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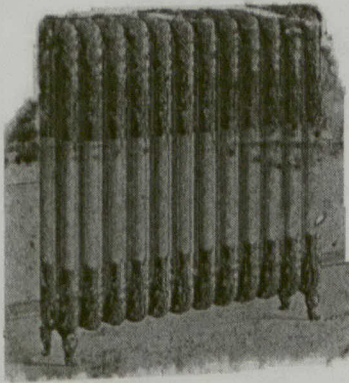
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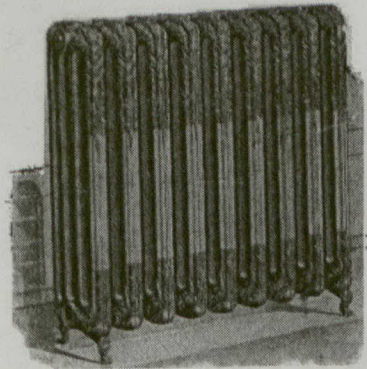
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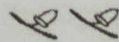
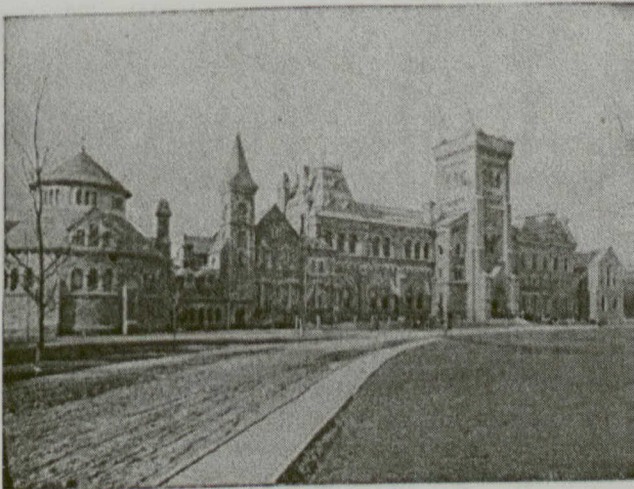
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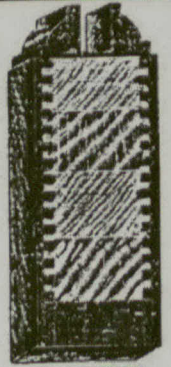
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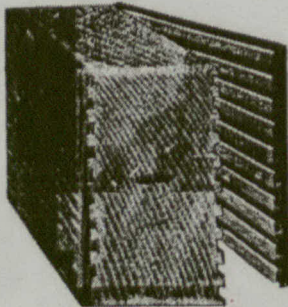
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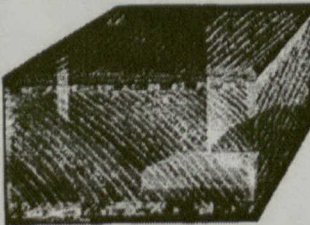


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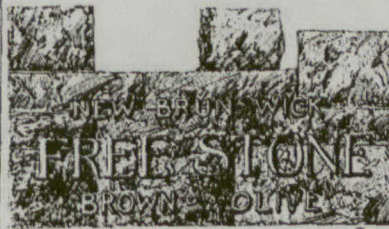
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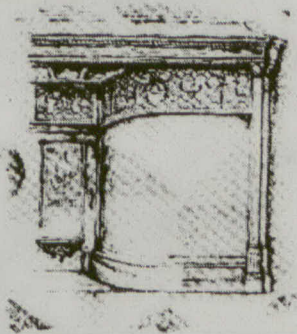
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The Canadian Architect and Builder

VOL. XVI.—No. 181.

JANUARY, 1903.

ILLUSTRATIONS ON SHEETS.

House on Park Road, Toronto.—Burke & Horwood, Architects.
Design for a Canadian Summer Cottage—Ernest Wilby, Architect.

ILLUSTRATIONS IN TEXT.

Ornamental Portico and Grill at the Residence of the Hon. Geo. A. Cox, Toronto.—G. M. Miller & Co., Architects.

ADDITIONAL ILLUSTRATIONS IN ARCHITECTS' EDITION.

Photogravure Plate—Certosa di Pavia—Detail of Facade and Interior Doorway.
Photogravure Plate—Monuments of Guiguelmo da Castel Barco, the Friends and Advisers of the Scaligers, Verona, Italy.
Stained Glass—By T. W. Camm, Smethwick, Eng.
Guardian Life Assurance Company's Building, St. James Street, Montreal.—Finley & Spence, Architects.

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SPECIAL CONTRIBUTORS.

PROF. S. H. CAPPER, R.C.A., Department of Architecture, McGill University, Montreal
MR. W. A. LANGTON, Architect, Toronto.
EDMUND BURKE, " "
S. H. TOWNSEND, " "
FREDERICK G. TODD, Landscape Architect, Montreal
W. H. ELLIOTT, Toronto.
J. C. B. HORWOOD, Architect, Toronto.
A. F. DUNLOP, R.C.A., Architect, Montreal.
FRED. T. HODGSON, Architect, Collingwood, Ont.

Prevention of Rust in Steel Construction.

From recent experiments conducted by Prof. Charles L. Norton at the newly established Insurance Engineering Experiment Station in Boston, to determine means of preventing the corrosion of steel frames used in building construction, the following conclusions have been reached:— First: Neat Portland cement, even in thin layers, is an effective preventive of rusting. Second: Concretes, to be effective in preventing rust, must be dense and without voids or cracks. They should be mixed quite wet where applied to the metal. Third: The corrosion found in cinder concrete is mainly due to the iron oxide, or rust, in the cinders and not to the sulphur. Fourth: Cinder concrete, if free from voids and well rammed when wet, is about as effective as stone concrete in protecting steel. Fifth: It is of the utmost importance that the steel be clean when bedded in concrete. Scraping, pickling, a sand blast and lime should be used, if necessary, to have the metal clean when built into a wall.

The O. A. A.

THE papers and discussions formed the principal feature of the annual convention of the Ontario Association of Architects held in Toronto last week. The papers covered a wide range of subjects, from decoration to modern methods of steel and fireproof construction. They were ably treated by the authors and evoked lengthy discussions, in the course

of which much additional information was elicited. The unusually large attendance at the sessions indicates that a programme of this character commands the attention of members of the profession who cannot but feel that to stay away from the convention is to miss gaining information of great value in everyday practice. In the present number will be found papers by Mr. Gustave Hahn on "Color in Decoration," and by Mr. E. C. Shankland, C. E., of Chicago, on "Modern Constructive Methods" with the accompanying discussions. In our February number will appear the remaining papers by Prof. Shortt, of Queen's University, on "Architecture as a Social Art," and by Prof. William L. Rice, of Philadelphia, on "Design," with the discussions thereupon.

Cement Production and Demand.

A recent article in The Monetary Times declared that the production of Portland cement in Canada next year would largely exceed the demands of the market. The estimated production for the year was placed at \$1,515,000 barrels, which we believe will be found to be an overstatement. While it may not be out of place to speak a word of caution to promoters of new cement manufacturing enterprises, our manufacturing facilities in this line are no more than sufficient, if indeed they are adequate to supply the demand in the Canadian market, which demand is rapidly growing. With the growth of population in

the north and west, the multiplication of industries in which cement is employed and the many new uses to which the material is being applied, there is no doubt still room for a considerable development of the industry. After the home demand shall have been met there will remain foreign markets to be exploited. There is no reason why Canadian cement manufacturers should not be successful in securing their share of foreign orders, as manufacturers in other lines are doing. The demand for cement is said to be rapidly increasing in the Spanish-American countries, as the result of the inauguration of extensive public works. No cement is manufactured in these countries, 95 per cent. of the demand being supplied by Hamburg and the remaining 5 per cent. from England. The French Commercial Adviser recently suggested that a group of French manufacturers of cement and mosaic tiles should form a syndicate and appoint five energetic representatives, who speak Spanish and are acquainted with the customs of the countries. They should be supplied with samples and visit the principal Latin-American towns with the object of obtaining government and municipal contracts. These representatives should be apportioned, as follows:—1. Mexico and Central America, Cuba and Porto Rico. 2. Venezuela, Colombia, Guiana and the lesser Antilles. 4. Argentina and Uruguay. 5. Brazil and Paraguay.

OUR BRITISH TRADE SUPPLEMENT.

A new feature appears in this number, in the form of a British Trade Supplement containing the announcements of a number of representative British firms engaged in the manufacture and sale of various materials for the use of architects and contractors. These British firms desire to introduce their goods in Canada, under the terms of the preferential tariff, and to obtain competent and reliable persons to act as their representatives in this country. The well-known reliability of British manufactured goods, and the desirability of closer trade relations with the mother country, should prompt Canadian architects and contractors to carefully examine the announcements appearing in our British Trade Supplement, to open correspondence with the various firms represented therein, and make fair trial of the goods offered. The publishers of the CANADIAN ARCHITECT AND BUILDER will be pleased to supply from their offices in Toronto and Montreal catalogues and information in behalf of these enterprising British firms.

C. A. & B. STUDENTS COMPETITION.

Thirteen sets of drawings have been received in our Students' Competition for designs for a \$2,500 Town or Suburban House. The drawings are now in the hands of the Committee of Award representing the Ontario Association of Architects and the Toronto Architectural Eighteen Club. On account of the annual convention of the former and the annual exhibition of the latter in progress at present, it was found impossible to have the designs considered in time for the result to be announced in this number. The Committee's report, with perhaps one or more of the successful designs, will be published in February. Meanwhile we wish to express our appreciation of the manner in which the Students have responded to our invitation

to enter this Competition. It will encourage us to announce others from time to time in the future.

ARCHITECTURAL LEAGUE EXHIBITION.

The Eighteen Club's display of photographs and prints, which constitute the circuit exhibition of the Architectural League of America, is of moderate interest. The most satisfactory work shown is in the collection of prints of English work, which are however very small and usually show no more than a distant perspective view of the parish churches which they represent. As English work, following English tradition, and suiting English taste and English church worship, these are admirable. An old English church or a modern English church may be, and are, of the same family, and the one seems as appropriate as the other. Mr. Cram, whose opinion given in his lecture before the Eighteen Club at the gallery on Jan. 17th, was courageously in favor of the same church design for the same form of worship in the Protestant Episcopal Church of America, is represented on the walls of the exhibition by a photograph of the well known drawing of his perpendicular church at Cohasset, Mass., but there is no getting over the feeling that this is an imitation, an English importation, planted on foreign soil. Whether this sentiment is reasonable or not, it is strong, and it is such sentiment that influences, or ought to influence the character of architecture, so as to bring it into the necessary harmony with its environment. It is safe therefore to say that the style of church design, which seems good on English soil and does not seem good on American, is good in England and is not in the United States.

The most interesting exhibit is without doubt the French work. French logic goes on where we only speculate, and the Frenchman becomes either a noble example or a shocking one. Even when he becomes a shocking example one cannot but admire the nobility of the spirit that led him to it. As a matter of fact the steel church, which is the text of these remarks (an uncompromising erection in unprotected columns of steel beams, rivetted together, and arched trusses of steel angle bars) bears study well and even grows a little upon the affections by study. It would at any rate inspire respect if not love, while a Chicago architect's church, which is shown both in its steel skeleton and again as a barrel vaulted structure; with coffers, vaulting ribs, arched recesses, and all the rest of it; excites nothing but loathing and boredom. It is dull.

The great interest of the exhibition, is Mr. Challener's decoration for the ceiling of the steamer Montreal, which forms part of the exhibition because Mr. Challener is using the gallery as a studio for this large painting. People who are accustomed to regard pastels as a convenient medium for amateurs, because it lends itself to a fuzzy effect that peculiarly suits a wuzzy manner of execution, should look at Mr. Challener's pastel studies and see that the real forte of pastels is a luminous brightness. The painting from these studies loses nothing in color. The ceiling will be a real work of art. The masses of floating figures—floating between dawn and darkness—form a decorative motive running through the two panels continuously, so as to carry on the idea which is represented by both together. And the figures do float: they form a large composition, are combined in interesting groups and are beautifully modelled, but they float like the irresponsible figures of a dream.

ONTARIO ASSOCIATION OF ARCHITECTS

PROCEEDINGS OF THE ANNUAL CONVENTION.

The fifteenth annual convention of the Association was held in the rooms of the Association, 94 King Street West, Toronto, on Tuesday and Wednesday, January 13th and 14th, 1903. Present—Mr. W. A. Langton, presiding, and Messrs. Aylsworth, Baker, Belcher, Bishop, Burke, Colwill, Curry, Denison, Duck, Edwards, Gemmell, Gouinlock, Gray, A. H. Gregg, W. R. Gregg, Hall, Helliwell, McBride, H. E. Moore, Munro, Pearson, Siddall, Simpson, Strickland, Symons, Townsend, Wickson and Wright. There were also present a number of visiting architects and others.

PRESIDENT'S ADDRESS.

In addressing, from the President's chair, an annual meeting of this Association, one naturally turns in the first instance to review the progress of the Association, and I must trouble you to follow me, to begin with, over some old ground.

We have been for two years established in these convenient and suitable rooms, and I think there is no doubt that the establishment in this manner is permanent. We have become an institution in Toronto, in fact, as well as a Provincial institution, by constitution; and I think it is by our activity in Toronto that we can best forward the interests of architecture throughout the Province. It is to the nature of these activities, the use that we are making of these rooms, that one turns in reflecting upon our progress.

We have always tried to make the education of students our special work as an Association. It is the particular work contemplated in our charter. The charter was enacted in order to advance architecture, by giving a prestige to membership of this Association, which would make the examinations required for entrance into the Association the first aim of all students of architecture intending to practise in the Province, and so bring about the improvement of architecture by ultimately producing a professional body, consisting entirely of educated men.

As former registrar of the Association, during the first ten years of trying to make the act effective, I can testify to the faithfulness with which the councils endeavored to carry out the purpose of the act. But failure was written in the act itself; because there was no real step taken to give to membership of the Association the prestige necessary to make architectural students feel membership of the Association, and in consequence, the examination which leads to membership, to be a necessary condition of entering upon practice in this Province. An act of this description, which aimed at a public reform and contained no provision for enforcing it, presupposed a higher standard of thought and aspiration in this country about architectural production than was likely to exist in a new country.

An attempt to carry out the act soon convinced the council that they, or, to speak more exactly, the ideas of the act were without disciples; the attempt to make the aims of the act effective by amending its provisions so as to create prestige for the Association, by giving its members the sole title to call themselves architects, soon convinced them that not only the ideas of the act, but they themselves were acquiring enemies.

We have, at this moment, a body of architects outside of the Association, opposed to us for the reason

that we have tried in the past to establish a standard of education, as defined by our act, by asking for legislation which would make the use of the title architect conditional upon passing our examinations. I cannot but consider all objections I have heard to this effort to be academical objections. That any one would be injured is not true; for, when such a drastic measure became operative, anyone then calling himself an architect would be entitled to continue doing so; would, in fact, become by right of his own previous career, a member of the Association. Nor is there any real force in the stock objection, that architecture is an art, that an architect must be an artist, and an artist cannot be made by examination. One usually flies from the imputation of thinking that examinations can make an artist—for as the point is stated, it does seem to place the supporter of examinations in a ridiculous light. But there is much in the way of putting a thing, and I am not afraid to take the highest type of architect as a subject for the examination theory, and affirm that the saying that an artist is born, not made, is only half a truth. That one cannot be made an artist who is not born an artist, is true; but it is equally true that one who is born a potential artist must also be made an effective artist. An artist must be both born and made, and examination—which is but a short form of expression for the education which the examinations are instituted to test,—education then, and, if necessary to make education an assured thing, examination, and even compulsory examination, is the only sure road to make a heaven-gifted artist able to make use of his gifts. What is at the bottom of the development of American architecture in the last twenty years? Nothing but education. The country is full of architectural colleges; a course at the Ecole des Beaux Arts is an ordinary thing now for an aspiring young architect. It has come to be recognized in the United States that office practice alone, as a course of study for the profession, is not enough; that it is necessary to study design theoretically, and to train the mind to powers of creative imagination, by exercising it in consecutive courses of study, designed expressly to develop those powers. In other words, for all classes of minds there is no hope of being up to the mark of modern design without a course of abstract study which can hardly be too extensive.

This, then, is the justification of this Association which, having to deal with a state of ignorance on the part of the public about this matter of the depth and extension of the training needed for public design, sought to place matters in such a position that the judgment of those who knew what architecture was like, rather than the indifference of those who did not, might fix the nature of the preparation of young architects for the profession.

The question whether or not this was a good move, as a means of getting the question of architectural education settled, is now a matter of history. This way of dealing with the matter is not likely to be attempted again without the co-operation of the Eighteen Club, who are at present opposed to it. In the matter of theoretical education, as a condition precedent to practice, the Eighteen Club and ourselves are agreed and, fortunately I think for the advancement of architecture in this Province, we have this year agreed to work together in carrying on classes to give students the benefit of instruction in mathematics and design—the former because they

require the assistance of a tutor in these subjects, the latter, because the studio method of criticism seems to be the best method available for acquiring a knowledge of method in design. The feature which pleases me most in the matter, as far as the work is concerned, is that we have combined to spend money on the education of the students. It is the only way to do, if we are to have the right instructors and feel sure that we really can count upon them. In the first place, teaching is a profession by itself, and the best architect is probably the worst teacher; but further, the conscience of a volunteer instructor is not with his voluntary work, but with that for which he is paid, and, if either has to suffer upon any occasion, there is no question in his mind as to which it is to be. It would be different if the present generation of the students were eager for instruction, if the volunteer instructor might feel an earnestness and enthusiasm on the part of the students that would quicken his own and make him feel that his work was of real public importance. But the contrary is the case. A handful of students, and some of them listless, is all we have been able to gather hitherto out of the large number we know to be in the city. With so much talk about education, as there has been since this Association was started, and the Eighteen Club took the matter up, there ought to be a more lively apprehension on the part of students of architecture of what studies they must undertake if they are to be properly equipped for the practice of architecture; yet the old attitude continues; the young men feel that if they can become architects without the tyranny of an apprenticeship, and without being answerable to anyone for the extent of their studious preparation, why should they voluntarily put their neck under a yoke, and—what seems of most importance to many of them,—take a longer road instead of a short one to the ultimate goal,—earning money? The state of public opinion is at the bottom responsible for this. Any clever young fellow, after two or three years' of experience in an architect's office, preferably in the office of an architect not engaged in such important work as to be beyond the grasp of a clever young fellow, can put up a Queen Street shop with sufficient credit to himself, and, learning as he goes, can really drive a profitable practice in a few years. His type is regarded with favor by the public. He calls himself an architect, thinks he is practising architecture, and expects to grow into a capacity to design monumental structures. But there is such a thing as working out of the capacity to design good work as well as working into it. It is possible, by beginning work too soon and being obliged to press on in ignorance of what constitutes good design, to make it forever impossible to really design anything. In architecture, as in every art,—as in everything that has character at the bottom of it,—there is no such thing as standing still; one must either advance or go back; if a designer is not improving, he is deteriorating. The self-confident may not take encouragement from the Greek saying, "one learns to play the flute by playing the flute," unless they are quite sure that what they are playing upon is really the flute; for one does not learn to play the flute by playing the jew's-harp; and in any case they should remember the saying of another Greek, a teacher of the flute, who charged so much for lessons, and double to those who had previously learned to play.

In seeking to advance architecture, I think there

is no doubt we shall be taking the shortest road if we go back to the old idea of an Association, with such prestige attaching to its membership, such recognition of it by the public, that common sense will point out to students that the way of safety in practice is enrolment among its members, and will take from its course of study and examinations the appearance of superfluity which now makes them weigh upon the spirits of pushing young men.

How to create this prestige is the question. I have tried during the past year to do something with our monthly meetings, but without success. We have done something, but not much.

I still think, in spite of the difficulty of getting the movement to move, that this should be the principal aim of the Association now. The prestige we aim at is to be found in this. If we cannot make this Association a society of the élite by law, let us do so in fact. Let us cease for the time to consider the students, and turn our attention to ourselves. It is time we took hold of the question by the other end. Instead of seeking them, let us make our society so desirable that they will seek us. I well recollect myself how much I picked up, when I began practice, from being included in the Toronto Architectural Guild, the mother of this Association, and having the privilege of discussing professional questions with older men at monthly dinners of the Guild. There will be nothing so valuable for young men as admission to membership of this Association, if we develop and carry on persistently our monthly meetings. We are busy men, it is true; but the tendency of such meetings will be to help us to transact our business with greater ease; and at any given meeting only one man will have had the trouble of preparation. It seems to give nobody in this Association any trouble to express himself; and, if anybody has conceived but one thought, and will bring it before the Association, I will guarantee that he will go away with a dozen. Our discoveries are not half as useful to us if we keep them for our own use as they would be if we communicate them. The way to get information out of other men is to pour information into them. If any one wants to get the worth of his membership fee back at one stroke, let him make a little paper upon any point upon which he has made up his mind, or wants to make up his mind (the clear arrangement of his ideas will alone be worth the money to him), and read it before a monthly meeting of the Association. He will find that he has got out of the transaction as much as he gave, or more.

The members of other professions are given to reading papers, and contributing the results of personal observation to their professional journals. Reports of professional proceedings are recognized authorities for engineers, and a doctor who does not read his professional journal regularly is likely to drop behind. The constant perusal of original papers, and the occasional preparation and delivery of one, is stimulating to thought. These professions are all alive. I know of a paper on surgical bandaging which was projected, while swimming, by a doctor who had received an injury, and observed the comfortable pressure of the water upon the injured part. That is the spirit we should have in a profession like ours, which continually calls forth invention.

I think there is a general impression that architecture is dead; that we are only copyists and imitators, making play with old forms and conventions, according to fashion, without regard to reason;

that, though we understand fully the logic of design as exhibited in the thirteenth and later centuries, we are barred from developing design from our material in the same manner on account of the very splendor of the past, which has formed our taste, and makes the thought of a genuine architecture in our slim materials impossible.

Since, however, steel must be protected, we are not required to hold the skeleton of our buildings up for admiration any more than the Creator has done this in the case of our skeletons; and I think, if Viollet le Duc were alive to make an analysis of some of the recent steel frame buildings, he would find them to be gradually approaching the logical ideal. We have at any rate, reached the point where it is not hard to see that there is a logical ideal.

But we are nearer the birth of a live architecture than that. We have at last got the new material that the world has been looking for to produce a new birth. Reinforced concrete is an architectonic material. It is not strictly homogeneous. It has concealed in the substance that appears another material which gives a greater strength than is suggested to the eye, and herein may be a difficulty; but not necessarily so. The extraordinary combination of delicacy and strength in marble led the mediaeval Italians to superpose great loads on columns which, to an eye accustomed to classic proportions or a less enduring material, seem at first to be disproportionately slender. It is necessary to become accustomed to this; to learn from experience in seeing, just as the old builders did from experience in using, that marble is able to carry these weights; then one learns to delight in it; to enjoy the contrasted relation of weight on lightness, one of the elements of the pleasure we derive from an arcade, which is never so attractive as in these Italian Gothic arcades with the slender marble columns. I do not see why we should not become accustomed to the proportions of reinforced concrete. There is always pleasure in a mass of material, but it is after all only the pleasure of the picturesque; one learns to enjoy better the lack of superfluous material in scientific designing. St. Ouen, at Rouen, with its extreme development of Gothic lightness, gives higher pleasure than the barbaric massiveness of the Early Norman chapel in the White Tower of London. It must be confessed that M. de Baudot's new church of St. Jean de Montmartre, shown in the September number of the "Architectural Record," is a shock; but a study of the illustrations does not convince me that the "bold nakedness," in which the writer of the text of the article exults, is a necessary condition of the design. That "the entire structure, walls and floor, forms one solid mass" does not necessarily exclude the employment of moulding to lead the eye to a perception of the structural lines. The "logical spirit," which the writer exalts so much, is usually considered to have been shown in perfection by the Gothic vaulting shafts, which are only expression, and the expression of an idea rather than of a fact: the pier is not in reality subdivided in its work; its subdivisions merely express the fact of subdivision in the vault, and seem to account for the thrust of every rib and connect it with the ground. If designers in reinforced concrete will let their fancy play over their design in a manner similar to this, I think we shall find that the material is a material from which architecture can be produced. This is the first consideration. The second is that the product must be original; for, although at first sight the ma-

terial suggests the idea of stone design, the lines of stress in this construction forbid unreflecting imitation of the forms of stone construction. Stone construction spans voids by an arch, the pressure line of which curves upwards; construction in reinforced concrete spans openings by a beam, of which the strain line on the underside cannot be less than horizontal, and may, with advantage to economy in material, curve downwards. The designer in reinforced concrete is therefore committed to beam construction, and will find that he must at last take the position for which advocates of pure design have so long been calling,—to adopt the spirit of Gothic designers rather than their forms; for, if he adopts their forms, his work will not stay up. One wonders how far the failures in concrete construction that one reads of—an evidence in themselves of a great departure in architecture, reminding one strongly of the failures that occurred in the early history of vaulting,—one wonders if the responsibility for some of these failures does not lie with timidity in departing sufficiently from old forms to suit the new construction. A floor failure that came under my own observation was due, I think, to the adoption of a concave soffit to the floor bays, designed to present an appearance on the floor below of flat

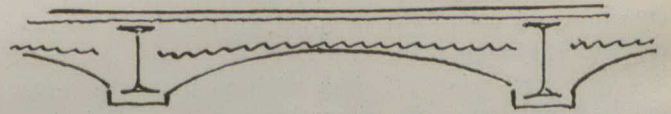


Fig. A.

groined vaults. (Fig. A). If the flooring material had been cast in the converse form (Fig. B), it would

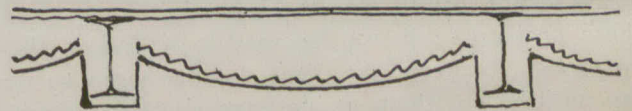


Fig. B

probably have stood, and I see no reason why the resulting form, though unusual, would not have a play of light and shade that would please any eye, and ought to please the trained eye more than a shallow imitation of groining.

It would be possible, of course, to keep almost the same economy of material, by turning the ideal beam upside down; so that the thick part bellies upwards, and the ceiling below is flat (Fig. C); but this

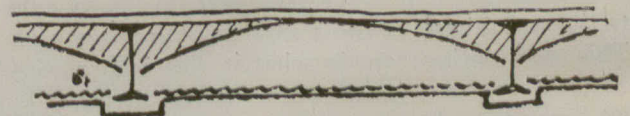


Fig. C

looks very like turning one's back on an opportunity, and it leaves work to do, in the filling in of spandrels, which, however cheaply it may be done, is unnecessary, and therefore a criticism upon the science of the design.

The way to make something of this material for design will never be found in trying to evade its exactions. A far more interesting and profitable labor would be to follow the lines of pos-

sible failure in a section, and endeavor to meet them by the form in which the material is cast. There is encouragement throughout the history of architecture, to believe that the expression of constructive lines is as pleasing to the eye as to the mind. From the day when the entasis was made to start at the point where science shows the strain on a column begins to diminish, the history of architecture gives illustrations of work which, designed by the eye, is approved by science. I think we may, therefore, conclude that it is not likely to be impossible to please the eye by following lines laid down by science.

Now, gentlemen, if I am right in taking this view of the importance of the new departure in architectural construction, it looks very much as if we have entered upon a period of invention in which there will be great benefit to be derived from putting our heads together to help one another to work freely and successfully. As a matter of fact, though I have confined my remarks to reinforced concrete, I might have spoken more generally, for there is continual effort now in the field of construction to devise new methods and new materials; and architects, if they are to keep abreast of the times, must discuss in common the question of the utility and application of these devices.

We want to cultivate the habit of meeting for discussion, and we ought to do it all together,—Association, Eighteen Club, and any guild, sect, or division that may arise. If they wish to have an independent existence, let them have it too; if it is a source of life, that is what we want. But we ought also to be united so that we may form a corporation, and a close corporation, too; devoted to the advancement of architecture, by advancing among architects a familiarity with the problems of modern life and modern construction, and their solution. We need not fear to give to each other in this way. These problems are not the matter of design, they are merely its grammar. One cannot begin to design until he has them at his fingers' ends. The invention of architecture should be concerned as little as possible with detail, so as to be concerned as much as possible with arrangement, which is its real field of imaginative effort. If we could standardize details and constructive methods as much as they were standardized in the periods of Gothic design, we should all be freer in our work, and the architecture of our generation would be all the better for it, not only to future generations, but to ourselves. We do not want the individual in architecture. His intrusion is an offence. We want large firms, composite design, similarity of feeling in the same district, with such variety in composition as variety in circumstance requires; and the way to get this is to cultivate the social basis of the social art of architecture.

This Association can do what it was incorporated to do, without any Act; without doing anything but what every true designer wants to do—to talk about design. If we keep together for the sake of the advantage we find in one another's society, we have the best kind of incorporation; and the life that we have in our body will be the best kind of prestige we can desire to make students hold before themselves the membership of our body as a thing to aim at. If we can form a professional élite that is based on quality, we shall form the closest kind of corporation; closer than law can create; for quality opens to nothing but quality. That is the kind of close corporation we want, in order to advance architecture; one which will both require and stimulate

architectural students to qualify themselves in order that they attain to membership; which will make them undertake the labor of such qualification, not because the law requires it of them, but because they want to.

Mr. W. L. Symons presented the Treasurer's report as follows:

TREASURER'S STATEMENT, JANUARY, 1903.

RECEIPTS.

1 balance registration fee.....	\$ 10	
Members, annual fees.....	346	
1 fee on account 1903.....	2	
Fees for water color class.....	24	
On account of rent of room to chartered accountants.....	5	
Advertising matter published in annual report.....	461.20	
Interest on bank balance 1902.....	20.50	\$868.70
Bank balance from 1901.....	732.79	732.79
		<u>\$1,601.49</u>

EXPENDITURES.

W. R. Gregg, Registrar.....	\$100	
Registrar's petty cash.....	25	
Rent.....	150	
Convention expenses.....	180.13	
Engrossing minutes.....	4.25	
Stationery.....	13.40	
Printing.....	31.50	
Journals.....	7	
Books for library.....	5.90	
Gas.....	5.16	
Insurance.....	5.53	
Safe and cartage.....	30	
C. M. Manly, instructor of water color class..	24	
Engineers' Club to adjust balance of common expenses.....	18.54	\$ 600.41
Balance in hand.....		1001.08
		<u>\$1,601.49</u>

Mr. Symons moved, seconded by Mr. Wickson, that the report be adopted.

Mr. Wickson: I have seconded the adoption of the report but I should like to ask one question. I thought there was some income coming from advertisements in our published Proceedings but I did not notice them in the statement of receipts in the report.

The Treasurer: We have paid all the expenses in connection with the printing of the reports but the income has not yet been placed to the credit of the Treasurer. I will present a supplemental report in reference to that.

Mr. Denison: Have you any idea of the amount?

The Treasurer: About \$432. That will greatly augment our balance, It will leave us a balance on hand of \$969, in the bank.

The President: I think a proposition, which was accepted at the meeting of the Council this morning should be stated here; that the proceeds from the advertisements in our Proceedings should be devoted to the development of the Proceedings and not treated as an asset of general profit for the Association, so long as we have to solicit advertisements for our Proceedings; if we develop the Proceedings to such a point of importance that the builders and others who advertise in the volume seek an advertisement because of its circulation, we shall be at liberty to utilize profits as we like; but as long as we ask for advertisements we must endeavor to attain to such a circulation as will pay the advertisers.

The President put the motion, and, on a vote having been taken, declared it carried.

Mr. A. H. Gregg: What about the money coming from the Guild fund?

The Treasurer: There is a balance of some \$775 but I have not got it yet; it has not been given to me. I do not know whether we have any legal right to it. Certainly it is not in our possession.

The Registrar: presented and read his report as follows:

REGISTRAR'S REPORT.

MEMBERSHIP.—The present membership of the Association is, honorary members, 2; resident members, 36; non-resident members, 33; total, 71.

Mr. A. E. Paul who was one of the first members of

the Association, and recently an honorary member, died during the year.

STUDENTS.—Seven students have filed articles in 1902; of these six are students in offices of Toronto members and one of London. Three students presented themselves for examinations in March, of which one passed the first examination.

A notice was sent out by the Council in February as follows:

Members have lately received the Curriculum of Pass Course, and the Curriculum of Honor Course of study and examination for students.

Now that the Curriculum for students is finally settled, members of the Association are requested to see that their students are registered, and that the articles are properly filed with the Registrar. Circumstances have convinced the Council that there has been great laxity about this matter, and that it is having a serious influence upon the usefulness of the Association. The following are the points to which it is necessary that members should give attention:

No member of the Association shall retain in his office any student unless such student is properly registered.

Before a student is registered, he is required to sign an Indenture or Articles as a student apprentice, and a copy of this Indenture must be filed with the Registrar. Blank forms of indenture will be sent to members upon application to the Registrar.

A reasonable time of probation in an office before articles are entered into is desirable, to test the fitness of a student for the profession; but a proviso, at the end of the indenture, limits the time of probation to three months.

The student is required to pay an admission fee of \$5, and a fee of \$1 upon the filing of Indenture; total, \$6.00.

Members are particularly requested to refrain from engaging a student who has served part of his term in another office, without obtaining satisfactory credentials from his former principal and requiring that an assignment of his articles shall be made and registered.

MEETINGS.—The Council has met seven times during the year with an average attendance of five members.

There have been two monthly meetings of the Association besides the annual meeting; and one monthly meeting was omitted for the purpose of allowing the members to attend a lecture before the Central Ontario School of Art and Industrial Design and the Ontario Society of Artists, by Mr. W. A. Langton, President of the O.A.A., upon City Planning.

The average attendance at the monthly meetings was 11 members and 4 visitors. At one of them a paper was read by Mr. G. S. Lemasnier and at the other the proposed changes in the Toronto City Building By-laws were discussed.

PROCEEDINGS.—The second annual volume of Proceedings was issued early in the year and five hundred copies sent to members and others interested in architecture, including a large number of architectural Societies and Clubs in Canada, United States, Great Britain, and other countries.

Valuable and interesting exchanges have been received from many of these Societies.

TARIFF REVISION.—The Council has amended the Tariff by adding to clause 3 "For superintendence, alone, two-fifths of the full commission for the work to be superintended."

COMMITTEE AND CHAPTER.—The following committees will present reports to this meeting:—

Rooms Committee, Library committee, Editing committee, Patrons of Studio Work, Educational committee, Membership committee, R.I.B.A. Examiners, also the Toronto Chapter.

On motion the report was adopted.

Mr. A. H. Gregg presented and read the report of the Library Committee as follows:

REPORT OF LIBRARY COMMITTEE.

The library continues to be well patronized and the number of lendings during 1902 is almost double that during 1901.

The Association subscribed to the following publications:—The Canadian Architect and Builder, the Architectural Review and the Studio. Besides these a large number of valuable exchanges have been received, among them being the Report of the Supervising Architect of the Treasury Department, European and Japanese Gardens, and the proceedings of many architectural societies, British and foreign.

The only books purchased during the year have been the two volumes of the Architectural Annual for 1901 and 1902 but several valuable works have been ordered from Germany, and these will be added to the library in a short time.

Hamlin's History of Architecture is missing from the library and the borrower would confer a favor by returning it.

It is the intention to subscribe for the current year to the Craftsman, the London Builder and Home and Garden in addition to the magazines already taken.

EDITING COMMITTEE'S REPORT.

The President (Chairman of the Editing Committee): We published the Proceedings of the last Convention which you have had in your hands, and since then there have been few meetings which are worthy of report and which will appear in the Proceedings to be issued in February. The report of this Convention will be the body of the Proceedings; in fact in the first place the volume was intended merely to preserve in convenient form the record of the annual meetings. In addition to an account of the present Convention, the volume that will come out this year will have a paper read here by Mr. Lemasnier and a valuable contribution by Mr. W. J. Hynes giving technical information about plasterers' materials and workmanship and a glossary of the correct terms to be used in specifying plastering; so that tenderers will agree in understanding the meaning of the specifications and we can get accurate tendering. At present plasterers' terms are not used with as much precision as the terms of other trades.

Mr. Denison: I think it would be a good thing if all the leading building associations would take the same line as Mr. Hynes. If the stone cutters, and brick layers and master builders' Associations would also prepare papers and read them at some of our little meetings so that there would be an uniform understanding as to technical terms.

The President: If you wish to make that operative, suggest to the chairman of the Chapter to ask the members of those Guilds and Associations to meet us at lunch as Mr. Hynes did.

Mr. Gemmell: Do you say that it is intended Mr. President, to use all the proceeds of advertisements in printing more copies of the reports or amplifying the report.

The President: Not necessarily.

Mr. Gemmell: Is the Association not to receive the benefit pecuniarily. We had a deficit last year and I understood the printing of the report was a means of getting out of that.

The President: I understand we ought to develop the Proceedings until we can claim to benefit from it; but in the mean time I think we owe a duty to the advertisers to make their advertisements of value to them. It is not only the expense of printing but the cost of procuring papers that is borne by this fund; our Proceedings are made of greater value by the importation of lectures without drawing on the funds of the Association (Hear, hear).

Mr. Gemmell: It seems hardly necessary to use all our profits to make the report a good medium for advertising.

Mr. Burke: The expense of all the papers will be taken out of that fund.

The President: Yes, certainly.

Mr. Baker: The Proceedings would not be of much use without the Association. I think if we could borrow a little from that fund or any fund to save us from going into a deficit it would not be a bad idea; but I appreciate what our President says about using the money to develop the Proceedings.

The President: I shall not be concerned in the management myself this year; but I think this policy if carried out will not only help the Proceedings but, in doing so, must necessarily help the Association.

Mr. Denison: Hear, hear.

REPORT OF COMMITTEE ON EDUCATION.

Your Committee on Education begs to report that the Courses (Pass and Honor) as prepared by last year's Committee and accepted by the Association at its annual meeting are working out as well as can be expected under existing circumstances.

In order that the educational work might be carried on to the greatest advantage it was thought wise to co-operate with the Eighteen Club. For this purpose a combined Educational Committee was formed consisting of representatives from the Ontario Association of Architects and the Eighteen Club. It is understood that this Committee has arranged for and is teaching this season subjects in both science and studio groups as mentioned in the pass course.

C. H. C. WRIGHT,
Chairman.

REPORT OF STUDIO COMMITTEE.

(Included under report of Committee on Education.)

MEMBERSHIP COMMITTEE.

Mr. Denison: I will call upon the Registrar to read the report of this Committee.

Mr. W. R. Gregg read the report as follows:—

Your committee beg to report as follows:— The membership for the year has slightly increased and much work has been done with a view to further increasing the same. The names of several architects wishing admission are now before the committee for consideration. Provision has been made in the By-laws to meet special cases. The fee for final examination of students has been raised to \$15.00 and includes membership fees to the Association. We are in favor of making this retroactive, so that all former students who have passed the final examination but have not paid the \$15.00 in addition to the \$10.00 fees, and have not joined the Association, should be admitted upon a further payment of \$5.00, this to cover the annual fees for the year in which they are admitted.

ARTHUR R. DENISON
Chairman.

Mr. Gregg: I might explain that these are students who passed the final examination some years ago and paid the \$10 fee for the examination, but as they were not in practise as architects, they did not join the Association which would then have cost them \$15 more. We have since amended the by-law so that a \$15 fee for the final examination serves also, if the candidate is successful, to admit him to membership without further fee. We recommend that this be made retroactive so that men who passed their examination, say ten years ago, and wish to come in may, as they paid \$10 at the time they were examined, join now by paying \$5 more.

The President: It will be necessary for the next Council to change this and I would suggest that this meeting pass a resolution which bring the matter before the new Council.

Mr. Denison having moved and Mr. Baker seconded a resolution to this effect, the President put the motion as follows: That the report of the Membership Committee in connection with the final examinations be referred to the Council. Carried.

ROYAL INSTITUTE MEMBERSHIP.

The President: I attended this examination. There were only three candidates, one a practising architect

from Nova Scotia, and two Montreal students. I thought the examination was a very useful one, particularly to Canadians, and came back impressed with the idea that it would be a good thing to get together a class of architects to study the historical styles with more accuracy than we usually attempt, with the possible result of some going up as candidates. This would be the principal use of the examination to us, to induce us to acquire an accurate knowledge of the historical styles. The rest of it any practising architect could manage to pass without previous study, but of course it would naturally be made an occasion for more exact study.

It takes a long time to have the papers examined and I have not heard whether any of the students at this examination passed.

TORONTO CHAPTER.

The report of the Toronto Chapter was presented by Mr. Moore as follows:

The officers of the Toronto Chapter beg to report to The Ontario Association of Architects in convention assembled:

GENTLEMEN,—At the annual meeting of the Chapter held last April the following officers were re-elected: Chairman, Mr. Edmund Burke; Secretary, Mr. Herbert E. Moore.

The Technical School Board representatives for the year 1903 are Mr. J. Wilson Gray and Mr. A. R. Denison.

The Chapter has met regularly throughout the past year in the Association rooms; these meetings are held on Tuesday of each week and are of a social character, taking the form of a luncheon at which the business of the Chapter is transacted and matters pertaining to the profession generally are discussed.

The total number of meetings held was 50, and the average attendance of members 10.

Deputations from various Associations and members of other professions have been present on different occasions, to discuss with the Chapter important questions that have a direct or indirect interest to the profession.

Strenuous efforts have been made to further the interest of Architecture and Art, and the influence of the Chapter has been directed successfully in many matters where it was important to have the consultation of a trained body.

The following is a list of some of the chief subjects discussed:

1. Toronto Exhibition Grounds and Buildings.
2. The Revision of the City Building By-laws.
3. Civic Improvements. In this matter the Chapter acted in conjunction with the Guild of Civic Art and other societies in trying to procure a plan for the present and future beautification and general lay-out of the city.
4. The affiliation of the Chapter with the American League of Civic Art: this matter is now pending.
5. GOVERNMENT BUILDINGS.—The Association asked that the plans for the New School of Science Building be submitted to competition, but the Government decided to carry the work through the Public Works Department. The privilege was then requested of examining the designs to be prepared by the Department and of making any suggestions for their improvement that might seem desirable. While this request was not refused, no definite information has since been received.
6. CO-OPERATION WITH THE DIFFERENT TRADES.—With a view to a more thorough understanding between Architect, Client, and Contractor.—As one result of these conferences, we would refer to a paper on "Plastering", by Mr. Hynes, which is to be published in the annual report of the Association.
7. Educational work.
8. Reading of papers and addresses on different subjects.

A further explanation is perhaps necessary touching those matters in which the Chapter feel that their efforts have produced direct benefits:

RE EXHIBITION GROUNDS AND BUILDINGS.—A general plan of the lay-out, showing alterations, and a scheme for future improvement was prepared by the Chapter and finally adopted by the Exhibition Board, with some few alterations.

The revision of the civic building by-laws was a subject much discussed. Mr. Frank Wickson was appointed by the City Council to act in conjunction with the City Commissioner and the Fire Chief in the revision of the by-laws. In company with Mr. Wickson a number of meetings have been held at which the by-laws were talked over, the result of which we hope will be that Toronto will have a set of by-laws that will compare favorably with any on the continent.

In the matter of educational work the Chapter has, acting in conjunction with the Eighteen Club, formed a joint educational body, which has established a class in scientific instruction under the Chapter and one in design under the Eighteen Club. Professional teachers have been secured and the fee covering both classes is \$5.00. The character of the work taken up is such as will prepare students for entrance to the School of Practical Science and train them in artistic and architectural design.

A general review of the history of the Chapter cannot fail to reveal the fact that it has fulfilled one desirable aim, viz. :—The holding together and fostering of a true professional spirit among the architects of the city.

(Signed,)

H. E. MOORE,
Secretary.

Applause.

Mr. A. H. Gregg : I have much pleasure in moving the adoption of this report. I think the report indicates that the Chapter is one of the best institutions in connection with the Association and I hope it will go on and prosper.

Mr. W. R. Gregg : I should like to call attention to the fact that a good many years ago the by-law recognizing the Toronto Chapter was framed, and this by-law begins, "The Association shall encourage the formation of local associations to be known as "Chapters" of the O. A. A. Any five members of the Association may apply for permission in any locality, etc." Now, it is time that Chapter No. 2 was formed in Hamilton or London or Ottawa and I would move that the Membership Committee or the Council take up the question of seeing whether there are not five members in some city that will form a new Chapter.

The President : You had better bring that up under the head of new business and in the meantime move for the adoption of all these reports.

Moved by Mr. A. H. Gregg, seconded by Mr. Wickson that the various reports received to-day be adopted. Carried.

Mr. W. R. Gregg : I move that the Membership Committee make enquiries and take the necessary action towards the formation of Chapters in other places.

Mr. Denison : I think that is a good idea, a move in the right direction. To bring that about it occurred to me it would be a wise plan for the Membership Committee to communicate with the architects who are now members of the Association in the cities and towns and proceed to bring about a meeting in those towns where it is thought desirable to organize a Chapter, and that members of this Association should be named to go to these meetings to meet the local architects and discuss the matter with them and help them to form such Chapters, if it is found desirable to have them. I think that would go a long way to strengthen this Association and I know it would bring members into the Association. If a city like London or Hamilton had a Chapter the local men would realize what a benefit the Association would be to them ; and a resolution or communication of any kind coming to us from a Chapter in one of these cities would have more weight than a communication to the Council from an individual. They could consult with each other, the same as we do now at our Chapter ; and

they would become friends instead of being at arms length as we used to be. I am satisfied they would see that some of their members attended our Conventions ; and the members attending our Convention could report back to their Chapters the matters that had passed before the Association meeting. I think much could be done in that way, and I hope the Association will see the necessity of it.

The President : I understand that there is something in the way of travelling implied.

Mr. Denison : I suppose there would be. I do not know how the Association looks at the matter. I should be prepared myself, at any time, to go up to Hamilton or to London, with two or three other members, paying my own expenses. I think in the interests of the Association we should pay our own expenses.

The President : It will be necessary to follow up this motion with some kind of action, which I suppose will be left in the hands of the Council.

Mr. Denison : I thought to mention the fact would create some little discussion, but it does not seem to.

The President : It does not seem to create any opposition ; but it seems to be incomplete. Unless we decide who is to go or what is to be done, nothing will happen. Somebody must decide these matters.

Mr. Denison : Will the Council afterwards have power to appoint members to visit these cities and to defray any side expenses ? Would they have that authority ?

The President : Yes, they would have that authority.

Mr. Denison : Probably it would be wise to refer this to the Council for further consideration.

The President : The matter is not presented to them very strongly at present.

Mr. Denison : I thought also if you had some expression by the Association whether they favored this idea or not—you understand that I do not feel like going into a thing of that sort if I felt that the Association did not agree with it. But, if the Association agrees, the Council would take it up.

The President : As far as I can see the consent given is a consent given by silence.

Mr. Wright : Are there any outside members here who might give us an opinion ?

The President : Mr. Munro might give us some idea whether it is worth while to go to Hamilton.

Mr. Munro : I spoke to several architects in Hamilton just casually but it never amounted to very much. I do not see why something could not be done there as Mr. Denison has said. Probably if a deputation was sent from the Association they would be able to foster a spirit that might lead to something. I am sure they would get all the support that I could give them.

Mr. Burke I think it would be a very good idea. Outside men could probably fuse the local element as a local man could not ; if a strong outside man or two went up to Hamilton or London perhaps something might be done.

Mr. Symons : I have had a good deal of outside work in the last couple of years, and in most of the places—I cannot speak of Hamilton latterly, but I can speak of London, Stratford, Kingston, and Ottawa—meeting with architects there, my opinion is that the thing is impossible. I think that a man who can form any kind of a Council, or Society in these places ought to be sent out to South Africa to help along the problem there. Of course to us here that state of things now seems absurd ; but it is the case nevertheless. In these places the position men take toward each other is absolutely a farce : it is funny. If they could only see it as we see it, with the eye of a bystander. In one or two instances my business brought me in touch with several of them, and I found it impossible to bring them together on a common basis even for business. As to a person from Toronto going to them, I think that would only be adding insult to injury ; if we went to some of these places we would simply be told to go and mind our own business. They know all about this Association.

Mr. Denison : I think the argument advanced by Mr.

Symons is the best that could be advanced in favor of my proposition. The fact that the architects in these other cities are at arms length gives us the whole reason why they do not join our Association. We need to do a little missionary work. Because if you went to the Fiji Islands they would eat you is not an argument that you should not be sent to the Fiji Islands (laughter). I hold that Mr. Symons is wrong anyway in this respect:—he met architects in opposition to him; he was a competitor.

Mr. Symons: Not in every case.

Mr. Denison: But if you send a deputation to meet them as a deputation from this Association, not as competitors but as members of an Association to which they ought to belong, I am satisfied they will meet us with a different spirit altogether. I am satisfied that if an architect practicing in London or Hamilton or any other city sent out a notice, asking the other architects there to meet him to discuss this question, they would be at once antagonistic to the idea; but if we go on a common platform and ask these gentlemen to meet us, it would be a different matter, and we could perhaps wipe away some of that feeling Mr. Symons speaks of. I am satisfied that where there is such a feeling among architects, it exists only because they do not know each other. While men are in the same town practising the same profession, their ideas and their tastes ought to be alike, and yet we are told that they very often do not know each other on the street. If we become members of an Association we would soon all become friends; and I am sure if we appoint a Committee representing the Association, who would not be in the position of competing for anything, we could do a good deal for them, and they would see that it would be to their own interest to band together.

Mr. W. R. Gregg: I am pleased with Mr. Symons' remarks; they exactly show the state of affairs; and anybody that takes a right view of it will see that he has given a very strong argument that, if there are five members in any town, there should be some way of bringing them together and introducing them to each other and showing them that it is to their benefit to unite.

Mr. Moore: I should like to ask how the Association expects to expand? If something like this is not done it will simply narrow down to the Toronto Chapter—what it is now. There are very few members outside of us actively engaged for the good of the Association.

Mr. Baker: I do not know whether it has occurred to any of you or not, but it seems to me this brings us back to the old proposition of holding the Convention in some other town besides Toronto. Why should we not here to-day decide to hold the next Convention in Hamilton, and pass it around. They say we sit down here and enjoy ourselves and do not take the trouble to go amongst them. I think it would be a far better thing to do than to try to work up a spirit by going there in small numbers. If we say now that the next Convention will be held in Hamilton, or Ottawa or London, then they will see that we appreciate their existence, and probably that will be the means of bringing them closer in touch with us.

Mr. Simpson: It strikes me that the result will be that, as the attendance at these meetings depends on the Toronto men while the Convention is held in Toronto, if it was held elsewhere there would be only about four show up.

Mr. Siddall: I am fully in accord with the idea of forming Chapters in the larger cities in Ontario; but I think Mr. Baker's suggestion is beginning at the wrong end; I think that Chapters should first be formed in other cities before we can entertain the idea of holding our Convention in them; but it might be a good idea for us to try the experiment of holding our convention in any city where a good strong Chapter is formed.

The President: I think from the discussion that has followed this motion, the Council will now have the matter clearly before them.

It has been moved by Mr. Gregg, seconded by Mr. Denison, that it is the opinion of this meeting that representatives of the Association should be sent out to induce the formation of Chapters in two or three large cities. Carried.

The President: It is now four o'clock, the time set to hear Prof. Shortt's paper. I have much pleasure in introducing Prof. Shortt. (This paper will appear in a future issue.)

SECOND DAY.

The proceedings opened at 11 a.m. with the following paper by Mr. E. C. Shankland, C. E., of Chicago:

MODERN CONSTRUCTIVE METHODS.

Had I seen Mr. Pearson's remarks delivered at your annual meeting of 1902 before accepting your Registrar's very kind invitation to read a paper at this meeting I greatly fear I would have refused.

At the best it is very embarrassing to a modest engineer, and modesty is the essential characteristic of the engineer, to appear before such a body of men as this. It becomes doubly so, when they have been informed in advance that he belongs to a clique who are using all their wiles and blandishments to seduce the simple-minded and unsuspecting architect into all kinds of nefarious schemes and awful projects.

Mr. Pearson's description reminds you of the Garden of Eden with the poor engineer in the role of the wise and subtle serpent, and the architect, whom I have always found perfectly able to take care of himself, under any and all circumstances, personating the lovely, but misguided Eve. However, I thank Mr. Pearson for one remark. He says: "For the solution of these problems it was necessary to appeal to the engineer." And he was right. In these strenuous days an Admirable Crichton, or a Leonardo Da Vinci becomes an impossibility. Competition is too keen; the lines are drawn too closely.

It is not many years ago that the architect felt himself to be, and was, perfectly competent to do any class of work which came to him. Now when he is designing a large office building, or any similar work he not only has to call upon the structural engineer, but the electrical, the mechanical, the sanitary, the heating and ventilating engineers as well.

The architect is at the head, he is responsible for the completed structure, and the designs of the various engineers are only integral parts of the whole, but it is manifestly impossible for one man to know all of the details of the various lines. He may have a smattering of each, but he cannot know, he has not the time to master each and every one. When he tries to do so he fails.

After this somewhat lengthy preamble I will get into the subject matter of my paper.

The most interesting portion of a building to the structural engineer is the foundation.

In Chicago the very compressible soil made unusual care necessary in designing the foundations of the high office buildings.

The soil of Chicago is made ground to a depth of 12 to 14 feet thick, then a layer of hard clay 6 to 10 feet is struck, and upon this layer is placed the spread foundations. Below this layer is a soft clay extending down to a shale formation overlaying the rock, the latter being found at a depth of 80 to 100 feet.

The first high buildings were put on spread, or floating foundations made of steel beams imbedded in concrete. Each foundation was made of such a size that the load coming on the clay would not exceed 3,000 to 3,500 pounds per square foot. This often necessitated putting two or more columns on one foundation.

In figuring load on clay, only dead weight of building is taken into account, as it was found impossible to get a uniform settlement when live load was carried into the footings.

In one large and costly building in Chicago built some years ago after plans by a celebrated Boston

architect, the live load was considered in designing the foundations.

The result is that the walls of the building settled very much more than the foundations, carrying the interior columns, and the floors are 6 or 8 inches higher at the center than around the outside. In consequence extra men are stationed on the floors to help the truckmen push the trucks up the incline.

The settlement of the buildings put on spread foundations is from 8 to 20 inches. This is allowed for by putting up the foundations when work is begun.

The settlement curves of the Masonic Temple 300 feet high are shown.

The first vertical row of figures on the left give the number of the column, the next row the inches of settlement, and the other spaces on the right show the years covered by the observations. You will note that the settlement is not great for about 2 months after foundations were put in place, but as the building went up, and the loads on the footings increased the curve becomes very much sharper. You will also note that the greatest variation in the settlement of the columns occurred at the start when the difference in loads was greater, afterwards the settlement becomes almost uniform, changing at north-east corner when the smoke stack at column 19 was increased in height, causing an increased settlement at this point.

No settlement has taken place in the past 5 months as shown by the horizontal lines. It is, however, questionable whether any of the very high buildings ever entirely stop settling owing to the effect of the wind against them. The prevailing winds in Chicago come from the west and south-west, and the higher buildings when they lean at all, invariably lean east.

The Great Northern theater hotel and office building was erected east of the Great Northern Hotel built several years before. The hotel has a court in the center of the east side, and the theater of the new building adjoining the court on the west.

Heavy fire walls separate it from the office and hotel portions. These walls, each weighing, with the floor loads, 60,000 pounds per lineal foot, meet the east wall of the present Great Northern hotel at right angles. This east wall had been originally designed as a party wall, and its footing had been constructed strong enough to carry a floor load from each side. The end of the theater wall, where it meets the east wall could not rest on the footing of the latter, which projects 9 feet 6 inches, as it would overload the footing, being only on one side, besides being too great a load. The old building had also practically stopped settling, and the new one would probably settle 10 to 12 inches. The floor load, however, from the east side had never been put upon this footing, and in addition it was deemed safe to load it somewhat higher than it had been originally, as the east wall, fourteen storeys high, had been resting upon it for four years. Plate girders were placed lengthwise in the theater wall, with their ends projecting through the old wall, and resting on 36 ton hydraulic jack-screws, which in turn were supported by I beams lying on the footing and parallel to the old wall. The plate girders were of such a length and so located as to transfer to the old footing the desired weight. The screws were raised to their full height, so that they could be lowered 14 inches if necessary. As the new building settled these screws were run down at regular intervals until the settlement stopped. Levels are being taken on the building. After the settlement has entirely ceased the screws will be surrounded with concrete and left.

A rather curious example of foundation exists at Duluth. The Duluth General Electric Company very recently installed a 1,000 k.w. dynamo, and the vibration caused by it affected buildings 500 feet away. The vibration of a 5 storey building over 500 feet away was very perceptible. The building is close to the bay, and I found on examination that the ground is swamp and made ground, down to about 16 feet, where a hard strata is found. This made ground is filled with water and transmits vibrations in waves.

The buildings are built on piles driven into the hard ground, but the top 16 feet are entirely unsupported laterally. One building, however, also about 500 feet away, was found to have no vibration whatever, and it developed that when the foundations of this building were put in the whole area was excavated down to the hard ground and filled with sand to the top of the ground.

In order to avoid the excessive and long continued settlement due to spread foundations, piles were used, and latterly concrete caissons going down to the shale overlaying the rock, or going down to the rock itself are supplanting both. When it is not found feasible to go clear to the rock the caissons are belled out at the bottom, generally to twice the diameter of the caisson itself: that is a 6' caisson is belled out to a diameter of 12 feet on the bottom and the angle of the slope of the bell is about 30 degrees with the vertical. Where the caissons go to rock the bell is not necessary. The caissons are made by digging down from 4 to 6 feet, just as a well is dug, and then lining up the shaft with wooden lagging, the strips vertical, held in place by iron hoops made adjustable. Then another section is excavated and lagging put in, and so on down. When bottom is reached concrete is put in, and lagging removed one section at a time until hole is filled.

One building now being erected will rest on about 90 caissons from 7 to 10 feet in diameter, carried down to rock which is from 100 to 104 feet below surface of ground.

A large State Street department store now occupying a 6-storey building, has just started to tear down the old building, and erect a 16-storey building in its place. The foundations for the new building, however, are all now in place, and have been put in during the past three months. Over 60 concrete caissons from 60 to 80 feet deep have been built without disturbing the old building, and without the knowledge of the thousands of shoppers who daily filled all the floors above. In some cases it was necessary to shore up the old building, and take out an old basement pier and put a caisson directly under it. At night the material excavated during the day was taken up to the street through an opening in the sidewalk, and hauled away in wagons.

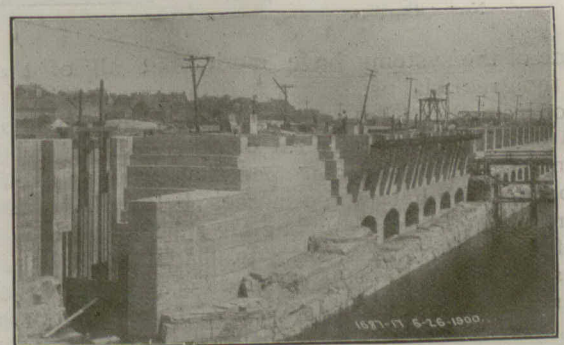
Concrete caissons and piles are often used in foundations of some buildings.

There is no settlement when caissons are used beyond that due to the shrinkage of the material while being put in place.

The use of concrete either in large masses, or reinforced by steel has made great strides in the past few years and continues to grow in favor.

The drainage canal used it in immense quantities and in some cases in a very bold manner.

This view shows a recent concrete structure, for the Economy Light & Power Company at Joliet, Illinois.



The next (not shown) shows steel cylinders filled with concrete. These cylinders are 7 feet in diameter, 52 feet high above the masonry and carry the ends of two 380 feet spans. The masonry piers are only stone on the outside, the stone being 24 to 30 inches thick, and the interior is concrete.

I have here three samples of concrete. Numbers 1

and 2 were taken from foundations of the L.S. & M.S. & C.R.I. & P.R.R.'s at Van Buren Streets which were put in about 31 years ago.

Sample No. 3 is about 8 months old, and is taken from the foundations of the new station now being erected.

The old station was built with limestone walls. When the building was torn down this limestone was put through a crusher, and the concrete of which this sample is made is from the limestone just as it came from the crusher without screening.

FIREPROOFING OF STEEL FRAME.

After foundations, next in importance comes the fireproofing of the steel frame of the building.

Concrete floor systems are now being exploited in great variety.

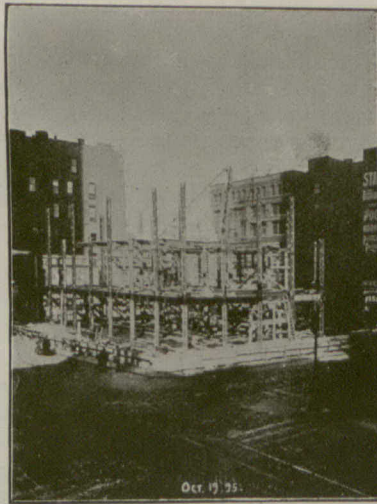
this way. Now in a 20 or 30 story office building, lateral stiffness in the floors is more essential than carrying capacity. A thin slab of concrete laid on top of 12 or 15 beams cannot by the very nature of things, add to the lateral support of these beams. But a 12 in. or 15 in. hollow tile arch laid in between the beams does make a stiff floor.

Experiments as yet have not demonstrated that concrete floors are fireproof as compared with hollow tile which already has been burned.

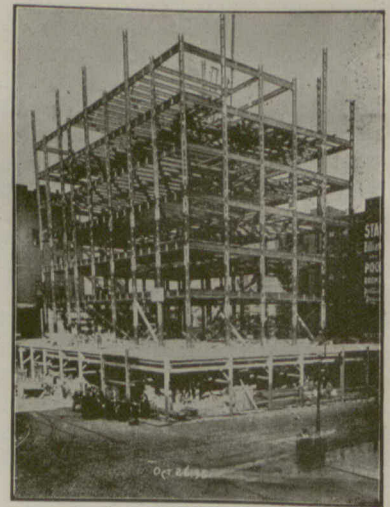
While I have faith in concrete and believe it has great possibilities which will be demonstrated in the future, yet I think that now, in order to compete with hollow tile, its advocates are making claims which cannot be substantiated, and in the future they will have to be more conservative not only in their statements, but in their construction in order to succeed.



Oct. 12th, 1895.



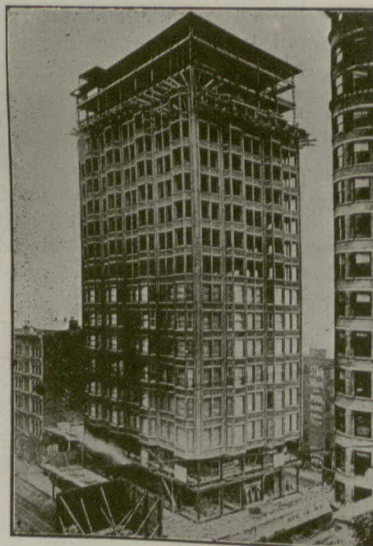
Oct. 19th, 1895.



Oct. 26th, 1895.



Nov. 12th, 1895.



Dec. 12th, 1895.



April 29th, 1896.

Some of the systems have merit, but all of them make too great claims.

A concrete slab 3 to 4 inches thick, even if reinforced with steel in some form or other, should not be used in a very much greater span than we now use for steel beams with hollow tile arches between. It has been gravely told me by a concrete sales agent that in case of two 15 in. beams, say 7 ft. span it would be perfectly safe not only to deduct the difference in weight of floor between the 3 in. concrete slab they proposed to use, and the weight of a 15 in. hollow tile arch, but in addition the section can be reduced 25 per cent. on account of the help the concrete gives the steel. In other cases they state you can, with concrete, use 17 to 25 foot spans, and save all the steel thereby taken out.

One question, however, they decline to answer. Ask them instead of telling the vertical load it will support without collapsing to turn their slab of concrete 3 in. or 4 in. thick and 17 ft. to 25 ft., span, on edge, and then load it. They invariably decline to test it

Recent failures in Jackson, Michigan, where the falling of the floors pulled down the outside walls; and of four floors which collapsed in a \$500,000 apartment building in Chicago will undoubtedly prove beneficial in the lessons they teach. Many other failures in concrete floor construction have occurred in the past few years, but these are the most recent.

Another thing, a building is not necessarily fireproof because it has steel floor beams and columns. Naked steel or cast iron is not fireproof. Wood is far preferable, for if it is of sufficient size it chars on the outside, and the charring acts as a protection. Every bit of structural steel must be covered with a fire-resisting material in order to be fireproof.

The last engineering papers give an account of destruction by fire of two English spinning mills, one resulting in the death of nine persons, injury of a large number. The report sums up both disasters as due to the breaking of the cast iron posts, but the same report says the cast iron posts were left bare. In the absence

of further information it is only reasonable to suppose that the true cause is that these columns were not fire-proofed.

Another and possibly a greater danger than fire is rust. Examination of steel buildings made recently show that the danger is not as great as some alarmists would have us believe, yet it exists.

In a building built in Buffalo in 1895 all the outside columns were filled with cement grout after the brick and fireproofing had been put around them, thus making the whole pier solid monolith with steel core. This is now being generally followed in the best buildings. While the interior columns do not need this treatment, it is well to fill around them solidly at every floor, because if it does nothing else it will prevent rats and

Around the outside of the building at every floor the spandrel sections were made of plate girders 30 inches deep run between the columns and riveted to them. Each floor was supposed to transmit pressure to all the columns of the building in that story, and so on to the ground.

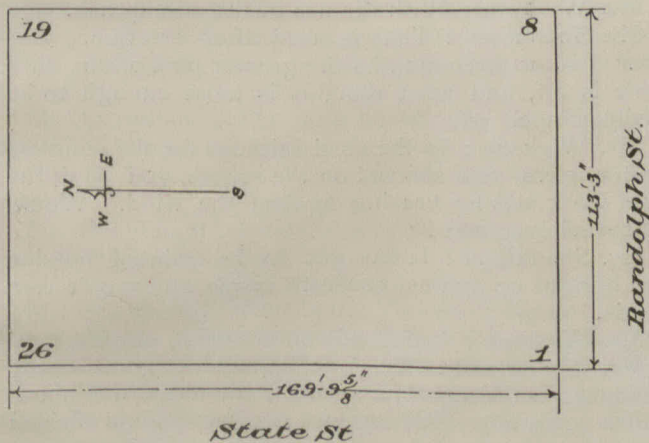
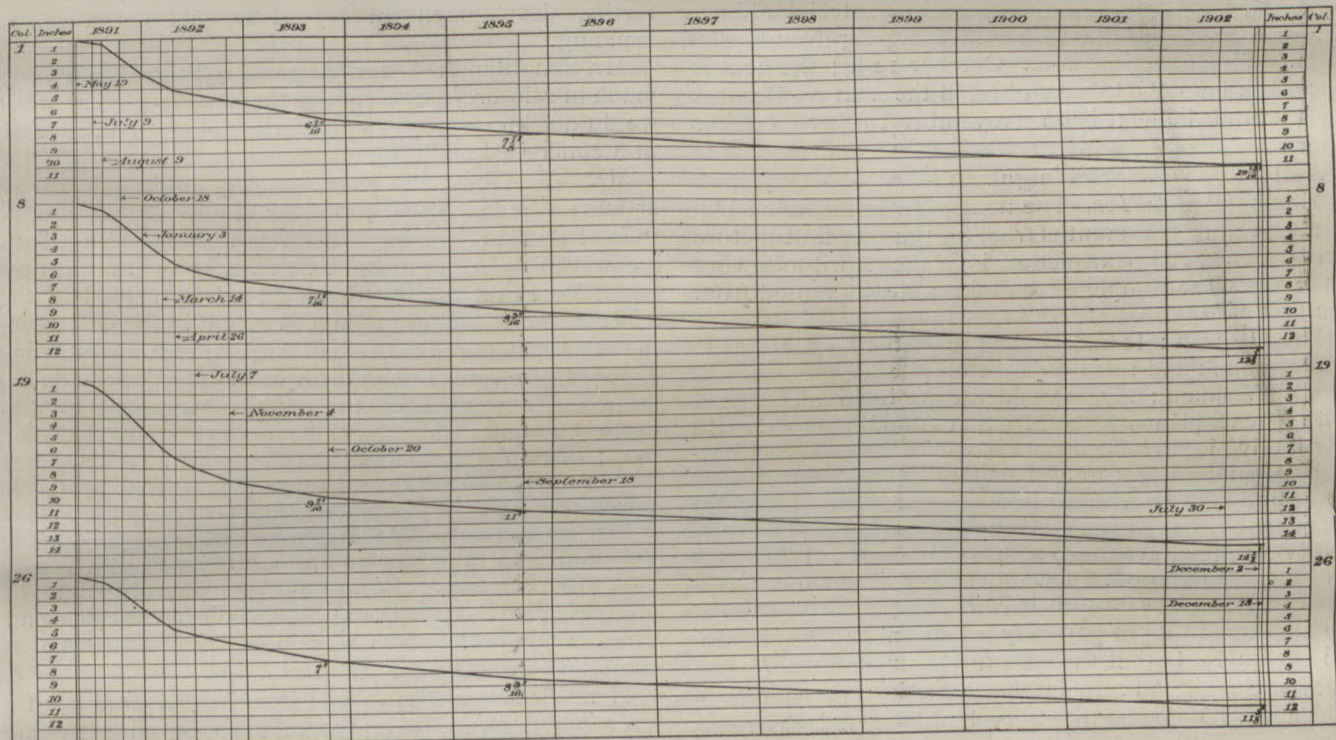
TIME OF CONSTRUCTION.

The views shown on preceding page of the Fisher building show the time in which a steel building can be erected.

DISCUSSION.

Mr. Shankland: These curves show the settlement of the Masonic Temple in Chicago from 1891 till about two weeks ago, on December 15th. The figures on

Levels Showing Settlement of Masonic Temple Chicago.



the left are the numbers of the columns at each corner of the building shown on this sheet. The building is twenty stories in height. You will notice the curves are quite easy for the first few months of construction. The zero was taken at the first construction. As the building becomes older the curves become very much sharper and the greatest portion of the settlement had taken place at the time the building was finished. The first show the dates from 1895 to 1897; the settlement was almost exactly uniform. Then they put extra weight on corner No. 19; they ran the stack up higher; and you see, in the increased curves there, that the foundation was affected at once. The settlement was 10 5-16 inches, 12 7/8 inches, 14 1/2 inches, 11 9-16 inches. The greatest settlement is 14 1/2 inches; the least of those four corners is 10 15-16 inches. The foundation was on spread footings, the load was 3,200 pounds dead load.

other vermin going from one floor to another. Floor loads: The building ordinances of the different cities cover all cases so completely, that very little is to be said. New York and Chicago both demand 100 pounds per square foot for each floor of an office building, or one to accommodate public gatherings.

WIND BRACING.

A great deal has been written about wind bracing in high buildings, and a great many methods of taking care of wind pressure have been brought forward.

Diagonal rods and portal bracing have been tried, but interfere too much with floor space, and the former especially can not be carried out and made a perfect system.

In the Fisher building Chicago erected in 1894, the wind was taken care of on the table leg principle.

A Member: How much of that settlement is live load responsible for.

Mr. Shankland: I do not think the live load causes any additional settlement. I do not believe a building of that size in Chicago ever stops settling; I believe the wind pressure has enough effect to keep a small settlement.

A Member: In that case inside columns would not be affected by the wind.

Mr. Shankland: The building acts as a monolith in that way. From July to December last there is no settlement shown. The levels were taken then. But that is too short a time to place any dependence on. This next photograph shows a work of solid concrete, twenty-six feet high and from six to eight feet on top. This is the Economy Lighting & Power Com-

pany of Joliet which is using drainage water to generate power to send to Chicago. That concrete work is not reinforced at all. It is a solid mass of concrete. The next photograph is shewn to illustrate the way concrete is used in bridge piers; those cylinders are seven feet in diameter and fifty-two feet high filled with concrete; the masonry is above high water but it is only a shell of masonry and the interior is all cement concrete. Those piers are 62 feet long and 22 feet high. The concrete is figured to carry the load and the steel only acts as wind bracing.

A Member: Why was not concrete used for the foundations.

Mr. Shankland: It would have been better if they had concrete instead of the natural stone, but the Board of Directors were not willing to allow concrete to be used to that extent. I wanted to use concrete. Piles were driven to the rock; they were sawed off and the building put on top. These next six views simply show the time it takes to construct a steel building. These views are of the Fisher Building eighteen stories high. The first view is on October 12th; the next is one week later, October 19th, and the next on October 26th. And the next is on November 10th, two weeks later.

A Member: Working night and day.

Mr. Shankland: Yes. The next view is taken on December 12, just two months from the time the first picture was taken. The next picture is in the April following and shows the completed building; it was rented from the first of May.

Mr. Denison: It hadn't time to settle.

Mr. Shankland: It was built on piles.

Mr. Wickson: Mr. President, we have all listened with great pleasure to Mr. Shankland's paper. He should live in a civilized place where they have a bottom to build on, not in a place like Chicago where they can't find bottom without going so far down. I do not wonder they have to pay so much attention to fire proofing when they have to go so near the centre of the earth to get a foundation. I want to ask a few questions. Mr. Shankland said that in calculating the load on the ground he does not pay any attention to the live load on the clay. Is that the case in all kinds of soil?

Mr. Shankland: It is the case in everything in Chicago. Of course a factory building or warehouse is always built on piles and there you take in a certain proportion of the live load. But in the spread footing of an office building the live load is not calculated.

Mr. Wickson: That applies more particularly to Chicago rather than universally?

Mr. Shankland: Yes.

Mr. Wickson: In looking over the Building By-laws of Washington I see that they take into consideration a considerable portion of the live load, thus following certain authorities.

Mr. Shankland: You naturally would if you did not want to get too great a settlement in the building.

Mr. Wickson: What do you say the proportion of concrete is in the caissons?

Mr. Shankland: One, three and six.

Mr. Wickson: How near are the caissons built to the party wall in that building you mentioned?

Mr. Shankland: They are built in the centre of the party wall; it is on a street on two sides—it is The First National Bank building. They are built in the centre of the party wall on the other side.

Mr. Wickson: In a case of that kind are the builders allowed to go to the street limit with foundations.

Mr. Shankland: They are allowed to go out to the kerb line.

Mr. Wickson: You have spoken about concrete and its uses; you have also given us some illustrations. Although concrete is being used so much in some respects I have found great difficulty in getting any data when I wanted it for concrete building—I mean the superstructure, not so much the foundation. It is rather a new thing; but still it is being used in some places. Can you give us any way by which we can

get data for the strength of the superstructure of a building.

Mr. Shankland: Elsner & Anderson of Cincinnati are trying to get a permit for a sixteen story building. They have not succeeded in getting the permit yet. I do not know how they have figured the concrete. I looked over the plans and, taking the floor load at 100 pounds, and the concrete itself is seven inches thick in the floors, I found they had 83,000 pounds on the basement columns without taking into account the floor itself.

Mr. Wickson: In your address your criticism was largely as to concrete floors.

Mr. Shankland: Concrete floors altogether.

Mr. Wickson: If we take the dictum of a paper called "Fire Proof" we would not use concrete in any shape. It says "During the mediaeval period concrete was extensively used for tombs; the same is true even unto this day." I suppose we shall have to wait for further development in regard to superstructure, in building.

Mr. Shankland: There are going to be great advances made in reinforced concrete in the next few years; but we do not know yet how they are going to take care of a concrete building.

Mr. Wickson: In your address and also in an article in the last "Brick Builder" there is this clause, "Good Portland cement even in thin layers is an effective preventive of rusting it is of the utmost importance that the steel be clean when bedded in the concrete." It seems to me a great difficulty is getting the steel actually into the building without spots being exposed, even in the handling of the steel, provided it is properly treated at the mills. I suppose in very large buildings they have some way of overcoming that; but in the ordinary building such as we get in Toronto what is to prevent these places from being exposed to rust?

Mr. Shankland: We used to give it a coat of oil at the mill and a coat of paint at the job, and a second coat after erection. We do not now paint it at all till after erection. A little red rust won't hurt steel at all; it is the mill scale which if painted over will come off sometime and take the paint with it.

Mr. Wickson: Then if the steel be delivered on the job properly clean, it is quite sufficient to paint it then?

Mr. Shankland: After erection.

Mr. Wickson: With the use of the wire brush.

Mr. Shankland: That is used after erection. But after two or three months the greater part of the mill scale is off, and what remains is loose enough to be easily scraped off.

Mr. Wickson: In the steel caissons for the concrete bridge piers you showed on the screen, you said the steel work was for bracing against the wind. Would that steel ever rust?

Mr. Shankland: It has got to be painted outside and is right up against concrete inside and won't rust inside.

Mr. Wickson: It depends on the paint outside.

Mr. Shankland: We investigated a good many buildings in Chicago last spring; the oldest was about fifteen years old. We cut into the foundations of eight or ten or a dozen of them and we did not find a particle of rust in the foundation. Some places we had to bale the water out when we cut away the concrete. But the blue-black of the mill was on them in every case; there was not the faintest indication of rust. Steel should not be painted when bedded in concrete.

Mr. Wickson: That leads me to ask another question. The preservation of steel seems to be very complete where it is coated with cement, and I notice in the "Brick Builder" also that there is a statement that the use of hollow porous terra cotta blocks in connection with the cement is now considered to be an excellent method. I did not quite see how they would use them. Was it a matter of entirely coating or casing the steel work with the cement first?

Mr. Shankland: Plastering against the beam and tile.

Mr. Wickson : The columns would be filled as you mentioned.

Mr. Shankland : Yes.

Mr. Wickson : I am not sure whether it is a fair question to ask you if any of these patent paints so extensively advertised have been found to have special merits.

Mr. Shankland : An architect does not get a chance to see the steel after it is in the building. I have always followed the best bridge engineers' practice in the United States and that means red lead and linseed oil. I have never used any of the patent paints. If architects had a chance to investigate for themselves they might be able to do it ; but, as it is, the only thing is to follow your leader.

Mr. Wickson : Have you ever on any occasion found the beams which are sent out from the mills not sound ? What defects have occurred ? Are they tested at all at the building as they are used.

Mr. Shankland : Only surface inspection. That should be made at the mill.

Mr. Wickson : Is there any other test.

Mr. Shankland : No. There couldn't be any other test. We have an analysis of the steel at the mill ; and then the surface inspection is made to see that there are no surface defects.

Mr. Wickson : I ask you that because there were a couple of cases I happened to hear of in which beams collapsed or broke before they were really in place, after they had been delivered at the building.

Mr. Shankland : I do not think that has happened for a few years. When they first started manufacturing steel they got internal strains in the steel. When the market building was in progress they unloaded a beam from a wagon on the street and it split up about six feet. But now they are making so much better steel than they did that there is not the same danger of this.

Mr. Wickson : Could you give us approximately what the percentage is of extra cost on a building which is made all fire-proof over one that would be well constructed without being fire-proof ?

Mr. Shankland : I could get nearer doing that a year ago than now. In the present conditions of work it would be hard to say. It would run from twenty-five to forty per cent. Steel itself is forty per cent. higher than it was two or three years ago.

Mr. Wickson : There is one other question I wanted to ask you although it hardly comes under your paper ; I am going to ask it for the general use of architects. What are good hand books to use for construction formulae.

Mr. Shankland : The best books are the Carnegie and Pencoyd pocket books.

Mr. A. H. Gregg : What about the various text books ?

Mr. Shankland : I hate to discuss books of that sort in a gathering like this.

Mr. Denison : They are compilations.

Mr. Shankland : That is it. You can't depend on all being reliable. The American Bridge Company is getting out a specification that promises to be very valuable ; it will give floor loads and methods of construction, the building laws of the different cities, and a great deal of data of that kind.

Mr. Wickson : I should like to be the mover of a vote of thanks to Mr. Shankland for his paper.

Mr. Jarvis : Mr. Wickson asked a question with regard to data for figuring the strength of concrete. I do not see why that should not be a very simple thing to get at, by going to the School of Science and having tests made. It is a very simple matter provided we are always sure of the cement ; and that is not a difficult proposition either, so long as you have it tested one week before the time that it is to be put into the works. I am sure that it would be one of the most accurate things in the world do deal with, just as accurate as steel, because it is so very positive ; that is, cement is a positive article to deal with, and so is your crushed stone, if you have them both right. With regard to making beams and columns of concrete, it seems to me

that that is also a very simple matter to deal with, having them strengthened with steel rods to increase the tensile strength of the concrete and that it would be a splendid thing for the Association to take up with the School of Science through Prof. Wright. I am satisfied myself that there is nothing in the world equal to cement concrete armoured with steel for almost every kind of building construction. It will be better and cheaper than steel. I happened to pick up a paper in Prof. Wright's office a few days ago which told of some engineer reading a paper, to the Society of Engineers in Cleveland which went as far back as the time that the Pantheon at Rome was built, which has a dome of 142 feet span built entirely of concrete. He says that this has stood the elements for nearly 2,000 years without the slightest weathering ; and that in England, in certain places where the natural stone was used for facing, and concrete was used as a backing, that the natural stone has entirely disappeared and that the concrete, which was intended to play the secondary part, is there as good as the day it was put in. In this paper the engineer says that we are returning with rapid strides back to the old and time honored masonry construction, not of bricks and stone, but of artificial stone, namely concrete armored with steel. I should like to ask Mr. Shankland if an artificial stone composed of Portland cement and crushed stone in proportions of 3 to 1, the stone having the dust removed, would not be absolutely indestructible as to its weathering qualities. I have been studying concrete for the last two years and I do not know anything so fascinating or interesting as science and art in this study ; and it is marvellous how few people seem to understand the first principles of making concrete. I have not seen it myself but I have been told by people who sell the raw material to the city that our engineers won't allow anything smaller for making concrete than what will go through a $\frac{3}{4}$ inch mesh ; that, after he has got his stone from probably 2 inches to $\frac{3}{4}$ of an inch, the rest of it is cement and sand ; they reject everything smaller than $\frac{3}{4}$ of an inch. The voids between the $\frac{3}{4}$ of an inch pieces would be considerable, and the amount of cement necessary to surround the sand which is necessary to fill up these voids would certainly weaken the concrete to a great extent, unless this crushed stone were graded from 2 or $2\frac{1}{2}$ inches down to probably a 10,000th part of an inch, and only dispensing with the dust. If you were to crush the whole of your stone down to the size of an 8th of an inch in order to make a very fine concrete or cement stone for the exterior surfaces of buildings, and you do not want anything larger than an 8th of an inch, there would be a great deal of powder in that. It would be half powder. It would be a powder that would go through a 100th mesh ; that is, 100x100 being 10,000, 10,000 grains would go through to a square inch ; that should be rejected. But if we were to use from 2 inches down to the 10,000th part of an inch, so that there is not any powder left in it at all, and so that there is just enough space left for the cement to surround each particle from the largest down to the 100 mesh, it is something you cannot miss and is the real science of concrete working ; and it seems to me it is just as easy to deal with as steel ; in figuring out beams and columns. But you have to get your formulae by actual test.

Mr. Burke : I have very great pleasure in seconding the vote of thanks proposed by Mr. Wickson. I would like to ask Mr. Shankland if he has made any examination of the outer columns of buildings cased with half brick or with a thin terra-cotta shell, in the manner so much in vogue a few years ago in Chicago. It seems to me that steel would be more likely to suffer damage by rust in a place like that than in the foundations.

Mr. Shankland : We examined the south-west corner column of the Pontiac building, in the 8th floor, last year. That was built in 1889. The only covering it had was 4 inches of pressed brick on both sides of the corner and fire-proofing inside. There was not

a particle of rust to be found, and we opened it up for about 4 feet.

Mr. Burke: Was the brick laid in cement.

Mr. Shankland: Yes; it is just 4 inches of pressed brick.

Mr. Denison: Do you ever advocate the use of common mortar in a case of that sort.

Mr. Shankland: No, not in high walls or in a skeleton building.

Mr. Denison: Mortar would not have the same effect in protecting the iron as cement.

Mr. Shankland: No; not lime mortar.

Mr. Pearson: What form of wind bracing do you think best.

Mr. Shankland: That shown in the Fisher Building; plate girders riveted in between the columns. When the wind strikes the building all the columns in that story go together. The stiffness of that floor will bring into action all the columns in the story.

Mr. Pearson: In treating the expanded metal floor your idea was to treat the floor as a column.

Mr. Shankland: Treat the floor as a stiff plate.

Mr. Pearson: If you take the stories about 12 feet high at 40 pounds wind pressure—that would be about right.

Mr. Shankland: That is very heavy.

Mr. Pearson: Well, taking that pressure, every horizontal foot of wall abutting against the end of a bay of floor would exert a pressure of 480 pounds and, the cross section of a 4-inch floor per foot being 48 inches, the pressure would be 10 pounds per square inch.

Mr. Shankland: Well?

Mr. Pearson: Can we get any data or information about that?

Mr. Shankland: I do not know of any as yet.

Mr. Pearson: Mr. Barrett, of the Expanded Metal Co., is here. We should like to get information on this matter; it is important. What is the deflection of the floor for the load? This is a factor in the matter. There are three forces in action, the dead strain, the live load and the lateral pressure, and the vertical loads work against the lateral pressure.

Mr. Shankland: A heavy wind is nothing but a blow; it does not last long nor does it cover an extended area.

Mr. Pearson: I wanted to get at some data in connection with the strength of these expanded metal floors. The manufacturers tell us that 3 inches is ample to do the work, but they give no data and no information; we must work the thing out ourselves.

Mr. Shankland: What I say is that a concrete slab should not be used in a high building where lateral stiffness is necessary.

Mr. A. H. Gregg: You mean where the wind gets at it.

Mr. Shankland: Yes. For a vertical carrying load it is another matter; but in a building 280 feet high and 70 feet wide lateral stiffness is very important.

Mr. A. H. Gregg: If you do not have a building over eight or nine stories it does not matter.

Mr. Shankland: Not if the area is corresponding, if the area is great enough.

The President: When you sink long columns into the earth, do you consider the earth at all as an assistance in preventing torsion.

Mr. Shankland: Of course if the clay is stiff enough it will give some lateral stiffness.

The President: Do you rely on it at all?

Mr. Shankland: No; neither can we give any figures for a 7 or 10 foot column 100 feet high, we have never tested one except theoretically.

The President: Under a party wall it might not be possible to insert a column of large diameter. I suppose in that case steel rods would make a small diameter possible.

Mr. Shankland: Yes.

Mr. Baker: We have all listened with great pleasure to Mr. Shankland's instructive lecture. What strikes me particularly in Mr. Shankland's remarks about con-

crete is the apparent poverty of it compared with what we specify here. Mr. Shankland stated that he specified one, three and six; in Toronto I think we generally specify about one, two and four or five for building purposes.

Mr. Shankland: We think you are extravagant.

Mr. Baker: I suppose we are; that is what we want to get away from, and no doubt will when our cements are thoroughly proven. In those bridge piers what load per square foot did you put on the concrete columns.

Mr. Shankland: Twelve tons at the top. In these caissons the ordinary load is 15 tons at the top.

Mr. Baker: I am not clear myself, and I do not know whether we all are in reference to your statement that you do not provide for any live loads in preparing the foundations of the interior columns. Of course 3,000 to 3,500 lbs. per square foot on the ground we would consider extravagant building here; I think we sometimes go up to 2 or 3 tons. By the dead load do I understand you to mean simply the weight of the floors themselves?

Mr. Shankland: The weight of the building.

Mr. Baker: The dead weight and lateral thrusts and everything of that kind. You do not include any superimposed load?

Mr. Shankland: This is only office building construction.

Mr. Baker: Of course if it was only office buildings you referred to the live load is small but you also referred to pushing trucks up an incline and that made me think it was in some warehouse building.

Mr. Shankland: It is a warehouse.

Mr. Baker: I should think there would be tremendous superimposed loads in a building like that.

Mr. Shankland: The outside walls settle very much more than the interior columns. The worst settlement is the walls and you never can counteract the first settlement.

Mr. Baker: Given a floor area of 200 sq. feet and a dead load of 40 lbs.—a superimposed load of 100 lbs. in a 10 storey building would raise the load on the ground from 3500 to 8500 lbs. which in Chicago might be rather high. Mr. Shankland referred to foundations going down 80 or 100 feet in the ground. My attention was drawn to a building in New York, where they are utilizing all that space for offices; in one case they are putting in eight stories of offices under ground. There is no reason that I can see why those could not be used.

Mr. Shankland: In New York they excavate in rock. In Chicago it would be a very difficult matter to keep the water from the lake out of the foundations.

The President: Have you examined the Stock Exchange in New York? They have excavated there some 30 or 40 feet of quicksand, and the seepage in the cellar was nothing when I saw it.

Mr. Shankland: In the Sherry Building they have put in a waterproof caisson and there they started at the surface on one side and had to go down 80 or 90 feet at the other.

Mr. Baker: What is approximately the cost of fire proofed buildings per cubic foot in Chicago.

Mr. Shankland: They run from 35 to 50 cents. That depends on the interior finish. In New York they cost 50 to 75 per cent. more than that on account of the interior finish.

Mr. Duck: I should like to ask Mr. Shankland what method he took to ascertain the proper proportion for concrete, that is of cement, sand and stone.

Mr. Shankland: That has been done several times in the physical laboratories; when we started crushing the limestone for the station they made an investigation of that, and the result of it in the tests was that you could get a stronger concrete to use it as it came from the crusher. All that has since been substantiated by the University of Illinois; and I think Perdue made some tests.

Mr. Duck: Is that in all kinds of stone? How about granite?

Mr. Shankland: Over at Perdue they used only limestone. I do not know about granite; it would not be so important there; it makes a stronger concrete.

Mr. Duck: The limestone in different localities varies very much. Some of the limestone is almost as fine as impalpable powder. In other sections we get a much better crushed stone.

Mr. Shankland: This limestone comes from Southern Indiana that we use in Chicago.

Mr. Duck: The process of pouring water into a receptacle full of crushed stone to get the amount of sand necessary to fill the interstices; then pouring water into this quantity of sand to get the amount of cement necessary to make a solid mass of the three substances usually comes out one, three and six, in taking a stone such as crushed boulders.

Mr. Jarvis: I should like to ask Mr. Shankland if cement made with a hard crushed limestone that would pass through an 8th sieve and be caught on a rooth, mixed in proportions of three to one, whether the water would have any effect on it so that the whole of the dust is eliminated, and no dust left, only clean particles of crushed limestone that go through an 8th and would be caught by a rooth.

Mr. Shankland: I do not think the water would have any effect on it.

Mr. F.W. Barrett: If I may be allowed to make a remark I should like to do so, as I am interested in reinforced concrete construction. Our business of course, is in expanded metal and concrete, or reinforcing the concrete floor with the mesh of expanded metal. I quite agree with Mr. Shankland on the inadvisability of excessive spans. In a concrete floor, our own practice is to keep down to six or eight feet as long as we are allowed to do it. Sometimes we are forced to make longer spans, but it is against our will. Long spans have to be built with great care. In the instance mentioned by Mr. Shankland, where part of a concrete floor fell in an Apartment House in Chicago, the accident occurred during construction, and was supposed to have been caused by a workman removing the centering while the concrete was green and not thoroughly set. I cannot say that I altogether agree with Mr. Shankland on the lateral strength of the floors; I think if you consider a concrete floor, where the beams are encased in the concrete, although the main slab is just over the top of the beams, each beam is encased in the concrete, so that the concrete slab will form a very stiff construction across the building from wall to wall; much stiffer than you will find in a floor where the spaces between the steel beams are filled in with separate blocks of terra-cotta. Then of course the consolidation of terra-cotta depends a great deal on the workmanship of the masons that are laying it; for, as you know, bricklayers are apt to leave a great many voids. On the other hand the concrete is laid in a plastic condition, and the beams are incorporated with the slab very largely. The result with the terra-cotta is that in place of a solid construction across the floor you have a number of joints; that is to say, each beam makes a complete separation from the adjoining slab; and if you have any settlement or special extensions or contractions on the part of your building you are going to take away the strength that it has in compression, and such a floor is going to be weaker than a monolithic concrete floor. We have tested concrete floors with our expanded metal construction and while a slab of $3\frac{1}{2}$ inches thick may seem very thin, tests have been made on a slab of 5 feet in width where the joist beams were fastened to girders 12 to 14 feet apart; and on a slab of that construction a partially distributed load of 4,000 pounds to the square foot, and a total distributed load of one hundred and sixteen thousand pounds, was put on that panel, and it did not go through. Mr. Shankland says if you set a slab of concrete up on edge it has not much lateral strength; but I think it has more lateral strength than a slab of terra-cotta of the same size set up on edge; I know that, for I have tried it. We can put up a partition two inches thick and it is a good working partition, but if you put

up a terra-cotta partition of double that you can push it over with your foot.

Mr. Denison: It depends upon the foot, doesn't it?

Mr. Barrett: I know we had to rebuild a lot of terra cotta partitions because they fell down in putting other work to them. Then again as to the fire-proof quality of concrete, as compared with terra-cotta blocks, I think Mr. Shankland may perhaps know of a fire in Pittsburg a few years ago in which two buildings were damaged by fire; one fire-proofed with reinforced concrete and the other with terra-cotta blocks; one building on each side of the original fire. The building where the reinforced concrete floors were, stood the fire which burned out all the windows, doors and contents of the building on that side, but the floors were intact after the fire, and the repairs were made so quickly that inside of a month the building was reoccupied. The damage was to the superficial parts, the woodwork and that sort of thing. On the other hand the building fire-proofed with terra-cotta blocks, on the other side, caught fire and it not only injured the floors but it absolutely destroyed them; the terra-cotta floors fell down though to the basement.

Mr. Duck: Was that hard tile or porous.

Mr. Barrett: I could not tell you.

Mr. Shankland: You remember that the engineers that reported on those two fires sent in very diverse reports.

Mr. Barrett: Yes; the engineers at that time favored the concrete, and the architects the terra-cotta blocks.

Mr. Shankland: The city I think appointed three experts; I do not say they had three reports, but they had two.

Mr. Barrett: They had two; the engineers reported for the concrete, and the architects reported against it. Then the Schiller Theater in Chicago was subjected to a fire test, and the terra-cotta cracked and split and fell off very largely. On the other hand while we cannot recall many buildings giving tests of very severe fires on concrete construction, largely because I suppose the fire protection systems are so complete that they do not have very large fires and they are able to put them out; but there are no instances where buildings have been very seriously damaged. In Montreal recently there was a building where they had concrete walls, and a great deal of the other parts of the buildings were of wood; all this wooden construction burned out and subjected the concrete walls to a very hard test. It was a very hot fire, but the concrete stood it all without any damage and it is as perfect now as the day it was built. Tests have been made with small sections of the terra-cotta work and concrete; they have been subjected to an intense heat and made red hot. Terra-cotta blocks made red hot, then taken out and subjected to cold water will crack and be very seriously damaged; a cinder concrete block of the same dimensions put into the fire and heated red hot and taken out and subjected to cold water is very little affected.

Mr. Denison: This discussion reminds me of the rival safe agents after the Chicago fire who were calling upon a man who had been burned out. One said, "Do you know that when Jones' building was burned down all his papers were in one of our vaults and, when the fire was out, they opened the safe and what do you think?" The man said, I don't know; I suppose you are going to say the papers were intact." The agent said "More than that; there was a little banty cock in that safe, and when they opened the safe that cock jumped out and crowed." The other fellow says, "That is nothing; one of our safes was in a bigger fire than that, and when they opened the safe what do you think was in it?" "I suppose you had a banty cock that crowed too," said the other one. "No, he didn't," said No. 2, "There was a banty cock all right in the safe, but he was frozen stiff."

Mr. Jarvis: I should think that the concrete used for fire protection could not stand at all if it were made with crushed limestone or broken limestone, because

the limestone under any great heat would calcine and you would have nothing but lime left. If it were made with crushed quartz or granite or some material of that kind it would be all right, but certainly not limestone.

Mr. Aylsworth: As concrete is used more and more for building walls, the question in my mind is what should be the proper treatment for the outside. I do not like the color of Portland cement and it will be necessary to treat the outside plaster with something. I would like your opinion on the question.

The President: I do not know whether you consider that within your province, Mr. Shankland.

Mr. Shankland: It is out of my line.

The President: If we have heckled Mr. Shankland as much as we can, I would like to put the vote of thanks which I have been asked to put. We are very much obliged to Mr. Shankland for coming here and standing this cross-examination; I think that when our proceedings are printed we shall find that we have got some valuable information, which will be of use to us in our work in the future.

It is moved by Mr. Wickson, seconded by Mr. Burke, that this Association pass a vote of thanks to Mr. Shankland for his kindness.

The vote was carried amid applause.

Mr. Shankland bowed his acknowledgments.

The President: Before the meeting adjourns I believe Mr. Symons has an addition to make to his report as Treasurer.

Mr. Symons: Since reporting to you yesterday in regard to the finances of our Association I have received the total sum of \$461.20 that was outstanding for advertising in connection with our papers. This sum, added to that previously reported, makes our balance now in the neighborhood of over a thousand dollars. (Applause.)

It being 1 o'clock p.m. the meeting adjourned for lunch.

AFTERNOON SESSION.

After lunch Mr. Gustave Hahn read the following paper:

COLOR IN INTERIOR DECORATION.

Before going into the details of the actual use of color for interior decoration it is necessary to consider the physical aspect and its relation to form.

Since this is really a subject by itself I will only try to touch the points which are absolutely necessary for the purpose of our discussion.

Often color and form are spoken of as if they were different and separate parts of decoration. In reality this is not the case, for everything we see is color. Our eye is not able to show us anything colorless. Only in looking at the deep blue sky or exposing our face to the full sunlight with closed eyes or opening our eyes under water we see shapeless color, either shapeless blue or yellowish red or yellowish green respectively. As soon as there appear within our vision discernible differences in colors—producing separate tones—with or without light and shade—we have form.

Therefore color is something absolutely necessary—a primary condition; form is the secondary element. Color penetrates us without our being conscious of it, while the appreciation of form is the outcome of intelligence.

Color then is the first and indispensable condition of decorative art and its study ought to be at the head of all teaching in this line. The greatest artists of the best periods have made color the subject of their serious study, endeavoring to form firm and well considered foundations for their art, and some have acquired scientific importance. Leonardo da Vinci's profound observation that "the sky is black, the air colorless and only appears blue on the dark background," until this day forms the starting point of one of the chief theories on color.

Color is the result of the process which begins with the entering of the light waves of the ether into our eye and ends with the sensation of blue, red, etc.

The waves which are necessary to produce the sensation of color do not only come direct into our eye from luminous bodies as the sun fixed stars, fire, electric spark. They are caught by other bodies and reflected and are received in our eye frequently after refraction and reflection, undergoing the most various changes. The bodies which the light waves have to penetrate outside our eye we call media according to their clearness and transparency, bright and dim media, to which belong besides the atmosphere in its various densities and mixtures with vapor and smoke certain vegetable, animal and mineral matters. These last form the basis of our pigments which we prepare or mix in order to convey certain color impressions. Therefore the painter on his palette does not mix actual colors but pigments.

It would be the subject of a special treatise to go into the question of the chemistry of pigments, although it is necessary for the decorator to make himself clear on these main points.

Coming then to the question of the treatment of the individual colors, brown takes the first place. There was a time when this color was undervalued, yes, even prohibited in decorative art. I am referring to the different periods of the 18th century although our modern time has given it its old standing and justly so. A modern authority on color even goes so far as to say "Harmony is brown." Perhaps a somewhat paradoxical remark yet containing a great deal of truth. For nearly every color may be blended towards the brown. Apart from the clear obscure of the shadow parts of a room, which are always brown, many local colors, as wine red, Indian red, olive green, sea-blue, even in a bright light, have a brownish cast. Brown in its endless gradations is the natural color of most varieties of wood, and if treated with color it should be with the colors verging towards brown or with oily or resinous stains. If, therefore, the greater part of the decoration of a room consists of wood surface the use of the brown tones ought to be restricted to the wood and the remaining surfaces treated in harmonizing colors, for two reasons. In the first place our eye requires a change alongside of such a rich tone as brown, and in the second place because we owe it to the wood not to interfere with its value. For if we were to color our wall spaces also a brown we would lower the color value of the wood. An unfavorable combination in this direction would be more justified if the coloring of the neighboring objects were inherent in the materials.

Although white should occur in all decoration in very small surfaces and although it is the most perfect pigment, its use is not as exclusive as brown. For we might imagine in a properly decorated room the floor, ceiling and walls in brown but not in white. In the fine decorations of the Gothic and Renaissance the rule was that the neutral tones, white and brown in broad surfaces, should have their place only in the strictly structural portions. Only the bright colorations of the Rococco upset these rules in order to enhance the light effect of the isochromatic trend. Doors, trims and furniture had to submit to the white treatment, although we find in the 16th century white stucco not only in the interior of churches but in secular interiors on walls and ceilings, as well as in halls and stairways, where the white color is structurally and materially justified. Wood retains its brown color. We may therefore speak of a white decoration of the old and of the new or rococco style. Then natural strong contrasts, now the unnaturally white wood contrasting with the colored wall. On account of its high tone value white requires the most careful treatment. Amongst our chief decorative colors it acts like a strong spice—a little of it enhances the effect, if too much and if dominating in the wrong place it becomes really despotic. In halls, architecturally important stairways, vaulted ceilings, white is unsurpassed as a luminant because with its clear shadows it emphasizes the structural

parts and also because it renders our eye through its simple neutral variations all the more susceptible to the rich display of color in the real living rooms.

The decorative art of the Renaissance has the underlying principle to retain for the white wall its right of color—a principle which has often been neglected in the wall decoration of Pompeii. With natural colored woodwork against white background a polychrome ornament in free treatment affords one of the finest effects.

Neutral gray as an applied local color and not as a mere shadow of strong white takes a subordinate place in decoration. The main reason for this may be that our eye has a natural aversion towards this weakest of all pigments which is neither a cool nor a warm color and is neither light nor dark. For it is its own complimentary color. We connect with it everything dreary and cheerless. It is the color of dust, rain and decay. It is the indispensable shadow color of white and silver. An independent appearance of this auxiliary color is therefore the less suitable the broader those two main colors—white and silver—are represented.

Although black is not as practical as its opposite, white, it is a color of great decorative importance. Amongst all colors it is the quietest and most noble, and therefore most suitable for outline. Pure neutral black is very seldom used. In painting in wood stains, etc., the brownish tones are more agreeable since body-shadows are brownish black and only in the distance, through the medium of the air, become bluish, whereas in tapestries and velvet textiles, on metal and clay, the bluish tones are to be preferred. Since man out of various practical and æsthetic reasons largely employs black as coloring for his garments and also as an expression of mourning, an extensive use of black surfaces for decoration is excluded. The Greeks and Romans who wore white garments could afford to paint their walls in black (for instance in Pompeii where large panels of black were used in decoration). On such a background people may have appeared as living statues. For dark tones in constructional materials very dark woods, as ebony, black oak, and dark stones, as slate and black marble, then iron and black leather, may be utilized. A rich effect may be gained with yellow silk on black woodwork, although red and blue materials or gold and silver will also show fine harmonies. Hot colored woods close by have to be avoided.

The noble modesty of black requires fine surroundings—poor and coarse materials or treatment are incompatible with it. All colors on a black background appear in their full intensity whereas on white ground their effect becomes quiet and cheerful.

The use of green in its natural strength is rather limited. Generally we only find it in connection with the plants which we keep in our rooms, since very few people can afford genuine malachite vases or antique bronzes. All the more we feel the want of this color since it reminds us of nature, the woods and meadows. It has a beneficial influence on the eye and therefore we like to impart it to many objects which allow of other colorings besides those proper to themselves. It is important to note that for broad surfaces the so-called poison green tones are excluded, also the shades which have a bluish cast. For textiles, wall hangings and painting on walls the yellower and olive tones are more to be considered. It is also a valuable color for tiles in contrast with brown and white. Not all shades of green occurring in the landscape can be transferred into decoration with equal effect; for instance, the color of foliage and grass. From Nature we accept the most vivid combinations with admiration—from art we expect no such striking effects but agreeable restfulness. The masters of the 16th and 17th century understood admirably how to depict even Nature decoratively, at least in cases where their works were intended to cover large surfaces. As broad background color it is only advisable in conjunction with equally broad masses of

brown or white. On ceiling or floor, green should only be used beside other preponderating colors.

For decorative purposes the more brownish shades of yellow are to be recommended, and when it approaches the color of gold in its purest tone as spectral color, its use is very much limited. The character of brown preponderates, for if the tendency towards the red would be sufficient, yellow, red or redish yellow would be decorative colors for broad surfaces, which is not the case, however. The most suitable combination for yellow is very dark woodwork. With the assistance of blue faience, and especially if fine textiles form the ground, as velvet, silk or leather hangings, the effect is one of the richest which could be attained. As a matter of course, beside light brown wood, yellow grounds are out of the question, although with a blending towards green in the woodwork the combination can be made possible.

Gold owes its pre-eminent position to the metallic lustre which cannot be substituted by any pigment. For if we combine it with wood, textiles, leather, paper, stone, glass or clay, the impression of metallic application always remains with us. This becomes most conspicuous in a case where we would condemn the use of any other pigment as tasteless. Brown woodwork may be partially gilt where yellow pigment could not be employed. Brownish or yellowish green wall hangings with gold ground or gold ornaments will have a rich effect. The value of gold color as outline and as a neutral tone generally is quite important, indeed so important in this direction that it should be used sparingly in order to preserve its dignity. Any excess in the use of gold has a dulling effect; objects of gold are brought to best advantage on crimson, blue or green background.

The decorators of the 18th century obtained good effects by giving the gilding of frames, furniture, etc., a greenish or reddish tone, which especially agreed with the refined decorations of the style of Louis 16th.

The usefulness of the white and gray metallic colors is a great deal less than that of the gold colors. They are almost entirely limited to such objects as are manufactured out of these metals—table implements and all kinds of vessels chiefly for utilitarian purposes. On all objects of silver which on account of regular use have to be cleaned, gilding would be out of place. Vessels or plates, etc., made of silver or pewter form indeed most magnificent subjects of decoration.

As applied color, silver has a limited use. From certain materials, for instance leather, it should be altogether excluded. In connection with black materials it serves for mourning purposes.

Not until the end of the 17th century had its use come into greater prominence, and since the Rococo included it in its sphere of decoration the effects which were attained with silver on light blue or brownish yellow background were really magnificent. For modern use silver in decoration is hardly practicable since it is liable to tarnish in spite of being protected, and its substitute, aluminum, lacks the color value of silver.

For decorative purposes on large surfaces the broken tones of red, as Indian red and Pompeian red are to be considered. Crimson and purple are agreeable in small portions and then only in fine materials. The usefulness of this color decreases as it approaches the blue. The character of bluish red and purplish tones is restlessness and is more suitable for costume than for decoration. Mauve and violet colors are too vivid, and at the same time are not cheerful. Blue is a color of great importance and its use forms always a touchstone for the ability of the decorator. It would be wrong to deny it force and strength. In fact we may attribute to it a lustre which brightens its environments. This quality is developed largely in combination with brown and red, whose yellow qualities are brought out by it. For large surfaces a pure spectral blue is not suitable. Even in the

Rococco style the whitish blues were preferred to the dark tones. The best use in large fields is on the ceiling. It is of great value in the ceramic art, chiefly the cooler tones. Plates and other objects of this description are of great additional value to decoration. The effect of artificial light on color has also to be studied. Blue and green appear darker since these colors absorb the yellow and red rays, while the warmer colors, as yellow and red, reflect the light and therefore appear brighter. In decorations seen by artificial light all colors ought to be kept in warmer tones.

Turning to the treatment of the different rooms of a typical house, the vestibule and hall usually have not the same amount of light as the other rooms, and in order to harmonize with the colors of the adjacent rooms, their color ought to be one that would harmonize with all of them. A gold color would answer that, besides giving a rich effect at the first entrance into the house. The yellow note gives at the same time more light. The wood-work in the drawing room and reception room is generally either white or of a light, natural wood. The color treatment of the walls ought to be in light and fairly bright colors. The use of these rooms also calls for brighter colors, since furniture, ornaments, etc., are of a brighter nature. The white treatment of the woodwork is really derived from or based upon the styles of the 18th century. It is more of a monochrome character—that is the one color scheme. A light green, not too blue, or rose are good colors in these rooms. I may say here that the more delicate the tones are which are used the more advisable it is to use fine materials, since the latter have a greater quality of reflecting light and produce a great deal richer effect. Indeed, it is very difficult to produce a rose color in mere paint, because we have no pigments fine enough to compete with fine materials.

The dining-room lends itself to quite a rich treatment. The woodwork may be of strong brown, or greenish tone. The more surface is taken up by the woodwork the richer the color may be used on the walls. Rich greens, deep reds on walls—lighter tones of contrasting colors on the ceilings. A greater variety of colors is also advisable though not in too large quantities. If the woodwork is of a greenish tone, the treatment becomes more difficult, since the range of harmonizing color is restricted. A soft brownish red with gold tones is also useful. Mahogany woodwork requires the strongest treatment on account of its own pronounced quality of color. Green with blue and a limited use of gold has a good effect. With black oak a yellow tone can be used to good advantage, although the difficulty arises of harmonizing the rest of the decorations of the room, as hangings, upholstering, etc. Besides, yellow is a poor background for pictures in color, in fact exclude them.

The use of the library requires a quiet treatment of the walls—books, pictures, furnish the color notes with quiet walls while the ceiling may have a more elaborate treatment. The hall, library and dining room are the most appropriate rooms for mural decoration.

In the bedrooms a higher key of color may be used and is more advisable. There should be no strong colored woodwork to compete with. The choice of color depends largely on the aspect of the various rooms, and the amount of light which they receive. For the north rooms and the darker rooms, the warmer colors are advisable, while in a south aspect the cooler bluish tones are in their place. The wall-space in these rooms usually is in excess of the woodwork, and colors and tones therefore have to be kept lighter.

A few words in regard to floor coverings and draperies since we have to reckon with these in connection with wall and ceiling decoration.

They have to harmonize with each other. But often the word harmonize is misunderstood. It does not mean, or not always mean, to get the nearest possible shade, but to find the most harmonious contrasting color.

With few exceptions, an entirely red, blue or green room is tiresome. The task is to blend contrasting colors into harmony, to enhance the value of one color against the other. The eye requires a change of color, not only in the different rooms, but in each individual room, and it is quite possible to retain certain color effects, that is, red, blue, gold, etc., without having every part of one room in that very same color. The change should not be so noticeable as to be striking. Repose ought to be the final achievement and this can only be reached by careful planning and restriction. Richness can be attained without exaggeration, and the result is more satisfactory.

DISCUSSION.

Mr. J. Wilson Gray: I am sure we have all listened to Mr. Hahn with a great deal of interest. I beg leave to move a vote of thanks to Mr. Hahn for his excellent paper. It seems evident to every thinking mind, at least to architects, that there need be no apology for color in interior decoration. We understand that the human eye physically requires satisfaction; that there can be nothing more painful to the eye than to be boxed up in a dwelling-house with plain white walls, or even black walls, now that there are no beautiful white figures to be relieved against it as in the days of the Greeks. The physical eye of man must be satisfied, and to be thoroughly satisfied, Mr. Hahn has told us this afternoon, it must enjoy perfect repose. We can only obtain that perfect repose by the use of color, and by the harmonious use of color, so that we need no apology for the use of color in interior decoration. I am only sorry the scope of the paper did not go outside of the interior work, because to architects generally the subject would have been a very practical one. Architects to-day are striving more than formerly for color in exterior work; to make it harmonize with its surroundings, and to satisfy individual fancy. Mr. Hahn has given us a good practical paper, and it should be all the more appreciated because this subject is largely, I take it, a theoretical one to most architects, built up very often in theories and wonderment as to how such and such a color will look in this place or in that; wondering how their client's wife will like this particular treatment; and eventually the client's wife determines the color scheme, or else the assistance of a professional decorator more or less competent is obtained. We often find that the case. And even when that is done, we find too often the architect, if the result is not entirely satisfactory, always ready and willing to lay the blame either on the lady of the house or the decorator.

These are practical conditions that we all come in contact with every day, there is no use denying it, and when we have one so well-informed and acquainted with the practical demonstration of this subject as Mr. Hahn, it behooves us to listen and learn.

The paper to-day has suggested, in fact, the whole subject has suggested to my mind, that the root of the inability of architects to handle schemes of interior decoration is that there is no system of educating an architect in that line: he is simply left to his own individuality; he is left to his own perceptions, and he has to formulate those when he comes in contact with the necessity for a scheme of color. I think it would be well if this Association would take some step and inaugurate a class or something of that kind to educate our younger men and give them an opportunity to take

hold of this subject, such as we have never had in the days gone by, that they might the better equip themselves to deal with the subject which has been presented to us to-day, and be capable of undertaking successfully what they are so often required to do, that is, to suggest schemes of interior decoration.

If we allow this subject to pass without evolving some scheme by which we can have a little more information from time to time by way of classes or some guidance, I think we shall fail to improve our position and the situation as it is to-day, because I think the situation of architects in interior decoration is very haphazard.

Mr. Denison : I have much pleasure in seconding the resolution. It will be a great help to us to have this paper printed in our proceedings. It will be of value to us. I should like to ask Mr. Hahn a few questions if he will kindly consent to give us the benefit of his opinion. I should like to ask him if he favors the use of white to such an extent as it is being used to-day in exterior decoration. To-day on the street we see whole rows of houses decked out in white.

Mr. Hahn : From my standpoint I should be against it.

Mr. Symons : Why ?

Mr. Hahn : Because I do not think we need any more light outside ; we have lots of light outside.

Mr. Wickson : I, too, am glad the paper will be printed, because I have no doubt we shall, all of us, be glad to refer to it often. I should like to ask Mr. Hahn if in domestic work he has ever tried decorating a whole flat alike, so as to get something more of a continuity than is usually obtained by decorating each room and the hall differently.

Mr. Hahn : It would not always be practical to do that. So much depends upon the light. The light on one side of the house is very different from the other ; a color that might be suitable for the north aspect of the house would not be suitable for the south. It depends altogether on the light the flat receives. I should think, in any case, a change of color, no matter how little it is, would be better than a monotone, one color through everything. You could carry one tone through different colors by changing the color, but keeping the same strength ; that would be a connecting link, as it were, between the different colors, and provide for the continuity you desire.

Mr. Denison : Do you favor the use of light colored brick in domestic architecture, that is, where grounds surround houses, or do you prefer deeper and warmer colors ?

Mr. Hahn : Personally, I am in favor of darker tones. I think the light always is sufficient outside ; and with bright sunlight, we get really more light than most yellow brick can stand.

The President : How about the effect of shadow ? In a white marble building you get more effect from shadow than in brown stone.

Mr. Hahn : If we could get white marble for the outside of all our buildings I would certainly use it. The texture of marble itself gives you a different effect from common material. The same is true of interior material ; if you place paint and silk of the same color alongside of each other, you prefer the silk on account of the quality of the material. You cannot get the same effect of color in two different

materials. Marble, of course is more valuable than brick, and certainly I should prefer marble to brick.

Mr. Denison : On the same line, supposing it was possible to get a marble of a soft, warm color, such as we spoke of, and a white marble, and place them side by side, surrounded by trees and grass, then what would be your taste ?

Mr. Hahn : I think I should prefer the warmer colored marble.

Mr. G. A. Reid : (Ontario Society of Artists) What would be your view of using shellac on wood surfaces ?

Mr. Hahn : That is a point I might have mentioned. I think one of the greatest mistakes made nowadays in any interior decoration is the gloss on wood-work. We have strong enough colors without making them stronger, and gloss always tends to strengthen the color. We can make surfaces practicable without putting a high gloss on them. We have finishes now that are high enough for any use, and there is no need of covering them with shiny varnish to make a high gloss.

Mr. Symons : There is one aspect of this question with which I have come in contact, and probably all of you have, and that is the inability of some decorators to grasp our side of decorative work. We finish a room and treat the architectural features for a certain result, for a certain fixed idea, which is to be evolved from our own work and further treatment by decoration. I won't say men of the ability of Mr. Hahn, but the average decorator, does not see, as we do, the design implied by our work. He seems to look at the work from an entirely different viewpoint ; and often his work, as a piece of decoration, destroys the architectural effect of the whole that we aimed at. The detail about the form of which we have been so careful, the shadows, and so on, that we have been fostering, and the general effects we aimed at, are destroyed by the color effects. Decorators do not seem to take the same meaning (I do not know any better technical name for it) out of light and shade itself. Their whole idea is an effect of color, while I think the architect looks more to the effect of light and shade, *per se*. During this last year there have been half a dozen cases in which I have had to call in expert services for decoration, and I have found the architecture of a room—absolutely the design of the room from our standpoint—has often been entirely changed by the color scheme ; we not being consulted by the decorators or by the owners in regard to the decoration. When we have finished our work, it is often not decorated for years to come ; but we have an idea in view when doing the work, and I think when the decorator's turn comes, he should spend some thought in trying to grasp that idea so as to make it the motive of his own work. We have Mr. Hahn's statement that we do not seem to grasp the situation from the decorator's standpoint ; but there is also our side to be considered.

Mr. R. Y. Ellis : (Manufacturers' Association), May I be permitted to make a remark in this matter ? The last speaker has referred to the difficulty of getting a decorator to assist him in his work. Mr. Hahn is what I should call an educated decorator, but it strikes me that all decorators have not realized the importance of an art education in connection with their business. I think they are beginning to realize it. We have some educated decorators, but most of

them, and perhaps most architects, too, might give more attention to what I may call an art education, (as distinguished from the purely architectural side), the study of color in particular. It must be a great help to an architect to have studied at an art school. The Central Ontario School of Art and Design is deeply indebted to some of your architects who have been on our board, and realize the importance of an art education; but how far as a body have you considered the importance of establishing an art school in our midst that will help you? I think you have simply passed the question by for want of thought. I think architects, as a body, do not recognize sufficiently the importance of upholding a high standard of art education in our midst, so that even ordinary decorators or painters may study art to some extent, and be of more value to architects.

I do not wish to trespass on your time, but I believe that in the matter of an art school the crisis is with us now. As you will see by the papers, there is a disposition to allow one body to govern the whole education of the city, technical education and art education as well. I should like to see you use your influence in the matter of art. It is only by bodies such as this exerting influence that we can accomplish anything. The difficulties the Art School has had in maintaining its position and taking a higher position have arisen because it has had little or no support; but in this present crisis, I hope you will exert your influence in its aid, which is in the aid of art.

Mr. A. H. Gregg: I think we are all anticipating a few remarks from Mr. Reid; but, before we go any further, I should like, on the subject of the use of light colors, to ask Mr. Hahn how he thinks the matter is affected by the consideration of our winter climate. Our summer climate is not much different from that of Italy, and we think then of the white marble of a southern climate, forgetting that we have also the winter months,—several months of the year.—when there is snow upon the ground. This should affect strongly our consideration of the color of buildings. I should like to know if Mr. Hahn has thought of that or noticed the effect it has on the color of our buildings.

Mr. Hahn: I think if we follow the rule that has been followed all through the centuries,—that the south has lighter and brighter colors than the north,—we shall incline to depth of tone and color for our climate. We do not want so much light and white. I think I would prefer the darker tones in every building material. I do not think a Greek or Roman temple would look quite appropriate in this country.

The President: There is much to be said upon the subject of this paper, but we are getting on towards the time at which the next should begin. Do you wish to speak, Mr. Reid?

Mr. Reid: I have really hardly anything to say beyond what has been said. I have listened with great interest and pleasure to Mr. Hahn's paper, and as a brother artist I thank him very much for the points he has brought out in it. They will be useful to all those who have to think about color. The artist and the decorator are thankful to architects who begin to realize the power that decorative art has to help them to elevate their rooms when they are too low, or to make them more cosy when they are too large. All these things are in the hands of the decorator to some extent; and, while architects are growing more and more acquainted with

the difficult problems of engineering and style, the specialist must be called in without a doubt when it comes to decoration; and the specialist ought, of course, to be an educated man just as much as the architect. The architect is undoubtedly the person who assembles all the other parts; he is the painter and the draughtsman par excellence; but he must call on the decorator in more or less degree to aid him in his ideas of color, and in the development of theory into practice in forming color and tone. Whether the specialist requires as much knowledge, or has as much knowledge, as the architect, of the theory of coloring, or the whole question of the design and disposition of masses, he at least has the sense of insight given by practice, and the skill to work out the architect's ideas by his own hand. The architect in his individual capacity, of course, waits on the large and general effect; and he has to draw upon the specialist, not only in the matter of coloring, but also in other ways, to develop the details of his design, and perhaps also its niceties. As a fellow artist of Mr. Hahn's, I thank the Association of Architects for the interest they are taking in decoration and I hope that the artistic side will be developed just as strenuously as the more mechanical and practical side. (Applause).

The President: I think myself that this paper of Mr. Hahn's is a model paper, and it gives us exactly what we want. It is not talking about art, but telling us how to make it, which is what we want to discuss here, and which will be of most service to us when printed in our proceedings. The paper is so condensed it is hard to carry it in the mind for discussion.

There are several strangers in the room apparently interested in the subject. We shall be glad to send a copy of our proceedings to anybody who will apply to Mr. Gregg, the Registrar, whose office is in this building, for them.

I have been interested in the way in which decorators think it is necessary to graduate their colors on walls. It seems to me to be a great mistake. We have even wallpapers with graduated friezes; but if you look at these walls you will see that the gradation is all done by nature. I had to pass a day in bed a little while ago. I was too ill to do anything,—I could only look at the walls and ceilings,—and, during the course of the day, from the time that the level rays of the rising sun came in and gave my pictures a color brighter than Titian's, until the shadows of evening came along, I found continual pleasure in the play of light and shade upon the walls; and I came to the conclusion that a great pleasure the eye receives from the color on our walls is one which we do not recognize until we have an opportunity such as I had of looking at it attentively,—the gradation of light. If you will cast your eye at this moment above the window and see how the shade which is gathered there grades off along the ceiling, you will see an instance of what I mean. Ruskin says that good painting implies gradation; that in a drawing by Turner, there is not a piece of color which has not some gradation in it. I should like to enter a protest, and I hope Mr. Hahn will agree with me, against all processes designed to produce a mechanical gradation of color on walls.

I have great pleasure, Mr. Hahn, in presenting to you the vote of thanks of the Association. (Applause).

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When the painters and decorators employed on the residence of Mrs. Herman Oelrichs, New York, fell out with the contractors and struck work; the lady waited a reasonable length of time for a settlement of the trouble, and then notified all concerned that if a settlement was not forthcoming within a week they

the street and put the rooms in order. And the painters and decorators are out to the extent of their interest in the work which she planned but has now deferred.

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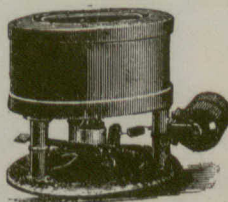
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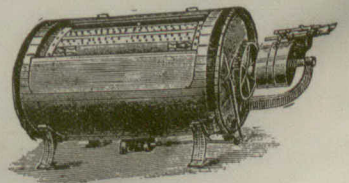


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BUSINESS NOTE.

In this issue will be found the advertisement of the Robert Simpson Co., Limited, Toronto, who make a specialty of carrying out the ideas of architects with reference to interior decoration and fittings. This progressive company can be relied on for the latest designs in carpets, curtains, hangings, as well as furniture. The architects of Canada we are sure will appreciate the assistance which the company are able to give towards the fulfilling of their ideals in the line of interior furnishings. The draperies and floor covers shown by them are strictly high-grade. We bespeak for the Robert Simpson Co. the support of the architects and decorators of Canada.

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BUILDERS AS LUMBER DEALERS.

The builders and contractors of Columbus, Ohio, are going to establish a retail lumber yard. They announce that they have become tired of paying the exorbitant prices demanded by lumber dealers and now propose to become dealers themselves.

The American Lumberman comments on this decision as follows: "Let them get their yard well under way and they will learn sundry things. The lesson probably will be a costly one, but there are some people who cannot learn except by experience, and experience is always an efficient, though dear teacher. As they are not lumbermen, though more or less familiar with lumber, they will have to learn about sources of supply, how to chase up delinquent cars, how to estimate the fairy tales offered by lumber salesmen, how to unravel the intricacies of freight rates and rebates, how to get rid of 10,000 feet of lumber that they had to take in order to get the 1,000 feet that they had to have, and many other problems of like nature. They will pro-

bably hire a manager and that manager will have to be paid, and they will discover that running expenses and leakage will be fully as large as the personal salary and modest profit of the lumber dealers whom they are trying to supersede."

NOTES.

A new brick manufacturing company has secured possession of a large tract of land in the north-west section of Toronto and will at once commence the erection of a plant. About 100 or more men will be employed.

The Association of Canadian Portland Cement manufacturers has just been formed, the following being the officers: Chairman, J.M. Kilbourn, Lakefield; Vice-Chairman, F.G.B. Allen, Deseronto; Secretary, R. J. Younge; Executive, Messrs. Maitland, McLaughlin, Kilbourn and Kline of Owen Sound, Stanhope of Durham, Knechtel of Hanover, Elliot of Brantford, Morgan of Longue Point, Que., and C. A. Masten of Toronto.

The Plasterers' Section of the Builders' Exchange held their first Annual Dinner December 16th, 1902. An interesting feature of the proceedings was the presentation to their President, Mr. J.M. Gander, of a bronze clock and address. The Section has made great progress in the past year, having met and amicably settled all differences with employees, and are now working with the architects on a glossary of terms defining their work for specification purposes.

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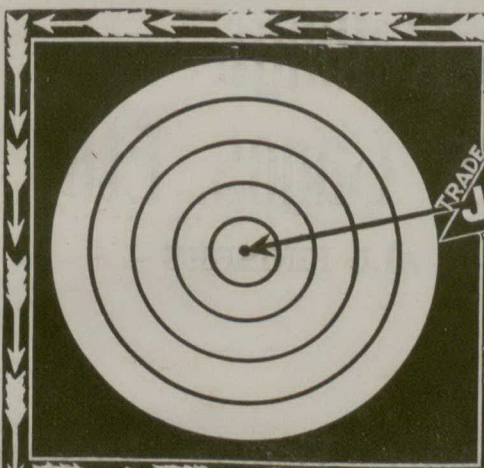
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BY THE WAY.

Among the restrictions which are being imposed by the city authorities of New York as safeguards against fire is one which prohibits after the beginning of this year the sale and use of parlor matches. Another regulation compels the use of fire-proofed wood in lofty structures, and large quantities of material called by this name have been rejected by the Building Commissioner as worthless.

x x x

Mr. M. B. Aylsworth, a well-known Toronto architect, has recently returned from Port Arthur and Fort William, where he was engaged for four months in the erection of a hospital and other buildings. He states that building progress in these northern towns is only limited by the difficulty of securing workmen. Bricklayers are being paid \$7 per day and labourers \$2.50 per day. There are no vacant houses, and not enough mechanics to put up the new ones which the citizens wish to build. Each of the railways will be compelled to build at least one elevator every year for some time to come to provide necessary storage for the rapidly increasing supply of grain.

x x x

In reply to an English draughtsman's enquiry as to the chances of employment in Canada, the Canadian Emigration Commissioner, in London, Mr. W. T. R. Preston, advised the young man that personal application would be necessary, and that the best time to come to Canada would be in the spring, when other

employment could be secured if an opening should not present itself in the line of his usual employment. There never was a better time than the present for efficient architects' assistants to secure employment in Canada, and especially in Toronto. The demand far exceeds the supply, and competent young men in this line from Great Britain arriving here about March or April would be almost certain to secure immediate employment.

x x x

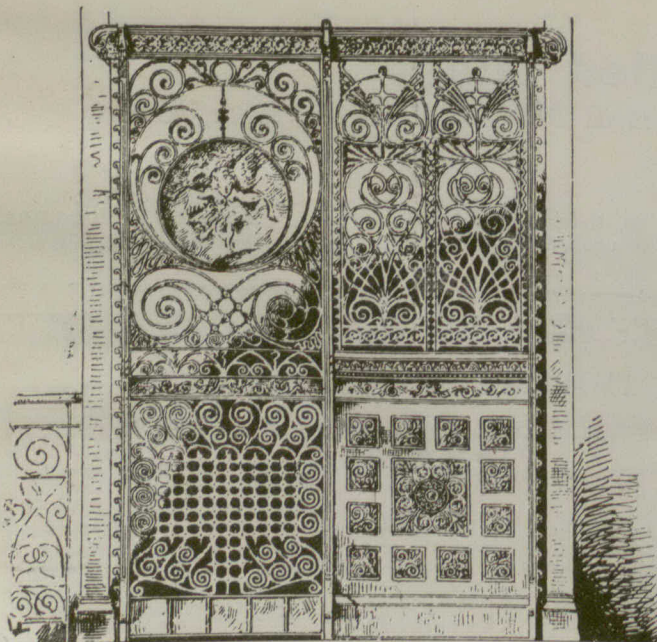
The congregation of the West Presbyterian Church in New Westminster, B. C., find themselves in serious difficulty as the result of having misplaced their building. The board of managers agreed with the board of managers of St. Andrews' Presbyterian Church, that they would not build nearer than half a mile to that church. It has now transpired that the West Church stands 200 feet nearer St. Andrew's than the specified limit, and the Presbytery has been appealed to by the congregation whose territory has thus been invaded. That body after much debate has allowed the congregation of West Church five months in which to remove their building and thus fulfil their obligation. To do this will cost \$1600, and as the church property is heavily mortgaged, this becomes a heavy burden. One is led to wonder what possible injury could result to the complainants from a mistake which placed a sister church 200 feet nearer to them.

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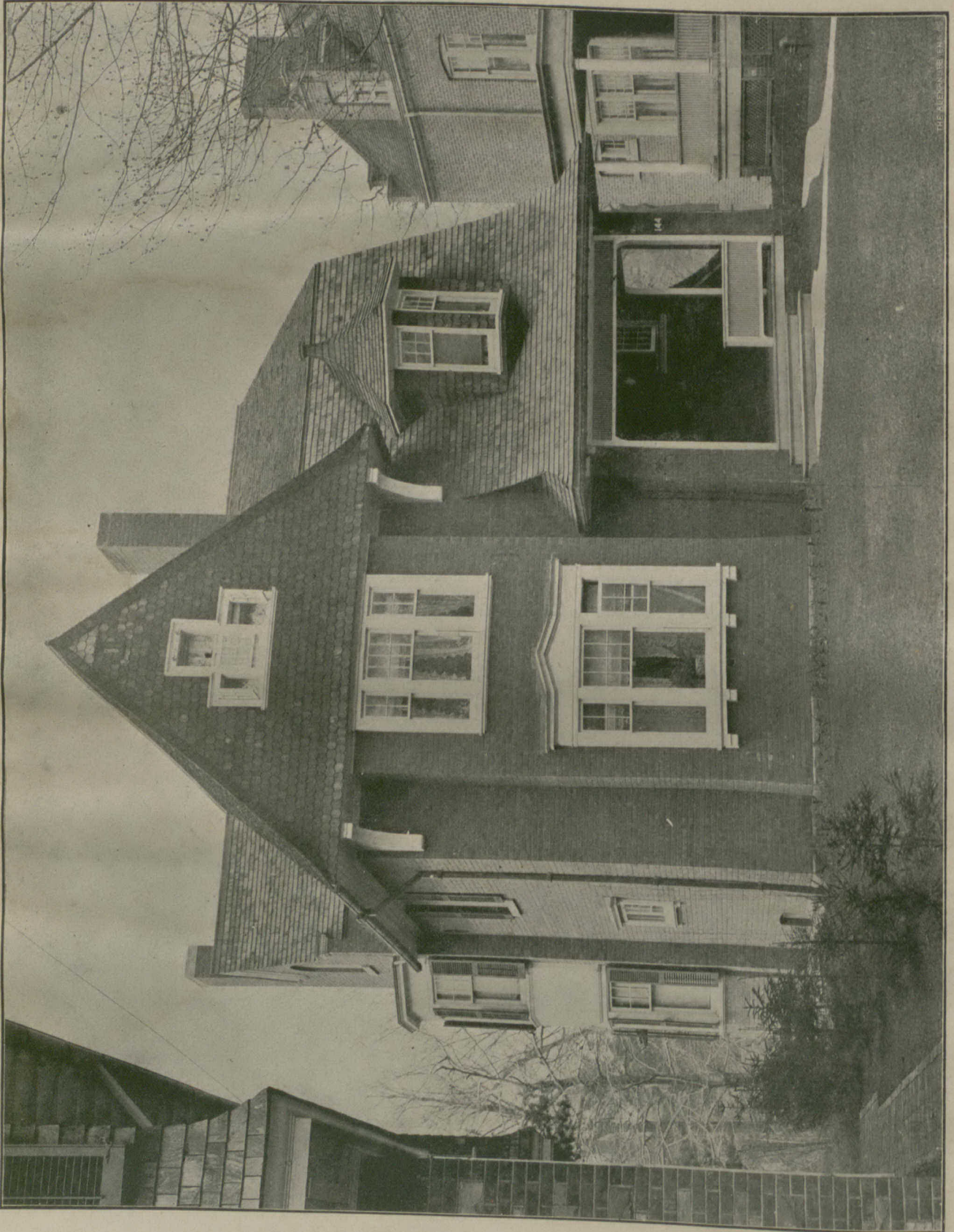


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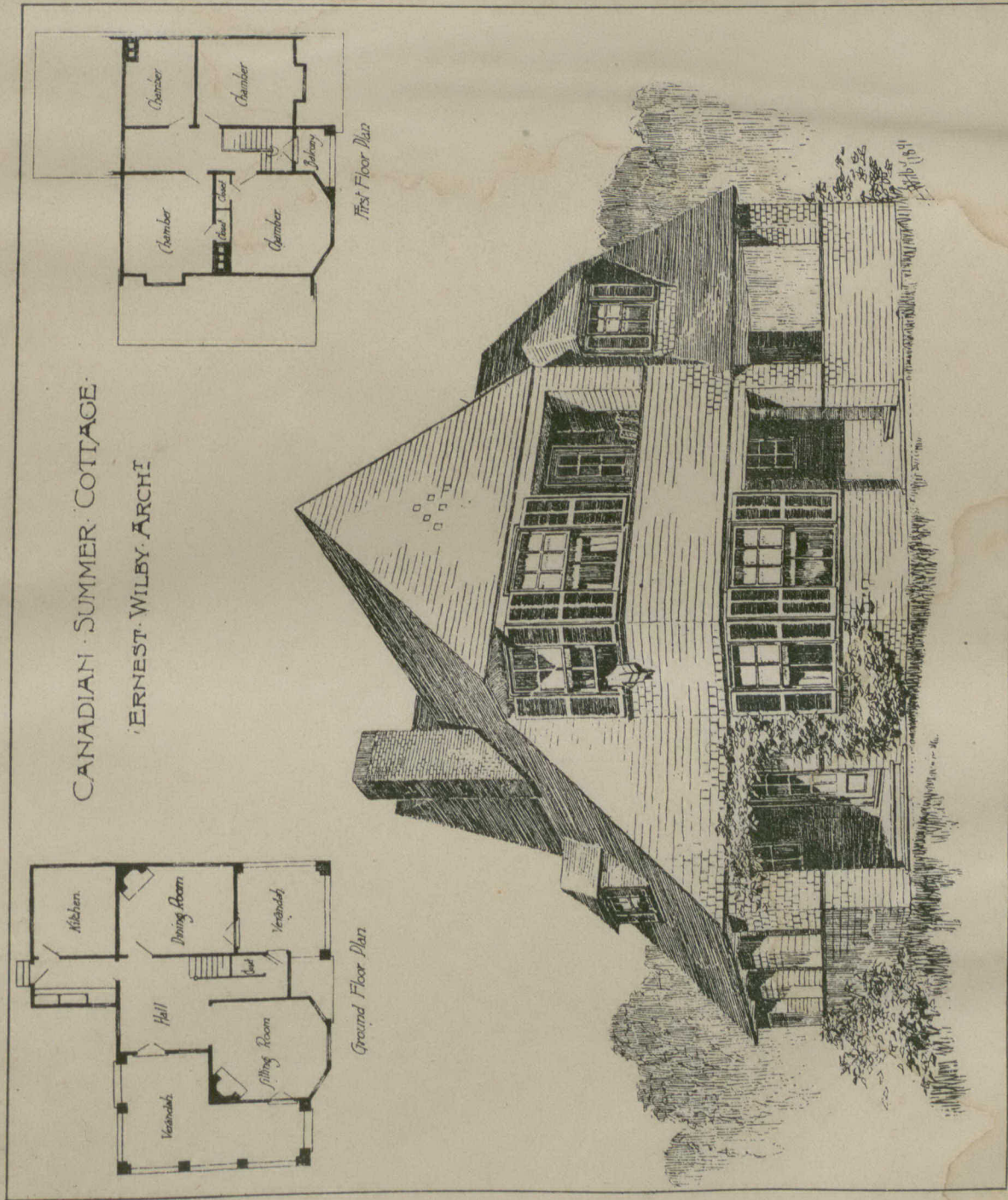
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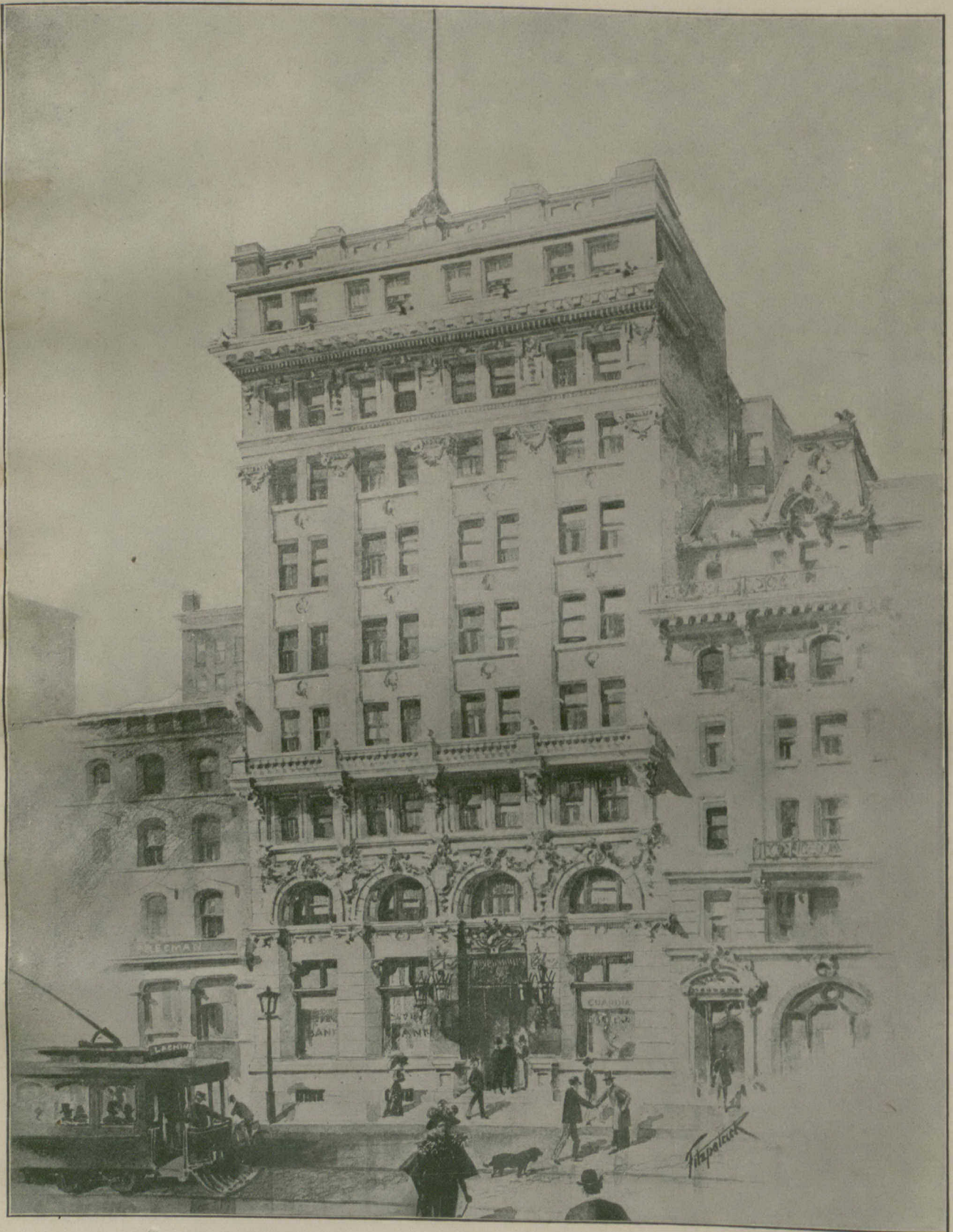


CERTOSA DI PIVIA—DETAIL OF PORTION OF FACADE—INTERIOR DOORWAY OF SAME.

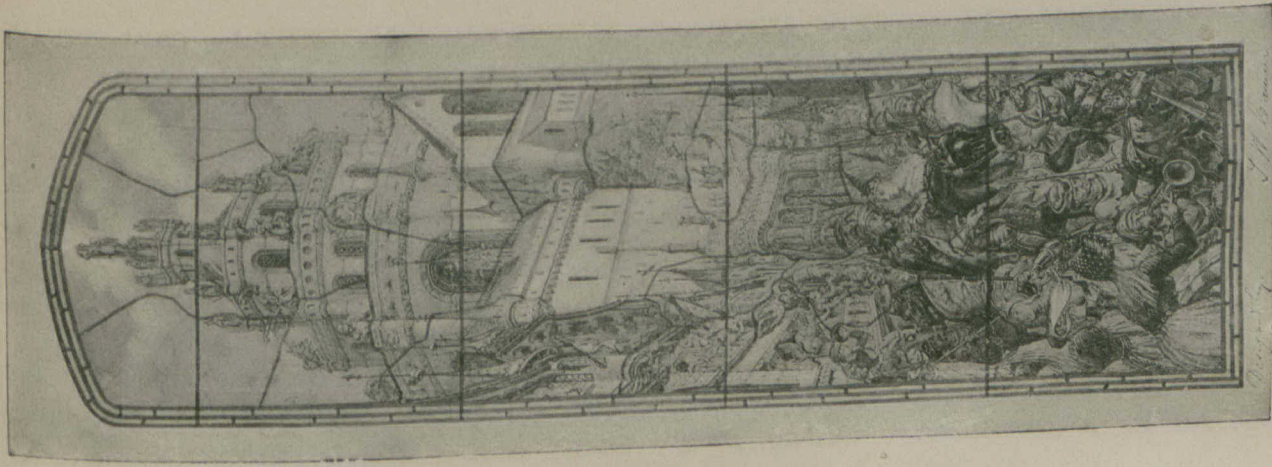


MONUMENTS OF GUGIELMO DA CASTEL BARCO, THE FRIENDS AND ADVISERS OF THE SCALIGERS,
AT VERONA, ITALY.

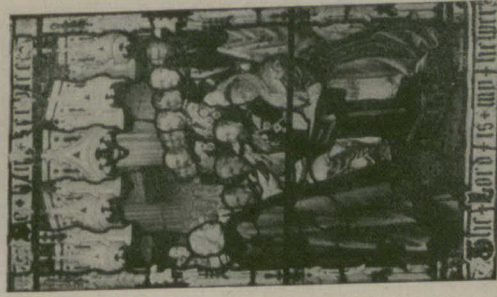
"As far as I know or am able to judge," (says Mr. Ruskin) "the most perfect Gothic sepulchral monument in the world," and he alludes to it again as "this pure and lovely monument, my most beloved throughout the length and breadth of all Italy; chief as I think among all the sepulchral marbles of a land of morning."



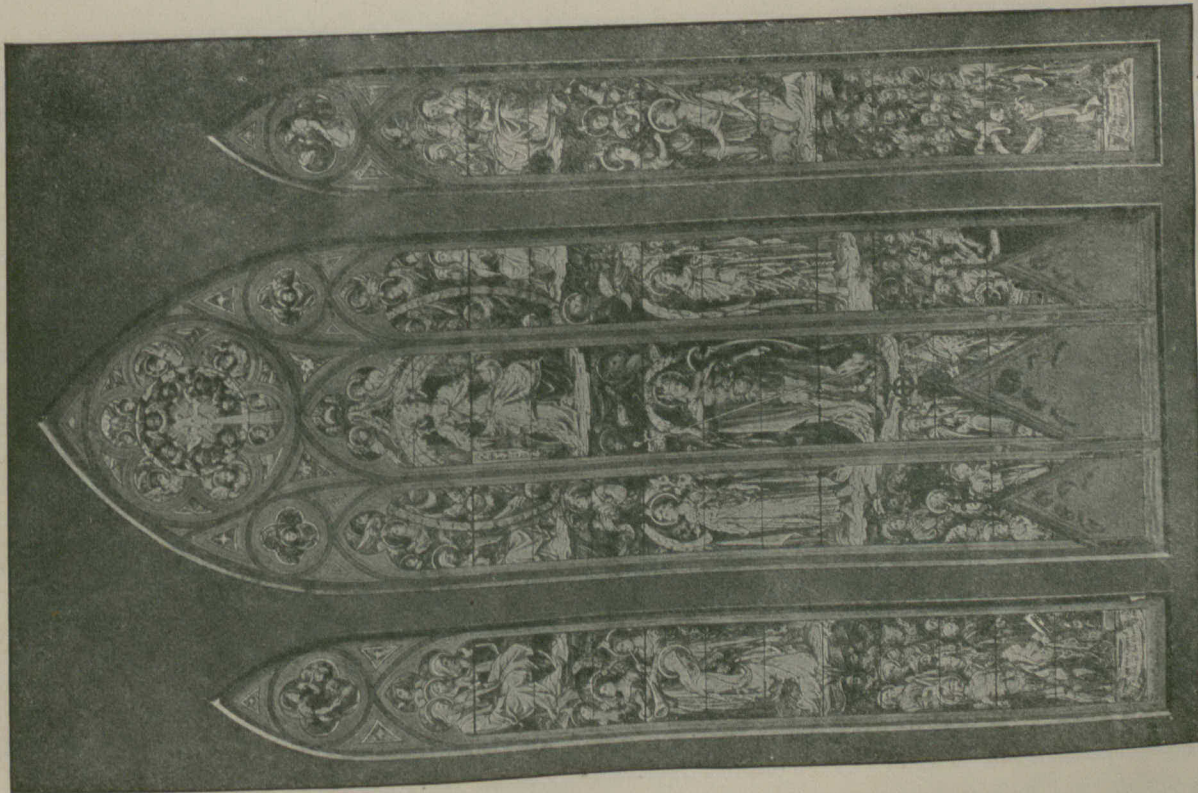
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Two Small Panels of the Jubilee Memorial Church, St. Maloecu. The crowning of Her Majesty, Queen Victoria, and the Thanksgiving Service on the recovery of the Prince of Wales (the present King).



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EXPERIMENTS WITH FERRO-CONCRETE.

The London Engineer publishes in abstract the results of some interesting experiments on reinforcing concrete by means of metal by M. Considere. In his earlier work M. Considere endeavoured to rationalise the reinforcement of masses of concrete against tensile strains by means of metal bars; but his later experiments have been concerned with the question of increasing also the compressive strength of such masses by a suitable distribution of metal. He finds that the most economical method of strengthening a concrete column is to lap it round with wire, metal used in this way being from two and a half to three times as efficient as an equal weight arranged as straight bars parallel to the line of thrust. A number of cylinders 40 millimetres (1.57 in.) in diameter were moulded out of a mixture of 400 kilogrammes (881 lbs.) of cement, with 1 cub. metre (1.31 cub. yds.) of sand, and were wrapped with fine wire, the volume of the latter being 0.034 per cent. of the total volume. These were tested by crushing at different ages, from eight up to one hundred days. Similar specimens without the iron were also moulded and tested, the comparative results obtained being as follows:

Age of specimen, days ..	8	14	22	23	100
Crushing stress, pounds per sq. in. with iron reinforcement	4,846	6,543	7,568	4,935	10,325
Crushing stress, pounds per sq. in. without iron reinforcement	560	711	853	853	2,418

Weight for weight, the hundred-day old re-inforced cylinder is very nearly as strong as iron. In some further experiments the cylinders tested were 15 centimetres (5.90-in.) in diameter, and varied in length from 0.50 metre (19.7-in.) to 1.30 metre (51.1 in.). The mixture used was 0.800 cub. metre (1.046 cub. yd.) of gravel, 0.400 cub. metre (.523 cub. yd.) of sand, mixed with, in some cases, 300 kilogrammes (661 lb.) and in others 600 kilogrammes (1,323 lbs.) of cement. The short specimens were tested in the laboratory of the Ecole des Ponts et Chaussées. The block without iron failed at a load of 1,052 lb. per sq. in., whilst another, which was wrapped with a spiral of hard-drawn iron wire 1/4-in. in diameter, wound to a pitch of 1.18-in., did not fail till the stress reached 5,120 lb. per sq. in.; and a third, in which the wire used was 0.167 in diameter, wound to a pitch of .59-in., did not fail under a load equivalent to 5,405 lb. per sq. in., which was the maximum the testing machine was capable of exerting. Another cylinder, in which the bulk of the metal was in the shape of longitudinal bars, failed at a stress of 2,418 lb. per sq. in. M. Considere states that the latter prism, as well as the specimen without iron, both failed suddenly, whilst with the spiral-wound blocks failure was very gradual. It was further noted that in the best of the spiral-wound blocks the amount of compression was considerable, being as much as 3.55 millimetres per metre before any signs of cracking could be observed.

The Board of Health of Ottawa have approved and sent on to the council by-laws to license and regulate plumbers and to regulate the character of plumbing work done in that city.

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TORONTO MONTREAL WINNIPEG

BUSINESS NOTES.

The Belleville Portland Cement Company has been incorporated with a capital of \$2,500,000, and it is reported will erect at Port Ann, near Belleville, Ont., one of the largest cement mills in the world.

A new company, composed of Mr. D. W. Robb and gentlemen composing the Amherst Foundry & Heating Company, is in process of formation at Amherst, Nova Scotia, to manufacture and sell the Robb hot water heater.

The Dennis Wire & Iron Co., of London, Ont., have sent out a card bearing new year greetings, and attached thereto a useful 6 inch celluloid rule, on the reverse side of which are given the weight per foot of iron.

The B. Greening Wire Company, of Hamilton, have as usual issued a most useful and attractive calendar, the date figures being large and discernible at a considerable distance. During last year extensive additions and improvements were made to the company's factory and offices.

The Canadian Revolving Door Company, Limited, having acquired all the patents heretofore owned and controlled by the Van Kannel Revolving Door Co., New York, also the patents heretofore owned by Walter W. Iff on revolving doors, are now being organized with a view of supplying revolving doors of the most approved designs and with latest improvements. Mr. Geo. W. Gaden, of Toronto, who is well-known throughout the Dominion, has been engaged as the company's general manager. The company have improved facilities for manufacturing under the direction of J. W. Hillock & Co., at No. 165 Queen street east, Toronto (which will be the company's headquarters). Three handsome revolving doors are now being made for the King Edward Hotel. Throughout Great Britain, France, Germany, Austria and Russia the revolving doors introduced and operated under the original patents are being recognized as a necessity. Our readers may obtain copies of the company's catalogues by writing the company at the above address and referring to their advertisement in this number.

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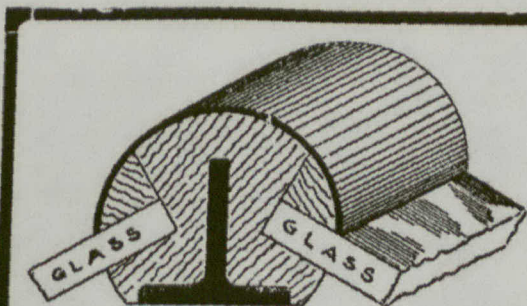
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PERSONAL.

Mr. Thomson, architect, of Sault Ste. Marie, Ont., is about to open a branch at North Bay, Ont.

Mr. Fred. J. Alexander, architect, has accepted an appointment in the Government service at Ottawa.

Mr. J. A. Ellis, architect, has recently removed his offices to the Manning Chambers, City Hall Square, Queen street west, Toronto.

Mr. J. E. Huot, of Montreal, has entered into partnership with Mr. Eugene Payette of the same city, formerly connected with Mr. Joseph Venne. The new firm will be known as Huot & Payette with offices in the Bank of Toronto Building, Montreal.

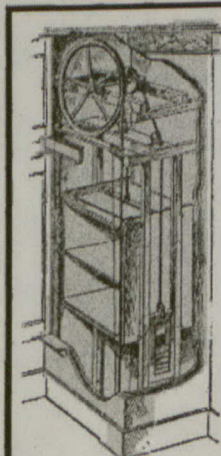
NOTES.

Messrs. Pilkington Bros. have opened a branch warehouse at Vancouver, B. C., in charge of Mr. A. G. Tyne, where a large stock of plate glass will be carried.

The Samson Cordage Works, of Boston, Mass., have recently published a new and attractive catalogue and price list referring to their sash cord and other productions in the cordage line.

The Craftsman is the title of a magazine published monthly at Syracuse, N. Y. Its principal object is to unite the interests of art and labor. Number 4 of Volume 3, now before us, contains excellent reproductions in half ton. of artistic pottery, faience fire-places, etc. Prof. Oscar L. Triggs contributes an interesting paper on "A School of Industrial Art."

Mr. G. W. Hill, sculptor, of Montreal, has been declared the winner of the competition for designs for the Soldiers and Strathcona monument to be erected in that city. The memorial, the main feature of which represents a Canadian scout dismounted, his hand on the bridle of a plunging horse, is designed to be about forty feet high, the figures being of colossal proportions and the dimensions of the base of the granite pedestal about 28 by 18 feet. Mr. Hill studied for several years in Paris at the Ecole des Beaux Arts as a pupil of Falgouire. He returned to Montreal in 1894. The second prize in this competition was awarded to Mr. Andrew T. Taylor, F.R.I.B.A., for a design for a triumphal arch.



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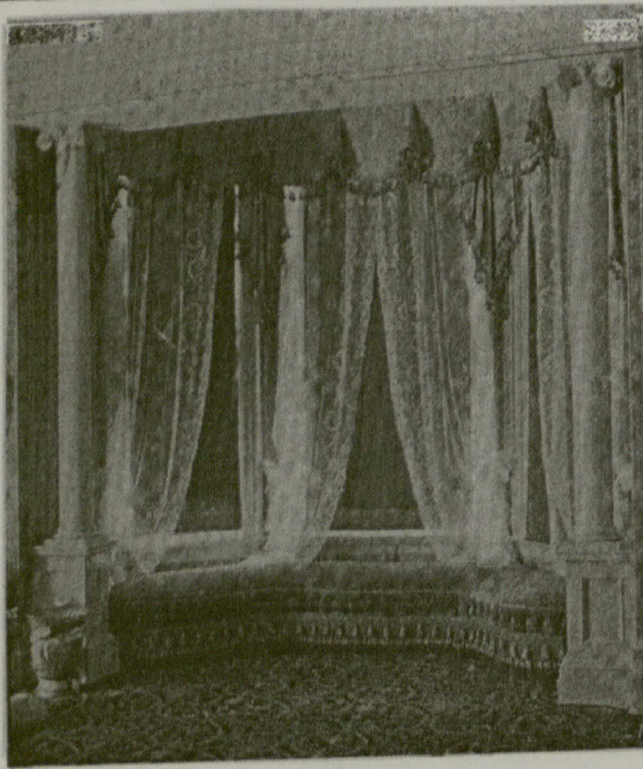


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British Trade Supplement

The Publishers of "The Canadian Architect and Builder" have arranged to furnish information respecting British Exporters of Building Materials and their goods advertised in this paper, and will keep on file at their Offices, Imperial Building, Montreal, and Confederation Life Building, Toronto, Catalogues, Price Lists, Etc.

Catalogues will be forwarded to Architects and Building Supply Houses in Canada on application.

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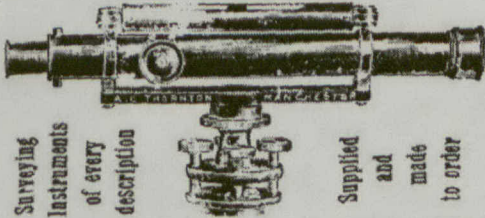
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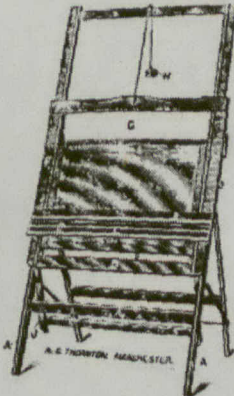
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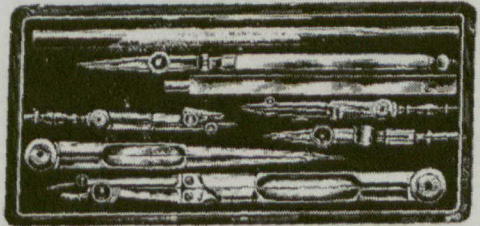
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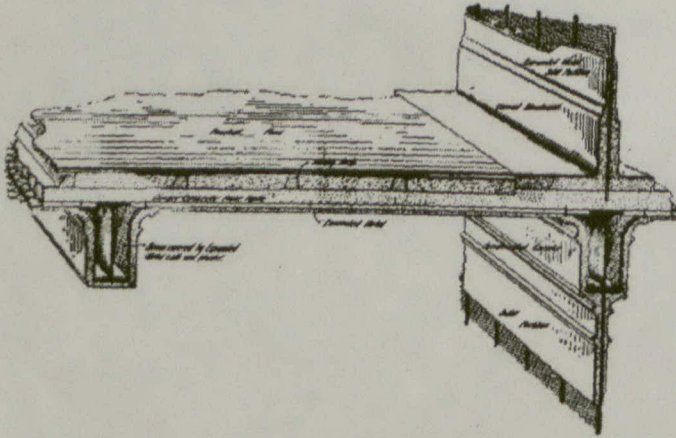
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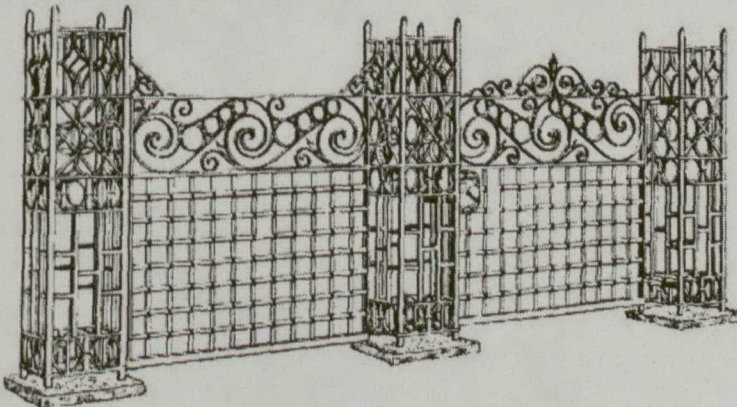
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