

**PAGES**

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## —THE— CANADIAN ARCHITECT AND BUILDER,

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THE Royal Institute of British Architects have decided that women may take part in the Institute examinations, and the proposal to admit them to membership in the Architectural Association is at present the subject of a lively discussion in the pages of the official organ of that body.

THE Commissioner of Customs states that notwithstanding a protective duty of 50 per cent., large quantities of wire goods and slate are exported from the United States to Australia, and he sees no reason why manufacturers of these goods in Canada should not compete with the Americans for the Australian trade.

SOME particulars have reached us of the invention by a Canadian of a process which promises to revolutionize the present methods of clay working in connection with the manufacture of brick, terra cotta, drain pipe, etc. It is stated that by this process the time required for the manufacture of materials of this description will be reduced in a wonderful degree with a somewhat proportionate reduction in cost of production. As the inventor has not yet secured the protection of his discovery by letters patent, it would not be just to him that we should make public at present any further particulars concerning it, but we hope to be in a position to do so at an early date.

IN the annual report of the Secretary of the National Association of Builders, presented at the annual convention of that body held recently in Boston, it is made to appear that there are upwards of 40 Builders' Exchanges in the Dominion of Canada, and in affiliation with the National Association. We have no hesitation in declaring this statement to be totally incorrect. There are not a dozen Builders' Exchanges or Associations in Canada, and not half a dozen in affiliation with the American Association. We would be pleased to see the builders of Canada as well organized as the report of the Secretary of the National Association would imply them to be.

A BILL has been introduced in the Ontario Legislature which provides for the taxing of church buildings. Petitions have also been addressed to the Legislature by the City of Hamilton and other municipalities praying for the enactment of legislation with this object. The passing of such a law would doubtless affect very materially the cost of many church buildings erected in the future, a result which would scarcely be appreciated by architects, whose commissions are usually based on the cost of the building. It would have a good effect, however, in the direction of restraining church trustees and committees from vieing with each other as at present in the erection of expensive churches, the funds for which must in most instances be raised by heavy mortgages.

MR. WAITE, of Buffalo, the architect of the new Legislative buildings at Toronto, is said to have recently preferred a claim for commission, amounting to about \$28,000 in addition to the \$38,000 or more which has already been paid to him by the Government. It will be remembered that the original limit of cost of the buildings was \$750,000, and that notwithstanding the designs submitted by Canadian architects were thrown out because the tenders on them exceeded this amount, Mr. Waite was afterwards given the work and allowed to expend nearly a million and a half upon it. It is said that the understanding was that he was to be paid a commission of 5 per cent. on the original estimated cost. However this may have been, he now demands his commission on the full cost of the building.

AN American contemporary says: "We have had so many applications of late for sample copies of *The Southern Architect*, which are unaccompanied by the stamps or other evidences of a disposition to appreciate the favor of such an accommodation, that we have been compelled to refuse all such requests. In fact the calls for samples are so numerous and regular that we suspect the sample copy fiend is trying our good nature and attempting to save the two dollars necessary to insure the regular monthly arrival of the paper." We have had a similar experience, and have satisfied ourselves that there are in the United States a large number of builders and some persons claiming to be architects who make a practice of writing to the publishers of architectural journals for free sample copies, with no intention of becoming subscribers. By this means they secure a collection of valuable illustrations and printed information at the cost of a few cents for post cards. From one individual we received at different times no less than three requests for sample copies, which confirmed our previous suspicion that a fraud was being practiced. Since then requests for free sample copies have been met with refusal unless they were accompanied by some evidence of the bona fides of the applicant. Publishers of architectural journals should refuse to be further victimized.

SINCE the ejection by the architect of Mr. Neelon, the contractor for the new city buildings at Toronto, and the granting by the Courts of permission to the architect to proceed with the erection of the building, both parties to the dispute have been busily engaged in collecting evidence with which to substantiate their positions when Mr. Neelon's suit for damages should come up for hearing. The case, which was looked forward to with much interest owing to its novel character and the magnitude of the interests involved, came up for argument before Mr. Justice Rose at Toronto in the early part of the present month. From the number of the witnesses and the mass of evidence ready to be submitted, it appeared probable that the case would occupy several weeks, but circumstances arose which brought it to a close for the present on the fourth day, when but little evidence had been adduced. Mr. Blake, the plaintiff's counsel, raised the contention that Mr. Lennox, the architect, had not the power to dismiss the contractor without the written consent of the Court House Committee of the City Council. The proceedings were adjourned to allow the Judge to consider the point, and as a result of such consideration he decided on the following day that the architect had the power under the contract to dismiss the contractor. Mr. Neelon's counsel having stated that his client was averse to proceeding further with the evidence in this Court, Mr. Justice Rose dismissed the action, with costs against the plaintiff. The case will be appealed to the Chancery Divisional Court, and should the decision there prove unsatisfactory, the plaintiffs will doubtless carry it to the highest court of appeal.

WE have heard much during the last month of the sufferings of the unemployed, and the unusual extent to which lack of employment prevails. We have witnessed also the unusual sight of the principal thoroughfares of Toronto being blockaded at certain hours of the day by crowds of people waiting to have food and clothing dispensed to them by certain of the newspapers, which, judging by the manner in which their charity was heralded, were quite as anxious to attract attention to themselves as to relieve the needs of their fellow citizens. We believe that positive injury has resulted from the methods pursued by these papers. In the opinion of ministers of the leading churches and of persons connected with the numerous charitable organizations of the city, the distress existing this winter is but little greater than in former years, yet it has gone abroad to the world that our streets are thronged with people clamoring for bread, while the overdrawn pictures of want which have appeared in the newspapers have emboldened the idle and dissolute classes of the community to assume a threatening attitude. The suggestion has very properly been made, that instead of paying out large sums of money to the unemployed for snow cleaning, and such like unnecessary work, the City Council should endeavor to provide useful employment by carrying out the construction of some of the needed improvements which must be undertaken in the near future, as for example, the trunk sewer or the water tunnel recommended by the City Engineer. If

such works as these are undertaken largely with the object of relieving the wants of the unemployed, it should be with the understanding that the unions will not as in the past insist on the city paying a rate of wages equal to that which might be expected under more prosperous conditions.

THE City of Toronto is once more giving evidence of its conservatism in adhering to village practices, by attacking its officials, and especially its engineering department. The present engineer has shown immense capacity for organization and grasp of the details of the whole work of his department, to which was added the charge of the water works, with its unenviable legacy of a leaking conduit, broken connections at all points, leaky pumping wells at the pump house and numerous other troubles. The work of the city has never been carried on so smoothly and satisfactorily, and instead of being thankful for their lot, a few new aldermen have assailed the whole organization of the civic staff. Of the miserly savings effected in the engineer's department,—about \$3,300,—over \$2,000 is contributed by four officials. With a most excellent and unlimited supply of pure water at their door, an unreasonable agitation has been sprung on the Council to bring water from Lake Simcoe. The council cannot be induced to consider the report of their own engineer which they themselves ordered him to prepare; it is at present waste paper. Lake Simcoe is the hobby of one man who seems to have completely hypnotized a section of the Council into believing and desiring to see carried into effect a scheme which will be the ruin of those who undertake it. Ten thousand horse power from Lake Simcoe to begin with, and any amount afterwards, to give power, light and heat to poor languishing Toronto, is as glibly talked about as building a head race for a flour mill. Millions of dollars of expenditure are spoken of with such levity that one is induced to believe the whole financial world is longing to help Toronto to drain Lake Simcoe, leave its 10,000 H. P. higher and drier than Noah's Ark, and seek no return or revenue for the monies invested. It makes one tired to hear this constant agitation about Lake Simcoe water. The promoters appear to have a considerable following in the Council; let them get their friends to move for an appropriation to extend and complete the surveys made when Mr. McAlpine and Messrs. Hering and Gray were here. An expenditure of \$5,000 will effect this, prepare estimates, and give the Toronto public full and reliable figures on which they can discuss intelligently the question of this source of water supply, and it will effectually settle the water supply, power, heating, aqueduct and canal schemes.

THE citizens of Toronto should feel indebted to Colonel Sweny for having suggested in the public press the construction of waterways on Toronto Island, which should afford communication between the different parts of the island by means of steam or electric launches, in preference to electric railway transit. Undoubtedly it would be possible by such means as Colonel Sweny has suggested, to make of the island a most attractive and healthful resort. In detail his various suggestions appear to be in some respects inconsistent. He objects to the electric cars because, as he states, they would create noise and by conveying crowds from one Coney Island show to another, the whole place would be given up to revelry and clamor. On the other hand he suggests the making of a race course, which would become the champion course of Canada and attract thousands of visitors annually to witness the great races of professionals and amateurs. The carrying out of this suggestion would probably destroy quite as effectually as the electric cars the character of the island as "a quiet and delightful retreat where many a family flying from the city's heat may find rest in the summer days." With the scheme as a whole, however, we are in entire accord. The World's Fair grounds at Chicago were a sufficient indication of what might be done at Toronto. We cannot agree with Colonel Sweny's statement, that "the past history of the island conclusively proves that neither the people nor its representatives are alive to the importance of the property they own." This was true as regards the island a few years ago, but the Parks and Gardens Committee of the City Council have within the last five years changed the aspect of the central portion of the island in a manner which has very materially increased its attractiveness,

and by doing so have shown themselves to be alive to the possibilities of improvement. The Toronto Architectural Guild at its last meeting discussed this subject, and unanimously adopted the following resolution, which will be forwarded to the City Council: Moved by E. Burke, seconded by S. H. Townsend:—"That the Architectural Guild respectfully urges upon the City Council the wisdom of a very careful consideration of the transportation and other problems at the island; that we deprecate the proposed introduction of the noisy and dangerous trolley, and would advocate such a scheme as that outlined by Col. Sweny in the public prints. The artistic effects in the way of connected lagoons and wooded islands, such as were introduced at the Chicago World's Fair, are possible here on an extended scale, and we think this generation will be very remiss and lacking in breadth of view if such magnificent opportunities are not taken advantage of from the beginning. The sanitary advantage gained will also be of immense benefit. We beg to suggest a very careful consideration of the whole subject and the engagement of the best available landscape architect to advise and plan for what may be made in time a Toronto Venice".

#### AN INTERNATIONAL EXPOSITION AT TORONTO.

As this number of the ARCHITECT AND BUILDER goes to press, our attention is called to a resolution adopted by the Toronto Board of Trade, favoring the holding of an International Exposition at Toronto a couple of years hence, and to an editorial article in the Toronto Globe in support of the project.

The space at our disposal will only permit us briefly to express the hope that immediate steps will be taken to carry out the undertaking. It would be the grandest possible advertisement for Canada, and would be the means we believe of giving a much needed impetus to immigration and business enterprise, while needed employment would be furnished to the laboring and artisan classes. The conditions are likewise most favorable to the carrying out of the scheme at the smallest possible expense. Architects and builders, who, with other classes, would be benefitted, should give the enterprise their prompt and earnest support.

#### TORONTO BUILDERS' EXCHANGE.

TORONTO, March 6th, 1894.

Editor CANADIAN ARCHITECT AND BUILDER.

Sir,—As a member of the Supply Dealers Section of the Toronto Builders' Exchange, I have to complain of the treatment which I have received at the hands of some of my fellow members. It is one of the regulations of the Exchange that members belonging to the Builders' Section who may purchase materials from members of the Dealers' Section, shall receive a certain discount off prices charged to outside builders on condition that the materials thus purchased are paid for within 30 days. Many of my fellow members to whom I have sold materials, allowing them the cash discount with the understanding that the goods would be paid for within the specified time, have failed to make payment for two, three or four months, and have then insisted on getting the benefit of the discount, notwithstanding their disregard of the terms upon which it was to be allowed, and unless their demand is complied with, I am given to understand that they will withdraw their orders from me. In view of the dull times, they well know that every dealer must be anxious to avoid loss of trade, so take advantage of this fact to repudiate the well known conditions of purchase as laid down by the Exchange.

This is a matter which the Board of Directors of the Exchange would do well to take cognizance of, as unless the members of the organization are compelled to deal fairly by one another, the benefits of membership must soon disappear.

Very truly yours,

MATERIAL MAN.

#### PERSONAL.

Mr. P. Lacroix, of Montreal, was a delegate at the convention of the National Association of Commissioners and Inspectors of Buildings recently held in Boston.

The death is announced at London, Ont., of Mr. William Wales, father of the wife of the Mayor of that city. Mr. Wales, who was a native of Devonshire, Eng., was a well-known contractor, having carried on business in his line at Kingston, Ont., and having recently been engaged on the construction of the Parliament Buildings in Toronto. The deceased was in his seventy-sixth year.

Mr. C. F. Fraser, who has occupied the office of Minister of Public Works in the Ontario Government since 1874, had tendered his resignation. Mr. Fraser has been in ill health for several years past, and on one occasion would have resigned his duties had not his colleagues in the Ministry prevailed upon him to continue in the position.

#### TORONTO TECHNICAL SCHOOL.

THERE can be but one idea with reference to the usefulness of technical schools, and we believe that the majority of the people in civilized countries hold to that idea, namely, that when managed by competent bodies of men forming the board of management, with zealous instructors, duly qualified, under them, nothing could be of greater advantage to the mechanic, anxious to obtain an education in his particular trade, which he could not possibly obtain without them. When, in addition to the facts that a technical school exists in any city, and is well governed and managed, the instruction is given absolutely free, the boon to the working man is simply immense. That a man should be able to acquire not only an insight into, but a thorough training in the science of his trade by diligent attendance three or four nights a week in a well lighted and well ventilated building, listening to the instruction given in a manner suited to his ability to grasp it, must be regarded as a very valuable privilege, and men who will not take advantage of all this, must be considered drones of their class. But everything in the success of such an institution must depend upon the zeal of the board of management, and the ability of the instructors. The board of management must be composed of men who are to a greater or less degree experts in the branches they represent; they must be men who will throw themselves into the work of the institution with zeal and unflagging interest, who will carefully watch their several departments and see that those who come up for instruction are receiving all that the school is able to give. Under them must be a supervisor or head master, who is responsible for the direct management of the school, and while capable of taking occasional classes himself, must be able to know that all the other classes are well managed, that the teachers are doing a thorough work and are able to impart instruction.

The teaching staff must not only be persons who have passed qualifying examinations and are experts in their particular lines, but they must have the *faculty of teaching*, which is by no means possessed by every one who may be considered an expert in any particular science. Necessarily, of course, they must have a love for teaching, and the ability to gauge the minds of those who come to them for instruction, and be readily able to grasp the meaning of the duller students who have difficulty in expressing their needs succinctly. Patience is a gift that must be possessed by all teachers, and then with a love of the subject and a desire to infuse into the students an equal love of the subject, the qualified expert will be a successful instructor.

We have in Toronto a technical school the general working of which is little known to the public. It is in its infancy, and much that such an institution desires to accomplish, is necessarily beyond the means in hand at present. But it speaks well for the school that the attendance has already become too large for the rooms now occupied, and the work done by the students such as is of a character that can be exhibited, is very creditable to the institution.

The Toronto Technical School has a board of management composed of the Mayor of the city, the chairman of the Executive Committee and three aldermen, ex officio members; two experts in technical education; two stationary engineers; two members of the Council of the Ontario Association of Architects; one manufacturer, and five representatives of the Trades and Labor Council. Of the technical staff, the head master Mr. Duff, and one other, are B. A.'s, and graduates of the School of Practical Science; one other is a graduate of the same school; one is a B. A., another a B. A. and M. C., while another is a member of the Ontario Association of Architects, and another a lady, is a B. A., and holds the position of Public Analyst.

We have given these particulars because of our insistence upon the necessity of proper qualification in the instructors of a school such as the one in question. It may be said that something of the same importance must attach to teachers in all schools, but there is even a greater necessity in an institution of this kind because it is not rudimentary work that is here studied, but work that cannot be successfully carried out but by eminently qualified teachers. Mechanics, chemistry, physics, mathematics, descriptive geometry and drawing cover a wide range of technical study, both theoretical and practical, starting at a point considerably in advance of the highest grade of public school instruction and stretching forward to an indefinite grade of study in science. One of the important points for first consideration therefore must be: what shall be the highest limit of the instruction given in a particular school. This must be decided by two things: first the amount of funds at disposal for the purchase of apparatus and appliances, and secondly by the requirements of the majority of the students likely to attend. There must be some limit, or the theorist might carry on his course over several years and a great deal of time would be spent in mere speculation, while in practical matters it would be a mistake to go beyond the recognized requirements of particular trades. It has been found necessary to treat in an elementary manner upon some subjects, such for instance as arithmetic and mensuration. A student would profit little by the most excellent instruction in mathematics unless he had a certain fluency in arithmetic, and as most students coming first to the school, have passed some years since they left the public school, their arithmetic, except in very simple matters, must necessarily be "rusty" even if they ever learned enough "at school" to enable them to take up the higher branches. Descriptive

geometry and drawing cover, perhaps, a larger field than any other subjects, from practical geometry, drawings of constructions in all trades, the setting out of carpenter and joiners' work (some of which is necessarily indicated) drawings for pattern makers for machinery, up to free hand, ornament and design, and even architecture. Thus this subject illustrates, in a way, the importance of a thoroughly qualified instructor.

Another very important point to which a Board of Management must be thoroughly alive is, that having satisfied themselves with the *qualifications* of the teaching staff, they ascertain from time to time that the teachers are making progress themselves and keeping abreast of the times. It is very easy for an instructor in any subject to "get into a groove" or even to become careless in the preparation of his lectures; the problems he propounds must be progressive and must carry with them important lessons; and again these problems must be suited to the various stages at which the students have arrived. A problem may be in every respect a very excellent one, but if it goes beyond the instruction given, or does not come up to it, it is valueless, for in the one case the student will work it out with the greatest ease as belonging to a stage he has passed, or in the other, it will be a waste of time for him to puzzle over something about which he has not as yet received full instruction. It has been said that the guarantee against failure, in this respect, on the part of the instructor would be, that the students would themselves complain that they did not obtain that which they found of necessity to them. But it must be remembered that the majority of students, probably, would not have sufficient ability to detect any weakness of this kind in the teacher, and few would like to take upon themselves the responsibility and the great unpleasantness of making a complaint. The consequence would be, that one or two, who felt this, but did not see how to help themselves would leave, while the majority would remain and waste their time under the impression that they were progressing. Examinations of students to ascertain their progress would not mend matters or be a sufficient guarantee in the matter. This work of keeping the instructors up to the mark would, we suppose, devolve upon the two experts in technical education. These two experts are Prof. Galbraith and Dr. R. B. Orr, and we find their names head the list of the "School Management Committee." In these two gentlemen we think the public have a thoroughly satisfactory guarantee in this particular.

One point which concerns the public generally more perhaps than any other, and vitally concerns the institution itself, is the salaries paid to the instructors. The suggestion of reduction of question of salaries is now occupying the attention of the Board of Management. Every institution in its infancy, to be a success, must be carried on on the most economical principles consistent with the objects to be attained. An institution of the kind in question requires a large number of appliances for the execution of its work, as well as competent instructors, and the instructors must necessarily be hampered in their work without a sufficiency of appliances. When the appropriation for the work of the school is limited, it becomes a nice question as to what proportion shall be spent in salaries and what in the purchase of appliances, having first deducted from the appropriation the current expenses, such as rent, fuel, light, etc., etc. It seems to us that the subject has not received the attention it deserves at the hands of the board of management, and that the principle in force in the technical school of Toronto is an easy one of disposing of a difficult question, but that it is open to question as to whether it is very fair to the instructors themselves or altogether judicious in view of the limit of the appropriation. We do not for a moment agree with undervaluing the services of qualified teachers, but the point is one of utilizing the funds to the utmost advantage. Out of an appropriation of \$7000, \$4000 is divided equally among the eight instructors, no difference being made between one who has to spend a large amount of time in necessary preparation of his lectures and one whose subject being practically book work, does not need much time for preparation—between one whose subject is endlessly progressive, and one whose subject is by very nature, a limited science. In the first place \$500 seems a large sum for an instructor who having the whole day for earning his livelihood, puts in say three nights a week for about six months of the year, and has little or no preparation to make for his class work at the school. But it does not seem too much for one who has to put in five nights a week for the same time, and has to spend two or three hours a day besides in preparation, even if he is an expert, and thoroughly posted on his subject.

In this institution the principle is that the work of instruction is to be divided up as equally as possible among the eight instructors, and if one has more than he can do in one subject, he must get the assistance of one whose time is not so fully occupied, so that the time of each shall be equally employed and all receive the same remuneration. But is there not a weakness here? The expert in one science is not likely to be an expert in another. If the instructor in drawing had too much on his hands, he could hardly obtain assistance from the expert in chemistry, or the expert in chemistry from the expert in mathematics. While we do not advocate the reduction of salaries as an all round principle, no less volens, we think that there would be a decided gain to the institution if the matter were regulated in a rather more practical manner than at present.

The limited space at command of the institution should make the matter of admission to its benefits, one of some considera-

tion. At present any applicant (unless something serious is known against his character for instance) is admitted. A youth may think it will do him good to attend certain classes and he applies for admission; he attends a few nights and "drops out"; another may find it a pleasant way of spending a few evenings a week, taking up much valuable time of the instructor, and learning nothing, or one may come to learn, for example freehand drawing, not for the purpose of improving himself at his trade, but simply as an accomplishment. Thus, the space being limited, these three would shut out others, worthy seekers after knowledge as a means of improvement in their trades, for whom we conclude the institution is primarily intended. Now that the two dollar deposit, originally demanded from an applicant is not required, there is absolutely no guarantee of serious intention on the part of the applicant. Some kind of enquiry should, we think, be made concerning the applicant before admission is granted, of a fuller scope than is supplied by the simple form of application.

There is one other point upon which we wish to touch, that is examinations. The institution, like all others in their youth, cannot be expected to produce in the short time that it has been at work, very great results, and the public should not be disappointed that experts are not turned out at the close of every term. The work is necessarily progressive, and a certain course must be taken (in some classes of two years duration), before the ground is covered. There are certain disadvantages perhaps in permitting each instructor to examine his own class, but there are many advantages, and on the whole this principle really has proved in the majority of institutions to be more satisfactory than the employment of "outside" examiners. The "outside" examiner is generally or should be necessarily an expert among experts, but he has no intimate knowledge of the students he has to examine. Consequently he looks over the work through which the students have waded in the term, concludes that they have reached a certain standard, and he possesses certain or if we may say so, stock or test questions, which, if every student was of the same mental calibre as his neighbor, would no doubt test their abilities very well. But in all classes, there are some students brighter than others, and some who cannot by any means grasp a subject so easily as others. Moreover every examiner knows that many a student fairly well posted in his subject and who has shown great diligence at his work may fail completely at an examination through nervousness or the inability to comprehend the exact meaning of the questioner; while it may happen and has happened that a student may be acquainted with the peculiarities of a particular examiner and come out with flying colours at an examination who really was not so well grounded as the former example. There is a difficulty here that is not easy to get over in the way of satisfying the public that the results of the work are commensurate with the appropriation. A certain amount of result may in some branches be seen, as for instance in the exhibition of drawings executed by students, but even this is not satisfactory, for if a student exhibits a beautiful drawing of an elaborate machine, the public cannot know from the drawing that the student has an accurate knowledge of the use and working of every portion of the machine. A knowledge of algebra and such sciences cannot be exhibited, nor can the result of a two years course of chemistry be practically demonstrated to the public mind. In this matter the public must trust to its representatives on the board of management. The duty of the public to themselves is to see that the best men for the positions are elected to fill these offices and the public may and should scrutinize carefully the work done and the attention given by each member of the board.

A visit to the institution satisfies us that so far as it is able to go, the lines upon which its work is based are very excellent. It is a school worthy of a much larger appropriation, but the foregoing suggestions with reference to improvement in management present themselves, and are worthy we think of investigation.

Our thanks are due to the very courteous reception we met with at the hands of Mr. Duff, and the pains he took to give us the fullest information concerning this valuable institution.

#### ONTARIO ASSOCIATION OF ARCHITECTS.

THE first of a series of public lectures to be delivered under the auspices of the Association was given by Mr. Grant Helliwell, in the School of Practical Science, Toronto, on the evening of Thursday, the 8th inst. The subject of the lecture was "Current Architectural Styles." The subject was treated in a most interesting manner, and illustrated by a stereopticon under the direction of Mr. C. H. C. Wright, Lecturer in Architecture in the School of Science.

In substance the lecture is embodied in the paper read by Mr. Helliwell at the recent convention of the Association, and printed in the present number of this journal. It was, however, considerably amplified and popularized as befitted the occasion.

The audience numbered between two and three hundred, but strangely enough the students and to some extent the architects also were conspicuous by their absence.

It is learned that a special autumn meeting of the Association has been decided upon. It will probably be held in September. It will not be a business meeting, but a meeting for instruction, for which an interesting programme of papers, etc., is to be provided.

## ROCKS.\*

Geologists and architects have at least one interest in common, they both deal in what a geologist calls "rocks" and an architect "stone." The rocks of the geologist include, however, the sand of a seashore, the soil of a field and the ice of a glacier, whereas no architect would think of building in any of these materials unless perhaps an ice palace at Quebec this or some other winter. The geologist when dealing with rocks is apt to dub himself a petrographer or a lithologist, but the architect is more modest and gives himself no special name because he builds in stone.

The petrographer divides rocks into three grand divisions,—massive or igneous rocks, resulting from the cooling of melted material; schistose rocks having their minerals arranged in a parallel way so as to split most readily in one direction; and sedimentary or clastic rocks made of fragments of other rocks deposited by water. The massive rocks show the greatest variety of minerals, and are always taken up first. Their mineral constituents are of two kinds—essential, when their absence would throw the rock into another species, and accessory when less important.

The mineral playing the largest part in the formation of rocks is quartz, a rock crystal when it displays its own form, a six sided prism ending in a pyramid. It is the hardest of the essential rock-forming minerals, is almost unattacked by the weather, and therefore is the most useful constituent of many stones suitable for building. Next in importance come the felspars, orthoclase with its flesh red or white cleavage surfaces, and plagioclase showing delicate striations, on cleavage planes. The former is a silicate of alumina and potash, and the latter of alumina and soda or lime. Some of the plagioclase felspars have a magnificent play of color, as in labradorite. Of the darker rock minerals, mica, hornblende and augite are most important.

There are several kinds of mica, but we need mention only muscovite, a silicate of potash having pale colors, and biotite, a magnesian silicate very dark in color. All micas may be recognized by their very perfect cleavage into exceedingly thin elastic plates. Hornblende is a dark colored silicate having two planes of cleavage with an angle of 124 degrees between them. The scales cleft off are not elastic. Augite or pyroxene, another dark, almost black, silicate, has usually no distinct cleavage, and may be distinguished thus from hornblende. Of the accessory minerals, few are of much interest to us, though garnet, often of a fine red color, occurs in many rocks around Toronto, and tourmaline in black triangular prisms may sometimes be seen. The most important of the accessory minerals to the architect, is iron pyrites, a hard, brassy looking sulphide of iron crystallizing in cubes, which under the action of the weather may change to a sulphate and finally stain the rock where it occurs rusty brown with oxide of iron.

Turning now to the rocks themselves, granite is naturally taken up first by both petrographers and architects, as the most widespread and useful of the group. It consists essentially of quartz, felspar and mica or hornblende, and takes on grey or flesh red colors from the prevalent orthoclase felspar. It is one of the handsomest and most durable of building stones, and but for its great hardness would no doubt come into much wider use. Its one defect is the ease with which it crumbles under the action of intense heat, as shown at the Boston fire. If quartz be omitted from granite the rock is called syenite, which has the same colours and uses as the previous rock, though a little softer to work. When the felspar is striated and mixed with hornblende, forming a dark green or black rock, it is named diorite; if augite is the dark mineral the rock is diabase or gabbro. All these rocks fall into the same line in the hands of the builder, who sometimes calls them black granite.

Porphyries are rocks, unlike those that have been described, in that the general mass is fine grained or compact in structure enclosing larger grains or crystals of quartz or the felspars. Some of the porphyries are very handsome stones for ornamental work, but are little used in building.

The more important ancient massive rocks have now been described; and it will scarcely be necessary to take up in detail the corresponding series of modern eruptive rocks, including the lavas, such as trachyte and basalt; since this whole group is absent from eastern Canada.

The schistose rocks, too, need only a brief mention, since only one of them, gneiss, practically granite, having a parallel arrangement of its mica plates, is used to any extent for building. In Norway one sometimes sees a whole house built of gneiss, roof as well as walls. Far more important are the fragmental or sedimentary rocks, which provide the most commonly used building stones. We may divide them into three groups, those made of clay in some form, those made up of silica or the silicates (quartz, felspar, etc), and those which consist of carbonate of lime or of this with carbonate of magnesia.

The clayey or argillaceous rocks are usually too feeble and easily acted on by the weather to be of use in building. The slates, however, which are clays consolidated and metamorphosed, are an exception, since innumerable minute crystals of mica and other minerals have begun to form in them binding the materials together and giving a resistance to the weather surpassed by no other rock. The perfect cleavage which gives slate its value as a roofing material does not correspond to the stratification, as one would expect, but has been caused probably by strong lateral pressure in mountain building. The different tones of color in slates are taken advantage of by architects to give variety in roof effects.

Perhaps the most useful group of rocks in architecture is that of the sandstones. Breccias, made up of large angular fragments are too rare to find much place as a building material; and conglomerates, formed of

rounded pebbles cemented together, are also rarely put to use, though some notable buildings, such as the Pitti Palace, are built of them. Our brilliant jasper conglomerate from Lake Huron with its red pebbles in a white ground might give striking effects, though it would be very hard to work. It would probably last for eternity, however, if put into a building. Sandstones, on the other hand, are among the most favored building materials. They consist chiefly of grains of quartz, often with a large admixture of fragments of felspar or other silicates, and result from the destruction of the older massive rocks. The cement binding the particles together has a great effect on the durability of the stone and should receive more attention than it does from architects. A siliceous cement forms a rock difficult to work but that will practically last forever. A ferruginous cement consisting of oxides or carbonate of iron is a durable one and occurs in many reddish or brownish sandstones. The cement is said to be calcareous when carbonate of lime is deposited between the sand grains. Such sandstones effervesce with cold, dilute acid, and the lime is more or less easily attacked by rain charged with carbonic acid from the air of cities, allowing the stone to crumble. The least efficient cement of all is argillaceous or clayey, and sandstones containing it readily disintegrate when exposed to the weather in a climate like ours. The clayey odor when breathed upon affords a rough test for the argillaceous cement. It is an unhappy fact that the durability of a sandstone is often in inverse ratio to the ease with which it is worked, so that the builder is tempted to use the poorer qualities.

Last come the carbonates, consisting of calcium carbonate in limestone, and of calcium and magnesium carbonates in dolomite. The two may be distinguished by the action of cold acid, which effervesces strongly with the carbonate of lime, but hardly at all with dolomite. The limestones are generally formed of broken shells, though in many compact varieties, such as lithographic stone, the fossils have completely disappeared. Porous modern limestones, formed by springs are called travertine. The most ancient limestones have been so metamorphosed as to become thoroughly crystalline, and when very fine grained and pure white are statuary marbles. Many of the colored varieties of so called marble are really, however, uncrystalline limestones. The limestones are often admirable building stones, durable and handsome, but are apt to be attacked by the atmosphere of great cities charged with acid fumes. The dolomites resist this action somewhat better. A very handsome variety of chemically deposited carbonate of lime, sometimes used for interior decoration, is called Mexican onyx in the trade, though incorrectly, since the true onyx is a variety of silica.

The coloring matter of rocks is usually some compound of iron. Reds are caused by the sesquioxide, hematite; browns and yellows by the hydrous or brown oxide. Red and brown sandstones are good examples of this, the paler they are the less oxide of iron they contain, while pure white ones are practically free from this metal. The flesh color of orthoclase felspar in the granites arises also from the red oxide of iron. On the other hand silicates and other compounds of iron in the monoxide state show various shades of green or gray, or almost black, as in the diorites and other greenstones, in green slates, and greenish grey sandstones. These green monoxide compounds of iron tend to weather into the ruddier sesquioxides. One often notices that pale greenish sandstones turn yellowish or brownish on exposure, a result of slow oxidation of ferrous oxide. The darker limestones are usually colored with bituminous or coaly matter, which on exposure gradually oxidizes; so that a blue limestone, like that of Kingston, eventually bleaches to a pale grey, almost white; Kingston by moonlight seems built of marble.

The weathering quality of rocks is a matter of great interest to architects, for on this turns the permanence of their work. Certain rocks, such as quartzites and sandstones with a siliceous cement are practically indestructible by the weather, as one can see on surfaces scoured by glaciers during the ice age 7000 years ago, but still showing the polish and scratches then given them. Rocks formed of silicates, like granite and syenite, are also very resistant; others like the limestones and marbles are slowly dissolved by rain and are more rapidly acted on by the impure air of large cities, which contains traces of sulphuric acid. The dolomite of the English parliament buildings is said to be suffering badly from this cause. Sandstones with clayey cements are readily disintegrated in moist and changeable climates; and stone containing much iron pyrites should be looked on with suspicion, since it is very apt to weather into brown oxide of iron, weakening the stone and giving rusty stains, as in the parliament buildings at Ottawa. The porosity of a stone is a matter of prime importance in a climate like ours where water soaked walls may be quickly crumbled under the action of frost.

In rocks composed of several different minerals, like granite, great changes of temperature tend toward disintegration through unequal expansion. Quartz has a cubic expansion of 0.00036 for one degree centigrade, the orthoclase only 17 parts in a million. In case of a great fire where the temperature may be raised suddenly 1000 degrees or more, this unequal expansion sets up strains which split off the surface, as in the great fires of Boston and Portland, where massive granite buildings crumbled to ruins. One would expect limestones to burn to quicklime and thus fall to pieces, but actually they resist far more heat than granite, while sandstones resist fire best of all.

The last point to be referred to is the best means of testing a rock intended for building purposes. The test of time is of course the most convincing of all, but then one cannot always wait a thousand years to see how durable a building stone is. The resistance of a cube of stone to crushing strain gives useful evidence as to its strength, and the amount of water it absorbs helps to a decision as to its durability in frosty climates; but the most valuable test of a scientific kind is a petrographical examination. The lithologist unlike other men can look through stone walls. By the microscopic study of thin rock sections one can determine the actual minerals that make up a rock, their relationship to one another, their state of freshness or decay and the character of the cement that binds the particles together. No other method will give such complete evidence as to the internal structure of a rock, on which its durability depends, as a careful examination of sections under the microscope.

\* Paper by Prof. A. P. Coleman, of the School of Practical Science, read at the annual convention of the Ontario Association of Architects.

## THE ARCHITECT.\*

As this is the first time that I have had the pleasure of reading a paper either before architects or others I sincerely trust that you will bear with me, look kindly upon any errors I may make, and if the paper as a whole be weak I hope you will be light in your vituperation and that I may be strengthened in this to better prepare another at some other time. I have chosen as you see for a subject "The Architect."

It has been said that any one possessing the knowledge of a poor carpenter, the skill of an indifferent draughtsman, a little audacity and a ten dollar bill, can appoint himself an architect. Certainly in the present state of affairs all persons are privileged alike in practising architecture, or rather in, shall I say, designing, and superintending the construction of buildings, notwithstanding the important consideration of health and safety of life involved, to say nothing of the hideous aberrations that our cities and towns are often besmeared with by men whose only passport to public patronage is their "gall" and the assumption of the name of architect.

It seems a pity that something cannot be done to limit the practice of architecture to properly qualified men. I have sometimes thought that instead of having the word "Registered" removed from Clause 25 of the Ontario Architects Act, that those only who have passed examination be allowed to call themselves "Registered"; all others who though still being allowed to practice, would not term themselves "registered architects" and thus save the ignorant public, if they choose, from being victimized.

I have also thought a measure of the trouble might be averted, the beauty of the city improved and the architectural profession edified, if the city would not grant a permit for any building unless a copy of the plan as made by, and bearing the signature of an architect be filed, and if the architect would not undertake to make plans for any person unless he be commissioned to superintend the construction of the building as well.

Loan companies and money lenders would have better security for their money if they would insist that the building on which they are asked to advance money should be planned and superintended by an architect.

But before the general public will be able to distinguish between architects and ARCHITECTS, it will necessary that they be educated to distinguish between good and bad architecture—to accomplish which there is no doubt this Association has done and is doing a great deal, but perhaps if architects would voice their opinions through the press oftener on things architectural the matter would receive more consideration from the public. The taste of the coming generation would be greatly cultivated along this line if the study of architecture were brought into our public schools. In whatever way this great change shall be brought about I cannot say, but I sincerely trust that the time is not far distant when incompetent men, such as real estate agents and mechanics, will not be allowed to practice architecture without the proper qualifications.

How often we see exemplified the sarcasm of Lessing when he says—

Tomkins forsakes his last and awl  
For literary squabbles,  
Styles himself poet  
But his trade remains the same—he cobbles.

I remember hearing of one of this stamp erecting a large building for manufacturing purposes where all the internal supports were wooden posts from basement floor to roof; the weight to be imposed on each support would be something enormous. Under each post he had one stone 18" x 18" x 9" resting on the earth, and but for the better judgment of the builder who objected to carrying out the plans in this respect, there would probably have been very disastrous results. This architect, with fear and trembling, went to the owner and made the excuse that owing to the softness of the earth which he had not foreseen, it would be necessary to enlarge the footings under the posts.

When we hear such things as this about people who call themselves architects, we can hardly wonder at owners employing what is known as the "practical man," instead of an architect, for this kind of work.

Plagiarism, or purloining the designs of others and calling them your own, is, unfortunately practiced by this class of people who usurp the name of architect, who, if they do not crib the entire design, pick out the features they think suitable for their purpose from the published work of other architects and who manage in this way to form some sort of a design, and hearing whatever praise the unsuspecting client may have given expression to, he "bears his blushing honors thick upon him" just as if they had been honestly merited. I remember being asked to compete for a small country church. Out of respect for the feelings of the kind friend through whose influence I was asked, I submitted plans, but was not, however, the fortunate man. In conversation with the secretary of the Building Committee he informed me that he had in his possession one design which met with the approval of the committee. He showed me the plans and perspective drawing, the latter being a tracing from the CANADIAN ARCHITECT AND BUILDER of a published design which I myself had made.

Dryden has aptly marked the three steps in the career of most men of genius, thus—

"What the child admired  
The youth endeavored and the man acquired."

In my mind I can scarcely conceive of a man being proficient in this profession whose career has not been marked by these three steps—one who has studied the profession from his early youth, spent a number of years in the office of a recognized member of the profession at all kinds of work in connection with architecture, and who makes a constant study of his profession.

It is perhaps a misfortune of the profession that its members must be at once artists, business men and scientific experts, and they cannot choose to be either more than the other without great injury to their usefulness and success. It is thought by a great many to be beyond human capacity to excel in design and anything else at the same time. The man who would be a thorough architect, while taking great pleasure in exercising his designing qualities, should not overlook the importance of making constant efforts to keep himself familiar with details of construction, prices and specifications.

It is often found that an architect for fear of discouraging his client at the beginning, systematically makes all sorts of encouraging responses to enquiries regarding the cost, and does everything to get a building started; so the owner after having seen a most elaborate sketch is tempted to go on with the work, although the tenders have now exceeded his appropriation by say \$2,000. Afterwards tenders are to be taken for mantels, gas fixtures, heating, etc. Of course the architect told him that these were not included in the original estimate, but he had no idea they would run into so much money: so that when the building is completed it has cost several thousand dollars more than he intended. The owner in his discouragement to his client in the first place and told him he was expecting too much for the money, all the trouble would most likely have been prevented. There is design artistically, but unfortunately without any regard for cost. What

credit is it to the architect who makes a pretty building where cost has not been a consideration?

The architect should bear in mind that his first clients will generally be his personal friends, and that defective specifications or ignorant supervision, bad construction or impossible plans, may bring extra expense and bitter disappointment to them; and to him, an unfavorable reputation from which he will suffer through his whole professional life.

I have heard very many definitions of what an architect is. The most amusing one to me was from the simple son of a lady client. It was my unpleasant duty, at one stage of the work, to condemn a large piece of Credit Valley stone. The contractor in the presence of Bob, the son, was affirming very forcibly that he thought the stone was good enough, and expressed several other things that he thought. "Well," says Bob, "That's all right, Mr. —, but there's a man paid to do the thinking."

There was a lesson in the remark for me, and to every conscientious architect, to be always thoughtful of his work, considering every detail—that the design be most suited to the purpose for which it is intended and to the purse of the owner—that from the foundation to the ridge every constructional problem be thoroughly considered, and that when completed the building will be beautiful. We will then find we shall have the mightiest of all proofs of success, that our clients will come to us for plans the next time they build, and use their influence with others on our behalf.

## HAMILTON.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

A special committee of the Hamilton City Council have recently recommended that the building by-law be amended by extending the fire limits, and providing that all schools, theatres, and other public buildings shall have fire escapes attached, and that no explosives be permitted to be stored in any building. The owner or contractor is made liable for the infraction of the by-law. The fire limits, which at present are Bay street on the west, John street east, the mountain on the south, and the Grand Trunk railway on the north, are to be changed to Wentworth street on the east, from the Grand Trunk Railway to the Northern and North-Western track, thence west to Ferguson avenue, south to Aberdeen avenue, west to Locke street, north to King street, west to Dundurn street, north to the Grand Trunk railway tracks, thence in a south-east direction to Queen street, south along that street to York street, east to Hess, north to Cannon, east to Bay street, and north to the Grand Trunk railway. Builders will be required to deposit with the inspector a ground plan of the buildings. Nothing but stone or brick buildings will be permitted to be erected within the fire limits.

## MONTREAL.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER.)

Mr. Geo. E. Wade, R. A., of London, Eng., who won the competition for designs for a memorial statue to the late Sir John A. Macdonald, to be erected on Dominion Square, in this city, has sent a representative here in the person of Mr. F. A. Williams to make the preliminary arrangements. The statue is to cost \$20,000, which amount has already been subscribed. It will stand on a base of unpolished granite, 12 feet in height, with steps on the four sides leading up to the pedestal of the main statue. The statue itself will be surrounded by twelve polished red granite clustered columns fourteen feet in height, and with bronze caps. Resting on these columns is a stilted arch nine feet in height, with reliefs in bronze, emblematic of Canada's progress. Resting on the arch are four colossal lions in bronze, and above these stand a group of seven figures, holding shields and linked arm-in-arm to represent the seven provinces of the Dominion, which were confederated by Sir John Macdonald. In the centre of these figures, and overtopping them, will be the statue of the Queen of Plenty, holding in her hand a cornucopia filled with Canadian products. Different bronzes, representing the various industries of the country, are placed at the base of the pillars. The model of the statue has been completed by Mr. Wade, and has been approved by Her Majesty, the Queen, and the Prince of Wales. The impression prevails that the winners of the second and third prizes in this competition will be declared to be Mr. Griffiths, of London, Eng., and Signor Xemenés, of Rome.

Contracts are about to be let for the erection of the Canada Life Association's new office building, plans for which have been prepared by Mr. Waite, of Buffalo. The building, which has been designed in the free Renaissance style, will consist of seven stories and a basement. It will stand at the corner of St. James and St. Peter street, extending back to Fortification Lane. It will have a frontage of 58 feet on St. James street. The frame work will be of steel, encased in fire proof materials and faced with Ohio blue stone. There will be two principal entrances, on James and St. Peter streets respectively. Offices for the owners will be arranged on the first floor; the ground floor story is to be occupied by the Canadian Bank of Commerce.

Referring to the appointment of a committee by the Architectural League of New York to draft an ordinance to forbid the erection of buildings of excessive height, on the ground of their being insecure, insanitary and inartistic, the Insurance and Finance Chronicle, of this city, says: If the action of the architects is backed up by the insurance companies, and all who have judgment enough to realize how health must be endangered by streets running through deep defiles of buildings that keep out sunlight and air, there will be a limit placed on these Babel-like structures.

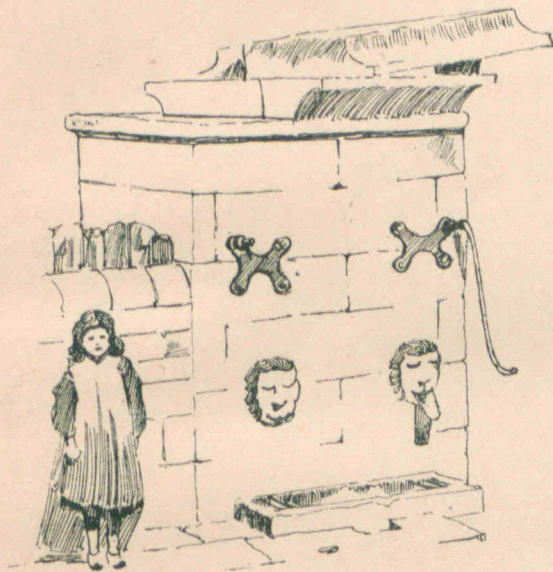
A dinner was recently tendered at the St. James club, in this city, to the Hon. Mr. Nantel, Provincial Commissioner of Public Works, on the eve of his departure on an extended trip to Europe and the Holy Land.

The Building Inspector reports that the number of buildings erected during 1893 was 561 as compared with 640 in the previous year. The value of the buildings erected last year was \$2,835,800, as against \$2,598,825 in 1892, thus showing the buildings put up last year to have been of a much superior class to those of the previous year. As the result of his recent visit to the convention of Building Commissioners and Inspectors of the United States, Mr. Lacroix will recommend that our building ordinance be amended so as to provide for the erection of fire escapes to a much greater extent than heretofore.

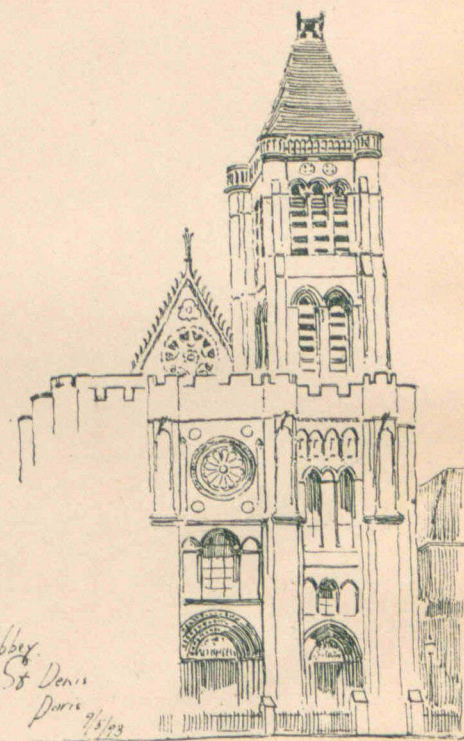
An old stone front building in the rear of the Home of the Sisters of Notre Dame collapsed recently, throwing into the street the walls and windows of the third story. Fortunately no one happened to be passing at the time; if there had been, one or more deaths would have to be recorded. This occurrence points to the necessity for frequent and careful inspection of old structures which front on public thoroughfares. It is due to our Building Inspector to say that he has usually shown himself to be thoroughly alive to the duties of his position in this regard.

The fifteenth annual spring exhibition of the Montreal Art Association will be opened on April 20th next in the galleries of the Association, and will close on May 9.

\* Paper read by Mr. H. Simpson, read at the fifth annual convention of the Ontario Association of Architects.



Parasol - Jarks  
16/95



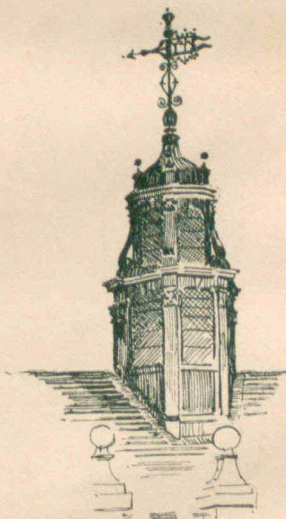
Abbey  
St Denis  
Paris  
9/3/95

# SOME WAYSIDE SKETCHES.

DRAWN BY E. WILLY

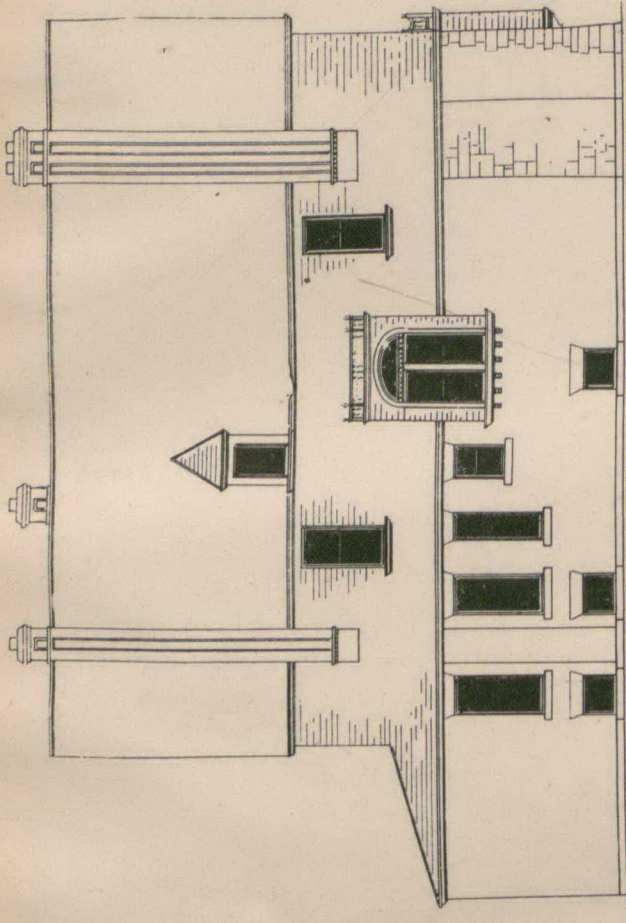


Olney Church, Yorks  
7/95



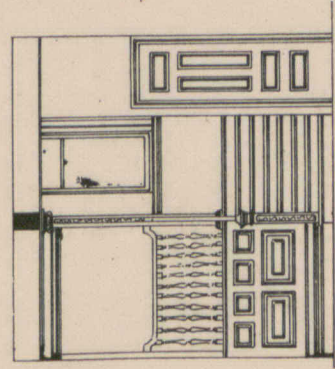
Turret  
Lambeth Palace  
3/2/95





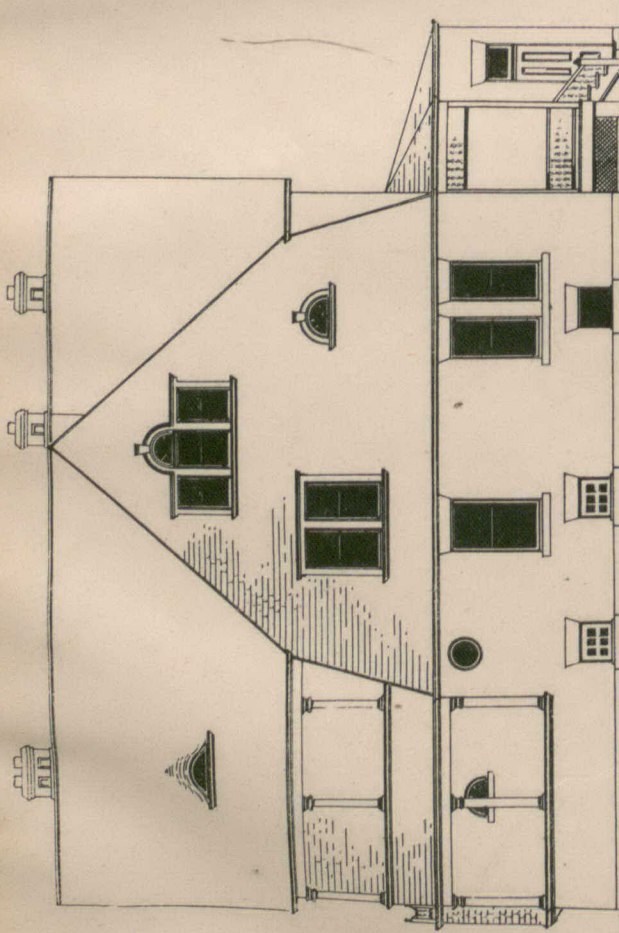
Side Elevation

*Design for a House of Stable, Submitted by  
Colonel,  
for Canadian Architect & Builder, Camp Jan. 2, 1894.*

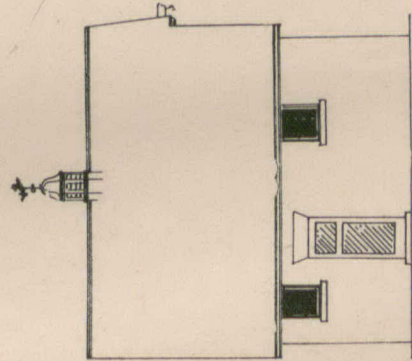


Detail of Hallway

Scale of Feet

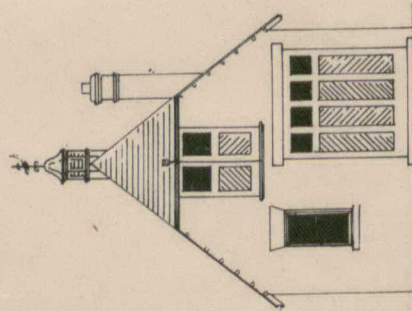


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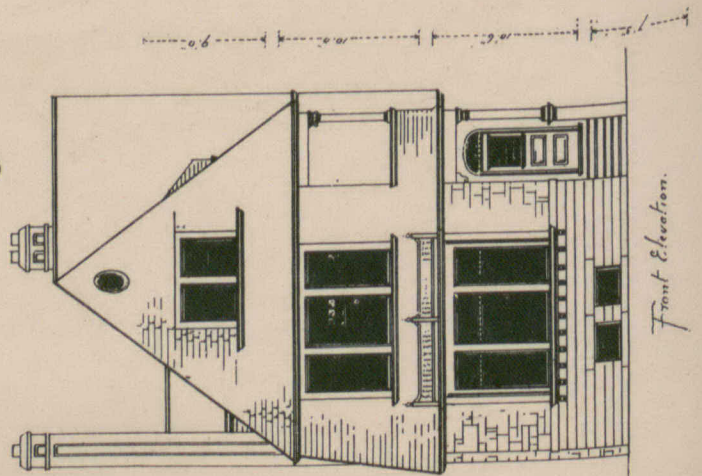


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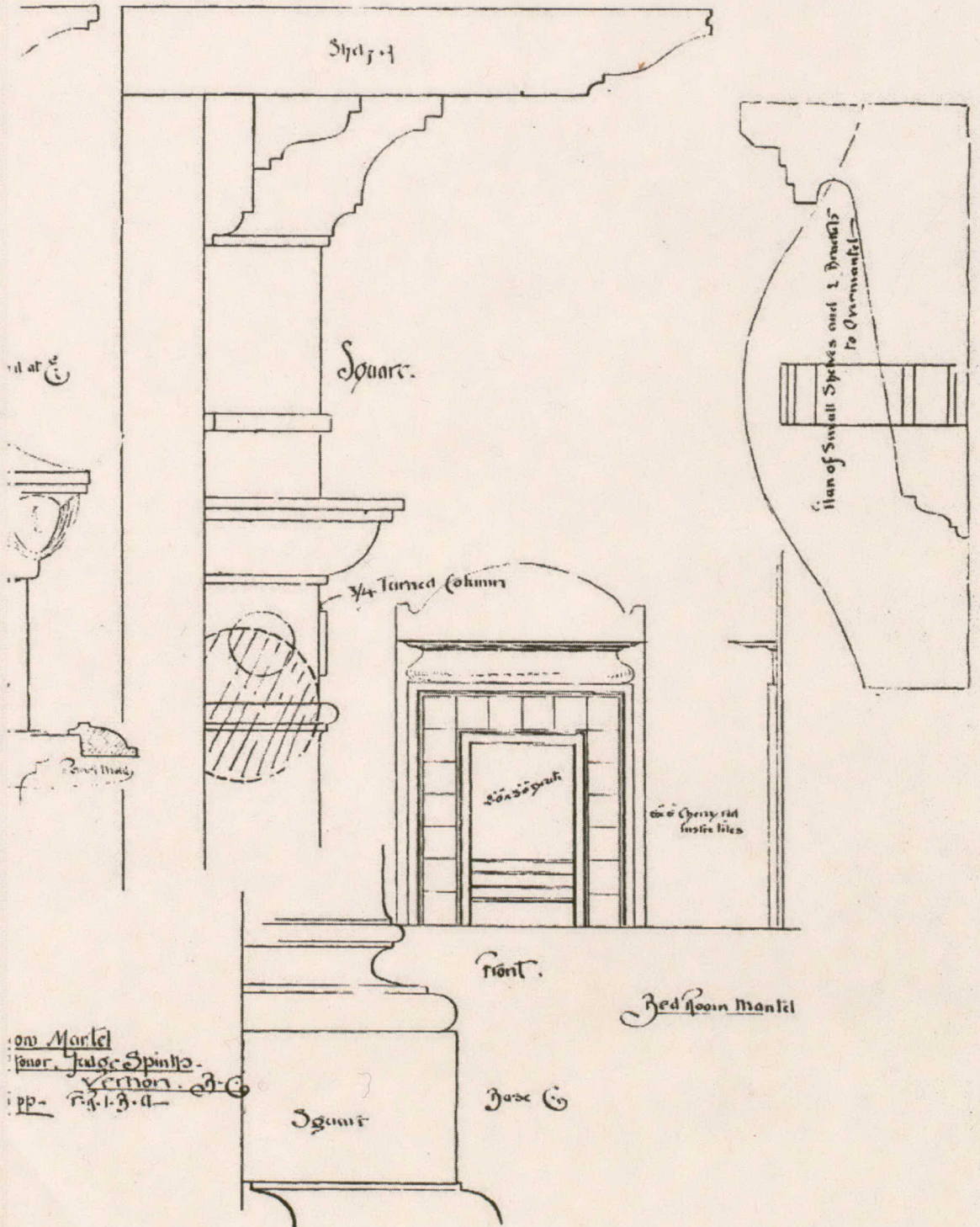
Scale of Feet

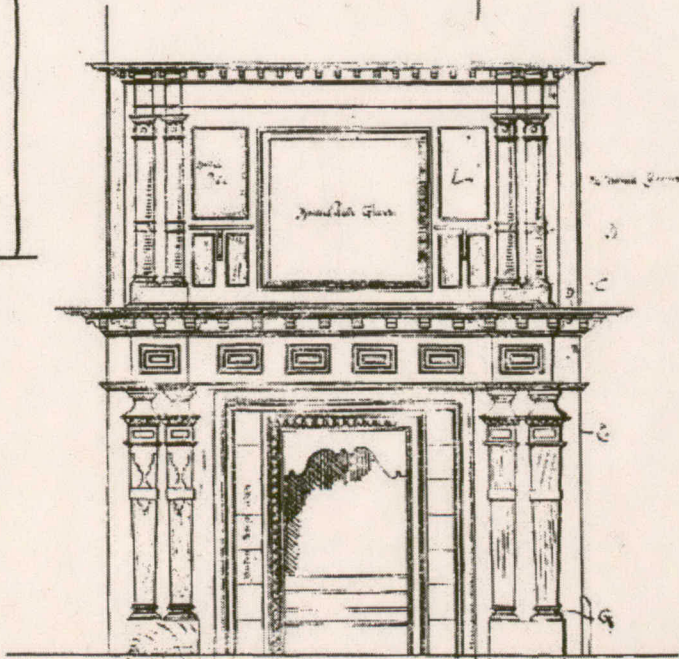
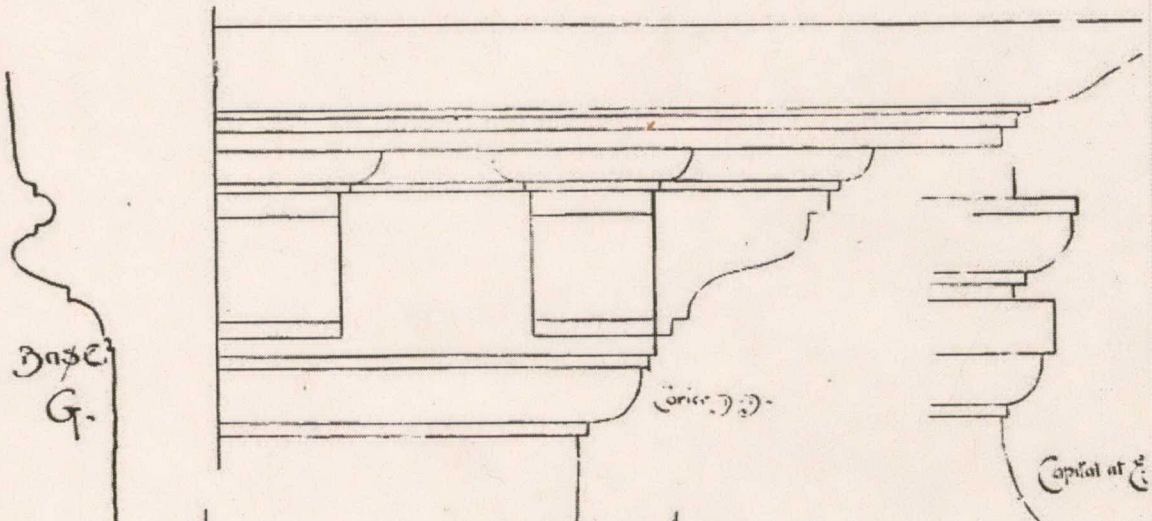


Front Elevation

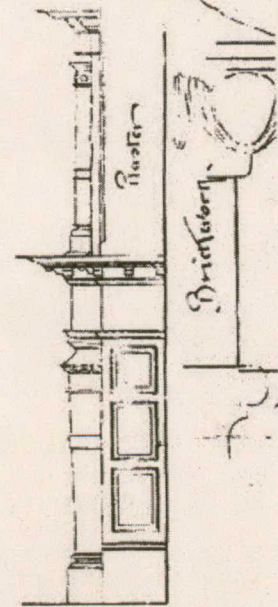


Front Elevation

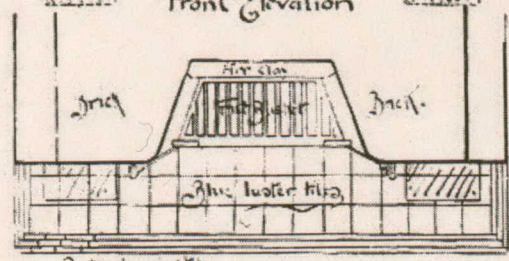




Front Elevation



Side



2 in. marginal tiles

Drawing Room A  
for His Honor.

March 1893.

R. Mackay Tripp.



## STUDENTS' DEPARTMENT.

"CANADIAN ARCHITECT AND BUILDER"  
STUDENTS' COMPETITION.

IN connection with the Students' Competition for a Drug Store and Dwelling, the conditions of which were announced in the ARCHITECT AND BUILDER for February, we regret to state that the number of designs received was not sufficient to form a basis for the decision of the competition by a vote of the students as provided for by the conditions.

It may be that the time allowed for the preparation of the drawings was not deemed sufficient, and also that the time of a number of students who would otherwise have entered the competition was fully taken up with the Ontario Association of Architects examinations. In view of the possibility that these causes may have hindered the success of the competition, it has been thought desirable to extend the date when the competition will close to the 8th of April.

It is hoped that in consequence of this extension of time a larger number of students will decide to submit drawings. Should this hope prove to be ill-founded, the competition will necessarily be withdrawn.

## INTERCOMMUNICATION COLUMN.

This column is intended to afford a means of correspondence for students, builders, and all our readers desiring information they cannot otherwise obtain. Questions for which an immediate reply is required should be marked "Urgent." Names and addresses of correspondents must be sent with their communications, but these may be signed with initials or otherwise for publication.

## QUESTIONS.

[9]. I have had a present of \$50 for the purchase of books most useful to me as a student of architecture and want advice how best to spend it? Could you get information for me in your new column.—BUDDING ARCHITECT.

[10]. An old stone barn in an exposed situation suffers much from the weather on one side. The stone it is built of is soft and though it was all carefully pointed up in the fall, the stone itself seems to need treatment. Can you tell me any method of preserving it that will be effectual as well as inexpensive?—J. B. M.

[11]. I should be glad if "G" [6] would give me some information as to what papers he would suggest for circulation in the proposed "Club." I should be pleased to join but would like to know about the expense proposed to be borne by each member.

[12]. The snow lies thickly on a church roof and what with the sun, and also the warmth of the building it sometimes slides off with a roar that drowns the voice of the preacher and considerably startles the congregation. Is there any way to prevent this?—N. J.

## REPLIES.

[1]. "Analysis of Ancient Domestic Architecture," by Dollman & Gibbons, "Batonial Halls," by Harding and others, "Domestic Architecture in England," Turner.

[2]. H. W.—There can be no doubt that hollow walls properly constructed, have many advantages over solid walls. It is best to build them with the air space as near the exterior as possible, i.e., in a brick wall, the air space should be next to the half brick facing, but in a stone-faced wall the air space must necessarily be against the internal brick work. Careful bonding of the thin portion to the thick, is a *sine qua non*, as also is a damp preventing course at the bottom of the air space; the inside face of the outside brick or stone face should be well parged, and if these precautions are taken a hollow wall will be a great improvement to a building.—P. M.

[2]. H. W.—I would recommend "H. W." to read what is said about "Hollow Walls" in Vol. II. "Notes on Building Construction," (South Kensington).

[4]. "Builder":—You say your contract does not say anything about the time for final payment; does it say anything about payment by certificate?—there may be a clause which covers the whole subject; I can hardly understand a contract without such particulars. Without a stipulated time for payment the architect's certificate does not bind the owner to pay at a stated time. I suppose your only remedy would be under the "Mechanics' Lien Act." Great care should be executed in dealing with such questions as this, and without the fullest particulars of the case, I can hardly venture to advise. I would recommend you to see your lawyer and suggest to him to study "Mechanics' Legal Hand Book" before advising you.—L. A. W.

[5] "Quebecer."—If you "invoke the aid of the law" to set you free, you would find that your "written agreement" was binding upon you, unless there is a clause in reference to the point raised. You have apparently been fifteen months at the profession; to do nothing but "kick your heels" would seem a waste of time certainly. Instead of having any unpleasantness with your employer, your wisest course is to ask him to help and direct you in a course of study, to prepare for being of greater use to him when more busy days arrive and to fit you for the examinations which you ought to go up for. You should have gone up for the "first intermediate" this month. Look up the

published questions of last years O. A. A. examinations and see if you can answer them; if not, here is a field with which to occupy yourself with great profit. You should be able to answer all these questions after being fifteen months in an architect's office.—[ED. "INT. COL."]

[7] "Jack."—The only way of mounting tracings on drawing paper so as not to injure them when rolled up, is to stick down one side and leave the others loose. It should be the top side, and it should then be rolled from this side; that, however, can hardly be called "mounting."—J. C.

[8]. "Architect."—Write to Mr. C. H. C. Wright, of the School of Practical Science, Toronto, who, from tests of cement made at the institution, could no doubt tell you the most reliable brands for your work in the country. Being at a distance you cannot easily get your cement tested, of course. Possibly one or two rough methods of test may help you. Fill a bottle with a paste made with neat cement and let it stand for a few days, if the cement is not in good condition it will expand and crack the bottle, or if it has not been burnt enough the cement will shrink slightly. Plunge your bare arm into the cement; if it feels cold it is bad, if hot it requires more turning over; to be good it should be pleasantly warm to the skin. I have known some fairly eminent men make use of the latter test when no other means were at hand.—"ARCHITECTUS."

N. B.—With reference to the suggested "Reading Club," we are sorry that we have not heard from more students so far, but when "G" answers the question which appears this month about it, we shall be somewhat surprised if there is not a rush to take advantage of it. The expenses we should think would not be more than a dollar (perhaps less) to each member.—[ED. "INT. COL."]

[13]. Where and of whom can we procure a book on brick-laying?—J. R. & SON, Dorchester, N. B.

[13]. We can procure for you any of the following books on bricklaying:—"Useful Information for Bricklayers," being an improved method for setting out gauged arches, by J. Buckle, price \$1.00; "Drawing for Bricklayers" by E. A. Davidson, illustrated, \$1.50; The Rudiments of Practical Bricklaying," by A. Hammond, including general principles of arch-drawing, cutting and setting, pointing, paving, tiling, etc., illustrated, intended to be a hand book for apprentices and beginners, 60 cents; "Practical Brick Cutting and Setting," by the same author, illustrated, 108 pages, 60 cents; "Brick Work," a practical treatise on the higher principles of cutting and setting and the application of geometry to roof tiling, etc., two editions, illustrated, 60 cents each edition.—ED. INT. COL.

## USEFUL HINTS.

Paste may be kept several months without getting mouldy if a little pulverized blue stone is added while hot.

Professor Laurie in a recent lecture at the Society of Arts, stated that there are at least two preparations on the market which are as valuable commercially as white lead, whilst they lack its qualities which are so harmful to human life. These are sulphate of lead and oxide of zinc. A mixture of the two, known as "Freeman's White," has been proved to have a greater covering power as a pigment than white lead, whilst oxide of zinc keeps its color for a much longer time in impure air, and is therefore valuable for interior work.

TAR PATHS.—Secure a firm foundation, and slope the ground with cinders or gravel, allowing a quick run towards the gutter. Sift furnace ashes through  $\frac{1}{2}$  in. screen and well mix with gas tar, lay on a layer  $\frac{3}{4}$  in. thick, well tread down, and finish by continually rolling, sifting over a little dry ashes and lime to prevent roller sticking. The greatest art is in finding how much tar is required to "set" the ashes, and not to put more, or it will be soft and spongy in warm weather. No absolute rule can be laid down, as much depends both upon the quality and nature of ashes. Try a small piece first, measuring both tar and ashes, use your own judgment as to the proportions. Do not boil the tar.

EXPANSION OF GIRDERS.—A writer on strains in girders referring to the amount of movement of iron girders due to expansion and contraction under extreme variations of temperature, observes that for iron and steel the coefficient or rate of expansion is nearly 1 inch for 100° of heat (F.) for every 100 feet in length. Thus a girder 60 feet in length will expand six-tenths of an inch for 100° increase of temperature, and contract the same amount for 100° decrease of temperature; or a girder 75 feet long will vary seventy-five-one-hundredths of an inch, or  $\frac{3}{4}$  inch, for a variation of 100°. He says: "In order to provide for all contingencies it is the general practice to allow for a vibration of 100° F., or a movement equal to  $1\frac{1}{2}$  inches for every 100 feet in length." A girder 60 feet long will therefore require to have an allowance for movement in the moving end equal to nine-tenths of an inch or 1 inch, the other end being fixed. It is only necessary to put the rollers under one end of the girder, so that the movement of the girder may be at that end only.

FIREPROOF WHITEWASH.—A most effective composition for fireproofing exterior surfaces may be formed by slacking a sufficient quantity of freshly-burned quick-lime of the best grade, and, when slacking is complete, there is added such an amount of skim milk, or water in its absence, as will make the liquid of the consistency of cream. To every ten pounds of this liquid is added separately and in powder, stirring constantly, the following ingredients in the order named: Two pounds of alum, twenty-four ounces of sub-carbonate of potassium or commercial potash, and one pound of common salt. If white paint is desired, a further addition is made to the liquid, though the whiteness is found to be improved by the addition of a few ounces of plaster of Paris. Lampblack has the effect of giving it a number of shades from slate color to black. Whatever tint is used it is incorporated at this stage, and the whole, after being strained through sieve, is run through a paint mill. When ready to apply the paint is heated nearly to the boiling point of water, and is put on in its hot condition. It is found that the addition of a quantity of fine white sand to this composition renders it a valuable covering for roofs and crumbling brick walls, which it serves to protect.

## CURRENT ARCHITECTURAL STYLES.\*

BY GRANT HELLIWELL.

The title "current styles" somewhat imperfectly expresses the object of this paper. To do justice to a description of the current styles of architecture, at least in these days, would be altogether beyond the scope of a short paper, and moreover, while extremely interesting, and to a certain extent profitable, it is a question whether, in the limited time at our disposal, in a convention of architects gathered from different parts of the province, the opportunity cannot be better employed. The object, then, will be, not so much to attempt a full description of the many styles now prevalent, as to briefly review some of the more important of them; to endeavor to look beneath the surface and if possible ascertain the fundamental principles underlying architectural style, and from our investigation to deduce some conclusions as to how real progress may be made in the achievements of a profession than which there is none nobler in the realms of art or science.

The frequency with which, in matters pertaining to architectural design or buildings, the public propound to one the question "what style is it?", would be amusing were it not so often embarrassing. It is embarrassing for two reasons. In the first place it opens up the question "what is style?"—one by no means easy to define. A thoroughly logical definition of the term is seldom attempted. Gossfried Semper says: "style is the coincidence, in a work of art, with the history of its coming into reality, with all the conditions and circumstances that are causal to its origin." Another authority defines "style" as "the language in which we express our thoughts, the natural expression of our requirements in building." But for the purposes of this paper it is not necessary to go further; these two definitions are probably sufficient to convince anyone that an explanation of the term is not quite so simple as at first it may appear. In the second place, the conundrum arises, respecting the building or design in question. "Has it any style, and if so what?" The answer to this may be more difficult than the first. True, if the building were a copy of one of the structures of ancient Greece or of one of the scarcely less famous cathedrals of the mediæval period, it would be easy for the veriest tyro to name its style correctly. Incomparably beautiful, however, in their respective classes, as those buildings were, their exact reproduction in modern times is usually deemed a ludicrous mistake. The customs, manners and conditions generally, under which they were erected, belong to a by-gone age, and charming as such structures might be to the eye, they would, except in rare cases, wanting in two of the chief elements of the highest art, viz., by utility and truth. But for the most part the buildings on whose style we are called upon to pronounce are of a very different stamp. Erected to fill many requirements, and restricted by innumerable conditions, the average modern erection is of a complex character. In many instances, perhaps the majority, it is more than doubtful whether the building possesses any style at all. In others, the taste and skill of the designer have produced a building, having an unmistakable air of character and individuality, but of whose style, in the ordinary sense of the term we are not so certain.

In proceeding to discuss styles of architecture, while we are primarily and chiefly interested in the architecture of our own Canada, we must, without any disloyalty or self reproach, admit that while we have produced work, which, in its class, compares favorably with that of any country, we are, architecturally, overshadowed, on the one hand, by the great and wealthy nation to our south, and on the other, by the head of that mighty empire of which we are proud to form a part, and to the architecture of of these two countries let us now direct our attention.

In reviewing current architecture in England, the traditions of the past are so intimately connected with modern work, that it may not be amiss briefly to refer to the early history of the art. Beginning with the crude ideas introduced at the time of the Norman Invasion, the progress of architecture as it slowly developed into the various phases of gothic is clearly marked in the buildings which still remain as monuments of English art. With the exit of the Tudor style a new and outside influence can be plainly discerned.

Renaissance forms appear, first of a German and Flemish type, followed later by evidences of Italian and French inspiration, culminating in that grand achievement, the pride of all England, St. Paul's cathedral. Since then the course of English architecture, at no time a particularly smooth one, has taken it through many vicissitudes. From the classic to the gothic, and from there to the renaissance again, first of one period, then of another, such has been its course. The gothic revival of the present century, ending perhaps with the erection of the London Law Courts by Street, was the last of anything approaching a uniform style. Since that time a spirit of eclecticism, the doctrine of selection, has reigned supreme. Every architect has felt free to choose this or that style as his fancy dictated, and the result has been an infinite variety of forms. This system prevails in England to-day, so that the term "current styles," as far as British architects are concerned, is a most comprehensive one. To those few men gifted with exceptional talent, this has been no particular drawback. It has developed in a special manner their individuality. This is markedly apparent in the work of

Norman Shaw, whose buildings, familiar to us all, delightfully charming in their scholarly picturesqueness, their freedom from conventionality, are a standing testimony to his genius, and yet they cannot be classed under the head of any known style, although possessing that quality in a strong degree. Another master in English art is his contemporary, Waterhouse, whose versatility is not less noticeable than his artistic talents. Although he has perhaps achieved his greatest successes in the Romanesque style, an illustration of which is one of the most noted of modern English buildings, the South Kensington Museum, a view of which will be shown us presently, the Manchester Assize Courts and the Town Hall in the same place, both in the gothic style, gave him a world wide celebrity, while his masterly treatment of the National Liberal Club building, is an example of his genius in renaissance art. Time forbids mention of some of the best recent work by other well known British architects, designed, for the most part, in some phase of Italian renaissance, though by no means wholly in that style. But it is an undeniable fact, that with certain few exceptions, English architecture of the last decade, shows little progress.

Interesting and instructing as it is to study the architectural types of English building art, it is with even keener interest and greater profit that we turn our attention to prevailing styles in America, for though bound by ties of kinship and political sovereignty to the mother land, in all those conditions which affect the subject of our discussion here, we have much more in common with our near neighbors on this side the Atlantic. We have the same climate and practically the same building materials, and even in our modes of living, our methods of business and all the environments of national life, we are more closely allied to them than to our honored head. So that the consideration of current styles in the United States may apply equally to Canada, and for the purposes of this discussion we will consider both countries as one.

Any review of American architecture, apart altogether from the ancient buildings of Mexico, is necessarily brief, being of such recent beginning as almost to deny it a history.

A nation of Anglo Saxon origin, and that not so very far back, nothing worthy of the name of architecture in its buildings dates over 200 years, and until comparatively recent times it has followed so closely in the lead of England that what has been said of the latter country is quite applicable to the new land. About the time of the birth of the Republic a modified classic style prevailed, now known as the Colonial, and many of the buildings of that era still remain to testify to the chaste and simple beauty with which they were clothed. But after this a decided retrogression took place, and for the greater part of a century few if any new buildings were erected having any claim to style. It was not until the beginning of the last quarter of this century that a distinctly new era in the architecture of the western world set in. That the restless vigor and energy so characteristic of the American people, and which in every other line has forced its achievements to the front, should remain quiescent in matters architectural, was not to be expected, and about the time above mentioned the bonds and shackles of traditional art were thrown off and an advance made into new fields of effort. The progress made has been most marked. Doubtless to the late H. H. Richardson more than to any other single individual is due the credit of the appearance, not of a new style, but of a new principle in American architecture. Trained in the modern Renaissance as taught in the schools of France, he early broke free from the limits of that style, and with his strong individuality took up the study of the round arch architecture prevailing in Europe prior to the gothic era, commonly known as Romanesque. In the hands of such a master work was produced which soon attracted the attention of his contemporaries and of the public. He above all men in his generation was the brightest example of that rare genius which can perceive and evolve the hidden beauties and possibilities of the work of past ages. Without slavishly copying, he was able to draw inspiration from every source and adapt it to the varying requirements of his art, and thus produced work which, while it bore the stamp of his own personality, challenged by its beauty and dignity, the admiration of all beholders. It is impossible to say to what degree of perfection, had he lived, he might have carried his chosen style. Apparently his mantle has not fallen on any of his successors. True, the influence of his work has been felt far more since his death than while he was amongst us. Like a tidal wave the fashion—for so we may call it—for Romanesque swept the land from ocean to ocean. Many large and attractive buildings were and are still being erected in that style. Some enthusiastic but superficial observers loudly hailed it as the long called for American style. But it was short lived. Richardson had many weak imitators, but few true followers; they copied the forms, but with the underlying principles that guided the master mind, with that power of adaptation, that fulness of resource possessed by him, they were unendowed. What was the result? Buildings, said to be Romanesque, rose by the thousand all over the continent, and the noble and dignified round-arch style was deposed from the lofty throne on which its greatest exponent had placed it to a position almost of contempt. As a consequence, those who did appreciate its charms and possibilities, and who, according to the measure of their ability, were thoughtfully and successfully working out the problems committed to their hands, forsook the style entirely and sought new

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motifs from other sources. Their methods of study and differences of taste led them in various directions; the spirit of eclecticism prevailed, and is still dominant.

There had been, even when the Richardsonian movement was at its height, some few men who had never inclined to the popular style; educated like him, in the French schools of architecture, thoroughly trained in and imbued with Classical art, they had remained true to their early training and had all along been producing good work of the Classic and Renaissance types. The waning of the Romanesque brought this style of design into special prominence, and the reaction which followed the surfeiting of the public taste with the characteristic freeness and irregularity of the former only served to render the symmetry and precision, the studied proportions, the refined and delicate detail of the beautiful Renaissance the more attractive. The example of these leaders, prominent among whom may be mentioned the names of R. M. Hunt and McKim, Mead and White, was soon followed by other members of the profession, and the new order of things quickly spread. About this time the projected Columbian Exposition at Chicago offered an unprecedented opportunity for architectural achievement, and the selection of Renaissance and Classic styles for its principal buildings and the subsequent successful carrying out of the designs was all that was needed to make these styles, perhaps even more popular than the Romanesque in its palmy days. Still, though no other style or styles can fairly be considered as in the field for popular favor, the disciples and exponents of many other types of architecture are not idle, nor do they fail to find an appreciative and responsive public. The variety of style as exhibited to-day in all classes of buildings is simply amazing. A walk through a residential street in almost any of our cities or larger towns affords a striking confirmation of this fact. Here for instance, we may see a large imposing residence, the great detached columns in the Ionic or Corinthian order extending through two stories and supporting the entablature with its low, broad pediment, the wide verandahs, the central doorway with semicircular fanlight, the broad square topped windows with moulded architraves, all tending to carry one back to the old Colonial days. Close by is a handsome dwelling with a high steep roof with ornamental eaves, the circular corner bays rising through the several stories and terminating in a graceful pointed roof, dormer windows, large and high, with slender crocketed pinnacles and sweeping lofty pediment and finial, window and door openings with ornamented pilasters of slight projection and moulded enriched cornices, all with a degree of symmetry and balance and loftiness, strongly suggestive of the French chateau. Across the way, possibly, is a dwelling of Elizabethan type, with coped gables of fanciful and pleasing outline. On a little farther, and we pass several residences in what we will call for want of a better name, the American dwelling house style,—lower story built of brick or rough faced stone, above this the walls and gables faced with shingles, sometimes without color other than the soft silver grey tint produced by the weather, but oftener stained in some of the pleasing hues of brown or olive here is a tastefully designed oriel window, there a cosily recessed and deeply shaded balcony; on one side the simple outline of the roof is broken by a graceful turret or dormer, on another it descends with sweeping curve to form the roof of a verandah. The general contour is certainly pleasing, the outline often picturesque, and there is an unmistakably homelike air about the whole that attracts in spite of many eccentricities and incongruities. It may be called the typical American home, in the production of which American architecture has gained its greatest success. But we are pre-eminently a commercial people and may naturally look to the buildings devoted to commerce in order to gauge the architectural progress of the day.

In any reference to current architecture in this country, the business buildings take a conspicuous place and we will briefly discuss some of their most characteristic features. And here, as nowhere else, has been brought to our architects a problem for the solution of which there was absolutely no precedent. The tremendous expansion of trade and commerce during the last two or three decades, has correspondingly increased the value of land in our great commercial centres and has necessitated the construction of those enormously high buildings which are the wonder, if not the admiration, of all who visit us. These buildings of 12, 15 and even 20 stories have been adversely criticized by some; but was it to be expected that in such an entirely new departure no mistakes would be made? The wonder rather is that such a measure of success as has unquestionably been achieved in the case of not a few of these gigantic buildings, should have been attained in view of the extreme difficulties of the problem. In perhaps the majority of instances the designing of these tall constructions, in which the height is so greatly disproportioned to the width, has been so skillfully managed by the disposition of the horizontal lines that the effect of height has been to a large extent obscured. The Romanesque style has been most happily employed in many cases, the usual disposition of the parts as seen in European mediæval structures lending itself admirably to the requirements of the design which is commonly composed of a basement boldly and massively treated comprising two or three stories, then a central division of several stories in height with disposition of arches, the whole composition terminating in an attic of two or three stories. In the most successful buildings the angles have been

admirably managed so as to give the appearance of strength and dignity necessary in structures of such size. Some of the later designs are in the popular Renaissance style and show a very clever treatment of the problem.

A word as to prevailing styles in ecclesiastical work. In a nation of such cosmopolitan character as America, embracing an almost innumerable variety of religious beliefs, it might be expected that great differences of style would be found, and such is the case. Romanesque, Gothic, Mauresque, Spanish and many other types are represented, though for the most part, it must be admitted to the discredit alike of their designers and the congregations for whom erected. In no class of architecture have the Americans so much to learn as in their church buildings. Still in their more recent works, signs of improvement are not wanting. The notable competition, a few years since, for the great Episcopal cathedral of New York has done not a little to advance ecclesiastical architecture. Although, as pointed out previously, a great variety of styles prevails in church work, it is doubtful if any are as appropriate for this class of building as the beautiful gothic forms, and the latest designs of perhaps a majority of our leading architects clearly point to this conclusion.

In her public and legislative buildings, with one or two notable exceptions, America has less claim to congratulation than in other architectural achievements, although here too, the most recently designed buildings show vast improvement over earlier work. No reference to American architecture is complete without allusion to the Capitol at Washington, a building of which any nation might well be proud. Although it cannot be termed a modern building, yet, inasmuch as the style in which it was built is more popular to-day than when it was designed, a reference to it is specially appropriate here. It is too well known to need description, and it is questionable if a structure of such stately dignity and grandeur will ever cease to exert a powerful influence on the architectural productions of the American people. In this sketch of current American architecture may be seen much that is encouraging. That there is an abundance of life and vigor is evident and that the character of our work has steadily and rapidly improved is equally apparent. Probably one of the most perplexing circumstances presented to our minds is the great variety of styles seen in our modern buildings, a spirit of restlessness, a lack of definite purpose which would seem necessary for the proper development of our art. Why is this so? Possibly one reason may be the deeper and fuller knowledge of the architectural styles of the past. If this is the case there need certainly be no fear as to the result, bearing in mind the fact that such knowledge includes not only an acquaintance with the form, but what is of vastly greater importance, a perception of the idea, of the principles underlying the outward form. To possess this knowledge and the power to apply it, requires patient thought and study, but there is no other royal road to the true development of architecture. Or again a reason may be the search after new elements of beauty, fresh and varied forms of architectural expression. This too need cause no alarm. Have we not in the works of nature an infinite variety of beautiful forms from the designs of the Divine Architect refreshing and delightful to our senses. Can we wonder then in this age of versatility, of the ever changing forms of architecture? The impressive and stately monuments of classic art cannot satisfy every condition of aesthetic taste and it is doubtless in response to this characteristic of our nature, that we may see, in the case, for instance, of domestic architecture, the signs of a return to the picturesque and quaint beauties of the half timbered houses of a decade or two since, in the very latest designs of some of our leading architects.

We may not look for the formation of a new style; all attempts in this direction have resulted in dismal failure, and this after all is not to be wondered at when we consider that the styles of past ages, admirable and beautiful as they are, were not created in any such way. The degree of perfection to which they were brought, was only attained after generations if not centuries of patient and laborious effort, in which the object to be gained was not novelty, but a beautiful and natural expression in the best materials at their hand, of the requirements of their age. And it is unquestionably in the same way only that any real progress can be made to-day in the true development of architecture.

#### ILLUSTRATIONS.

DRAWING ROOM MANTEL FOR HIS HONOR, JUDGE FRINK, VERNON, B. C.—R. MACKAY FRIPP, A.R.I.B.A., ARCHITECT.

SOME WAYSIDE SKETCHES—DRAWN BY E. WILBY.

C. A. & B. COMPETITION FOR A TOWN HOUSE AND STABLE—DESIGN SUBMITTED BY "COLONIAL," (EDWARD LANGLEY, JR.) AWARDED THIRD PLACE.

Iron gas pipe was originally made up of gun barrels, lengths being formed by screwing the muzzle end of one into the breech end of another. After this, welded tubes of equal diameter and thickness were made, and the screw socket joint used to unite them. The seam was first welded, a few inches at a time, by inserting a rod within the heated tube and hammering the lap together. After this came an improvement which took the form of drawing the heated tube, arranged for butt welding, through a pair of half circular dies which forced the edges to unite.

# RECREATION OF FURNITURE

## CARVING.



If we consider for a moment the present condition of the sculptor's art, as it is exemplified in the best of our modern furniture, we cannot fail to congratulate our wood carvers upon the immense advancements they have made in their industry during the past fifty years. At the time of the great exhibition the handicraft of the wood carver had sunk to the lowest art level that it is possible to conceive. Now that we have arisen from such an inartistic lethargy, it is

amusing to occasionally look back into the illustrated Art Journal of the '51 Exhibition and reflect upon the many ridiculous designs that are chronicled there, as emanating from some of the then leading fashionable furnishers. If we regard such exhibits with a view of studying the contemporary carving, we can indeed discover a plethora of wonders. Sideboards carved all over with bewildering growths of convolvuli, tables with myriads of curves and cabriole legs galore, cabinets carved entirely in imitation of rustic work, and looking like glorified summer houses in suburban back gardens. Such fancies as these—unstudied, uninspired, barbarous fancies—passed current in those days for "noble and magnificent wood carving."

That kind of sculptured work represents one bad extreme—an extreme to which we have, as yet, no fear of returning. But there is an opposite extreme, viz., *forced elegance*, and to this we are quickly drifting. We lack conception, freedom and individuality in our carving, by paying too great a deference to old work, and, like the sculptors of the cinque cento, who made the same error, we are beginning to err on the side of finish and beauty, and to lose thereby the very life and soul of our labor.

The tremendous differences between the carving of our National Woodwork and the carving of to-day is evident to everybody. But, unfortunately, whereas most cultured people appreciate and admire the *old* work, they, none the less, would

and roughest employment in the figure was regarded, in its true sense, as a quick and lasting expression of a more or less brilliant idea—not as an example of painstaking patience.

Nowadays our figure work must be perfect or it is to be condemned. And what is the result? Neither perfection or imperfection, but a worse state of affairs—the almost total absence of any attempt in our everyday furniture to introduce the figure at



FIG. 2.—FRENCH CARVED PANEL, PERIOD HENRY IV.

all. This ought not to be so. The human figure is a beautiful and essential element in our carved work, and its absence is much to be deplored. The figure gives life and sentiment to our old carved work, and all the finest epochs of our industry abound with representations of the human form.

Far be it from us to advocate crudeness—the old work was crude enough in all conscience, but then the carvers of that day did the *best they knew*. Let us, therefore do likewise, and if our sentiments urge us to introduce the figure into our work, let us

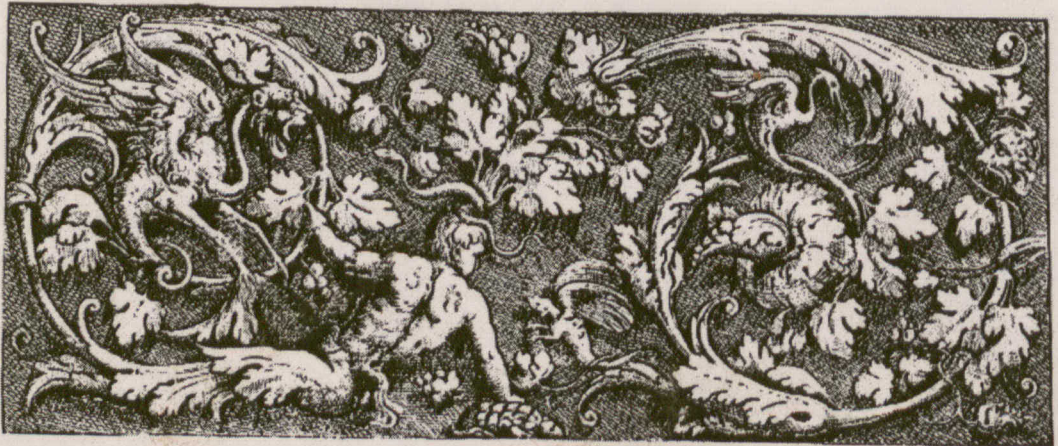


FIG. 3.—CARVED PANEL, EARLY GERMAN RENAISSANCE.

not accept such sculpturing from the hands of the *modern* craftsmen. Thus they do their utmost—unconsciously, no doubt—to discourage true originality. The most delightful scroll-work and vigorous crude figure carving would infallibly pall upon the taste of such people. That which many a connoisseur would rave about as *quaint* and spirited in an Elizabethan panel, would, forsooth, be blamed as barbarous if it were known to have been produced by a modern true art workman. It is this deplorable public inability to discriminate between that which is clever and original, and that which is merely a tasteful repetition, that has so effectually prevented the general introduction of the "human form divine" into our modern carved work. In an old Dutch buffet, or on a piece of Jacobean panelling, the crudest

give the reins to our fancy, and not wait until we become Royal Academicians before we essay to attempt figure sculpturing at all. Our predecessors three hundred years ago did splendid work, with but indifferent—if any—knowledge of anatomy, and surely we, who have innumerable advantages, can excel them if we wish. But, alas! Our very advantages are our hindrances, for if we had not the means to become so clever, by studying the work of others, we should be compelled to rely on our resources and—work—instead of copy.

Let us glance, for instance, at the piece of old German scroll-work which is shown in fig. 1. The figure contained therein may or may not be anatomically correct—it does not matter—it is a part of the scroll, and a necessary and very interesting feature of



the panel. How much better is this than the orthodox vase would be with its everlasting acanthus scroll, even though it were Italian or Oriental London in design! For that matter, too, how unmistakably does it excel the next example that we show in fig. 2! This, however, belongs to a different period, viz., that of Henry the Fourth of France, and though it is somewhat formal design—as was usual with the work of that era—yet it is a bold and fearless effort to introduce some part of the figure at least. That life-representing head—crude and grotesque though it be—would attract the eye of an observer much more readily than the most delicately wrought but lifeless vase or patera that it would be possible to carve in its stead.

And what shall we say about the "Grotesque?" That it is a joke in art; a mere bit of fanciful bye-play? If so, it is welcome, for it cannot fail to interest us, and, may-be, amuse us. Why should not our furniture occasionally contain some embodied piece of wit? The old buffets often did; surely we stand in need of mirth in these matter-of-fact days, much more than our jovial ancestors. The sparing introduction of the grotesque into our cabinet would be a boon. It would be an easy change to effect, too, for the grotesque in carving is very much less difficult



FIG. 3.—GROTESQUE HEAD, PERIOD EARLY LOUIS XV.

to render than the perfect figure. This will be at once apparent to any one who attempts to draw a face. For example, it will be found to be extremely difficult to make a likeness, whilst it is the easiest thing imaginable to make a burlesque, simply because anything you do is a burlesque, whilst anything you do is not necessarily a likeness. So with the grotesque. Provided that we do not set ourselves to adopt any recognized school of art in this matter, we shall soon be able to produce grotesque figures with considerable facility.

The last of our sketches shows a capital study in this direction. It is French of the early Louis Quinze period, and though this is, of course, an elaborate example, it will serve to show what a degree of animation may be awakened in our work by the introduction of the figure, even though it be grotesque.

It would be well for the carver to remember, however, that there are many styles of grotesque art, and that these are extremely varied and distinctive in their several schools. These, therefore, should either be carefully studied or studiously avoided.—Furniture and Decoration.

From the budget speech of the treasurer of the Ontario Government it is learned that the expenditure on Government buildings during the last five years has been \$3,167,656.

The value of new buildings for which permits were taken out in the city of Toronto in January of the present year, is \$73,600, as against \$56,300 for the same month last year.

Mr. Hebert, the sculptor whose design had been accepted for the Sir John A. Macdonald Statue to be erected on Parliament Square, Ottawa, has assured the Minister of Public Works that the statue will be ready for unveiling in October.

The expenditure and contracts to date on the new Legislative buildings, at Victoria, B. C., have reached the sum of \$686,425, or \$89,425 in excess of the limit of cost fixed by the Legislature. It seems probable that another hundred thousand dollars at least will be required to complete the buildings.

The second annual meeting of the Association of Ontario Land Surveyors was held in Toronto, a fortnight ago. The meetings, which occupied two days, were presided over by the President of the Association, Mr. Elihu Stewart, of Collingwood. A number of interesting papers were read and a pleasant time was spent at the annual dinner. The following officers were elected for the ensuing year:—President, Mr. J. Fuller, Napanee; vice-president, M. Gaviller, Collingwood; council, W. Chipman, T. B. Speight, V. Sankey, J. McArce, Toronto; H. J. Bowman, Berlin; J. D. Evans, Trenton; E. T. Wilkie, Almonte; H. Winter, Thornyhurst; J. W. Tyrrell, Hamilton; R. Coad, Glencoe, and W. R. Burke, Ingersoll; auditors, M. W. Hopkins, Hamilton; I. Traynor, Dundalk; H. B. Proudfoot, Toronto; T. H. Jones, Brantford; secretary, A. J. VanNostrand, Toronto.

## SOME POINTS ON BUILDING.\*

By JOS. POWER.

In taking this as a subject for a paper, I do not intend to go into any of the many points on which I may touch with any degree of elaborateness, from a scientific point of view; but merely the most salient from a constructional point, and on which so much depends; sometimes—yes often—success or failure.

In proceeding, let us suppose we are going over the requirements of the ordinary every day building. By this I mean one with which we are all familiar. We are consulted as to a building on a certain lot or site; its purpose is named. Consider well the surroundings (if of a permanent nature), the style of design best fitted for the requirements of the proposed building; and no matter for what purpose, let it speak for itself as far as practicable. By this I mean, let your design give the ordinary passer-by an idea of its use—not by ginger-bread ornament and signs, but by character and treatment. Let a "wholesale" be a plain, heavy, substantial looking building; a bank, a massive building of refined treatment; a school, plain and substantial; a collegiate, college or other public building, classic or of classic feeling, plain, neat and substantial; the public building, with broad and lofty open portal, or other entrance, simple in treatment and decoration. And, above all, let a church be a church, a model of perfection, perfect in every detail and without sham.

All this you will say is a matter of cost and seldom to be realized. Admitted, to some extent, it is; but work and advise to that end, and if then it cannot be got, do the best you can, always bearing in mind that what you do must be substantial, even if perfectly plain, and if this cannot be done with credit to yourself, better have nothing to do with it. But in most cases you can advise and prevail that more money be put in it; or the building cut down so that it may be fairly well done for the amount available.

Your design being satisfactory, see that the foundation is good—if not the rock,—that your footings are good, of large stone flags and cement, piles and steel beams if necessary. The drainage being properly provided for from a sanitary standpoint, see that it is so put in, first that the intended grade and no more is taken out, or if by chance it should, that it is made up with broken stone. Do not depend on earth, even if tamped in. Next see that the pipes to be used are of the best salt glazed, and without blemish, laid with tarred rope of sufficient size to just fill the space or difference in size between pipe and fosset, tamped well up to the shoulder of fosset. Throw your level over them to be positive that there are no low spots; then have them well blocked under with stone, to prevent rolling. They may now be cemented. Try an occasional joint by passing your knife into the cement, to know that the rope has been tamped well to the shoulder of the fosset and be most particular that they are cemented all round, especial attention being given to the under side, and if satisfactory they are now ready for filling, which, however, should not be done until the cement is dry; then fill carefully with clay well rammed to the top of the pipes.

The masonry is probably the next to require our special attention, as too many, especially when building coursing or ashlar, will give you two very poor walls where but one is required by building up the face to as much as two feet before backing it up and bonding over. This should not be allowed for at most more than one foot, and then it should be well bonded.

See that all joists have  $4\frac{1}{2}$  bearing, and are cut back that not more than two inches are in the wall at top edge.

When partitions are over one another, let the studs of the upper come down on the head of the lower and thus save settlement by shrinkage of joists and breakage or cracking of plaster in angles, to some extent. Where partitions meet walls have first stud well spiked to walls.

I will now pass on to the question of plumbing, one I need hardly state of the most important to the profession to-day. In laying down your system, avoid placing the pipes against outside walls, burying them in cement or behind plaster as far as possible. The soil pipe or drain should be of medium iron, well coated inside and out, with brass cleaners, whereby to remove any chance stoppage which might take place by the introduction of foreign matter, for such things will occur, even under the best of management. Introduce fresh air, if trap can be got 12 or more feet from building, or where there are no windows over, and run pipe through and well above roof, enlarged to prevent stoppage by hoar frost. Before fixtures are set, have openings plugged and system tested by filling with water. Vent all traps with pipe of same size into standing vent. Have all fixture connections made with brass and rubber, and all lead joints properly wiped and gasketed, funnels run and caulked to cast pipes. After fixtures are set, subject the whole system to a second test of either smoke or oil of peppermint. In short, have it done in the best possible way; put in no more than what is really necessary and can be done in a thoroughly sanitary and substantial way.

Mr. Blue, of the Ontario Department of Mines has lately been inquiring into the existence of clay suitable for the manufacture of vitrified brick, and reports that there are large deposits of such clay available.

\* Paper read at the fifth annual convention of the Ontario Association of Architects.

WINNIPEG.

(Correspondence of the CANADIAN ARCHITECT AND BUILDER).

As the season advances rumors of "costly" and "beautiful" buildings like "the flowers that bloom in the spring" fill the air with a sweet aroma, refreshing to the souls of the weary waiting who cannot but rejoice when they see the clouds are breaking, and the shadows of hard times disappearing before the rising sun of brighter days.

Plans were prepared last year for the new St. George's church, providing for a frame building on stone foundation, but the congregation have decided to build a higher basement arranged with a large Sunday school room, class, vestry and furnace rooms, and to build the superstructure of frame and brick veneer. The style to be Gothic treated in a quiet manner.

The tenders of the Wesley College building were received on the 7th instant, and the amounts of some of the bulk tenders were less than \$75,000 the sum appropriated for its erection. The building no doubt will be built above grade line, with Calgary stone, which is grey in color with a granite tint, very soft when first quarried, but becomes harder after being exposed to the air, is easily worked, and after allowing for the long haul, can compete successfully with our local lime stone, which is of a hard, flinty nature, and difficult to split or cut.

This country is seldom without a railroad or two looking for financial assistance from the government, and from any one else who is willing to give it. The Hudson's Bay Railroad was such a fizzle, and saddled the province with such a heavy debt, for which it has nothing to show, that the government are wisely cautious in not granting aid to any but gilt edge enterprises. The latest is the "South Eastern Railroad" to run from the city to the Lake of the Woods, with a prospect of forming a connection there with another railway to Port Arthur, thus giving a line to Lake Superior independent of the C. P. R. The promoters of the S. E. are interested in the lumber mills at Rat Portage, Keewatin, &c., and they state that should this railroad be built, all the lumber mills now at the Lake of the Woods will be removed to Winnipeg, which would be very beneficial to the city in many ways, reduce the price of lumber, and provide the market for the

slabs and saw dust, which have now to be got rid of by burning in furnaces specially built for that purpose at a cost of about \$5,000 each.

The Scotch pastime, the roaring game of curling, which has been "running" this country every winter for the past four or five years, has caused buildings of a new style to spring into existence, and while they are now put together in a rough and ready manner, no doubt if the curling fever continues and the several clubs grow richer, a higher style of architecture will be demanded, which will develop and become as characteristic of the purpose as the buildings erected for other kinds of amusement.

We have here in Winnipeg, in the new Court House addition erected the past year, an excellent illustration of the old adage "great minds think alike" for the resemblance of this building to the Court House, Tacoma, W. T., is very striking, and shows how two designers miles apart can be inspired with similar ideas. The former Court House, however, is not equal to the latter either in proportion or detail, and has a squat and undignified appearance, entirely out of harmony with its surroundings, and the purpose for which it has been erected.

PUBLICATIONS.

The "Progress of the World" of the *Review of Reviews* is not confined merely to a review and discussion of current political, financial, economic and sociological events. In this department of the March number, for instance, appears a report on the geographical and scientific explorations that have recently been completed, are now being carried on, accompanied by maps and portraits of the explorers.

Whites from lead should never be used in water-color drawing. In many of the drawings by the old painters patches of black occur where the high lights were introduced. This is due to the use of white lead.

The New Massey Music Hall now in course of erection in Toronto, is to be opened with a grand musical festival on the first of June. At a meeting of the architect, contractors, and the festival board, held a few days ago, it was decided that the building should be completed by the date mentioned.

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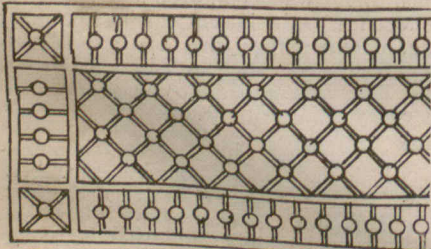
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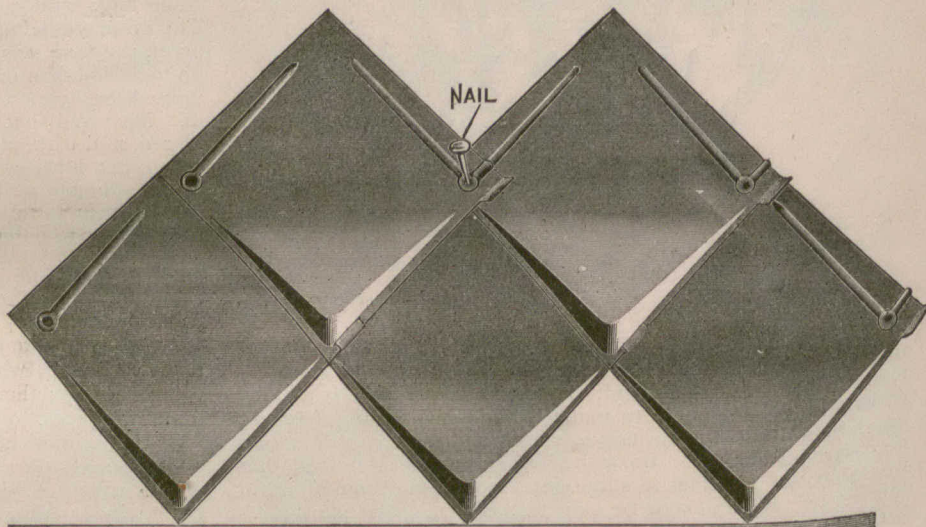
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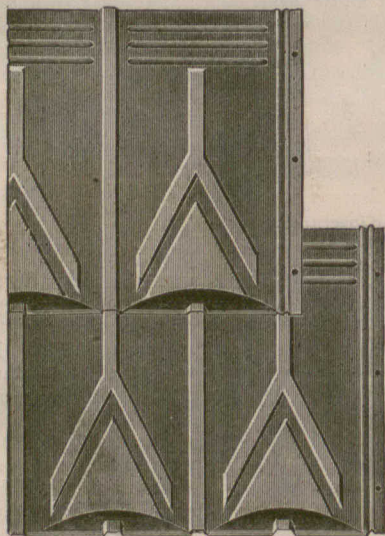
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Paper has been applied to many purposes of construction, one of the most remarkable being lately announced in *Le Genie Civil* of Paris. It is a factory chimney forty-eight feet high, composed of this material, which has just been put up at Breslau, and said to be absolutely fireproof. The cupola of the new government observatory at Greenwich, England, is to be constructed of paper.

**POLISHING PASTE FOR BRASS.**—Dissolve 15 parts of oxalic acid in 120 parts of boiling water, and add 500 parts of pumice powder, 7 of oil of turpentine, 60 of soft soap, and 65 of fat oil. The polishing agent is usually mixed with oil, alcohol or water, to prevent scattering, and is then applied to the articles by means of cloth or leather buffs. Either the work or the tool should revolve with great velocity in order to secure good results.

Cement one bushel, and sand two bushels, will cover three and one-half square yards one inch thick; four and one-half square yards three-quarters

of an inch thick, and six and one-quarter yards one-half inch thick; one bushel cement and one of sand will cover two and one quarter square yards one inch thick; three square yards three quarters of an inch thick, and four and one-half square yards one-half inch thick.

**HARD STOPPING FOR WOOD.**—This is often called Beaumantique, and is used for filling in any holes that may be in the work before commencing to polish. Put one tablespoonful of shellac, one tablespoonful of powdered resin, a piece of beeswax the size of a walnut, into a cup or iron pot, and set on the stove or in the oven until melted. For mahogany, add to it a little Venetian red, to match up the wood; for oak add yellow ochre; for ebony or rosewood, add lampblack; mix it well up. It can be used while liquid, or it can be made into sticks like sealing wax, by pouring a little on to a board, and rolling it with another board slightly warmed. If made up in sticks in this way, it is a good plan to have a variety of colours. When using, melt it over a lighted candle or gas light, and run it into the place to be repaired; level off with chisel, and smooth down with glass-paper.

At the annual meeting of the Milton Press Brick and Sewer Pipe Company, Ltd., held at Milton a few days ago, a very satisfactory report was presented of the preceding year's business, and a good dividend declared.

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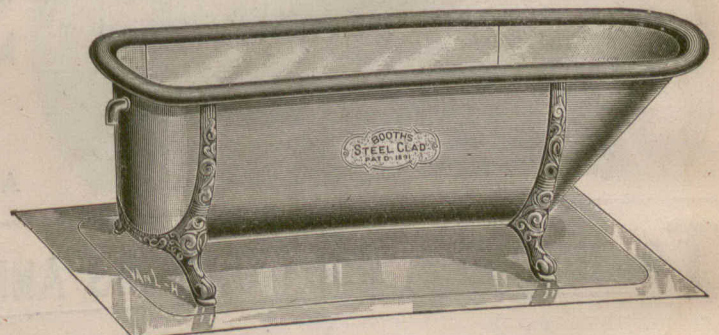
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## USEFUL HINTS.

The use of embossed wood for interior finish, is becoming more and more popular. As recent improvements in manufacture have made the embossing permanent, ornamented work is taking the place of plain finish with a decided gain in richness and beauty.

The lighter woods for hardwood floors are now in vogue. Fashion in this case rests upon a more substantial basis than mere whim, as the light floors are not only more attractive, but show less the effect of wear as they are harder and more readily kept in order, besides being more cheerful.

**LEAVES IN ART.**—Every decorative artist can but copy nature, and must sedulously work upon nature's laws. Thus the simple lilac leaf may become ternate as in the Hepatic, doubly ternate as in the creeping, crowfoot; triply ternate as in the celery, until, when you desire it, you arrive at the intricacy of the parsley, which is still upon the triple principle of division. Nature carries out the principle even upon the same plant—as in the ivy—where the leaves next the flower are perfectly plain and undivided, the young leaves upon the leaf stems are ternate, which further develop in the older leaves into a pentagonal form. The pentagonal principle is again carried on from the ivy, through the maple (which has subdivided lobes) the vine and hop serrated, the cinque-foil (where it becomes five distinct leaflets), and to the horse chestnut, in which it arrives at seven leaflets.

**PILE DRIVING.**—The object of the investigation of pile driving is not to determine to a fraction of an inch the distance a pile may be driven—and especially so, as the resistance offered by the earth, which is the most important element, cannot be correctly ascertained—but the object is to elicit the simple and general truths upon which the system depends. Dr. Whewell deduced: 1. A slight increase in the hardness of the pile, or in the weight of the ram, will considerably increase the distance the pile may be driven. 2. The resistance being great, the lighter the pile the faster it may

be driven. 3. The distance driven varies as the cube of the weight of the ram. Although these deductions cannot be depended upon as exact under all circumstances, they give a tolerably correct indication, and are in accordance with those which may be arrived at by general reasoning. The complication in the original expressions arises from taking into consideration in the general question the weight and inertia of the pile. The weight of the pile bears so small proportion to the resistance of the earth, that it may be neglected: for a pile 25ft. in length and 1ft. square weighs about one-half ton, and if the fall of a ram weighing one ton is roft. and the distance driven by the plow is 2in. then the resistance of the earth will be to the weight of the ram as 120in.—that is, it will be sixty tons, of which one-half of a ton is the 120th part, and may, therefore, be neglected.

**CONSTRUCTION OF IRRIGATING DITCHES.**—The Railway Review says: "Out on the sandy plains of California, where water for crops has to be conveyed for miles in ditches, it is an important matter to reduce leakage to a minimum. This is generally accomplished by covering the sides and bottom of the trench with concrete. Some work recently done for the company controlling the El Monte basin, near Los Angeles, may be taken as a sample of the methods of construction. The excavation for the conduit was in fine, soft sand, and was carried on by hand after the material had been loosened by plows. The exact outside dimensions of the cut were ascertained by a templet, and the men soon became expert in working the proper shape. The concrete was made chiefly of one part of Portland cement to eight parts of sand and gravel. On the bottom and sides of the conduit the concrete was two-and-one-half inches thick, with additional material at the corners; it was placed in the trench against the outside of a frame, just as the conduits for cable railways are generally built. After it had set a heavy wash of cement was laid on nearly in the consistency of thick cream. The conduit was finished by covering it for its entire length with a roofing of redwood planks."

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