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PAGES

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The Canadian Architect and Builder

VOL. XVII.—NO. 201. SEPTEMBER, 1904.

ILLUSTRATIONS ON SHEETS.

Maxwell Farm, an Elizabethan Farm House (on the right) added to (on the left), by Mr. Seth Smith.
Store Building at Halifax, N. S., Built Entirely of Concrete —R. A. Johnson, Architect.
Lodge for Western Art Association, Brandon, Man.—W. N. Lailey, Architect.
Plans of Lodge of Western Art Association, Brandon, Man.—W. N. Lailey, Architect.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Union Bank, Winnipeg, Man.—Darling, Pearson & Over, Architects.
Head Offices of the Bank of Montreal, Montreal, Recently Remodelled.—McKim, Mead & White and Taylor, Hogle & Davis, Associate Architects.

CONTENTS

SPECIAL CONTRIBUTORS.

MR. W. A. LANGTON, Architect, London, Eng.
" EDMUND BURKE, " Toronto.
" S. H. TOWNSEND, " "
" Prof. Percy E. Nobbs, Montreal.
" FREDERICK G. TODD, Landscape Architect, Montreal
" W. H. ELLIOTT, Toronto.
" A. F. DUNLOP, R.C.A., Architect, Montreal.
" FRED. T. HODGSON, Architect, Collingwood, Ont.

Improvements for Toronto.

The embodiment in the report of the Toronto City Engineer, recently published, of two suggestions that have been made for the improvement of Toronto—suggestions of a couple of diagonal thoroughfares and of a lake front drive— mark that these propositions have at last reached, or are on the verge of reaching, the region of practical politics. The diagonal streets, when they are accomplished, will be one of the greatest improvements made in Toronto since it grew to be a big place on a plan that is only suitable for a small one.

There is no time like the present for a work of that kind since freedom from costly obstruction is so necessary. "At present," the City Engineer says, "there are no expensive buildings on the line of the proposed avenues." But, if the suggestion underlying this statement is that it is a necessary condition that the proposed avenues should be straight from one end to another, we could almost wish there were expensive buildings on the line; not enough to daunt the promoters, but enough to make it necessary that the avenues should have what would be a great advantage to their beauty and interest—vistas of moderate length terminating with a building, and having at that point the refreshment of a bend of some kind. College street, though of no startling beauty in its present state, offers, between Spadina avenue and the west, suggestions of how little obstruction a slight bend is in a road, and how much pleasanter it is to travel over when varied by even such slight curves as these; and, as to the question of vistas, the view from about Euclid avenue looking east to Spadina avenue, where the tower of the Broadway Tabernacle rises as a central object in the road, is far better than the interminable vistas of King or Queen streets.

We have at last discovered that constant right angles do not make perfection in laying out streets; let us go a step further and abandon the bee line too. We all want to get home as soon as possible, but there is no reason why we should not enjoy the process of getting there if we can. That a street should here and there deviate from straightness adds practically nothing to its length and takes much from the fatigue of traversing it. It is direction that is the essential consideration in a street. For this it is worth while to take pains and, if necessary, pay money; but to suffer over making a street straight, or to suffer the want of it because it cannot be made straight, is to suffer in vain, for straightness is neither necessary or desirable.

As to the lake front drive, from Queen's wharf to the Humber, it seems to be all advantage ; even the making is a gain. As long as the street commissioner has innumerable cart loads of ashes and other stuff to dispose of, and no where in particular to put them, no inequality of ground is safe from his necessities ; and to create a safe dumping ground for him, which will ultimately turn out a boulevard, is a happy state of affairs, equal to Sidney Smith's account of the cooking of oat meal water : "She put some dirty water in a pot and by the blessing of God it came out a pudding." And by the time this boulevard is made, perhaps the City Council will have in sight a destructor which will settle the question as it ought to be settled and has been settled elsewhere, by burning up ashes, rubbish, garbage and tin cans all together, making of them a slag harder and better than stone for making and mending the roads.

Lessons from the Toronto Fire.

The General Committee of Fire Insurance Companies have published a report which is a rather dry statement of facts conveying, however, one or two practical lessons. There is the usual complaint about the interference of overhead wires with the work of the firemen, which it is as well to keep in mind until these wires are put underground ; but there are two or three practical lessons which ought to have immediate effect in influencing the manner of rebuilding the warehouses that have been destroyed. The most striking suggestion may be extracted from the account of the "Sprinklered Risks," viz: the warehouses of W. R. Brock & Co., Kilgour Bros., and the Evening Telegram. The two former were supplied with both inside and outside sprinklers, and the evidence seems to show their efficacy if the flow of water can be kept up in spite of the competition of the hydrants. There seems to be no doubt that in the case of W. R. Brock's building, if there had been fewer hose going, if the fire had been concerned only with its immediate neighbour, this warehouse, though exposed to precisely the same contact with fire as in the April fire, would have escaped burning ; but in a conflagration which kept 50 streams of water running and reduced the pressure at the hydrants from 70 or 80 pounds per square inch to 37½ pounds, the water curtain from the outside sprinklers, which kept the fire off while pressure lasted, began to fail in the upper stories ; "then," the report says, "it is supposed that the fire entered the risk through the upper windows at the rear." The automatic sprinklers inside kept the fire in check until the tank supply was exhausted, after which the supply to the upper floors ran dry inside as well as outside and the fire got possession of the building.

The account of the Kilgour building's apparatus is not so clear. It had the advantage of a larger tank supply for the inside automatic heads, and the outside heads are said to have had a steamer connection auxiliary to the supply from city pressure ; but it is not said whether the steamer connection was made use of, or whether the safety of the building, and the credit which is due to it of having stopped the fire at that point is due to its superior apparatus or to the good fortune of having had as its exposing neigbour on its uninjured side, a lower building than the Brock warehouse had. One point is clear, that, where the building did take fire, its advance within was held in check by "good division walls ;" but that is a precaution well known, however little used. The immediate example furnished by these buildings is the efficacy of sprinklers if their efficacy is secured, and the simplest way to secure it would be to supply these, as well as hose pipes, with water from the fire engines. It would require a point of application at a comfortable distance from the fire ; not up a lane but on the street; and on the edge of the sidewalk rather than against the building.

The Telegram building, though sprinklered, did not get to the point of opening the heads. The fire was successfully fought with inside hand hose, and special mention is given to good work done with a length of hand hose attached to a roof hydrant. This sounds like a good thing to have but not to rely upon. It is good to stop small beginnings, but the flame that reaches across a street would make short work not only of a hand hose but of those who operate it.

A second lesson is that a longitudinal fire wall hinders only a transverse fire; and a transverse approach is no longer the only thing to be expected from fire. Buildings are now so much higher than formerly, in relation to the width of the road, that it is only a question of the direction of the wind whether the flame from a burning warehouse will attack its adjacent neighbour or its neighbour across the street. Fire walls should run all round a building and the roof drain to the middle.

The great lesson of the fire, however, is one that was taught before, when the McKinnon warehouse took fire through its windows from the Globe office across the way. A building is not fire-resisting unless its windows are protected. With protected windows any brick building with fire walls and a reasonable roof would be hard for the fire to get at; without them a building may be as fireproof as a stove and burn as well. It is the stock that burns. Most stock burns well and much of it is very inflammable. There is nothing to prevent fire running through a fire proof building from front to rear, if there is nothing but glass between its stock and a fire across the road.

There is one other question of some interest :—How far is a portable fireproof safe a certainty in case of fire? There are rumours of safes being burst open by their fall from an upper floor. Whether this is founded upon evidence or conjecture there is certainly, in one statement of the Insurance Companies' Report, some food for conjecture as to the fate of safes which fall to the cellar. The report says :— "The hardware stocks were in very bad shape; hardened steel tools, gun and rifle barrels and heavy shelf hardware being found in masses, sometimes of several tons weight." How is a safe likely to fare that falls into the sort of fire that could make one mass of steel implements such as are described above! There should certainly be some hold in the wall for portable safes, to keep them out of the cellar. What answered once will not necessarily answer now ; for with bigger buildings we have bigger fires.

THE ARCHITECTURAL ASSOCIATION AND ITS WORK.

SECOND ARTICLE.

In a previous article some account was given of the habitation of the Architectural Association and its Day School, which takes care of preparatory and junior work. This work is carried on further by an Evening School, necessarily held at that time because it is for working students.

The EVENING SCHOOL, like the Day School, is a serious affair with a comprehensive curriculum and paid lecturers of experience; and the hours of attendance for students, 6.30 to 9.30, for four nights a week, means serious application on their parts.

"The complete curriculum" (to quote the Association Brown Book) "is arranged in two divisions with some extra subjects and extends over four years. There are in each division two parallel but distinct courses, viz.: a course of Lectures and Classes, and a course in the Studio." This means that the theory of Design, Construction and Sanitation so far as it can be taught by word of mouth is thus taught in the course of Lectures and Classes, and the instruction so given is worked out on the drawing board by practical exercises in the Studio. These parallel "Courses" of Lectures and Studio work are again sub-divided into "Divisions," not for the further classification of subject but simply that the whole subject matter may be cut into four convenient lengths to occupy the evenings of four winters. There are thus two divisions of lectures and two divisions of Studio work, and they are usually taken alternately, so that Division I. of the Lectures is followed by Division I. of the Studio, which runs parallel with it; and Division II. of the Lectures by Division II. of the Studio.

What is accomplished is laid down in the curriculum as follows:—

DIVISION I. LECTURES AND CLASSES. 1. Greek and Roman Architecture and Classic Ornament. 2. Elementary Principles of Building Construction. 3. English Architecture to A.D. 1500. 5. Outlines of Mediæval and Renaissance Architecture in Europe. 6. Elementary Physics as applicable to Building, Formulæ and Calculations, Stresses and Strains. 7. Plane and Solid Geometry.

DIVISION I. STUDIO. 1. Freehand Drawing. 2. Descriptive Geometry. 3. Perspective. 4. Ornament: Drawing from the Cast. 5. Greek and Roman Architecture: The Orders, their optical corrections, characteristic forms, mouldings and ornament. 6. Mediæval Buildings and their Accessories. 7. Building Construction. 8. Elementary Architectural and Decorative Design.

DIVISION II. LECTURES AND CLASSES. 1. Materials, their Nature and Application. 2. Construction. 3. Hygiene (Drainage and Water Supply). 4. Hygiene (Materials and Construction, Ventilation, Lighting, and Heating.) 5. Professional Practice, including the London Building Act, Valuations, Dilapidations, Light and Air, Specifications, Approximate Estimation of Cost, Contracts and Agreements. 6. Lectures and Field Demonstrations on Land Surveying and Levelling.

DIVISION II. STUDIO. 1. Stereography and Sciagraphy. 2. Architectural Perspective. 3. Ornament and Shaded Drawing from the Cast. 4. Studies in Ancient, Mediæval and Renaissance Architecture and Design, founded upon examples in these styles. 5. Designs and Working Drawings of Modern Buildings. 6. Internal Decorative Work. 7. Time Sketches.

The EXTRA SUBJECTS are:—1. Lectures and Classes on the Elements of Quantity Surveying, including the Preparations of Estimates. 2. Instruction in Modelling. 3. Elementary and 4 Advanced Water Colour class. 5. Ornament and Colour Decoration. 6. Class for Sketching and Measuring. 7. Lectures and Demonstrations on Perspective. 8. Discussion Section.

The latter comes under the head of extra subjects chiefly in virtue of its special fee of half a crown. It is simply a paper reading meeting, held on the fifth night of the week, but it is made safely instructive by securing the presence of a person of special experience in each subject under discussion, to sum up the debate.

This it is not too much to ask a busy man to do occasionally, but with the exception of this, which strikes few places far between, there is no volunteer work connected with the evening school. There is also a School of Design and Handicraft which resembles what in America is usually called a Sketch Club, except that to the School of Design and Handicraft it is intended to add a course of workshop demonstration. This school has, for each of its two divisions, a monthly meeting presided over by an architect drawn from a large Committee of Visitors. This also is volunteer work; but with the exception of this and the chairmanship of the Discussion Section there is no volunteer work asked for in the teaching work of the Association. In fact one might almost say there is no volunteer work asked for at all, for, though the president and other honorary officers must no doubt give their minds to the affairs of the Association during their term of office, they are not called upon to do any clerical work. For this there are salaried officers.

This is the central fact to be extracted from an inspection of the doings of the Association; nothing is expected for nothing and nothing is given for nothing. It is recognized that no one can afford to give time and labor such as is required for real teaching, unless he can get or help to get his living thereby. This is the fundamental basis of the schools; they offer something worth having. The right to ask for the fees which carry the work along and the readiness to give them are consequences. It should, however, be noted that the kind of immediate inducement, which young people and even their parents require to seduce them to a proper valuation of the necessity of high training, is present in the examinations of the R.I.B.A. The letters signifying associateship and fellowship of the Institute are becoming more important to architects than ever, as the demands made upon the architect's capabilities become more complex, which is only to say that it is the need of education that is recognized by young architects rather than the necessity of letters. The Institute's examinations have come to take exactly the place they ought to take—a place which our examinations ought to take—a convenient standard for testing efficiency; a definite landmark to aim at in an outlook which extends to such hazy distances that it is satisfactory to have something obtainable in view, which, when reached, is a guarantee that one is in the right way and is getting on fast enough. This is the advantage that the Institute is to the Association. The Association, however, does not live by reason of this,

but because its work is good ; and it is good because it is paid for. The condition precedent to paying teachers must be receiving fees, but more certain than this is it that the condition precedent to receiving fees for teaching is offering the sort of teacher that can only be got by payment. There are virtuous circles as well as vicious circles, and this is one. However, the Association circle was started in its round, it is working all right now ; in both the day school and the evening school the fees received from students more than pay the salaries of the instructors—in the day school by nearly as much again.

The same quid pro quo principle holds in other doings of the Association. They publish a Sketch Book which has grown to be a valuable production—one that our architectural associations would do well to subscribe for. The first thing that occurs to one who knows the difficulty of keeping up anything that depends upon voluntary work is "how is the supply of 72 plates a year kept up?" The answer is simple—they are paid for. The subscription for the sketch book is a guinea a year, but four drawings, i.e., one for each quarterly part, entitles the contributor to receive the Sketch Book for a year and ten extra copies of each of his drawings. This is a good bargain for all concerned. Every advanced student or young architect makes some measured drawings during the year, either in his own country, which is full of invitation, or in the little holiday on the continent which is now so common. The obvious thing to do is to make the drawings 17¼ x 13½ inches to suit the Sketch Book and take some pains about them that they may be accepted. It means a guinea in pocket for doing what one was going to do anyway, and ten copies of one's work instead of one. To the Sketch Book it means a competition of drawings, instead of labour to get them ; to the subscribers generally, the same competition must give better and better drawings every year ; and the virtuous circle is completed by the impulse given to holiday studying by this reward for its immediate results.

One might go further in investigating the proceedings of the Association and still find this method of reciprocal benefit : the travelling student, for example, is anything but free in using his scholarship. He must submit his route for approval ; he must send back a journal ; he must give up his drawings for exhibition, and the Association have the choice of one to keep. The Association thus get something out of their gift, but the benefit is still the greater to the student who makes better use of his scholarship under these conditions than he otherwise would.

It is evident that the first consideration in providing for the instruction of students is to provide a good thing ; it is only thus it will obtain support. It may be necessary to begin with money in starting the circle, as the good thing must be presented to students in order to get support, and the cost of presentation is the first step in establishing the circle of advantage. But for this, if for anything, it is fair to ask for aid from the public or the rich. Indeed, a loan might be all that is necessary, for, if similar methods bring similar results, the financial statement of the Architectural Association shows a profit on teaching that would make it easy to pay back soon a sufficient initiative loan.

It may be the better for definiteness to have the Association figures before our eyes ; without supposing that either fees or salaries must necessarily be the same over here. The fees for the four regular divisions of classes and studio come to about $26.63 a year, and the Sketch Club 65 cents a year additional. The extra subjects spread over the four years come to about $6.42 a year. That is to say the cost to the student, who takes every opportunity offered, averages $33.70 a year and amounts to $134.80 for the four years. The cost to the Association in 1903-4 was $2,401.42, in lecturers' fees for the evening school and the students' fees received exceeded this amount by $590.

W. A. LANGTON.

THE TORONTO BUILDING STRIKE.

After more than a month of idleness the striking builders' laborers in Toronto have gone back to work at the same rate of wages as they were receiving prior to the strike. The bricklayers who supported the strikers have also resumed work. The net result to the strikers is the loss of thousands of dollars in wages which might profitably have been spent in providing fuel and other necessary supplies for the approaching winter. Owners of new buildings under construction have been put to great inconvenience, and the general trade of the city injured.

The strike was entirely unwarranted, in fact was nothing short of a "hold up," and was generally so regarded. Public sympathy was unmistakably against the strikers, and some of the daily papers found courage enough to denounce in plain language the action of the unions. The absurdity of the demand made by the laborers' union for a wage of 28 cents an hour is shown by the fact that the rate paid in Winnipeg, where labor is scarce and cost of living nearly double what it is in Toronto, is only 22½ cents. Furthermore, it would manifestly be unjust to pay such a wage to unskilled labor while paying only 30 cents an hour to skilled carpenters who, in addition to the years spent in acquiring the technique of their trade, must lay out a considerable sum in the purchase ofexpensive tools.

The bricklayers were under no obligation to stand by the striking laborers and thereby violate their agreement with the Builders' Exchange. On the contrary, they should have shown their disapproval of what they knew to be an unjust demand. Had they done so, the strike would have collapsed at a much earlier date and they would have been money in pocket. To show how little their support was appreciated it need only be stated that while they were walking the streets many of the striking laborers were working at 20 cents per per hour as helpers to concrete and other contractors.

As a means of avoiding these untimely interruptions to trade the Builders' Exchange should insist that in future agreements to govern wages must date from the first of January.

H. C. Standage writes to the Decorators' and Painters' Magazine that one of the easiest methods of cleaning a sponge that has become fouled by wiping the surface of paint or varnish, is to dissolve 1 oz. of permanganate of potash in 5 parts of water, and steeping the sponge in the fluid for fifteen minutes. Then squeeze out the fluid and allow to dry. When dry, put the sponge into a solution prepared by dissolving ½ lb. of hyposulphite of soda and 1 oz. of oxalic acid in 1 gallon of water. Allow the sponge to soak in this bleaching fluid for 15 to 20 minutes ; then take out and rinse well in cold water, and hang up on a line until dry.

NORTHWEST NOTES

Branch Office of THE CANADIAN ARCHITECT AND BUILDER,
310 McIntyre Block, WINNIPEG, September 12, 1904.

WINNIPEG BUILDERS' EXCHANGE.

The Exchange held its fifth monthly meeting on the evening of the 6th inst. and had a record turnout. The meeting proved a very interesting one and considerable business was transacted.

New members continue to be brought in, nine names being added to the list at this meeting.

A number of enquiries were received from outside points regarding business here. One from Toronto touching on the question of laborers' wages was discussed.

One important motion passed was to the effect that no member of the Exchange should sign any form of contract other than that approved by the Exchange—"The Uniform Contract." Any member violating this resolution will be subject to the penalty imposed in the by-laws, providing among other things for expulsion from membership.

Another motion passed was to the effect that no member of the Exchange should figure on any contract where another member had work in the same line unfinished without the consent of the first contractor.

An interesting paper was read on "Sentiment in Building" by Mr. E. S. Estlin.

Altogether the meeting was very satisfactory and showed that the Exchange is rapidly getting into shape and doing good work.

BUILDING OPERATIONS.

That the building trade is still very brisk is evident by the large number of building permits issued during August, viz., 181. There are still a large number of houses to be built before the season closes. The total amount of building so far this year has reached about 7½ million dollars; being by far the heaviest season Winnipeg ever had.

Yet with all the increase there has been in houses there seems to be as great a scarcity as ever of houses for rent, and rents remain much higher than they were last year. This speaks well for the increase in the population of the city. One needs to take a drive over the city to realize the vast amount of building that has been done this year. In all parts—north, south, east and west—houses have gone up and new streets have been opened. In Fort Rouge, the favorite residential part of the city, this improvement is especially noticeable.

Numerous wholesale merchants who have been increasing their accommodation are getting their buildings near completion, although no doubt it will be the end of the year before the finishing work is all done. There is hardly a wholesale building in the city that has not had two or three stories added to it—a proof that the original builders anticipated a great growth in the wholesale trade of Winnipeg and prepared the foundations in the first place so that additions could safely be added to their buildings.

A very interesting and busy scene is the work on the new subway on Main street at the C.P.R. station. Work here is progressing very rapidly. The cement and concrete walls and piers are almost finished, and a large number of supports for the concrete arches have been placed. The excavating of the roadway is finished and the electric street railway tracks have been run as far down as possible so that the through car service with the north end of the city may be quickly established. The C.P.R. track has to be raised yet as it is not at its full height, but that will be done quickly when the time comes.

The contractors found that the excavating took more time than such work usually takes as the steam shovels usually used for this class of work could not be employed in the tough clay here which had therefore to be dug out by hand which makes it a much slower and more expensive process.

Eastern contractors putting in tenders for work in the west would do well to bear in mind the great difference there is in the soil in the west, the tough clay taking much more time to excavate. Other peculiar differences exist which add to the expense of working.

A RECORD FLAG POLE.

A flag pole designed to be placed on the top of the new Union Bank building is the longest ever brought into Winnipeg. It wa imported from Washington Territory by the Sprague Lumber Company. It is 86 feet 11 inches long, and tapers from 12 × 12 inches at the butt to 7 × 7 inches at the point.

PERSONAL.

Mr. Herbert H. New is the latest addition to the list of architects in Winnipeg, where he has established an office in Molsons Bank building. Mr. New has recently arrived from Boston where he was engaged with the well known firm of C. & H. Blackall. He is much impressed with the prospects of Winnipeg.

Mr. H. B. Rugh, who had just taken an office at 367 Main street, Winnipeg, as our last last issue went to press, is now settled and has already submitted some attractive drawings, and is on the eve of starting his first commission.

BRICK MAKING AT BRANDON.

The Brandon Brick and Lumber Company, Ltd., which was incorporated several months ago with a capital of $100,000, is on the eve of completing the installment of their plant, and expect to be in full operation very shortly. This company have purchased the right of the "Huennekes System" for Western Canada. The product will be a dry pressed brick of sand and lime, baked in a chemical steam cylinder, the special advantage claimed being the production of a brick of a stone like character at a moderate cost.

The sand is first passed through a drying machine, the heat for which is supplied by the exhaust steam from the boiler. It is then carried by a band conveyor into a tubular grinder at the entrance of which is a unique apparatus which acts as a measuring or weighing machine and at this point the correct quantity of lime is admitted, to mix with the sand passing into the grinder. From this machine the two materials are conveyed into a mixing machine where a sufficient quantity of water is added to slack the lime. From thence the material is elevated to a storage receptacle immediately over the brick press of sufficient capacity to hold one day's working, the mixing of one day being held over until the following.

The "Press" has 3 moulds and has a working capacity of 15,000 bricks in a day of 10 hours.

After passing through the "Press" the dry brick is wheeled on trucks into the immense cylinder, which measures 62 feet in length by 6 feet diameter, provided with a steaming apparatus, with small perforations the whole length of the cylinder; into this cylinder the bricks are placed and the steam is applied at a pressure of 100 to 125 lbs.; thus, steam bakes the brick; there is a small "reservoir" at a certain point in the steam fittings, into which is placed a chemical mixture which has the effect of adding to the steam as it passes through the properties which give to the brick its special hardness. The company is expecting to do a very large business, as they have a large supply of sand available in the district, at a minimum cost of production.

The directors of the company are:—Dr. McDiairned, Mr. H. Sampson, Mr. J. Clark, Mr. H. A. Rose, Mr. A. R. McDiarned.

MANITOBA'S STONE SUPPLY.

The present season will probably close as the "record" season in Winnipeg's building, but as pointed out in previous issues, many more buildings would have been completed, had there been available a more plentiful supply of material.

Undoubtedly one of the main causes of this lack lies in the fact that supplies have to be drawn from outside, and in many cases from far distant points. It was therefore welcome news that there was evidence of an unusual quantity of good material in the shape of lime stone within easy reach of the city. It was to demonstrate this that the Garson Quarry Company, Limited, chartered a special train on Saturday, August 27th, and sent out invitations to all interested in the building trades, to visit their Tyndall quarries, an invitation which resulted in a goodly array of prominent Winnipeg building men sallying forth prospecting.

The quarries were reached after a smart run about three in the afternoon.

There are three separate quarries at work, one in operation by the Garson Quarry Co., and two by the Gunn Quarry Co. The first to be examined was that of the Garson Company. Excavations have been made to a depth of 55 feet and reveasome very useful stone for all ordinary purposes. It is interesting to note that the contractors for the C.P.R. Hotel at Winnipeg have made arrangements to draw the whole of their supply from this quarry. The quarry works cover a space of some 2½ acres. The company have rights extending over 200 acres and tests thus far made are said to have proved 70 acres to be good building stone.

Great interest was evinced in the various details of working, the steam drill coming in for no small amount of attention, work-

ing as it did with the greatest ease, making a 2" hole 8 ft. deep in the solid rock ; dump drills, hand drills, and all the methods were here seen in operation. On one side of the quarry was fitted up a complete manufacturing plant, a machine for cutting, a turning machine, and a large staff of stone cutters were at work preparing stone for buildings now in progress. There was also a row of some 8 lime kilns, with a total capacity of 2,000 bushels per day.

Turning to the adjoining quarries, about ½ mile distant, conclusive evidence appeared of the general "stone" character of the district. Although in these, development had not progressed so rapidly, still the stone brought to light was equal in every respect to that previously considered. The method of chiseling here was somewhat different to that in the other quarries, a large steam chisel being in operation, working at a pressure of 80 lbs. and capable of chiseling 100 ft. per day of 10 hours.

After a very pleasant and instructive afternoon, the company were entertained at an excellently spread table, provided by the

"Garson Quarry Co." Conversation naturally turned upon subjects of interest to building men, ending with a few informal speeches and votes of thanks.

There is little doubt but that the result of the afternoon's trip will be an increased interest in the use of local stone for Winnipeg's future buildings, and should the transportation question prove as satisfactory as the supply is adequate, a large and profitable business is in sight.

The present quarries have only been in operation 5 years and at the present rate of development they are expected to last well into the century.

PLASTIC DECORATION.*

By John D. Crace, Hon. Associate R.I.B.A.

The lecture was very fully illustrated by plaster models and casts lent by Messrs. George Jackson & Sons and by the South Kensington Museum authorities, by a series of large mounted photographs lent by Mr. B. T. Batsford, and by numerous lantern slides, of which five and twenty had been placed at the lecturer's disposal by the A. A. Camera Club. Having alluded to the prehistoric use of cement and plaster as a uniting substance and a protective surface material, the author gave reasons for his inference that stucco was used decoratively in an early period of Greek history. Among the many wonderful revelations of Mr. Arthur Evans's explorations in Crete are the stucco decorations in relief of the walls of the Palace of Knossos which was destroyed before 1500 B.C. Beautiful specimens of decorative stucco-work have been unearthed in excavating the ancient sites of Rome and the surrounding country. The author referred to those at the baths of Titus discovered in the sixteenth century, to those at Herculaneum and Pompeii, and to the decoration of two sepulchral chambers discovered on the Via Latina, dating about A.D. 160. In the Farnesina grounds remains of buildings have been unearthed with stucco reliefs unsurpassable for elegance and refinement of execution. One great value of these works is the lesson they teach us in the adjustment of the actual treatment in execution to the nature of the material. The whole surface speaks aloud of the ready and dexterous use of fingers and tools on a light plastic material. One almost imagines the stucco yet moist, still impressible to the touch. It is as if some fairy goddess had found it soft and lightly fingered it. There is a sense of evanescence about it, whilst the charm of perfect attainment remains.

The author then turned to a beautiful but very different growth of plaster decoration developed under the Mohammedan conquerors, describing the decorations of the great ninth century Mosque of Ibu Tooloon at Cairo. In the Arabic art of Egypt plaster continued to be used as an important factor in decoration during the next five centuries. The ornamentation of the domes and the use of a fine stucco in low-relief ornament, as a preparation for gilding and colour on the wooden beams of its flat roofs, are especially noteworthy. The palace of the Alhambra is the very apotheosis of plaster—of plaster casting carried perhaps to excess of richness and elaboration, but never losing its true quality of ornament designed purposely for casting. The beautiful effects of a mere repeat casting, the author thought, were attained because (1) the designers thoroughly understood grace of line and how to fill their spaces ; (2) they never lost sight of the fact that the work was to be cast ; (3) most important of all, the repetition did not include the representation of natural objects, for it is where representations of nature are concerned that repetition is offensive.

In European art during Mediæval times we get little glimpse of the decorative use of stucco until the 15th century. An original and striking example is to be seen in the drum of the dome of San Eustorgio at Milan, the work of Michelozzo Michelozzi, of Florence, said to have been executed in 1462. In the second half of the 15th century Bernardino Pinturicchio was making considerable use of the low-relief enrichments,

* Abstracted from a recent lecture before the Royal Institute of British Architects.

not only for the mouldings with which he divided the surfaces he had to decorate, but as ornamental features within the paintings themselves. A few years after Bramante was at work on St. Peter's. His investigations, says Vasari, resulted in the discovery of the method of preparing stucco employed by the ancients, the secret of which had been lost in their ruin, and remained concealed ever since. Vasari relates how Raffælle and Giovanni da Udine went together to see some subterranean chambers then just discovered in excavating the Baths of Titus. Giovanni was so much impressed by the stucco decorations with which they were covered that he devoted himself to their study, and reproduced them with so much grace and facility that there was only now wanting to him the knowledge how to compound the stucco. At length, by compounding finely-powdered white marble with the lime from white travertine, he succeeded in producing the stucco of the ancients. Raffælle at once caused Giovanni to decorate all the vaultings of the Papal Loggie in stucco. Pierino del Vaga, another of that wonderful band of young artists in the Vatican, stands pre-eminent as an ornamentist and as a decorative colourist; his stucco-work has a quality of fine decorative appropriateness, both in design and scale, that has been surpassed by none. Of his bolder conceptions the great ceiling of the Sala Regia is a fine example. Alessandro Vittoria was one of the best-known stucco-workers in the latter half of the sixteenth century. His work under Sansovino at Venice, in the Libreria, and in the Scala d'Oro of the Ducal Palace are characteristic examples of his style.

Francis I. attracted to France some of the most capable of the Italian artists skilled in stucco. Primaticcio and Il Rosso came about 1530, and their wonderful stucco decorations at Fontainebleau long influenced French design and French sculpture. Niccolo dell Abbate followed twenty years later, and then his three sons, the youngest becoming after a time the director or manager of these decorative works. Their work is a fine field for the study of what may be done in stucco, and it was the parent of the rich decorations of Louis XIV.'s reign, which, in their turn, became the model for civilised Europe.

Henry VIII, was also very successful in securing the services of able artists in England, many of them pupils or relations of those who were at work on the masterpieces of the Vatican. Pietro Torrigiano, who was among the earliest, completed the bronze monument of Henry VII, in 1519. It was to the Palace of Nonsuch that the new stream of talent was directed; although not a vestige of it now remains, the names of some of the men who adorned it are a guarantee that the work was neither coarse nor commonplace. As to the question lately raised about the external panels of Nonsuch being in stucco, the author said there was not the smallest doubt on the subject. There were plenty of examples done more roughly within the next seventy or eight years which remain to this day, in spite of exposure and neglect.

External decorative work in plaster continued to be a feature of many English houses down to the end of the 17th century. But the interior was the more important field, and from the time of Nonsuch for a century no house of any pretence was without its elaborate plaster ceiling and frieze. Admirable in many ways as these old English ceilings are, few of the men who did them had either the art or the skill of the Italians, who made ornamental plaster work popular. The latter endeavoured to make their work perfect in modelling and finish. Each figure was a work of art. In the English plasterwork, however, scarcely a figure can be found that is not more or less barbaric in execution, and the minor work, effective as it is, is often greatly wanting in grace of line and in intelligent modelling.

The next step in English plaster-work leads straight to the Classic work of Jones and Wren. The gap caused by the Civil War made the change more complete. Building operations after the Great Fire opened the way to new men and methods. French and Italian plaster-workers were again invited to England in Charles II's reign. Besides the work in St. Paul's, St. Stephen's, Walbrook, and other city churches, the chapel of Trinity College, Oxford, may be cited as a good typical specimen of plaster ornamentation. A feature of some of the plaster decoration of the end of the seventeenth century is the elaborate modelling of fruit, flowers, and foliage in full relief, often in parts quite detached from the grounds and either supported by wires imbedded in the plaster or by small sticks of tough wood. This work, full as it is of artistitic ingenuity and clever modelling, was by that very ingenuity departing from any true principles of stucco-work, and therefore hastening the decay of the art. A notable example is the ceiling of the chapel of the Royal Hospital, Kilmainham. The next modification of style was largely due to Kent. In his designs the plaster ornamentation is mainly used as architectural enrichment, bold in treatment—sometimes too bold for the space, but effective in its way. Following closely on Kent's work came a flood of plaster ornament derived from the French work of the time of Louis XV. This was sometimes very good—often straggling and purposeless, yet not without a certain elegance. The best of it was at least partly modelled, but the greater part was cast and fixed. With this style stucco modelling practically came to an end. All that followed was cast and fixed. The change of style brought about by the brothers Adam was due to the same influence which has produced the detail of the Vatican Loggie and the Villa Madama—namely, that of the antique stucchi in the excavated ruins in Rome. The difference in the result may be thus accounted for. Giovanni da Udine studied them, as an artist by endeavouring to produce similar work with his own hands. Robert Adam, as a draughtsman, copied them on paper, as did probably the Frenchmen through whom France adopted the style. It was undoubtedly elegant, and the effect refined; and, since the method of reproduction was mechanical, it lent itself to extensive use.

Much good plaster work has been done in the last half of the 19th century—always in the form of attempts, sometimes very successful, to reproduce a past style, and by casting. "Fibrous plaster," introduced since 1861, is a valuable innovation, and presents immense advantages. It does away with the danger of enormous overhead weight, and requires so much the less timber structure to carry it; it can be executed quickly, and it dries quickly. The facility of plaster work is at once its recommendation and its danger.

It is, perhaps, well to be sometimes reminded that the simplest materials have not been scorned by the greatest men, and that the finished result of any art pleases not only by the talent bestowed on it, but by the fitness of the limitations which the artist has imposed on himself.

Mr. R. Phene Spiers, F.S.A., proposed a vote of thanks to Mr. Crace, and expressed his concurrence in the lecturer's condemnation of the imitation in modern plaster work of the wavy surfaces and crooked lines found in old examples, and due in them to indifferent technical skill. He held that all plaster decoration should be executed on curved surfaces, as not only was a perfectly flat surface less pleasing to the eye, but it gave the appearance of sagging.

Mr. G. H. Fellowes Prynne, in seconding the motion, remarked that stucco was not satisfactory or permanent as external work in this damp and variable climate. Plaster decoration should only be employed under cover, and then in low reliefs on plane surfaces. For such mural decoration in low relief there was now a very large opening.

Mr. W. Aumonier observed that the harmonious effect of 16th-century plaster was due to the fact that both the moulding and the modelling were entirely handwork, whereas in most of the present day decoration all the mouldings and outlines were rigidly and mechanically produced, and even much of the modelling was executed in facsimile.

In replying to the vote of thanks, which was carried bo acclamation, Mr. Crace said he agreed with Mr. Spiers that very low relief decoration appeared to greatest effect on a curved suface ; but for all that the artistic merit of a subject did not depend upon the angle at which it was seen.

DESIGN.

A conference dealing with arts and crafts was held in connection with the Bradford Exhibition a few weeks ago, when Mr. Walter Crane, the well-know artist-craftsman, gave a lecture on "Design."

Mr. Crane first showed the linear resources in abstract which were at the command of the designer, and went on to demonstrate some of the rules which were observed in different classes of designing. Coming to speak of the importance attached to beautiful things, he observed that, as a domestic nation, fond of their homes, and exercising constant and often highly-cultured taste in respect of their decoration, considering carefully the colours which they cared to live with, the patterns with which they would have to put up day in, day out, the form of the furniture, and all these things, Englishmen had been forced to consider whether they should not make the things of their homes beautiful as well as reasonably useful. A sort of national shyness, or shirking from display had laid a rather wholesome check on exuberance in ornament.

Turning to speak of the style which is known as the "New Art," Mr. Crane observed that that style had had a very sudden rise, but its origin was quite traceable. If there was a public analyst for art, he would rather like to catch some of the most extravagant specimens of the "New Art," and send them to the analyst in a bottle for examination. The sources of the details could quickly be determined. The whole style might be described as a species of rhetoric in design—a rhetoric which was rather meaningless, and which was much repeated, sometimes in skilful hands but very often in unskilled. It had had, however, great influence over the decorative art of our time, both at home and on the Continent. It could not be denied that it had about it certain dramatic power. But one could not live too far from Nature for long without suffering in health, and the forms reminded him of plants which, under artificial stimulus, had been drawn up into very long stalks, with flowers only on the extreme end. Although it was "New Art," it seemed to him already in decline. It had exhausted its own stock of expressions.

Mr. Crane urged students to study Nature, observing that they need not be inappropriately naturalistic but the more they studied natural forms the more varied and interesting would be their design. A new fashion had now come in, a kind of secondhand Louis XVI., with early Victorian mixed. This pretended to go to Nature, but a real rose would blush to find itself by one of the rose garlands of the newest art. Mr. Crane proceeded to speak of the modern movement toward beauty in craftsmanship, and pointed out that a necessary constituent in the beauty of an object was that in its design there should be full recognition of the characteristics and limitations of the material which was used in its production.

There was, he observed, in all manufactures a tendency to imitate, and to exert skill in trying to step beyond the nature of the material, which found acceptance at the hands of those who, if they could not have costly things, would rather have a cheap imitation than nothing, or than something which was simple. Under the industrial organisation of the last century the ideal had been mechanical precision—quantity rather than quality. A different idea was asserting itself more and more.

Where England was behind was not in the capacity for producing beautiful and individual objects, but in the realisation of the national importance of art—art as the expression of the life of the community. England did not give sufficient opportunities to her sculptors to do great things. Instead of perpetuating the form of an eminent citizen in senatorial garb—frock coat and so on—his portrait might, he ventured to suggest, be confined to a bust or to a medallion, and the artist might be called upon to exert his skill in a heroic group or composition typifying the life's work of the citizen who was honoured. England had a great deal to learn in that respect from her neighbours of France and Germany.

In conclusion, Mr. Crane commended the drawing which he had that day seen at one of the Bradford schools, and emphasised the importance of the teaching of drawing well. Education, he pointed out, did not consist in learning various facts, and he feared that in schools not enough play was left to the imagination. English people were over-industrious, and were afraid of the pleasures of the imagination.

A SUBSCRIBER writes : "I have to fix a brass curb on a marble curb around a dining-room grate. The brass has already been fixed once or twice in cement, but this has been broken and the curb has come out of its place. Which would be the best way to fix it ?" The best plan would be to rivet iron bars on to the standards, pass them through the marble curb and bolt to the underside of the hearth.—Builders' Journal.

THE McCLARY MANUFACTURING COMPANY'S NEW WORKS AT LONDON, ONT.

These new works, situated on the north bank of the Thames river, at the corner of Adelaide and Trafalgar streets, and devoted exclusively to the manufacture of stoves and furnaces, contain many features in the way of special arrangement and equipment, a description of which it was thought would prove interesting and instructive to architects and engineers. The buildings consist of a moulding shop, a stove mounting shop, a storage warehouse and an independent power house.

The new works have been laid out with the object of simplifying and expediting as much as possible the sequence of processes of the manufacture of stoves and furnaces, and the equipment has been arranged in such a way that the material in process of manufacture is received at one end and shipped from the other end of the works, thus avoiding the necessity of any piece in process of manufacture being carried back to any point it has once passed.

One of the most important elements of the thoroughness and efficiency of the plant is contributed by the electrical equipment, the various machines in the works being arranged in groups, similar machines being in one group driven by a single line shaft driven by an individual motor attached to the ceiling or placed in such position above the floor as to be entirely out of the way. The result of this distribution of power is that the line shafts have been placed in the most advantageous positions to give ample room, light, and convenience. The difficulty so frequent'y met with in industrial establishments, namely, the laying out of the line shafting and the counter shafting in such a way that all will form a unit driven by one or two engines, has been entirely dispensed with, with the result that the company have one of the cleanest, best lighted, best ventilated and most efficient industrial plants to be found anywhere.

The buildings were designed by and erected under the supervision of Messrs. Moore & Henry, architects, London, Ont., and the power plant and electrical distribution system and equipment were designed by and installed under the supervision of Mr. Roderick J. Parke, consulting electrical engineer, of Toronto.

The moulding shop or foundry, in which the first process of stove construction takes place, is situated at the north-west corner of the property, and is 200 feet wide by 220 feet long, one storey high, built of white brick with concrete foundations and having a roof of the saw-tooth variety, as shown in Fig. 2, the glass sides of the roof being exposed to the north, giving all the light desired without exposing the workmen to the direct rays of the sun. The moulding shop has a concrete floor ; across the south end and divided from the moulding room is the milling room containing the tumblers and core ovens. A Colliau cupola having a melting capacity of 10 to 12 tons of iron per hour is located in the centre of the moulding shop, as shown in Fig. 4. The charging platform is constructed of steel and concrete to support a track from the cupola to the north wall of the building at which the pig iron and coke are received from the railroad cars which are taken in on a siding especially constructed for the purpose, the moulding shop being located in such position as to take advantage of a hill at the north side, thus enabling the railway cars to be shunted up to the level of the charging platform. The progress of the material and product through the moulding shop is direct and continuous, toward the mounting shop.

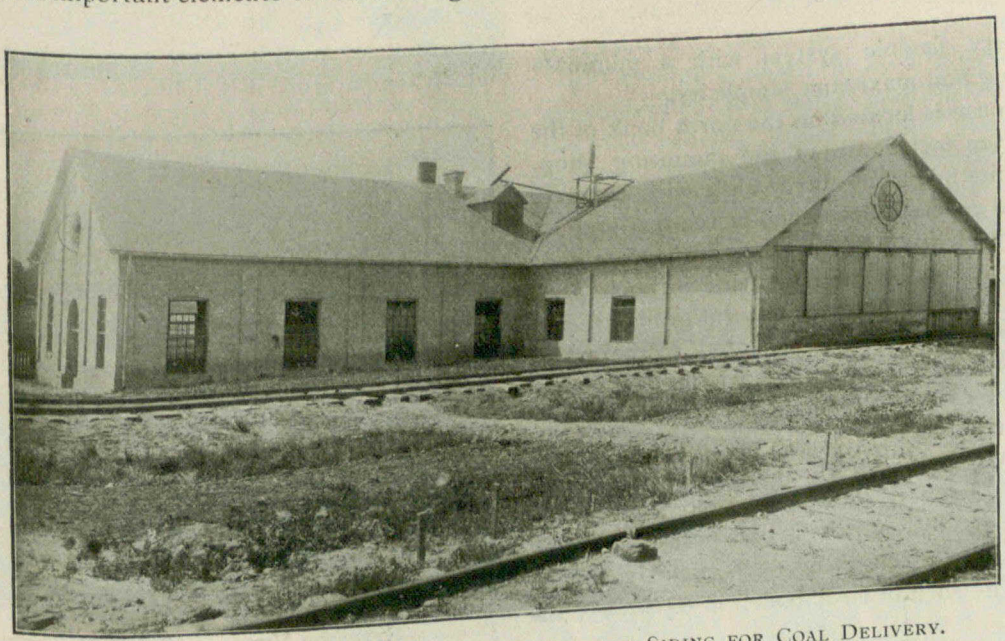

FIG. 1.—VIEW OF POWER HOUSE, SHOWING RAILWAY SIDING FOR COAL DELIVERY.

The mounting shop, located about 200 feet east of the foundry, is 307 feet long by 32 feet wide, two storeys in height ; the walls are built of solid concrete, and the floors of steel and concrete, being of absolutely fire-proof construction. Between the foundry and the stove mounting shop is the pattern storage warehouse, 130 feet long by 40 feet wide, one storey high.

All of the motors in the mounting shop are supported on or near to the ceiling so as to occupy as little useful room as possible. Each motor is controlled by a Cutler-Hammer motor starter with automatic no-voltage release. Push buttons are installed at various points so that a motor can be instantly stopped in the event of an accident occurring or a quick shut-down becoming necessary.

Direct current is distributed throughout the buildings to the various motors and lamps, at 230 volts. The works are illuminated by means of Adams-Bagnall 3.5 ampere 230 volt arc lamps, and 230 volt incandescent lamps. Separate circuits are provided between the power house and the shops so that separ-

ate control is had at the switchboard for the lamps and motors in the moulding shop and the mounting shop. Sub-distribution panels are located in the shops for the separate local control of incandescent and arc lamp circuits and certain of the motor circuits, thus

FIG. 2.—EXTERIOR VIEW OF FOUNDRY, SHOWING "SAW-TOOTH" ROOF CONSTRUCTION.

affording a very flexible system with a minimum amount of wiring and maximum simplicity.

The power house is located on the north bank of the River Thames 300 feet south of the mounting shop. It is built of white brick one storey high with concrete foundations and concrete floors, and is 104 feet long by 35 feet wide, with a wing 56 feet long by 44 feet wide for the storage of coal, this wing being in such position as to take advantage of the natural gradient, permitting the railroad cars to be shunted to the north end of the coal house so that the coal can be dumped directly from the cars into the coal bunkers.

The boiler equipment consists of three 100 h. p. standard internal fired Scotch boilers, manufactured by Messrs. E. Leonard & Sons, London, Ont., and constructed for 160 lbs. working steam pressure. They are 15 feet 9 inches in length over all, exclusive of the smoke box. The shell of each boiler is 84 inches in-

FIG. 3.—INTERIOR VIEW OF FOUNDRY, SHOWING CUPOLA AND CHARGING PLATFORM.

side diameter, made of 19/32 inch steel plate. There are 56 tubes 3½ inches outside diameter and 12 feet 6 inches long. Each boiler is equipped with a Morrison suspension type corrugated steel furnace, 40 inches inside diameter by 12 feet 2¾ inches long and 7/16 inches thick, and a Jones underfeed mechanical automatically operated stoker, which with the induced draft equipment affords an available capacity of 150 h.p. from each boiler when required. When the fourth boiler, for which space is provided, is installed, the total plant capacity will be 600 h.p.

A Green fuel economizer has been installed to operate as a part of the steam plant. This economizer contains 1920 square feet of heating surface and is divided into 40 sections, each section containing four tubes 4 9/16 inches external diameter and 9 feet long. The economizer is provided with a safety valve 2¼ inches diameter and a blow-off valve 3 inches in diameter, and the front or face of the machine consists of 10 sectional removable covers 2 feet 5 inches wide with 2 inches of asbestos lining. Each section of the economizer was subjected to a hydrostatic test of 350 lbs. to the square inch before erection, and after the economizer was erected it was subjected to a hydrostatic test of 200 lbs. per square inch.

The advantage of the economizer is apparent, in view of the fact that when the plant is operating at full load the temperature of the feed water is raised from 112 degrees Fah., at which temperature it is received from the exhaust heaters, to 260 degrees Fah., at which temperature it is delivered to the boilers.

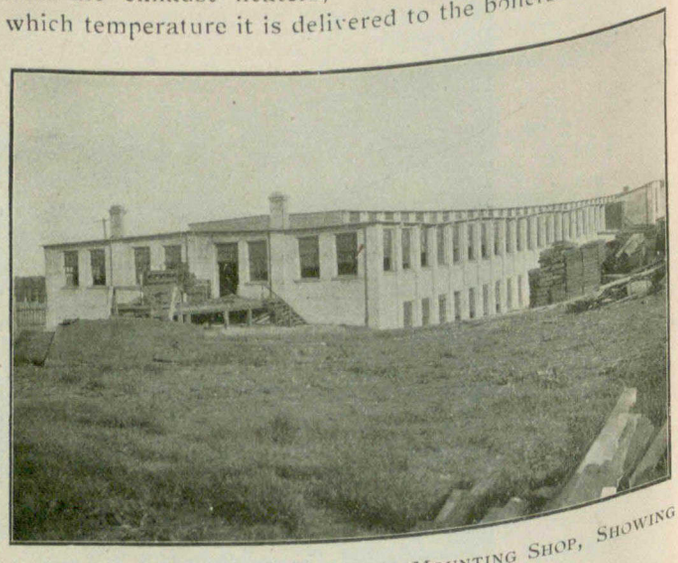

FIG. 4.—EXTERIOR VIEW OF STOVE MOUNTING SHOP, SHOWING CONCRETE CONSTRUCTION.

The reader will notice on looking at the illustration the absence of a tall stack or chimney. Draught for the boiler furnaces is obtained by means of forced and induced draught combined, the forced draught being supplied from a 30 inch three-quarter housing bottom horizontal discharge Buffalo Forge Company steel plate fan delivering air at 2 ounces pressure into an underground pipe leading to the underfeed stokers. This fan is driven by a 6 in. x 6 in. horizontal high speed engine supplied by the Robb Engineering Company, Amherst, N.S.

The induced draft is created by a duplicate fan apparatus furnished by the Buffalo Forge Company; the equipment consists of two 8 foot full housing-up blast steel plate steam exhausters, each being driven by a direct connected 4½ inch by 5 inch single vertical double acting engine having the cylinders below the shafts. The equipment is provided with water-cooled bearings, a sheet steel smoke chamber and a Y smoke outlet connection upon which the stack rests, the stack being 47 inches in diameter and 15 feet high, the top of the stack being about 40 feet above ground.

The smoke breeching connecting the boilers, fuel economizer, and induced draft apparatus, is provided

with by-passes and dampers arranged so that the economizer can be cut out of the smoke circuit at any time and the smoke turned directly from the boilers and through the induced draught fans to the stack. The induced draught fan engines and the stoker engine are controlled separately by two Foster automatic steam pressure regulating valves, so that when the steam

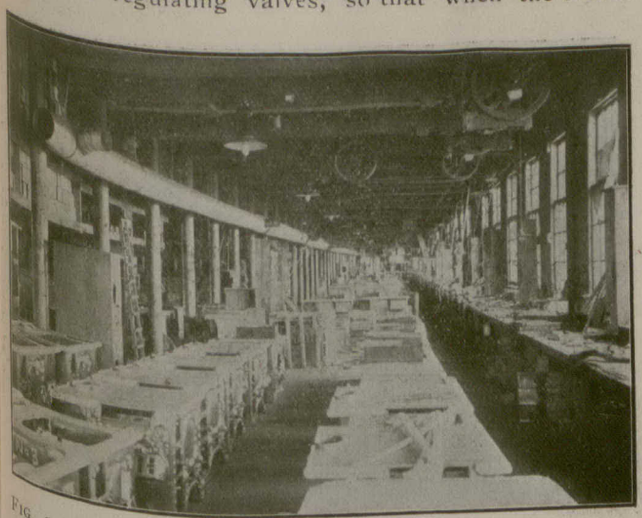

FIG. 5.—INTERIOR VIEW OF MOUNTING SHOP, SHOWING ERECTING DEPARTMENT AND "HOT BLAST" HEATING CONDUIT.

pressure falls below a given point more steam is admitted to the engines, and their speed is increased with a corresponding increase in the draught, with a reversal of this operation when the steam pressure goes above the pre-determined point for which the valves have been set.

The water used for condensing is drawn directly from the Thames River and is allowed to run to waste, as in view of the adoption of other methods of utilizing the waste heat the advantages of having a hot well are so small that its use is not warranted. Owing to the poor quality of the Thames River water for boiler feeding, the feed water supply is obtained from a creek across the river, this creek furnishing practically pure water. A special conduit was the city water mains to pro ide a reserve for use in the event of repairs being required for the regular feed-water supply system. The feed water is forced by the pumps, through the heaters, thence directly to the Green fuel economizer, thence into the boilers. By-passes are provided in the feed water line so that any heater and the economizer can be cut out of service when required. A feed water thermometer is provided at the outlet of each heater, also at the outlet of the economizer and on the main feed water line between the heaters and the economizer, thus enabling the attendant to determine instan ly and accurately the value of the work each individual heater is doing, as well as the net results of the combined operation of the feed water heating system.

The engine exhaust is arranged as follows : The 75 h. p. engine and 50 k. w. dynamo unit is used only when a melting-heat is in progress and when required for lighting the works. The exhaust from this engine is connected directly to its condenser, but a branch and valves are provided so that the condenser can be cut out of service and the exhaust turned directly into the works heating system. An automatic relief valve to the atmosphere is provided between the engine and the condenser, this valve being adjustable to give any desired back-pressure within ample limits when the steam is being supplied to the factory heating system. The exhaust from the 185 h. p. tandem compound engine can be turned directly into its condenser,or directly into the factory heating system, or to the atmosphere, as may be required. A branch is provided to the 200 h. p. feed water heater, which latter can be run under a vacuum or at atmospheric pressure or cut in or out of service, as may be required.

The exhaust steam for the induced draught fan engine, the mechanical stoker engine, the condensers, and the boiler feed pumps, is run into a common exhaust pipe leading into the 80 h. p. heater, on the outlet of which is placed a vent pipe to the atmosphere, with an adjustable back-pressure valve on it. The exhaust steam from the auxiliaries is not condensed since it is utilized to better advantage in heating the feed water passing through the 80 h. p. heater. The temperature of the feed water from the small heater with the plant running under normal conditions averages 210 deg. Fah., and the temperature of the feed water passing through the 200 h. p. heater while the large engine is running condensing averages 110 deg. Fah. When the large engine is running non-condensing the temperature of the feed water averages 210 deg. Fah. It will be apparent from the above description that the auxiliary plant as designed affords full facilities for operating the power plant under the most economical conditions during the winter and summer season, in addition to permitting advantage to be taken of the exhaust steam for heating the shops in winter, and of condensing in summer.

FIG. 6.—VIEW OF PORTION OF BOILER ROOM, SHOWING 100 H.P. INTERNAL FURNACE BOILERS WITH UNDERFEED STOKERS AND PORTION OF STEAM PIPING.

The switchboard equipment consists of two generator panels and a feeder panel, of blue Vermont marble, 65"x24"x2", with sub-panels 25½"x24"x2", each generator panel being equipped with an I-T-E "Dublarm" automatic double-pole 250-volt circuit breaker, con-

nected so that it is impossible to accidentally short-circuit either generator, the function of the circuit breakers being that the single poles of each breaker open and close independently of each other, so that in the event of a short circuit or overload remaining on the generator circuit after the breaker has been thrown open, the closing of the second pole will immediately open the other. These circuit breakers were made by the Cutter Electric Company, Philadelphia, and are adjustable for a capacity of 50 per cent. above and below the rated capacity of the respective generators which they are intended to protect. A double set of busbars with double throw switches has also been provided on the switchboard and the connections arranged so that the generators can be operated independently or in parallel. This provision has been made with the object of providing an independent control for lamps and for the 50 h.p. cupola blower motor in the foundry, as it is necessary to vary the speed of this motor at times, the variation of speed being secured by manipulation of the generator rheostat on the switchboard. When the cupola is in operation, the 50 k.w. unit and the 50 h.p. motor operate as an independent combination, a special pair of mains being run from the switchboard to the cupola for this purpose.

The circuits between the dynamos and the switchboard are run in trenches built into the floor, these trenches being covered with cast-iron checkered plates. The conductors are rubber-covered and are supported

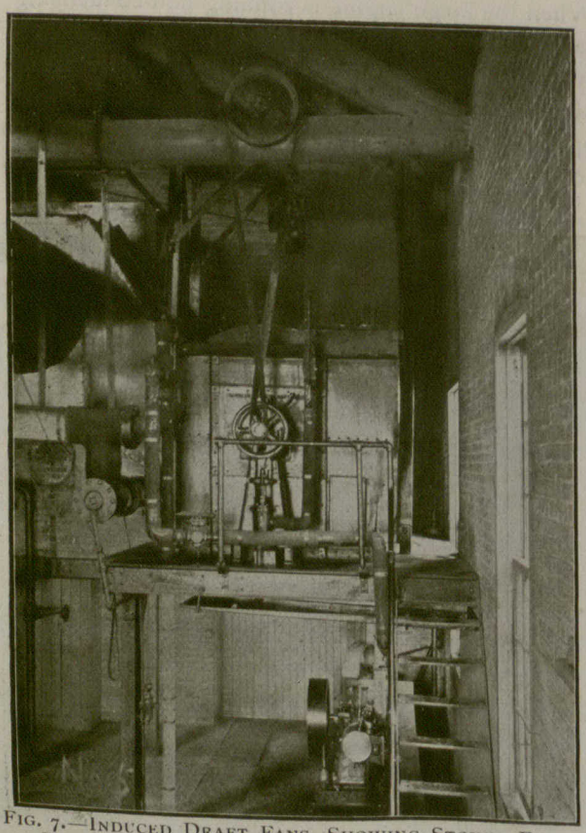

FIG. 7.—INDUCED DRAFT FANS, SHOWING STOKER ENGINE BELOW PLATFORM, AND PORTION OF GREEN FUEL ECONOMIZER AT LEFT HAND.

upon split porcelain insulators held in position by iron clamps fastened by screws to 3″ × 3″ vertical wood strips set into the concrete flush with the walls of the trenches. The outgoing circuits from the power house are run underground through a brick tunnel. Forming a part of the switchboard is a gauge panel upon which are mounted a 10″ engine room clock, an 8″ boiler pressure steam gauge, an 8″ steam gauge connected to the receiver between the high and low pressure cylinders of the compound engine, and two 8″ compound vacuum and back pressure gauges, one connected to the exhaust pipe from each engine.

For furnishing compressed air for operating the pneumatic hoists and other pneumatic machinery used in the works, a class D-2 10″ × 16″ × 12″ Canadian Rand

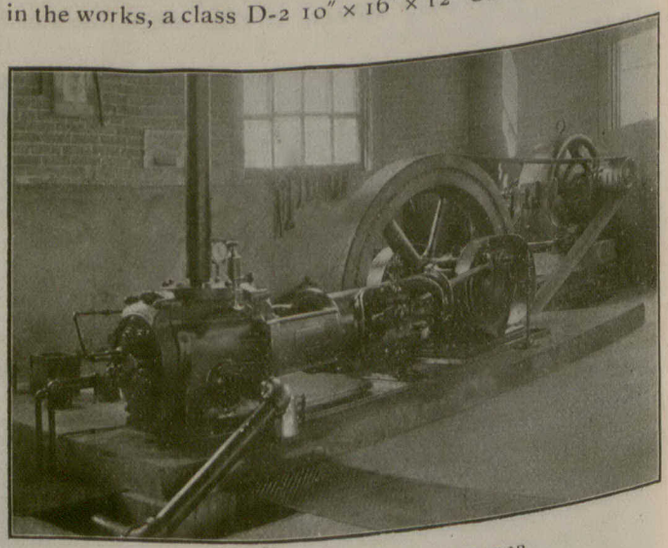

FIG. 8.—AIR COMPRESSOR AND MOTOR.

Drill Company air compressor has been installed. This compressor is driven by belt from a 40 h.p. Westinghouse direct current motor. This compressor is designed as a compound machine, the high-pressure or 10″ × 12″ half being installed at present, the foundations being so arranged that the low pressure or 16″ × 12″ half can be installed when required. The capacity of this compressor is 446 cubic feet of free air per minute at a speed of 120 revolutions per minute.

A RHAPSODY OF THE NEW ART.

O catfish maid with the taffy arms—
A loop and a curve and a daub of green—
Flaunting the flow of thy molten charms
On the side of a soup tureen.

Art thou a girl or a goop or a fish,
Or merely a tinted thought,
Like a chocolate caramel stuck to the dish
And into thy semblance wrought?

O, limpid lips' insipid peace—
A loop and a curve and a daub of green—
O, rapture covered with verdigris
And Art that is sight unseen!

A lily grows on a silver stem
That twists as a bedspring might,
In the ruby shade of a Turkish hem
It holds an electric light.

O, lines of beauty, O, lines of care!
O, art of the new, new fad!
Loop, loop the goop of the limbs and hair.
Till the drinkers of fudge go mad!

—Wallace Irwin in N. Y. Globe.

Cement production in the United States in 1903 amounted to 28,454,140 barrels, according to the U. S. Geological Survey. Of this amount 20,897,973 barrels were Portland cement, 7,030,271 barrels were natural cement and 525,896 barrels were slag cement. The amount made in 1903 was about 2,700,000 barrels more than the output in the preceding year.

The effect of maintaining a higher standard of purity of the air breathed could not better be illustrated than by the following statement of facts: By improved ventilation the death rate has been reduced in children's hospitals from 50 to 5 per cent., and in army hospitals from 23 to 6 per cent., while prison records show, in one case, a reduction from the yearly average of 80 to 8. In the army stables of the German Government better ventilation has reduced the death rate among the horses from 19 to 1.05. Such facts speak for themselves.

AN EXTRAORDINARY FEAT IN HOUSE MOVING.

The Engineering Record describes how the John Eichleay, Jr., Company, of Pittsburg, Pa., transplanted a brick residence to a new site 160 feet above the one on which it originally stood at the foot of a cliff, without in any way injuring the building. The face of the cliff behind the house was terraced by excavating in it six cuts making an equal number of horizontal platforms about 90 feet long and from 10 to 20 feet wide, affording level seats for the successive tiers of cribbing. The excavation was nearly all in solid rock, which was drilled and blasted with light charges of dynamite, thirty men being busy on it during the entire progress of the work.

Holes were cut through the end foundation walls and 12 x 12 inch longitudinal needle-beams about four feet apart were inserted in the usual manner. They were parallel to the face of the cliff and reached through from wall to wall of the main part and the wing. Main 12 x 16-inch sills were placed under them and carried, on each side of the front and rear walls, 12 x 12-inch longitudinal sills which supported the latter with pairs of short transverse 10-inch I-beam needles. The main sills were jacked up to lift the building clear of the foundations, which were then removed and the ground was leveled to receive lines of cribbing under each of the main sills. Each line of cribbing was located on the center of the sill and consisted of a continuous row of cribs made of 6 x 8-inch timbers about 3½ feet long. The bases of the separate groups were made horizontal, but at irregular heights, offset to correspond with the surface of the ground, and were leveled up so that the upper courses were in exactly the sale planes. There were in all eight lines of cribbing perpendicular to the face of the cliff, one under each main sill. Two lines of cribs supported each end wall of the main part of the house. Two more lines were spaced at equal distances between them and two carried the end and centre of the wing. About three hundred 5-ton jacks were set under the sills bearing on the second course from the top of the cribbing. These were divided into thirty groups of from eight to twelve each, from three to five groups being located under each sill. At a signal given by blowing a whistle, one man started at the end of each group and gave each jack in succession one-half turn. After all the groups had been turned, another signal was given and the men returned to the starting points, screwing each jack another half turn and so on back and forth, simultaneously screwing the jacks so as to raise the building uniformly about one-half inch at each round trip.

The building was thus raised about 14 inches in less than two hours. A new course of cribbing timber was then laid in the space between the last course and the sills, and the jacks were simultaneously slacked off sufficiently to lower the sills to bearing on it. The jacks were then screwed down, set one course higher, the building raised another fourteen inches and so on. As the building was raised the lines of cribbing were extended so as always to reach beyond it to the gradually receding face of the cliff where new cribs were started on successive footings leveled to receive them. In every eighth or tenth course longitudinal timbers 20, or 30 feet long were used to bind the cribs of each line together, and the next course above them usually contained several long transverse timbers reaching through, and built into, the next line of cribs to bind the two together and insure their lateral stability. The cribs were also braced by inclined shores and were X-braced by wire ropes reaching from the top to the bottom of each panel under the main part of the house. In each panel between cribs vertical planks were spiked to the longitudinal sills, and horizontal longitudinal beams were bolted to their lower ends to carry the suspended working platform of loose transverse planks. These were arranged at the proper height to be convenient for the workmen to build the cribbing and operate the jacks and rollers. They were always maintained in the same relative position as the building was raised, and when the floor planks approached the cross timbers, the latter were picked up and placed on top of them so that when the scaffold was raised a little higher, it engaged them and lifted them off. The main sills supported a stiff-leg derrick with a boom commanding the full length of the building and operated by a hoisting engine at the bottom of the cliff. This derrick delivered the crib timbers to the men who were always busy on the suspended platforms.

After the building had been raised to a height of about 60 feet a pair of long track timbers were laid on top of each line of cribbing, and wooden rollers 8 inches in diameter and 4 feet long were inserted about 12 inches apart on centres between them and the sills, and the building was moved back on them about 40 feet to the face of the cliff. This was accomplished by two nine-part tackles with 2-inch rope and fall lines about 1,200 feet long. In the front of the building the tackles were attached to vertical oak timbers bearing at the upper end on the saddle pieces over the needle-beams, and at the lower end on the main roller timbers. The tackles passed under the house and were anchored at the face of the cliff to horizontal longitudinal timbers bearing across the runway timbers under the rollers. The lead lines were carried through snatch blocks to two 2-horse-power windlasses on top of the cliff.

After the house was moved, the crib-work which had been released was taken down and used in building up the second section of cribbing from the roller level to the top of the cliff as the building was continuously raised the remaining 60 feet to the top of the cliff. It was then rolled over beyond the face of the cliff and moved in the usual manner on inclined runways to the new location. The total weight handled was about 1,200 tons and no mishaps occurred during the progress of the work. All the plant and materials used were regular stock from the contractor's yards.

WALLPAPER AND HANGINGS.

Apart from considerations of the design and the appearance of a wallpaper under certain conditions, the architect should also consider the means of its manufacture and the materials of its composition, says a writer in the Architectural Record. Wallpapers and hangings may be divided into two main classes : (1) the printed papers, and (2) the flock and relief. With regard to the first, the printing is done either by hand or machine. In the hand printing the colors of the different blocks are not applied until after the color is dry, while in those printed by machine the various colors follow on wet, the whole design being printed as the roll of paper passes through the machine. It will, of course, be easily understood from these conditions of manufacture that hand-printed papers have greater sharpness and accuracy, each color being distinct and separate, while in the machine work they frequently run together more or less. The hand-block printer also has the advantage of being able to print two or three pieces at very little extra expense, whereas with machine-made papers the cost of "setting" a machine is so considerable that it does not pay unless a large quantity of paper is printed, the consequence being that after a year or two it becomes impossible to repair a room with machine-printed paper or to repeat the same design if desired. The flock papers are made by printing on the paper with a cementitious material and then scattering finely chopped wood fibre evenly over it. As each different color requires to be worked separately and strewed with wood fibre, the process is, of course, very expensive. The coverings in relief are prepared by a variety of special processes which are to be referred to the general principles of embossing by the application of pressure or moulding when in a plastic or flexible condition, either separate or combined. With regard to the materials of which wallpapers and hangings are composed, the colors are either distemper or oil. The distemper colors have a tendency to fade in sunlight, though much depends upon the colors chosen and the composition. Papers printed in oil colors always darken and yellow—i.e., the ground does—giving a dingy and shabby appearance unless the designer has made allowance for it. When new, they are often good in effect, though, I think, they never equal distemper papers. They have one advantage over distemper in allowing a tint to be gradated by the mezzo-tint process. Papers printed in oil colors may be twice sized and then varnished so as to allow washing, but a varnished paper is always unpleasant. Papers sold as varnished ready for hanging should be avoided, for they are varnished with a quick-drying, hard, white spirit varnish, and have very little durability. If a varnished paper is desired it is best to varnish it after hanging. One little point worth noting in connection with varnished papers is—that allowance should be made in the paint of the room for the yellowing of the varnish.

In wallpapers from reputable manufacturers there is no danger to be apprehended from poisons in the colouring matters, but from the smaller manufacturers a warranty should be obtained that the green papers are free from arsenic (even then it is best to test them oneself) and that papers of other colours are free from copper or mercury. "Pulp" papers have the back of the paper the same colour as the ground of the front. Papers in which the ground or pattern, or both, have a sheen as of satin are known as "satin" papers, and are made by mixing Spanish white with the colouring matter and polishing it with a burnisher ; such papers are very susceptible to damp, and should be protected by a lining paper. The materials of which the coverings in relief are composed are mainly paper, wood, fibre and cloth. One well-known hanging which claims to be the only material solid both in colour and relief is composed of oxidized linseed oil and wood flour mixed with colours and a few minor ingredients. Another is made by placing wood pulp in moulds to a considerable thickness ; others are composed of asbestos, canvas or silk refuse.

The American Window Glass Company controls an invention for the manufacture of that article for which they are said to have refused ten million dollars It is designed to reduce the cost of production by dispensing with blowers, gatherers and snappers, all of whom are high-priced men. For a year past, three of the machines have been secretly operated, all imperfections and drawbacks eliminated and overcome and the company has installed 12 of them in the old De Pauw plant at Alexandria, Ind., this plant being newly equipped throughout for the making of glass.

Dr. William Collinridge, medical officer of health to the Corporation of London, has issued a report in which he suggests that all owners of kitchens and above-ground bakehouses be informed that a standard of requirements has been drawn up by the Corporation and that upon complying with this a certificate will be granted. The proposed standard requirements are set out at the end of the report. They stipulate smooth impervious floors, walls and ceilings, double covers to inspection chambers, minimum height of rooms 8ft., minimum cubic capacity 1,500ft. and not less than 400 cub. ft. per employee, temperature not to exceed 80 degs. Fahr., each bakehouse oven furnace to have a flue for carrying off sulphurous fumes and an outlet for heat and steam immediately above the oven door ; underground kitchens to have inlets for ventilation at least 12in. above the footway or ground level, proper lavatory and w.c. aecommodation, storage water cisterns with dust-tight fixed covers, shelves to be 2in. from the walls and hose to be provided for washing the room efficiently.

AN ENTIRELY CONCRETE BUILDING IN HALIFAX.

On the illustration sheets of this number is a building owned by A. M. Bell & Co. in Halifax, N.S., in which the walls and piers are entirely of concrete and steel bars. This forms quite a precedent in Canada, as in the majority of cases of buildings of concrete construction we usually find the facings of brick, stone or marble, but in this building all the face work and even the mouldings are of concrete.

The walls were constructed in the usual way by building up wooden sheeting on each side and filling in the concrete. They are twenty inches thick to the top of the first floor, sixteen inches to the top of the second and twelve inches in thickness for the remaining three upper stories, the building being five stories high. The piers on the two frontages are four feet wide and two feet thick.

The mouldings which stand out strongly in the illustrations were formed by building up the reverse mouldings in wood, thus forming the concrete mouldings in one piece with the walls.

Cracks, dne to the expansion and contraction of the concrete, were prevented by building up the main piers in both frontages separately with boxes built in recesses to receive the ends of the lintels which were built in later, thus forming joints where the movement due to expansion and contraction could be taken up. These lintels, as also all the piers and walls, were reinforced by iron beams and twisted steel rods, while iron rods were laid horizontally in the walls every four feet of the height, and twisted iron rods were run vertically the full length of the piers.

The concrete used in the construction was of various grades and qualities, that used for the walls being composed in the proportion of seven parts of sand and gravel to one of cement; that in the piers of five parts of sand and gravel to one of cement, while the mouldings were constructed of cement composed of equal parts of sand and cement.

Within the interior of the building is a large two-storey vault with double 8-inch cinder concrete walls.

The building was designed by R. A. Johnson, architect, successor to Hopson Bros. of Halifax, N.S., and constructed by Geo. B. Low, contractor, of Halifax.

PUBLICATIONS.

A fourteenth edition, revised and rewritten, of the Architects' and Builders' Pocket Book, by Frank E. Kidder, C.E., Ph. D., has been published by John Wiley & Sons, New York. It contains 1650 pages, size 6½×3⅞, with 1000 illustrations. Price, in morocco binding, $5.00.

The McGraw Publishing Company, 114 Liberty Street, New York, have recently issued an instructive work by Frank W. Skinner entitled "Types and Details of Bridge Construction." The book comprises 294 pages and is liberally illustrated. It is printed on heavy paper and substantially bound in cloth. The price is $3.00.

When melting size for distemper keep it well stirred, and it should not be allowed to get beyond a lukewarm state. If very hot when mixed with the whiting the distemper will be "runny" when cold instead of a jellified mass.

NOTES.

Mr. Peter Brass, one of the oldest and most highly respected architects of Hamilton, Ont., died a few days ago following an operation in the general hospital of that city.

Two strikers were picketing the entrance of an alley during the strike at the factory of the Kellogg Switchboard & Supply Company in Chicago. A non-union man came out of the factory and started across the street. One of the strikers picked up a brick. As he looked at it an expression of disgust came over his face and he threw it down.

"Why didn't you throw it at the scab?" asked the other striker.

"Because it's a non-union brick."—The World's Work.

The New Century Refrigerator & Manufacturing Company, Limited, of Dundas, Ont., have their large new factory completed and in full operation. It is splendidly equipped with the best and most modern machinery and systematized so as to reduce the amount of labor to the minimum, and is one of the most complete wood-working factories in Canada. There are large and extensive dry kilns by means of which all lumber will be thoroughly seasoned before being manufactured. The company will make a specialty of hardwood veneer doors with built-up bodies, which they claim are unshrinkable and are guaranteed not to warp or twist. They are made in modern designs, artistic in appearance and equal in construction and finish to any door on the market. They will also give close attention to architects' special designs of doors and trims. Agents will immediately be appointed in the different districts, and they will doubtless find their products a profitable line of goods to handle.

—THE—

CANADIAN ARCHITECT AND BUILDER

Monthly Journal of Modern Constructive Methods,

(With a Weekly Intermediate Edition—The CANADIAN CONTRACT RECORD).

PUBLISHED ON THE THIRD WEDNESDAY IN EACH MONTH IN THE INTEREST OF

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Prices for advertisements will be sent promptly on application. Orders for advertisements should reach the office of publication not later than the 12th, and changes of advertisements not later than the 5th day of the month.

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Contributions of value to the persons in whose interest this journal is published are cordially invited. Subscribers are also requested to forward newspaper clippings or written items of interest from their respective localities.

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The Engineering News has found eighty-two gas plants supplying heat to customers through a distributing system. Fourteen of them have central heating systems. The Progressive Age says in regard to this list, that "Although there is a great deal of head-shaking going on over gas companies entering other lines of business, yet the fact remains that if a product can be sold it should not be thrown away. This holds good not only for residuals, but for waste heat and steam, and coke breeze as well. Through the flues and up the chimneys of gas-works go many millions of heat units which might be sold at a profit if a way were found to put them into marketable form. We pay money for heat units, and when we waste heat units we waste money. Whether we are compelled to spend as much as we will save depends upon the method, but the success or otherwise of these central heating plants will solve a very important problem in public supplies and private economies.

MAXWELL FARM, AN ELIZABETHAN FARM HOUSE (ON THE RIGHT) ADDED TO (ON THE LEFT).

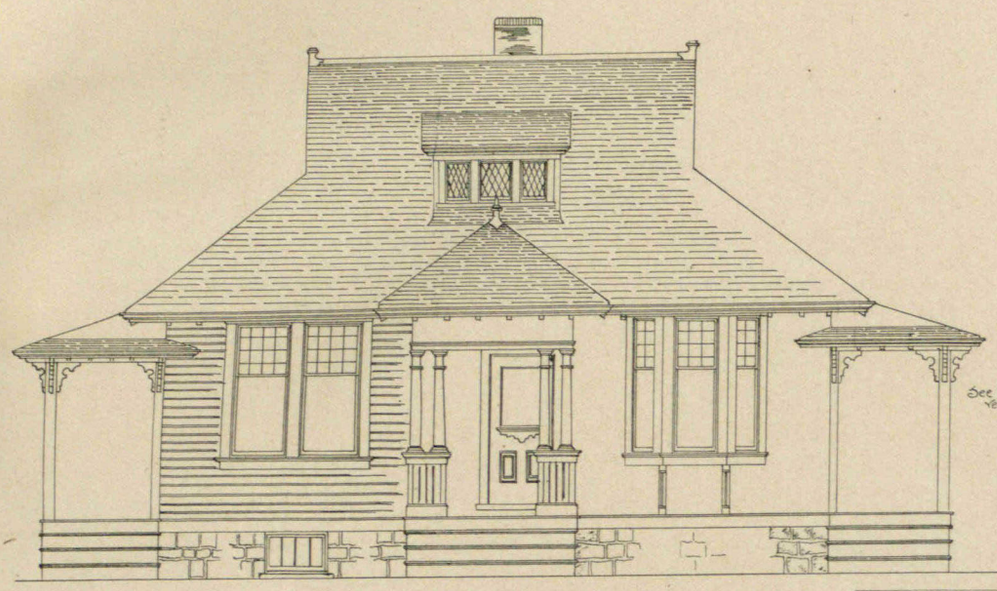
BY MR. SETH SMITH.

STORE BUILDING, HALIFAX, NOVA SCOTIA.

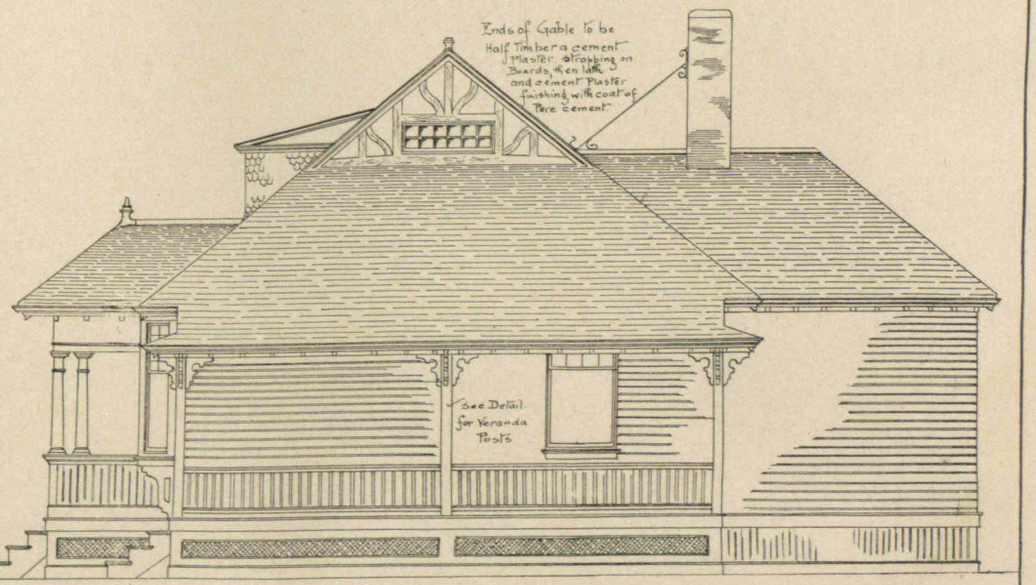
Built entirely of Concrete.

R. A. JOHNSON, ARCHITECT. GEO. B. LOW, CONTRACTOR.

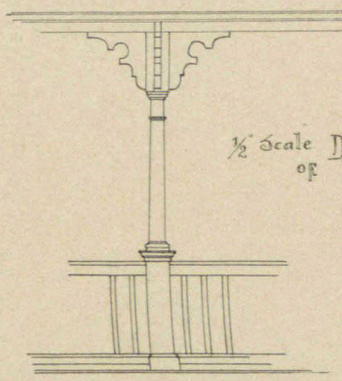
DRAWINGS OF LODGE
FOR
THE WESTERN ART ASSOCIATION,
BRANDON, MAN.



EAST ELEVATION.



NORTH ELEVATION.



½ Scale Detail of Veranda Posts

LODGE FOR WESTERN ART ASSOCIATION, BRANDON, MAN.

W. N. LAILEY, ARCHITECT.

SUPPLEMENT TO
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SEPTEMBER, 1904

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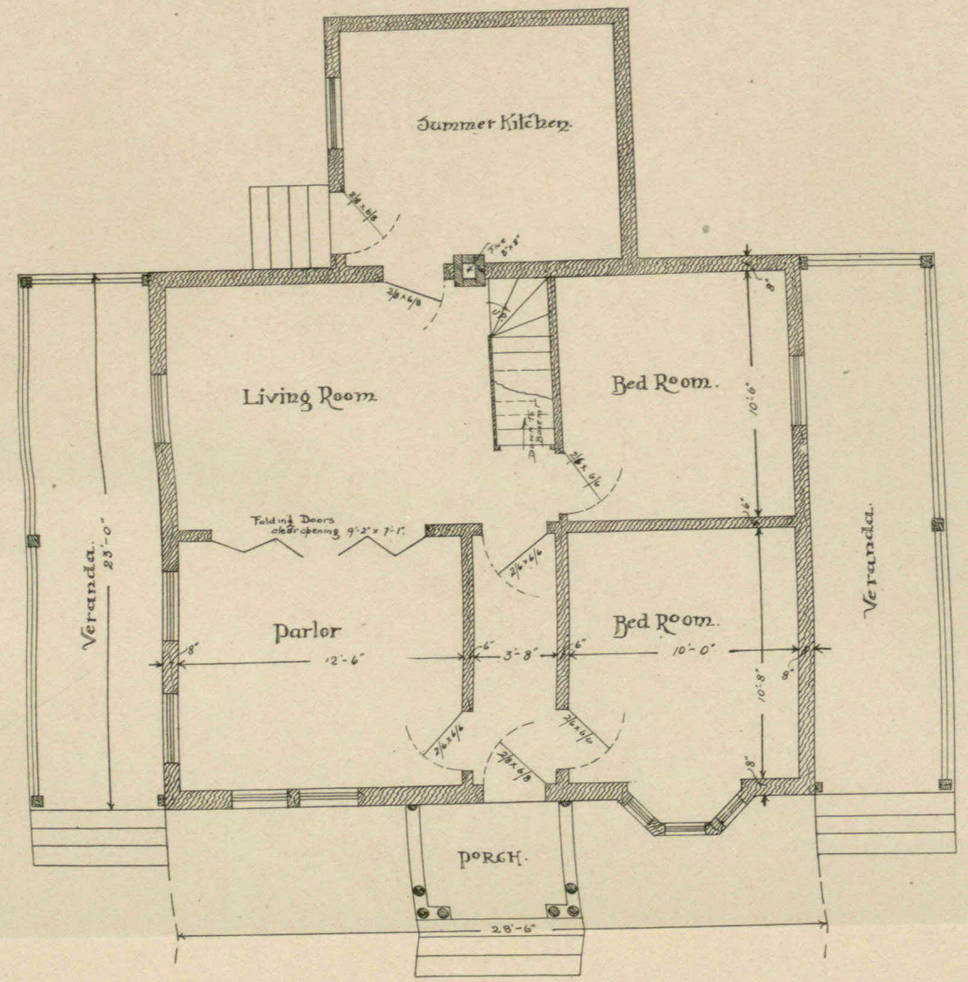
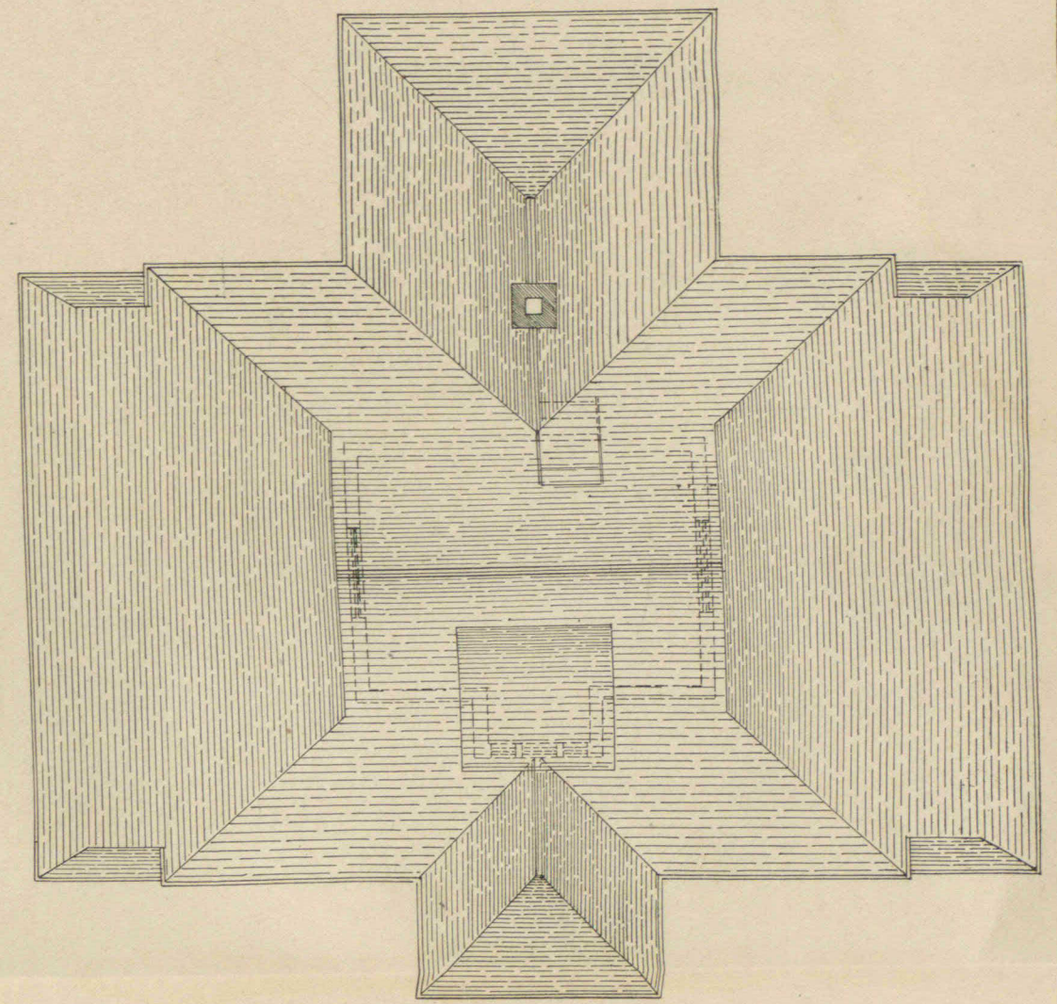


GROUND FLOOR PLAN.



ROOF & ATTIC PLAN.

PLANS OF LODGE FOR WESTERN ART ASSOCIATION, BRANDON, MAN.
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SEPTEMBER, 1904

A CORRECTION.

A statement which appeared in the July number of the "Fireproof Magazine" to the effect that J. E. Vanier, engineer of Montreal, had advocated the use of armored concrete trusses for the purpose of supporting the reinforced concrete floors of the Maternity Hospital, Montreal, which unfortunately had begun to sag, proves entirely erroneous.

Mr. Vanier who was seen by a member of our staff stated most emphatically that he was not consulted at all with reference to any alterations or improvements to the building in which these trusses now exist. "What I was consulted on," said he, "was in connection with some armored concrete floors which had sagged in an adjoining building, owing to the ignorance of the parties constructing, who had failed to put in enough of steel work to take care of the tension of the stress."

"Furthermore," continued Mr. Vanier, "the "Fireproof Magazine" is entirely in error in its statement that the building they refer to possessed reinforced concrete floors, and that the trusses were installed for the purpose of supporting these floors, as nothing but wooden floors are to be found in the building, while the trusses were required for the purpose of holding in suspension the floors over the chapel, which had somewhat sagged, this means of support being chosen in preference to the erecting of pillars, which it was thought would tend to obstruct the view of the congregation."

PERSONAL.

Rev. Cannon Bouillon, architect of the Roman Catholic diocese of Ottawa, has retired after an active service of 30 years.

Mr. H. B. Gordon, of the firm of Gordon & Helliwell, architects, Toronto, has just returned from Korea, where he spent more than two years, being engaged in designing and superintending mission buildings.

Mr. S. G. Beckett, of the firm of Chadwick & Beckett, architects, Toronto, has been receiving the congratulations of many friends upon his recent marriage to Miss Florence Ethel Fletcher, of Barrie, Ont. The ceremony took place at Barrie, on August 16th.

Visitor—What a racket the steam makes,clanking through the pipes!

Flat Dweller (shivering)—Yes. It reminds me of one of Shakespeare's plays.

Visitor—Which—"The Tempest?"

Flat Dweller—No. "Much Ado About Nothing.—Town and Country.

Among the exhibits at the Canadian National Exhibition, Toronto, which attracted much attention was one shown by the Toronto Cast Stone Co., 40 York St., Toronto, manufacturers of Concrete Block Sill Heads, Columns, etc. The company have recently bought out the interest in the Jarvis Concrete Co., Ltd., of Toronto.

PLASTER AND STONE.

Mr. Guy Dawber, in an address in England, said that he would go so far as to say that plaster work outside houses might be introduced into towns and cities. It was only in the last hundred years that the art of plastering had become degraded to its present level—so much so, that when they mentioned plaster and stucco to people they were met with contempt. In Austria there were towns in which all the houses were done in painted and colored plaster, and the effect was most charming. The difference between that work and our work of the last hundred years was that in Austria plaster had been treated as a plastic material, whereas we endeavored to treat it to look like stone, which rightly enough brought it into contempt with both architects and the public.

DANGEROUS CORNICES.

The Building Act Committee of the London County Council, reporting on the fall of the parapet and cornice of the main portion of premises in Westbourne Grove, Kensington, which killed one person and injured several others, says :—"An examination of the remaining portion of the parapet showed that the accident was due to defective construction of the brickwork, the pressure of the wind and the weight of the projecting cornice. The brickwork of the parapets of the adjoining houses were also found to be decayed and cracked and bulging outwards. In view of the serious nature of this accident and of others that have occurred, we thought it desirable to send a circular letter to district surveyors calling their attention to the necessity of the cornices, coping and parapets of buildings being kept under careful observation. We are of opinion that a useful purpose would be served by public attention being drawn to the danger caused by defective cornices, parapets and copings, and to the fact that these portions of the buildings are, on account of their exposed position, more liable than other portions to be injuriously affected by the weather, and consequently should be more frequently inspected and repaired. We have accordingly asked the Metropolitan Borough Councils to give publicity to the action taken by us in the matter."

BUSINESS NOTES

The business of the Jarvis Concrete Co., of Toronto, has been purchased by Mr. John E. Webb and Mr. G. Elliott, contractors.

The Roman Stone Co., Ltd., Marlboro Avenue, Toronto, manufacturers of plain and ornamental stones of all kinds, window and door sills, lintels, columns, etc., had an interesting exhibit at the Canadian National Exhibition, Toronto.

The O'Keefe Mantel & Tile Co., 97 Yonge St., Toronto, with Mr. L. E. Thomas, purchased the interest in this line of goods from the Chas. Rogers & Sons, Co., Ltd., some nine months ago and have continued the business in the same show rooms, 97 Yonge St. They devote all their energies to this particular branch and manufacture mantels from their own and architects' designs from the simplest to the most elaborate form. Mr. O'Keefe has followed this line during his business career of 30 years, 20 of which he was in the British Isles, and for the past 10 years manager of the Chas. Rogers & Sons, Co., Ltd. In their show rooms are always to be found the latest productions in grates and fire place fittings, also floor and wall tiles.

The oldest building in the world that has been uninterruptedly used for church purposes is St. Martin's cathedral at Canterbury. The building was originally erected for a church, and has been regularly used as a place for religious gatherings for more than 1,500 years.

NOTES.

Every difficult lesson mastered in school, every finished task, or anything else done as well as it can be done gives so much added power for the next lesson or task; likewise every slighted lesson, every half-finished task, or every slipshod piece of work weakens the power for the next undertaking.

The Bartlett Illuminating Co., of Saginaw, Mich., is putting up a warehouse building close to its main plant, and has purchased a quantity of old brick from the big chimney on the burned Lee mill and at the Christy buggy factory. This brick is being crushed in a powerful stone crusher run by electricity, and is being used in place of stone in the concrete work.

Numbers of visitors to the recent Canadian National Exhibition were attracted by the exhibit of The Cement Stone & Building Co., corner Queen and Abell Sts., Toronto. They manufacture cement stone for the trade at their works at above address, and have a light and simple machine which can be easily operated to turn out cement stones at the rate of one a minute.

The lack of perfect symmetry in many of the famous cathedrals and temples of Europe has been a subject of many investigations by Mr. William H. Goodyear, of Brooklyn, N.Y. Ruskin pointed out the aesthetic meaning of this asymmetry and a few others have noticed it, but no careful study was made until Mr. Goodyear undertook the work. Some years ago he pointed out the presence of curvature in the horizontal lines of famous buildings, and more recently he has established the divergence of columns and the presence of vertical curvature. The most important result of the measurements seems to be a proof that from the time of the Greeks, and possibly the Egyptians, until the Renaissance gradually drove out Gothic architecture, the master builders of the greatest skill were accustomed to modify the straight lines of their structures by various devices to improve their appearance to the observer. It is the failure to do this which has produced in modern building a sense of something lacking, according to Mr. Goodyear.

The air-cleansing apparatus at the Royal Victoria Hospital at Belfast, Ireland, is constructed as follows, according to Mr. Henry Lea, of Birmingham, designer of the ventilating plant. In a timber framing, reinforced tee bars, are removable with panels, each having two strong wooden rollers, one at the top and the other at the bottom. Cocanut fiber in the form of a yarn is wound from one roller to the other, over and under; the fibers are stitched together close to each roller to prevent them from moving and the rollers are held apart to keep the screens in tension. The subdivision in panels is partly due to the fact that one portion of such a filter, as the upper, will rot quicker than another and panels can be kept in stock. The screens are kept wet by means of horizontal perforated sprinkler pipes. These are fixed near the top of the screens, about 12 inches away in a horizontal direction. They are supplied with water from a series of automatic flushing tanks, set to discharge the requisite quantity of water about once every ten minutes. The water strikes the tops of the screens and runs down the yarns to the bottom.

USEFUL HINTS.

To fasten the colour in limewash used on the outside of a building to your limewash, while slaking, add to each pailful about two pounds of Russian tallow. If that is not available, use linseed oil—about a pint and a half to each pailful of wash.

To test linseed oil, hold it up to the light—the stronger the better—and if it seems at all opaque, don't have anything to do with it. If from properly ripened seed it will be limpid and even brilliant, and instead of tasting rancid will be pleasant. It is most important to have oil from fully ripened seed.

PAINT FOR WIREWORK.—The following is believed to be a good recipe for such:—Boil as much litharge with really good linseed oil as will make it of just a convenient consistency for putting on with the brush. Add lampblack, 1 part, to each 10 parts of the litharge, and boil the whole for three hours over not too fierce a fire.

PAINTING ON CEMENTED SURFACES.—Previous to painting with oil paint, the entire surface should be washed with a solution of carbonate of ammonia. The ammonia should be exposed to the air until the crystals of the same effervesce into white powder. About a ¼ lb. of the ammonia should be dissolved in nine quarts of cold water. After this wash is applied and dry the paint should be applied. The cement surface should be at least three weeks old before painting.

LEGAL.

Builders as long ago as 1826 were informed in courts of law that an architect has no general power to order extras. If he does so without express authority the contractor cannot recover from the building owner unless special arrangements have been made. Since then many cases have been fought on this point which contained differences of detail, and thereby differences of decisions. One was recently heard on appeal at Glasgow by Sheriff Guthrie. A firm of contractors had agreed to effect alterations to underground premises for £4,746. 12s. 3. The employers left the control of the work to Mr. Bell, their architect. Unexpected difficulties were encountered, especially the foundations, which required to be excavated, and brought up the total cost to £7,821. 7s. 11. The employers refused to pay the balance. They were ordered by the court to pay the whole amount on the ground that though the work executed was not included in the estimate, it chiefly consisted of extras ordered by themselves or their architect. Sheriff Guthrie, after hearing the appeal, said that from the evidence it was clear that the employers left the whole operations under the control and power of Mr. Bell, and it was equally clear that he ordered and priced after measurement the whole of the work done under contract, including extras and deviations. It was certain that the defenders' directors knew that deviations were taking place, and it was equally certain that both in accepting the contract at first and in every stage of the work these directors entered into no direct communication with the pursuers beyond occasional conversation and consultation, and that the whole superintendence, direction and control of the work was left by them to Mr. Bell. The magistrate, in conclusion, said: It might not perhaps be wise in all cases for owners of property to put themselves entirely into the hands of their architect, but if they did so they had themselves to blame, and if the architect had exceeded his powers in dealing with contractors who had been allowed, as in this case, to suppose that his powers were unlimited, their remedy was against him, and not against the innocent contractor.

McNally & Plummer, Blyth, Ont., were exhibiting at the Canadian National Exhibition, Toronto, their Eureka cement block machine for concrete construction. It is simple in construction, easy to operate, strong and durable.

PAGES

MISSING