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PAGES

MISSING

The Canadian Architect and Builder

OCTOBER, 1904.

VOL. XVII.—NO. 202.

ILLUSTRATIONS ON SHEETS.

Cottage at Brandon, Man.—W. Nicholson Lailey, Architect.
House for Mr. Sanford Evans, Winnipeg, Man.—George Brown, Architect.
Fireplace, House in Queen's Park, Toronto.—Sproatt & Rolph, Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

House in Queen's Park, Toronto—Sproatt & Rolph, architects.
Stair Hall, House in Queen's Park, Toronto—Sproatt & Rolph, architects.

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" EDMUND BURKE, " Toronto.
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" 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.

REMOVAL NOTICE.

On the first of November, 1904, the Winnipeg office of this Journal will be removed to Rooms 720 and 721 of the new Union Bank Building. This building, which is just nearing completion, is thoroughly fireproof and in construction and equipment is the equal of any on the continent.

A standing invitation is given readers and friends of the Journal to call when in Winnipeg. Any possible information or assistance will be gladly furnished them.

Belgian vs. British Structural Steel.

The large trade which a few years ago was being done in Great Britain by Belgian and German manufacturers of steel joists and girders, is reported to have been killed as the result of tests and inspection to which the material was subjected by users in Great Britain. The trade is now in the hands of British firms whose product is not so cheap, but is uniform and reliable in quality.

Safety of Elevators

The Coroners' Jury appointed to enquire into the circumstances attending the death of Dr. McPhee, of Ottawa, who was recently crushed in an elevator, returned with their verdict of accidental death the following recommendation :—"We would recommend that the city by-law governing elevator operators be changed, so that no operator be less than eighteen years of age, and no operator be engaged without first having a certificate as to competency from the building inspector."

Building in the West

Several Toronto contractors are finding a profitable field of operations in Winnipeg, where building is more active than in any other city on the continent. The value of building permits issued for the nine months ending September 30th, was in round figures $8,000,000, a sum in excess of the expenditure for this purpose in any other city in the United States or Canada, not excepting New York. In spite of this large expenditure, it has not been possible to meet the demand for houses. During the past summer a considerable number of families lived in tents. Some of these have been unable to secure other accommodation, and are at a loss to know where to find shelter during the coming winter.

"Fire-Proofed" Wood.

The Mayor of New York as the result of strong pressure has withheld ratification of the ordinance recently approved by the Board of Aldermen of that city compelling the use of fire-proof trim in the erection of new buildings above 75 feet in height. Builders asserted that the ordinance would be valueless except to the

manufacturers of so-called "fire-proof" wood. The term "fire-proof" they claim to be a misnomer as applied to wood. Experience is said to have demonstrated that its fire-proof qualities are dead within three years at the longest. We have seen samples of wood impregnated with chemicals, which could not be burned, but cannot say anything regarding the durability of the process. If not durable, the use of such material, involving as it does considerable extra cost, would be of little value, and must prove a hindrance to building and an added burden in the form of higher rentals to the public. On the other hand the great losses caused by fire renders necessary building laws that will insure as far as practicable the use of non-inflammable materials.

Building Regulations.

A clause of the new building by-law of Toronto provides that walls of new buildings exceeding 35 feet in height shall be built in cement mortar. In the case of the first church building to be erected since this by-law came into operation, the walls are 28 feet in height, but the gables exceed 35 feet in height. The city architect has ruled that the entire walls must be laid in cement mortar. This will entail an extra expenditure of $500 in the construction of the building. The architect offered to increase the width of the foundation walls by 4 inches above the thickness required by the by-law for ordinary lime mortar construction, but the city architect insisted that cement mortar must be used throughout the entire construction. This would seem to be a doubtful interpretation of the provision of the by-law and one that does not appear to agree with common sense. The gables of the building in question do not support any weight and constitute but a very small percentage of the total wall area. This case emphasizes the fact that not only must building by-laws be very carefully framed in order that they may be equitable, but also that they should be interpreted in the light of common sense if hardship and injustice is not to result from their operation.

Patents on Skyscrapers.

Mr. Leroy S. Buffington, an architect of Minneapolis, has brought suit in the United States Circuit Court of Appeals at Chicago against the National Safe Deposit Co., owners of the first National Bank building now under construction in that city to recover damages for alleged infringement of a patent granted to him covering a method of employing a steel skeleton in building construction. Mr. Buffington's attorneys claim that his patent, which was granted on May 22nd, 1888, is a valid one, and broad enough in its claims to cover all the buildings of the steel skeleton type erected throughout the United States in recent years. The claim for infringement is specially based upon the use of essential features of the patent, viz., a shelf or projection on each story to carry the outer walls for the succeeding story, whereby expansion and contraction due to changes of temperature cannot endanger or seriously affect the structure, and a continuous post consisting of a plurality of plates, placed side by side and diminishing in number towards the top; another feature is the employment of non-conducting packing between the veneer and the steel skeleton. Mr. Buffington proposes to institute other suits for a similar purpose. The outcome will be watched with much interest by building owners, architects, contractors and all others in any way identified with the erection of buildings.

Sand Bricks.

At several points in Canada experiments are being made with the manufacture of sand bricks. What advantages are claimed for these bricks above those manufactured by the ordinary method has not been learned. A recent test in Europe of ordinary lime-sand bricks of good quality and clay made bricks of similar quality demonstrated that the latter were less absorbent. The present would appear to be an opportune time to make known the advantages of sand bricks and to place them on the market, in view of the exceeding scarcity and high price of ordinary bricks. In Toronto at the present time best quality common bricks are reported to be selling as high as $14 per thousand. This fact is causing owners of property and especially speculative builders to hesitate about starting the erection of new buildings this autumn. It is estimated that by reason of the enhanced prices for materials and labor, the cost of building this year has exceeded that of 1903 by 10 to 20 per cent.

The Winnipeg Exhibition

Financially the Dominion Exhibition held recently in Winnipeg must be counted a success, the management having in hand a cash surplus of $6,482. The attendance was also measurably satisfactory, totalling 200,000 persons. Viewed from the exhibitors' standpoint, and as the precursor of successful Exhibitions in the future, our information is that it left much to be desired. The arrangement by which the exhibits were placed in the rear and the side shows in front, worked out badly for the exhibitors. We have been told that a large percentage of visitors never got beyond the side shows and left the grounds without seeing the exhibits at all. Consequently the thousands of dollars expended by eastern manufacturing firms desirous of bringing their products prominently before the notice of the people of the west, were to a large extent wasted. The exorbitant charges for accommodation demanded by hotels and boarding houses militated against the success of the enterprise and is calculated to have an even more serious result in deterring persons who did attend from visiting future Exhibitions in the same city. The lack of interest shown in the exhibits, combined with the excessive charges for accommodation decided a number of the eastern exhibitors to quit the Exhibition before the closing day, while visitors living within reasonable distance of Winnipeg made a point of spending only a part of one day in the city, and of returning home in the evening. Before the people of Winnipeg can hope to induce either residents of the west or outsiders to attend in large numbers any future enterprise of this character they must give assurance that care will be taken to remove the causes that that have occasioned dissatisfaction this year.

The Lac du Bonnet Mining and Brick Company, of Lac du Bonnet, Man., reports an increasing demand for bricks. Their output this year has been over five million and a million of these have been fine pressed brick for face and finishing purposes. They are now engaged on an order for 1,000,000 brick for the new power house of the Winnipeg General Power Company, and another order for 100,000 for the new immigration sheds at Winnipeg.

OPENING LECTURE OF THE DEPARTMENT OF ARCHITECTURE, McGILL UNIVERSITY.

By Prof. Percy E. Nobbs.

Strictly speaking, this lecture belongs to the third year of the course for the new degree of Bachelor of Architecture and as its theme is one of very general application and paramount importance to designers, I have ventured to invite the presence of others besides my third year students.

In naming the course The Building Trades the intention has been to avoid the use of the word Crafts, which is perhaps more applicable to the subject matter about to be covered, because that word has during the last twenty years come to be associated with a certain amateurishness in the field of art which the ancient craftsmen would have been the last to approve. Also, because during the last decade the "Arts and Crafts Movement" as it has been called, has tended more and more to countenance certain eccentricities in design which its loudest and most strident supporters have dubbed "originality". Having set up a brazen calf in the wilderness so to speak, the cult of the new art (or L'Art Nouveau) has resulted, and the word "craft" is never out of the mouth of those who follow that way.

I do not propose at the present juncture to set forth my views on the training of designers further than to name to you the mental elements which I think are combined to form the mental image of an unmade and rightly designed possible object. This high function of conceiving an unmade thing is the nearest to actual creation that man can attain to.

It is this line of thought that Mr. Kipling has made articulate in his verses "To the True Romance":—

"What is is thine of fair design in thought and craft and deed.
Each stroke aright of toil and fight that was and that shall be,
And hope too high, wherefore we die, had birth and worth in thee."

And again in "L'Envoi"—a celebration of an accomplished work with all the imagery of building operations, beginning:—

"My new cut ashlar takes the light where crimson blank the windows flare;
By my new work before the night, Great Overseer I make my prayer.
If there was good in that I wrought, Thy hand compelled it Master thine;
And where I failed to meet Thy thought, I know through Thee the fault was mine."

That is the way to regard the function of design—as a thing with a right and wrong about it; not a mere matter of taste and whim. Why the very phrase the "Architect of the Universe" makes the paltryness of the vast majority of the architectural performances of the last century appear as sheer blasphemy by contrast.

Well, to return to these same elements, they are:

Firstly, That sympathy born of knowledge, or knowledge born of sympathy, I know not which it is, that enables the designer of a tea spoon or a town hall to realize the full uses of the object he is to conceive. This element is made up of all experience.

Secondly, and of equal importance is a knowledge and sympathy concerning the material and technique (for these things are interdependent) by which the designer's idea will gain tangible concrete existence.

Thirdly, we have scholarships in art which constitutes our heirship to the vast heritage of past traditions, past masterpieces, past failures.

And fourthly, there is the sense of proportion which some men have and most men lack,—this is not a matter of rule or teaching, and the schools of architecture which have professed an exact science of proportion as a thing which can be taught have failed absolutely to leave behind them monuments of any human interest. Cold stones at the best. I refer particularly to the influence of Vitruvius.

It is not to speak of the attainment of knowledge of "what is wanted," nor of scholarship, nor of proportion, that I venture to intrude upon your time, but to discuss very briefly a few examples of the influence of material and technical process on design. In the Ruskinite literature truth is made out to be the touchstone of good architecture, and "Gothic honesty is held up as a moral precept for our architectural regeneration." Now a great deal of the Ruskinite literature, especially with regard to architecture, can only be regarded as charming prose but in thus claiming for truth a place in design from which it had been systematically kept out for a matter of a hundred years, Mr. Ruskin and his followers may be said to have lit the torch which resulted in the revival of sane design in England and which despite the temporary aberrations of the "Art Nouveau" movement is making steady progress all over Europe and in the States.

Now the great quality of truthfulness can only be obtained by having due regard for the natural limitations of materials themselves and the techniques to which they are subjected.

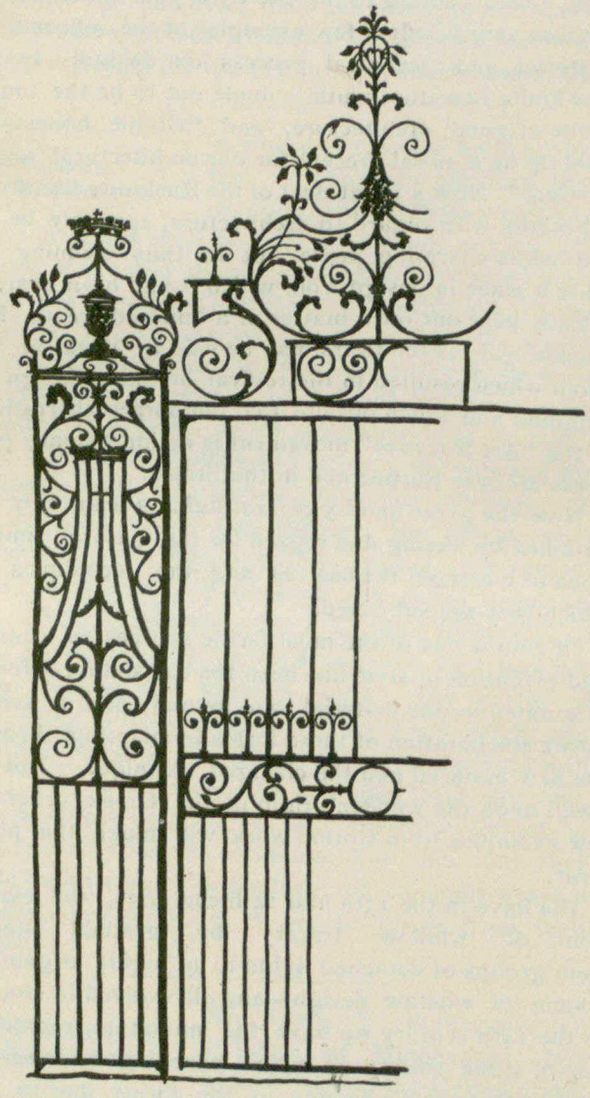
Of course one of the most fertile sources of change and evolution in style has been the translation of forms originated in one material to a second, and a subsequent amelioration of these forms in adapting them to the new material and the changed technique. Not to dwell upon the wooden origin of the Greek orders a few examples from Gothic work will make the point clear.

We have in the 13th and 14th centuries, the evolution of window tracery by gradual stages from groups of detached lights to a highly organized system of window design—and all evolved in stone! In the 14th century we have the miniature reproduction of stone tracery in wood panelling and screen work with certain changes in the forms due to the wood and the joiner's tools being substituted for the stone and the mason's chisel, and a system of framed panelling dominating the design of the whole. Then, later in the 15th century, this system of framed panelling is transferred back to stone wall surfaces and ceiling vaults in the perpendicular style of Gothic. This phenomenon, Mr. Prior in his history of Gothic Art in England refers to as "the discovery of the principle of panelling by which was got a scheme of surface distribution that employed partition horizontally and vertically as a reasonable exposition of space."

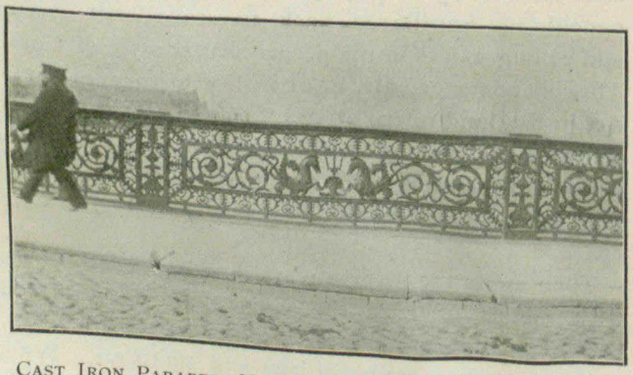
Then again the diverse ways man has found to deal with metals or even the same metal have afforded fruitful sources of artistic inspiration. Let us for a moment compare wrought iron and cast iron. We all know that these two things attain different kinds of strength and are formed in different ways. We all also know that wrought iron is continually being copied in cast iron. (See any trade catalogue).—We are also aware of the reason,—cheapness; and the result is a highly fragile and unreliable kind of a railing from the

utilitarian point of view and utterly lifeless, stupid and ugly from the artistic standpoint.

A clumsy, thickset heaviness is right and proper and beautiful in cast iron while a lacelike slimness is equally characteristic of the material and technique of wrought iron. Here I have the cast iron parapets of two bridges in St. Petersburg which as cast iron design leave nothing to be desired and some English XVIICentury wrought iron which shows at its best the full influence of the hammer technique.



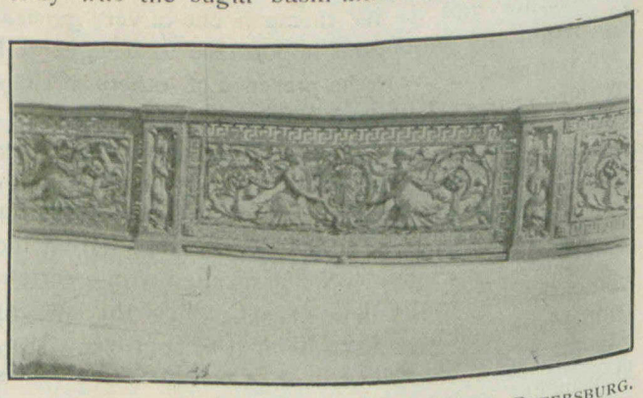
BELTON HOUSE, LINCS:
Private Entrance to Churchyard.



CAST IRON PARAPET, NICHOLAS BRIDGE, ST. PETERSBURG.

One more example, and this from the breakfast table of the average boarding house will show how general is this disease of blatant sham in the field of design.

Look at the ordinary cream jug or sugar basin. It is facetted all over with a design of geometrical structure natural to cut crystal and to nothing else. But is this crystal? and is it cut? I trow not! It is very common glass, it is moulded and the facets are so futile that they absorb more light than they reflect. Why was the sugar basin made so ugly?—for before



CAST IRON PARAPET, ALEXANDER BRIDGE, ST. PETERSBURG.

it was squeezed into its mould it had all the grace and beauty of a ball of glass in the blowing. I suppose because taste is thoroughly depraved and the ordinary man finds a beauty (to him it is beauty) in the imitation of what is rich and rare and a misguided satisfaction in getting the appurtenances of life cheap.

Enough has now been said to prove the contention that materials and techniques have it in them if rightly apprehended to suggest a very great deal with regard to the decorative treatment of objects, and it has incidentally been made abundantly evident that no good results from avowed and unadapted imitation in one material of another or of a superior by an inferior technical process.

In the course we are initiating work of the different building trades will be studied as such regardless of historical sequence, and the masterpieces of all periods will be called in to illustrate the best way of doing things at the time when they were done best.

Designs for details of all the trades will be prepared not as tricky sketches but as working drawings.

By this means I hope the students will get at least a glimpse of the best workmanship of our civilization during the last 3,000 years—XVI Century plaster work and XIV Century glass; VI Century mosaics and XII Century marble inlay; XV Century carving in marble and XIII Century carving in stone. From Italy and England, Constantinople and Rome, France and the Low Countries and sunny Spain.

When the student understands Gothic joinery construction and Renaissance iron work, Modern plastering and Ancient glass painting, there is some profit for him in the study of historical styles and ornament. Without such knowledge such study can only be hurtful to any instinct for design he may possess or which might be induced.

This, gentlemen, is the message as I take it of the Gothic Revival of the 2nd half of the XIX. Century—a movement which by the way has had its chief effect for good in classic design. To treat materials with sympathy and techniques with understanding; to ask what shall this be made of or how will that be wrought before the pencil is committed to the paper; and above all things the negative precept not to sham.

In the burnt district of Baltimore a company is about to install a central heating and refrigerating plant. Prof. Woodbridge is said to be making a study of Washington public buildings for a similar purpose. The use of such a plant should greatly reduce the fire risk and consequently the cost of insurance. It is proposed to install meters which wil register the amount of condensation in the pipe lines, so that the consumer will pay for only the amount of steam used.

VENTILATION.

By Robt. Bennett.

Ventilation is a term applied to the method by which a due supply of fresh air is maintained in buildings and other confined places.

The word was invented about 200 years ago by Dr. Desaguliers, a well known scientific man of that time, who devoted a great deal of time and money and skill towards improving the sanitary conditions of buildings, which at that time were considered very bad. He invented a "fanning wheel," or, in other words, an "air propellor," which was worked by manual power, and the man who worked it was called the "ventilator." The word has since been divorced from its original meaning and is now used to signify an opening in a building through which air may, or may not, pass, according to circumstances.

Everybody knows that a supply of fresh air is necessary for all living things, even for plants and vegetation. To cover the head with a cloth for a short time produces a sense of oppression, and on its removal a feeling of relief is experienced. The heat of the person's breath causes oppression. People often say of a crowded building "it is too hot," whereas the discomfort is caused chiefly from the impurity of the atmosphere.

Many diseases are produced by the impurities in the air. Continued breathing of impure air lowers the tone of health. Consumption and scrofula are attributable to vitiated air. The instance of the confinement of 140 Englishmen in the Black Hole of Calcutta in the year 1756 is illustrative of the fatal effects of breathing foul air. After 10 hours of imprisonment therein only 23 persons were found alive. Fresh air is essential as the purifier of disease and also for resisting diseases. The use of gas adds greatly to the impurity of air. The poisonous effect of gas combustion has been the cause of many deaths.

The subject of ventilation is being sadly neglected. Churches, houses, schools and public buildings are being built without proper regard to necessary ventilation. Those responsible for the building of churches and other places of worship seem to be the worst offenders in this respect. For instance, a church is planned and submitted to, and passed by a fixed authority—it is difficult then to introduce changes. The usual form of church building, copying more or less the beautiful architecture of the 13th or 14th centuries is by no means an ideal form from a sanitary point of view, whatever it may be in other respects. It is generally built in the form of a nave and side aisles, lighted by clerestory windows, giving practically (including the chancel) four ceilings of different heighth, making it most difficult to extract the air at the level of the roof. The clerestory windows chill the warm air as it rises, and send it down in the form of a cold draught on to the heads of the congregation. The roof is lofty and dark, necessitating a large amount of light, and as a rule about twice as much gas is burned as is necessary. Nonconformist places of worship are even worse on account of the frequency of galleries and consequent crowding.

How often do we see the windows of a church opened when one or two of the congregation have fainted from the stuffy atmosphere of the buildings. Only recently in a west end church of the city of Toronto I was an eye witness to that sort of thing—the service had only just commenced and everyone apparently felt the discomfort of the badly ventilated place—when two ladies fainted and were taken into the vestry by the wardens—then the windows were opened to admit fresh air. The fresh air came in with a mighty rush which caused a great number of the worshippers to look askance and to draw their garments closer around them, in fact I noticed two gentlemen turn up their coat collars during the prayers; needless to say the service was not so enjoyable in consequence. We often catch severe colds coming out from churches, concert rooms, public buildings, theatres, etc., from that very cause.

Dwelling houses, too, suffer from lack of proper ventilation. It has often been remarked that we are apt to prize but lightly what we possess in abundance, and it is a fact that cannot be denied that the two most important foods on which human life depends, viz., pure air and pure water, are by the great majority of us least esteemed. These two foods, more especially the former, are so abundant that we need pay very little attention to obtain them. We should recognize the importance then of supplying every building and habitual dwelling with proper ventilation. In thousands of houses in our great cities the most elementary principles of ventilation are systematically ignored.

People who would take the greatest care not to drink polluted water, are yet careless of breathing impure air and seem to forget that one may be quite as dangerous as the other—personally I am of opinion that impure air is really more dangerous than impure water, since the air is taken directly into the lungs and comes in contact with the blood more speedily than water which enters the stomach. I do not propose to write with medical authority at all, but simply from a little observation of my own. I believe that ventilation is an exact science, admitting of exact results, and if everybody could be induced to believe the fact that bad air was detrimental to health; if the fact of a room being close or stuffy was regarded as disgraceful; if people refused to attend a badly ventilated place of worship; then the architects, the builders and the occupiers would soon find means to alter the existing state of things.

FERRO CONCRETE CONSTRUCTION.

A lighthouse of ferro-concrete has just been constructed at Nicolaieff, near Odessa. The height is 131 ft., the diameter at the base 28 ft. and that at the top of the shaft 6ft. 7ins. The service-room which is 14ft. 3ins. in diameter, is corbelled out, and thus overhangs 3 ft. 10 ins. on each side of the tower. For purposes of design the tower was considered as a tube firmly fixed at one end and acted upon by a distributed pressure, due to wind, 56·4 lbs. per. sq. ft. The foundation is sunk only 8 ft. 3 in. below the surface of the ground. The skeleton consists generally of upright rods and of circular rings, the surrounding concrete being mixed in the proportion of 660 lbs. of Portland cement, 1 cu. yd. of ballast and half a cubic yard of sharp sand. In order to ensure that the concrete takes a firm hold of the framework the latter is brushed over with grout prior to the concrete being run in. It is claimed that a saving of 40 per cent. is effected by the use of the ferro-concrete. The weight of the building is given as 453 tons, of which 342 tons only represent the weight of the ferro-concrete, whereas the weight of such a light-house put up in the ordinary way would be 1,343 tons.

BY THE WAY.

In consequence of the destruction wrought by recent fires the Norwegian government propose to make compulsory the use of brick in building. Hitherto the decision as regards materials to be employed has rested with the municipal authorities, and wood being plentiful and cheap, has been largely used.

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As a rule the streets of Chinese cities are badly paved, but one of the coast cities is an exception in this regard. The streets of this city have been paved with grind-stones, i. e., stones originally employed for the grinding of meal, but which, when partially worn out and defective, have been put to this new and useful purpose. They number many thousands and must therefore have been collected throughout a wide district.

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The plan adopted in Toronto and other Canadian cities of placing a band of brass having an inverted edge round the trunks of shade trees to prevent the tussock moth from climbing to the top and destroying the tree, is in tropical countries applied to the cups of the small iron supporting columns of buildings to prevent destructive insects such as the white ant and all sorts of vermin from climbing beyond them. The flight of steps leading up to buildings in these countries either stand in pans of water or are painted with grease to render them vermin proof.

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That well-known and usually well-informed journal the English Builder is considerably astray in some of its recently published remarks on cement construction in Canada. It is not the fact that cement coffins are largely in use in Canada, indeed so far as we know they are not manufactured here, nor is the statement that concrete steel construction appears to have made little headway in Canada, much nearer the mark. Contrary to the impression which the editor of the Builder seems to have gained—building methods and materials in Canada are quite as modern as those of the United States.

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It is very galling at times to have to follow one's own advice or to swallow the medicine prepared for another patient, so no good American can wonder that our newspaper writers are writhing in indignation at the audacity of the Canadian Government in ordering the deportation of certain civil engineers holding important positions in the work of constructing the new Canadian transcontinental railroad, the Grand Trunk Pacific. What right has Canada, or any other country, to protect its citizens hy enacting an "alien contract labor law?" Is not that one of our own most precious inventions, and can't we do something to prevent an infringment of our rights in it? One is sometimes tempted to believe that Americans nowadays are a bit too strenuous to be wholly satisfactory occupants of this world.—American Architect.

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Mr. Robert Williams, F.R.I.B.A., of London, has been commissioned by an Egyption Pasha to prepare plans for a Mosque to be erected for the benefit of the Mohammedans residing in the great metropolis. The plans which are to be submitted at Constantinople for the approval of the Sultan, show a facade 120 feet in length and a longitudinal measurement of 150 feet. The style is Saracenic, or the mediaeval architecture of the Arabs. The building will have a base of polished red granite probably from the old Assouan quarries. The walls will be of red Mansfield stone, relieved with Doulting and Portland stone. The details of the interior will be richly done in marble and Welsh jasper. That part of the floor where the people prostrate themselves will be of teak, and the furniture of oak and teak. The whole building will be surmounted by a beautiful minaret, with balconies and galleries, about 200 feet high. Groups of turrets will also surmount other corners of the mosque, and these will be ornamented with golden spires and crescents.

CEMENT FOR THE NORTHWEST.

In view of the certainty that cement must enter largely into the construction of buildings in the Canadian Northwest, enquiry was recently made of a number of the cement manufacturing companies and wholesale dealers in Eastern Canada regarding the possibility of successfully manufacturing cement in the Northwest. They were asked it they had made any investigation to determine whether the necessary materials for the purpose were available, and if it should be found impracticable to manufacture the material in the west, from what quarter the supply would be likely to come. To these enquiries have come the following replies :

Marl and clay—the two raw materials used in the manufacture of artificial (the best) Portland Cements, are to be found in every province of Canada. Lime stone takes the place of marl where the latter is not found, but is deficient in quantity of carbonate of lime compared with marl or chalk. There is no reason why in the Northwest Portland Cement should not be made profitably. The Canadian Pacific Railway started a factory near Vancouver some years ago on a small scale for their own requirements and ran it successfully as far as the quality of the material turned out was concerned.

D. McNALLY & Co., Montreal.

DEAR SIRS,—Replying to your circular letter of the 22nd inst., would say that at present we consider it ridiculous for anyone to think of promoting any more cement factories in Canada. Even with the North-We t market and without the several factories now under construction in Ontario, the Canadian factories have been selling at a loss in order to get rid of their output. After the factories that are now being built are completed in Ontario, we will require the whole of the Dominion as our market if it is to be made a paying industry. We would rather see cement factories in the west than to have foreign cement go there but under existing circumstances, consider it unwise and unprofitable for anyone to build another cement factory in Canada.

THE HANOVER PORTLAND CEMENT CO., LIMITED.

HANOVER, ONT., Sept. 24, 1904.

DEAR SIRS,—Replying to your inquiry we understand from reports that the materials for making Portland Cement exist in some localities in Manitoba, but as to their extent and accessibility, we are not aware. Our own impression is that reports of the political surveys of the several districts would give more accurate information. In the meantime it appears to us that the supply of Portland Cement for the North-West Territories and New Ontario, must come from Ontario and other outside points.

THE COLONIAL PORTLAND CEMENT CO., LIMITED.

WIARTON, ONT., September 24, 1904.

DEAR SIRS,—Replying to your inquiry of the 22nd, I have not heard that the necessary material is available in the Northwest for the manufacture of a high-grade cement, but I do not pretend to have examined the question closely.

C. I. DESOLA.

MONTREAL, 23rd September, 1904.

GENTLEMEN,—Replying to your favor of the 22nd would say that we have not given the question you mention sufficient thought to express an op nion.

THE ONTARIO PORTLAND CEMENT CO., LIMITED.

BRANTFORD, ONT., Sept. 23rd, 1904.

MONTREAL NOTES.

The city of Montreal though not one of the largest cities in the world has yet that cosmopolitan character which is generally found in the largest cities. Perhaps it would be more correct to say that it has that cosmopolitan want of character which belongs to huge masses of humanity moving together and mixing and touching continually yet without any distinct common aim and without even sentiments in common except always on the largest and most broadly human issues. In the city of London, a Chinaman might wander long enough without meeting a single individual with whom he could share, one, even the slightest, of his celestial reflections. But should the same man chance to meet some sudden accident the first dozen passers by would minister to his necessity with as ready and genuine a sympathy as if he also were a son of Father Thames. The further apart we find our lines of life to be cast the more glad we are when we can meet one another on the common ground of simple human nature.

The larger the city the more manifold become the interests of its inhabitants and the more thoroughly disintegrated does sentiment become. In this way such a thing as 'esprit de corps' almost ceases and can only be revived by an appeal to the more elemental bonds of society. Thus cities go on shaping themselves in a shapeless way.

This sort of thing takes place more readily where there are initial conditions tending to keep people apart and in Montreal such a condition exists in the division of the people into French and English sections. The two races are held apart more than anything else by that strange division that a difference of language involves. Everything that tends to freedom in the interchange of ideas and sympathies helps to knit people together and strengthens them in all common thought and effort. Everything on the other hand which clogs this ready interchange must tend either to conflict and friction or to apathy and aloofness.

Another cause of the general lack of common interests in Montreal is the very large influx to the city of persons with purely private interests. They come from many lands each with his axe to grind, and each seeking nothing in Montreal but a grindstone suited to his needs. The rapidity with which the city has grown lately and still continues to grow further contributes to its formless and dishevelled state.

In a ci y of this kind then, where are we to look for hope for a better state of things—for some pride in having the city to appear well in the sight of men—in the sight of her own men and of the stranger who comes to her gates? The said stranger if he comes by water is tipped out into an unassorted lot of fragments of wharfs and grain elevators. Regretting that he should have arrived at so unfortunate a time when such extensive alterations were just at their thickest, he mounts a cab and is conducted up St. Francis Xavier or St. John street. These curious streets are unfortunately also a little out of repair and if the picturesque profusion of poles and wires were a little less thick one might be able to say whether or not these large buildings were of substantial construction. In St. James street he can recognize that the buildings are indeed substantial and tall enough to satisfy any mind not smitten with the fever of giantism. This street is unfortunately narrow—a result doubtless due to its antiquity—so, paying due reverence to age, he can admire the picturesqueness of this street with its spasmodic buildings. In Craig street one encounters the phenomenon of a fine wide thoroughfare, convenient and central, which is as yet little taken advantage of for trade or business purposes and is largely occupied by a class which exhibits a painfully low order of intelligence in disfiguring whole rows of the neatest old stone houses imaginable with disproportioned and unattractive, not to say repulsive signs, in apparently some kind of simple and unquestioning faith that they thereby recommend themselves to the general public. A little modesty and tidiness would make a wonderful transformation here.

Telegraph poles and wires we know are mortal and will pass away—we hope to live long enough to see them decently interred underground. The electric car wires give promise of a longer period of pernicious life, but to improved methods of traction these too will yield. These are accompaniments of unperfected engineering devices. They are the derricks and scaffolding required in the growth of our civilization and will be taken down when the constructed fabric comes into the full exercise of its functions with implements more efficient and more seemly. But these disfiguring signs are worse than sins, they are blunders, and to architects they are particularly offensive as being a cheap way of obliterating even the finest architecture.

What one should wish and can surely hope to see is an intelligent emulation in excellence of appearance, not in magnitude of announcement—in appropriateness and charm of expression not in loudness and piercing quality of voice. At the present day advertisement is everywhere loudly acclaimed as the one true god who will lead our endeavours to success. Let us remember then that our gods are images of ourselves and be careful how we shape our advertisements.

In the beautifying and ennobling then of this our so cosmopolitan and formless Montreal we must look to the broad sentiments which are the property of all mankind. Its diverse elements are a great potential mine of wealth. Though hard to fuse together their eventual fusion will yield the richer product. The resultant character will be broad and inclusive, made up of many of the strands that compose our human nature. Such a character we may hope some day to see expressed in the streets of our city—its buildings with grace fulfilling their functions and therefore looking appropriate thereto, and the people exhibiting manners as sane and delightful as their buildings—both equally free from the present blatant advertisement and untidy scuffling—their work a pleasure to themselves and to those who deal with them.

"CONCORDIA SALUS."

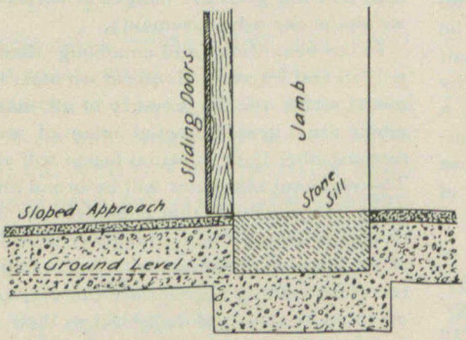
CHURCH HEATING AND VENTILATION.

Particulars are given by the Decorators' Gazette of an interesting method of church warming and ventilating introduced by a German heating engineer in a Berlin memorial church that in general plan resembles St. Paul's Cathedral in London, though of smaller dimemsions, the height of the nave and transepts being 82 feet and of the dome 237 feet. The corresponding measurements of St. Paul's are 100 feet and 360 feet respectively. To the height of 80 feet from the floor the walls are traversed by hot-air chambers, so that from the ground to the galleries 22 feet above, there is no perceptible difference of temperature, the air being kept constantly at 60 degrees. The radiating surface is placed high up, in the neighborhood of cooling surfaces, maintaining a higher temperature in the upper portion of the building, and intercepting and reheating the cooled air in its descent toward the lower part occupied by the congregation. There are thus four strata of air of different temperatures. On the ground floor and in the galleries there are very few coils, but along the first entablature, at a height of 95 feet, the coils are sufficiently numerous to counteract the loss of heat through the walls, which are no longer traversed by hot-air channels, and to maintain from this level to that of the second entablature—at a height of 145 feet, or 50 feet above the first—a temperature a few degrees higher than that in the parts below. Other coils are fixed above the second entablature and in the lantern of the dome. To avoid the dangerously chilling draughts that would follow the opening of the doors in the intense cold of a Prussian winter, the entrances are provided with double swing doors and coils are placed in the intervening passage. The engineer maintains that the system of heating the upper more than the lower regions of the air is the only proper course in such lofty buildings as churches. He holds that with the ordinary method the air heated on or below the ground level is cooled in reaching the roof, and, fouled by the products of respiration, descends on the heads of the congregation, unless withdrawn by some such exhausting arrangement as is carried out in the English Houses of Parliament; while in his system the fresh air is warmed to an agreeable temperature in its passage through the walls, and its ascent is favored by the coils between the first and second entablatures. The coils in the dome, although they do not contribute to the warming of the parts occupied by the worshippers, serve effectually to prevent the descent of the foul air by securing its continued ascent toward and escape through the apertures in the lantern that crowns the edifice.—Decorators' Gazette.

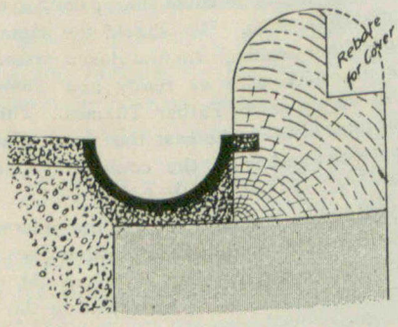
In the construction of a large factory on the site of what was formely the bed of a canal, of Cincinnati, it was found impossible to set a foundation except by driving piles. As wooden piles would rot, resort was had to concrete piles which were successfully driven home by the impact of a 4,000 lb. hammer. The top of the piles were prevented from chipping by the use of a steel bonnet. In some instances it required 400 drops of the huge hammer to sink the pile. This is said to be the first time the this method has been employed in the United States.

SOME NOTES ON MOTOR HOUSES.

With the swift strides made in the automobile industry during the last few years the demand has arisen for a class of building unthought-of a decade ago; and there will soon be but few architects in general practice who will not at one time or another have been called upon to prepare plans and specifications for a motor house. At this early stage no settled definite planning has been arrived at; much that has been done must be looked upon as merely tentative; and I would therefore ask the reader to remember that I put nothing forward as final, preferring my remarks to be treated simply in the light of suggestions, from which (in combination with the opinions and experience of others) some settled lines may in due course be evolved.



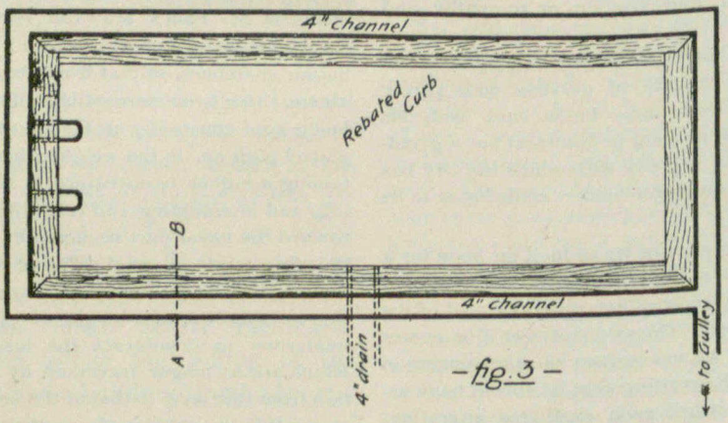
—fig. 1—



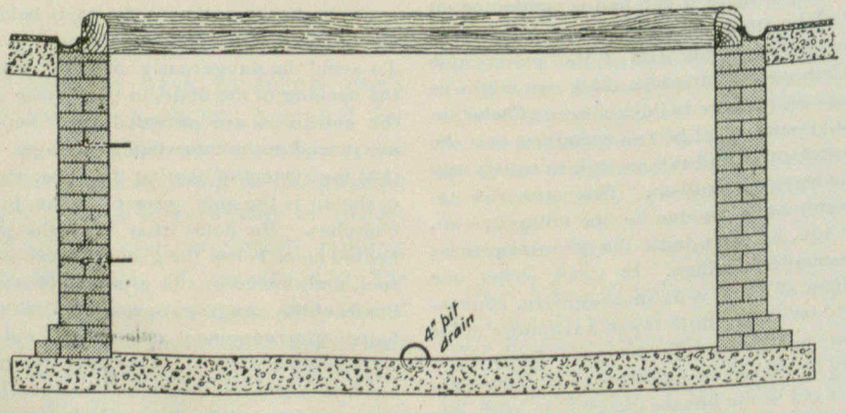
—fig. 2—

It is scarcely necessary to say that nothing of a temporary nature should be deemed good enough for the stabling of a motor car. Wood and corrugated iron buildings, whether portable or fixed, are both unsuitable for the purpose, warmth, dryness and approximate equality of temperature being of first importance in the preservation of a car. It is a poor policy to risk the well-being of a vehicle costing hundreds in order to save a few pounds on the structure in which it is to be housed, and beyond this there is the question of personal safety, which may be seriously imperilled in consequence of the rusting of parts of the machinery or the action of damp upon the fabric of outer covers and the rubber of inner tubes.

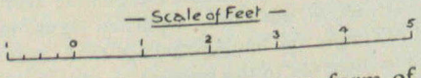
With the style of building I have no concern, that being entirely a matter for the individual architect neither am I concerned with the materials to be employed for walls and roofs so long as they are lasting and thoroughly wind, weather and damp-proof. The walls internally may be finished with struck-jointed brickwork or they may be plastered; but the best finish



—fig. 3—



—fig. 4—



is of course given by some form of tiling, with a dado of enamelled bricks for the harder wear in the lower portions of the walls. Roofs should be boarded and felted and should, if possible have neither rooms nor loft above so that plenty of top light may be obtainable.

In place of the obsolete coach-house doors, steel-hinged wood revolving-shutters or sliding doors should form the entrance, as with these there is no danger of damaging the car by the swinging of a hung door in a heavy wind. The doors, if sliding, must run on an

overhead track, and all framing should be inside, with flush boarding outside to throw off the wet. A paved approach laid to an easy fall leads to the stone entrance sill, which is on the level of the finished floor surface and about six inches above the level of the surrounding ground (see Fig. 1).

The chief figure which distinguishes the motor house from every other building is the planning of the floor, and it is in regard to this that great care must be exercised. Whatever the size of car to be housed, a pit must be provided for cleaning and inspection purposes, and it is advisable (though not necessary) in the case of a double motor house to have two pits, one for each car, so as to avoid the frequent changing of position which would otherwise be necessary. I will, however, confine myself to a single pit. This should be not less than 3ft. wide and 4ft. 6in. deep (see Figs. 3 and 4). Length will depend upon the size of car; but it would be as well to anticipate a little and make it, say, from 9 to 12 feet—the latter size being, in my opinion, the maximum requirement for any make of private car. The pit may be brick built with rendered faces, and with floor finished as the floor of the house, and no care or expense should be spared to render it thoroughly watertight. The drain will discharge outside over a trapped gully, with small inspection pit built up, or an ordinary syphon-pipe with extra inlet carried to ground level (to form inspection eye) may satisfy local requirements. Around the pit is laid a 7in. by 5in. hardwood curb, securely fixed to the brickwork of the walls, the curbs laid in the direction of the length of the pit being rebated to receive the movable covers (see Fig. 2). The curbing should be laid so as to be 4in. above ground level, as otherwise (i.e., with a flush or nearly flush curb) there is a danger of the car mounting the curb and sustaining serious damage by a fall into the pit. Pit-covers are best made in small light sections, so as to be easily moved, and they must be strongly framed (to take the weight of the heaviest car) and provided with flush handles for lifting. Personally, I do not see the need for a cover at all; but owners seem to like them, and after all it is a matter of small moment. Step irons should be built into the brickwork of the pit for access purposes.

The floor itself may be formed of any non-slippery, impervious and hard-wearing material—asphalt or tiles for preference. Around the pit a 4in. glazed stoneware channel is laid flush with the floor and butting against the wood curbs (Fig. 2), and the floor is best made to fall in every direction to these channel pipes, which discharge eventually in the open over a trapped gulley. With raised kerb and the channels no trouble can arise from water finding its way into the pit.

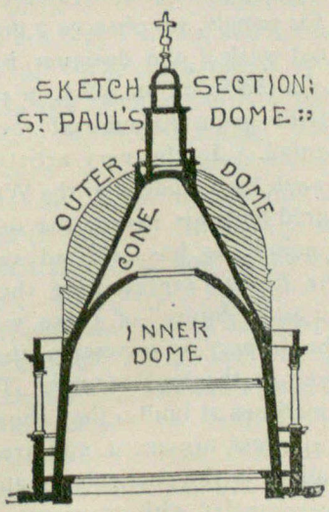
Lighting and heating are matters which require more or less special consideration in each case. I have mentioned the importance of plenty of light; in fact, the simplest way is to "pier" the walls and fill in with solid frames and casements, having small top lights to open for ventilation in addition to the casement sashes themselves, which may all be stayed open in favorable weather. The roof-lantern will afford constant ventilation in practically all weathers. Heating is a necessity, whether by hot-water pipes, radiators or open fires—the selection being left to the judgment of the architect, upon a consideration of the most suitable system. The life of a car (and especially of its working parts) is very much prolonged by housing it in a warm, dry, equable atmosphere. Artificial lighting is another matter which must be regulated by local facilities; to discuss it here would be a waste of space.

Lavatory and water-closet should both be provided, together with a wardrobe for motor garments, rugs, etc., and a drying-room—fitted with pegs, battens and slatted shelves—for the reception of the same after a wet run. The drying-room will need to be well ventilated for the escape of moisture, the heating arrangements depending upon those adopted for heating the motor house. A small workshop is a very handy thing to have in connection with the house; but where expense precludes the provision of this a bench (fitted with vice, &c.) should be fixed in one corner of the house, and racks provided with tools, spanners, wrenches, &c. Wooden harness pegs are eminently adapted for spare covers, and a row of these should be placed in some convenient position. Water must, of course, be laid on, and it is a wise plan to have the taps fitted with unions for hose connection. Petrol is best stored with other oils in a separate building (of however rough a nature), detached if possible.

As to the size of the motor house itself, this will again naturally depend upon the size of the car, but ample room must be left to get round on all sides. Excluding the space required for bench, cupboard, lavatory, &c., a safe size for a small car is 10ft. by 14ft., and from this one may go, in the case of larger cars, up to 14ft. by 20ft. It is the biggest mistake in the world to cramp the building, as an extra foot or two by no means entails a proportionate initial cost, whereas structural alterations for the accommodation of a larger car may mean a heavy expenditure.—B. WYAND in London Builders' Journal.

CHAINS USED IN BUILDINC CONSTRUCTION.

St. Paul's Cathedral, with its celebrated dome, higher outside than inside, was completed by Sir Christopher Wren about two hundred years ago, and he put an iron chain round the base of the cone. The construction of the wooden external dome, the support of the stone lantern by an inner cone of brick-work, quite independent of either the external or internal dome, are wonderful examples of Wren's constructive ingenuity.



In the "Parentalia," written by Wren's grandson Stephen, partly in his own words, partly in those of his grandfather, is this passage: "Although the dome wants not butment, yet for greater caution it is hooped with iron in this manner; a channel is cut in the bandage of Portland stone, in which is a double chain of iron strongly linked together at every 10 ft., and the whole channel filled up with lead."

DESIGN AND CRAFTSMANSHIP.

Ever since the ideas of mankind had to be converted into concrete form, there has existed a gulf more or less wide to bridge over, and even in this twentieth century, with all its arts and appliances, we are still scarcely able to reconcile design and construction. The exhibition of selected works from the various national schools of art we noticed last week shows to what an extent this discordance is still observable. The examiners in their several reports speak with much reserve and caution of works in different branches which indicate this separation. Though in many instances the drawings or designs reach the standard required, the executed specimens sent in show a falling-off ; the designers' ideas have not been realized in some important quality. In not a few cases the subjects attempted are beyond the students' capacity or powers as with regard to the architectural designs. In many more the design has been made in complete ignorance or forgetfulness of the actual condition and limitations of the material ; and directly the student passes the barrier, puts his ideas into execution, he finds a great deal of the beauty and glamour of the conception disappear. These qualities seem to elude his grasp, and in their place we get the hard and intractable qualities of stone, wood, or iron, the want of precision and definition inseparable from moulded and cast materials, and machine tools, the inequalities of form and colour caused by firing in pottery and tiles, and the technical defects inherent in textile and woven fabrics. A decorative design may look admirable on paper ; but when it comes to be translated into the real material, by stenciling or brushwork, by the arrangement of tiles or tesserae or thread, the effect may have been considerably diminished. We notice these defects in most of the stencilled work we see executed, in tile decoration, where the painting and pattern are at variance, and in woven textiles where the technique of weaving is not understood. In furniture, wood inlays for panels, we observe a distinct inferiority in the executed work if the designer has not selected the proper-coloured wood for inlay, or placed them according to their grain to suggest the nature of the object presented. In the very artistic firescreen we noticed last week by a student of the West Ham School for which a gold medal is given, the designer has observed these points, he has selected suitable coloured woods for the figures representing the four seasons, and the grain and "figure" of these woods are made to suggest the drapery or vestments, the hair, even the growth of trees in the background. The designs on paper are sometimes at fault : they show or expect too much ; they suggest ornament and treatments which cannot be realized in the particular material ; they are frequently overcrowded with ornament. On the other hand, the designer may know little of the material he uses or the method of construction ; his selection of material to represent his design may be imperfect, or his method of application faulty. Owing to one or the other of these errors, or both, the execution fails. One sometimes sees a design that is really defective and faulty in itself, yet which by the skill of the workman or artist engaged in execution is produced in a very satisfactory manner. This result is because the craftsman has discerned the designer's intentions, and has put forth his own personal skill in the execution. It is the way in which the success and charm of a good deal of Mediaeval building and detail can be explained. Both designer and craftsman devoted their heart and soul to the work : they put into it their best efforts, and what one failed to do the other rectified or perfected. But under our modern system of workmanship we have no such corrective : the designer does not co-operate with the executive artist—there is little sympathy between them, and so the inferior design is misinterpreted or aggravated in the result. The craftsman obtains no personal interest in the work or extra pay for endeavouring to improve the design or offering suggestions. Why should he trouble to do more than follow the drawing when he reaps no reward for his skill ? So the modern estrangement between the work of designer and craftsman is detrimental. On the other side, the design may be all that can be desired ; but it is placed in the hands of workmen or artists who are imperfectly educated in art, and who do their work in a mechanical way. This is, perhaps, the commoner failing ; it is the one which the architect who carries out contract work so often experiences. His ideas and intentions are thoroughly misunderstood or evaded, with the object of cheapening cost. Such things occur as details altered or cut down, mouldings misunderstood or altered, depth of relief diminished, the ornament mutilated—in short, the design really "murdered." Whichever may be in fault—the design or the material and method employed—the result is disastrous for art. The two things must go together. Design and construction or handicrafts engaged must be linked together, as any disagreement or difference is fatal to both. We may have good construction without skilful design. Thus we may have a building perfect in every trade, and scienific in its construction ; but from error in planning or a discord in the external design it never satisfies. Or we may have the reverse—perfect design linked to a building that is badly constructed, and is always showing signs of weakness and decay. Neither is desirable. The Schools of Art combined with technical instruction have attempted to bridge the chasm—to unite both the artist with the industrial producer. We do not deny a good deal has been done in this direction. Artists and designers have been brought into touch with manufacturers. We have now much better and more satisfactory metalwork, woodwork designs, furniture, pottery and porcelain, stained glass, modelled work, wallpapers, hangings, carpets, and textile goods, and the training in art has influenced our industries all round ; but still there is the distinct and separate training given to each. The designer is still taught to furnish designs based on traditional methods apart from materials and methods of construction, and the craftsman is taught little of the art or methods employed, and is satisfied if he can turn out so much work in a certain time. Other causes have kept the two apart.

The divergence between design and construction or execution is greater under some conditions. Where the artist designs in only one material, the difference is less than it would be if several materials are employed. Thus designs for modelled work are more likely to honestly express the actual result ; but when several materials have to be taken into account in the construction, there is the likelihood that the design cannot express equally well in each the actual want. A work of architecture comes under this category. A building is constructed of various materials ; brick, terracotta, stone, timber, iron, plaster, &c. It is almost unreasonable to expect the architect to beexpert as a designer in

each. If he can express his intentions artistically in brick or stone, we may excuse his faulty details in materials like iron or wood or plaster. The result is that in building the power or ability to design is much more rare; it requires more extended study of materials and trades than the designer in wood or metal, or any other single material. The artist in one material soon acquires a manipulative power over it: he knows its structure and physical peculiarities, and he soon acquires the skill to handle it and to bring out its technical and artistic qualities. Thus in modelled design, in metal or repoussee-work, in tilework and pottery, the results are more satisfactory: a shorter study is necessary in mastering the technical methods, and the designer, in short, is able to express his ideas more directly in the material. So the designer and worker in modelled work or metalwork or carving ought to be the same individual; in the old days they were always so, and it is almost impossible to imagine a designer of sculpture or carving who was not also the sculptor or carver. So in other art-crafts where only one material is employed, like those of wood, or metal or plaster. The most satisfactory results are derived when the two functions of designer and handicraftsman are united. The students' work done in the London County Council Central School of Arts and Crafts is an effort in this direction, the aim being to supply those engaged in artistic handicrafts, training in design and manipulation which is now impossible owing to the subdivision of labour and modern mechanical processes. The modern workshop has not yet assisted in this direction, though to it we must look for new spirit and energy. In architecture the relations between design and craftmanship are more complex. Several materials have to produce the result, requiring a band of trained craftsmen under one head. And the more composite the building is, the greater is the effort required for a satisfactory result. Thus in buildings in which the effect is largely due to one material, say, stone or brick, more unity and harmony of effect is attainable than in a structure composed of various materials, each having its own limitations and methods of execution. Thus it is that in the designs contributed for buildings there is a larger number of failures than for designs in one material. In this connection the question of the architect being capable of executing his own designs (if possible) comes in. There are many who protest, and of course, the "professional" architect is chiefly averse to such an idea. It is, of course, nowadays at least, quite impossible to imagine any such a union as architect and craftsman, although it is obvious it is all the better for the designer to have an acquaintance with the conditions and limitations of the work he is designing. But, as we have hinted, he would have to be a craftsman in each of the materials employed in a building—an impossible thing nowadays at least. Imagine a Scott, a Street, or an Aston Webb so engaged. As Mr. Walter Crane has put it, an architect would not be able to pay his rent and taxes if he did so; yet, he observes, with some force, "If a designer does not realize the conditions of his design and the nature of the method, and the materials by which it is to be carried out, he cannot practically design at all." We will not discuss the point now, or how far such a combination as an architect and craftsman is possible; but it will be admitted that designers have imparted some freshness into crafts that had sunk deep into trade ruts. It may be an ideal, but not a practical mode of working. Designers of buildings and decorators must now intrust a great deal of their work to trained assistants—such, for example, as the repetition of a pattern like a scroll or ornament, or the details of woodwork or ironwork. It would be wasteful of his time and energy for an architect to have to execute or even supervise every detail of a building. The workshop system is one way by which the difficulty can be solved—that is, a designer co-operating with assistants or craftsmen whom he can train and inspire, and from which band of workers others may learn the craft. As one writer says, every designer should be able to take up the craft for which he is best adapted. There are some crafts which depend more on individual expression (as those of one material) than others. These are best in the hands of men who can design as well as execute in them.

Our leading artists and designers now look to the workshop and the studio as the main sources of inspiration. Mr. Ashbee has remarked that art must be carried on in the workshop and not in the studio, and he draws a graphic picture between the workshop and the studio. The latter is described as a "Happily situated nest somewhere in the region of villas and top hats; it is fitted with all apparatus for the lighting, lifting, and wheeling to and from exhibitions of the large masterpiece, and it is ornamented with all the conventional gusto of the prevalent Queen in-Anne-ity. Within these are scraps of damask silk, bartered from Roman curiosity-shops, divers subjects under way, various Madonnas of the future, suggestions of decorative work sprayed upon the odd moments of panels. There is a cast from studios, a photogramme of Millet, a skeleton, and a lay figure. In the corner a pair of embroidered slippers. . . . The inmate for whom these things have their being works hard, appreciates the solitude and silence of his surroundings, and is comfortably conscious of his Bohemianism. In the afternoon there are lady visitors, and his servant brings in five-o'clock tea." The workshop is almost as light as the studio, though less pleasantly situated, and near the racket of some big thoroughfare. But what matters noise? There is noise within—hammering and sawing and what not. Nor are the internal surroundings as pleasant to look on. Blue whitewash takes the place of damask fragments, and movable gas-jets of patent reflectors. The place is in a condition in which no housewife would enter it, and the gluepot is simmering on the stovepipe. As to the fittings, there are benches and racks for the tools and a good deal of grime. To hang up prints would be inadvisable . . . . The inmates of the workshop pursue their avocation with the regularity of clockwork; a light in their faces, perhaps of an armed resistance to something—and the dinner-hour at twelve o'clock is enlivened with the perusal and discussion of racy paragraphs from the half-penny radical prints. These are the two pictures; but I hold that in the higher sense the proper place of decorative art is the latter." And the same writer goes on to say: "In the first place, the right understanding of forms of ornament—elements of design—is only possible in their direct bearing on forms of material—elements of construction. You need your basis of matter wherein to engender the spirit. You must understand the stone, the wood, the pigments, the clay; what each can do, what its limitations are; and this means an understanding—if merely for the sake of conceiving our

own incapacity to use them—of the tools that are the guardians of these limitations. 'Rivington's,' that famous tome of building construction, whose pyramidal ascent of facts has to be scaled before youthful architects pass Royal Institute examinations, would lose half its value if it were not for the fact of the isolation of the architect's studio, euphemistically termed his office ; but a half-hour in the workshop would save days of fruitless drudgery over its pages." As he says, every hour in the workshop reveals something, or we may go to our studios and copy realistically ; but, given the knack, it always remains easier to copy realistically than to master the limitations of material. It is true also that ideas may be conceived in solitude, but they are brought to birth by co-operation. By coming together creativeness is engendered by the very magnetic affinities that spring up between men.

Academies and exhibitions—the agencies of modern times—have had a blighting influence on practical art by encouraging the sensational and unreal. In the old days, the artists of the Italian, German, and Flemish schools produced handicrafts in abundance. As Mr. Yeames, R.A., said some time ago, referring to the drawbacks to art arising from competitions and exhibitions : "Then the artist kept a shop, and priest or noble who wished his church or palace decorated went to his shop, and, if satisfied with his skill and pleased with his designs, commissioned him to decorate a chapel in his church or a portion of his palace. The artist's thought was then to bring his work—whether fresco or carved marble, whether Scriptural subject or fountain with Venus and Tritons—well into harmony with the surroundings of the place which it was henceforth to occupy, and to make it express not only his own fancies and views on art, but also the feelings and character of the man who gave him the order." Nothing sensational was attempted ; there was a community of thought between the designer, the patron, and the craftsman. All concerned worked in unison : there was a harmony between building and ornament, between sculpture and painting, between furniture and vestments. The point chiefly to notice is that exhibitions encourage and foster the unreal and tricky effects of art and draughtmanship, to the detriment of workmanship, material, and texture. In this manner they discourage the practical side of art work. The only corrective to this unreal quality of design is to look at it from the workshop point of view. Under such a system there would be a living tradition in design and workmanship. To the separation of brains and hands we must attribute the present paralysis of art. No one can be so unreasonable as to suppose that there must be no subdivision of labour : the workshop system assumes such a system where designers and craftsmen can learn each from the other, and where there is a helpful co-operation in the carrying out of a building or a piece of decoration. Technical schools are doing something to train designers to execute their own designs in at least some materials.—The Building News.

The joint weekly luncheons of the Toronto Chapter of the Ontario Association of Architects and of the Toronto Eegineers' Club have been resumed. They are held in the rooms of the Societies, 94 King Street West, every Tuesday at one o'clock. A cordial invitation is extended to all engineers and architects to attend.

ARCHITECTURAL CLASSES.

The Mathematical Classes for architectural students conducted by Mr. A. H. Harkness, B.A., last autumn and winter, were resumed in the rooms of the Ontario Association of Architects, 96 King Street west, Toronto, on the evening of Monday, October 10th. Arrangements are being made for a continuance of the studio classes, but announcement has not yet been made of the date on which they will be resumed. These classes as heretofore will be conducted under the auspices of the joint committee of The Ontario Association of Architects and the Toronto Architectural Eighteen Club. The usual fee of $5.00 covering tuition in both courses will be charged. An invitation is extended to all architectural students and draughtsmen to join.

COLOGNE CATHEDRAL.

The present site of one of the finest specimens of gothic architecture in Europe was formerly occupied by a cathedral commenced by Hildebrand, Metropolitan of Cologne, early in the ninth century. Some years later, in common with other churches on the lower Rhine, it was practically demolished by the Normans, and was rebuilt under Williebert, and after twice escaping destruction by fire in the eleventh and twelfth centuries was burnt down in a great conflagration which occurred in 1248.

Soon afterwards the present cathedral was commenced by Conrad of Hochstaden, the design being attributed to Gerhard von Rile, and by 1322 the choir was completed and consecrated. Subsequently the work preceeded but slowly, especially after Conrad's death. At the time of the Reformation the work was suspended, and after passing through various vicissitudes, the repairing of the Cathedral was taken in hand early in the nineteenth century, and the building of such portions necessary for the completion of the whole structure.

The Cathedral is cruciform in plan, and is composed of a nave flanked by double aisles, and transept with single aisles ; the outer aisles terminate at the choir, which is surrounded by numerous chapels. The many richly coloured windows add greatly to the imposing effect of the interior.

NOTES.

Experiments have recently been made in Germany to determine the cohesive power of clay, and, if possible, to increase this power in the natural material. Samples of clay mixed with a two per cent. solution of starch, dextrin and tannic acid were stored for six months side by side with samples mixed only with water. The tensile strength was determined in each case after three week's storage and again at the end of six months. Taking the ordinary tensile strength as one, that of the wet clay was found, after three week's storage, to be 1.35, and after six month's storage to be 1.39. Starch and dextrin did not appreciably increase the tensile strength, but tannic acid gave most satisfactory results, showing the tensile strength during the first three weeks to be 1.75 and at the end of six months 3.22.

Two Canadian patents for fireproof construction have recently been granted. The main feature of one is a network of wires or rods, fastened with hooks to supporting beams, and covered with a reticulated material ; concrete is then placed on top of the beams, rods and this material, and above that are placed alternate layers of felt paper and insulating material, and the floor is laid on top of them. The other patent consists of a fireproof tower containing ventilating shafts, in connection with a system of water-pipes arranged in the ventilating shafts and within recesses in the floor of the building. Other inventions are a device for removing shingles and a tiled flooring.

NORTHWEST NOTES

Branch Office of THE CANADIAN ARCHITECT AND BUILDER,
720-721 Union Bank Building, WINNIPEG, October 14, 1904.

The unchangeable wet weather of the past month has greatly hindered the work of finishing buildings in the city and all classes of work are behind hand in consequence. As the cold weather is approaching, contractors are doing their utmost to complete the many buildings on hand, and every endeavor is being made to get all outside work finished before the winter sets in.

Last fall quite a number of buildings were continued far into the winter, but the expense of supplying the necessary heat when bricks and mortar have to be kept hot to prevent them from freezing, and the additional time required for work on account of the intense cold makes it almost a prohibitory proceeding. We understand, however, that rather than carry some of the buildings under progress over until next spring, that they will be continued through the winter, providing sufficient materials are to hand. This in the winter is very difficult to provide for. Here again the question of transportation comes in, as freight moves more slowly in winter than in summer.

There are quite a number of interesting structures under construction. The new Free Press building on Portage avenue and Garry street is well advanced and about ready for roofing. It is of steel frame construction with concrete floors and consists of four stories and a basement. The frontage is 42 feet on Portage avenue by 150 feet on Garry street. The outside is of Tyndall stone to the ground floor, Lac du-Bonnett pressed brick and stone trimmings for the upper stories, finishing with a copper cornice. The building is to be of the most modern fire-resisting construction, having iron and slate stairs. The interior is finished in oak on the ground floor and in ash above. It is equipped with the Wabash system of heating and is supplied with its own electric plant for lighting, operating the presses, etc. It will be the most up-to-date newspaper building in the Dominion, having some 40,000 square feet of area. The cost will be about $175,000. Mr. H. Stone, of Montreal and Winnipeg, is the architect. Messrs. H. R. Ives & Co., of Montreal, have the contract for the iron stairs.

The Manitoba Club is another fine building, on which work will be continued throughout the winter with the object of reaching completion in the spring. It occupies a very suitable position on the corner of Broadway and Fort streets. The plans show two wings, but at present the east wing will be omitted and added in the future. The building is being constructed of red sand mould brick and Bedford limestone and will have a frontage of 96 feet on Broadway and 82 feet on Fort street. The first and second stories are for club purposes and the attic and basement for attendants' quarters. Separate suites of rooms will be provided in which the ladies can give private parties. For these there will also be a private entrance. There will be a large lawn at the rear of the block on the south side. This again is adjacent to the old Fort Garry Park, where the old fort gate is keep in good repair as a memento of by-gone days; so that the Club House will always have a large open space at the rear. The building alone will cost $80,000; it is to be richly finished and decorated. T. F. & W. A. Peters are the architects.

Another large building that is nearing completion for the present is the warehouse of Messrs. Teese & Peerse. I say "for the present" as it is the intention to put an addition to it next year. The portion now being finished is 60 x 66 ft., five storeys and basement, but when the whole building is completed it will be 240 ft. long by 66 ft. wide. It is of mill construction and designed to carry 600 lbs. to the square foot, live load. All windows are fire-proof, made of galvanized iron and wire glass. It has a private siding, being built on the C.P.R. track at the corner of Princess street. The present work will cost about $25,000 and after the addition is built it will cost about $100,000. H. Stone, of Montreal and Winnipeg, is the architect, Plaxton & Co. are doing the heating, Cotter Bros. the plumbing and J. A. Payne the painting, all of Winnipeg.

J. H. Hough is building a large warehouse on Princess street which will be occupied by the Alaska Feather and Down Co., Limited. It will be 66 x 117 ft., 3 storeys high wtih basement, with two additional storeys to be added later, and will cost about $25,000. Darling, Pearson & Over, of Toronto and Winnipeg, are the architects.

Darling, Pearson & Over are also the architects for the new Post-office to be built on Portage Avenue next to the Free Press building. It will be one of the finest buildings in the city. Tenders are to be in by October 17th, but only the foundation will be done this fall.

Several other large blocks will soon be occupied by the tenants. Bullman Bros'. seven-storey building on the corner of Bannatyne Ave. and Albert St. will be occupied as offices.

Another large stone and brick block 130 x 44 ft. is almost completed. It is on Portage Ave., is three storeys and arranged for stores and offices.

The Macdonald & Wright Block, also on Portage Ave., is about ready for the tenants. It is built of local brick and stone and is three stories; also intended for stores, offices and residences.

Messrs. A. Carruthers, Bros & Co. are just completing their building on Logan Ave.; it is 125 x 66 ft. and has three floors.

H. S. Wilson has a large block 105 x 45 ft. on the corner of McDermott Ave. and Albert St. almost finished. It also is for stores and offices.

There are numerous other large business blocks that are being finished of which mention may be made later.

The past season has seen considerable progress in the direction of providing apartment blocks for Winnipeg, something that was very much needed. Although quite a number are being built still the demand has not been met as is evident by the large number of applications for suites of rooms, in spite of the fact that rents are very high. A very substantial apartment block built of brick and stone on Cumberland Ave. will soon be ready for occupation. It is very well arranged in three floors, steam heated, electric light and every modern convenience. Each floor has two suites complete in every detail. Another block of a similar class is being built on Notre Dame Ave., also a large one three stories high on Fort St., one on Main St. in the north part of the city, and another just commenced on Smith St. near Portage Ave.. One would think the demand for offices and apartments would be well supplied by the end of this year, yet one builder tells me he has had at least forty applications for a suite of rooms in his block and it only contains four suites.

Up to the present time there have been 1,552 building permits issued, covering 2,017 buildings, at an aggregate cost of $8,536,700. This is $3,300,450 above the amount of last year up to the same date. Winnipeg has something to be proud of in the fact that no other city on the continent can reach her in this years building valuation. New York comes second and Chicago a poor third while others follow on down the list.

Since writing these notes we regret to say that Bullman Bros.' fine new block previously mentioned has been completely burned, also J. H. Ashdown's large retail store, just opposite, which had recently undergone considerable alterations and improvements, was completely gutted.

We regret to say that Mr. V. W. Horwood, architect, whose plans were accepted for the Public school at Fort William, is in Winnipeg hospital very low with typhoid. His brother, E. L. Horwood, architect, of Ottawa, is attending to the detail plans.

A large block 132 x 130 feet is being commenced on the south-east corner of Portage avenue and Donald street, just opposite the T. Eaton block. Mr. J. A. M. Aikens is having it built and will fit it up to suit tenants. Mr. Woodman is the architect.

The Dominion Express Company's new stables on Alexander avenue east, have just been opened. They are of modern fire-resisting construction. The present capacity is for 25 horses and rigs. Mr. Woodman is also the architect for this building.

Sproats, Rolph & Chrysler are the architects for C. H. Campbell's new house. The tenders were let for $18,500.

The large addition to the Winnipeg Electric Street Railway will soon be completed; further particulars of which will be mentioned later.

The C.P.R. subway will be ready for opening by November 1st and next month we may be able to give a description of the work. The new station, offices, Immigration buildings, etc., are making rapid progress and are being rushed as rapidly as possible, as the present state of things causes great inconvenience to all concerned.

The Canadian Northern Railway are also building a new station at Carberry. It will be up-to-date and will cost about $6,000. Mr. N. H. Fraser, contractor, has the work in hand.

Summing up the situation in the building trade we find all the contractors in a fairly satisfactory condition regarding the buildings they have on hand. Here and there a building has been delayed for want of material, and bad weather has hindered building. Unusual quantities of rain have in cases caused trouble with the excavating and the foundation work, but on the whole nearly all buildings will be in good shape when winter sets in. Inside finishing work can thus be done during the winter. The towns throughout the province are in the same condition; all building is well in hand for the winter.

To say that the contractors have had a busy season is putting it mildly, as most of them have had so much on hand that they hardly knew what to do first. Architects are very well satisfied and have plenty of work ahead of them to get into shape for next spring.

DIFFICULTIES AND METHODS OF PLASTERING IN WINTER.

Plastering in winter is always attended with more or less unsatisfactory results. The walls possibly do not become hard or they are disfigured by yellow stains or smoked a dark gray color from the fires used to keep the house warm, or there is an unusual amount of cracking ; the white or finish coat rubs off like whitewash or most of the plaster peels from the walls, requiring it to be entirely replaced. These and many other defects are due to very simple causes, which with little care can be easily remedied. So little attention has been paid to the question that the causes of the ill results in winter plastering are little understood.

Heretofore wall plaster has been a mixture of varying proportions of slaked lime, sand and hair made at the building, usually out in the open with no protection from the elements. If cold weather came on the mixture would freeze and could not be used until thawed out, with consequent injury to the binding qualities of the material ; or, as often happens, the frozen mixture is applied to the walls to soon come off as the frost thaws out. Then, too, the quality of lime used varies greatly, and poor lime is cheap. Sand also differs greatly in quality, and sand that contains a large percentage of loam requires less time to bind it together ; but loamy sand makes a very inferior plastering mortar. When lime of the best quality is obtained and good sharp sand is at hand, the proportions that enter into the mixture are uncertain and are guessed at by the laborer who does the mixing. This laborer is the unskilled workman of the job, and if he does not properly manufactnre the mortar all the skill in the world in applying it to the wall by skilled workmen will avail little.

This unsatisfactory state of affairs in making plastering mortar has now been overcome, as many manufacturing plants have been established throughout the country which slake lime by machinery, dry the sand, card the hair, automatically weigh the proper proportions of each and mix the whole together thoroughly by machinery and deliver this mixture in a dry state to the building in suitable containers, usually jute bags. As the material so prepared requires only water to be added at the building to make it ready for use it does away with a great many of the disadvantages of the old way, and has the great advantage of insuring a uniform plastering mortar of very superior quality that is easily handled.

Plastering mortars prepared in this way can be taken into the building and mixed with water in water-tight boxes on the floor where it is to be used, and this avoids all chance of freezing if the building is properly heated, as it should be.

In the treatment of some of the troubles encountered in plastering in winter, we will not consider those met with when plastering mortar is made at the building in the open in the old way, but will consider that if the mortar is made at the building that it is properly protected as far as its manufacture is concerned. With this exception the following comments apply equally to all kinds of plastering mortar.

Plaster is necessarily applied in a wet state and the surplus water has to evaporate or be dried out of it. It is this surplus water and other dampness in a new building that are the chief causes of trouble in winter plastering.

The amount of dampness in a building is very much greater than is usually supposed. In frame structures there is moisture in pretty much everything that enters into it, the brick in the chimneys, the cement concrete in the cellar and bath rooms, even the lumber contains much moisture. In the larger brick or stone buildings with thick walls, concrete or tile floors the amount of moisture is very great. The greater part of this moisture will have to be dried out of the building sooner or later, but until this is done it is liable to be a source of trouble, and this is particularly the case in winter.

The methods used to get rid of this moisture are for the most part crude, and in many cases are the causes of greater trouble than the moisture itself. In hardening, the plaster of paris and lime in wallplaster combine chemically with some of the water, either in the form of water of cystalization or in formation of hydrates. Therefore, all of the water added to wet the plaster does not have to dry out. The so-called hard or patent plasters all contain more or less plaster of paris, they do not require as much water to be dried out as other plasters that do not contain plaster of paris ; in other words they dry quicker. This chemical change or hydration takes place gradually, and it is not desirable to dry the plaster so quickly as to prevent its taking place properly. An overheated building is quite if not more injurious than an underheated one. The majority of builders regard the ideal drying conditions in winter an overheated tightly closed building with no circulation. This is far from being right. Circulation of air is, if anything, more important than heat, if the outside atmosphere is above freezing. On such days as the atmosphere outside is very damp and moist, it is better not to open the windows.

The ideal condition is to have a gentle heat to keep the atmosphere warm, and allow sufficient circulation of air to absorb and carry off the moisture. It is especially important that the heat should be kept up during the night. The proper way to accomplish this is to have the heating apparatus installed in a building and in working order before any plaster is applied. Temporary connections can be made and heaters placed in the middle of the room. By doing this and observing the simple precaution of opening the windows from the top during the day time to allow a free circulation of air to let the moisture out, the greater part of the troubles of winter plastering would disappear. No time is gained by not doing this, and it is a mistake to think that a building can be plastered quicker by starting the work before the building is properly heated. On the contrary it is much quicker to delay starting the plastering until the heating apparatus is in working order, as the plaster dries out within a few days' time in this case, whereas it is liable to be weeks and months when this is not done.

With a temperature sufficiently high to evaporate the moisture, the plaster dries quickly, and the rest of the work can follow at once, but the usual method is not to wait until the heating apparatus is in order, but to enclose the building with muslin screens and use stoves, salamanders or open fires to dry out the building. Usually the fires are not kept going at night, and in consequence the building (which has probably been overheated in the day time, as is always the case of the ceilings in the rooms in which the stoves or salamanders are placed), is allowed to become cold at night. The chances are, too, that no precaution has been taken during the daytime to permit a draught of air to circulate through the rooms to carry off the moisture. What is the result? The heat of the day vaporizes the moisture and the cold of the night, after the fires are out, again condenses it and it settles on the plastered walls and is absorbed, or if the temperature is very low the moisture freezes on the face of the plaster, which is found covered with ice the next morning. In many cases this process of heating by day and cooling by night is kept up for weeks, with the moisture for the greater part still in the building at the end of that time, or possibly a sufficient amount of it has been gotten out to make the plaster appear sufficiently hard to finish, and the finish coat is applied. Each coat should be thoroughly dry before the next coat is applied.

After applying the finish coat of plaster all moisture from the under coats has to dry through the finish coat, and as the finish coat is denser and more compact than the under coats it takes very much longer for the latter to become dry after the finish coat has been applied than if this drying had taken place before the application of the last coat. The results are usually as follows :

1. The Effect of Dampness Remaining in Plaster.—The most serious effect of plaster remaining damp and

soggy and not drying out in proper time is to cause it to lose its set or strength, and in consequence it does not become hard. In other words the result is the same as if the plaster has been retempered. It is a well known fact that with plasters or Portland cements when they are retempered their strength is lost.

As time goes by, therefore, the plaster that has been allowed to remain wet and soggy dries out, but it is very apt to fall from the wall or crumble away like so much sand.

2. Staining Due to Dampness.—The scratch and browning coats of plaster should be perfectly dry before the finish coat is applied. If the finish coat is applied before the scratch and browning coats are dry, any staining from the wood lath (sap) or from brick or terra cotta walls will be carried by the dampness through to the surface of the finish coat, leaving a discoloration or stain. All moisture in the scratch and browning coats, and for that matter in the brick walls as well, dries out through the finish coat, with the result that the latter remains damp until all this moisture has entirely dried out. This seriously injures the finish coat and it is liable to remain soft. In large office buildings where the walls are massive, the dampness remains in the plaster for a long time, and beads of water are frequently seen standing on its surface. In case of brick walls when the water evaporates it leaves long, fine crystals of substances that have been brought to the surface in solution. Usually these substances are crystals of carbonate of soda, chloride of soda or other soluble salts. The use of damp-proof paints on brick or terra cotta walls, before plaster is applied, prevents much dampness coming through the plaster and should be used whenever possible.

3. Effect of Frost on Scratch and Browning Coats of Plaster.—The general effect of frost on plaster is to seriously injure its binding qualities or strength. The plaster becomes soft and does not set hard, and the plastered wall that has been frozen, is liable to fall. If the frost has gotten into the first or scratch coat of plaster and causes it to lose its strength, it will not be strong enough to hold up the two succeeding coats (browning and finish), even though no frost has gotten into these last two coats ; but should the scratch coat not be injured to such an extent as to cause it to fall, the frost will thaw out and in this process push off the browning and finish coats.

It is not an uncommon thing to see the browning coat separate from the scratch coat in large sheets where frost has affected the latter. In like manner, if frost gets into the second or browning coat, this will be damaged, as in the case of the scratch coat, and if the third or finish coat is applied while frost is still in the browning coat, the finish will be pushed off in sheets when the frost thaws out, just as was the case of frost in the scratch coat.

4. Effect of Frost on the Finish Coat of Plaster.—Frost causes the finish coat of plaster to become soft and chalky and without strength or hardness. The finishing coat rubs off like whitewash and is a constant source of annoyance to the occupants of the house.

5. Plaster Appears Dry. — Scratch and browning coats of plaster appear to be dry on the surface when, in reality, underneath the surface they are still wet. This appearance is often misleading and the finish coat is applied too soon, with the result of having the finish coat remain damp until all the moisture has dried out from the under coats. As the finish coat is less porous than the scratch or browning coats, it naturally takes longer for a wall to dry that has had the finish coat applied while the under coats are still wet, than if the moisture in the under coats were allowed to dry out before applying the finish coat. This dampness in plaster is the cause of the disfigurement of decorations.

6. Staining and Cracking Due to Use of Salamanders and Coke Pots.—The sulphur and smoke from the coke or coal used in the salamander disfigure plaster. The smoke blackens the wall, but the sulphur of the coke unites with the lime in the finish of the plaster and forms sulphide of lime, which is yellow. These are the yellow spots or blotches that appear so often on the surface of plaster that has been applied in winter time. As the sulphur only units with lime when it is damp, these yellow stains appear in round spots, the moisture drying out in small circles, just as if water were dropped on blotting paper and were allowed to dry. These small damp spots absorb the sulphur of the coke and cause an unsightly wall. The small furnace used by the plumber also adds to this yellow staining. Coke pots, when placed to near the recently plastered wall, are apt to dry it too quickly, and, in consequence, draw the wood lath, causing the lath to twist or buckle and the plaster to crack.

7. Decorating on Plaster that is not Thoroughly Dry.—When plaster is damp, as shown above, the lime which is a constituent of the finish coat of all plasters (there is no exception to this rule) acts as a bleaching agent. Paper applied on damp plaster, therefore, will fade or discolor, and paint or kalsomine will be similarly affected. Naturally the more delicate the tints of paper or kalsomine the more liable they are to be affected. Often rooms are repapered and repainted, and even the second application of paper or paint is spoiled. If the dampness in the wall is excessive, the paint is pushed off from the plaster and peels off in spots several inches in diameter.

Walls should be thoroughly dried before they are decorated and this takes time. If proper care has been taken in heating the building when the plaster was being applied, and this heat has been kept up until the trim is on and the walls are hard and dry, there is no reason why with proper precaution the walls cannot be decorated. Paint is very much less affected than kalsomine or paper. Delicate shades of either are more liable to damage, but if the walls are properly sized they can be decorated with satisfactory results. If very expensive decorations are to be made directly on the surface of the plastered walls it is best to allow the walls to become seasoned for at least one year. When decorations are on canvas or if burlap is used instead of wall paper little trouble is experienced. The trouble lies in the mistake that plaster that is hard and does not feel wet to the touch is considered by most persons to be dry, but this is far from the truth.

As poor drying conditions in winter are the cause of the troubles of plastering in winter, replace them with proper drying conditions and there will be no trouble. This can be easily brought about by observing the following simple precautions :

First, a building should be well enclosed. Nothing is gained in time by starting plastering before a building is properly ready to be plastered.

Second, a building should be well heated by furnace, steam or hot water heat. Salamanders, coke pots, stoves or open fires should not be used. They are not necessary and their use does not hasten the work. If, however, they are used their bad effects can be materially lessened if care be taken in their use. In case of coke pots or salamanders have them lighted out of doors, so that the first smoke will pass away and the coke become well ignited before they are placed in the house. Coke should always be used and not coal, as there is less sulphur in coke and less smoke than in coal.

Third, a building should be well ventilated. The windows should be opened from the top in the daytime and closed at night. This allows the current of air to circulate through the building and carry out the dampness. It is a great mistake to keep the building tightly closed during the time it is being plastered. Fresh air is a good dryer.

Fourth, if the precautions in regard to properly enclosing, heating and ventilating a building are looked after carefully, there will be little trouble with winter plastering. It is not well to paper or paint too soon on new plastering. Even under the best conditions, the plaster finish acts as a bleaching agent, and it should be well seasoned before it is decorated. When it is necessary to decorate quickly, the precaution should be taken of using canvas or an extra heavy coat of sizing before either papering or painting.—D. L. Haigh in Engineering Record.

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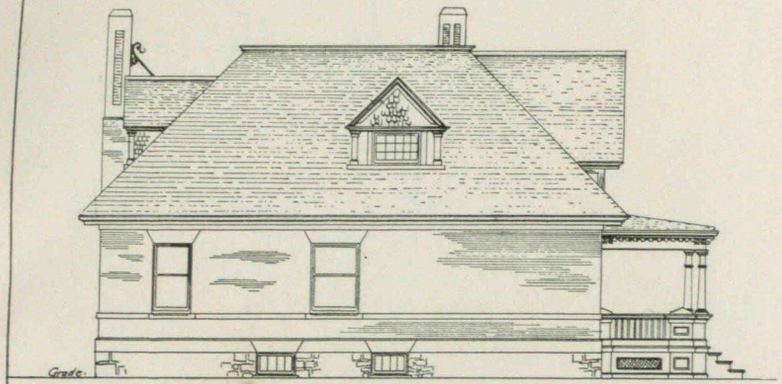
Mr. Sanford F. Smith, of the firm of Sanford & Smith, architects, Toronto, was married on September 28th to Miss Mabel Beatrice Breyman, of Ottawa.

At Woolwich Arsenal recently transverse breaking tests were made of plate glass from several factories. The thickness of the glass varied from ⅛ in. to 1 in. and the span from 8 ins. to 24 ins. The modulus of rupture, which ranged from 2000 lbs. to 8,000 lbs. per sq. in., was generally greater with the lesser thicknesses. Of the various kinds of glass tested—rough, ribbed, polished and wired—there was little difference in strength except that the wired glass showed a little greater strength than the other kinds. The strength was also greater for the "sandwiched rolled" than for the solid rolled wire glass. The strength of glass set in frames was practically double that of the specimens tested transversely.

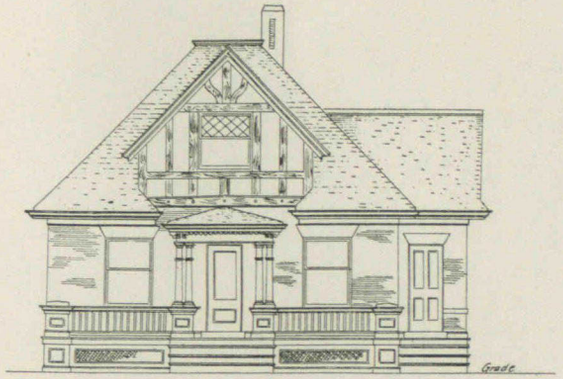
DRAWINGS OF BRICK VENEERED COTTAGE FOR E. SHAGFIELD ESQ. BRANDON, MAN.

Scale 1/8"-One Foot.

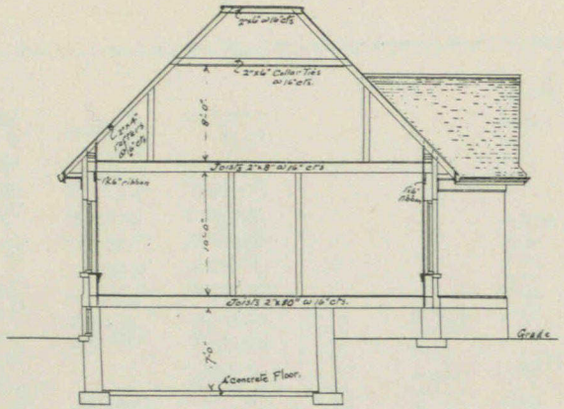
W. Nicholson Lailey,
Architect
Brandon.



NORTH ELEVATION



FRONT ELEVATION.



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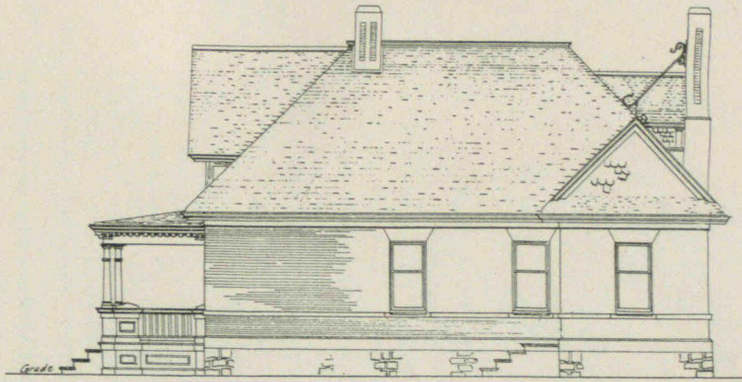


SOUTH ELEVATION.

Cottage at Brandon, Man.

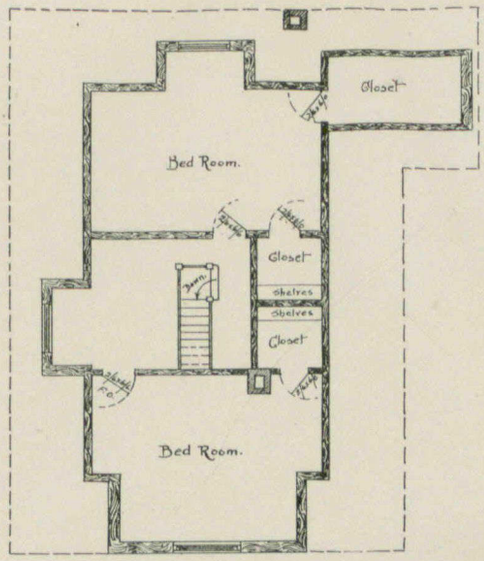
W. Nicholson Lailey, Architect.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
OCTOBER, 1904

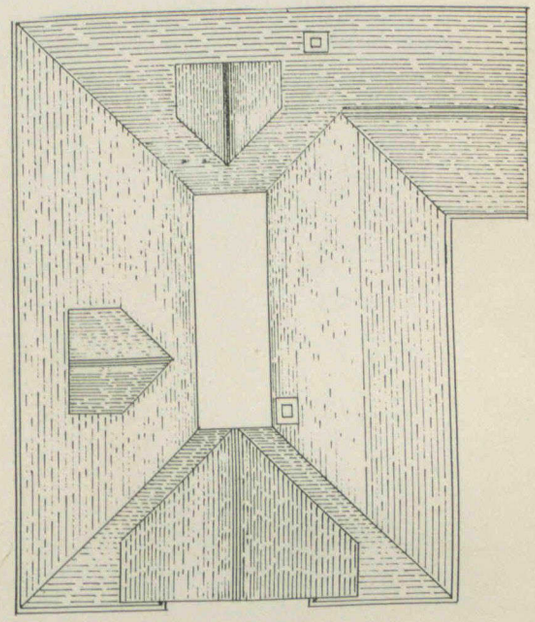
DRAWINGS OF BRICK VENEERED COTTAGE FOR E. SHAGFIELD ESQ. BRANDON, MAN.

Scale 1/8" = One Foot.

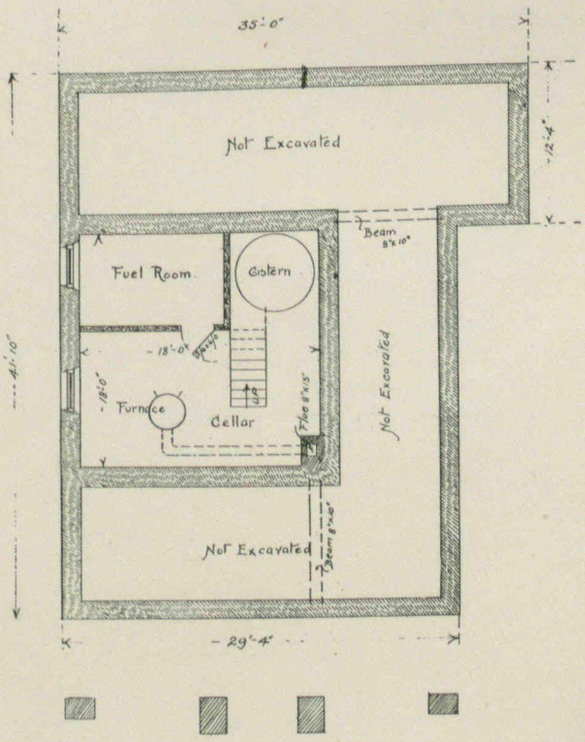
W. Nicholson Lailey.
Architect.
Brandon.



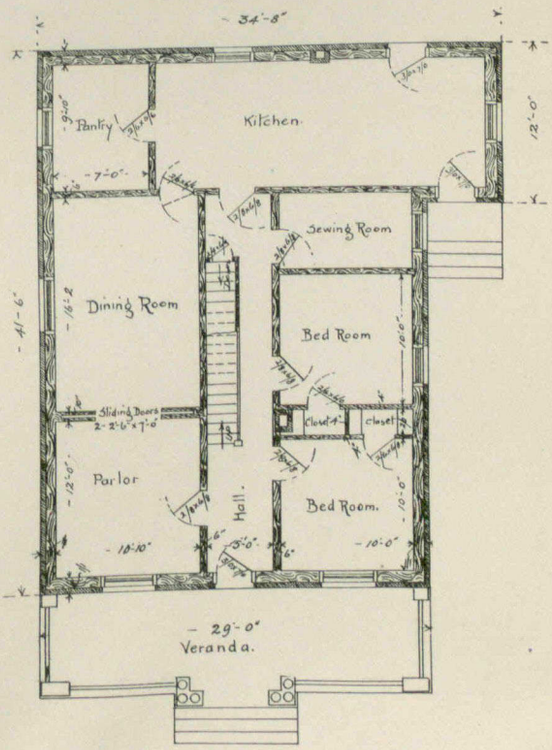
ATTIC PLAN.



ROOF PLAN.



BASEMENT PLAN.



GROUND FLOOR PLAN.

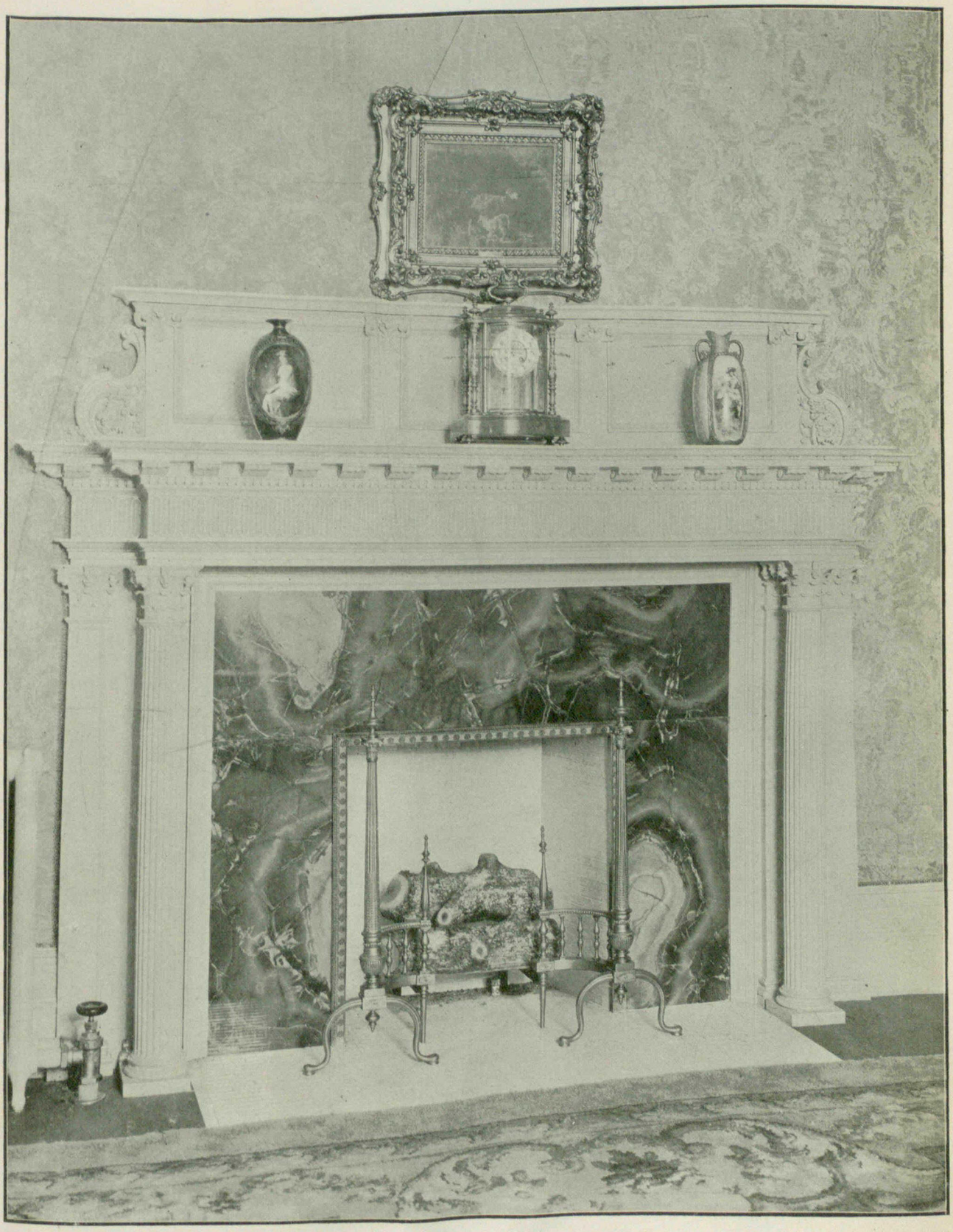
COTTAGE AT BRANDON, MAN.
W. NICHOLSON LAILEY, ARCHITECT.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
OCTOBER, 1904

House for Mr. Sanford Evans, Winnipeg, Man.

George Browne, Architect.

SUPPLEMENT TO
DIAN ARCHITECT AND BUILDER
OCTOBER, 1904



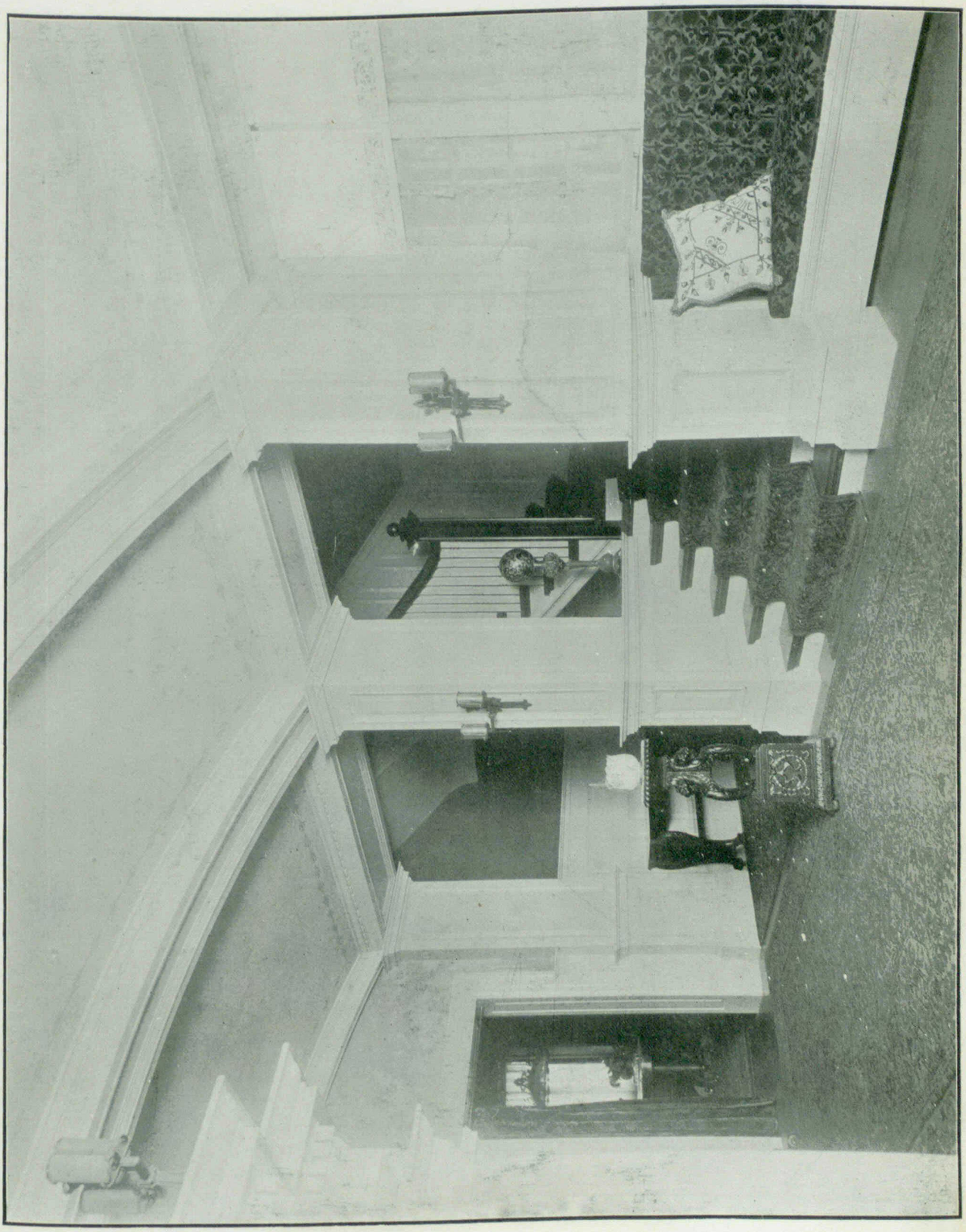
FIREPLACE IN HOUSE IN QUEEN'S PARK, TORONTO.

SPROATT & ROLPH, ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
OCTOBER, 1904

HOUSE IN QUEEN'S PARK, TORONTO.
SPROATT & ROLPH, ARCHITECTS.

SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
OCTOBER, 1904



STAIR HALL, HOUSE IN QUEEN'S PARK, TORONTO.

GERMAN REGULATIONS FOR REINFORCED CONCRETE.

The regulations as to reinforced concrete in building construction issued in the form of a circular by the Prussian Minister of Public Works are a most important contribution to the subject and deserve the closest attention of architects and engineers in this country. These regulations are entirely commendable. They are based upon a recognition and understanding of the real nature of armoured-concrete construction ; they are so framed that invention and originality of design and technical methods of execution are not unduly interfered with ; and they are drawn up with due regard to avoidance of annoyance by unreasonable inspection, &c., which too often is a feature in our by-laws, causing delay and increase of cost. The latitude which these regulations give the officials to grant concessions where engineers or contractors can show good reasons for modification is particularly worthy of note, being a model of what our own building by-laws should be, especially in rural districts, for the red tapeism of standing by the strict letter of the law is a crying evil. The regulations officially acknowledge the pretensions of advocates of concrete-steel construction that, provided proper care is taken in the choice and admixture of materials and in the execution of the work, the stresses in members constructed of these two materials in combination can be very exactly determined, and they specify rules and give data for the design of structures on this system.

It will be seen that the Prussian authorities take the coefficient of elasticity of steel as fifteen times that of concrete, whereas ten times is considered sufficient by many ; but the regulation is on the right side for safety, and as the authorities express their willingness to allow a concession on sufficient showing we see no reason for complaint. Again, in columns it is stipulated that the concrete shall not be stressed beyond one tenth its breaking stress nor the steel beyond one fifth. This is also on the side of safety, but most engineers would probably be ready to work with a much smaller margin of safety where ordinary care is exercised in execution. It is a wise provision that all the tensile stresses in a beam shall be treated as being resisted wholly by the steel reinforcement, for while well-made concrete may theoretically be capable of offering a substantial resistance to tensile stress, the impossibility of determining cracks or weakness in the concrete prevents any reliance on this in structural calculation. The common theory of flexure by which the intensity of bending stress varies directly as the distance from the neutral axis is prescribed by these regulations for beams, in view of its simplicity.

Some authorities, we might point out, have endeavoured to supplant this common theory with a complicated one or an arbitrary law such as the variation of the intensity according to the ordinates of various curves, in view of the observed result that the common theory of flexure does not hold good throughout when an armoured-concrete beam is tested to failure ; but considering that there is just as much, if not more, variation from the same theory in the case of steel beams tested to failure, the wisdom of using such a simple method of calculation within the limits of ordinary working stresses for this new method of construction is apparent. It is also stipulated that stresses shall be conveyed to the steel reinforcement by the form of the latter as far as possible, but where this cannot be done the adhesive stress of the concrete for the iron shall be computed. This regulation is drafted in view of the fact that actual experience has shown that while the bond between the steel and the concrete is of material value, and may even be high, its amount is frequently uncertain, and with a view of giving to the steel reinforcement the stress which it must carry the form of the steel bars employed has become of great importance.—Builders' Journal.

THE ACTION OF LIGHTNING ON BUILDINGS.

Mr. Killingsworth Hedges, the Hon. Sectreary of the Lightning Research Committee of the Royal Institute of British Architects, in a paper written for the British Association Meeting at Cambridge, gave some results of the investigations as to the principal causes of the failure of the usual style of lightning rod as fitted on the buildings investigated. They are stated thus :—(1) Insufficient number of conductor and earth connections ; (2) the absence of any system of connecting the metallic portions of the buildings to the lightning conductor, especially the interconnection of the finials, rain-water pipes, and gutters. In the author's opinion the frequent damage by side-flash from the conductors might be lessened by running a horizontal conductor along the ridge, or along the parapets of all the roofs, somewhat after the method which is almost universally adopted in Central Europe. The lightning strokes may be divided into three classes : (1) Those where the conductor conveyed a portion of the flash to earth, but the side-flash to other unearthed metallic conductors damaged the building ; the practice of running the conductor round the projecting masonry, often taking sharp bends, doubtless facilitated the deviation of the current from its direct path to the earth. (2) In several observations a metallic roof of large area received the flash, consequently became highly charged, and the single conductor failed to convey the whole of the stroke, a portion of which took a circuitous path—for instance, through a speaking tube and an electric bell wire. (3) A flash struck the building at two points simultaneously, a lightning conductor taking one part of the stroke, but damage was caused by the other portion selecting an unprotected part of the roof.

With a few exceptions earth connections had the defect common to nearly all earth-plates which are simply buried in the ground close to the foundations of a building, and owing to drainage soon became dry, consequently are of very high resistance. Architects as a rule object to sufficiently deep holes being made near a structure ; consequently the permanently moist ground is not reached. The tubular earth designed by the author does away with this objection, and can be kept moist by leading a small tube to the nearest rain-water pipe. Although the utility of the external metal was specially put forward in the report of the Lightning Rod Conference in 1882, their recommendation has been apparently disregarded in all the cases under review. The Cavendish Laboratory stroke, which was fortunately unattended with danger owing to the gas in the gas-pipe which formed the path of the current being turned off, would not have taken this circuitous path had the leaden roof been connected to the conductors which ran down the tower only, also to the rain-water gutters and pipes, which should have been interconnected at the bottom and properly earthed. Again, at Bedford last year, St. Paul's Church was seriously damaged by the flash leaving the single conductor on the tower by the water on the roof and passing thence to earth by means of the rain-water pipes. In this case it is interesting to note that the lead pipes were not fused, but their round section was changed into an oval one ; the iron water-pipes were broken. This incident and that at St. Pancras Church, Euston, show clearly that the damage was due not to

direct stroke, but by a portion of the flash leaving the main conductor and taking a circuitous path round the unconnected metal work outside and inside the buildings.

Quite the most interesting case is that at Possingworth House, struck in June and again in August, 1902, although the roof fairly bristled with air terminals, every chimey being protected, mostly with its own conductor and earth connection. It is probable that on the second occasion the flash divided, one part selecting a chimney stack, which is damaged, bending the air terminal to an angle of 45 deg., while the other, neglecting the many points, fell on an unprotected statue much lower than the chimney and went to earth by the iron frame of a conservatory, showing the unreliability of a number of independent conductors which should have been interconnected by means of a horizontal wire led along the ridge; this would in all probability prevent any serious damage. Sir Oliver Lodge has shown by an interesting experiment that a column of hot air is often selected by a flash although a lightning rod may be affixed to the side of the chimney. Most of our large stacks have a band of metal to which the air terminals are fitted, and from these two conductors should be led to earth. The method adopted in Germany appears to be simpler, and consists of a heavy iron frame rising to a sufficient height above the stack, and continued at the apex so as to form an aigrette. That lightning may prefer the smoke issuing from a chimney was shown by the stroke at the East London Waterworks, Sunbury, last year, the flash doing some damage to the capping before it arrived at the standpipe inside, which was a perfect earth in that it was in direct connection with the company's mains.

There is very little advantage in placing isolated rods on an ordinary building unless it has a high tower. A church, for instance, with a spire should have at least two conductors from top to earth. Even then, if any other part of the structure happens to be in the path of a discharge from a cloud to the ground, the stroke may disregard the protected towers or spire and fall on the building, choosing some lower point. If the suggestion put forward by Sir Oliver Lodge at the Bath meeting in 1888 were more closely followed, and the conductors so arranged that they form a protective network over all the roofs, a flash would in all probability be received by some portion of the system and pass without harm to the ground by one of the numerous earths to which the network would be connected. The insurance offices appear to disregard the question of adequate protection, and are quite content if the single conductor which has not prevented serious damage, for instance, to a church is replaced, and, moreover, take no steps to have the earth connection tested periodically; also the few unconnected lightning rods erected on our national museums, picture galleries, and other public buildings, contrast most unfavorably with the more scientific methods adopted on the Continent, more especially in Germany, where in some districts the local authorities have issued rules as to the erection and testing of lightning conductors, to which the various public bodies have to conform, and in some cities householders are subject to a penalty if the system is allowed to get out of order.

NOTES.

On the continent and especially in Germany it is the usual practice to introduce hinges or pivots at the springings and also at the crown of arches, whether built of stone or concrete, with the object o concentrating the pressures at certain well-defined points and enabling the arch to make small movements, so as to adapt itself readily to the influence of external forces without developing cracks and fissues. The chief causes of such movements are changes of temperature, operations of striking centres, unavoidable unsymmetrical distribution of rolling load.

It is sometimes desired to darken glass where the light falls too strongly. The following method is a good one for the purpose: Prepare as if for oil colours some sugar of lead with boiled linseed oil, and carefully lay this evenly over the glass with a hog's hair tool. This distribution is best accomplished by a dabbing movement, until the appearance of ground glass is produced. When dry this will be found to have the effect of obscuring the glass which still remains transparent.

The sixth International Art Exhibition of the municipal council of the city of Venice will open on April 22nd and close on October 31st, 1905. It will contain pictures, sculpture, drawings, engravings and objects of decorative art. The exhibition is founded by and under the administration of the municipality. The exhibition is divided into Italian, Foreign and International rooms. The works of artists not personally invited are subject to the verdict of an International Jury of Admission. Works already shown in Italy will not be accepted at the exhibition. The city of Venice will give some honorary diplomas to the best decorated rooms and some gold medals to the best works. Articles intended for exhibition must be notified not later than January 1st, 1905.

THE APPRENTICESHIP QUESTION.

The National Association of Master Plumbers of the United States, at their annual convention held in St. Louis recently, set forth their position on this question by resolution as follows :—

"Be it recommended that the apprenticeship committee feel that all local associations of Master Plumbers should at all times have control of the apprentices, and not the journeymen, and it is further reccommended that local associations, on making agreements with their journeymen, should insist on regulating the number of apprentices to be employed at the trade, and not let the journeymen regulate it for them, to the total abolition of the apprentice, as it now exists in several localities."

ARMORED CONCRETE VAULTS.

To the Editor of THE CANADIAN ARCHITECT AND BUILDER :—

I was interested in your paragraph in a recent issue of the CANADIAN ARCHITECT AND BUILDER on "Vaults" and the reference to the Baltimore Fire. I agree that brick and cement work properly built fulfils in a great measure its purpose in protecting valuable documents,etc., but I would prefer "armored concrete" as a building material for vaults, in fact for any fireproof work. It may interest some of your readers to know that two armored concrete vaults have been constructed quite recently right here in the city of Toronto—at Messrs. Eby, Blain's warehouse in Front Street. The walls were 25 inches thick supported on a solid foundation 4 feet thick of cement concrete, with an air space in the centre of the walls of 2" galvanized iron sheeting properly ventilated. The ceilings were heavily armored with sheets of expanded metal; iron rods placed diagonally and cramped at the ends, and 10 inch rolled steel joists imbedded in the concrete, which was 3 feet feet thick. The doors of the vaults were properly built in the concrete.

I have had considerable experience with armored concrete and I firmly believe that it is the best material for vault construction. The cost may be a trifle in excess of properly built brickwork in cement. It has been proven that cement concrete will withstand the effects of fire better than brickwork.

The subject is one of great importance to the merchants of Toronto, as many must surely know by bitter experience by losing valuable documents and business records in the late fire. One has only to walk through the fire district to-day and see the miserably constructed vaults of bricks and mortar of the poorest type, still standing total wrecks amongst the ruins.

Respectfully yours,

ROBERT BENNETT,

Concrete Engineer and Specialist.

Toronto, October 4th, 1904.

NOTES.

E. James & Company, roofers, etc., Montreal, is composed of C. O. Darcie and A. T. James.

F. E. Came, manufacturer of railway appliances, St. Croix, N. B., is reported to have assigned on demand of Arthur Hersey, of Montreal. The assets are stated to amount to $63,000, with liabilities somewhat less.

A fourteen storey New York office building, containing 927,000 cubic feet of space, shows a consumption of 118 to 125 tons of coal per month, or an average of 48 tons per day, equal to 11½ pounds per day per 1,000 cubic feet of space.

A paper read before the chemical section of the Franklin Institute a short time ago dealt with the durability in pigments, and showed the advantage of microscopical examination. This is the more important where the object is protection rather than decoration; and one point brought out clearly in the paper read was that the current arguments for thinning out paints with oil to make them cover more surface are fallacious.

A well-designed chimney stack is not only useful constructionally, but if arranged at the end of a house, gives great character and charm, and deserves much time and attention being spent on it. If building in brick, try and plan your fireplaces and flues so that the chimney stacks are solid and square; anything is better than a long flat chimney of some ten or a dozen flues and only 18 in. wide! Its effect is always poverty-stricken, and the additional brickwork in the chimneys makes them stronger and warmer, and consequently able to draw better.—Mr. Guy Dawber.

NEW CEMENT BRICK MAKING MACHINE.

The following particulars are given of a machine designed for the manufacture of cement bricks which has lately been introduced into London, Eng.:—It consists of an iron frame provided at one end with a rectangular box, divided into two compartments, the bottom of each being formed by a loose board, supported by a frame attached to the upper end of a mechanical movement, through which vertical motion is imparted to the board. Thus the bottom of each compartment can be raised to the level of the top edge. One side of the rectangular box, as well as the diaphragm parallel thereto, is slotted vertically in such manner as to permit the entrance of parallel knives, which are moved horizontally by means of a lever, and in their final position they divide the two compartments of the rectangular box into ten compartments, each of the size of an ordinary brick. The process of brick-making may be thus briefly described:—(1) A supply of mortar, in the proportion of one part Portland cement to three parts sand, is mixed near the machine; (2) the compartments of the rectangular box are filled with mortar, which is well rammed in so that the corners may be thoroughly filled; (3) the horizontally moving knives are drawn into their final position, cutting the mass of mortar into the form of ten bricks; (4) the knives are drawn back to their original position; and (5) the lever raising the movable bottoms of the compartments is operated, and the bricks are thereby brought out of the mould and can be carried away to await setting.

One of the latest innovations to be practically tested is cement roofing tiles, which are made one foot square and are colored as desired. They are said to be about half the weight of slate tiles and are formed with overlapping ridges which make a roof covered with them absolutely water-tight. Another advantage claimed is that the material may be transported in bulk to the scene of building operations and the tiles moulded as the work progresses. Experiments have also been made with cement concrete as outside sheathing for buildings with satisfactory results.

A NEW PLUMBING DEVICE.

The James Morrison Brass Manufacturing Company, Limited, of Toronto, Ont., dealers in plumbing supplies, are now introducing to the trade a novel and sensible device, viz., a folding urinal. This device is both sightly and very compact. The urinal is made of cast aluminum, all the connections and flushing attachments being heavily nickeled, ensuring strength and durability. Where ever this new equipment has been used it has been found to be a decided improvement and a lively demand has already sprung up. The James Morrison Brass Manufacturing Company, Limited, are making a special proposition on this specialty to dealers throughout the Dominion and will be pleased to furnish information concerning the device to anyone sufficiently interested to write them.

A demand of assignment is reported to have been laid upon Brunet & Desjardins, brick manufacturers, Montreal.

Mrs. Thomas Beauvais has registered as proprietress of the business of Thomas Beauvais & Company, plasterers, Montreal.

CEMENT BUILDING STONE.

A new company, under the name of the Cement & Stone Building Co., has been formed recently, in Toronto, for the manufacture and sale of cement building stone and machines for making the same.

Each machine or mould requires two men and one boy to operate it and has an average output of 180 stones per day of nine hours. Each stone measure 18 in. x 9in. x 8¾ in. and works in perfectly with brick. The stones are hollow and are also grooved at each end, giving another space between each stone. This forms a honeycomb like air space all through the wall, permitting a constant circulation of air to all parts of the wall; making it absolutely frost and damp proof, thereby doing away with the necessity of lathing and strapping prior to plastering. By simply adding coloring to the sand and cement while mixing it, stones of any color desired can be produced. One week after a stone has been moulded it is ready for the builder. During a recent test one of these blocks, eight days old, is reported to have successfully withstood a pressure of 20,000 pounds.

The machines for making these stones can be purchased from this company by the builder or contractor and set up on the site of the building being erected. The Cement Stone & Building Co. are a stock company with a capital of $50,000. Their office and works are at present located at the corner of Abell and Queen St. West.

BUSINESS NOTES.

A new company under the name of the Victor Varnish Co., has been formed in Toronto. They have bought the factory and plant of the Robertson Varnish Co., Limited, 400 Eastern Avenue, and are doing business at that address. The aim of the new company is to put a superior quality of varnish on the market. Mr. Jno. Fennell, of Berlin, is the president, and Mr. E. J. Stewart, of Toronto, manager.

The Winnipeg Ceiling & Roofing Co. is situated in Fort Rouge, on the Canada Northern Railroad, and have a new factory for the maufacture of steel roofing, siding and ceiling material. It has been in operation about four months and is doing considerable business already. They manufacture steel ceilings, roofing, siding, corrugated iron and fire-proof window shutters, metal cornices, etc. The material is received in sheet steel plates and is then shaped and designed for whatever purpose it is required for.

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