naphtha of 70° was placed in an iron pot and ignited. It continued to burn without being affected by the shower from the sprinkler.

Second: Boards representing flooring or wood-work, as benches, fixtures, etc., were wet with naphtha and ignited. By the time the naphtha had burned off the wood-work was as fire.

Third: The above was repeated with fresh wood. The sprinkler was allowed to operate, and while it did not extinguish the flames, it prevented them from igniting the wood.

Fourth: A quantity of rubber cement, worked up with naphtha into the ordinary consistency, was ignited in an iron pot. The sprinkler promptly extinguished the flames. The wet cement was then immediately ignited from the touch of a match and again readily extinguished by the sprinkler. Cement placed on woodwork was ignited and extinguished just as it was in the pot. Re-ignited and again extinguished in the same way.

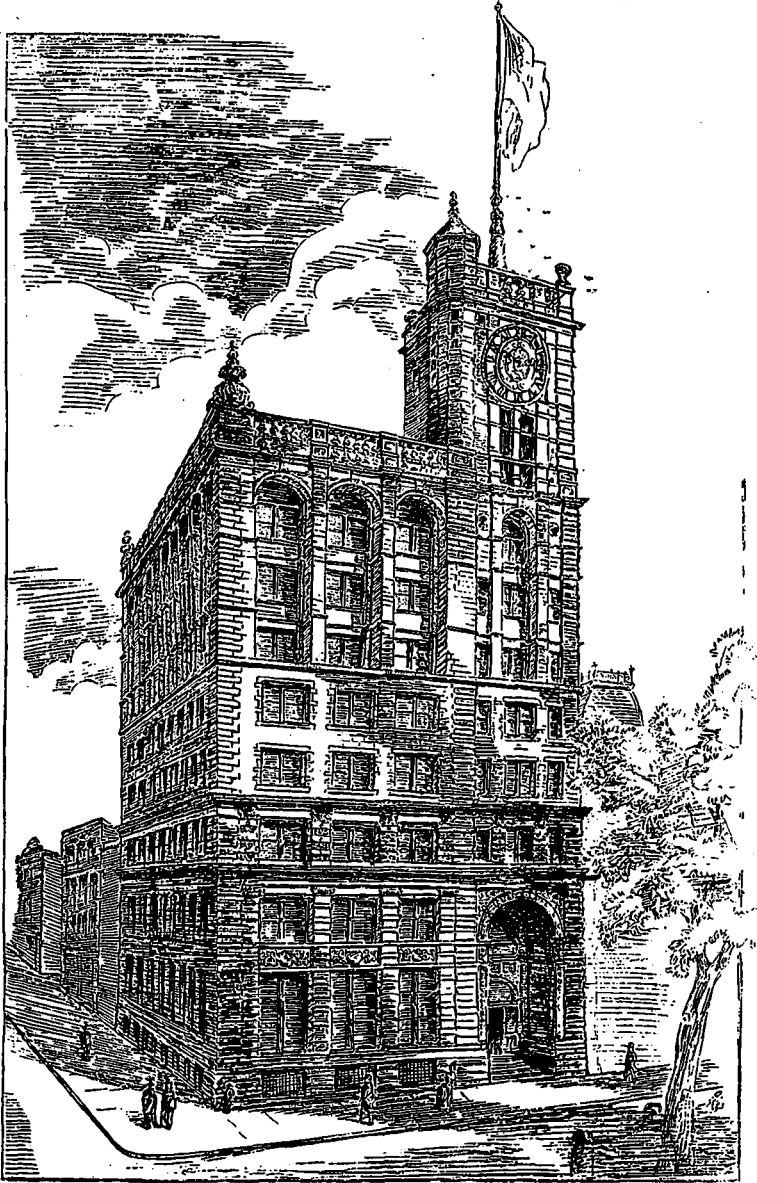
Fifth: Cement was placed on woodwork and ignited. No sprinkler was used, and the cement shortly communicated the flames to the woodwork.

Sixth: A lot of woodwork was saturated with naphtha and another lot was covered with cement. Both were ignited and the sprinkler allowed to work. The flames on the lot covered with cement were promptly extinguished, but the flames on the lot covered with naphtha continued unaffected by the water, and the naphtha exhausted itself. But neither lot of woodwork became ignited.

Seventh: A considerable quantity of cement still remaining, it was ignited in a tin dish, and the sprinkler promptly extinguished the flames. The receptacle was warped out of shape but not melted, and can be seen at Secretary Taft's office containing the cement which was ignited and extinguished.

The experiments with the incandescent electric lights which have been made at the torpedo station at Newport have developed a novel use for these lamps, and one that is said to promise to be of great value in naval warfare. With lamps of about 100-candle power fastened on the ends of poles submerged in the sea to a depth of twenty feet the water is so illuminated that objects in it can be distinguished within a radius of 150 feet. There is little or no glare from the submerged light to betray the presence of the boat using the poles. It is believed that by this means a boat might countermine an enemy's field of submarine mines by cutting his cables or sweeping them to one side. It is probable that torpedo launches will be equipped with these lights.

INCANDESCENT LAMP GLUBES.—The common practice of surrounding incandescent lamps with open globes or globes of ground glass, leads to a loss in the one case of from forty to sixty per cent. of the light, and in the other of from twenty-five to thirty-five per cent. A simple method by which the character of the light can be softened without experiencing so great a loss of intensity has recently been proposed, and consists in covering the globe of the lamp with a film of ordinary collodion, which can, by adding successive films, be made of any desired thickness. The reduction of the light of the lamp does not, it is said, with this method exceed ten per cent., and the system possesses the further advantage that the film can at any time be removed by simple friction. —Boston Journal of Commerce.



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# Decorative

## STAINED GLASS AND CANADIAN ART.

By S. JONES.

There is no intention in the following paper to give a historical or critical essay on the above subject, or to demonstrate the connection between its two branches; but it may be pertinent to say a few preliminary words on what constitutes art, Canadian or otherwise. It is scarcely necessary to point out to the readers of a journal of this character the illogical absurdity of the vulgar idea that all art is confined within the four sides of a picture frame, yet this false conception has been disastrously prevalent even down to the present Victorian era of English art. Many of the most eminent painters (not to trouble you with enumeration of great models and workers in brass, iron, stone, wood or the many forms of artistic reproduction) have been also designers, and have let their art run outside of picture frames. The draughtsmen for, and workers in, stained glass, for instance, now reckon among their number names that were, or could have been, eminent in any department of art. Nor is there need to press the claim of stained glass as a medium for the highest form of art workmanship. Since its discovery and application to all purposes of utility and beauty, its translucent and prismatic charms have won for it a recognition too general if anything, for the beauty of it is such, it seems almost to possess the faculty of dazzling the judgment as well as the visual organs, so that the same superstition has held since its latter revival, that *anything* must be good if it is stained glass. This is an absurdity as inimical to true art as the picture frame theory. No fortunate jumble of pretty color in any material can be called art. Design is the foundation of all art, from a lady's brooch to a Cologne cathedral.

To appreciate the distinction between good and bad heraldic work, just compare an ordinary sign painter's treatment of any quadruped or bird, with its weak, unctuous roundness, shapeless masses of muscle, and saucer-eyed ferocity, its smoothly badgered shadows, deep-cast shades and reflected lights, and the vigorous drawing and flat decorative treatment of one of the pure Gothic school. It is the difference—even when the drawing is equal—between the grace and life of a greyhound and the bloated rotundity of my lady's overfed pug.

The renaissance of stained glass is scarcely half a century old, and from its revival to the present day, gigantic strides have been taken in the direction of beauty and consistency of design, architectural fitness, more natural and correct drawing, harmonious coloring, and in church work of devotional expression. Clayton, Henton, Holliday, Grylls, Morris, Bayne, Kemp, Burn Jones, and a few others, are the root and life and the acknowledged masters of the movement that has since spread over the civilized world. Germany, Italy, Austria, and even France, the modern Greece—the cradle and home of art—acknowledged the supremacy of the English school. All that is good in Canada or the States springs from this one source. But though "there were giants in those days," I am not denying the fact that other decorative artists have arisen since who may be equal to some of those mentioned, Frederick Shields and Almqvist, an Anglicized Swede, being among the number.

Turn we now from the old world to the new, and enquire, briefly, how stands the manufacture of stained glass in the United States and Canada? Has the young western giant who has advanced by leaps and bounds in science and literature—whose enterprise and vigour, boundless resources and commercial genius have seemed resistless—imbibed all the old world experience and improved upon it? Not so! The tourist, the traveller, who would seek for high-class native American art work in glass and interior decoration, would have to explore far and wide. With the exception of Mr. Lafarge, by far the greatest naturalized American artist, and some work by the Tiffany Company, in New York, he will find that all the good church work comes from London, Paris, Lyons, Berlin or Munich. Why, this is, exactly, I cannot say. Several explanations are feasible. The conditions have not been hitherto favorable. The large churches and cathedrals are only now being built.

There has not been the demand for good work, the knowledge of what it consists of, the desire for it, or faith in native ability to produce it. The only certain thing about it is that, despite some recent assertions to the contrary, it has hitherto not been forthcoming. I trust I am doing no injustice to our American cousins. My knowledge of their work is very limited compared to my experience of English glass. Still, I would hesitate to make a charge like this on my own responsibility. I am not relying on personal observation. It is the consensus of opinion from reliable and independent sources, and I stand by the statement. I have the highest admiration for their achievements in many directions of art even. In many branches of lithography and engraving, for instance, they have distanced the world. I frankly admit they do some good domestic work with a beautiful material called opalescent glass. To those who are not familiar with this material, any written description of it would be clumsy. Less transparent than pure glass, it catches and holds the light better from its inequality of surface and latent opacity, changing its hues and reflecting radiances somewhat as the gem would from which it derives its name. I have seen some good specimens of color and design in this material, but in too many cases reliance is placed simply on the beauty of the product. Many intricate forms are

appropriate to a religious edifice. But, of course, if our neighbors think different—well, it's a free country, out I prophesy they will soon educate themselves out of it.

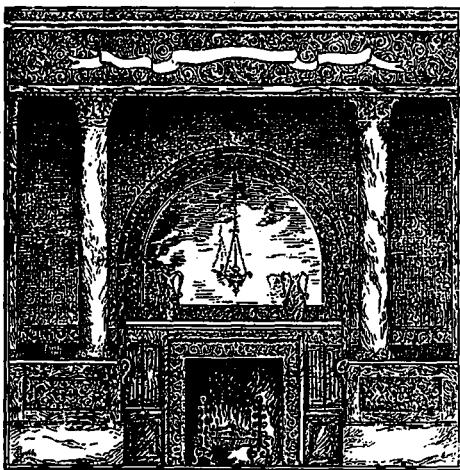
The only window John Ruskin has been known to praise was one by Messrs. Burlington & Grylls, of London, where the key of color was very low—grey blues, dull olive greens, brown reds; the main tint in white and gold, but producing a sombre rich effect—depending on the form, the leading motif, the design, so that the window merges itself into its frame, the edifice itself, and does not glare out like a vulgar patch of gaudy frippery on a sober suited garment.

Let us now examine the state of taste, knowledge and proficiency, in glass work here at home. Canada, despite her many drawbacks, has steadily advanced: her log huts budding into villages, her villages into thriving towns, and her towns spreading into broad, fair cities. From "Muddy York" to the "Queen City of the West," Toronto—like the swift Atlanta—has so rapidly outrun all her fair competitors that it is not easy to realize in how short a space of time she has emerged from the chrysalis shell of her shanties of logs to the beauty of her many palatial residences that adorn her streets and suburbs—exchanging her crude plaster little Bethels for the magnificent churches for which she is famed. So brief is this space of time, it is difficult to determine the growth of art in its varied applications. Some of the early work in engraving, lithographic printing, carving or stained glass, for instance, would be deemed crude and unsatisfactory by the firms now engaged in their production. But with the constant connection, the ever renewed touch with all art centers—the steady influx of skilled craftsmen and designers from the same sources—Toronto is brought abreast with her old-world rivals in many respects. In the recent Colonial Exhibition, Canada surprised the world by her display of natural products, but even a greater surprise was reserved for her proficiency in many forms of art manufacture: her organs and pianos, carved cabinets, and stained glass.

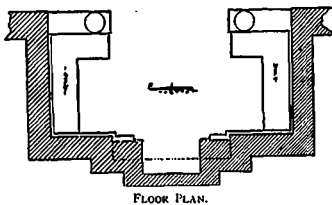
It should be the pleasure, as it is the duty, of all Canadians who have the permanent prosperity of the country at heart to give a wise and generous patronage to all that is good in native workmanship. Too seldom are prophets honored in their own country. Whilst we unlock our boundless wealth of forest, lake and mine, why not cultivate the adorning graces too that shall soften and ennoble this rough-hewn structure? Get a School of Mines by all means, that should be the deeply-laid foundation of Canada's future greatness; but also aim at a School of Art that shall not be American, French, or even English, but Canadian. Establish a

School of Design: they have done wonders in the old country, having wrenched the palm of superiority for many art products from France and Germany. Why may not Canadians do the same? They are of the same stock. Let us give our youths especially a more technical training and reform the system of apprenticeship. For the minerals the earth yields us, train a battalion of Tubal Cains to mould the metal, not for utility only, but to all forms of grace and loveliness. Be content with no second place, but aim at the highest. Step right out in the front and stay there, and if older civilizations dispute our claim let them put their powers to the proof in fair encounter. Something has been done already. Not Canada, not Ontario alone, but the city of Toronto has been heard of in all corners of the earth as a great musical center, thanks to the efforts of a few earnest artists, and in particular Mr. F. H. Torrington. We have native poets, on whom the "immortal nine" have looked benignly. Some portrait painters in Toronto are in the front rank, and do work that would grace any salon in Europe. We have architects, too, who could "erect dreams in marble and preach sermons in stones" with any European architects.

If Canada sink back into oblivion or remain but half civilized, the fault will lie entirely with the purchasing public, "the men of light and lending," who should show a better example. It is not that native work is inferior, that the most aesthetic taste cannot be satisfied at home, nor from any necessity or love of art that wealth is sent abroad, but simply at the dictate of fashion or the more contemptible behest of some mercantile motive. The best art manufacture can be had right here by those who can appreciate it, and are willing to pay a fair price for it. As Ruskin complained long since: "The fashionable rich know nothing of art and care less, but must nevertheless make-believe to have taste, and get the greatest conventional art effect for the smallest possible outlay." If this stigma once



RECESS AND FIRE PLACE FOR HALLWAY.  
By Geo. G. BENTON.



FLOOR PLAN.

obtained, requiring great skill in the cutting and leading of such difficult substance, but there is too feeble an attempt at any given style, at any consistent design, even to a scheme of color; and much of the work in this direction, paid a good price for and highly thought of, is simply (apart from the mechanical skill required to cut and lead it) destitute of all directing intelligence—a heterogeneous mass of mindless magnificence. There is a rage just now for using the same material for church work in the States, which, till I see more of, I will say little about, except that it strikes my insular views as a move entirely in the wrong direction. Infinite pains and patient labor are required in selecting a piece of opalescent that will represent a well-drawn portion of drapery, for instance—painting nothing in a figure but the head, hands and feet, and leaving the whole of the remainder of a raw material—however beautiful, still raw, and too dazzlingly bright to conform to the atmosphere of a temple for worship. I have an old-fashioned prejudice in favor of the effect which Milton describes when he speaks of

"Stained windows, richly dight,  
Casting a dim religious light."

Such effect could scarcely be produced with opalescent glass. The brightness and glitter that would cheer a home in a fan-light or hall door, is not necessarily as

applied to the older civilization, why must it to the new? Why not Canada throw off old world trammels altogether and set an example of true culture to both continents?

A handsome memorial window has just been put in position in St. Thomas' Church, Hamilton, by the relatives of the late Isaac Anderson. It consists of three panels representing the transfiguration of Christ.

Mr. Begy, the well-known painter and decorator, of St. Catharines, is adding a brick and plate glass front to his establishment on James St., and is converting the first upper floor into an artistic show room.

An ingenious veneering process consists in pressing a metallic pattern into the wood, this pattern being usually composed of zinc. After inlaying in the mould thus provided, the rest of surface is planed to the same level and then polished.

All effects in decorative art are studies in the relations of things. Any two things which belong to each other are related by a third that unites them—the essence of both. Unrelated things are always ugly—a load of furniture, for example.—*Edmund Russell.*

The bronze powders may be used by the home decorator for many purposes. Small plaster casts carefully bronzed—using a fine camel's-hair brush—make elegant little statues for stand or bracket ornaments, and larger casts treated in the same way will look nearly as well as real bronze statuary.

**CARVER'S POLISH.**—In a pint of spirits of wine, dissolve two ounces of seed-lac and two ounces of white resin. The principal use of this polish is for the carved parts of cabinet work, such as standards, pillars, claws, etc. It should be laid on warm, and if the work can also be warmed at the time, it will be still better. All moisture and dampness should be carefully excluded.

**FRESCO PAINTING.**—A microscopic examination of the ground on which fresco pigments are laid shows a film of crystals, due to the absorption of carbonic acid from the water with which it is damped, converting the surface of the hydrate into carbonic lime. Hydrate of lime oozes out from beneath through this crystalline film and penetrates the pigments, which are held in place by capillary attraction, but the pigments must be applied before this exudation has proceeded too far.

A finer, cheaper and more durable moulding than plaster of Paris, and which becomes in time as hard as stone, is made as follows: Two pounds of best whiting; one pound of glue and half a pound of linseed oil are heated together and thoroughly incorporated by stirring. The compound is then laid on a stone, covered with whiting and rebated, and when of tough consistency is cut into pieces adapted to size of mould into which it is forced by a screw press. The ornaments or cornice may be fixed to frame or wall by means of white lead.

The high capacity for decoration of the open grate renders welcome its approval by sanitary authorities as securing good ventilation and favoring radiation, that pleasant form of securing heat as against the alleged amount of heat lost, but with the announced progressive advance in the price of coals, the suggestion is opportune of supplying a screen beneath the grate, rendering it air tight, it being sufficient for consumption, that the air has access to the top of the fire. Not only is coal thus economized, but less heat escapes and gases are better consumed.

**IVORY GLOSS ON WOOD.**—There are two kinds of varnish used to produce this white gloss—one a solution of colorless resin in turpentine, the other in alcohol. For the first pure copal is taken; for the second sixteen parts of sandarac are dissolved in sufficient strong alcohol, to which are added three parts of camphor; and lastly, when all are dissolved by shaking; five parts of Venetian turpentine are added. In order to cause the color to remain a pure white, care must be taken not to mix the oil with the white paint previously put on.

Best French zinc paint mixed with turpentine is to be employed. When dry, this is rubbed down with sand paper, and this is followed with the application of the varnish above described.

Paper hangers' paste is best made by first heating the water to boiling, then adding flour, stirring constantly, to prevent the formation of lumps. The flour may be passed through a sieve, so as to insure it a more equal distribution. Agitation is continued until the heat has rendered the mass of the desired consistency, and a few moments further boiling it is ready for use. In order to increase its strength, powdered resin in proportion of one-sixth to one-fourth of the weight of the flour is added. To prevent its souring oil of cloves of a few drops of carbolic acid should be added.



#### KEEP PLUMBING FIXTURES CLEAN.

THERE are many housekeepers who imagine that first-class plumbing should not require any attention. How often have we seen plumbing fixtures of the best design and quality kept in the most filthy condition?—a condition so bad that inferior plumbing would cause less injury to health.

Where people are aware that the plumbing in their houses is of an inferior quality, they take every precaution to reduce the to the greatest possible extent by cleanliness; but when the plumbing is of the best quality, many seem to think that cleanliness is not required, and blame the plumbing for any sickness which may result from their carelessness in not keeping the fixtures clean.

The fact of the matter is that the better the plumbing, the greater the care to keep everything in perfect order. Where there is good work there is generally a large number of fixtures, and the more fixtures the greater the necessity of cleanliness. In houses where the best plumbing is done, servants must be to a large extent depended upon to keep everything in order; and where servants are not closely watched, the work they should do is only too often neglected. The habit which many servants have of storing anything and everything about the plumbing fixtures, should not be allowed. It should be insisted upon that all fixtures should be left perfectly open and clear, so that a free circulation of air should pass in and about them. Closets, sinks, etc., should be regularly cleaned and all copper lining kept bright. The wood-work surrounding all fixtures should be thoroughly washed at frequent intervals or otherwise kept perfectly clean. In short, we would urge the most perfect cleanliness of all the fixtures and surroundings in every part.

The servants' fixtures should receive the attention of the mistress, as servants are proverbially careless of their surroundings. It is not enough that the principal fixtures should be clean—all should be clean, even in the most out-of-the-way part of the house.

It often happens that because the plumbing is good, temporary and local smells are noticeable. With bad plumbing, there is always a close, heavy odor, to which people become accustomed, and the temporary odor is not noticeable. When plumbing is good, the careless or indifferent use of the apparatus may be noticeable because of the absence of the overpowering and ever-present odor usually about inferior work.

Another portion of the house that should receive close attention is the cellar. Nothing should be allowed to remain in it in a state of decay or filthiness. The cellar should be kept as scrupulously clean as any part of the house.

#### TORONTO MASTER PLUMBERS' ASSOCIATION.

THIS Association was started four years ago with only four members, and for some time struggled along with very little success. Not infrequently in those early days of its history the President and Secretary were the only ones to respond to the call for a meeting. Nothing daunted however, the leading spirits in the movement kept right on, and eventually succeeded in getting into the organization all the leading plumbers of the city. The proposal to put into operation a Plumbing By-law, seemed to awaken some interest among the plumbers in the Association, which has since grown into an active, influential organization representing about forty establishments. The Association is represented at the Federated Trades Association by W. Burroughes, J. Ritchie, Joseph Wright and A. Fiddes.

At the annual meeting of the Association held on the 30th January, the following officers were appointed for the ensuing year: President, W. J. Burroughes; Vice-President, J. Sim; Secretary, W. T. Guy; Treasurer, J. Ritchie, Sr.; Guide, C. Weeks.

The following resolution was adopted: "That all master plumbers of this Association will in the future, after the passage of this notice, refuse to supply any materials or furnish any labor to complete a job of plumbing or work of any kind on which a master plumber of this Association has been previously engaged except by the full consent of the plumber who has been previously employed. And such consent shall be given in writing only."

A resolution was all passed to the effect that in future

no plumber will do work for a lump contractor, but will deal with the owner direct.

The Association has petitioned the City Council to amend the Plumbing By-law as follows:

That in rule 1, clause 10, the following words be inserted: "That the plumber shall be responsible only for such works as are actually performed by him. That after the word "time" in the fourth line of clause 9, be inserted "during the progress of the work"; and after the word "Inspector" in the last line of the same clause, "who shall on the satisfactory completion of the work, give to the plumber a certificate to the effect that the work has been inspected by a person appointed by the city, and found to fully comply with the requirements of the By-law, and that the certificate shall free the plumber from any further responsibility." That in clause 10, all words after "By-law" (2nd line) to "Toronto" (4th line) be struck out. That in clause 14, in place of the words "any credible witness," in the fourth line, be inserted the following: "the Plumbing Inspector, and in the event of any person being charged with infractions of this By-law, he may in his own defence produce one or more witnesses, such witnesses to be master plumbers in good standing in Toronto."

The Association is very desirous that the By-law, after being amended in the directions suggested above, should be immediately enforced.

#### THE RELATIONS OF TEMPERATURE TO HEALTH IN DWELLING HOUSES.

BY D. BENJAMIN. M. D.

WHAT is generally called a "cold," is always produced by some change of temperature, with or without moisture, to which a part or the whole of the person has been exposed. In most cases the change must be from a given temperature to a lower one in order to produce a cold. One is more apt to take cold if a part and not the entire body be exposed to a low temperature. Dampness adds greatly to the power of a low temperature to produce a cold.

A cold is a disturbance of the circulation of the blood, whereby a part of the body has too little blood in it, and, therefore, some other part has too much. The part that has too much is said to be congested, and if the congestion is not promptly relieved by treatment inflammation is sure to follow. If in the throat, crop; in the lungs, pneumonia; in the bladder, cystitis, etc.

The human flesh is elastic and contractile, and, therefore, when cold is applied to a part it contracts, holding much less blood, consequently some other part must contain more than it should. Moreover, all vital action goes on more slowly in a low than in a high temperature, so that by cooling a part overmuch its nerve energy and vital force are greatly affected, causing delayed and dangerous reaction, or actual destruction of a part; while the undue blood in some other part of the body lights up inflammation that would not have been called into existence without this stimulus.

Cold applied to the skin generally produces congestion of the mucous membranes, because of their similarity of construction, nerve supply and continuity of structure to the skin.

The most healthful temperature for the human body to live in is about 70° Fah. In a slowly moving atmosphere at 70° Fah. a person cannot take cold; but a change of 10° Fah., especially if it is sudden, is often sufficient to cause one to take cold.

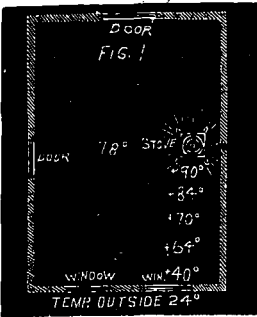
The foregoing are undeniable truths, based on physiology, chemistry and physics. Their importance, and the practical application of them, especially in the prevention and treatment of diseases of the respiratory organs, we will now consider.

A few years ago I began making some observations and experiments on the circulation and temperature of air in rooms, with results which appear to me to be of practical importance. The conditions of temperature and circulation of air vary greatly in rooms, especially those that are in use.

Fig. 1, gives the results of experiments in a room 10 feet high, 12 feet wide and 20 feet long, with a good stove and steady fire. Three-story brick house, south front, twelve rooms, and warm cellar. Out-door temperature, 24° Fah. By examination of Fig. 1, it will be seen that when the center of a room is 78°, four feet from the window it may be 70°; one foot from the window, 54°; and at the window 40° (no doors or windows having been opened for thirty minutes); a difference in the room of 38°.

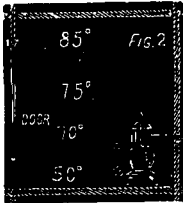
In Fig. 2, a vertical section of the same room, it will be seen that while the head is in 75° the feet may be in 50°. What must be the effect on a person who removes his warm boots and wears slippers, or the one that lies down to sleep on such a floor? Many do these things, however.

Fig. 3. shows an every-day occurrence among thousands, yes, millions of people. A child three or four years old, from playing near a stove or on a nurse's lap, in a temperature of 70° or 80°, perhaps in a sweat, goes to a window and stands, without any change of clothing or protection, for half an hour or more, in a temperature anywhere from 30° to 55°. How such a

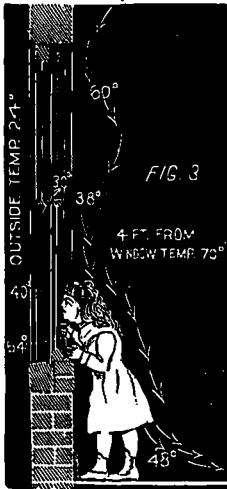


thing can occur without resulting in croup or pneumonia must be marvellous to any one who studies the subject even casually.

In many instances there is a small crack or opening



either under the sash or at the side, and almost always at the junction of the upper and lower sash, where a stream of air is passing into the room nearly as cold as the outside air, though it be below zero. Cold air at a high speed striking a child directly on the bare throat



or breast can seldom fail to produce some dreadful disease.

On a very cold day, in some of the wooden houses inhabited by poor people with many children and little time to look after them, children may often be found sitting on the floor in a temperature of 38°, or standing with nose against a window pane at 20°, when the mother is washing or ironing in 65°. These people generally have but one fire in the house, and that in a cook-stove, which cannot heat the floor at all, while cold drafts come from every other room, and especially from the stairway. In churches and theaters the galleries will be 85° to 90° when the floor is 70°; then the opening of a door or window is very injurious, and going out into the air at 10° or 20° also causes a dangerous strain on the system.

In view of the principle already given, it seems to me that this is a striking state of affairs, and perhaps no

principles of hygiene are so grossly violated as these. No wonder that the death list in Philadelphia alone in a single year reaches the dreadful sum of 1,000 from pneumonia, and about 400 from croup (preventible diseases in most cases). It is also somewhat remarkable that the subject has not before been written up in medical works. The thermometry of hygiene and the sick room is a fruitful field for cultivation.

By reference to the cuts, it may be seen that it is easy to be exposed in five seconds to a change of 40°, a circumstance that can never occur out of doors. In open air the temperature is nearly the same from head to foot, and changes much more slowly than in the house. A child gets off the bed and sits on the floor—a change of 10°, it may be 20°; or it goes to the window, possibly to scratch in the beautiful frost-work on the glass—a change sometimes of 40°. This explains why people take cold more frequently in the house than they do out of doors. In fact, I do not believe that people will take cold by habitually going out if they exercise and are properly clothed.

**THE TORONTO PLUMBING BY-LAW.**

THE By-Law passed by the Toronto City Council for the regulating of plumbers who desire to carry on business within the city, and which has now been in successful operation for the period of one year, reads as follows:

(1). Upon and immediately after the passage of this By-law, in every ensuing year, there shall be taken out by every person desiring to carry on business or trade as a Plumber within the limits of the City of Toronto, a license, for which license the person, or persons in the case of a partnership firm, shall pay at the time of taking out such license the sum of one dollar; and no person shall receive such license who shall not have attained the age of twenty-one years and have a place of business within the City of Toronto, and who shall not furnish the City Engineer and the Medical Health Officer of the City of Toronto with satisfactory evidence of his responsibility and skill to ply his trade in accordance with the terms and conditions, rules and regulations contained in this By-law and in any other By-laws in force from time to time in the City of Toronto respecting plumbing, drainage, sanitary matters, and the Toronto Water Works; and no license shall be granted to any Plumber except upon the certificate of approval of the City Engineer and Medical Health Officer, save as hereunder provided.

(2). Every person desiring such license shall file with the General Inspector of Licenses a petition in writing, giving the name of the firm, if he shall be one of a firm, and each member thereof, together with the place of business, asking to become a licensed Plumber, and said petition shall be accompanied by a bond signed by two or more sureties to be approved of by the Chairman of the Local Board of Health, conditioned in the sum of one thousand dollars, that he or they will conform to all the conditions and requirements of the said Corporation and of the By-laws of the said City for his government or in default thereof will submit to such penalties as are or may be prescribed, by the Council for the government of Plumbers.

(3). Any change of the firm or location of the business must be promptly reported to the General Inspector of Licenses, and the license shall be kept in a conspicuous place at the place of business.

(4). When two or more persons are co-partners, licenses shall be issued in the name of the firm or co-partnership, and no license shall be transferable.

(5). Any Plumber, or firm of Plumbers, who shall be guilty of violation of any of the provisions of this By-law shall forfeit his license and shall be subject to the penalty of the By-law, hereinafter set forth.

(6). All licensed Plumbers shall be held responsible for all acts of their agents or employees done by virtue of their said license. No license shall be granted for a greater period than one year or the unexpired portion thereof. All licenses shall expire on the last day of December of each year, unless sooner revoked.

(7). The following Rules and Regulations shall be observed in the construction of the drains, soil pipes and plumbing of all houses and buildings within the limits of the City of Toronto:

RULE 1.—It shall not be lawful to construct or extend any drain for the reception of sewage or waste water under or into any hotel, tenement house or dwelling house, or to connect the same with any public or other sewer, drain or cesspool, unless the said drain shall in its plan and construction conform to the following requirements: First—All the drains and plumbing fixtures of every house or other buildings shall be provided with sufficient traps and vents to prevent gas from the sewer drain or waste pipes from escaping into any

apartment, and each such fixture shall have its own trap with sufficient vent. (8.) The outlets of above mentioned soil pipe and inlet pipe shall be so situated that from neither of them shall gas be liable to pass into any window, chimney or other opening into any other house or other habitation. (9.) No refrigerator waste shall be allowed to connect with any drain. Second—Between the said trap and the foot of the soil pipe there shall be connected with the main house drain, at or near the point where it leaves the house, an inlet pipe for the admission of fresh air, and the soil pipe within the building shall be continued above the roof, and left open so that the whole of the inside drainage may be thoroughly and constantly ventilated.

RULE 2.—Before proceeding to construct any portion of the drainage system of a hotel, tenement, warehouse, dwelling house or other building, the owner, or his agent, constructing the same shall file in the office of the City Engineer a plan thereof, showing the whole drainage system from its connection with the common sewer or cesspool to its terminus in the building, together with the specification and sizes of all branches, taps, ventilating pipes and fixtures.

RULE 3.—All plans must be legibly drawn in ink on heavy white paper or on tracing linen.

RULE 4.—The size of the paper or linen must be 12½ inches by 15 inches, and the drawing so made as to leave not less than one inch margin outside thereof.

RULE 5.—One vertical drawing will be sufficient for a building when it can be made to show all the work. If the work is intricate and cannot be shown by one drawing, two or more must be furnished.

RULE 6.—One plan will be sufficient to show the work of any number of houses, if built alike at one time and situate together. Upon the plan the street numbers of the houses of which the said plan represents the plumbing arrangements must be marked.

RULE 7.—Every plan must be accompanied by a clear description thereof, or abstract of the specifications in a blank form, prescribed and supplied for this purpose showing size, kind and weight of pipes, and kind of traps, closets and fixtures to be used.

No lead pipes shall weigh less than the following:

FOR WATER WORKS.	
¾ inch internal diameter,	4 lbs. per lineal yard.
½ " " " "	6 " " "
¾ " " " "	8 " " "
1 " " " "	10 " " "
1 " " " "	13 " " "

LEAD WASTE OR VENT PIPES.

LEAD WASTE OR VENT PIPES.	
1 inch diameter,	6 lbs. per yard.
1½ " " "	7 " " "
1½ " " "	8 " " "
2 " " "	10½ " " "
2½ " " "	13½ " " "
3 " " "	16½ " " "
4 " " "	24 " " "

No iron pipe shall weigh less than the following:

IRON PIPES, WEIGHT PER LENGTH OF 5 FEET.

IRON PIPES, WEIGHT PER LENGTH OF 5 FEET.	
6 inch diameter,	100 lbs.
5 " " "	85 " "
4 " " "	45 " "
3 " " "	30 " "
2 " " "	20 " "

RULE 9.—A duplicate on tracing linen of each plan as approved must be furnished for the use of the Inspectors before the first inspection. Tracing paper will not be accepted.

RULE 10.—Plans and specifications shall be approved of or rejected within ten days from the time of filing.

RULE 11.—If, upon inspection of said plan, the City Engineer, Medical Health Officer, or other official or officials appointed by the Council for the purpose, shall find that the same does not conform with the rules and requirements laid down or to be laid down by him or them in respect to plumbing and drainage, either by this or any other By-law, or with the By-laws of the said City of Toronto, he or they shall not issue any permit for the construction of such building or its drainage, and it shall be unlawful to construct such building and the drains connected therewith or connect the same with any sewer. All regulations and By-laws referred to in this rule shall be printed by the Department, and a copy supplied to any ratepayer applying for the same.

RULE 12.—The City Engineer must be notified when any work is ready for inspection, and all work must be left uncovered and convenient for examination until inspected and approved of. The inspection shall be made within three days after the notification shall have been given to the City Engineer who shall apply either the ether, peppermint, water or smoke test, and record the result of such inspection in his office.

RULE 13.—After a plan has once been approved, no

alteration of the same will be allowed except on a written application of the owner, or of the agent of the owner, to the City Engineer.

(8). (a) Each house or building must have its own separate soil pipe and drain, and such soil pipe or drain shall be so placed as to be always readily inspected without excavation or destruction to walls or floors, and the Plumber shall be responsible for the proper connection of his work with the system of drainage, which connection shall be made by a cast iron bend and three feet of pipe from the vertical soil pipe; and no two or more houses or buildings shall have drain in common until each separate drain shall have passed outside the walls of the house or building which it serves. (b). No pan closets shall be fitted up or used in any building, and no closet or other convenience which allows the escape into the house of air or gas which has been confined in any part of it, or from the drain or soil pipe, or which allows the accumulation of filth in or about it shall be fitted or used. (c). Every connection between lead and iron pipes shall be made with brass thimbles or ferrules having properly wiped joints, and the ferrules shall be properly gasketed, leaded and caulked into the said pipe. Ferrules for four inch pipes shall weigh not less than 2½ lbs., for three inch pipes not less than 1½ lbs., and for two inch pipes not less than 1½ lbs., each ferrule not to be less than four inches in length. (d). All water supplies within a house or building must be graded down to a stop and waste cock, which is to be placed just inside the outer wall of the building or cellar. (e). The Inspector must be satisfied that all water pipes are laid with due regard to freedom from danger of freezing, and every service pipe must be provided with a stop and waste cock for each consumer, easily accessible, placed so as not to be endangered by frost and so situated that the water can be conveniently shut off and drained from the pipes.

(9). All work done by licensed plumbers shall be subject to the inspection, supervision and approval of the City Engineer, Medical Health Officer, or Inspector appointed by the Corporation of the City of Toronto for that purpose, and all faulty or defective work which may at any time be discovered shall be made satisfactory to the said City Engineer, Medical Health Officer or Inspector, as the case may be.

(10). Any plumber whose license shall be declared forfeited by the City Engineer for a violation of any provisions of this or any other By-law relating to drainage, plumbing, sanitary matters, or the Toronto Water Works and the supply of water to the City of Toronto, shall not again be entitled to a license until the said declaration of forfeiture shall be revoked by the City Engineer.

(11). The City Engineer, Medical Health Officer, or any Inspector appointed for that purpose, shall have the right, and they are each and every of them is hereby authorized and empowered to enter upon and into any premises at all reasonable hours, and from time to time, as the occasion may require, for the purpose of enforcing compliance with the provisions of this or any other By-law, Rule or Regulation which may at any time be in force in the City of Toronto respecting the Toronto Water Works, licensing and regulating plumbers and plumbing, sanitary and drainage matters.

(12). The Council of the Corporation of the City of Toronto shall from time to time, as occasion may require, on the nomination of the Local Board of Health, appoint such and so many Inspectors of Plumbing as may be found necessary, but no person shall be eligible to such appointment who shall not have passed a satisfactory examination for proficiency in both the practice and theory of plumbing and draining, before a Board of Examiners consisting of the said City Engineer, Medical Health Officer, two practical master plumbers in good standing in Toronto, to be chosen by the Master Plumbers' Association, and an architect or sanitary engineer, to be chosen by the Sanitary Association of Toronto, to hold office for one year.

(13). Any candidate for a plumber's license shall be examined before and by the Board of Examiners named in the preceding section of this By-law, and their certificate, or the certificate of a majority of them, shall determine the right of the candidate to a license.

(14). That any person or persons guilty of an infraction of any of the provisions of this By-law shall, upon conviction before the Mayor, Police Magistrate, or any Justice or Justices of the Peace for the City of Toronto, on the oath or affirmation of any credible witness, forfeit and pay, at the discretion of the said Mayor, Police Magistrate, Justice or Justices convicting, a penalty not exceeding the sum of fifty dollars for each offence, together with the costs of prosecution; and in default of payment thereof forthwith, it shall and may be lawful for the Mayor, Police Magistrate, or Justice convicting as

foresaid, to issue a warrant under his hand and seal; or in case the said Mayor, Police Magistrate, Justice or Justices, or any two or more of them, are acting together therein, then under the hand and seal of one of them to levy the said penalty and costs, or costs only, by distress and sale of the offender's or offenders' goods and chattels; and in case of no sufficient distress to satisfy the said penalty and costs, it shall and may be lawful for the Mayor, Police Magistrate, Justice or Justices convicting as aforesaid, to commit the offender or offenders to the Common Jail of the said City of Toronto, with or without hard labor, for any period not exceeding six calendar months, unless the said penalty and costs be sooner paid.

#### INTERESTING EXPERIMENTS WITH TYPHOID GERMS.

THE village of Iron Mountain, Michigan, was last summer ravaged by typhoid fever, epidemic in its nature. It was suspected that impure drinking water was the cause of the trouble, and to settle this point a sample of the water was sent to Dr. Vaughn, of the School of Hygiene, at the State University, for an analysis. The epidemic was so severe that 350 cases were reported, first and last, and 35 deaths. One part of the town has a public water supply and escaped the scourge, but the other part, whose inhabitants are supplied with water from shallow wells of from 6 to 20 feet in depth, was sorely visited by the disease. The examinations of Dr. Vaughn led to the conclusive discovery of germs in the water capable of producing typhoid fever. The doctor inoculated sterilized meat preparations and sterilized milk with the well water, and kept the preparation at the temperature of the body for seven days. During this time the germ developed in both the meat and the milk.

He then resorted to a further experiment, which is said to be the first of its kind, and which may prove to be of the greatest possible interest and value. Taking some of these typhoid germs, the doctor inoculated several cats with them, and in each case a disease similar to typhoid fever was developed, thus apparently establishing the certainty of the source of the epidemic and also the possibility of using the lower animals to trace such a disease back to its cause. In a report covering these interesting facts, just made to the State Board of Health, Dr. Vaughn says that there are annually in Michigan 1,000 deaths and 10,000 cases of sickness from typhoid fever, adding his conviction that nearly all this may be prevented if the people will only stop polluting the soil and the water. He adds some other important practical conclusions. A succession of freezing and thawing may ultimately result in the destruction of the typhoid germs in the water, but it matters not how cold the winter may be if there is not a continued succession of freezing and thawing the typhoid germ will not be affected. The same is true with regard to ice formed on impure water. The poisonous germs will be preserved intact to do their deadly work the moment the ice is brought into use. As in so many cases typhoid fever arises from the use of impure water and impurely diluted milk, the doctor recommends, where any doubt exists as to the purity of the water, that it should always be boiled.

The Port Arthur Water and Light Company has recently been incorporated.

The city authorities of Winnipeg propose to extend the city sewers and provide for the proper flushing of them.

The Board of Health of Quebec province report that during the year 1887 not a single case of small-pox appeared in the province.

Stratford is discussing the electric light. A proposition has been made to buy a Royal plant at a cost of \$10,000, to run fifty lamps.

Cholera has broken out in some of the South American ports. Our quarantine officials will doubtless keep a careful look-out in that direction.

A committee appointed by the Ontario Provincial Board of Health has reported that the recent fever epidemic at Ottawa was caused by the use of river water of inferior quality.

The Goderich local papers are calling on the town authorities to take measures for preventing the spread of infectious diseases, in view of the prevalence of diphtheria in the town lately.

It will be remembered that last year Sir Donald Smith and Sir George Stephen gave half a million dollars apiece towards the erection of a public hospital in Montreal. The city thereupon gave a site for the building at the foot of the mountain, above the reservoir. The Local Board of Health has decided to ask the Council to get the opinion of a scientific commission as

to whether the city water supply would be likely to be affected by the nearness of the hospital.

The Drain Inspector of Montreal says that housekeepers should not think so hardly of draughtly, cool houses in winter. He believes that many people are saved from sickness in badly drained houses owing to unmediated ventilation. "Often and often," said Mr. Lowe, "the house we would consider the warmest, best and nicest fixed is the one where sickness stays longest owing to the imperfect drainage. There is nothing like ventilation. Housekeepers, too, do not pay sufficient attention to the sinks. Closed sinks get especially dirty, and prove little hotbeds of disease."

A system of steam heating for railway cars is said to be in successful operation on the Canada Atlantic Railway. It is known as the Sewall system, and consists of a main pipe with radiators in the cars. Heating is supplied by the engine; and provision is also made for supplying heat, independent of the engine, in case of a car being side tracked or waiting at junctions for incoming trains, or in event of accident interrupting the connection with the main supply of steam. In such cases heating steam is supplied from a small boiler in each car, that receives the drip of condensed water from the pipes, having a small fire box under it.

The proceedings of the second annual meeting of the Association of Executive Health Officers of Ontario, just closed in this city, were of a most interesting and profitable character. The programme included reports of committees on "House and Land Drainage and Disposal of Sewage"; "Ventilation of Houses, Schools and Public Halls"; "Food, its Adulteration and Unwholesome Supply"; "Milk Supply, its Sources and Contamination"; "Water Supplies and their Contamination"; "Removal of Night Soil and Garbage"; "Control and Prevention of Disease"; "Dangerous and Unhealthy Occupations"; "Sanitary Legislation." Instructive and valuable papers were read on "Methods of Dealing with City Sewage," by P. Drayton, Chairman Local Board of Health, Toronto; "Recent Methods in Milk Analysis," by N. B. Nesbitt, B.A. M.D., Toronto; "The Duty of the State in Investigating the Causes of Disease," by Prof. Victor C. Vaughan, of the Laboratory of Hygiene, Ann Arbor, Mich.; "Methods of Biological Analysis of Drinking Water," by Prof. Ramsay Wright, M.A., University College, Toronto; "Compensation of Health Officers," by Francis Rae, M.D., Chairman Provincial Board of Health; "Cremation of Town Refuse," by Prof. W. Oldright, M.A. M.D., University Medical Faculty, Toronto; "Condition of Factories in Ontario," by J. R. Brown, Inspector under the Factories Act. We may have more to say regarding the work done at this convention in our March number.

#### WHAT CONSTITUTES JUDICIOUS ADVERTISING?

AS to the advantages of judicious advertising, most business men are agreed; but judging from the vast amount of money wasted annually by advertisers, the methods of judicious advertising are but very imperfectly understood. The following extract from an article in the *Toronto Saturday Night*, on "Advertising as a Fine Art," is in accord with common sense, as well as the experience of successful advertisers. Our contemporary says:

"Promiscuous advertising is most injudicious. A man who wants to express goods to a certain town will not ship them over half-a-dozen roundabout roads. He will send them by the most direct route, get them to his patrons quicker and save himself annoyance and expense. It is practically the same in advertising, although the only-tongued advertising agents who flood the country and earn a precarious living by assurance and gab, would endeavor to convince the advertiser that all roads lead to Rome. It is a mistake to suppose that advertising in a paper with a large circulation is necessarily judicious advertising. No greater error could be made. I spoke a while back of the wholesale grocer and his advertisement in the widely-circulated daily as compared with the same advertisement in a trade paper. The same illustration answers here. The trade paper may not have the circulation of the daily, but IT GETS TO THE PEOPLE THE ADVERTISER WANTS TO REACH, which is all he wants, while he saves the percentage of money he would have to spend to put his advertisement before those readers of the daily not affected by it, and who are consequently of no use to him. If he desires to reach a thousand people in a certain walk in life, it is cheaper for him to utilize the columns of a paper that goes to those thousand people and no others, than it is to pay five or six times more for the use of a paper which only reaches about half the people he is anxious to appeal to, although its outside circulation may amount to forty thousand."

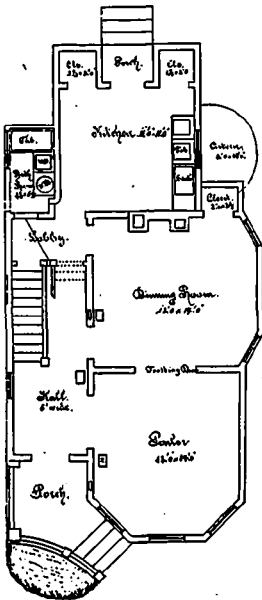


Street Front.

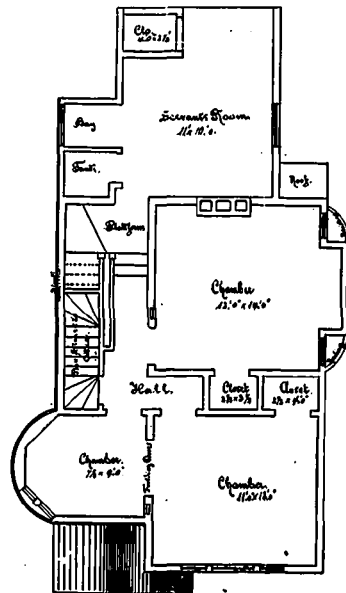


Side Elevation.

# DESIGN FOR COTTAGE COSTING \$3,000.



First Floor Plan.



Second Floor Plan.



Shellac and borax boiled in water produces a good stain for floors.

The Peierloro Bridge Works have been removed to larger premises.

The Beaverton Brick and Tile Co. have dissolved partnership. Mr. Taylor will in future conduct the business.

A company formed in this city recently will establish large works near the mouth of the Niagara River for the manufacture of heating furnaces, etc.

A test of the new pumping machinery for the Water Works Department of Hamilton, showed the pumping capacity of the engines to be in excess of the requirements.

The beautiful enamelled bricks frequently used for outside or interior decoration are made by applying to the surface a colored flux, which during the burning causes the silix to melt and cause a vitreous covering.

Mr. R. Davis, ship builder, has closed a contract with a firm producing works company of Montreal to freight 2,000 tons of soapstone from Portland Bay, Rideau Lake, to Montreal during the coming summer.

Operations have been going on briskly at the Forks of the Credit, notwithstanding the severity of the weather. Messrs. Scott & Pattullo, Armstrong & Sharp and Brindell & Co. are each giving employment to twelve men.

The bulk of the stone used in the construction of the new International Bridge at South St. Marie was quarried at Oren Sound. Mr. G. M. Patterson, the inspector of masonry, says the quality of this stone is unsurpassed on this continent.

A colossal stick of lumber from Puget Sound has been contributed to the Mechanics' Exhibition at San Francisco. Its length is 131 feet, and it is 20 x 20 inches through. It is believed to be the longest piece of lumber ever traced out of any saw mill.

At a meeting of the St. Thomas Plate Glass Association held a few days ago, the following directors were appointed:—J. J. Nicklborough, A. M. Hutchinson, Dr. McLarty, Alex. Lindsay and Dr. Eaton. Dr. McLarty was elected President and J. P. Martyn, Secretary-Treasurer.

The Hungerford Marble Quarry Co., Madoc, Ont., are receiving very encouragement as the result of their recent explorations. It has been demonstrated as the opening of the vein continues, that the marble is there in paying quantities and of a very good quality. Mr. Whitney, the manager, expects to have the product of these quarries in the market during the coming summer. The industry promises to return handsome profits and employ a large number of men.

A new invention designed to take the place of stained glass is white paper manufactured from cotton or linen and modified by chemical action. The paper is dipped into a preparation of alcohol and camphor, which makes it like parchment. From this point it can be moulded and cut into remarkably tough sheets, entirely translucent, and can be dyed with almost the whole outside colors, the result being a translucent sheet showing, it is said, far more vivid hues than the best glass exhibits.

Rocks composed of chlorite are found in various parts of the world, and are used for ornamental constructions, especially for making smaller objects which can be turned with a lathe. These

are the stones which are called by the French *pierres olivines*. A chlorite from Boston, in Lower Canada, has been used. It is found in beds of the Lower Silurian age, lying immediately upon the Laurentian rocks; it is associated with dolomite or serpentine, and, like the latter rock, it contains some chrome iron.

TEST FOR GLUE.—The following simple and easy test for glue is given: A weighed piece of glue (say one-third of an ounce) is suspended in water for 24 hours, the temperature of which is not above 50° Fah. The coloring material sinks, and the glue swells from the absorption of the water. The glue is then taken out and weighed; the greater the increase in weight the better the glue. If it then be dried perfectly and weighed again, the weight of the coloring matter can be calculated from the difference between this and the original weight.

We learn from the London *Free Press* that arrangements are in progress with a firm in that city for the construction of a machine, patented by Mr. Israel Kinney, of Windsor, for the manufacture of patent fire-proof lathing. The machine weighs between eight and ten tons, and will take six or seven months to build. It is intended to construct the machine and operate it in London. Mr. Kinney also states that the machine will turn out creosote, grating screens and bridge-work. He has a patent for the invention both in the United States and Canada.

IRON BRICKS.—Louis Jochim, of Ottweiler, near Saarbruecken, Germany, is introducing paving blocks, which he calls iron brick. They are made by mixing equal parts of finely ground red argillaceous slate and finely ground clay, and adding 5 per cent. of iron ore. This mixture is moistened with a solution of 25 per cent. sulphate of iron, to which fine iron ore is added until it shows a consistency of 38° Baume. It is then formed in a press, dried, dipped once more in a nearly concentrated solution of sulphate of iron and finely ground iron ore, and is baked in an oven for 48 hours in an oxidizing flame, and 24 hours in a reducing flame. The German Government testing-laboratory for building materials has reported favorably on this brick.

HOW TO PREPARE CALCIMENT.—Soak one pound of white glue over night; then dissolve it in boiling water and add twenty pounds of Paris white, diluting with water until the mixture is of the consistency of rich milk. To this any tint can be given that is desired. *Lilac*.—Add to the calcimine two parts of Prussian blue and one of vermilion, stirring thoroughly, and taking care to avoid too high a color. *Gray*.—Raw umber, with a tiring amount of lampblack. *Red*.—Three parts of vermilion and one of red lead, added in very small quantities until a delicate shade is produced. *Lavender*.—Mix a light blue and tint it slightly with vermilion. *Straw*.—Chrome yellow, with a touch of Spanish brown. *Buff*.—Two parts spruce, or Indian yellow, and one part burnt sienna.

A Russian professor has been experimenting on the best way to remove dry rot. He says that a thorough draught will destroy the parasite within twenty-four hours. If the action of draught be assisted by that of sunlight, a few hours will often suffice to put a stop to further damage. A concentrated solution of common salt is very efficacious, and the stronger it is used the more rapid its action. The action of a concentrated solution of cupric sulphate (blue stone, blue vitriol) is still more energetic and complete than that of common salt. Crude carbonic acid is rapid in its action and cheap, but inconvenient to use. But he considers that the best, cheapest, and most convenient material to employ is the tar obtained when birch wood is distilled for acetic acid; the tar surfaces of the flooring are painted with the tar.

IMPROVED BRICKS.—For obtaining products that will offer greater resistance to humidity, etc., than ordinarily is the case, an improved process of manufacturing bricks has been brought forward in Germany. After drying and grinding the clay, a mixture is made of 9 1/2 parts of the latter, 3 parts of iron filings, 3 of table

salt, 1 1/2 of potash, and 2 of elder or willow wood ashes. The whole is heated to temperature varying from 3,352° to 3,623° Fah. At the end of from four to five hours the argillaceous mixture is run into molds, then re-baked in the ovens—always protected from the air—at a temperature of 822° to 932° Fah. The product may be variously colored by adding to the above quantity two parts of manganese for a violet brown, one part of manganese for a violet, one part of copper ashes for a green, one part of arsenic of cobalt for a blue, two parts of antimony for yellow, and one and a half parts of arsenic and one part of oxide of tin for white.

In the new system of electric bells invented in England and now being introduced, says the Boston *Journal of Commerce*, the magnet box is dispensed with and the hemispherical bell is replaced by one of the church type, inside of which is the electric magnet, the latter being a single solenoidal magnet of special construction, and by it the armature is attracted by both poles simultaneously. By this means less than half the usual quantity of wire is required, thus reducing the external resistance of the circuit one-half. Moreover the armature, besides being magnetized by induction, as acted on in the ordinary method, is directly polarized by being in actual magnetic contact by the connection of the ginal—which is in one piece with the magnet—with the core iron of the iron bell, and it is thus induced to perform the largest amount of work with the smallest electric motive force. Again, instead of the armature and clapper being in a straight line attached to a rigid spring, which necessitates a considerable attractive power to primarily give it momentum, this new system has the armature and hammer in the form of an inverted U, and being perfectly balanced from the point of suspension, the lines of force from a comparatively small magnetic field suffice to send this improved form of armature into instant regular vibration. By using a flexible break-and-make arrangement, a better result is attained.

TESTS OF WOOD FOR BUILDING.—J. B. Johnson, director of the U. S. Testing Laboratory, at Washington University, says: Manufacturers, builders, architects and too many engineers rely solely on the tables and formulae given in the trade or engineering handbooks. They know nothing of the original experiments from which the tables are derived, and too often are unable even to verify the truth of the formulae. As a matter of fact, the portions of these books referring to the strength of materials, and especially of wood, were based on experiments on small specimens and were made about one hundred years ago! Some of the arguments in favor of a new test are given below. All the old tests were made in England, and, as already remarked, on small specimens. The Western American woods have never been fairly tested for strength. Such tests as have been made on large specimens of American wood have shown the strength to be only about one-half what all the tables give them. Many cheaper kinds of timber may prove more valuable for structures than more expensive varieties, which have been supposed to be stronger. The pine supports or pilings have been found stronger than oak ones, when tested in full-sized samples. Notches cut in beams or joists, whether at the ends or in the middle, have been found to weaken the pieces a great deal more than is generally supposed. When a joist is notched into a floor beam or header, it is only about one-half or one-fourth as strong as when left full size and resting on the bottom. It always splits from the notch. If the portion below the notch be doubled off so as to be the full depth at the middle, the strength is doubled. That is to say, by removing a portion of the joist (in case of a notch), the strength is increased. This seems paradoxical, but it is true in premise and consistent with theory. It then does not fail by splitting from the end, but by breaking apart in the middle. The shearing or splitting strength of timber is of great importance in structure and is almost always overestimated. A few well-arranged tests will give more information to the designer than all the tables in the handbooks on these matters.

BUILDING MATERIALS.

Table listing various building materials such as Yellow ochre, Yellow chrome, Green chrome, Paris, Black lamp, etc., with their respective prices.

CEMENT, LIME, etc.

Table listing cement and lime products like Portland Cement, France & Son's "Victis", etc., with prices.

LUMBER

Table listing various types of lumber such as 1 1/2 inch thicker clear picks, 2 inch siding, etc., with prices.

BRICK

Table listing different types of bricks like Crown, brown, Jersey, etc., with prices.

Cutting up planks, 1 1/2 inch thicker, dry

Table listing various lumber products and services like Dressing stocks, Plena, American inspection, etc., with prices.

PAINTS (In oil, U.S.)

Table listing various paint products like White lead, Can, Red lead, etc., with prices.

YARD QUOTATIONS.

Table listing yard quotations for various materials like Mill cut boards and scantling, Shipping cut boards, etc., with prices.