VOL. 6 NO. 7

JULY, 1913

$3.00 per Year
35c. per Copy

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

• OFFICE OF PUBLICATION •
• TORONTO •
• BRANCH OFFICES •
MONTREAL - - WINNIPEG
NEW YORK

FRESCO-TONE

For Simple Interior Decoration—

You know that simplicity of treatment is a prime requirement in modern interior decoration.

***

You are specifying flat toned oil paints for this purpose. But—

***

Do you know Fresco-Tone? It is not merely another in a long line of "same things." It is distinctive. It was deliberately withheld from the market until we were satisfied that it was the best for its purpose.

***

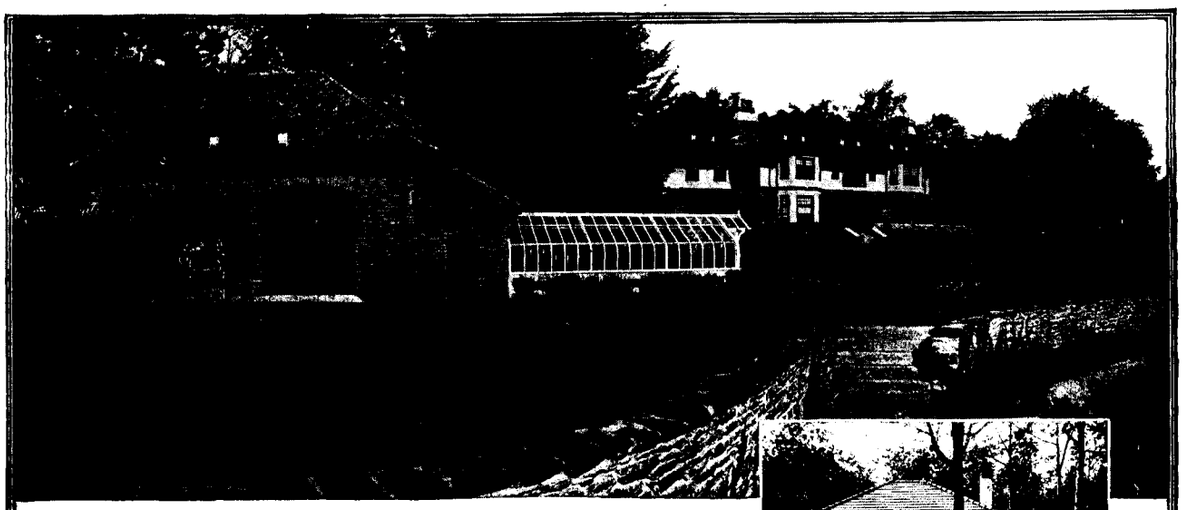
It gives velvety depths of softness to the finished surface. It is decorative in the highest sense. For durability we honestly believe that it has no equal; it may be wiped or washed without its beauty being marred in the slightest degree.

***

Please specify Fresco-Tone on an early job. Watch results carefully. We urge you to do this now for we believe Fresco-Tone offers you valuable decorative possibilities beyond the ordinary.

BRANDRAM-HENDERSON LIMITED

Montreal Halifax St. John Toronto Winnipeg

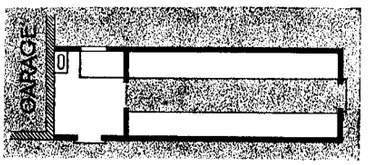


This straight-away even span greenhouse is 11 feet wide and 25 feet long. The work room, although adjoined to it, is entirely separate from the garage itself. This arrangement prevents all possibility of gasoline or its fumes reaching the boiler or the plants. Either is apt to be disastrous.

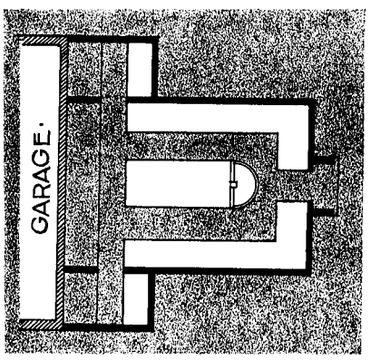
Garage Greenhouse Combination

First—there is the economy of it.
You save on building costs.
You save on heating.
You save on building, whether you divide part of the garage off for the greenhouse work room, or if you add a work room direct to the garage, and then join your greenhouse.
You save on the heat, because the one boiler can heat both garage and greenhouse with but little more coal than it would take to heat the one.
You have a compact, attractive, every way practical proposition that will be a source of perpetual pleasure and satisfaction to you.
If you have a garage we will build the greenhouse for you.
If you want both garage and greenhouse, we will design them for you.
Just to give you an idea how attractively we have handled some such subjects, send for our Greenhouse-Garage Circular.
It is a beautiful bit of printing done in a charming color treatment.
We have been building greenhouses over in the States for half a century.
Our Canadian business began asserting itself so strongly that we now have a Toronto branch and arrangements are being consummated for a factory.
We want you to have our catalog. It's really more of a text book on greenhouses and conservatories, than a catalog.

You will agree, this combining of leanto and even span greenhouse, as joined to the garage is most effective. Note from the plan that there is no opening between garage and greenhouse.



Plan of Number One.



Plan of Number Two.

LORD & BURNHAM CO., LIMITED

OF CANADA

12 Queen Street East, Toronto, Canada

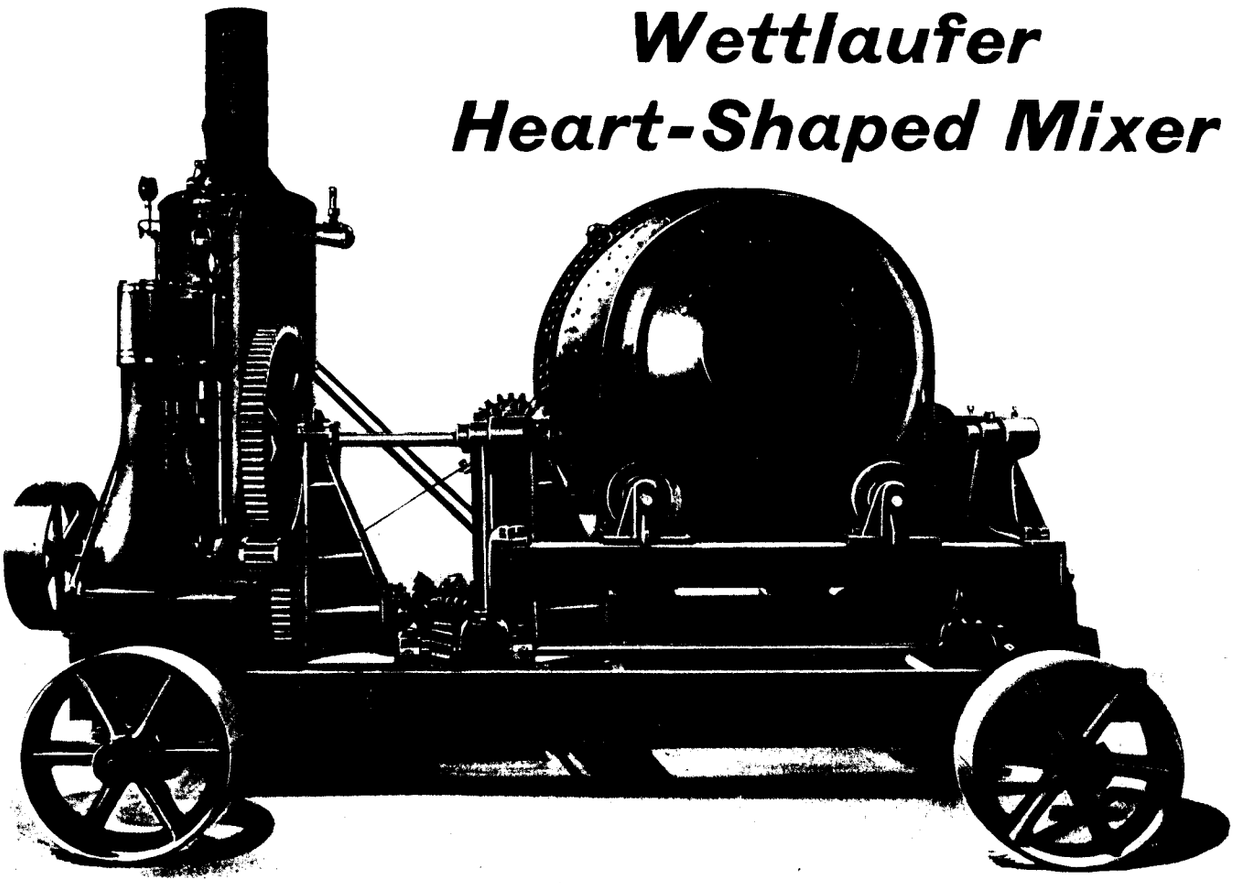
New York Boston Philadelphia Chicago Rochester

FACTORIES:

IRVINGTON, N.Y. DES PLAINES, ILL.

It Pays Big Dividends—

Wettlaufer Heart-Shaped Mixer



WETTLAUFER HEART-SHAPED MIXER

"The Mixer that delivers the goods"

The Wettlaufer Heart-Shaped Mixer is the cheapest mixer you can buy, because you get bigger returns for the money invested in it than with any other kind. First of all, in the matter of endurance: The Wettlaufer is an all steel mixer. It is made for hard knocks and steady work. At the end of a season you will find it in splendid condition for the next season's work. Your repair bills amount to practically nothing.

The special construction of the Heart-Shaped Drum makes it the quickest mixer and the most thorough. You can complete a job at less labor expense and there are no comebacks through using a defective mixture.

Call at any of our showrooms and see it work. We will gladly demonstrate it for you, and tell you the actual experiences of contractors who have used this mixer on all kinds of big concrete jobs. Have us send you our catalogue on Hoists, Pumps, Stone Crushers, and Tile, Block and Brick Machines.

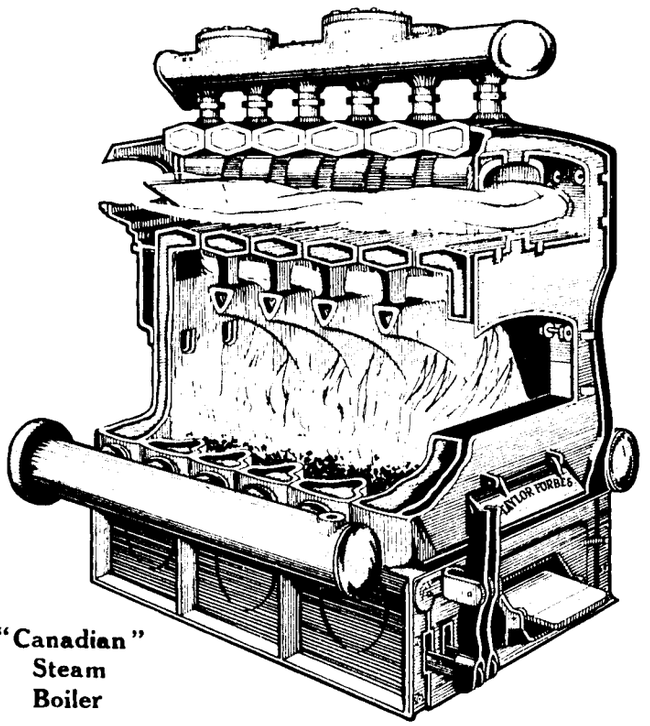
WETTLAUFER BROS., Head Office and Showrooms: **178 Spadina Ave., TORONTO**

BRANCHES

Winnipeg Office---CANADIAN BRITISH ENG. CO., 324 Smith St.
A. R WILLIAMS' MACHINERY CO., 15 Dock St., St. John, N. B.
J. L. LACHANCE CO., 263 St. Paul St., Quebec, Que.
MAYSMITH & LOWE, 1057 Mears St., Victoria, B. C.
WETTLAUFER BROS., 316 Lagauchetiere St., Montreal, Que.
R. F. MANCILL, 41 Codigan Block, Calgary, Alta.
A. E. HODGERT, Regina, Sask.
HALLMAN MACHINERY CO., Vancouver, B. C.

FACTORIES---Mitchell, Ont.; Buffalo, N.Y.; Detroit, Mich.

Taylor-Forbes "Canadian" Square Type Sectional Steam and Hot Water Boilers



"Canadian" Steam Boiler

TAYLOR-FORBES Canadian Steam and Hot Water **Square Sectional Boilers** of **Header type construction** are of great efficiency for heating residences, schools, public buildings, etc., being made in five series, or width of grate, and listed in **twenty-eight capacities.**

All Canadian Steam and Water Boilers are connected with running thread locknut nipples and **equalizing headers.** The large variety of sizes offers a wide range of capacities suitable for heating all sizes of buildings and the given capacity can be increased at any time by adding additional sections.

The prominent feature of these boilers is the **drop tube construction,** which presents 70 per cent. of the entire **self-cleaning fire surface** directly to the hottest portion of the fire.

The **firebox** is also **corrugated,** which adds largely to the amount of **direct heating surface** in the boiler.

The flues **are large** and give a good draught to the fire. The **large waterways** and the peculiar construction of the sections **permit rapid movement of the water without friction,** and induce a **continued positive circulation.**

Each section is so arranged that it is **not dependent** upon any other portion of the boiler. In case of accident, any section may be cut off and the boiler used until the damaged section is replaced with another.

The **fire is not allowed to go direct to the chimney,** but is baffled by the water tubes in such a manner that practically **all of the heat is absorbed** by the water in the boiler.

The grate bars are built upon the rocking and dumping principle and are regularly furnished suitable for **hard coal, pea coal, soft coal, coke or wood.** These boilers can be **adapted for use with natural gas for fuel.**

Taylor-Forbes Company Limited

Head Office, Works and Factories — GUELPH, ONT.

TORONTO—1088 King St. West
VANCOUVER, B.C.—1070 Homer St.
QUEBEC—Mechanics Supply Co.
MONTREAL—246 Craig St. West
WINNIPEG—Vulcan Iron Works
ST. JOHN, N.B.—16 Water Street.
CALGARY—P. D. McLaren, Limited

The Foremost
The Canadian Burnt Clay

Recent Toronto Orders

CIVIC ABATTOIR
W. R. Perrin, Architect.
1,500,000 White Enamel, No. 1 Red Pressed Wire Cut Bricks
200,000 Feet Porous Terra Cotta

WELLSBORO APARTMENTS
Redmond & Beggs, Architects.
1,200,000 Wire Cut Brick

ERNSCLIFFE APARTMENTS
Neil G. Beggs, Architect.
2,500,000 Wire Cut Bricks

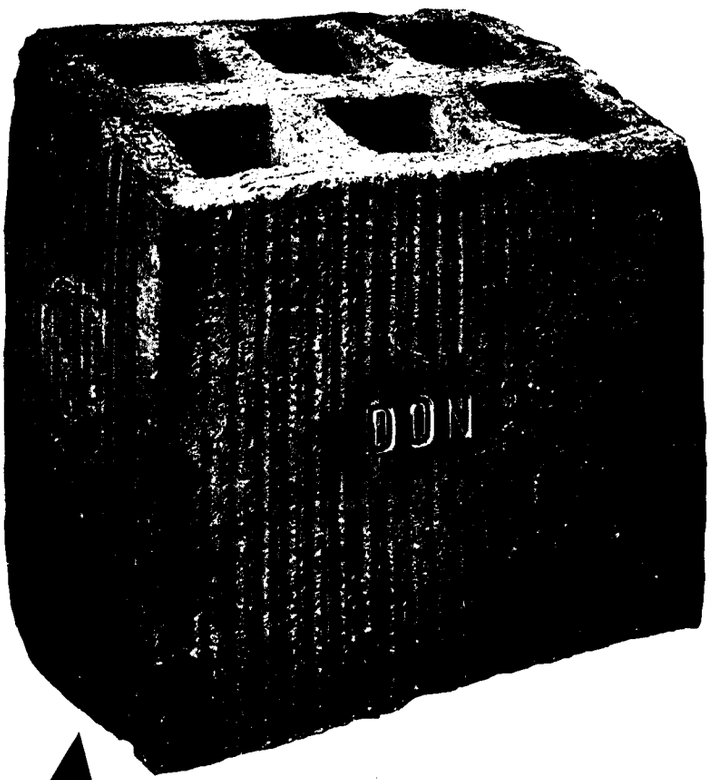
DOHERTY MANUFACTURING CO.'S FACTORY
J. Wilson Gray, Architect.
1,000,000 No. 1 Red Pressed Bricks

ROBERTSON BROS.' NEW FACTORY ADDITION
H. G. Salisbury, Architect.
1,000,000 No. 1 Red Pressed, Grey Stock and Wire Cut Bricks

WARWICK BROS. & RUTTER'S NEW FACTORY ADDITION
Wm. Steele & Sons Co., Architects.
500,000 No. 1 Red Pressed, Grey Stock and Wire Cut Bricks

M. & L. BENJ. SAMUEL & CO'S WAREHOUSE
Burke, Horwood & White, Architects.
1,500,000 Etonia and Wire Cut Bricks

WESTMINSTER APARTMENTS
Langley & Howland, Architects.
Don Valley Bricks and Porous Terra Cotta Fireproofing Throughout



Between Every Well-Constructed Building and Fire-Loss

Montreal Agent
DAVID McGILL
83 Bleury St., Montreal

DON VALLEY

Products of Industry of The Present Day

Between the Mortar of Every Well-Constructed Building

Recent Buildings in Montreal

Don Valley Pressed Brick

McNAINEE BUILDING
Corner Little St. James and St. Antoine Sts.

APARTMENT HOUSE
Cote des Neiges Road

PRESBYTERY
St. Leo's Church, Westmount

MONTEFIORE CLUB
Guy St.

MASONIC TEMPLE
Dorchester St.

RESIDENCE
George Summer, Esq.
"Oaklands," Belvedere Road

RESIDENCE
W. W. Butler, Esq.
Cote St. Antoine Road

RESIDENCE
Thos. Hodgson, Esq.
Simpson St.

RESIDENCE
Geo. B. Fraser
Murray Ave., Westmount

BAKERY
Stuart Co. Inc.
Laurier Ave.

Porous Terra Cotta Fireproofing

COMMERCIAL UNION BUILDING

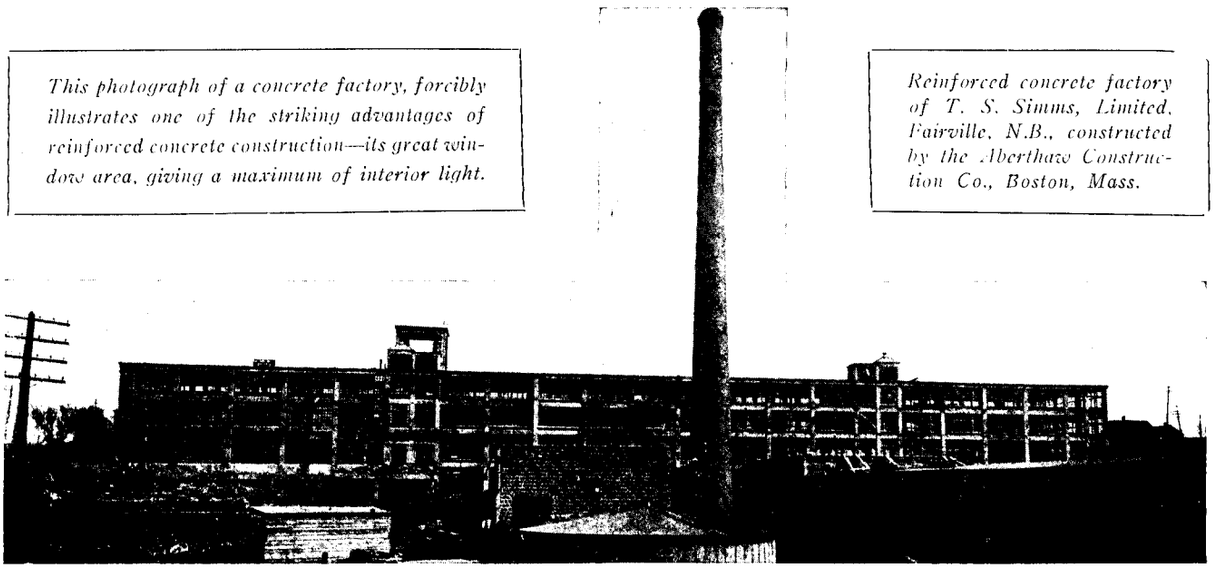
ROYAL TRUST BUILDING

BRICK WORKS

Head Office
36 Toronto St.
TORONTO

This photograph of a concrete factory, forcibly illustrates one of the striking advantages of reinforced concrete construction—its great window area, giving a maximum of interior light.

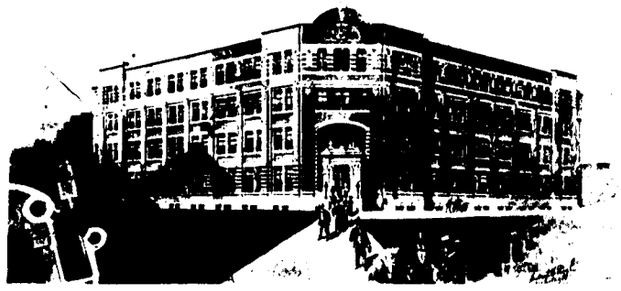
Reinforced concrete factory of T. S. Simms, Limited, Fairville, N.B., constructed by the Aberthaw Construction Co., Boston, Mass.



A Proper Concrete Specification

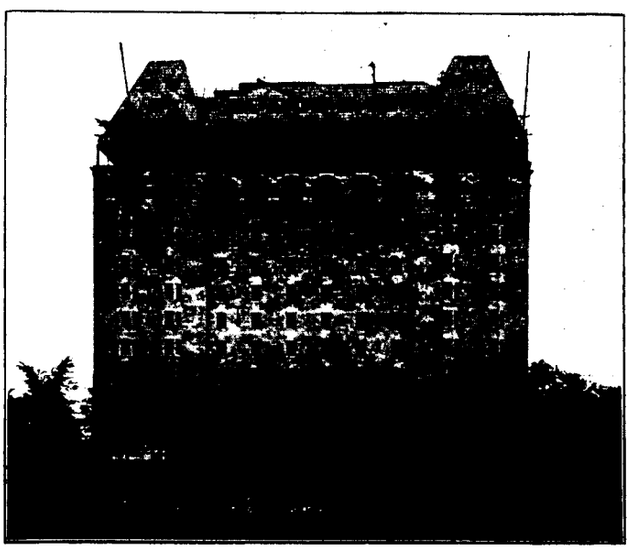
Clearly Defines What Waterproofing is to be Used

Write in "MEDUSA WATERPROOFING"—There is no Equivalent



Isolation Hospital, Winnipeg. Architects—Ross & MacDonald.
Contractors—Clayton Bros. Medusa Waterproofing Used.

MEDUSA WATERPROOFING



Fort Garry Hotel, Winnipeg. Architects—Ross & MacDonald.
Contractors Geo. A. Fuller Co., Ltd. 30,000 lbs "Medusa" Waterproofing used in this building.

By overcoming its well known tendency to absorb water, MEDUSA WATERPROOFING has made concrete an absolutely dependable building material in all climatic or soil conditions. "MEDUSA" comes in the form of a dry, white powder, to be thoroughly mixed with dry cement. But a small quantity is necessary to secure permanent waterproofing, and it will not wash out of the mixture under the most severe water pressure.

Specify and use it in your next concrete job.

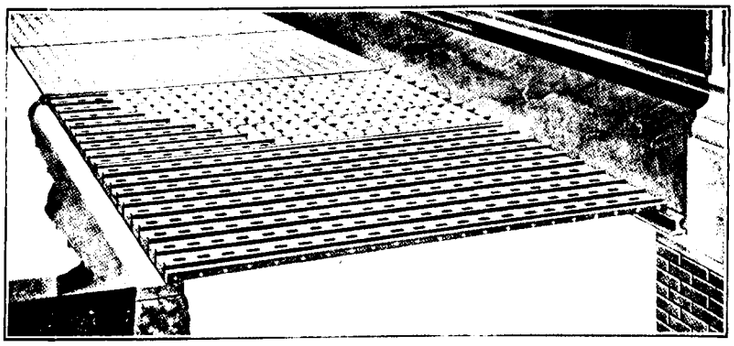
It has been used in all parts of the world with uniform success.

Manufactured by

Stinson-Reeb Builders' Supply Company, Ltd.

Tenth Floor, Eastern Townships Bank Bldg., Montreal, Que.

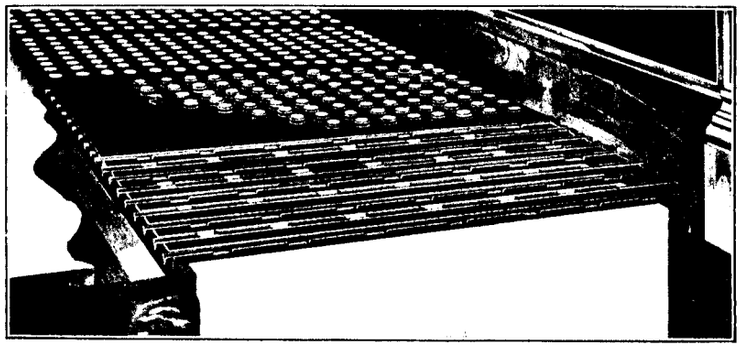
PAVEMENT SIDEWALK GLASS



If you are interested in Sidewalk Prism Constructions that are guaranteed against leakage, write for particulars regarding these.

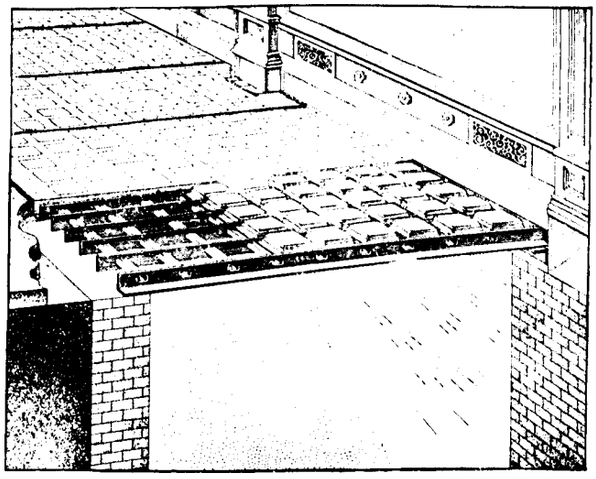
Simplex Sidewalk Construction

is the only double reinforced construction on the market and is the acme of perfection in sidewalk lighting. Architects and owners who understand and appreciate the advantages of SIMPLEX willingly pay the additional price for this construction.



Nu-Plan Sidewalk Construction

is shipped in knock-down form and is exceptionally easy to set up and can be installed by an ordinary cement finisher. This construction derives its enormous strength from the use of angles instead of bars.



Barlock Sidewalk Construction

has stood the test of years, and installations of many years ago are still in good condition. The glass area of approximately 70 per cent. on the underside of this construction gives you the assurance of the maximum amount of lighting.

All of the Above Constructions Are Covered by Canadian Patents

With any of the above we can furnish glass to suit the requirements of the basement or other part of the building to which light is required to be reflected.

We can supply the blank glass, the 3-point prism glass and the single pendant prism glass.

All glass sent out by us is coated with our patented plastic malleable compound, which insures glass from shaling from exposure of the cement or steel.

THE HOBBS MANUFACTURING COMPANY LIMITED

MONTREAL TORONTO **LONDON** WINNIPEG VANCOUVER

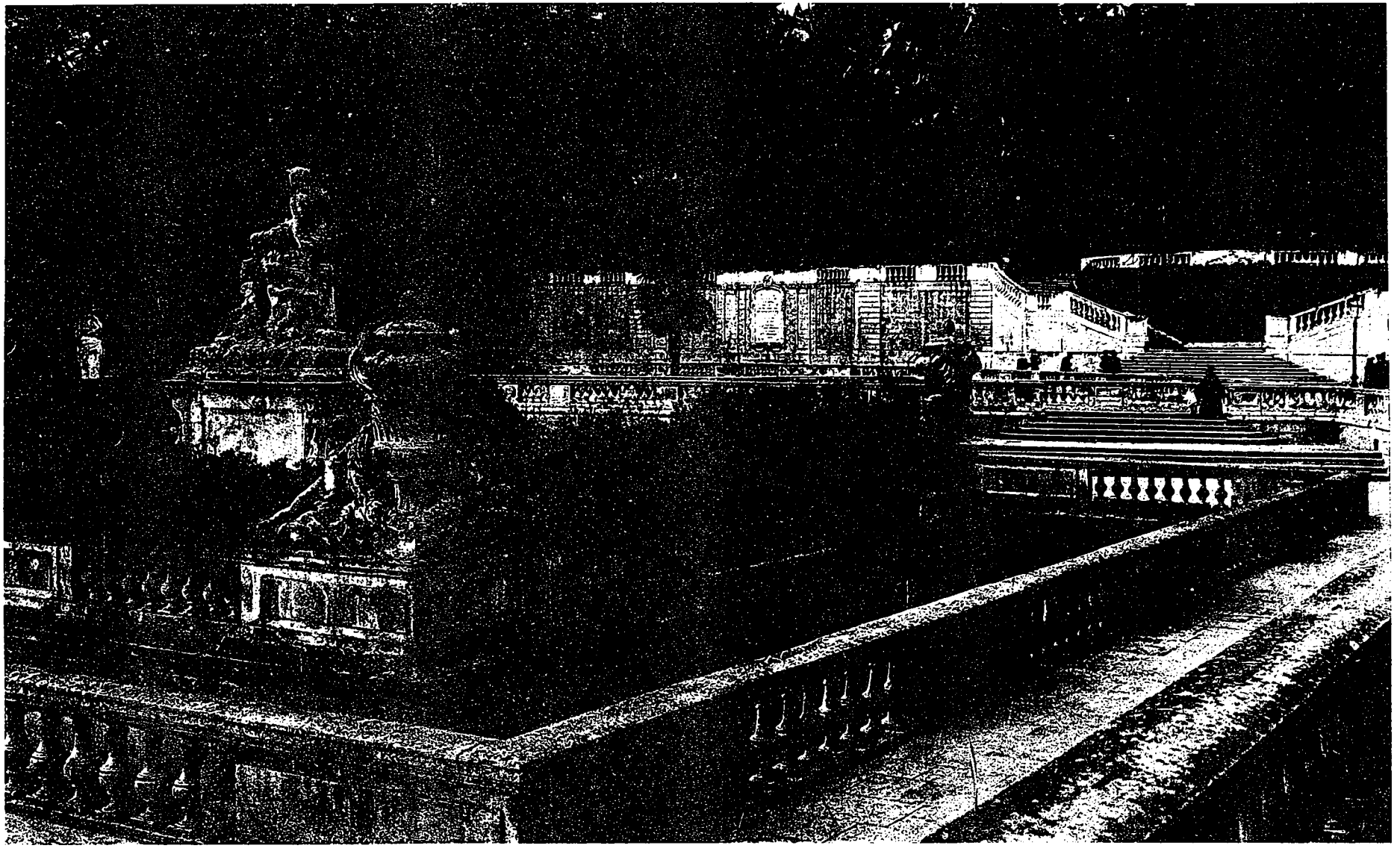
CONSTRUCTION

VOL. VI NO. 7

CONTENTS FOR JULY, 1913

Full Page Illustrations

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BUILDING, TORONTO, CANADA
BRANCH OFFICES :
MONTREAL WINNIPEG CHICAGO NEW YORK



PUBLIC GARDENS,
NIMES, FRANCE.

¶ *Canada's need of Beaux-Arts work—A help to our draftsmen in creative work—the time to adopt the system is now.*

THE INFLUENCE of the Ecole des Beaux Arts bids fair to dominate the world's field of architecture. Not satisfied with the wonderful progress in France, it is entering England, much to the chagrin of a large number of her prominent architects. We all know how far-reaching has been the effect of this school. The vast majority of successful designers in England and America have been tutored by her, already the American system is based directly upon the French method of architectural education. Now the well organized system of the Ecole has been started in England by the establishment of the atelier in Wells Mews which will be directed by Beaux-Arts men. Mr. Cox, of England, in drawing a parallel between a design class and an atelier, says: 1. The preparatory atelier, where projects are set by the patron or professor for the students to work out together as practice for the admission competition into the Ecole. 2. The atelier for those students who are received into the Ecole, and who render in the atelier the projects set by the professor of theory of architecture of the Ecole. It would be gratifying indeed if some of our prominent architects would grasp the needs of to-morrow and take a similar step towards bettering conditions. Since it is universally recognized as the one best method, why not establish it in our large cities at least? It means little expense, some sacrifice on the part of the men fully competent to conduct the work and a tremendous impetus to the character of work being done, as well as the ambitions of the young men who hope to be the builders of to-morrow. If such a system could be established we might follow the English idea of having the various ateliers take up problems on the same project as well as privileges for preliminary studies based on the French system. Eventually, when the time warrants, have a school of fine arts, enabling the students to study free. The time to take the initiative is now. Why wait until our nation is built, rather let it be the means of helping us to build it right.

¶ *City planning—The successful results in Germany and our need of emulating the motives and systems of other countries.*

THE WORK of our civic commissions augurs well for the future development of our cities. Still there is reason for further study and action in this direction. Too many places are progressing with little thought of the needs twenty years hence. William Sheperdson expresses himself in the New York Times that Germany in the handling of her cities, in the constructing and in the administering of them is to all intents and purposes at the top of all Governments, and that, although there would be neither sense nor profit in taking up a German city government and setting it down intact in America, many of the most important and fundamental projects of the Empire could be turned admirably to account here, and Germany could and should be our most gratifying and abundant source of wise precedents. Mr. Sheperdson attributes the superiority of the Germans to the idea of municipal control. It is one continual planning and building to meet the requirements fifty years ahead. The Germans understand thoroughly the beautification of their city streets. They also lay great stress on each undertaking which will in any way affect the health or property of the individual. One special lesson is the failure of the past and it is seldom that a second disaster or mistake will occur. There is a determined effort to provide thoroughfares, plan parks and play-grounds, which will meet all future contingencies.

One of the best examples of their careful planning is shown in provisions always made for the workingmen. So many towns are models of cleanliness in the cheaper districts while the sanitary arrangements are beyond reproach. In this way the filth and squalor of our own municipalities are guarded against and the children are brought up to know the meaning of healthy surroundings.

One handicap exists among us that is ever absent in Germany. We strive to individualize our aims, allowing each administration to choose its own method of operation. The Germans, on the other hand, work with a definitely prepared scheme and

no change in the improvements is made when other forces come into power.

To cite an example of their practical nature let us take the idea presented by Herr Wolf at the Dusseldorf exhibit. He shows a city block shallow enough to permit of only one row of houses to be built in it, facing the streets at the outer edge of the block. In the rear is an entrance leading into a roomy court which is naturally a park. The courts have an outlet into the streets and are designed for children's playgrounds and passage ways for pedestrians, which affords an avenue of escape from automobiles on the main street as well as a protection against dusty air made by heavy traffic. The whole scheme resolves itself into placing the walks behind the houses instead of in front, which eliminates all dangers of street traffic. Such a plan gives to the exterior a city character and a suburban effect in the rear.

This issue gives a condensed report of the "Fifth annual conference on city planning," and the progressive reports were gratifying. With a more consistent effort to secure a proper scheme and the privilege of working it out without political interference, our cities will appreciate the cleanliness and wholesomeness of those in other countries.

¶ *The Fourth International Congress on School Hygiene—A comparative programme covering the entire field has been prepared, also exhibits.*

UNIVERSAL INTEREST is being manifested in the Fourth International Congress on School Hygiene, to be held in Buffalo, N.Y., August 25-30. The one idea dominating the action of each committee is to assemble a body of men and women interested in the development of the proper facilities for school children. By a hearty co-operation of everybody—and it is a question which deeply concerns each person—this congress will undoubtedly be the most successful ever held and will go far towards the happy settlement of many complexing problems. A comprehensive programme covering the entire field of school hygiene has been arranged. Papers will be read dealing with results secured through the practical application of scientific facts and procedures of school hygiene, and with the results of scientific investigation and laboratory research. One of the features of the assembly which will be of extreme interest to our readers is the part dealing with plan, structural features and equipment of buildings. Such headings will be thoroughly discussed, as site, architecture, decoration, ventilation, illumination, plumbing, furniture, bathing facilities, etc. And it is only too evident in studying the existing conditions prevalent throughout the various provinces that we are quite deficient in our knowledge of these various phases. It behooves the architects, engineers, builders and contractors to attend this conference and if such a course is impossible to keep closely in touch with the daily proceedings.

¶ *Canadian buildings erected by American contractors—A need for local concerns and a promising outlook for a decided change.*

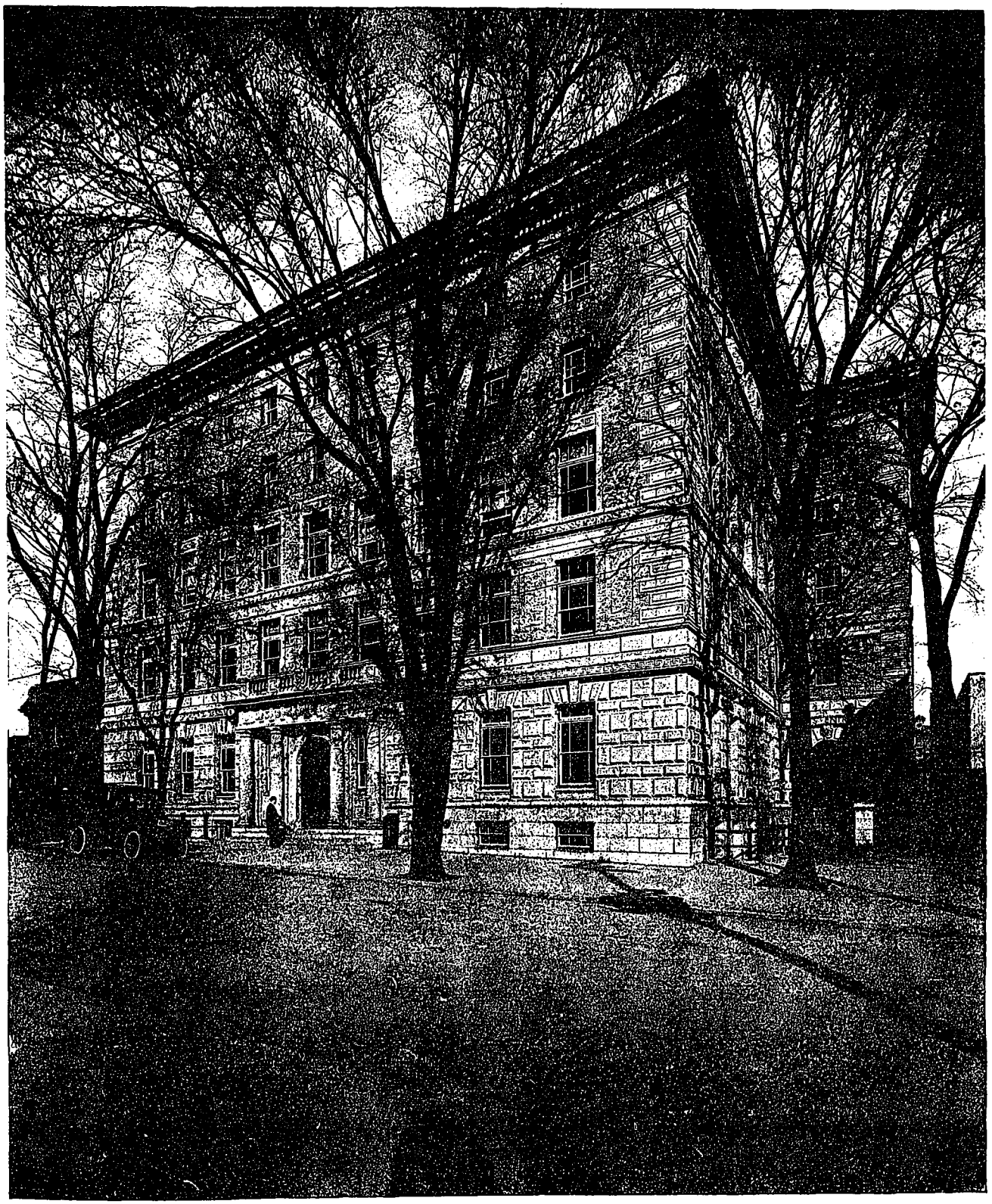
"WITH ALL its activity in building construction, Canada has developed no contracting firms of great size or extensive resources, and prominent concerns on this side of the border line have stepped in there during the last few years and gained nearly all the important building contracts." The veracity of the above quotation coming from the New York Sun, can be judged best by glancing over the large work which is being carried on throughout the Provinces. American contractors have completed or are building the Chateau Laurier at Ottawa, a $1,250,000 hotel; the Fort Garry hotel at Winnipeg, a $1,500,000 building; the Grand Trunk Pacific new $1,350,000 hotel at Edmonton; the C.P.R. building at Toronto, costing $900,000; the Prudential Trust building at Winnipeg, to cost $600,000; the Ritz-Carlton, $2,000,000 hotel at Montreal; the Read building at Montreal, worth $500,000; and the Royal Bank building at Toronto, to cost $1,200,000. Not many years ago the States chided us on the fact that our prominent structures were designed by Americans. The case is quite the reverse now—a fact which leads us to believe that all buildings of importance will in a few years be erected by Canadian contractors.

¶ *Conclusive arguments why women should enter architecture—A warning to the men and a ray of hope for the women.*

MRS. SPENCER, one of the pioneer architects among women, has written some conclusive reasons why her sex should rank high in the field of art. Her arguments are better quoted: "I never design a house without first living in it in imagination. I go through all the housework, fancy myself cook, and housemaid, and mistress, and thus discover any awkwardness of arrangement in the interior construction. I never build a house with steps between scullery and kitchen. Being a woman myself, I recall the continual inconvenience such an arrangement would be to the housewife and cook. Why so many men place the kitchen range in a dark corner is a curious problem. One must have light by which to cook.

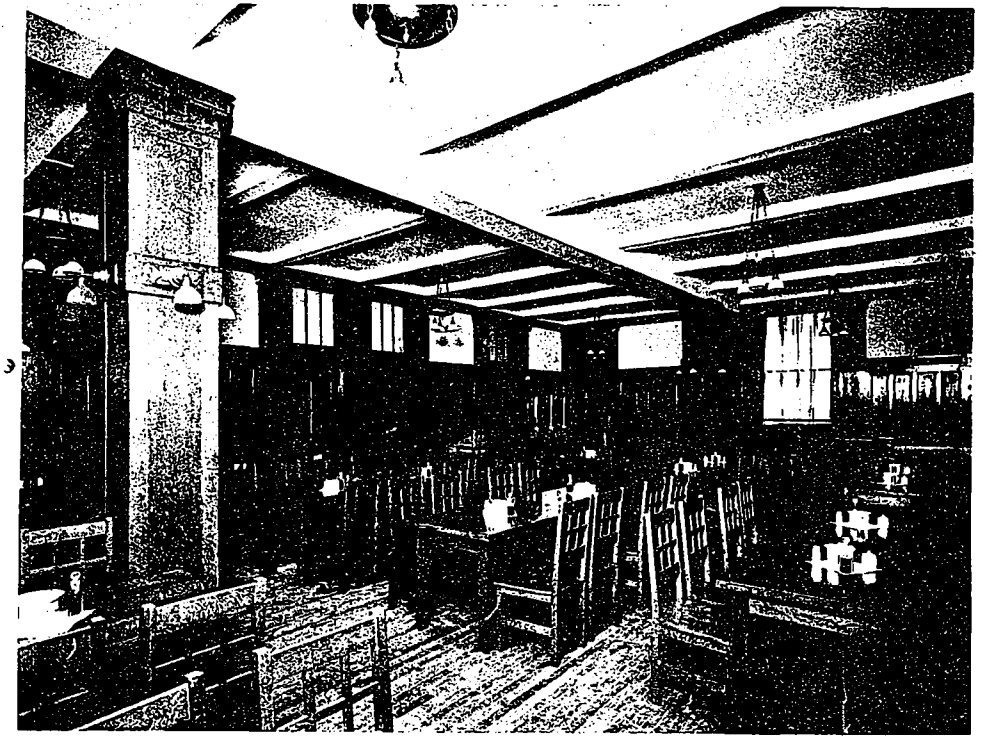
"A woman builder has the advantage of practical experience. Shelves, for example, are too often placed at the height of a workman's arm. We would eliminate dark rooms in a house, even a dark coal cellar. If the coals are kept in an outhouse, why should this not have glass slates in the roof?"

Such arguments will undoubtedly persuade us that women could better handle the complex problems which confront every big office. The men should study these weighty problems set forth by Mrs. Spencer, else they find themselves supplanted. The spirit of the article should be inspiring at least to the dozen women who claim to be practising architects.

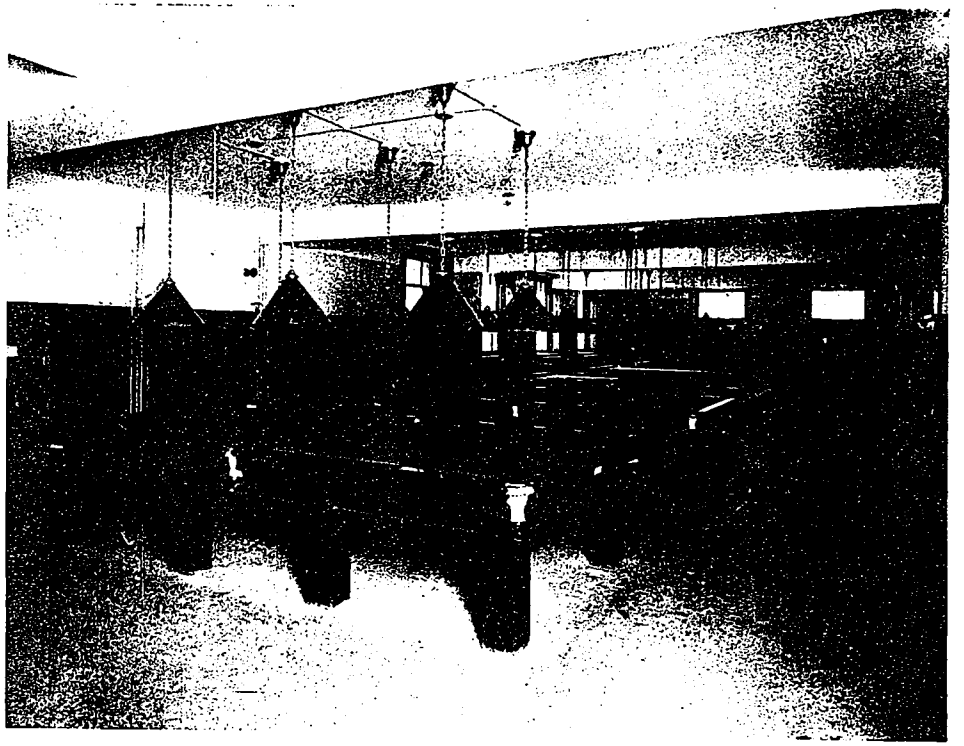


NEW CENTRAL Y.M.C.A. BUILDING, MONTREAL, QUE.

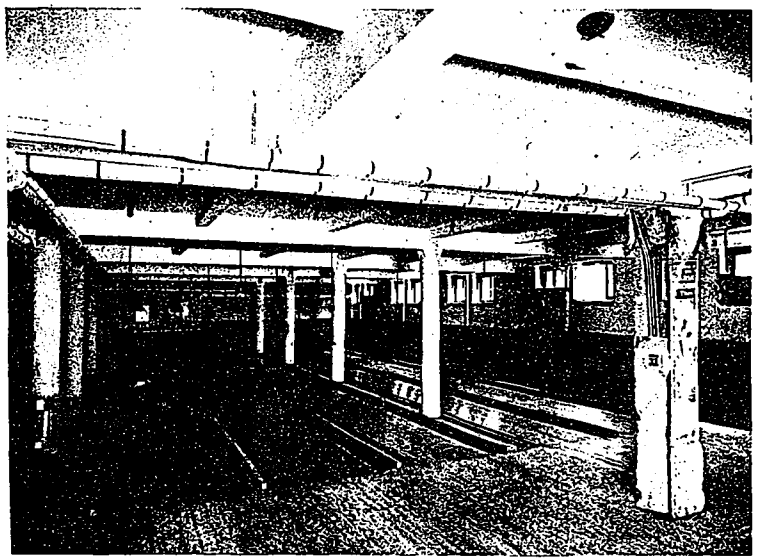
JACKSON & ROSENCRANS AND ROSS & MACFARLANE, ARCHITECTS.



CAFETERIA.



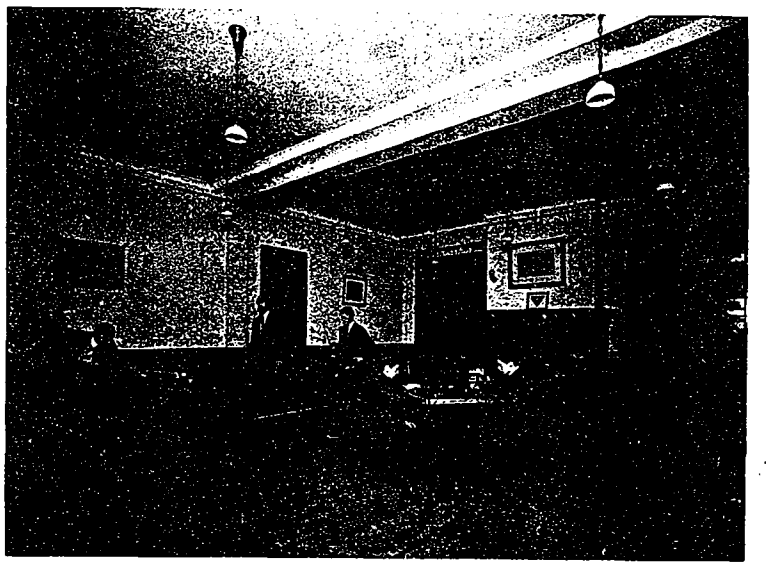
BILLIARD ROOM.



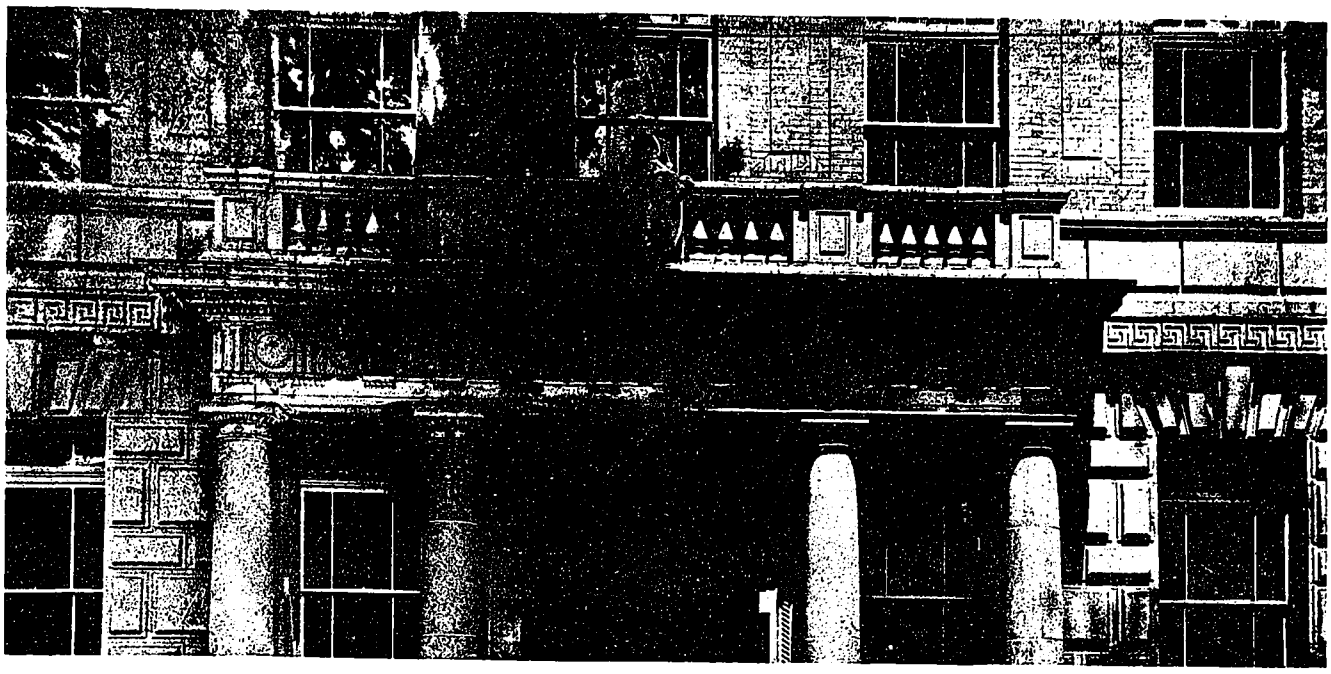
BOWLING ALLEYS.

NEW CENTRAL Y.M.C.A. BUILDING, MONTREAL, QUE.

JACKSON & ROSENCRANS
AND
ROSS & MACFARLANE,
ARCHITECTS.



BOYS' ROOM.



New Central Y. M. C. A. Building, Montreal

MONTREAL was the first city on this continent to undertake a work for young men on the same basis and principles as outlined in the organization known as the Young Men's Christian Association, founded by Mr. George Williams (later Sir George Williams), almost under the shadow of St. Paul's Cathedral, London.

The vision and faith of the founder, supplemented by the consecrated effort of men who have followed him, have resulted in thousands of buildings being erected all over this continent and in every quarter of the civilized world. As the birthplace of the movement on this side of the Atlantic, Montreal has kept pace with the development of the work, reaching out from the distinctively religious foundation upon which it is reared to the physical, social and educational fields, which make for the complete development of manhood.

The following photographs illustrate the exterior and interior of one of the three new buildings recently erected in Montreal. The architects were Messrs. Jackson & Rosencrans, New York, and Ross & MacFarlane, Montreal, associated.

The exterior is constructed with terra cotta and Columbus, Ohio, gray brick. The building is fireproof construction of steel frame and reinforced concrete. The main entrance is on the east side of Drummond street, entering a large reception hall with a fireplace alcove immediately opposite the entrance, a reading room and small meeting room on the right, and the writing room and secretarial offices on the left. Separate entrance is provided for the junior department as shown on the exterior view, and on the north side a corresponding entrance leads to the auditorium, which can thus be used for entertainment without in any way affecting the specialized work of the association.

The basement contains the lower part of the plunge room and plunge; the latter is 75 feet long by 25 feet wide, and presents one of the most attractive rooms in the building. The plunge bath, the floors and the walls, including the facings of the spectators' galleries, are laid with ceramic mosaic tile. It is well lighted from ceiling lights set in the vaulted ceiling. The source of the water supply for the plunge and the entire building, excepting the boilers, is a well penetrating 860 feet of limestone, yielding 6,750 gallons an hour. A wholesome, pure supply, without the necessity of filtration, is thus assured. This room also contains the showers and communicates with the locker rooms for boys and men.

Men's lockers, steam laundry, barber shop, cafe, billiard room and bowling alleys are also on the basement floor. The illustration of the billiard room shows a portion only of this room. The bowling alleys are well lighted and are among the best in the city, and fully justify their place among the association privileges.

On the first, or main floor, one view only is given of the reception hall, looking across toward the meeting room, and reading alcove. This room is tiled and the wood finish is fumed red oak. The furnishings are in harmony both for design and tone and the rugs impart a note of color that makes this part of the building exceedingly attractive.

The auditorium has a seating capacity of 500 people, and has been constructed with the columns so placed that as little obstruction as possible would affect the view of the stage. The ornamental plaster work of this room is very effective and considerable

comment has been made on the modeller's skill in this connection.

The gymnasium is on the main floor and is placed in convenient relation to the locker room and plunge; it also has special exercise rooms in immediate connection, and a banked-up running track with spectators' gallery. The requirements as to height for hanging apparatus and equipment has been observed.

The physical director's offices and examination room are on this floor, also the cloak room conveniently placed with relation to the gymnasium and auditorium.

On the second floor are situated the junior department with its own complete equipment, including secretary's office, reading room and library, reception room, game room and meeting room, club rooms and gymnasium, with spectators' gallery, locker room and shower baths.

Quite separate from the above, and yet so placed that communication can be arranged, the library, committee rooms, cafeteria and kitchen are provided. The offices of the Metropolitan Board are also on this floor. Illustrations are given of the boys' gymnasium and game room, the men's library and reading room and the restaurant, the wood finish in all cases being fumed oak.

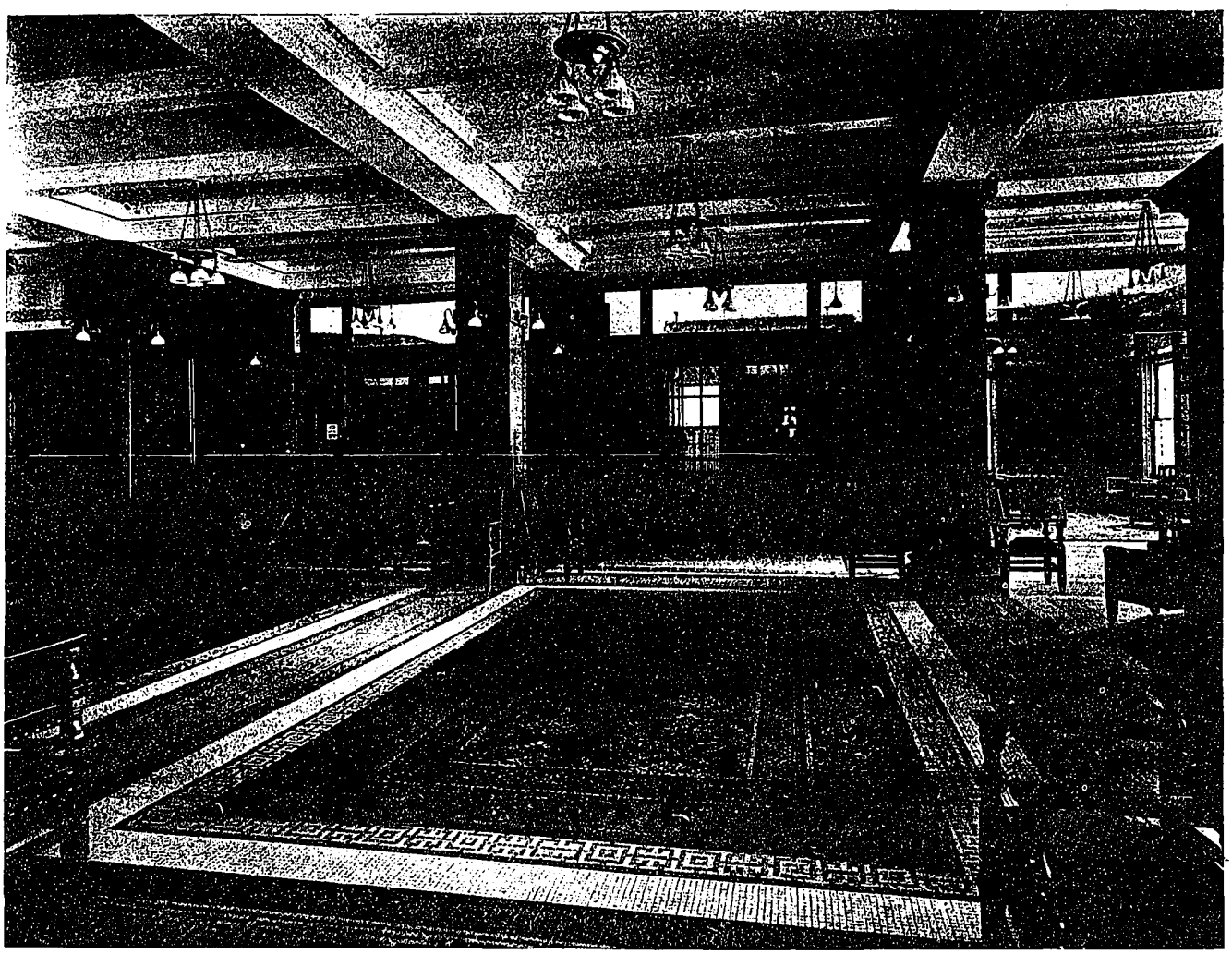
The third floor is given up almost entirely to the educational department. There are eleven large class rooms, each with accordeon doors to enable the use of one or more together as may be desired. The educational directors' offices, a few bedrooms and the dark rooms of the photographic department are also on this floor.

The fourth and fifth are the dormitory floors, providing over 175 bedrooms for the members, with the necessary trunk rooms, shower and toilet rooms on each floor.

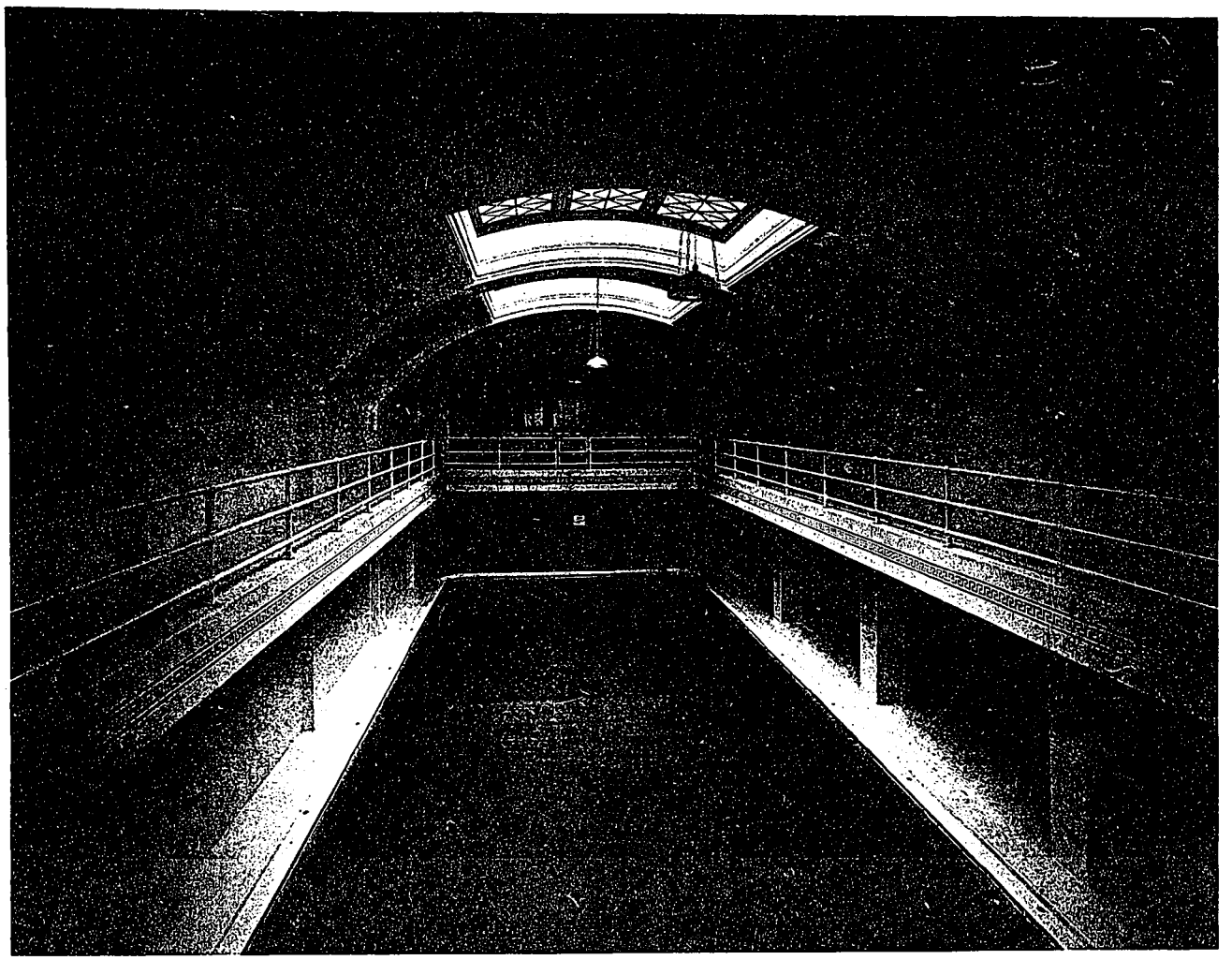
Freight and passenger elevators provide communication to all floors. The kitchen arrangements are such that dumb waiter communication reaches the boys' gymnasium, men's gymnasium and auditorium, making it possible to serve dinners or association banquets in any or all of these audience rooms with considerable ease, requiring only the additional help necessary to meet the demand on the kitchen resources.

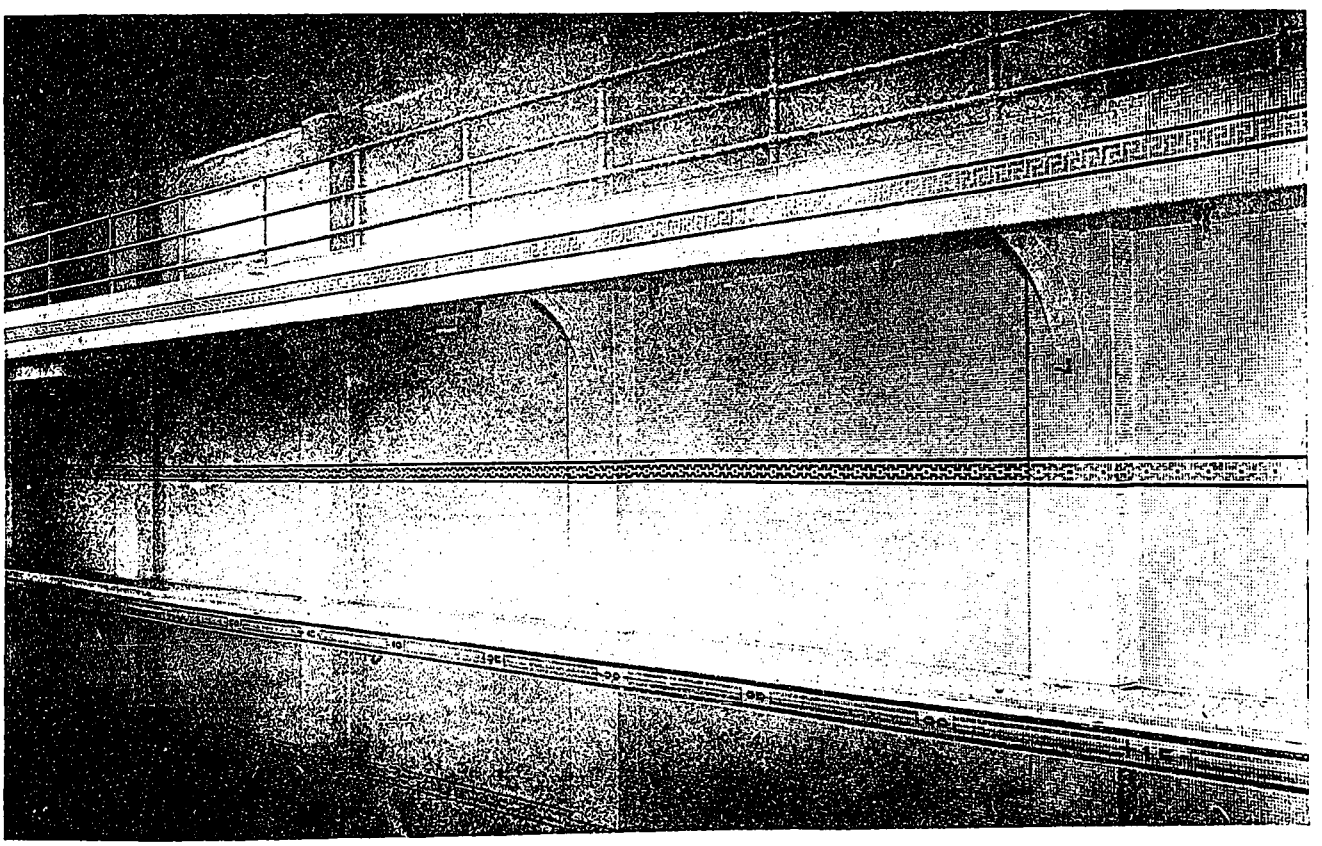
The power plant and equipment is in a separate building in the rear, placed with due regard for convenience and economy in operation, and serving all the requirements of main building.

The total cost of the building without furnishings was about $397,250.00.



RECEPTION HALL.

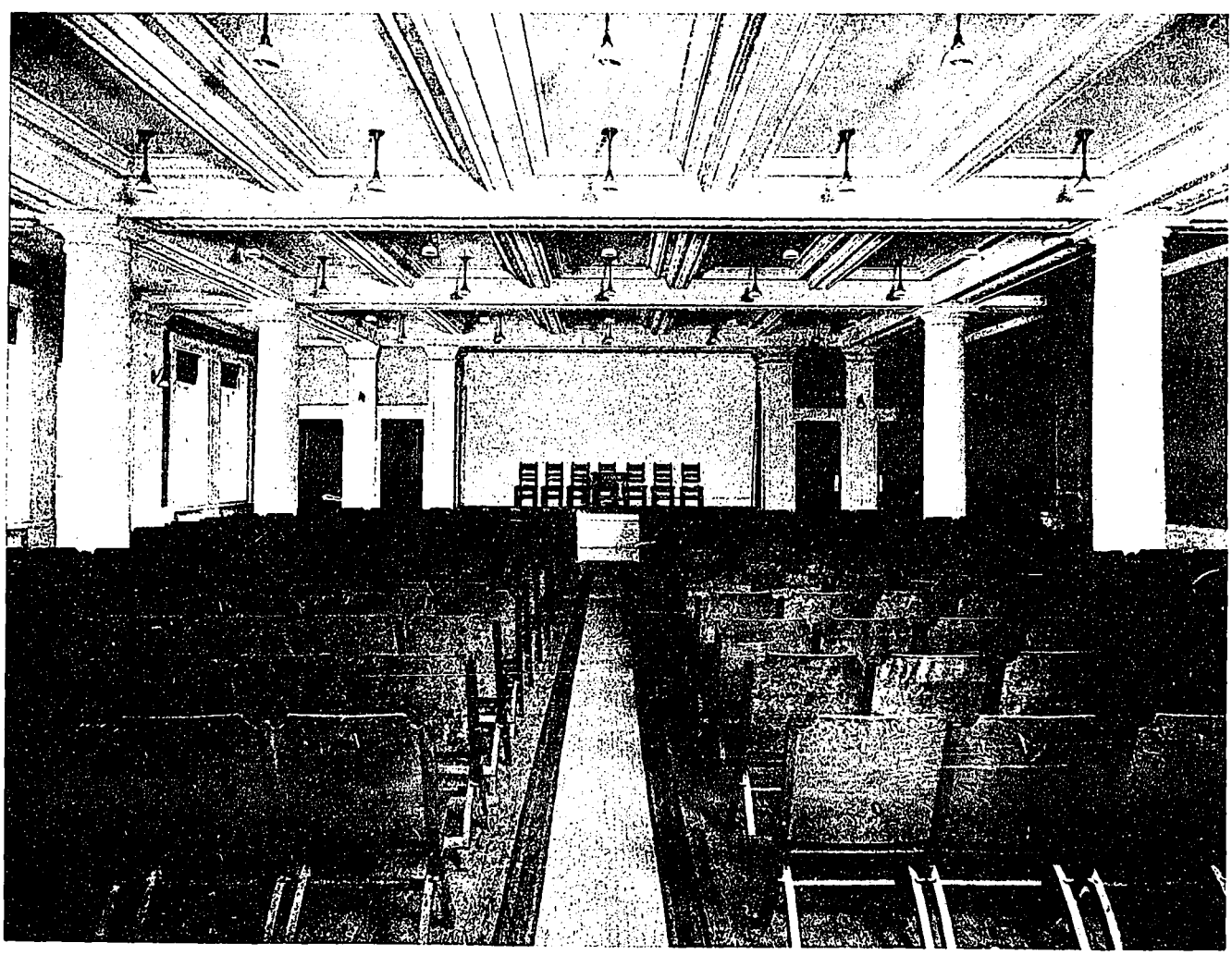




THE PLUNGE.
DETAIL OF PLUNGE.

NEW CENTRAL Y.M.C.A. BUILDING,
MONTREAL, QUE.

JACKSON & ROSENCRANS
AND ROSS & MACFARLANE,
ARCHITECTS.

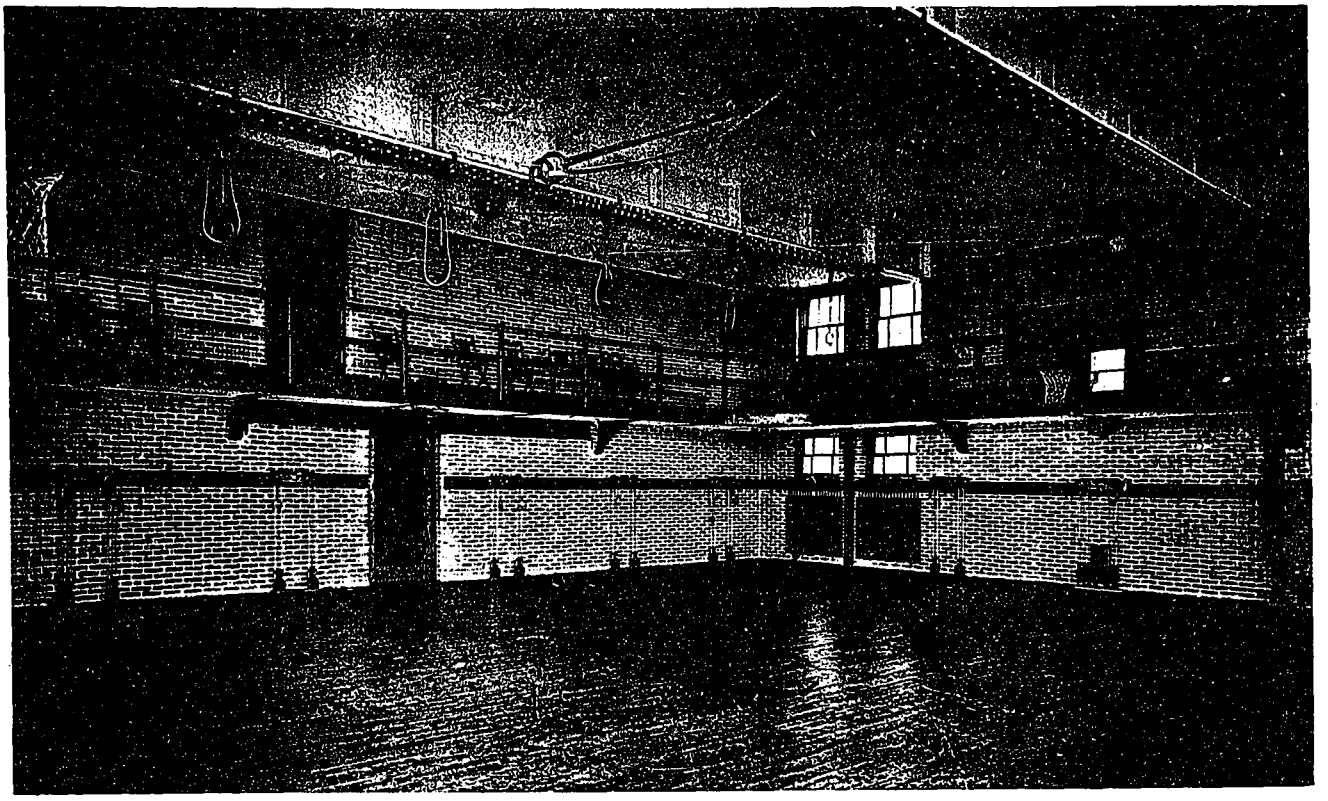


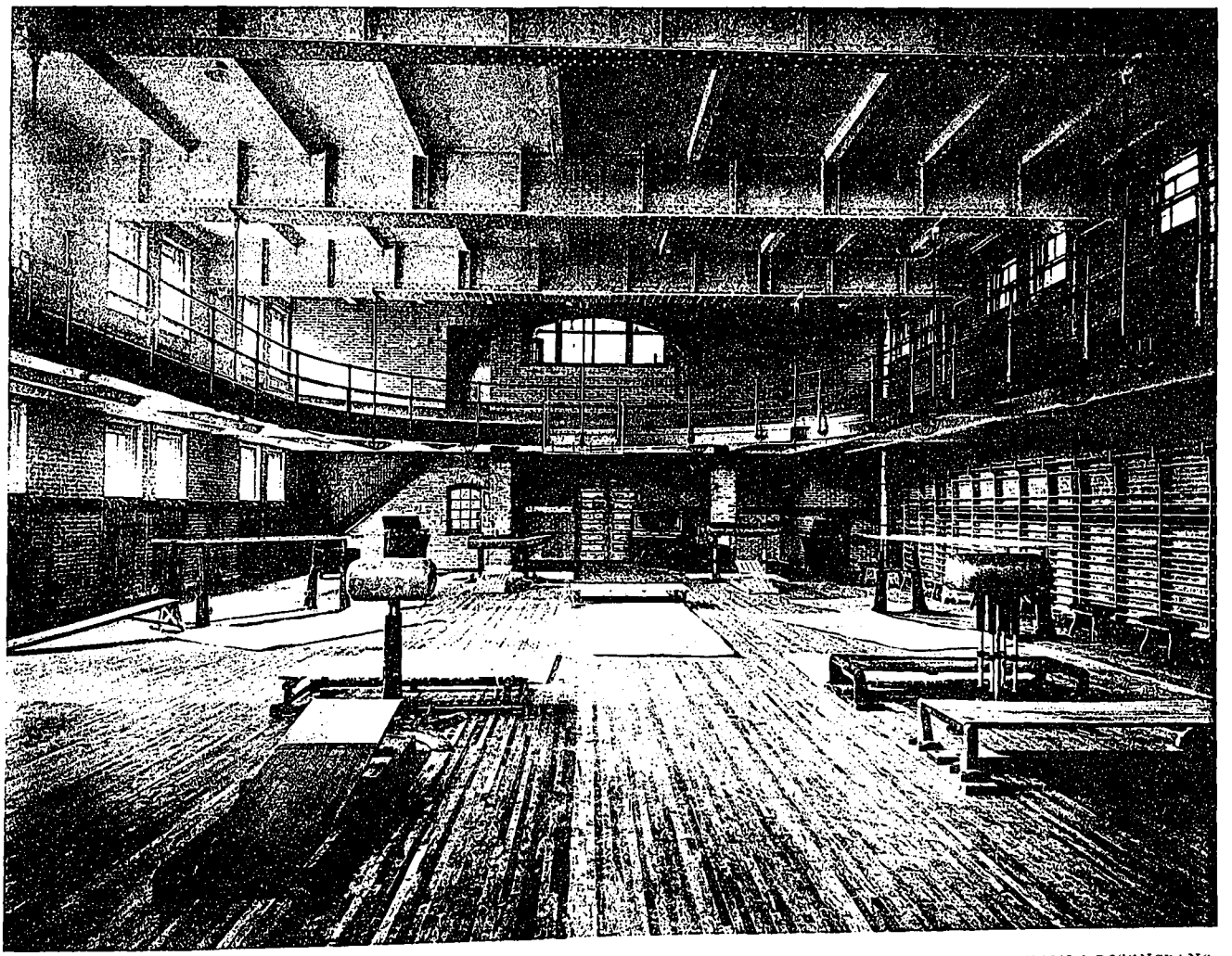
MEN'S LIBRARY.

AUDITORIUM.

NEW CENTRAL Y.M.C.A. BUILDING,
MONTREAL, QUE.

JACKSON & ROSENCRANS
AND ROSS & MACFARLANE,
ARCHITECTS.



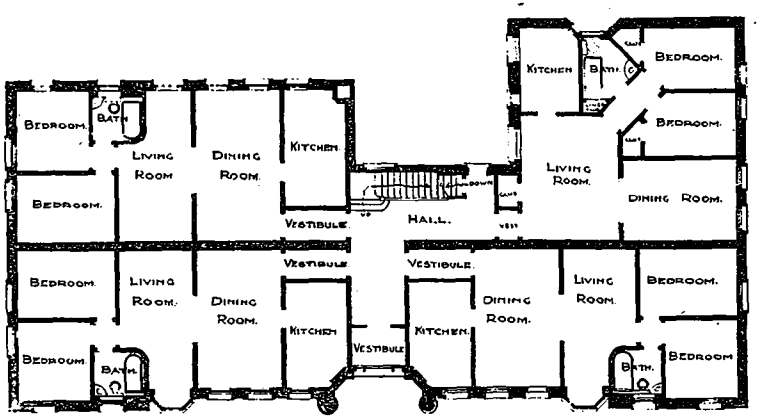


BOYS' GYMNASIUM.

MEN'S GYMNASIUM.

NEW CENTRAL Y.M.C.A. BUILDING,
MONTREAL, QUE.

JACKSON & ROSENCRANS
AND ROSS & MACFARLANE,
ARCHITECTS.



WILLARD APARTMENTS,
KING STREET AND TRILLER AVENUE,
TORONTO, ONT.

HENRY SIMPSON,
ARCHITECT.

Apartment Houses, Toronto

WITHIN THE LAST FEW years the rapid growth of Toronto has necessitated the erection of numerous apartment houses. Their types vary considerably, ranging from the small duplex apartment to those which accommodate a large number of suites. This same need is experienced in all our cities and it is worthy of comment that in the majority of cases the plans have been carefully studied and made practical by the adoption of the best in all modern up-to-date work.

The cause of the rapid development of the apartment is given to the high cost of individual houses, both as to the rental and to the maintenance of same. People felt that for a small family a house was too large; the servant problem too troublesome, or the anxiety of the household cares too burdensome. These and other causes led many to encourage such structures and there seems to be little trouble in renting them, no matter how quickly they seem to spring up.

So many of the apartments have been erected by speculative builders, who gave no thought to a proper plan or the latest improvements. This practice to a certain extent has been eliminated by the gradual education of the people and it is to be hoped that the Canadian cities will escape the thousands of unsanitary, impractical and unsightly apartments which fill the American cities.

WALDORF APARTMENTS.

The plan is the chief feature and demands considerable thought. How often in early structures would the door to the sitting room command all others, or directly opposite a toilet, or back of less important rooms. The servants were forced to use the same entrance and stairs. All of which objectionable features are taken care of and the apartment of to-day should lack nothing in arrangement or comfort.

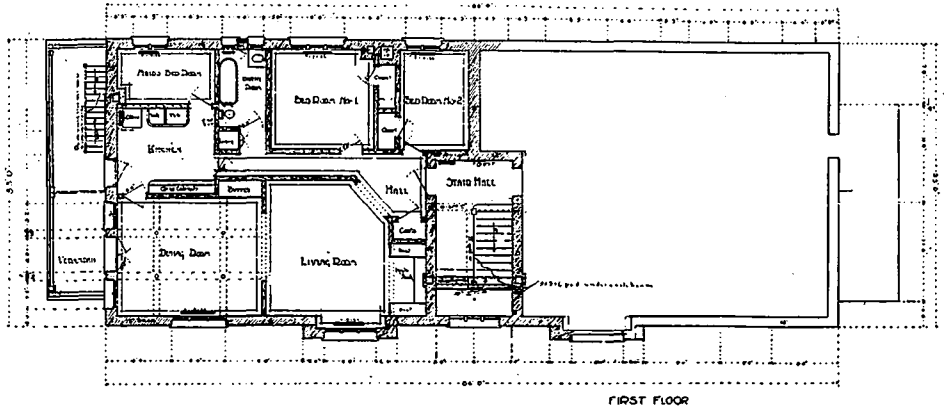
The College Heights Apartments are situated in one of the most desirable residential districts and carfully planned to meet every requirement of such a location. Pressed brick and cut stone are used upon the exterior; oak throughout the interior except in the living room, trimmed in mahogany. All floors are of hardwood and each apartment has one or more electric fireplaces. The heating system is steam. In the basement are provided the laundries, store-rooms, heating plant, etc.

The Waldorf Apartment consists of eighteen suites, all lighted from the exterior, there being no light shafts or areas in the building. Upon the interior oak and cypress provide for all woodwork. The floors are noise-proof, finished in seven-eighths-inch thick. Tiling is used in the entrance and staircase hall. The plumbing is supplied with hot water from a central boiler, while the heating is by steam. As in the other apartment, all the basement space is given up to the heating equipment and storage-rooms. Each apartment contains at least one fireplace with an ingle-nook containing seats.

The Bradgate Apartment is designed in dark red brick, Roman stone, light stucco, and rough sawed pine stained dark. Upon the interior the stairs are of iron and the floors of oak.

The Willard Apartments are built of buff brick with light stone trimmings. The two buildings face each other and are designed with balconies overlooking the lake. Mahogany is used throughout while the living rooms have a dado of the same material 5½ feet high. Tiling is used in the entry, halls and bathrooms. The tar and gravel roof is arranged for the private use of the tenants as well as the basement. Steam heating has been installed, making the cost per cubic foot 20 cents.

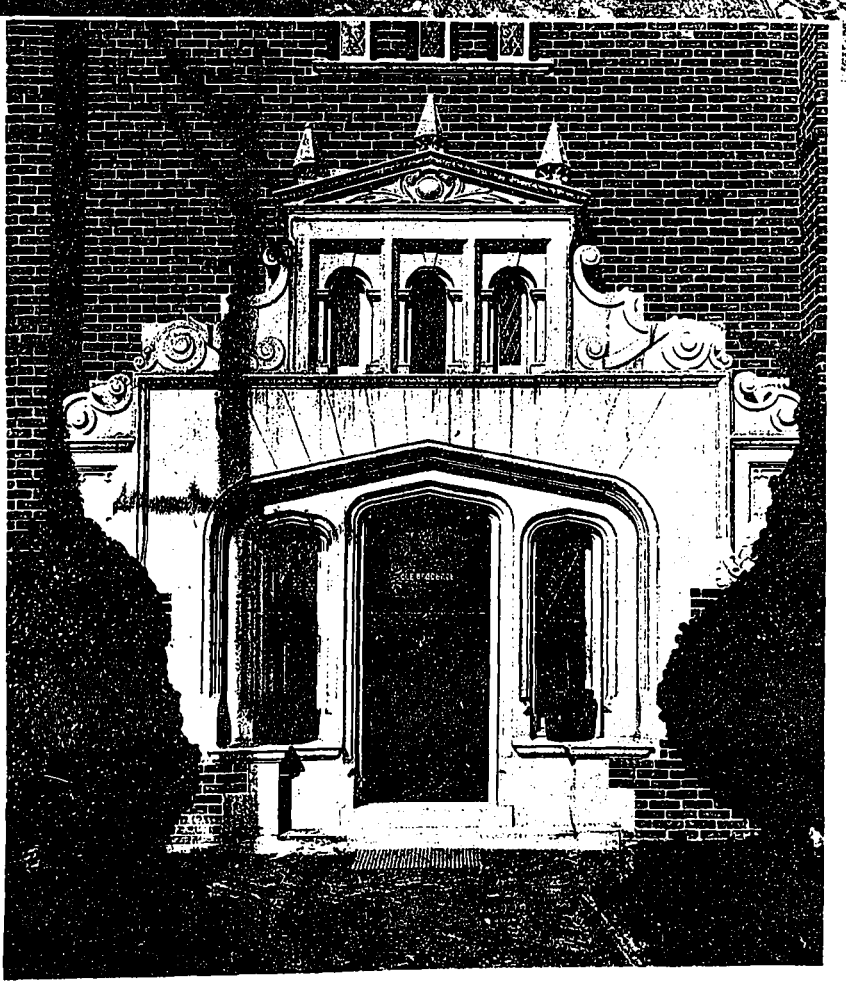
The Hampton Apartments consist of buff pressed brick with Ohio stone trimmings. Arrangements are made for thirty suites, accommodating from three to five rooms, and separated by brick walls. The interior finish throughout is of quarter-cut oak and hardwood floors. Eighteen of the suites are accessible from one street, while the remaining twelve open upon another. The basement is planned with locker spaces and mechanical equipment. The cost approximated 20 cents per cubic foot.



FIRST FLOOR

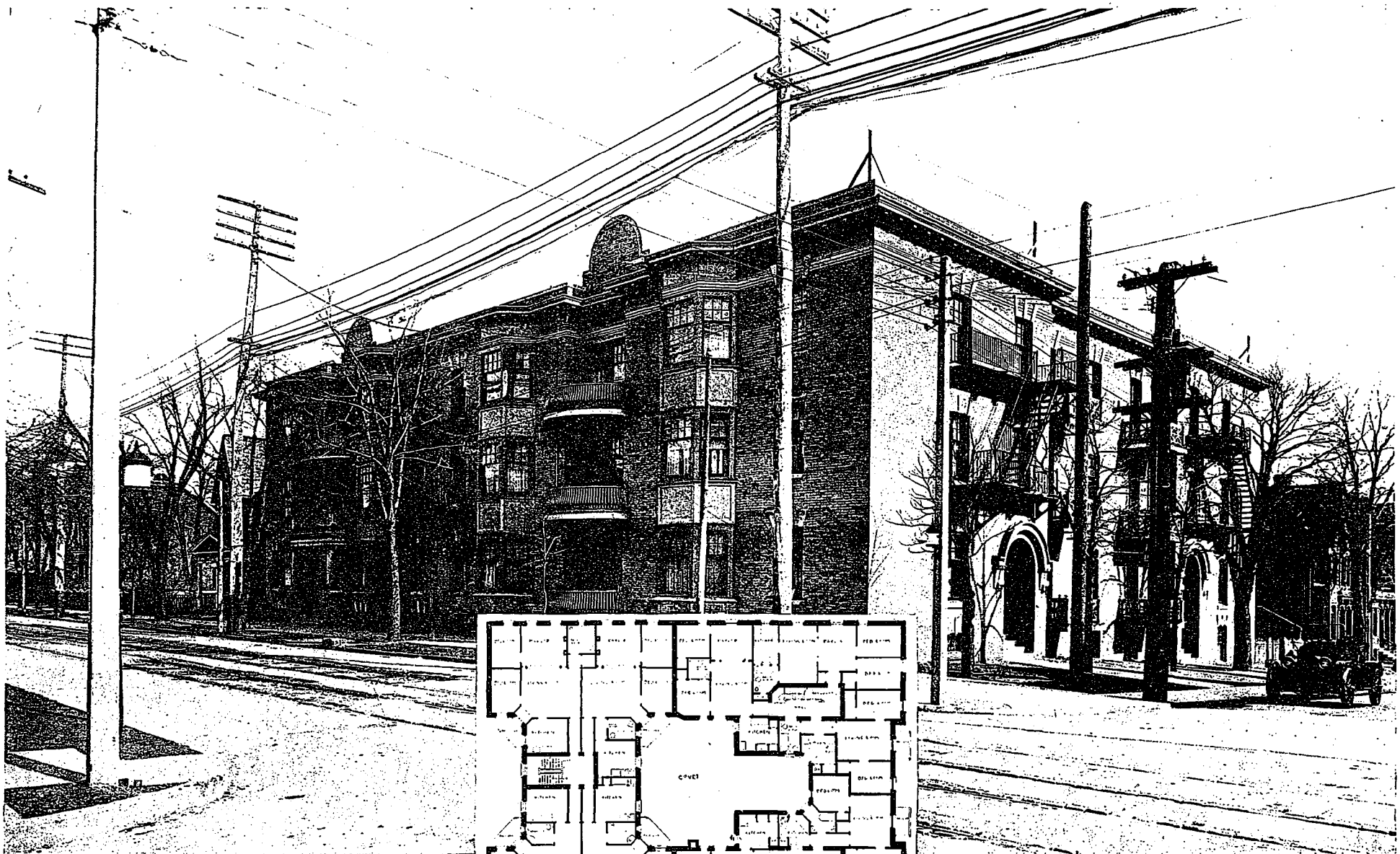
BRADGATE APARTMENTS,
AVENUE ROAD HILL,
TORONTO, ONT.

PAGE & WARRINGTON,
ARCHITECTS.



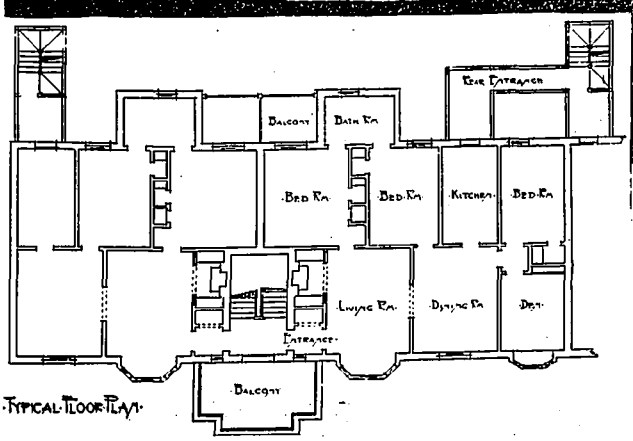
DINING ROOM AND ENTRANCE, BRADGATE APARTMENTS, AVENUE ROAD HILL, TORONTO, ONT.

PAGE & WARRINGTON ARCHITECTS.



HAMPTON APARTMENTS,
WINCHESTER AND METCALFE STREETS,
TORONTO, ONT.

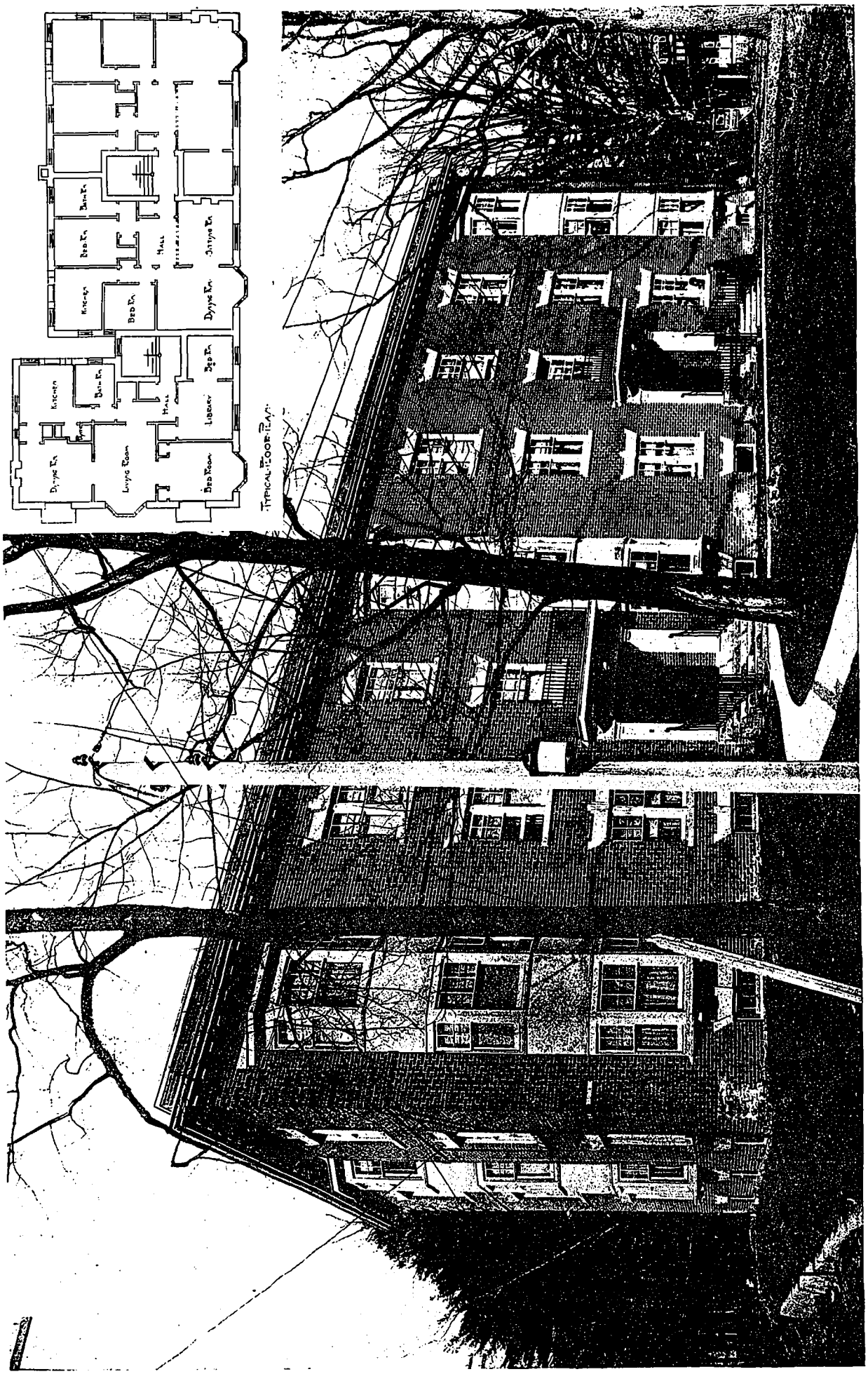
HENRY SIMPSON,
ARCHITECT.



Typical Floor Plan

WALDORF APARTMENTS,
KING STREET WEST,
TORONTO, ONT.

R. J. EDWARDS & SAUNDERS, ARCHITECTS.



COLLEGE HEIGHTS APARTMENTS,
ORIOLE ROAD AND ST. CLAIR AVENUE, TORONTO.
R. J. EDWARDS & SAUNDERS, ARCHITECTS.

CONSTRUCTION

A · JOURNAL · FOR · THE · ARCHITECTURAL ENGINEERING · AND · CONTRACTING INTERESTS · OF · CANADA

FREDERICK REED, Editor

H. GAGNIER, LIMITED, PUBLISHERS

Corner Richmond and Sheppard Streets,

Toronto, - - Canada

BRANCH OFFICES:

MONTREAL—171 St. James Street

WINNIPEG, MAN.—13 Royal Bank Building

CHICAGO—Advertising Building

NEW YORK—156 5th Avenue

CORRESPONDENCE—All correspondence should be addressed to "CONSTRUCTION," Corner Richmond and Sheppard Streets, Toronto, Canada.

SUBSCRIPTIONS—Canada and Great Britain, $3.00 per annum. United States, the Continent and all Postal Union countries, $4.00 per annum, in advance. Single copies, 35c.

ADVERTISEMENTS—Changes of, or new advertisements must reach the Head Office not later than the first of the month preceding publication, to ensure insertion. Mailing date is on the tenth of each month. Advertising rates on application.

CONTRIBUTIONS—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and duly returned.

Entered as Second Class Matter in the Post Office at Toronto, Canada.

Vol. 6 Toronto, July, 1913 No. 7

CURRENT TOPICS

R. K. SHEPARD and D. D. Calvin have formed a co-partnership for the practice of architecture under the firm name of Shepard & Calvin. Their address is 43 Scott street, Toronto.

* * *

C. HOWARD ELLIS, of Toronto, formerly connected with the office of Chas. H. Platt, New York city, is taking an extended trip through Europe. Mr. Ellis expects to practise architecture in the Canadian field upon his return. Mr. Ellis is a son of J. A. Ellis of the firm of Ellis & Connery.

* * *

ARRANGEMENTS for calling for competitive plans for the new departmental buildings in Ottawa are being completed. Messrs. J. G. H. Russell and Thomas E. Colcutt, who, with J. O. Marchand, are the assessors who will have charge of the competition and will select the best design, are arranging the general ground plan, with the acting Premier, Hon. George Perley. The competition is to be open to architects all over the British Empire, and prizes will be given for the best half-dozen plans received. The author of the successful design will secure the work, and the five others next in merit will receive $3,000 each. The ground plan already prepared will be used as a basis in calling for plans, but the competitors are to be at liberty to send in different ground plans if they so desire. The competition will close in the fall and work on the first of the new buildings will commence next year. These buildings will include a new Supreme Court to accommodate also the Railway Commission and the Department of Justice, and a departmental office block. They will be erected on the recently expropriated property overlooking the river west of Parliament Hill.

Mr. Colcutt is a past-president of the British Institute, is the holder of King Edward's gold medal, a member of the Society des Artistes Francaises, and a member of the Belgium Architectural Society. He obtained the grand prix at the last Paris Exhibition for designing artists.

* * *

THE PLANS already in course of preparation for the various portions of Montreal's great municipal scheme of conduit work throughout the city, will when finished include twenty-three miles of city streets, while the placing of conduits in still other sections is also under contemplation. With the completion of the conduits already planned there will disappear about five thousand telegraph poles from the twenty-three miles of streets and approximately a thousand miles of overhead wires will be removed. In many parts of the city the telegraph poles are within two or three feet of one another. Within a distance of twelve feet at a point on St. Catherine street, there stand four poles, but placing them on an average of fifty feet apart the above estimate is made. Likewise, with the telegraph and power wires. On many of the business streets over forty wires are carried across each pole, but estimating an average of twenty wires to the twenty-three miles of streets with poles on both sides, a thousand miles of wiring is reached. The conduits provide for a future "Great White Way" street lighting, and for a perfect system of fire alarm and police patrol wiring. The method of distributing the light-giving, heat-producing or power-conveying, electric wires to the places of residence and business along the route of the conduits is interesting. The large manholes provide for the large cables carrying high voltage current and are stretched to the smaller transformer manholes. From the transformer manholes, the wires return to the main manholes and on through the main ducts to the service manholes, situated at intervals between the main manholes, and from the service manholes through the round service ducts into the private buildings.

SENATOR BERENGER has enthusiastically approved of the idea of M. Cochon, head of the Federation des Locataires, or Tenants' League, for the creation of barracks in which to house the very poor of Paris. It will be recalled that it was M. Cochon who one day found building sheds in the gardens of the Tuileries and appropriated them for his poor proteges. Another time he moved their furniture on handcarts into the Court of the Ministry of the Interior. Next he tried to lodge them at the Elysee, at the Ministry of War, and at the Palais Bourbon. M. Berenger declares that whatever there may be of the grotesque in such enterprises, yet the fundamental idea is no doubt good and praiseworthy, and M. Cochon's eccentric doings have at least had one good effect, that of drawing public attention to the matter. There are hundreds of destitute people, and often very respctable workmen, with large families, evicted from their lodgings on quarter day. The building of workmen's dwellings does not meet the case, as they are occupied as soon as built by workmen who can afford to pay for a fair amount of comfort. The people, on the other hand, who are evicted, especially when they have large families, have got into trouble because they are totally destitute. Senator Berenger suggests that the latter should be treated simply in the way that the temporary housing of soldiers is treated by the military authorities. Permanent barracks should be constructed, where these destitute people could find a shelter. The City of Paris has many empty plots of ground which it could lease for a nominal rent. With the buildings there should go large playgrounds for the children, and finally, this sort of workmen's barracks should be supplemented by suitable trade schools, in which the children should be taught a trade and fitted for life.

* * *

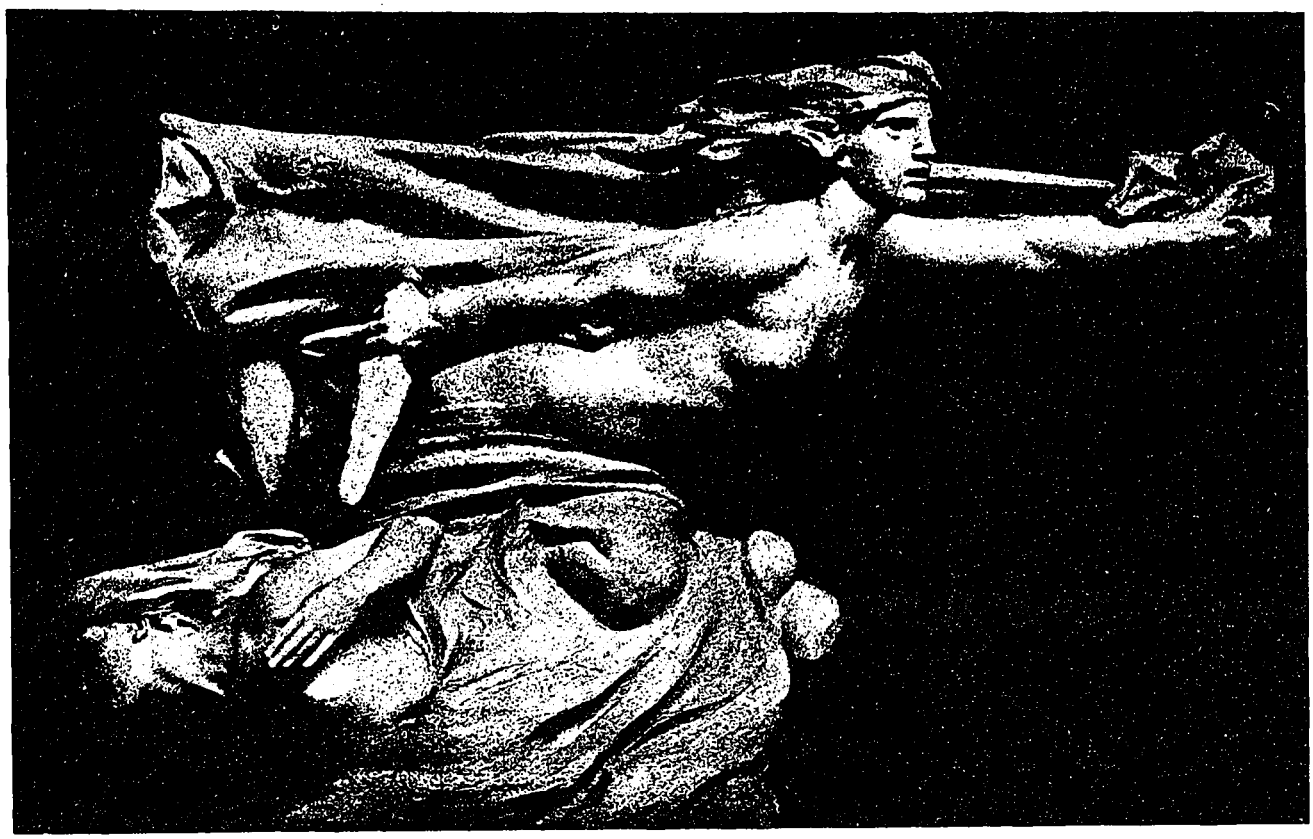
THE SOCIETY of Architects, London, considering it desirable in the public interest that persons requiring professional aid in architecture should be enabled to distinguish qualified from unqualified practitioners, and that steps should be taken to prevent incompetent persons from posing as architects, have to that end drafted "A Bill for the Registration of Architects." This will be presented in due form to Parliament.

The following present some of the reasons for their action in this regard: Architects have the spending in the aggregate of vast sums of public money and the control of matters affecting the life, health, convenience and financial interests of a very large section of the community. The practice of architecture calls for the possession and exercise of many and varied gifts and attainments, chief among which are, artistic sense and feeling, scientific and professional knowledge, practical skill, and business ability. The various architectural bodies publish registers of their members, but the value of these lists of architects as a guide and protection to the public is very considerably discounted by the fact that the public directories necessarily schedule under the title of "architect" without reference to his qualifications, any person who claims that designation, whether justified or not. The proposal for the registration of architects is not a new one, nor does it introduce any new principle. It is merely carrying to its logical conclusion of state registration, the present voluntary system of registration of their members by the various architectural bodies. Registration is in force in several European countries, many of the American States, and a number of our own Dominions, while others are applying for it.

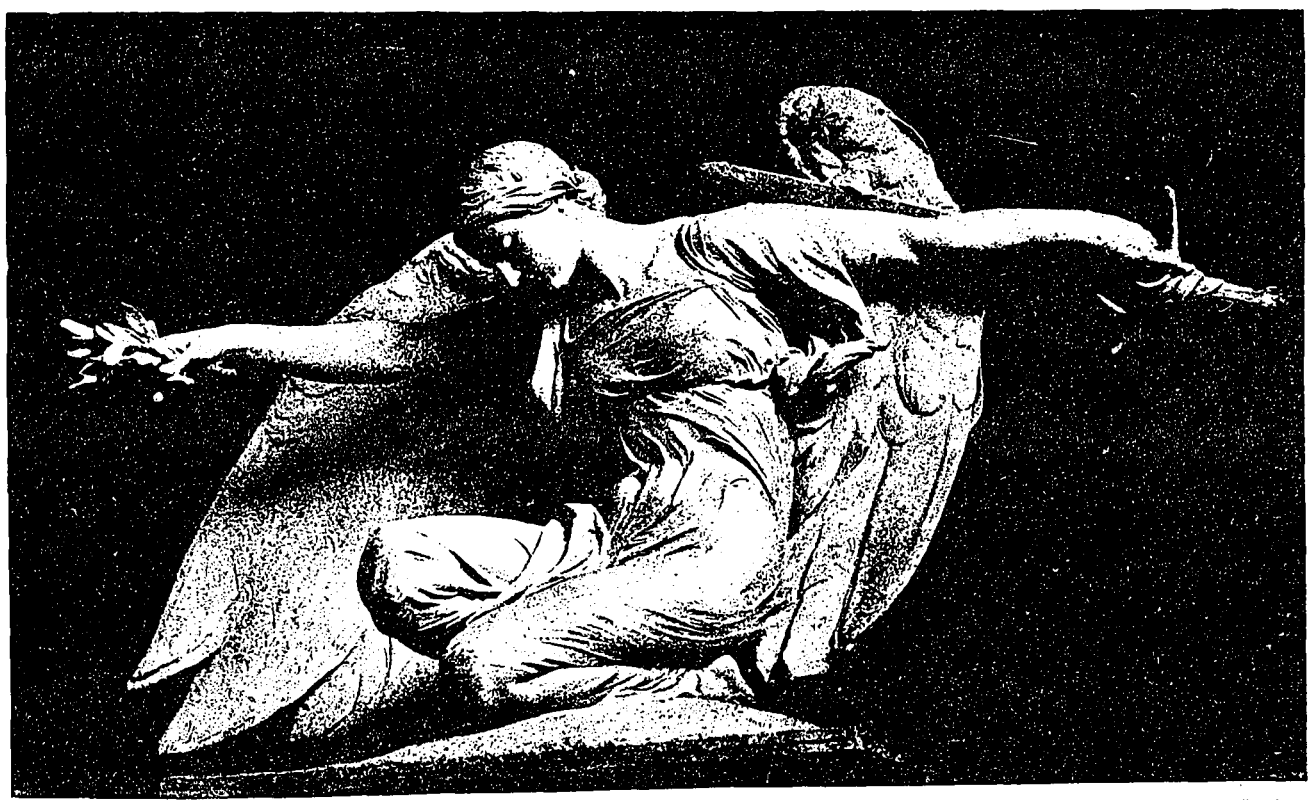
The proposal is that at the time of the passing of the Act every bona fide qualified architect shall be entitled to register and that the vested interests of engineers, surveyors, clerks of works, builders or other persons who may be affected shall be protected, and opportunity afterwards given, to all who wish to practice architecture, of qualifying for admittance to the register. Only those so registered are to be entitled to recover fees for services rendered as architects. The bill would provide (*inter alia*) for the establishment of a registering body or council, comprised of members appointed by the Privy Council, the Royal Academy of Arts and the architectural societies, for the administration of the Act and the conduct of the examinations.

The first effect of an architects' Registration Act would be to give an immediate and definite impulse to architectural education and training, by setting up a compulsory standard of qualification. The chief weakness of the present voluntary system of architectural examinations is that they are not obligatory (except under certain conditions for admittance to membership of architectural bodies). At present such examinations are not in any case essential as a preliminary to the practice of architecture or to the claiming of the title of architect. The ultimate result of such an Act of Parliament would be that the unqualified practitioner would be gradually eliminated by effluxion of time without inflicting injustice or hardship on anyone, and without creating a monopoly, while the public would have a guarantee that in employing any architect they would secure the services of a person possessed of at least the minimum qualifications required for the proper performance of his very onerous duties.

Among some of the advantages to the public which in the opinion of the society would be secured as a result of the passing of a Registration Act of the kind advocated, would be: the raising of the standard of architectural education and training by the substitution of a compulsory in place of a voluntary system of qualification, the consequent adequate protection of the interests of that large section of the public affected, and the recognition by the State of the Art of Architecture as a great national asset to be fostered and cultivated to the utmost.



WAR.

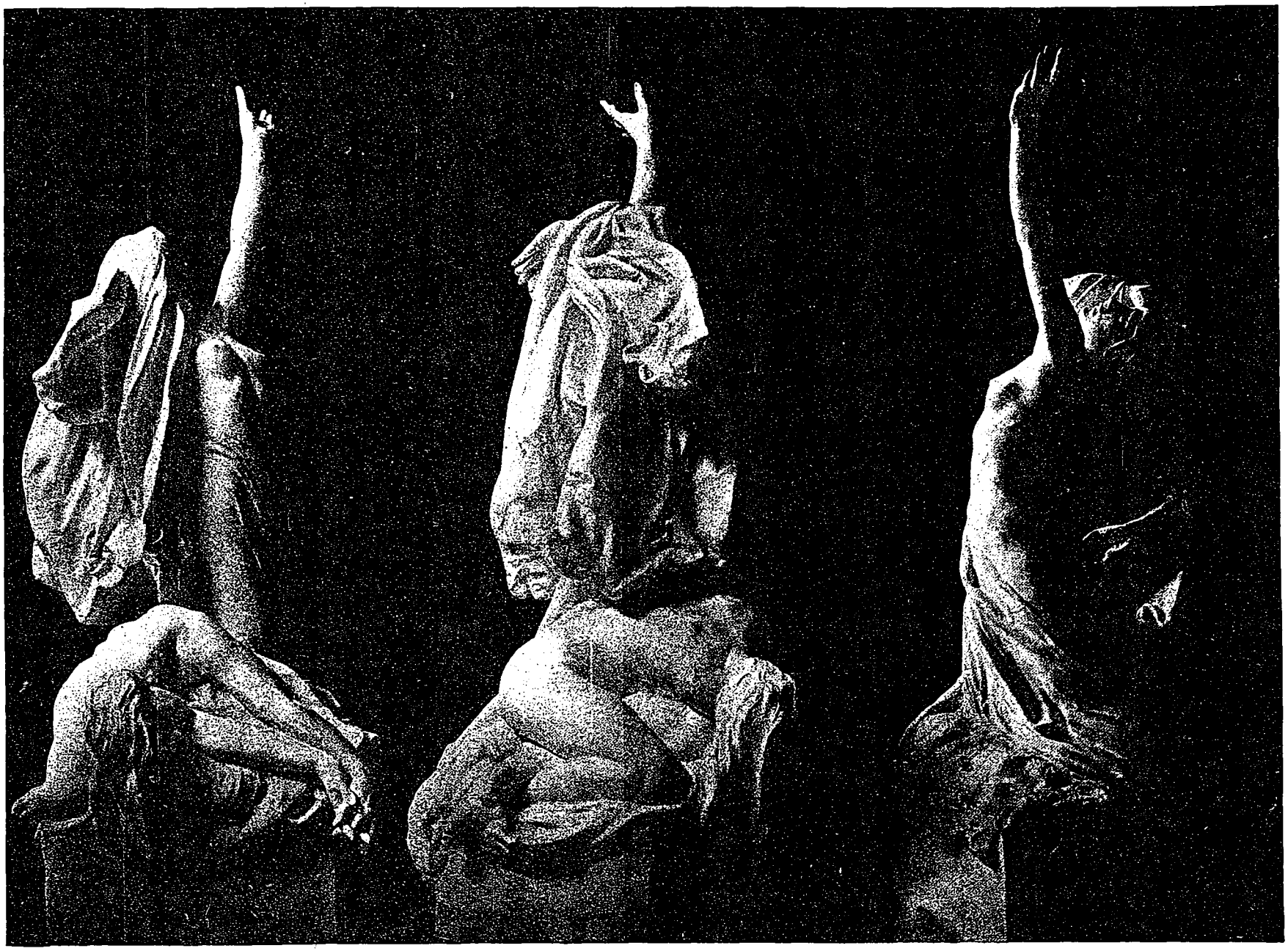


PEACE.

From Architectural Review, London.

C. M'CLURE,
SCULPTOR.

GROUP AND FIGURE
FROM THE
SOUTH AFRICAN WAR MEMORIAL,
LEICESTER, ENGLAND.



GROUP SYMBOLIZING "GRIEF." SOUTH AFRICAN WAR MEMORIAL, LEICESTER, ENGLAND.

CROSLAND M'CLURE, SCULPTOR.

From Architectural Review, London.

Fifth Annual Conference on City Planning

THE FIFTH annual conference on city planning, held in Chicago from Monday to Friday, May 5-9, witnessed a gathering of 200 delegates, most of whom were experts in civic matters. Canada showed up well, sending five delegates from Montreal, ten from Toronto, two from Calgary and one each from Regina, Ottawa and Winnipeg. Toronto was previously represented on the committee of the conference and Montreal was now added as a tribute to the Canadian representation. The chairman of the national conference, Frederick Law Olmsted, of Brookline, Mass., and a city planner of national reputation, opened the proceedings by outlining a city planning programme showing: (1) The development of a city planning movement and the organization of unofficial activities and of official bodies to be charged with the duties of city planning; (2) The principal steps in the preparation of a city plan after its preparation is established, and (3) Methods of putting a city plan into execution.

Mr. Olmsted prophesied that "In fifty years an official body in every city will be assigned the responsibility for the carrying out of a consistent building plan." He said: "There are three logical divisions of any city planning movement: the winning of public support, the planning itself and the translation of plans into facts. The three divisions are concurrent, they advance or fall together. A knowledge of the facts is the first requirement, and the basis for a city plan must be a city survey covering information as to four classes of facts. The first of these includes the facts of the physical environment of the people; the second, the social facts concerning the people themselves and the reactions between them and their physical environment; the third, the economic and financial facts as to the resources of the community and the possible means of bringing those resources to bear on public improvements; and the fourth, the facts as to the legal and administrative conditions which must be reckoned with in any attempt to control the physical environment." Mr. Olmsted's address was followed by a statistical report on the city planning activities of the year, prepared by Flavel Shurtleff, of Boston, secretary of the conference. This was illustrated by stereopticon views of improvements actually effected in American cities, together with statements of the cost, etc.

Mr. Wacker, in the course of his remarks, said:

"I believe the experience of Chicago has demonstrated there are four important legal obstacles to be removed before the science of city planning can be made mose effective. One of these is the law forbidding cities to condemn more property than is actually needed for an improvement. Our cities should have ample powers of excess condemnation, that they may take whatever wide belts of property may be advisable in any improvement district, holding the same for rearrangement and resale after the completion of the improvement has added largely to the values. Secondly, our cities should have the right to acquire property for the purpose of eliminating unsanitary districts. Thirdly, the law should provide for issues of long-term bonds, under proper restriction, so the citizens of the future who will enjoy to the full the benefits of the great improvements may be called upon to contribute toward paying for such improvements. Fourth, to provide for economy, legal means should be had to stop realty speculation based upon the certainty of increased values growing out of improvements under a city plan, and also to prevent erection of costly buildings fronting thoroughfares to be widened, unless such buildings shall be erected to fit in with the new plans, and thus be exempt from condemnation, thereby lessening expense to the city.."

During the convention Dr. Hegemann, general secretary of the German City Planning Conference, pointed out the danger of ignoring the railway facilities and criticized the Chicago plan as having made such a mistake. In speaking of Paris he showed how $500,000,000 had been expended in making it a Renaissance city while the housing conditions and location of railways were poorly handled.

Dr. Hegemann, who had objected to seeking as a model for Chicago Paris, where, he said, transportation and housing were the worst in the world, told again of the results of the greater Berlin competition. Then he continued: "For a comprehensive transportation plan of a large city, the opinion of the leading transportation experts of the country—if not of the world—must be asked. At the competition for Greater Duesseldorf in 1912, nearly all the competitors worked in co-operation with some transportation expert. On the basis of a good solution of railroad problems, a satisfactory development of housing can be worked out. The main thoroughfares, the parks, and the public buildings, can be put in their right place without being endangered by resettlement of railroad troubles. The creation and protection of desirable districts for the homes of the people can be worked out on this basis. The well-to-do will be able to invest his money safely without fearing the deterioration of the neighborhood, and the man of modest means can get good connections with pleasanter little houses—far enough away from the heart of the city to give him ample opportunity to have all the garden he may desire. The basis of the city beautiful is the businesslike handling of transportation. Modern transportation, if thoroughly applied to city planning, will produce a new type of a decentralized city, which will contain more green spaces, gardens, and parks—with a corresponding improvement in the health of the people—than the crowded cities we have known up to date."

Designing and Laying Out of Towns

T. HAROLD HUGHES*

Approaching the Problem.

I. The Architectural Ideal.

THE architectural standpoint in designing and laying out cities and towns is that point of view which demands the subordination of many component parts to the production of an harmonious and united whole, which shall not only satisfy all utilitarian requirements but contribute to the mental and moral welfare of mankind. Practical problems must be so solved as to appeal to our sense of beauty. Such necessities as water supply, will, within broad limits, exercise no influence on schemes of drainage, or the transmission of power, the ultimate effect of the city; but lines of transportation, the allocation of the various quarters, the distribution of park lands, public buildings, and monuments, and the lay-out of streets and squares will all be designed to assist in the realization of some great artistic scheme.

Town planning is an art with a far-reaching influence. The painting or statue placed in the art gallery or in the dwellings of the wealthy is seen by few; but the town planner, whose canvas is the hill and the plain, can by his creation of the city beautiful give pleasure day by day and affect the lives of many not only for the present but for generations to come.

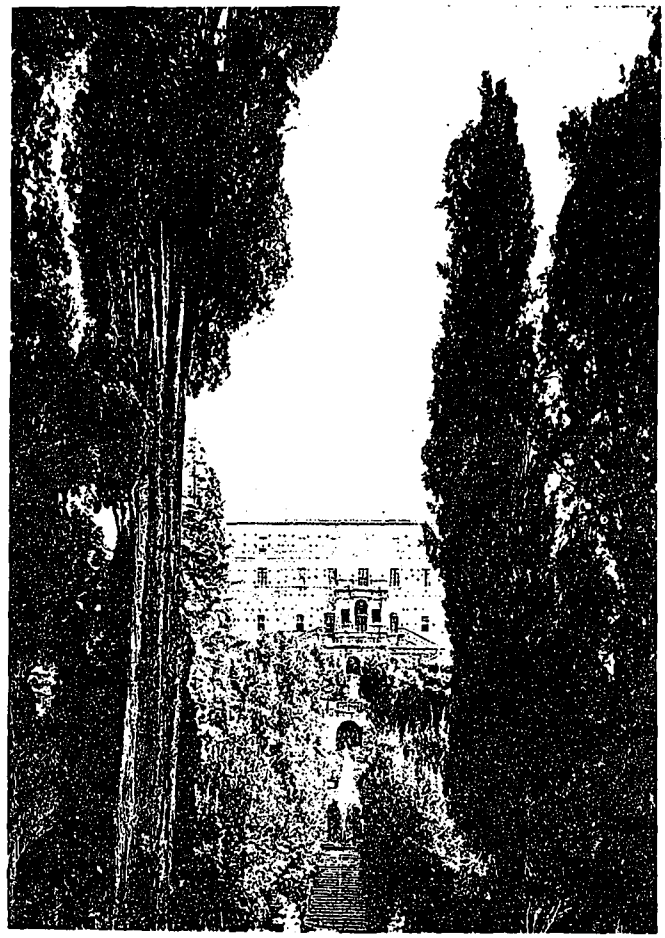


FIG. 1. VILLA D'ESTE.

To whom must we look for the creation of the beautiful town? The mind accustomed to the design of buildings, to the grasp of an entire problem, to the harmonious relation of many details fitly proportioned to their object, alive to the value of the axial line and vista, knowing how and where to concentrate interest, able to accentuate and subordinate parts, this mind—the mind of the architect—is the one to design the town such as I would define it.

How must the problem be approached? No great work of art can be achieved without some high ideal, to attain which the artist constantly must strive. Some great thought must be embodied in every design, every detail must be attuned to some great ruling principle, and in a large comprehensive scheme the designer must seize upon every opportunity of enforcing the dominant idea.

The town must be conceived as a whole, and must be the work of one whose high ideals and imagination can rise above the host of details which beset the designer of such a vast and complex problem. The planner of towns must be a dreamer steeped in ideals and freeing at the outset his mind from all pretty details. He must create around him by his thoughts a favorable environment, and so conceive the broad lines of his scheme. By a wise study of the past, recognizing its limitations and its ideals, he can stimulate his imagination and gain an insight into the qualities required to create the city beautiful. Knowledge of the ruling principles and aided by these, an attempt to recreate in his mind, from their ruins, the cities of long ago, will be of the utmost value; and may he not, in this respect, glean something from painters who could depict the glories of the past in such scenes as the Landing of Cleopatra, or Dido and Carthage?

II. Lessons of the Past.

(a) Greek.

Was it well-considered planning and the grouping of buildings and accessories into one great architectural scheme, or beautiful buildings superbly placed, which contributed to the effect of a Greek city? I think the latter. Selinonte, influenced by the work of Hippodamus, in whom we see the highest attainments in Greek planning, owes its beauty to its elevated position above the water and to the sense

*Essay submitted under the motto "Redundancy," awarded the Royal Institute silver medal and twenty-five guineas, 1912. Published through the courtesy of the Journal of the Royal Institute of British Architects.

of unity in the design of its buildings—as a town plan it is a failure. From the great period of the fifth century B.C. to the time of Alexander there was an increasing desire for clear reasoned thought and an attempt to render some fine conception in the city plan, in place of chance haphazard growth; but that perfect unity and subordination of all details to one great idea so beautifully shown in their individual buildings was never attained. Though attempts are made to obtain the best effects within the limits imposed, the necessity of fortifications, and the insistence on the preservation of sacred spots, precluded the adoption of any unified architectural scheme. At no other period can a more complete understanding of the site and its resources be seen. Art and Nature are happily wedded, as shown in the magnificent disposition of their buildings on some prominent site or in the theatre cut out of the slopes of the hill; and at Pergamos, Athens, and elsewhere, the value of broad level lines on a hilly and diversified site is apparent.

The buildings on the Acropolis, Athens, though not planned in direct relation one to the other, were so placed on the rock as to give the appearance of one great *ensemble* as seen from the city below, the outward and visible sign of that which dominated their lives. The Propylæa, traced from the early Cretan palace to Mnesicles' superb edifice at Athens, shows a desire to obtain a dignified first impression and a portal worthy of the precincts to which it gives access. Public gymnasia and stadia were brought more into architectural relation with the city—a contrast to our method of dealing with recreation grounds, though now, as then, physical exercise plays an important part in life. The Agora, placed in relation to the two main cross streets of the town, shows an appreciation of the importance of the vista, and the grouping of their public buildings round it shows the value attached to the formation of some climax in their design, an effect, however, more magnificently obtained by the placing of the great dominating temples on an eminence, giving to the whole composition a sense of unity extending to the smallest houses, however distant and irregularly scattered about. Though symmetry was not always striven for, a general sense of balance is felt and an interesting sky-line maintained.

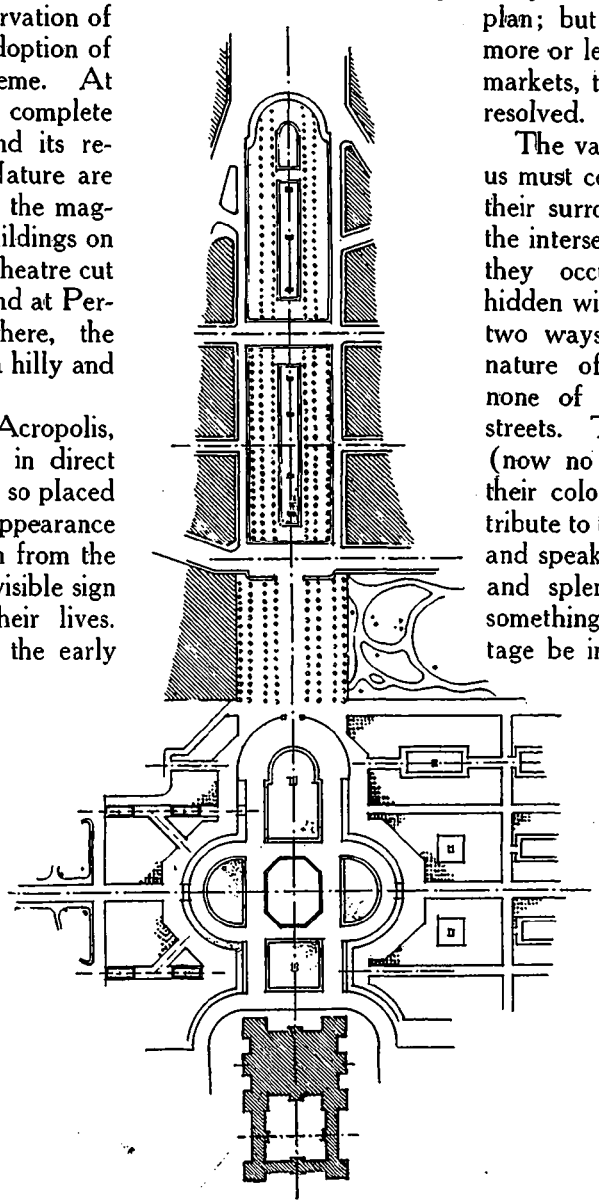


FIG. 2. LUXEMBOURG GARDENS.

(b) Roman.

In the study of Roman Civic Art it is the great scale and the big way of approaching problems which strike one most forcibly. Possessed of more power and fewer restrictions than the Greeks, they did not hesitate to cut away the side of a hill or to fill in a valley to suit their magnificent plans. Regular and symmetrical schemes were adopted, the chess-board system being more or less customary—the two main streets of the town set at right angles to one another regulating the lay-out of the remainder of the city plan; but effective planning is limited more or less to the public buildings and markets, the residential parts being unresolved.

The value, then, of Roman study to us must centre chiefly on the Fora and their surroundings. Placed usually at the intersection of the two chief streets, they occupy central positions, but, hidden within the angles formed by the two ways, they partake more of the nature of enclosed spaces and shed none of their glory on the adjacent streets. The surroundings of the Fora (now no longer market places), with their colonnades and porticos, all contribute to the total effect of magnificence and speak eloquently of the civic pomp and splendor of Roman public life, something of which might with advantage be infused into our own.

The importance attached to unity and regularity of planning and to the vista is shown in the grouping of the Fora in Rome, which are so placed that they are not only complete in themselves but are in architectural relation to those already built; moreover, in the great Fora of the Eternal City the important principle that public buildings must be well placed, if they are to have their full architectural value, is exemplified. Great care is taken to mask all irregularities—in the colonnaded streets of Palmyra, set axially with the temples at each end, any deviation from the straight line is overcome by a skilful adjustment of triumphal arches.

Delightful emphasis was given to the junction of cross roads, and an added importance to the axial lines by the placing of large pylons or four-way arches at the points of intersection. The Triumphal Arch to the Forum of Trajan, the Hexagonal Hall to the Temples of Baalbec, or the steps and mighty crescent forming the entrance to the Palace of

Augustus on the Palatine Hill, all show the same desire to create a magnificent first impression.

In the placing of civic ornament much may be learnt from the Romans. Their use of statuary placed on pedestals in the Fora in relation to the whole design, or on corbels attached to the columns, the lines of the drapery thus contrasting with the formal architecture, is far nobler than our haphazard methods of dealing with such objects at the present time.

The monumental character of Roman work is the result of a close adhesion to three great principles: (1) Symmetry; (2) the maintenance of the axial line, and (3) the establishment of some central feature and subordination of accessory parts. These principles, so well shown in their great Thermæ with their beautifully grouped halls, directly or indirectly must assert themselves in any successful city scheme.

In the hemicycle with its great possibilities, the Romans added the curve to the straight line of the Greeks to be fully developed in the Renaissance.

(c) Mediæval.

In all great periods of art a desire for symmetry and regularity is observable, at one time more pronounced than at another. In the Middle Ages, plans of towns, when laid out *de novo*, were regular and symmetrical whenever the nature of the site would permit. The majority of examples, however, have developed the irregular forms they take owing to determining lines of fortifications and a gradual unregulated growth; under these conditions then, they cannot have the value for study for a modern city, which should not be laid out to afford material for the water-color artist! It is possible to admire and love the marvellous effects of these old towns without wishing to reproduce them in the twentieth century. They are the products of a time when to do the right thing came naturally, and each man, with a great tradition behind him, unconsciously built so that his work took its place beautifully as a unit in the whole, and effects were obtained for which it would be absurd, under modern conditions, to strive.

Lessons, however, may be learned from mediæval work. The walls of fortification enclosing the old towns, and clearly defining them from the country around, show the value a definite boundary would be to our modern cities, instead of the straggling outskirts so often a disfigurement. The clustering of the town around some great towering church or cathedral, a dominating mass, like the Acropolis at Athens, gives a sense of unity to the whole; whilst countless examples show that perfect geometrical regularity on paper is not always necessary, for little deviations from the square are with difficulty measured by the eye. From the market place we can learn the value of the quiet, restful effects obtained by a judicious arrangement of street entrances, giving an unbroken frame of buildings, and with it that sense of seclusion so suitable for a square in a busy commercial centre (an effect which may be obtained without meandering streets but in a rectilineal system with streets entering "en bras de turbine"). Such an arcaded market place as that of Montpazier would make, in principle, an excellent model for our shopping centres; and we can learn something too for our residential quarters, where, removed from the centre of the city, the need of formality being less, a judicious variation in the building lines of the street gives a pleasing and welcome variety.

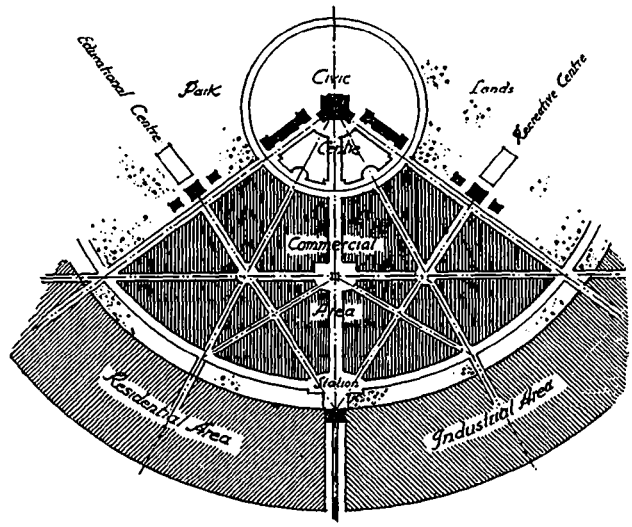


FIG. 3. RADIAL PLANNING: DIAGRAM OF A MODERN CITY BASED ON THE PLAN OF KARLSRUHE.

(d) Renaissance.

With the revival of Classic architecture in the fifteenth century in Italy, and with it earnest study of the great buildings of the Romans, appeared the revival of the "grand manner" in planning, and that fine sense of breadth and scale in architecture so closely associated with the name of ancient Rome. The regularity and symmetry of the buildings soon

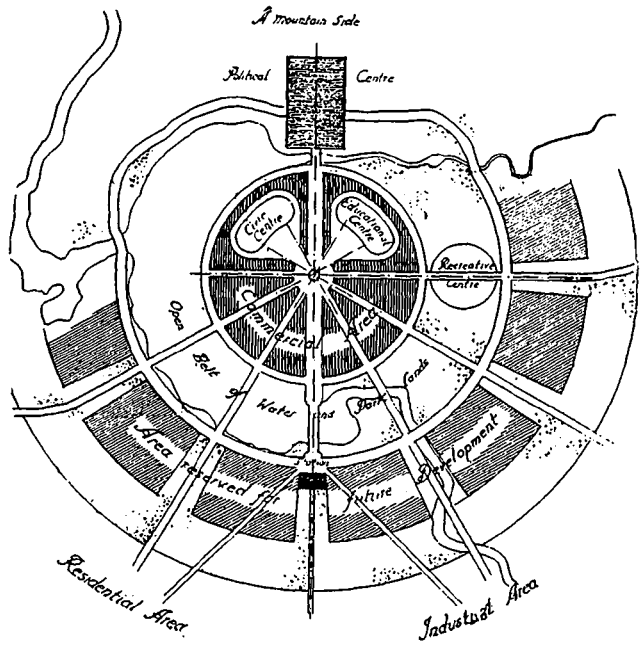


FIG. 4. A CAPITAL CITY: GOVERNMENT BUILDINGS DOMINATING THE WHOLE.

spread to gardens, streets, and "places" which were laid out at that time and in conjunction with them. The setting of buildings and arrangement of their sites and the practice of formal gardening developed a desire for larger fields to conquer, and plans of cities and towns were schemed showing a desire to consider the problem in the light of a complete harmonious whole. A masterly grasp of the possibilities, a largeness of conception, and a power and a courage to handle civic design on a scale such as never before had been attempted now becomes apparent.

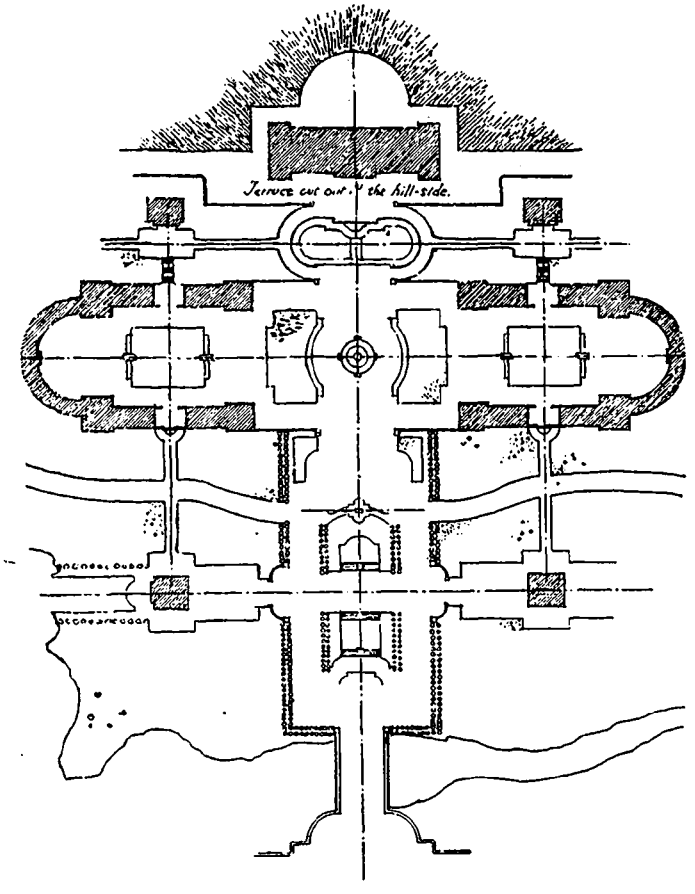


FIG. 5. GROUPING OF GOVERNMENT BUILDINGS ON A HILL-SIDE.

The desire to shed the glory of important buildings upon their surroundings by placing them on some prominent point to which many roads converge, large open spaces or forecourts to buildings to enable their designs to be properly appreciated, magnificent vistas, a predominance of geometrical forms, and a linking up of many features into one connected design are all characteristics to be seen in the plan of any Renaissance town.

The Italian villas of the sixteenth and seventeenth centuries (largely the works of men who were painters before architects!) are excellent examples of the "grand manner" in architecture. A realization of the possibilities of the site, of the value of dignified approaches, of noble terracing, of vistas, of formally laid out gardens in excellent relation to the buildings, these and many other qualities which defy analysis are to be seen in such designs as the Sacchetti (Fig. 1), Madama, Aldobrandini, or the D'Este.

But in other countries besides Italy, countries to which the Renaissance spread, there also may be studied noble works. In France, perhaps more than anywhere else, can be seen the finest examples of the harmonious design of buildings and sites—of grounds treated as an essential part of the architecture. The sites usually flat, prolonged vistas (Fig. 7), large open spaces and beautiful broad effects of water, grass, and foliage, are points in which the French excelled. No other people have shown such a magnificent sense of breadth and space as may be seen in such creations as the gardens of Chantilly or Versailles. In the Renaissance, for the first time, we see the city planned as an artistic whole. A fine conception precedes its slower realization, and every detail is subordinated to the one central idea. Would that we again could pick up the threads of a lost tradition!

III. Influences of To-day.

All good art must live—it must reflect the age we live in. Full recognition must be given to all the practical considerations which affect civic art, for town planning is not an art plus a science, but demands that all modern utilitarian requirements and scientific problems be accepted and expressed in beautiful forms. Our retrospective glance at the cities of the past shows the results of forces entirely different from those at work to-day, and the habits and customs of the people who inhabited them are clearly written in their plans. It follows, then, that we must consider every tendency of modern life, science, and invention which will directly or indirectly affect our design and reflect the twentieth century.

Determining factors will be found in the railway and transit systems in general. The speed of traffic almost as much as its bulk will regulate the width of roads, and faster transit facilities will be desirable in the future. Motor and other rapid modes of locomotion necessitate long, straight streets, the avoidance of awkward turns, and the provision of open points of intersection together with means of easy supervision and direction. Modern city life with its stress, demands that office quarters be as free as possible from traffic; and, as shopping streets and centres must always entail blockage in the traffic, for such quarters as these duplicated streets may be the only solution.

Class distinction, "fashionable quarters," or socialistic tendencies will all leave their mark on plans. Economic problems, the cost of living, the desire of the workman to have easy or cheap access to his work, the tendency to avoid domestic problems and live in flats and hotels, and many other such present-day influences will have a marked effect on the city, and, properly grasped, will help in the production of a living plan suited to the needs of the population of to-day and to-morrow.

Scientific progress must leave its mark. The ten-

dency to concentrate in the production of power at large central stations will affect the aspect of the city, and newer methods of transit both by land and air must be considered. May it not be something of a fetish that in the days of such undertakings as the Suez and Panama Canals we should let our designs be regulated by every little undulation of the site, perhaps to the detriment of a broad, straightforward scheme?

Attainment of the Ideal.

The General Town Plan.

(a) The Individuality of the Town.

To portray the town's individuality and to express its character must be the first consideration and constant endeavor of the designer. He must consider the life of its people, the use of the city, be it collegiate, legislative, or commercial, the materials to be used, the vegetation that will thrive, and, greatest of all powers to give individuality, the configuration of the site, considerations which, by a clear acknowledgment and expression in his design, will give to the city its distinctive character and clearly reflect the life and history of its dwellers.

(b) The Site in General.

A glance at those cities which stand out pre-eminently as the most beautiful in the world will prove that, in each instance, the nature of the site has entirely governed the general lay-out, and will show how natural features have been turned to the greatest advantage; but whereas in the cities of the past military considerations have usually governed the selection of the site, we, more or less within limits, may select one for its æsthetic possibilities. Full knowledge of the site must precede the formation of any scheme for its covering—no greater mistake can be made than to approach the problem with some preconceived idea of a type of plan "formal" or "informal" which the designer wishes to produce. Originality, it should be remembered, will arise from a close adherence to the demands of the site.

The mountain, valley, plain, or river will all determine the form of plan (Fig. 4), whilst every feature of the site, woods, ponds, or clumps of trees must be taken into consideration and turned to good effect. The lake will suggest a water frontage and the public buildings placed in conjunction with it (Fig. 8). The river, perhaps, will have the strongest influence in the development of the city site, and the possibilities of great sweeping curves to its embankments, or the splendid position for public buildings, lining each side, should not be overlooked. The bridges should be carefully placed, since they will govern the setting out of the streets on each side, and care must be taken in the placing of the industrial quarters that they may not in time unduly spoil the river-side development. If the river runs at the foot of some precipitous hill, as does the Wear at Durham, a magnificent site is afforded for the building, ecclesiastical or civic, which is to dominate the whole city plan.

The hillside or summit will afford the most commanding position for the chief public buildings of the city. If the former, its dark covering of trees and foliage will demand a careful silhouette to the buildings grouped upon its slopes, and if these be of a public nature the effect must not be spoilt by allowing the town to develop behind them. If the hill or mountain side be steep many opportunities may occur for noble terracing and sheer cliffs of wall. The residential quarter will naturally require high ground, which should not, however, compete with the spot selected for the civic centre.

Not only will the nature of the site itself determine the general lines of the design, but also prominent features of the surrounding country. Views of distant mountains, hills, or water, or any beautiful prospect, should be linked up with the city. Avenues, open spaces, and the forecourts to important buildings must be schemed to obtain a view of the distant country, the formal city buildings forming a foil and setting to the landscape.

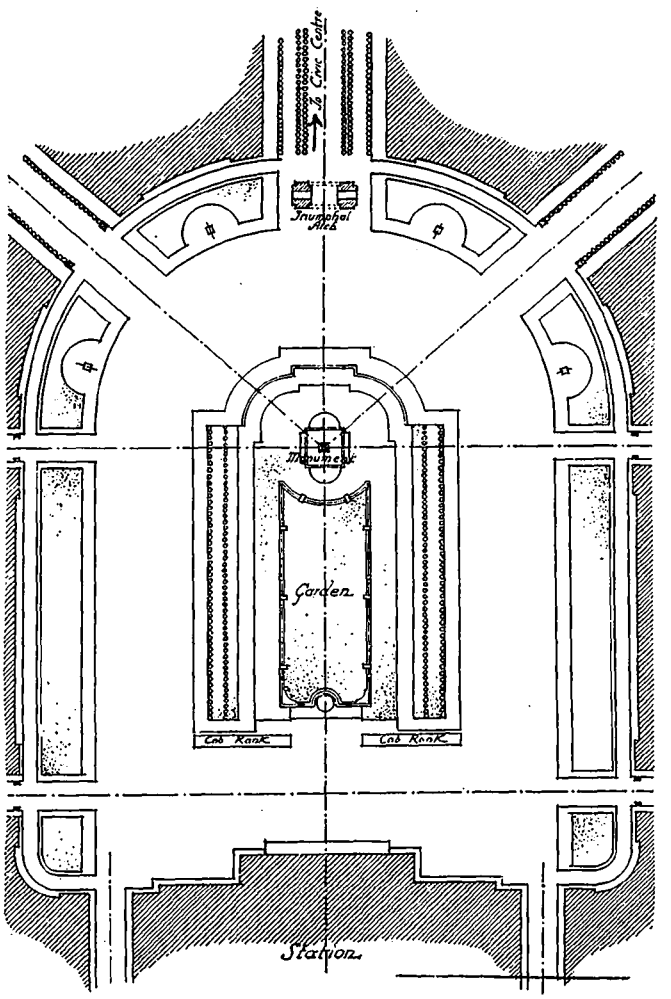


FIG 6. A STATION PLACE, RECESSED FROM LINES OF TRAFFIC AND SURROUNDED BY HOTELS.

Every part of the site having been given the fullest

consideration, and all its possibilities grasped, the planner, always thinking in three dimensions, may outline his scheme.

(c) The Sub-division of the Site.

Practical considerations such as prevailing winds, rainfall, geological formation, etc., accounted for, we may begin to dispose of the various quarters which will go to make up the city plan.

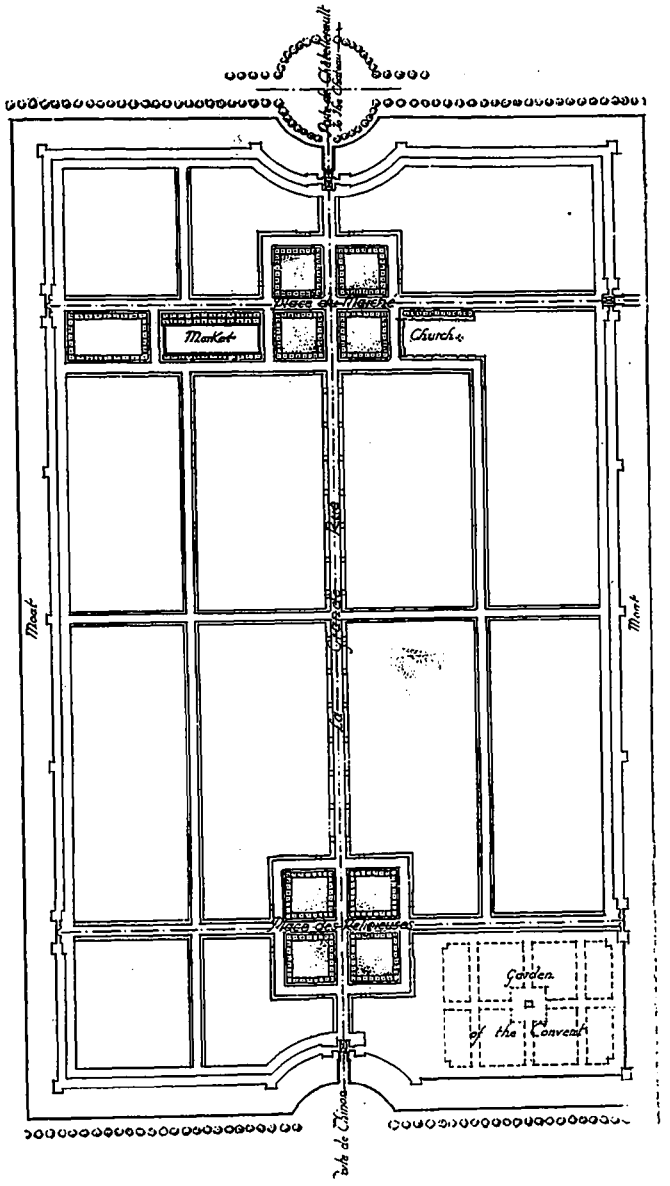


FIG. 7. RICHELIEU, AS LAID OUT BY J. AND P. LEMERCIER.

The city may be sub-divided into three areas: (1) The Civic and Commercial, conveniently considered together; (2) the Residential; and (3) the Industrial. Reasons of convenience and health may dictate that these areas must, within certain limits, be separately placed and grouped and determine the relative positions they should occupy. Our architectural standpoint demands more—it demands that, though separated (and each requiring a different treatment and some effect of centralization in itself), they shall retain their positions as units in a complete whole, and be in relation to one another whether viewed from the mountain-top or public square. The following are ways by which this may be obtained: (1) The subordination of the minor parts and accentuation of the chief, giving a greater vigor and sense of completeness to the whole. (2) Main radial avenues between the heart of the city and its outskirts (Fig. 4), which should, at their termination both in the centre and in the area they serve, have some prominent and well-fixed focal point, to give a sense of connection to city and suburb. (3) Ring roads maintaining their width and character throughout. (4) Great formal sweeps of dwellings in the residential quarters, perhaps terraced high on some hill like the seats of a Greek theatre, and having the chords of their curves in definite relation to the centre, whilst, whenever possible, straight streets, however short, may be planned with their axes radiating from the important buildings in the heart of the town. (5) Scale obtained by the adoption of a similar unit for both town and outskirts. There is no reason for the level lines of classical cornices in the civic centre to give way entirely to spires and mediæval gables in the environs.

Of great importance are the problems of the disconnection of the various areas, and the transition from one quarter and class of building to another. No definite rules can be laid down since each site will require a different solution. By treating the main avenues connecting the areas for part of their length as park-ways, not only would the park system be continued from the open outskirts to the more closely built upon commercial part, but the transition from one class of building to another would become less noticeable. More effective, perhaps, would be ring avenues of ample width connecting up a series of open spaces.

Where the residential area is in close contact with the commercial, the office buildings should not give way immediately to the detached villa standing in its own grounds. Flats or tenements would form a more agreeable transition from the city block to the suburban dwellings—yet, in any attempt to attain pleasing transition from one area to another, great care must be taken not to give too disconnected an appearance to the whole.

Assuming the positions to the various areas already allocated, each individual one may be considered. Something of the principles governing the lay-out of the whole town will apply to each area, each must have some centre of greater or less importance, whilst various other points of emphasis should be provided round which the plan may form. Proportion of solid and void, of masses of buildings and masses of foliage carefully considered, will greatly assist in the ultimate effect of each quarter and of the whole.

1. The Civic and Commercial Area.—Something of a climax is required in the whole city design, and this "climax," if the city be a political one, will be formed by the Government buildings (Fig. 4); if collegiate, perhaps by the university; usually it will

be formed by the civic centre of the city itself (Fig. 3). The preliminary consideration of the site will have shown the most suitable position for this centre; an elevated spot, the mountain side, or water frontage, or a combination of these, being selected as the most important and prominent place; round it the civic and commercial area will be formed.

Dignity should be the key-note in the lay-out of this quarter, and a greater degree of formality obtain here than in any other part. A more spacious distribution of the various parts, of roads, buildings, and open places, and a greater breadth of treatment, not only in the design of the individual buildings, but in the proportions of streets and forecourts, should pervade; and, in general, architectural magnificence will demand a more generous treatment than mere utility requires. From this quarter the greater number of avenues will radiate; its general shape and lay-out, then, should be so devised that its more prominent buildings may be seen from as many points as possible and cast their radiance over the greatest area practicable. It will be the organic centre of the whole, and should be so disposed as to leave no doubt in the mind of the visitor, arriving by rail, road, or water, as to which is the heart of the city. If circumstances dictate that the civic quarter be placed at one end, then, in its relation to the other quarters, it should occupy some such position as does the Schloss and surrounding buildings to Karlsruhe (Fig. 3).

Ample space should be reserved for the civic buildings, which, with their surroundings, should embody the pride of the citizens, for such centres as those of education, amusement, and shopping, and for the general commercial and office quarters; and if the various important buildings of the different centres be linked together by broad avenues, the value of each and of the total effect will be greatly enhanced.

2. The Residential Quarter.—A more homely, restful character will be proper to this quarter, and a much greater use of foliage, together with the smaller and more disconnected type of building, will prevent this part, on however much higher ground, competing with the civic centre. In this, as in other areas, a centre point to the design is desirable. Round this subsidiary centre, which should be spaciously laid out in conjunction with the great avenues coming from the city, churches, branch libraries, shops, etc., will be built, and from it avenues should radiate to the various parts of the area. Other points of interest in the plan may be formed at the junction of main roads, where groups of shops, a church, or a school may be placed to give further emphasis to the plan, whilst recreation grounds will, in the poorer quarters, similarly provide points of interest. The main avenues should be laid out in a simple and direct manner; they may be of great width and planned with centre plots of grass and trees, forming promenades. Variety may be obtained by broad terracing, by plateaux, and by great formal curves, having, when possible, relation to the centre of the area or the chief civic centre itself.

Great care will be required in plotting the streets when the site is hilly. A street carried straight up an incline will, if the houses be built fronting it, result in broken, restless masses. It would be better in such cases to make the streets run on level lines on the hill-side, giving the long, unbroken roof-lines so suitable to such a quarter. If the road to ascend the hill winds to right and to left, delightful effects may be obtained if direct access by foot be given by long, easy flights of steps, always providing some spot of interest at the summit.

Endless rows of small houses in the poorer quarters must be avoided. Houses should show some method of concentration and be grouped together in the streets or round open squares or spaces, as any appearance of dotting the buildings separately about the site, each with its little garden, would be ruinous to the effect as a whole.

Street junctions offer interesting problems in design; the houses must be so spaced and designed as to form interesting vistas to the incoming streets and to prevent any unpleasant effects from unconsidered "side elevations."

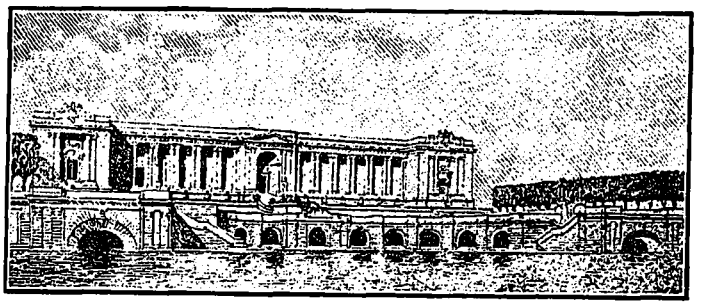


FIG. 8. THE WATER FRONTAGE TO A PUBLIC BUILDING.

3. The Industrial Quarter.—The treatment of development cannot be easily foreseen. It will, in its general disposition, be governed by railway lines this quarter will be the most difficult, for its future and sidings, rivers or canals. It follows, then, that in the careful placing of railways and waterways in the first place much can be done to ensure some ordered growth. This area, just as any other, should express its character in its streets, its places, and its buildings. Civic ornament will find no place here. Large and important buildings, such as customs houses, goods stations, or power houses might provide point of emphasis, and here, as elsewhere, a good street system will count for much. Architectural magnificence must, in the avenues, give way to the requirements of heavy traffic, and the buildings lining them should be of strong and simple character. Open spaces, quiet and restful in appearance, will be needed here more than anywhere else, and such should be placed away from the busiest thoroughfares. Offices and warehouses should be grouped in an orderly manner, and when large yards are required for loading and unloading goods, these might

face the road with the buildings grouped round the sides, the breaks thus formed giving variety to the lines of the streets.

(d) The Approaches.

The problem of the first impression is one which the architect is constantly called upon to solve in the planning of his buildings, recognizing how much it will count in the beholder's appreciation of his whole design. How much more important, then, must be the approach to the city and the impression given by it! It may be by water, rail, or road. Whatever the means, the first view should be as beautiful and impressive as it is possible to be, and should embrace the chief buildings and points of attraction which the city may possess (Figs. 3 and 4).

The Approach by Water.—In our country this may be from the sea or river. Water in relation to a town has great possibilities, and in the approach from the sea, the harbor should be brought into direct relation to the heart of the town, presenting the most imposing buildings, and the docks and warehouses treated in a more dignified and orderly fashion than usually obtains. Many cities may possess a river approach. Here again, if possible, a vista should be opened out from the docks to the civic centre, and the river-side given as attractive an appearance as possible. If the sides of the river are embanked the buildings should not be placed too closely to the river-side, but set some way back to give full value to the wide sweeps of river-side road, though, at intervals, some building, a customs house or dock office, may with great effect rise sheer from the water's edge.

The Approach by Rail.—The station, a noble building, the entrance portal to the modern city, should be placed in proximity to the best quarter, and from it should radiate avenues to the various centres, terminating in vistas of some important buildings (Fig. 3). Where possible, the chief avenue should lead directly, on the axis of the station, to the town's civic centre, framed in by a monumental arch or imposing pylons. In front of the station there should be a large open space, and the building itself must be somewhat recessed from the point of the traffic's greatest density. This open space should be laid out in a generous fashion, and planted with grass and foliage (Fig. 6). Something of the city's character might here be expressed, by the chief industries of the place forming the subject for sculptural ornament, and, recessed from the whirl of the traffic, a statue of some prominent citizen who may have brought fame to the town might well be placed. Ample provision for cab ranks and car shelters must be made so that they detract as little as possible from the general effect. The passage of the railway lines through the city must be devised to present as pleasant a picture as possible to the traveller, and, when they must necessarily run through districts fully built upon, it would be wise to plant the sides with trees, and in every case some reasonable space should be left between the rails and buildings.

The Approach by Road.—All main avenues will be designed to open out a vista of some important building which will add interest to the approach by road (Fig. 4). Main roads connecting the city with the neighboring towns should be wide and imposing, great piers or pylons should be built on the boundary line, which could serve the purpose of distance-indicating posts, and on the outside of these a less formal treatment of trees, hedges, and footpaths will all serve to mark more distinctly the transition from country to town.

The whole city should be designed to present a beautiful mass and outline as seen from afar, and some attempt should be made to define its boundaries, such definition not necessarily being incompatible with the provision for expansion. Wide ring avenues, belts of park land, or fields might help to attain this, whilst streets laid out in the outskirts should be so designed and the buildings so placed as to give a closed-in appearance to their outer ends—gable ends, curbstones, and macadam too often rub shoulders with grass and trees. Beyond the boundaries, too, straggling houses must be banned; inconvenient as they are to schemes of drainage and lighting, they are still more objectionable as eyesores.

(e) The Main Avenues.

From the architectural standpoint these are of twofold value: (1) As determining the development of the scheme, and (2) for their intrinsic beauty.

1. The main traffic lines will always be the chief factors in regulating the growth and expansion of the city, forming as they do the backbone or structure of the city plan. They must then, within such latitude as practical considerations and the configuration of the site allow, be laid out to give a broad, simple, and dignified scheme, helping to give a sense of connectedness and unity to the various parts and areas (Fig. 4), and to accentuate the physical centre of the plan. These main avenues will naturally by their connection with the outlying main roads help to link up country and town, an object, however, more effectively obtained by laying out streets so that they have as vistas some distant mountain, hill, or other beautiful prospect, linking up Nature and Art—whilst the formal lines of architecture will give a delightful setting to the view.

2. The avenues should be broad, not alone for traffic facilities, but as befitting the great scale on which an important town should be built, and an air of stateliness may properly be given to them. Buildings forming vistas to these great avenues must be of such size as to provide satisfactory terminations and not be dwarfed by them. Care must be taken that the road levels be continuous, either flat or inclined, dips and curves being avoided as destroying the effects of the avenue itself and in many cases obscuring the terminal vista.

Formal planting of trees and shrubs will make

these avenues pleasant promenades as well as traffic routes, and fountains and monuments placed to form focal points to by-streets will give additional points of interest, helping to break up too lengthy a vista. Trees planted in the avenues must have definite proportion in height and width to the street and buildings, and when strips of turf are planted in conjunction with them in the centre or side the plots should be simple and unostentatious in design. By the use of trees, shrubs, and grass, by fountains and monuments, and with good proportion between the height of buildings and width of roadway and well-schemed vistas, interest in the avenue itself should be maintained.

Ring avenues with their constant change of direction and vista afford a delightful contrast to the straight street. At their intersection with the main avenues large open spaces are necessary; here triumphal arches and great pylons may be placed, and suitable sites contrived for important public buildings.

(f) Allocation of the Various Centres.

The position of the various areas—residential, commercial, and industrial—settled, and the approaches and traffic lines laid down, the next step will be to provide focal points and spots of emphasis giving the necessary architectural expression to the plan (Figs. 3 and 4). These points will be supplied by the various centres which practical as well as æsthetic considerations render desirable, civic centres, centres of education and recreation, of commerce and shopping. Such centres should be treated in a generous manner, indicative of the wealth and importance of the town, being formed as they will by its chief buildings, whilst in their treatment something of their function and relative importance in the life of the inhabitants should be expressed.

Centres may be formed in connection with park areas, in connection with water or in the heart of the city, when they may be grouped in some great, broad street or round some place or group of open squares; whatever the site they should be so treated as to add as much dignity as possible to the neighboring streets and "places." The total effect may be increased, and greater importance given to each individual centre, by a judicious linking up, one to the other, with spacious avenues, and in their relative positions in the whole plan a balance of effect is necessary.

1. The Civic Centre.—The point for this centre, which must be the chief and predominate over the whole city, was selected on the first consideration of the site, since to a certain extent it governed the setting out of the main avenues and the general disposition of the quarters, and in laying out the civic and commercial area it was so placed as to be seen from as many points as possible that all might feel it to be the "hub" of the city and city life. This centre will include such buildings as the town hall, law courts, public offices, etc., and round it offices, both public and private (such as legal) will naturally congregate, and provision for them in relation to the chief buildings must be made from the first, assisting as they will in the architectural treatment of the whole centre. The arrangement of the streets and open places in connection with it should be spacious, and they should be so placed and proportioned as to express something of the "pomp and splendor" of the town. This portion of the city will afford the best positions for public statuary.

2. Educational Centre.—This centre, including such buildings as museums, art galleries, libraries, and colleges, will, especially if it include a university, form one of the largest. If such be the case, a compromise must be effected here; museums and libraries must be near to the heart of the city, to the people, whilst a university will require a more secluded spot, and ample space for playing fields—even then it may be brought architecturally into touch with the remainder by opening out a vista of it from the square round which the museums, libraries, technical colleges, etc., are grouped. If it be brought actually into conjunction with the other buildings, the large open "campus" such as will then be necessitated will add greatly to the breadth and dignity of the whole and form a noble setting. The necessary residences might be linked together and form interesting features in the scheme. A quiet and dignified effect should be striven for, and an artistic lay-out, well-designed buildings, and good sculpture, happily combined, will have an educational value in themselves.

3. Recreative Centre.—This centre, the centre especially of sports and pastimes, offers endless opportunities. Stadia, playing fields, swimming ponds, and playgrounds can be arranged to form a magnificent composition of architecture and formal gardening on a large scale. Physical exercise, occupying as it does so much of our modern life, might be provided for more on such lines as those of ancient Rome, the baths of Titus, with their surroundings, forming a better model than the present-day park playgrounds, playing fields, and scattered baths. This centre will probably form part of the park system, the most healthy spot being naturally chosen, and an effort should be made to form such an architectural whole of buildings, grounds, and surroundings, that, whilst the body is being exercised, the educational influences of an artistic environment may be felt.

4. Shopping Centre.—Shops will naturally be formed along the most frequented routes, but the establishment of a market in one spot will lead to the congregation of shops around, and this might form the chief centre. At such spots as this, and wherever any considerable number of shops will be formed together, an attempt to obtain orderly and artistic grouping should be made, and whilst a sense of quiet and enclosure is desirable the whole must have some architectural expression and value in the plan. Too wide a spacing of the streets and "places" will defeat the object of the centre, but great effects might be obtained by the frequent use of colonnades and covered ways, such as those of the Rue de Rivoli,

and arcades linking street to street and place to place will in themselves afford excellent opportunities for architectural treatment.

5. Commercial Centres.—The stress of business and the bulk of the traffic will demand that here everything be spacious and reticent in design. Sculpture and ornament should be reserved for less distracting spots. This centre, for which Wren's city centre in his scheme for rebuilding London is an excellent model, will contain such a building as an exchange, round which other public or semi-public buildings, banks, and offices will be arranged. These must all be grouped in an orderly and architectural manner; a centre square, with the lofty office buildings surrounding it, offers great opportunities for a dignified treatment of an essentially twentieth-century problem.

6. Minor Centres.—These can be effectively devised for small towns and residential quarters, giving the architectural emphasis which may be there required. Small centres, such as of hospitals or theatres, massing together buildings devoted to the same purpose, will all help to give variety to the plan and break up any too large areas of regular streets and buildings.

(g) Parks.

The existing system of dotting about "natural parks" unrelated to one another is bad. The park system should at all times provide a sight of its glories; all parks must be so placed that they may help to adorn the city, and that their benefits may always be felt. The tendency therefore should be to provide a number of gardens and parks—not dotted about, but connected together into one big system by wide boulevards and strips of park-way linking up the open spaces and providing walks and drives about the town.

Land should be reserved for park-ways on the outskirts of the city, thus spreading the value of the system further afield. Such strips of park-way carried out on radial lines will give delightful effects by the contrast of building and cool green trees (Fig. 4), and greatly enhance the appearance of the city by creating interesting "voids" in the city's mass of buildings, giving a more open and dignified appearance and affording a pleasant setting to any building or buildings which may be placed in conjunction with them. Under such conditions they should be so planned that their value may be felt over as large an area as possible.

City parks will, perhaps, be placed to separate the commercial areas from the residential, or the resident from the industrial. The nearer to the heart of the city the park is, the more formal must be its character, though the principle to be observed in the lay-out of a park will, of course, depend upon its use. It may be primarily for children, or perhaps a means of education, containing a vivarium, aquarium, botanical or zoological gardens. It may, again, be used as a recreation ground with tennis, football, and other fields, when it will form part of the recreation centre; or perhaps it may be used for music or a parade, as the Bois de la Cambre or Hyde Park are used, though for such purposes as drives a wide ring avenue or boulevard would be much more effective. Parks, in addition to those suggested within the town and of a different type, may be required in large manufacturing districts when the country is far away and inaccessible to the poorer classes. These parks, large in size, should naturally contain as many beautiful features as possible, running streams, hills and dales, and have in addition good views of the surrounding country. No attempt must be made to make unpromising sites look naturally romantic, and, when Nature is not especially beautiful, for man to try to "design" her is false and impossible of attainment.

In designing the parks a sense of spaciousness and scale should be observed throughout, the general plan being laid out on simple broad lines, with quiet masses of foliage and unbroken stretches of grass. On no account must any attempt be made to bring little scraps of country into the town, and the best types to select as models for our parks would be such examples as Kensington Gardens, Hampton Court Gardens, or the Tuilleries. When there are no dominating architectural lines a sense of formality and an easily grasped geometrical lay-out become all the more necessary.

These parks will afford excellent situations for monuments and sculpture, to which foliage, perhaps planted in great hemicycles, will form a delightful background.

Road frontages to parks are often desirable, spreading their influence over a large area. The problem of the transition from the buildings and streets of the town to the park is an important one. A park laid out on simple formal lines will usually easily fall into place, but if some great avenue run directly up to the park gates, a satisfactory termination to it must be provided, and it would be wise to continue the avenue, in no way cut up, for a short distance into the park, to terminate in some feature such as a monument, which may also form a focal point to which the park avenues may converge. White stone terraces and balustrades, etc., will all help to "carry through" the architecture of the city into the park.

Vistas of groves, woods and parks should be planned for the open places and groups of public buildings, whereby both will gain by the contrast of Nature and Art and more dignified view-points will be obtained for the buildings.

(h) Streets in General.

The various areas and centres of the town's activity located, the large avenues and boulevards laid down, and the position of parks and approaches determined, the development of the city plan will be completed by the lines of the various streets. The disposition of these will have an important ultimate

effect on the plan and can do much to accentuate the ruling idea which has so far governed the design. The setting out should be simple and direct, and every line should have a purpose in, and definite relation to, the whole scheme.

Streets, where possible, should converge on to points of interest and show to best advantage the prominent buildings, an effect which streets radiating from some centre will give, providing a splendid series of vistas. Again, some streets in distant parts may be laid out in relation to the chief city centre itself, so giving greater unity to the plan. A "grid-iron" treatment of the whole city must be avoided, but efforts must be made in laying down the lines of the streets to form good building plots and to avoid sites difficult to deal with.

The gradient of the street will materially affect its appearance—a long street will appear less monotonous if on an incline than if perfectly level. Changes in section, longitudinally, of the roads must be carefully considered, they may cut off the view of the terminal vista and have a disagreeable effect; the levels of the roads also must be taken into account in the design of the buildings lining it to obtain a pleasant treatment of the sky-lines. The streets should always be of a width and character suitable to the district they serve. In the main traffic lines the amount of traffic will determine their size, but some definite proportion should be given to the minor streets, both as regards length to width, or width to the height of buildings. The former cannot be easily regulated, and for the latter no hard-and-fast rules can be laid down, but, generally speaking, it will be found that they should either be definitely wide—the width being not much less than twice the height of building—or, when necessary, definitely narrow, high buildings being less suited to broad streets than to those of restricted width. When no vista is provided it becomes all the more important that the street be well proportioned and of interest in itself.

Long straight streets may become monotonous, however imposing the vista; in such cases their too extended appearance may be broken by fountains or monuments, not so large as to spoil the value of the terminal vista, and placed to accentuate the intersection of another street, which intersection may also be widened out to increase the value of the break. The widening out of the minor streets at their junction with the main avenues will, by displacing a certain part of the perspective, create interesting breaks, an effect which may be also obtained by setsback in the building lines, giving sites for more important buildings, and an opportunity for the introduction of foliage.

Whilst straight streets offer the most dignified approaches to architectural monuments, opportunities should be taken to plan great formal curves, and crescents and quadrants may be with advantage used. Such arcs of circles will give right-angled junctions with streets planned on a radial system, an effect which may be also obtained by bending the two ends of the street to an obtuse angle with the centre. This type of street and the curves will, well treated, afford excellent "closed street pictures," effects which will be all the more valuable as a contrast to the wide, open avenues. When two points have to be joined together, if the line connecting them forms awkward angles with the places around these points. the ends may be curved with good effect, and thus afford regular junctions.

The junctions of streets require careful management; merely canting the angles of the buildings does not give a sufficiently dignified treatment. It would be better that they should be widened out, to form circuses or other shapes, and thus give better sites for buildings and opportunities for their successful treatment. Streets intersecting at various angles should be avoided, since they form sites difficult to treat satisfactorily, and careful proportioning between the width of streets and the buildings between them is always necessary. An attempt should be made to provide a satisfactory vista to each incoming street.

Care must be taken to avoid spoiling any feeling of breadth and continuity by bringing too many cross streets into another street, and when brought in they should be reasonably spaced apart to leave good building blocks between.

Footpaths should be broad and carefully proportioned to the width of road. They need not be paved for their full width; when trees are planted strips of grass or of gravel may be laid down, and in the former the tram-lines could be made to run.

In the heart of the city important centres with their public buildings may be linked together by wide streets giving a continuous impression of spaciousness and increasing greatly the value of each individual centre. Such streets might be primarily "show" streets, and be of great width, with gardens and statuary in their centre and amply planted with trees.

In the residential areas difficulties will arise in laying down the lines of streets, for these districts will usually be on hilly ground giving new problems in street plotting. Here lines that may appear to be formal on paper will not necessarily be so in reality. Long lines of buildings should not attempt to "climb the hill," but should be made to run on one level. and the effect of the sky-line considered. Broad terracing would here be an effective solution.

In the width of streets in residential parts a greater latitude will be allowable. Streets which are not thoroughfares, but serve only groups of houses, need not be wider than will allow two vehicles to pass, though the distance apart of the houses will be much greater. Gardens to houses which face important roads must be treated by the town-planner in a *continuous* and broad and simple manner, making the strips of garden form part of the roadway in effect. the only sub-division being a stone curb, low wall or hedge.

(i) Open Spaces.

Open spaces are desiderata in every plan, and

may vary in size from the vast round point or square in the heart of the town to the small enclosed place recessed from the busy street. There are two ideals in the designing of open spaces, each having its proper place. The object of one is to cast its radiance on the adjacent streets, while that of the other is to form a sense of enclosure, becoming in its nature something of an open-air room. A combination of both these ideals may at times be made, and it should be remembered that open spaces, linked together by broad avenues and well planted with trees, will form valuable and effective park systems. Open spaces which are complete in themselves and not connected up with strips of park-way can, both "open" and "enclosed," be of various shapes. Squares, oblongs, ovals, circles and ellipses, hexagons and octagons, may all be effectively used, many of these shapes giving excellent effects of light and shade on the buildings which surround them.

Good proportion and complete harmony between the open spaces and the buildings around them are essential. One of the objects of the open space being to show to advantage the buildings in relation to which it is planned, great care must be taken that it be not so large as to dwarf them, nor so small as to prevent them being properly seen. Though no definite rules can be laid down, it will be generally found that a long building will require a space longer than deep, whilst the narrow lofty building will require the reverse. Care should also be taken in the method of running streets into the "place" to preserve the regular lines of the buildings surrounding it, and important buildings should be so placed as to form interesting vistas to such streets. Uniformity in the skyline is desirable, and in places of circular or elliptical form, attempts should be made to preserve the great sweeps of cornice and roof.

Large open spaces will be much used as traffic centres, and as such should not be placed in direct relation to any public buildings. They must be big enough to receive effectively the great avenues, and to preserve regularly the line of buildings round. The large round point will, when used as a "place" with traffic circulating round, and not crossing the open space, afford an excellent opportunity for some large central monument, which, with avenues entering obliquely, must be of such a form as to present a regular face to all points.

When open spaces have buildings occupying the sides only, some architectural frame to the angles, formed by trees or by columns, will be necessary to prevent any feeling of weakness at such points. Sometimes it may be necessary to group several open spaces round a building when owing to its location plenty of open ground is required, which must not, however, dwarf the building; then by some subdivision a proper setting to it on all sides may be obtained.

The value of the enclosed space should not be overlooked. The sense of enclosure may be obtained by a judicious arrangement of the incoming streets, by effectively closing the vistas of all openings out of it, by linking up the buildings with colonnades, trees, or arches, or the lines of the buildings themselves may be strong enough to carry the eye across an intervening street. Some methods of enclosing the space may be architecturally of great value, as, for instance, the use of hemicycles as at Nancy, and the Roman Fora with their magnificent colonnades are excellent examples of the happy treatment of similar problems.

When the centre of the place is laid out as a garden, well-designed piers and railings, preferably of stone, should be used. Thin cast or wrought iron fencing is ineffective in scale.

(k) Bridges.

In the well-laid-out town railway bridges within the city will be avoided, and the only bridges required will be those crossing some river or deep ravine, or, with streets at different levels, viaducts offering interesting problems in design. It should be borne in mind that the bridge must be satisfactory not only as seen from the top, when its proportion and vistas will be of great account, but as seen from beneath, when the proportion of its arches, its general design and connection with the embankment are the chief considerations. Naturally many lines of traffic will converge on to the approaches; these, then, may be made of great size, and possibly would be best in the form of large circuses, giving greater dignity to the bridge. The scale of the structure and its approaches must be very carefully considered in relation to the surrounding buildings—in all cases they will necessarily be so diverse that it will be advisable completely to disconnect them.

The ramps to bridges should make agreeable composition of line both with the bridge and embankment. The architectural forms which may be used to decorate the open place in front of the bridge should also have some definite connection with the embankment, welding by firm lines the river-side and open space together. Flights of steps, triumphal arches, colonnades, and trees may be used for the purpose, connecting the embankment with the bridge and giving greater importance to the approach.

Monumental bridges may be adorned with colonnades, whilst the piers will afford excellent opportunities for the introduction of sculptural decoration, and their approaches may be enhanced by triumphal arches, pylons, and great curved colonnades.

Long bridges with strongly marked architectural lines and broad formal surroundings should have no camber if it can be avoided.

When iron bridges are necessary the iron should be used in the simple straightforward manner expressive of construction in that material, and to bring the bridge into harmony with its surroundings stone abutments, pylons, and balustrades to the approach should be used, as so well exemplified in the Pont Alexandre III. at Paris.

(l) Grouping of Buildings.

The grouping of buildings is of the utmost importance in giving greater emphasis to the chief points in the plan, and, more effectively than can be done by a single building, however large, in making an impression upon the spectator (as it should be the designer's constant effort to do) of the bigness of scale of the city and the greatness of the civic life which the buildings express.

Public buildings must always be placed where they will be seen to best advantage and confer the greatest dignity upon the whole design. They may be grouped in a wide street, when their projections and general treatment should be modified to suit the points of view obtainable. They may be placed at the end of a long avenue, when care must be taken to proportion effectively to the latter the forecourts and open space in front, and the design itself must be composed to tell at a distance (Fig. 5). They may be built on an eminence, when a crypto porticus, great embankment walls, terraces, carriage-ways, flights of steps and buildings placed at a lower level to throw back the central mass, will all be conducive to a great monumental effect. They may be placed in conjunction with an open space or spaces, and then must be so grouped as to be well seen from the various avenues which may be connected with them; or again, they may rise from the water's edge, when the treatment of water and architecture offers endless opportunities (Fig. 8). A continuity of effect may be obtained by linking up the several groups of public buildings by wide avenues or strips of park-way.

The scale of the buildings must always be adjusted to the distance from which they will be usually seen, and should be suited to the size of the town which they adorn.

Buildings placed in architectural relation to one another may be all in line, some may be recessed or advanced from the general front or placed at right angles, or they may be grouped round a forecourt, or all these methods may be combined. When it is desired to preserve a vista of a building some distance away the grouping may take the form so effectively devised by Wren at Greenwich, a treatment which might also be adopted when an opportunity occurred in the streets of the town. When one building is placed behind another, it should be simple and severe in its lines as a foil to the more richly treated building in front.

In grouping, some principal units should be repeated through all the designs, thus obtaining unity of effect; and small subsidiary buildings must be so treated and placed that they may not be hindrances to the preservation of the general scale, a matter of some importance. A concentration of interest is desirable, and this, when produced by larger masses and deep shadows, will materially increase the value of the vista (Fig. 7).

The buildings may be linked together by arcades, colonnades (not timidly used, but used as Bramante would have done at the Vatican!), trees, terrace walls, and steps, whilst police boxes, monuments, statuary, and flights of steps well placed will help to link up the buildings with their surroundings and to create a greater total impression. All lines of grass, steps, terrace walls, and trees or shrubs should be so laid down as to give good composition of line with the buildings and their details.

An endeavor should be made to raise the buildings, when on the flat, above the general level. When the approaching street rises it should be made of great width, and the centre part may be sunk to form a series of flat terraces, connected by steps, the broad lines of which will greatly help in the attainment of a monumental effect.

(m) Buildings in General.

Modern conditions of city life and methods of transit condemn the irregular streets and junctions; on all hands formality is required, and this formality must be carried through to the buildings, long level lines of cornice and string best suiting the straight street and formal curve.

The planner of the town, unhappily, will not supervise its execution. He must not calculate, therefore, in his disposition of the several parts, that one building by a greater projection or a greater height, or by the addition of a tower, porch, or gable required to form a pleasing termination to some vista, will be erected when the time comes for his plan to be completely carried out. Such is impossible. All points of emphasis therefore desired in the buildings must be located at the centre or angle of a façade, or any other point which would naturally receive attention at the hands of its future designer.

Some system of massing buildings together should be adopted, avoiding a multitude of little straggling units, especially in the residential quarters, where it would be better to group several houses together and throw the little bits of garden into one large open space. Similarly six or seven storied flats and hotels could be grouped together round some open space, well laid out, the sum of all the unbuilt-on areas belonging to each.

Scale should be maintained in the buildings of each quarter, and their heights might be regulated in different well-marked zones. An attempt also should be made to obtain a certain uniformity of color and bulk in buildings on a given area. Absolute symmetry is not so essential as a balance of skyline, and it should be remembered how roof-lines affect the appearance of the city as seen from without. Long, level lines will generally be found to suit a hilly site, whilst vertical lines will be more effective on the plain.

The character of buildings should be expressed in their elevations, certain areas expressing their purpose in the design of the edifices—a solidity and plainness will characterize those of the industrial quarter; quiet, restful lines and a homely effect those of the residential; whilst a greater richness and wealth of

ornament, together with an appearance of greater dignity, will be the note for the buildings of the civic centre.

Buildings should be designed to suit the positions from which they are likely to be most seen—breaks and projections being avoided when it is impossible for the spectator to get far enough back to appreciate them properly, and the effect of the sun on the buildings according to their position should be carefully considered.

In the long city thoroughfare a judicious break might be formed by a set-back in the building line which may extend to the ground and be filled with trees, or to the first floor only, leaving a roof garden, a pleasant spot of color in the street. Similarly in the residential area long rows of buildings exactly alike should be avoided, and houses occasionally set back or brought forward from the general building line or gathered together into groups of definite form will give a welcome variety.

An effort should be made (in spite of our lack of tradition) to give some architectural character to the city, a character such as the dome gives to Byzantium, column and pediment to a Greek city, or the spire and gable to a mediæval town. Even under present conditions the establishment of a Minister of Fine Art might do much to preserve a more uniform and higher standard of design in the buildings of our towns.

II. The Town's Ornamentation.

(a) Trees, Shrubs, and Gardens.

Of all methods of adorning our towns the use of greenery is naturally one of the most attractive, and every town plan must provide amply for trees, shrubs and gardens. These must not be thoughtlessly dotted about, but subordinated to the architecture and used to assist in the general city design. No attempt must be made to make the work of man imitate that of nature, and trees and gardens used in our cities must partake of some of the city's order and formality. The introduction of trees, shrubs, and grass may be considered under the following heads: (1) Trees in Avenues and Open Places; (2) Shrubs, Flowers, and Gardens; (3) Plots of Grass; (4) Treillage.

1. Trees in Avenues and Open Places.—Trees, as spots of color contrasting with the buildings of the city, add much to its beauty. They must not be scattered about, but will be used to best advantage when planted in some open space or forecourt or in the long lines of the street. A building of strong classic lines may gain in appearance by the contrast of a free and informal treatment of greenery in front, and so with squares which are surrounded by buildings simple in outline, as may be seen in many London examples; but care must then be exercised in the disposition of the larger trees that they do not by their bulk dwarf the buildings and prevent the square being seen as one complete and architectural scheme. In avenues less than seventy feet wide trees should not be planted in the centre of the roadway, but only at the sides and openly spaced. In wider avenues the trees may be planted in the centre in one or two lines, and may be paired or used in rows of four, giving delightful shaded walks beneath. They must always be proportioned in their height and bulk to the buildings on either side. Variety can be obtained by using different kinds in the various squares, but care must then be taken to avoid anything in the nature of specimen planting. Trees may often be planted to frame-in some distant view; and long avenues of trees with some interesting terminal vista, such as in the Luxembourg Gardens, should find a place in every city plan (Fig. 2). Trees may be effectively used to link building to building and complete some great architectural scheme.

2. Shrubs, Flowers, and Gardens in Open Places.—Shrubs, since smaller in size, may be planted in greater freedom. In open spaces they may be used with advantage to accentuate the angles of the gardens there laid out, or, again, clipped, used as a border and in connection with statuary to which they form an excellent background. Shrubs in boxes should be freely used in conjunction with buildings and monuments, and flanking the steps of the former they will give an added dignity. If they are to be disposed regularly as a border to open spaces, and to accentuate angles or cross-paths, excellent models will be found in the Tuileries and Luxembourg Gardens. When put on parts which are paved and too small to permit of earth beds, they are of great value in "carrying through the green." Large shrubs in boxes, lining an avenue to a building, will, by the contrast of their mass and shape, give something of the effect of an avenue of obelisks before an Egyptian temple.

Parterres may be laid out in the open spaces, where masses of one kind of flower only should generally be used and not divided patches of different colors; for the shape of their beds, simple and interesting geometrical figures will always be best. In their general lines they must contribute to the total effect of the surroundings, and a fussy and restless appearance be avoided.

3. Plots of Grass.—Plots of grass will naturally be chiefly placed in the open squares and forecourts of public buildings, long wide stretches of grass unbroken by shrubs or flowers giving a splendid sense of breadth and repose. Intersecting paths should form good shapes to the plots, and an edging of flowers or shrubs will help more clearly to demarcate their shapes. Proportion between the paths and grass must carefully be observed, the bulk of grass (unless merely surrounding a statue) must predominate: the Schloss Garten, Vienna, is an example of the ill effects resulting from a neglect of this rule. Grass will be most effective in avenues when it is flanked on each side by shrubs or trees, and will help to take away from the hard dusty look of too broad an expanse of paving and roadway.

4. Treillage.—As a general rule the light appearance of treillage will exclude it from any position near to the large public buildings, and it will be best reserved for parks and open spaces, where it may be used with great advantage in connection with such utilitarian structures as conveniences, shelters, etc. As a background to a garden, in its general lines treillage should take some architectural form, and with it many interesting little alcoves and recesses may be formed.

(b) Water.

In addition to the river, lake, or stream, which the site may possess, the possibilities of sheets of artificial water or of playing-fountains should not be overlooked. These may be introduced into all parts of the city, the calm and repose suggested by water being intensified when contrasted with the roar of traffic.

Small streams or rivers passing through the city site, and of themselves too small to be in scale with their surroundings, might well be converted into water canals broad and formal in treatment, their banks affording excellent opportunities for the laying out of strips of pleasure gardens. When such streams or brooks are tributaries of rivers and their banks likely to be used for manufacturing purposes, Wren's scheme for the Fleet Ditch should be borne in mind.

Water as used to decorate cities may be considered under four heads: (1) Large Sheets and Canals, (2) Ponds of Medium Size, (3) Small Ponds, and (4) Fountains.

1. Large Sheets and Canals.—Big sheets of water are well adapted to the plain, and when large canals or lakes are planned they should definitely become the dominating element in the scheme, any grass plots in size and number being subordinate. With the great formal shapes such as these sheets of water would take, it would be best to avoid a too formal cutting of the surrounding trees; the Château de Chantilly and Versailles with their broad masses of foliage are good examples of the most effective treatment. Vast expanses of water such as these, with their feeling of great breadth, are eminently suitable for the forecourts to palaces or large public buildings. As sculpture in the water would be out of scale and detract from their broad effect, small jets of water only should break the line; and any sculpture should be placed at the ends, where, with architectural details, it may become an integral part of the scheme. The edges of the lakes should be kept low and parapets be avoided; a wide stone curb and an edging of grass will appear more effective and less disturbing to the general sense of breadth.

2. Ponds of Medium Size.—As with plots of flowers or grass, the first essential is that ponds shall be of interesting shapes, and so disposed as to harmonize with their surroundings. In a scheme in which both grass plots and water ponds are used, the water ponds will naturally be placed where any special point of emphasis is required, as in the gardens of the Tuileries or the Luxembourg (Fig. 2). Variety can be obtained by sinking the ponds below the general level. Much scope will then be afforded in the treatment of the sides with architectural details and formal planting, and, here as elsewhere, terminal figures might be placed in such positions as to give interesting reflections from prominent view-points. Delightful effects may be obtained by planning long narrow strips of water, the sides closed in by tall trees and the ends terminating in a building or piece of sculpture.

When sheets of water are planned in relation to buildings they should be so placed, both as regards levels and position, as to obtain from suitable points some interesting reflection. The great possibilities of water in conjunction with architecture should not be overlooked: water emerging from the deep shadowy recesses of the sub-structure of a building or terrace, or the walls rising sheer out of some lake or stream, such as Du Cerceau pictured in his ideal Châteaux, give effects worth striving to obtain.

3. Small Ponds.—Small ponds of water are of value in giving emphasis to certain points in a park or open place, or at the intersection of avenues having in their centres strips of grass. Such water ponds, when occupying important positions, may often be most effectively combined with architectural features, such as bridges, balustrades, and fountains, as in the Villa Lanti, Bagnaia. The small ponds will also afford excellent opportunities for the exercise of the sculptor's art and for the combination of architectural details with water. Interesting geometrical shapes will be the most effective, and proportion between the surface of grass and of water must always be carefully considered; one or the other must predominate.

4. Fountains.—Fountains should not be indiscriminately placed about the town, but rather reserved to accentuate spots of interest, and should be placed either in connection with some building to which their suggestion of life and movement will form a striking contrast, or in some relation to a formal lay-out in the avenue, open space, or park. A small and interestingly shaped basin fed from a fountain in some dark recess round which rise the approaching steps to the entrance of a building, as may be seen in such examples as the Villa Sacchetti (Fig. 1) or the Capitol, Rome, would greatly increase the importance of the entrance when the principal floor is much above the level of the ground.

In the bringing of the water service to a town, particularly if it be closely surrounded by hills, a water château could be most effective, even if on such a small scale as may be seen at Bourges.

(c) Utilitarian Accessories.

Such features as car shelters and cab ranks have, in this country at least, proved themselves objectionable, not only on account of their bad resigns, but chiefly because of their lack of proper positions.

Structures of this nature should never be placed at the sides of streets; from the very first in a well-ordered design they should have a proper place assigned to them where they will not detract from, but rather add to, the effect of the avenue and open place. Given a proper position, they might be built of a more permanent material; wooden erections can hardly be in keeping with the dignity of the surroundings.

Lamp standards might more frequently be of stone when in conjunction with buildings. If of metal, both wrought and cast-iron, properly treated, will give satisfactory results; better designs might also be attempted for the standards of the electric-car systems—designs more expressive of the material of which they are made. Lamp standards should be placed to serve some definite purpose in the street or square or on the buildings they illuminate, when, by day and night, they might enhance the effect of the architecture or the lines of the open place; the brilliant effect obtained by a judicious arrangement of lights, following the lines of the plan, may be seen in the Place de la Concorde.

Street name-plates should be uniform in size, of good lettering, and placed at uniform levels. They would be better on lamp standards than on buildings, the varied features of which will naturally prevent uniformity of height always being obtained. These and many other utilitarian objects necessary to the city, if provided for in the first place, even when not objects of beauty, will at least not assert themselves to the detriment of the general effect.

(d) Civic Ornaments.

Civic ornament must be in scale and harmony with its surroundings. Having a definite part in the conception of the whole scheme, it should be used, like ornament on a building, to concentrate upon points of interest, and as in architecture the structural parts are left severely plain, so also civic ornament would be better reserved for less distracting spots than the busier thoroughfares and traffic places.

Civic ornament may be divided into four classes: (1) Triumphal Arches; (2) Monuments; (3) Statuary; (4) Architectural Details.

1. Triumphal Arches.—These should be sparingly used and only in connection with some great wide avenue or bridge; in the first case, either to mark in an imposing manner the beginning of some such avenue, or used at its termination in some open space. Arches may be used in connection with bridges either in the centre or at the ends. They may, especially when used with a small bridge, be of great size, completely dominating the whole and forming a magnificent entrance to a city, or, with larger bridges, they may be smaller in relation and linked by colonnades and other details to the bridge and open space in front. Triumphal arches should be unattached to any building which, of its nature, must be different in scale, and skill is required when using them in juxtaposition to prevent the scale of the latter being destroyed. The arches themselves must be so designed and of such dimensions as to prevent their looking insignificant in comparison with neighboring buildings or forming an ineffective terminal to a vista. They must be placed with discretion; the Marble Arch can hardly be regarded as an example happy in its position, serving as it does no definite purpose; and they should never be placed to form, seen obliquely, a terminal vista to any important avenue or street.

2. Monuments.—Every city will have in the course of time some citizen or incident the people may wish to honor or perpetuate the memory of by some large monument. Such may be largely architectural with sculpture of secondary importance, such as Wren's monument to the Fire or the monuments to the cities of France in the Place de la Concorde; then, as with all other civic details, situation is of primary importance. They may be set in the centre of some large open place, such as Napoleon's column in the Place Vendôme; and when in direct relation to a building or group of buildings they must accord in bulk, shape, and detail with their architectural surroundings. They may be placed to form terminal vistas to the avenues or within the parks, in both of which cases the immediate surroundings should be formal and architectural in treatment, a link between the monument and the trees and gardens around. The importance of the monument may be increased by the addition of colonnades, large flights of steps, water basins or statuary, when it may become the *raison d'être* of a surrounding open square.

3. Statuary.—The use of sculptural detail should not be to mark the absence of any architectural idea, but rather to accentuate one, and if sculpture be used with buildings, as it should, then to have its full value in any scheme it must be thought out from the very first in relation to the architecture it is to adorn. Statuary may be used most effectively in conjunction with buildings in such positions as flanking flights of steps, when its light and more fanciful touches will contrast well with the more formal building. Detached groups of sculpture completing the scheme of the building itself will have the value of linking the architecture with the open spaces and streets in front. The details of isolated groups of sculpture should always be designed to blend with the architectural character of the neighborhood, and when placed in conjunction with some building, the details should be considered with those of the building itself. "Realistic" statuary would be best reserved for parks and gardens away from the buildings, while monuments with much movement and grouping of figures may be "steadied" by an architectural canopy. The beauty of statuary in combination with foliage must not be forgotten, but figures should not alternate with vases—such a plan only results in the scale of each being destroyed. The subject of the sculptural decoration of buildings might well be the history and industries of the town, and so help to portray its individuality.

4. Architectural Details.—These include such objects as seats, steps, vases, and other civic furnishings, all of which must take their place as units in the whole scheme, not asserting themselves, but helping to attain the general effect. Decorative paintings, iron, bronze, marble, and many other materials and crafts might be used to adorn the city and give color to a usually too sombre appearance. Finally, every little detail requires careful consideration, for interest in the town's design must be maintained to the least accessory. A baluster ugly in contour may mar the effect of a whole terrace. As Sir William Chambers said, speaking of mouldings, the whole can be spoilt by bad details, just as a fine musical composition may be murdered by a group of village fiddlers.

In the realization of a fine conception, by a steadfast adherence to a great ideal and a rejection of all that is unessential the city should have, as Wren said of buildings, at least "the attribute of eternal."

* * *

THE OLYMPIC STADIUM, erected for the athletic meet in 1916 in Berlin, Germany, was dedicated June 8th. The stadium is built of stone and concrete in the form of a huge oval within the new Grunewald race course on the western outskirts of Berlin. It contains 30,000 seats, each one of which, the management boasts, commands an unobstructed view. The stadium contains ample space for football, track, cycling, and aquatic events, and represents an expenditure of $500,000. The funds were provided by the Jockey Club, which owns the Grunewald race course, and the Government. The German Olympic Committee believes that the athletes of the world who will meet there in 1916 will find the Berlin stadium the finest yet constructed.

* * *

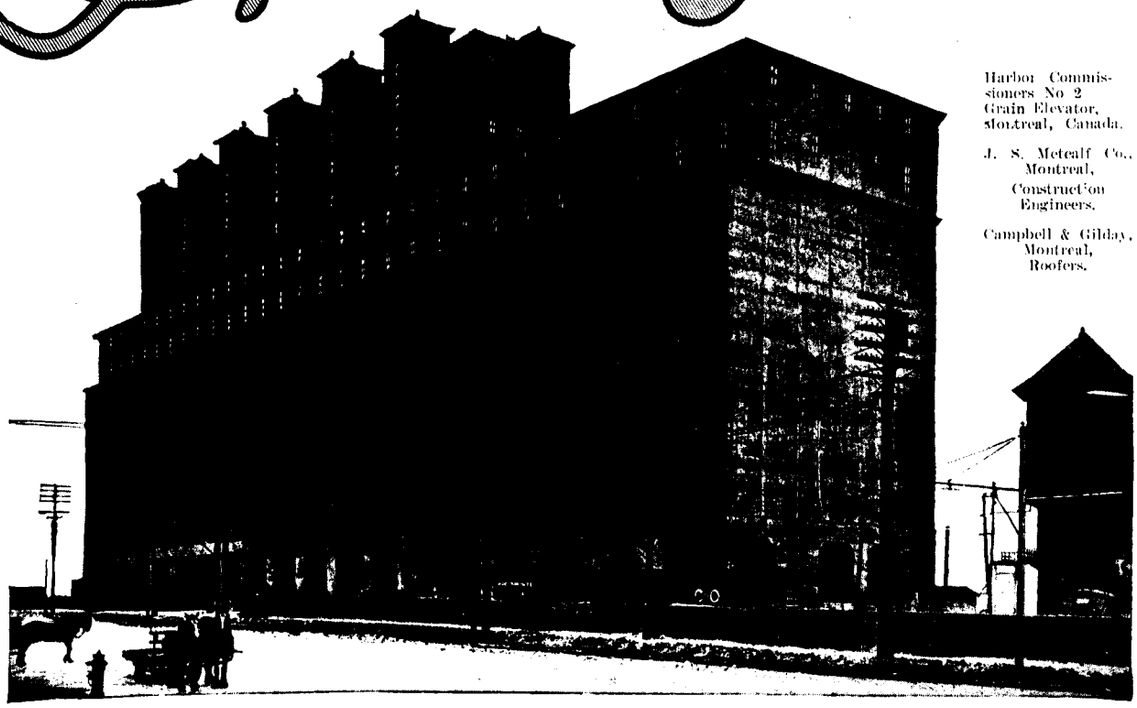
THE SWIMMING POOL room and plunge in the Montreal Young Men's Christian Association building, illustrated in this issue, is one of the most attractive features of the building. The treatment consists of a hard vitrified tile which forms the bottom, sides and overflow gutter, also walk, walls and facia of gallery around swimming pool room. The work represents the highest standing in swimming pool construction, every detail being most studiously worked out, and for cleanliness and sanitation the materials used are the best the market produces for such a purpose. The introduction of color in the underwater guide lines, the distance marks on the side walls of pools, the depth marks, the decorative treatment of the pool room, are all of colored tile. The ceramic treatment prepared was also installed throughout the floors of the entrance lobby, etc., and in a simplified manner on the walls and floors of toilets. The work was contracted for and installed by the Wm. H. Jackson Company of Canada, Ltd., who has furnished tile for many of the most prominent hotels and Y.M.C.A. buildings throughout the Dominion.

A NEW COLOR-CHART has just been issued by Samuel Cabot, Inc., of Boston, which will be of considerable help in selecting a color scheme for the house of any style or shape. The chart reproduces the coloring effects of Cabot's creosote shingle stains by a lithographic process. It shows the artistic qualities of the stains and how the various colors blend when used together. Sixty-four different combinations can be made by means of this ingenious method of showing the harmonizing effects of the Cabot's stains.

* * *

WHAT IS DECLARED by prominent authorities on higher mathematics to be the greatest invention of its kind is being demonstrated by its inventor, Sydney A. Gross, a 16-year-old student of Philadelphia. The device is an angle sector, which mathematicians who have examined the instrument say is capable of dividing an agle not a right angle and which they say has proved erroneous the prevailing theory since Euclid's time that there was no practical method of trisecting such angles. Gross' device is made of cardboard shaped like an eight-pointed star and divided into four large compartments along two axes, each of which is divided into eight subdivisions and the points joined together so that a complete series of rectangles are formed and which may be moved about by means of flexible hinges. To divide an angle the device is placed over the angle and its hinges worked so that it forms the required section. It will make three groups of twin triangles which are equal and every group of two angles is one-third of the entire angle. Since 180 B.C. the only known method of trisecting an angle has been by higher curves. But this makes practical the trisection of an angle. It will be of inestimable value to architects and mechanical draftsmen and in the mechanical arts, where it is often necessary to make such divisions for the construction of polygon figures.

Barrett Specification Roofs



Harbor Commissioners No 2 Grain Elevator, Montreal, Canada.

J. S. Metcalf Co., Montreal, Construction Engineers.

Campbell & Gilday, Montreal, Roofers.

On the World's Largest Concrete Grain Elevator

As we have frequently pointed out, most of the large commercial buildings of the day are covered with a Barrett Specification type of roof. For example, here is the great new grain elevator at Montreal. It is said to be the largest in the world, with a capacity of 2,600 000 bushels. It carries a Barrett Specification Roof 55,000 square feet in area.

The engineers chose this type of roof because it is the lowest-priced and most reliable roofing known.

Barrett Specification Roofs require no repairs or attention of any kind, they invariably last twenty years or more, and are fire-retardant.

Architects, engineers and owners of permanent buildings of all kinds should have a copy of the Barrett Specification on file.

A request will bring it by return mail.

Special Note

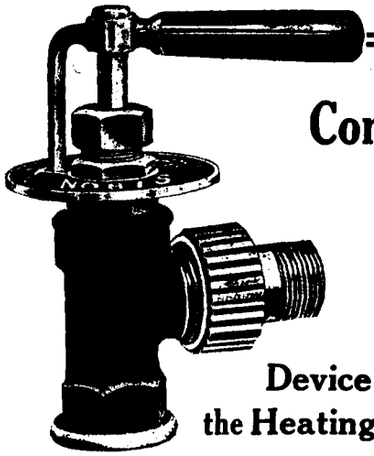
We advise incorporating in plans the full wording of The Barrett Specification, in order to avoid any misunderstanding.

If any abbreviated form is desired, however, the following is suggested.

ROOFING—Shall be a Barrett Specification Roof laid as directed in printed Specification, revised August 15th, 1911, using the materials specified and subject to the inspection requirement.

THE PATERSON MANUFACTURING CO., Limited

Montreal, Toronto, Winnipeg, Vancouver, St. John, N.B., Halifax, N.S., Sydney, N.S.



Commonsense Heating Control

A Practical Device for Regulating the Heating of Residences

Architects and householders who have experienced the discomforts of the usual factory-like installations for househeating which overheat the rooms, even when the radiators are shut off and where the heat of the latter cannot be regulated to the requirements of the room, should find out about this new valve.

It permits you to regulate the heat to any desired degree, a simple turn of the handle, as when turning on gas or water gives you all the heat necessary, a boon to the average householder, especially the women, who chiefly suffer from poorly regulated heating.

Have us show you how it works. We guarantee our valves to work satisfactorily.

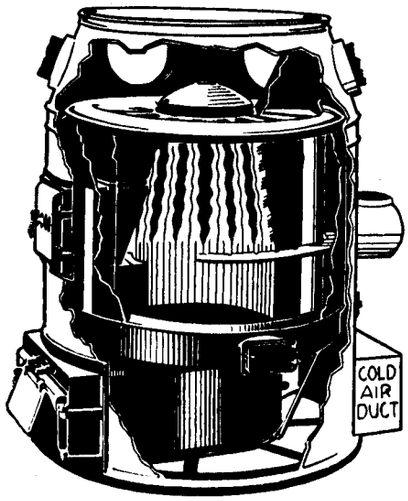
The Nobis Engineering Co.
329 West King St., Toronto.

Heating—Against the Wind

This is a hard problem.

It has been *solved* in the Kelsey warm Air Generator through the Kelsey Positive Cap Attachment.

The Kelsey Positive Cap Atachment directs warm air in independent currents to wherever it is wanted. It forces a full supply of heat to every part of the building. But if it is desired, all the heat can be concentrated on one or two rooms by means of the same attachment.



This feature recommends the Kelsey as an *efficient and economic heater.*

Write for descriptive literature.

The Jas. Smart Mfg. Co., Ltd.
Brockville Ont. Winnipeg Man.

KAHN SYSTEM

of Reinforced Concrete

Steel Sash
Hyrib
Rib Bars
Rib Metal

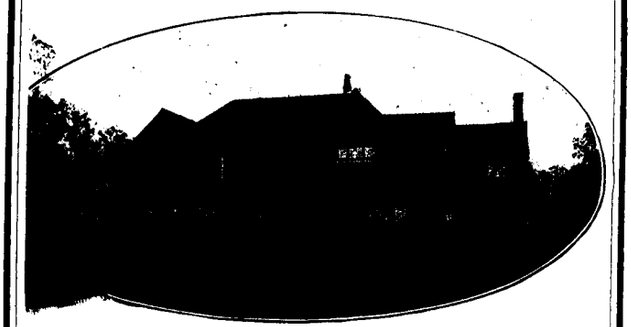
KAHN SYSTEM
Reinforced Concrete

Concrete Finishes
Waterproofing Pastes.

Trussed Concrete Steel Co. of Canada, Limited

Head Offices and Works: Walkerville, Ont.

Branches Everywhere



COUNTRY CLUB, ST. JOSEPH, MO.
Stained with Cabot's Stains.
Roof in Mottled Red Tile Effect. Trimmings Dark Brown.
Walter Boschen, Architect, St. Joseph.

Reliable Shingle Stains

Shingle stains can be as cheap and worthless as the maker's conscience will allow. Kerosene is the favorite cheapener, mixed with coarse and adulterated colors. Such stains are not worth applying, because they cost as much to apply as good stains, and the colors wash off and fade, and your shingles are made dangerously inflammable. *Don't accept any stain that smells of kerosene or benzine.*

Cabot's Creosote Stains

are made of refined Creosote and no kerosene. The colors are lasting, clear, and beautiful. They are the original and standard shingle stains, and every gallon is guaranteed.

You can get Cabot's Stains all over the country.
Send for samples and name of nearest agent.

Samuel Cabot, Inc., Mfg. Chemists, Boston, Mass.

Canadian Agents:

A. Muirhead Co., Toronto.
Henry Darling, Vancouver.
Saskatchewan Supply Co., Saskatoon.
Braid & McCurdy, Winnipeg.
Seymour & Co., Montreal.
Canadian Equipment & Supply Co., Calgary.

Cabot's Quilt, Waterproof Cement and Brick Stains
Conservo Wood Preservative, Damp-proofing, Waterproofing.

A DIRECTORY FOR
ARCHITECTURAL SPECIFICATIONS & CONTRACTORS' SUPPLIES & MACHINERY

Adamant Plaster.
Stinson-Reeb Builders' Supply Co.

Air Washers and Humidifers.
Sheldons Limited.

Architectural Bronze and Brass Work.
Dennis Wire and Iron Works.
Meadows, Geo. B. Co.

Architectural Iron.
Canadian Allis-Chalmers, Ltd.
Dennis Wire and Iron Works.
Meadows, Geo. B. Co.
Metal Shingle and Siding Co.
Pedlar People, The.

Architectural Stucco Relief.
Hynes, W. J., Ltd.

Architectural Terra Cotta.
Toronto Plate Glass Imp. Co.

Artificial Stone.
Roman Stone Co., Ltd.

Asbestos Products.
Asbestos Mfg. Co.
Canadian Johns-Manville Co.
Ormsby, A. B., Ltd.

Bank and Office Railings.
Canadian Allis-Chalmers, Ltd.
Dennis Wire and Iron Works.
Greening Wire Co., Ltd.
Meadows, Geo. B. Co.

Bank and Office Window Blinds.
Dennis Wire and Iron Works.
Greening Wire Co., Ltd.
Meadows, Geo. B. Co.

Bath Room Fittings.
Canadian Johns-Manville Co.
Robertson Co., James B.
Standard Ideal Co., Ltd.
Standard Sanitary Co.

Bent Glass.
Toronto Plate Glass Imp. Co.

Belting.
Canadian Fairbanks-Morse Co.
Gutta Percha and Rubber Mfg. Co., Ltd.
Mussens Limited.

Blowers.
Canadian Fairbanks-Morse Co.
Sheldons Limited.

Blow and Vent Piping.
Metal Shingle and Siding Co.
Ormsby, A. B., Ltd.
Pedlar People, The.

Boilers.
Clare Bros. Co.
Dominion Radiator Co., Ltd.
Goldie & McCullough Co., Ltd.
Mussens Limited.
Pease Foundry Co., Ltd.
Taylor-Forbes Co., Ltd.

Brass Works.
Kerr Engine Co.
Robertson, James B. Co.

Brick and Terra Cotta.
American Enamel Brick and Tile Co.
Dartnell, E. F., Ltd.
Don Valley Brick Works.
Stinson-Reeb Builders' Supply Co.

Bridges.
Canadian Allis-Chalmers, Ltd.
Dominion Bridge Co.

Building Paper and Felts.
Asbestos Mfg. Co.
Bird, F. W. & Son.
Canadian Johns-Manville Co.
Metal Shingle and Siding Co.
Pedlar People, The.

Building Supplies.
Bird, F. W. & Son.
Canadian Fairbanks-Morse Co.
Dartnell, E. F. & Co.
Metal Shingle and Siding Co.
Mussens Limited.
Stinson-Reeb Builders' Supply Co.
Pedlar People, The.

Caen Stone Cement.
Hynes, W. J., Ltd.

Caps for Columns and Pilasters.
Hynes, W. J., Ltd.
Metal Shingle and Siding Co.
Pedlar People, The.

Cars (Factory and Dump).
Mussens Limited.
Sheldons Limited.

Cast Iron Columns.
Canadian Allis-Chalmers, Ltd.
Pedlar People, The.

Cement.
Canadian Allis-Chalmers, Ltd.

Cement (Fireproof).
Canadian Johns-Manville Co.
Dartnell, E. F., Ltd.
Stinson-Reeb Builders' Supply Co.

Cement Block Machinery.
London Concrete Machinery Co.
Mussens Limited.

Cement Brick Machinery.
London Concrete Machinery Co.
Mussens Limited.

Cement Machinery.
London Concrete Machinery Co.
Mussens Limited.

Cement Tile Machinery.
London Concrete Machinery Co.
Mussens Limited.
Stinson-Reeb Builders' Supply Co.

Cold Storage and Refrigerator Insulation.
Bird, F. W. & Son.
Linde British Refrigerator Co.
Linde Canadian Refrigeration Co., Ltd.

Concrete Construction (Reinforced).
Metal Shingle and Siding Co.
Pedlar People, The.
Trussed Concrete Steel Co.

Concrete Mixers.
Canadian Allis-Chalmers, Ltd.
Canadian Fairbanks-Morse Co.
Dartnell, E. F., Ltd.
London Concrete Machinery Co.
Mussens Limited.
Wettlaufer Bros.

Concrete Steel.
Canadian Fairbanks-Morse Co.
Dennis Wire and Iron Works.
Greening Wire Co., Ltd.
Metal Shingle and Siding Co.
Noble, Clarence W.
Pedlar People, The.
Trussed Concrete Steel Co.

Conduits.
Conduits Co., Ltd.
Pedlar People, The.

Contractors' Machinery.
Canadian Fairbanks-Morse Co.
Mussens Limited.

Contractors' Supplies.
Dartnell, E. F. Ltd.
Greening Wire Co., Ltd.
Mussens Limited.
Stinson-Reeb Builders' Supply Co.

Cork Board.
Canadian Johns-Manville Co.

Corner Beads.
Metal Shingle and Siding Co.
Pedlar People, The.

Cranes.
Canadian Fairbanks-Morse Co.
Dominion Bridge Co., Ltd.
International Marine Signal Co.
Mussens Limited.

Crushed Stone.
Stinson-Reeb Builders' Supply Co., Ltd.

Cut Stone Contractors.
Dartnell, E. F., Ltd.

Damp Proofing.
Ault & Wiborg Co.
Canadian Johns-Manville Co.
Pinchin, Johnson Co.

Deposit Boxes.
Canadian Fairbanks-Morse Co.
Goldie & McCulloch Co., Ltd.
Taylor, J. & J.

Doors.
Burton & Baldwin Mfg. Co.

Drills (Brick and Stone).
Mussens Limited.
Star Expansion Bolt Co.

Drying Appliances.
Sheldons Limited.

Dumb Waiters.
Otis-Fensom Elevator Co.
Turnbull Elevator Co.

Electro-Plating.
Dennis Wire and Iron Works.

Electric Wire and Cables.
Greening Wire Co., Ltd.
Robertson Co., James B.

Elevators (Passenger and Freight).
Otis-Fensom Elevator Co.
Turnbull Elevator Co.

Elevator Enclosures.
Canadian Allis-Chalmers, Ltd.
Dennis Wire and Iron Works.
Greening Wire Co.
Meadows, Geo. B. Co., Ltd.
Otis-Fensom Elevator Co.

Enamels.
Ault & Wiborg Co.
Berry Bros.
Canadian Bitumastic Enamels Co.
Imperial Varnish & Color Co.
International Varnish Co.
Moore, Benjamin Co.

Engines.
Canadian Fairbanks-Morse Co.
Goldie & McCulloch Co., Ltd.
Mussens Limited.
Sheldons Limited.

Engineers' Supplies.
Canadian Fairbanks-Morse Co.
Kerr Engine Co.
Mussens Limited.
Robertson Co., James B.
Sheldons Limited.

Exhaust Fans.
Sheldons Limited.

Expanded Metal.
Galt Art Metal Co.
Leslie & Co., A. C., Ltd.
Metal Shingle and Siding Co.
Noble, Clarence W.
Pedlar People, The.
Stinson-Reeb Builders' Supply Co.

Expansion Bolts.
Star Expansion Bolt Co.

Fire Brick.
Dartnell, E. F.
Stinson-Reeb Builders' Supply Co.

Fire Sprinklers.
General Fire Equipment Co.
McGuire, W. J.
Vogel Co. of Canada, Ltd.

Fire Extinguishers.
Canadian Johns-Manville Co.
General Fire Equipment Co.
Ormsby, A. B., Ltd.
Vogel Co. of Canada, Ltd.

Fire Escapes.
Canadian Allis-Chalmers, Ltd.
Dennis Wire and Iron Works.
Meadows, Geo. B. Co., Ltd.
Reid & Brown.

Fireplace Goods.
Carter & Co., Ltd.
Dennis Wire and Iron Works.
Murray-Kay Co., Ltd.

Fire Proofing.
Canadian Johns-Manville Co.
Dartnell, E. F.
Don Valley Brick Works.
Noble, Clarence W.
Port Credit Brick Co.
Pedlar People, The.
Trussed Concrete Steel Co.

Fireproof Steel Doors.
Dennis Wire and Iron Works.
Metal Shingle and Siding Co.
Mussens Limited.
Ormsby, A. B., Ltd.
Pedlar People, The.
Stinson-Reeb Builders' Supply Co.

Fireproof Windows.
Galt Art Metal Co.
Hobbs Mfg. Co.
Metal Shingle and Siding Co.
Ormsby, A. B., Ltd.
Pedlar People, The.
Stinson-Reeb Builders' Supply Co.

Flooring.
Bird, F. W. & Son.
Seaman-Kent Co.

Furnaces and Ranges.
Clare Bros., Ltd.
Pease Foundry Co., Ltd.
Taylor-Forbes Co., Ltd.

Galvanized Iron Works.
Metal Shingle and Siding Co.
Ormsby, A. B., Ltd.
Pedlar People, The.
Sheldons Limited.

Galvanized Iron.
Leslie & Co., A. C.
Metal Shingle and Siding Co.

Glass.
Consolidated Plate Glass Co.
Hobbs Mfg. Co.
Toronto Plate Glass Co.

Grille Works.
Dennis Wire and Iron Works.
Meadows, Geo. B. Co., Ltd.
Taylor, J. & J.

Hangers.
Ormsby, A. B., Ltd.

Hardware.
Canadian Yale & Towne, Ltd.
Taylor-Forbes Co., Ltd.

Hardwood Flooring.
Canadian Fairbanks-Morse Co.

Heating Apparatus.
Clare Bros., Ltd.
Dominion Radiator Co.
Dunham, C. A. Co.
Goldie & McCulloch Co., Ltd.
Kerr Engine Co.
Pease Foundry Co., Ltd.
Sheldons Limited.
Taylor-Forbes Co., Ltd.

Heating Engineers and Contractors.
Sheldons Limited.

Hoisting Machinery.
Mussens Limited.
Otis-Fensom Elevator Co.

Hinges.
Taylor-Forbes Co., Ltd.

Hydrants.
Kerr Engine Co.

Iron Doors and Shutters.
Dennis Wire and Iron Works.
Metal Shingle and Siding Co.
Taylor, J. & J.

Iron Stairs.
Canadian Allis-Chalmers, Ltd.
Dennis Wire and Iron Works.
Meadows, Geo. B. Co., Ltd.

Iron Supplies.
Kerr Engine Co.

Installation.
Bird, F. W. & Son.
Canadian Johns-Manville Co.
Seaman-Kent Co.

Interior Woodwork.
Seaman-Kent Co.

Jail Cells and Gates.
Dennis Wire and Iron Works.
Goldie & McCulloch Co., Ltd.
Taylor, J. & J.

Joist Hangers.
Taylor-Forbes Co., Ltd.
Trussed Concrete Steel Co.

Lamp Standards.
Canadian Allis-Chalmers, Ltd.
Canadian Tungsten Lamp Co.
Dennis Wire and Iron Works.
Seaman-Kent Co.

Lath (Metal).
Galt Art Metal Co.
Greening Wire Co., Ltd.
Metal Shingle and Siding Co.
Noble, Clarence W.
Pedlar People, The.
Stinson-Reeb Builders' Supply Co.
Trussed Concrete Steel Co.

Laundry Tubs.
Toronto Laundry Machinery Co.

Leaded Glass.
Hobbs Mfg. Co.

Marble.
Dartnell, E. F.
Dominion Marble Co., Ltd.
Missisquoi Marble Co.
Robertson Co., James B.

Metallic Sash.
Hobbs Mfg. Co.
Metal Shingle and Siding Co.

Metal Shingles.
Galt Art Metal Co.
Pedlar People, The.

Metal Store Fronts.
Dartnell, E. F.
Dennis Wire and Iron Works.
Hobbs Mfg. Co.
Metal Shingle and Siding Co.

Metal Walls and Ceilings.
Metal Shingle and Siding Co.
Noble, Clarence W.
Ormsby, A. B., Ltd.
Pedlar People, The.

Municipal Supplies.
Mussens Limited.

Non-Conducting Coverings.
Ault & Wiborg.
Canadian Johns-Manville Co.

Ornamental Iron Work.
Canadian Allis-Chalmers, Ltd.
Dennis Wire and Iron Works.
Meadows, Geo. B. Co., Ltd.
Turnbull Elevator Co.

Packing (Steam).
Canadian Johns-Manville Co.

Packing.
Canadian Fairbanks-Morse Co.
Gutta Percha and Rubber Co.

Paints (Steel and Iron).
Brandram-Henderson Co.
Canadian Bitumastic Enamels Co.
Dartnell, E. F.
Imperial Varnish & Color Co.
International Varnish Co.
Pinchin, Johnson Co.

Paints and Stains.
Berry Bros., Ltd.
Brandram-Henderson Co.
Canadian Bitumastic Enamels Co.
Dartnell, E. F.
Imperial Varnish & Color Co.
International Varnish Co.
Pinchin, Johnson Co.
Robertson, James B.

Perforated Steel.
Greening Wire Co., Ltd.

Pipe Covering.
Canadian Johns-Manville Co.

Pasters.
Brandram-Henderson Co.
Canadian Johns-Manville Co.
Hynes, W. J.

Plaster Corner Beads.
Metal Shingle and Siding Co.
Pedlar People, The.

Plate and Window Glass.
Consolidated Glass Co.
Hobbs Mfg. Co.
Toronto Plate Glass Co.

Plumbers' Brass Goods.
Canadian Fairbanks-Morse Co.
Robertson Co., James B.
Standard Ideal Co., Ltd.

Plumbing Fixtures.
Robertson Co., James B.
Standard Ideal Co.
Standard Sanitary Co.

Pneumatic Tools.
Mussens Limited.

Porcelain Enamel Baths.
Robertson Co., James B.
Standard Ideal Co., Ltd.
Standard Sanitary Co.

Radiators.
Dominion Radiator, Ltd.
Taylor-Forbes, Ltd.

Refrigerating Machinery.
Linde British Refrigeration Co., Ltd.
Linde Canadian Refrigeration Co., Ltd.

Refrigerator Insulation.
Bird, F. W. & Son.
Canadian Johns-Manville Co.
Metal Shingle and Siding Co.

Radiator Valves.
Kerr Engine Co.

Reinforced Concrete.
Metal Shingle and Siding Co.
Noble, Clarence W.
Pedlar People, The.
Trussed Concrete Steel Co.

Relief Decoration.
Hynes, W. J.

Roofing Paper.
Canadian Johns-Manville C.o
Bird, F. W. & Son.
Pedlar People, The.
Metal Shingle and Siding Co.

Roofing.
Asbestos Mfg. Co.
Bird, F. W. & Son.
Canadian Johns-Manville Co.
Metal Shingle and Siding Co.
Patterson Mfg. Co.

Roofing (Slate).
Ormsby, A. B., Ltd.

Roofing (Tile).
Dartnell, E. F.
Metal Shingle and Siding Co.
Pedlar People, The.

Rubber Tiling.
Gutta Percha and Rubber Co.

Safes (Fireproof and Bankers').
Canadian Fairbanks-Morse Co.
Goldie & McCulloch Co., Ltd.
Taylor, J. & J.

Sanitary Plumbing Appliances.
Robertson Co., James B.
Standard Ideal Co., Ltd.
Standard Sanitary Co.

Sand Screens.
Greening Wire Co.

Shafting, Pulleys and Hangers.
Canadian Fairbanks-Morse Co.
Goldie & McCulloch Co., Ltd.

Sheet Metal.
Leslie, A. C.
Metal Shingle and Siding Co.

Sheet Metal Workers.
Galt Art Metal Co.
Metal Shingle and Siding Co.
Ormsby, A. B., Ltd.
Pedlar People, The.
Sheldons Limited.

Shingle Stains.
International Varnish Co.
Pinchin, Johnson Co.
Robertson Co., James B.

Sidewalks, Doors and Grates.
Dennis Wire and Iron Works.

Sidewalk Lifts.
Otis-Fensom Elevator Co.

Sidewalk Prisms.
Hobbs Mfg. Co.

Slate.
Robertson Co., James B.

Stable Fittings.
Dennis Wire and Iron Works.

Staff and Stucco Work.
Canadian Johns-Manville Co.
Hynes, W. J.

Steam Appliances.
Canadian Fairbanks-Morse Co.
Kerr Engine Co.
Sheldons Limited.
Taylor-Forbes Co., Ltd.

Steam and Hot Water Heating.
Dominion Radiator Co., Ltd.
Dunham, C. A. Co.
Sheldons Limited.
Taylor-Forbes Co., Ltd.

Steel Concrete Construction.
Noble, Clarence W.
Pedlar People, The.
Trussed Concrete Steel Co.

Steel Doors.
Dennis Wire and Iron Works.
Mussens Limited.
Ormsby, A. B., Ltd.
Pedlar People, The.

Structural Iron Contractors.
Canadian Allis-Chalmers, Ltd.
Dennis Wire and Iron Works.
Dominion Bridge Co.
Reid & Brown.
Structural Steel Co., Ltd.
Toronto Iron Works.

Structural Steel.
Canadian Allis-Chalmers, Ltd.
Dennis Wire and Iron Works.
Dominion Bridge Co.
Mussens Limited.
Reid & Brown.
Sheldons Limited.
Structural Steel Co., Ltd.

Telephone Systems.
Northern Electric & Mfg. Co.

Terra Cotta Fireproofing.
Carter & Co., Ltd.
Dartnell, E. F.
Don Valley Brick Works.
Missisquoi Marble Co.

Tile (Floor and Wall).
Carter & Co., Ltd.
Dartnell ,E. F.
Don Valley Brick Works.

Vacuum Heating System.
Dunham, C. A. Co.

Varnishes.
Ault & Wiborg Co.
Berry Bros., Ltd.
Brandram-Henderson Co.
Imperial Varnish & Color Co.
International Varnish Co.
Pinchin, Johnson Co.

Vaults and Vault Doors (Fireproof and Bankers').
Goldie & McCulloch, Ltd.
Taylor, J. & J

Valves.
Canadian Fairbanks-Morse Co.
Dunham, C. A. Co.
Kerr Engine Co.
Robertson Co., James B.
Taylor-Forbes Co.

Ventilators.
Metal Shingle and Siding Co.
Sheldons Limited.

Wall Finishes.
Berry Bros.
Brandram-Henderson Co.
Dartnell, E. F.
Imperial Paint and Color Co.
International Varnish Co.
Pinchin, Johnson Co.

Wall Hangers.
Taylor-Forbes Co.

Waterproofing.
Ault & Wiborg Co.
Bird, F. W. & Son.
Canadian Johns-Manville Co.
Dartnell, E. F.
Kerr Engine Co.
Mussens Limited.
Pinchin, Johnson Co.
Stinson-Reeb Builders' Supply Co.

Waterworks Supplies.
Mussens Limited.
Robertson Co., James B.
Standard Ideal Co., Ltd.

Wheelbarrows.
Mussens Limited.

White Lead, Putty and Oils.
Brandram-Henderson C.o
International Varnish Co.
Pinchin, Johnson Co.

Window Guards.
Dennis Wire and Iron Works.
Greening Wire Co.

Wire Rope and Fittings.
Greening Wire Co., Ltd.
Mussens Limited.
Otis-Fensom Elevator Co.

An Index to the Advertisements