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CONSTRUCTION

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



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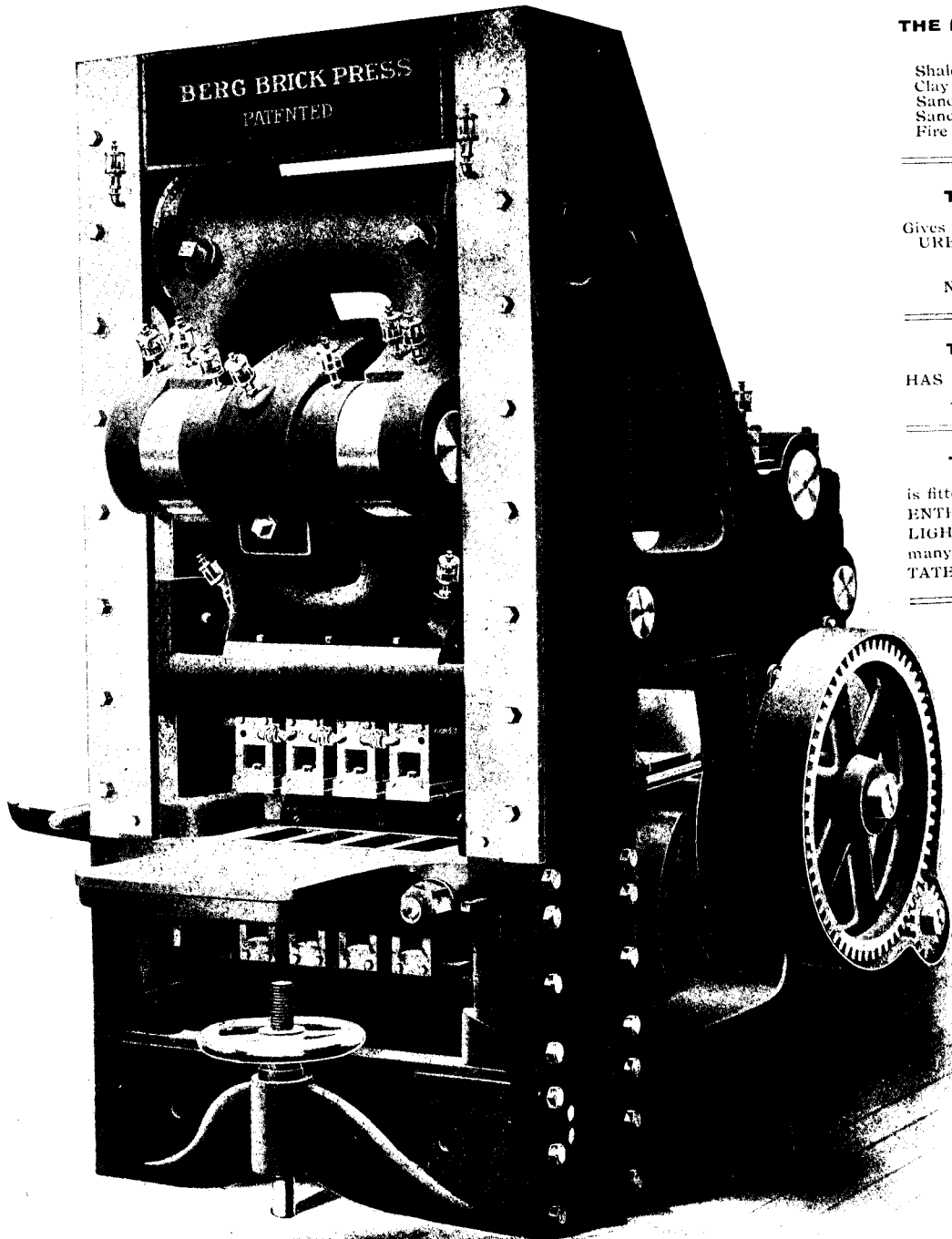
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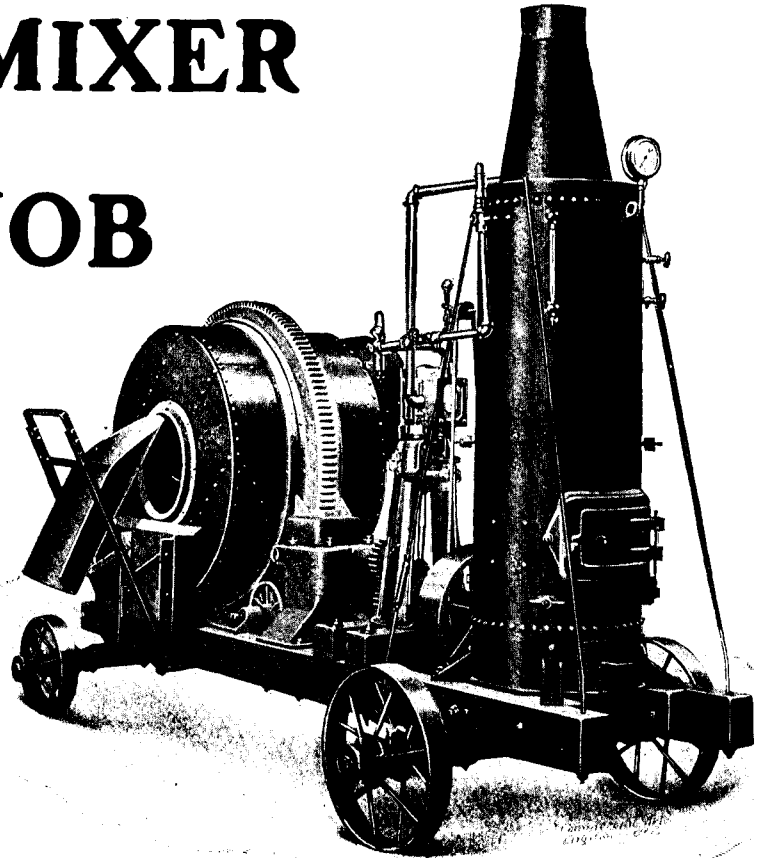
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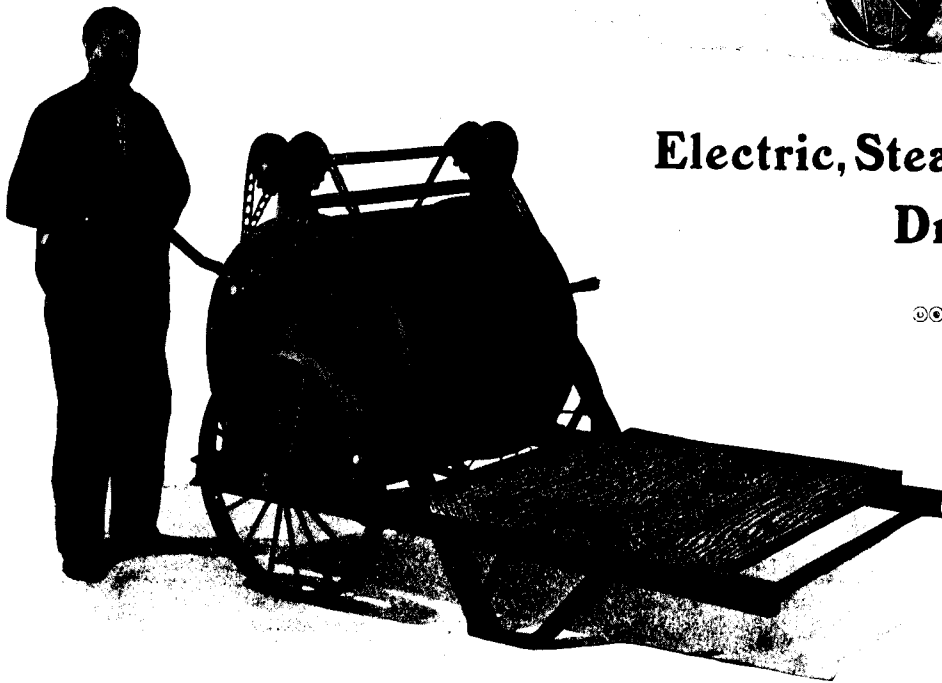
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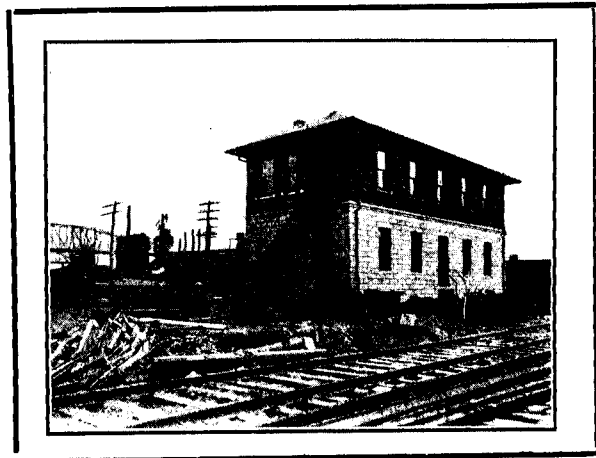
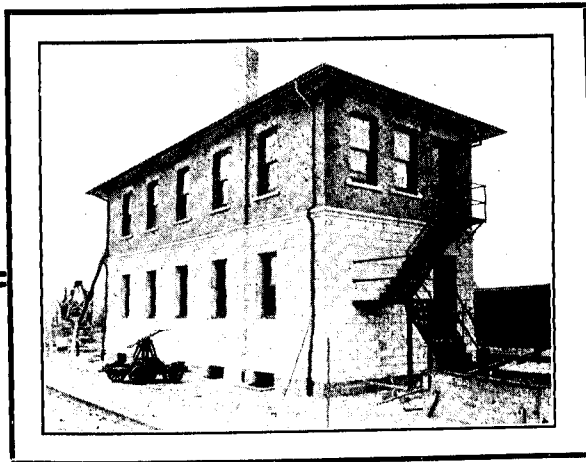
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for the lower story **ONLY**, and high-priced brick for the second story. After the Tower was completed, the Lake Shore Railway were so satisfied with “Ideal” construction that they have since built twelve such Towers of **“IDEAL” BLOCKS THROUGHOUT**, having their own **“IDEAL” Machines** and making their own blocks.

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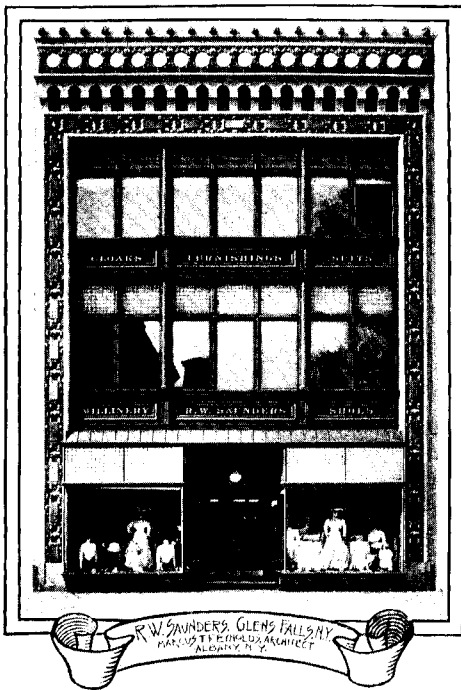
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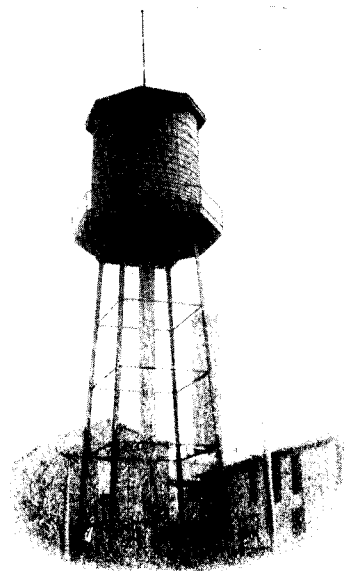
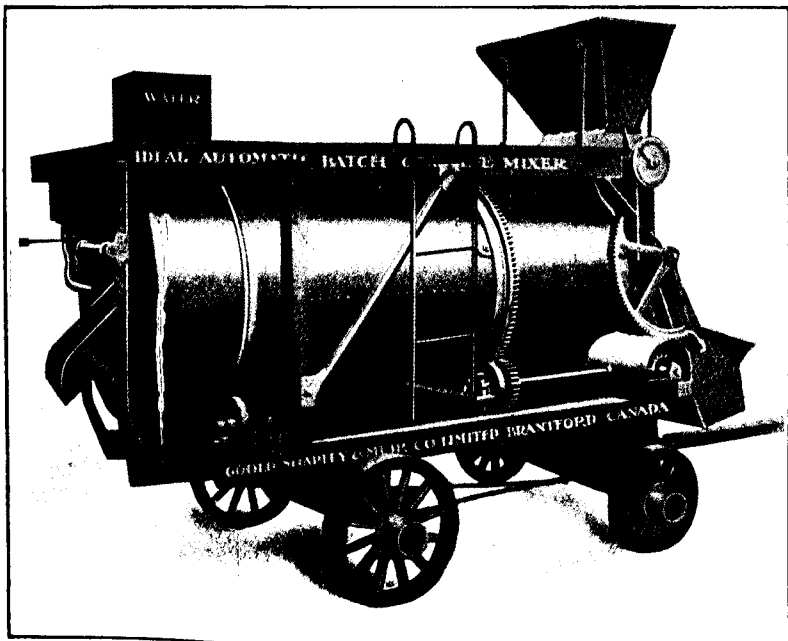
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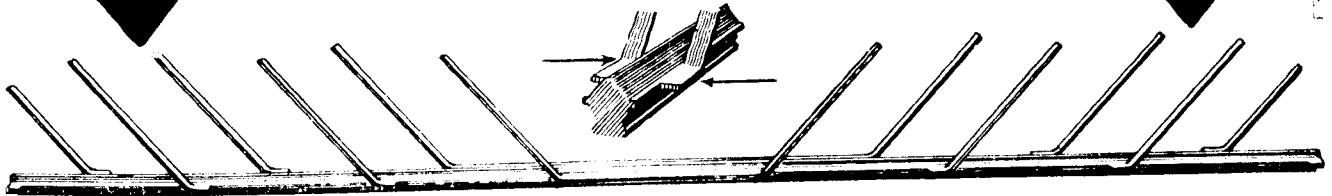


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We invite the consideration of
ARCHITECTS to the fol-
lowing points relative to



Kahn Trussed Bars

Strength and Safety

The shearing strains in concrete beams, reinforced with Kahn Trussed Bars, are transferred directly to the horizontal tension members by the rigid connection of the shear members, instead of by the adhesion of the concrete. Beams reinforced with loose stirrups depend upon this adhesion, and fail when the steel, stretched beyond its elastic limit, decreases in cross-section.

Correct Scientifically and Practically

The shearing strains of concrete beams can be analyzed into compression and tension stresses at right angles to each other and inclined at 45 degrees with the direction of the beam. The rigidly connected diagonals of the Kahn Trussed Bars are inclined at 45 degrees to take care of the tension, and present a flat surface to the compression stresses, which grip them like a vise. Loose stirrups are ordinarily much less efficient because they are placed vertically and made of band iron, presenting a thin, narrow edge to the compression stresses.

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Kahn Trussed Bars save steel, because the shear members are formed from that portion of the flanges of the main bar where the whole of it is no longer required to resist bending moment. This saves the entire expense of additional steel required for loose stirrups. The Kahn Trussed Bar saves the labor of installing many loose separate bars, because shear members and main bar are handled as one piece. Practical builders know that this saving of field labor amount to a very considerable item.

Do not these facts convince you that Kahn Bars mean for your client a safe-shingle more fireproof buildings—that the work of erection will proceed more rapidly and with less liability to mistakes?

KAHN bars have marks on shipping tags corresponding to marks on working drawings which we furnish free. Our engineering department consists of engineering experts who have specialized in concrete. We would be glad to have you avail yourself of their services without any obligation on your part.

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Kahn System Products also include: Rib Metal, for Slabs and Conduits; Coiled Hooping; Rib Bars, for Direct Stresses; Fly-Rib, for Roofs, Sidings, Partitions, and Ceilings; Rib Lath and Rib Studs, for Plaster and Stucco; also United Steel Sash, for Fireproof Windows; and Trus-Con Products, for Waterproofing and Finishing Concrete.

Accuracy of Placing

The Kahn Trussed Bar is a complete unit in itself, and none of its members can be misplaced and left out by careless workmen or dislocated by the pouring of the concrete, as is the case where loose stirrups are used. Every bar is where it belongs, at the start and all of the time. A careless placing of the concrete around the bars in the bottom of the beam lessens the adhesion of the concrete and reduces the strength of loose stirrup beams. Kahn Trussed Bars are, of course, independent of such weakness.

Fireproofness

Severe fires attack and weaken concrete to a depth of about one inch, destroying the adhesion between the concrete and the steel. As the strength of the loose stirrup design depends upon this adhesion, such buildings will be greatly weakened by the attack of fire. With Kahn Trussed Bars the diagonals extend well up into the concrete beam, and adhesion is not necessary. Beams have actually been built in which the bars were entirely exposed on the bottom side and when tested have developed their full strength. A building reinforced with Kahn Trussed Bars is as strong after the fire as before, as exemplified by the severe fire at the Dayton Motor Car Company's factory, Dayton, Ohio.

Shockproofness

Tests show that the adhesion between concrete and steel is greatly weakened by repeated loading and unloading of the concrete beam. (See "Fatigue of Concrete," by I. D. Van Ornum, M.A.S.C.E., Proceedings A. S. C. E., December 1906.) In structures subject to shock or moving loads, as in factories and bridges, it is not safe to rely upon the adhesion of the concrete, as is necessary where loose stirrups are used. The rigid connection of the shear members makes the Kahn Trussed Bars especially suited for such structures, as proven by the explosion in the Prest-O-Lite factory, Indianapolis, Ind.

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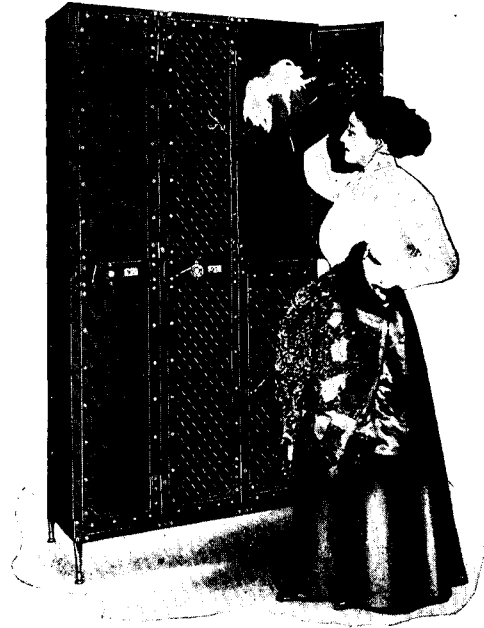
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Sanitary and Fireproof	Germ Proof
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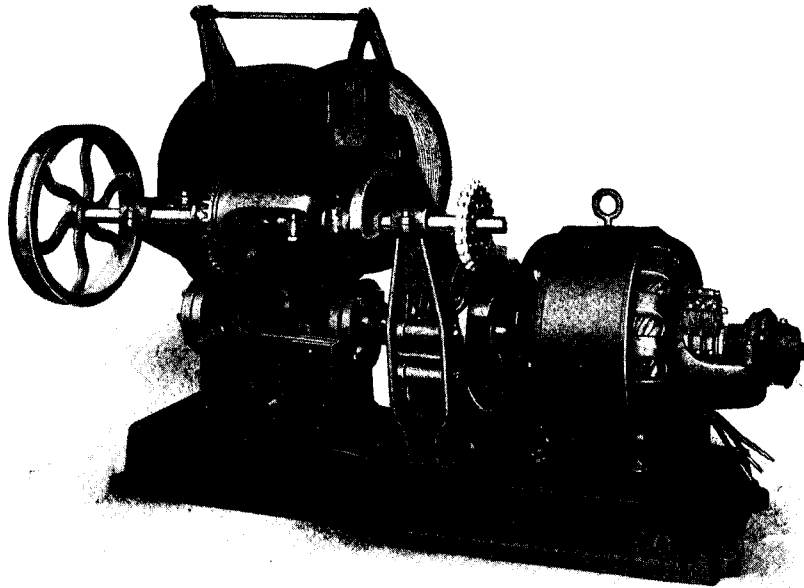
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The machine may be located at top of hatchway or on concrete foundation in basement. The motor is Slip Ring Type with high starting power in order to reduce the amount of current used, the worm gearing is equipped with ball-bearing end thrust to reduce friction and the winding drum is back geared for heavy service. The elevator is operated by a hand cable at the side of hatchway.

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UP FROM ARCHITECTURE



The Development of Concrete

in connection with the advancement of domestic architecture has been one of the marvels of the age. Cement has now come to be recognized as an ideal building material for residence construction.

During the past few years the price of lumber has advanced to almost prohibitive figures, and it is therefore only natural that favorable consideration should be directed to a substitute material affording the advantages of *moderate cost, durability and beauty.*

Every Canadian Architect

and contractor is keenly alive to the fact that there exists a continuous and increasing demand for concrete houses; and experiments in this direction by noted members of the profession have conclusively demonstrated that a moderate-cost concrete house need not be inartistic. It is true that houses can be built of concrete at a cost ranging from \$2,200 to \$5,200, that are splendid examples of residential architecture.

There are Many Admirals
with the Use of Concrete
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RURAL MEDIOCRITY



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We Would Like to Have an Order

from you just to demonstrate our capacity to serve you faithfully and adequately. The outcome of such a step, we believe, will result in mutual profit.

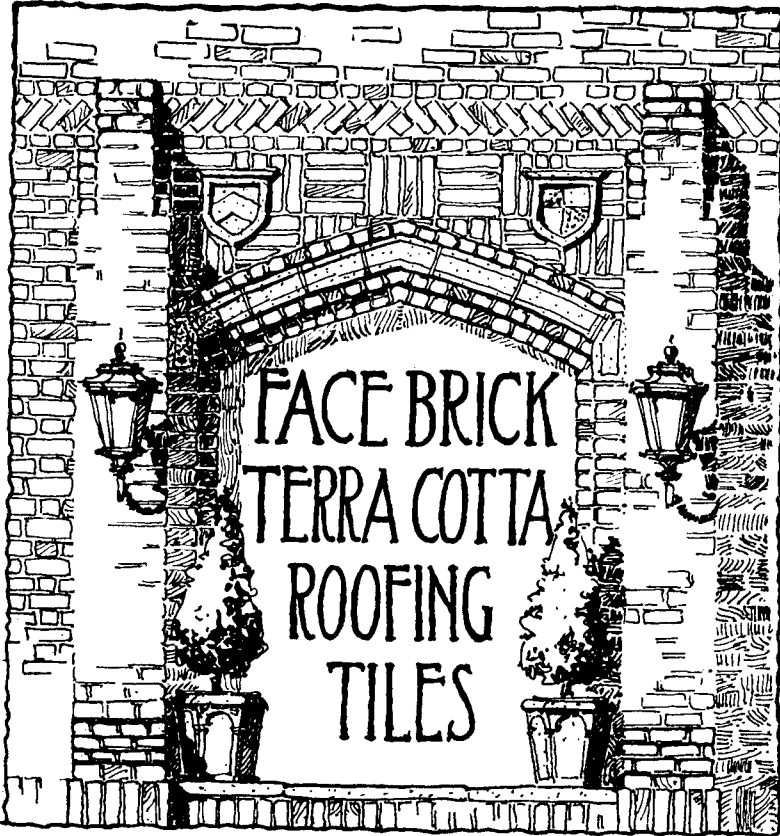


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MONTREAL



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FACE SURFACE

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A slight increase in cost will not influence him as between a pleasing and displeasing interior, and if it were more generally known that in a residence the difference in cost between the cheapest and the best face brick will range between

One Hundred and Three Hundred Dollars

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This Mixer has won its reputation because of lightness in weight and its fast mixing.

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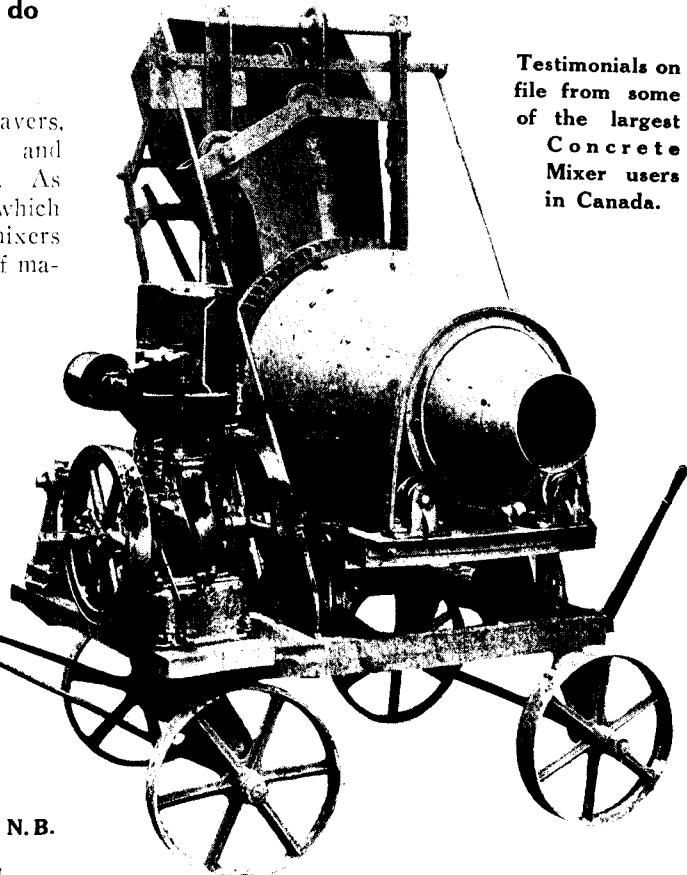
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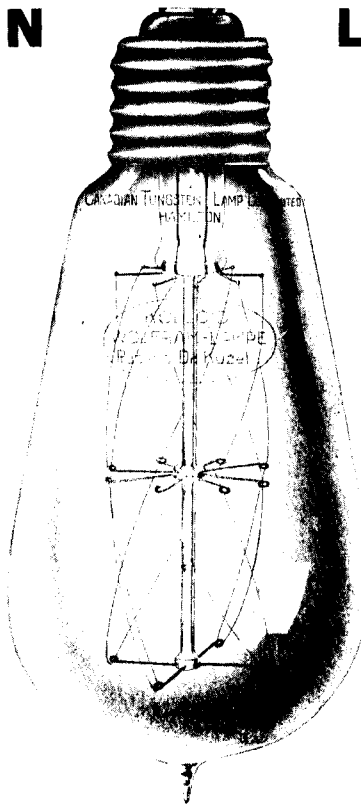
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Before ordering fixtures consider how many outlets are saved by using Kolloid-Wolframs — one 50 c.p. replacing Three 16 c.p. Carbon Lamps, and gives more light.

**Half the Cost!
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PEDLAR

Ferro-Dovetail Plates

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1861

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HALIFAX, 16 Prince St.; ST. JOHN, 42-46 Prince William St.; QUEBEC, 127 Rue de Pont; MONTREAL, 321-3 Craig St. W.; OTTAWA, 423 Sussex St.; TORONTO, 111-113 Bay St.; LONDON, 86 King St.; CHATHAM, 200 King St. W.; PORT ARTHUR, 45 Cumberland St.; WINNIPEG, 76 Lombard St.; REGINA, 1901 Railway St. S.; CALGARY, Room 7, Crown Block; EDMONTON, 633 Fifth Ave. North of Jasper; VANCOUVER, 319 Pender St.; VICTORIA, 434 Kingston St.

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AND

Asbestos Building Lumber

Mark an Epoch in the Building Industry as far as Fireproof Construction is Concerned

The roof of a building is traditionally its weakest spot. It suffers more from exposure than any other part of the structure. It is almost invariably through the roof that a building is ignited by exposure to a nearby fire. In every recent conflagration, the spread of fire was almost wholly due to defective, combustible roofs. This was especially so with the Toronto, Three Rivers, Hull and St. John fires.

ASBESTOS CEMENT SHINGLES produce an absolute fire-resistive roof. They are fire-proof in themselves; they do not rot, blister, crack or split; they require no repairing or painting; are indestructible, and produce a roof that outlasts the building.

ASBESTOS CEMENT SHINGLES are dense and elastic, made of hydraulic cement—reinforced in every direction with interlacing asbestos fibre—dampness (rain and snow), freezing and thawing—hasten the maturing of the cement and make the shingles tougher and harder.



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ASBESTOS CEMENT SHINGLES may be obtained in numerous shapes and sizes to fit any architectural scheme.

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is one of the numerous reasons for its popularity.



Something of a Stunt
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The Herringbone ribs, when viewed from the back of the lath are shelves. The wet mortar rests here securely, comfortably sealing in the filaments and making an "all-clinch" job. If it falls off, it must be replaced or the work suffers. It means that less plaster makes a better job.

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For metal surfaces, exposed and encased, composed of the best pigments for the purpose obtainable, and pure oxidized linseed oil specially prepared. While in frequent test our Iron Clad Paints have shown superiority over other structural paints, we specially commend to your consideration Iron Clad Natural and Purple. Iron Clad paint makes a perfect surface, expanding and contracting with the metal without breaking. They are a prevention against corrosion of all Iron Clad surfaces.

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is a durable flat oil paint that produces a dead, flat finish, smooth and soft as velvet. It is easy to apply, covers perfectly, is sanitary, unfading and extremely durable and economical.

Sani-Flat is especially adapted for wall painting, as it produces the soft, beautiful effect of water colors, with the great advantage of being washable and durable as oil paint. It is also suitable for woodwork, furniture, steel ceilings, radiators and for all classes of interior paintings and decorating. As a foundation or undercoat for glass enamels it cannot be excelled.

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is the acknowledged high-class WALL FINISH. Possesses the merits necessary for the finest decorations. It is made in white, sixteen tints and sixteen colors. There is only one grade of MURESCO, and it must be mixed in Boiling Water. Under ordinary conditions one coat is sufficient, although another can be applied, consequently it is very economical. MURESCO is absolutely sanitary.

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A perfect flowing, easy working Enamel with great covering capacity, interior and exterior use. Does not set quick or show laps. Makes a permanent and beautiful finish, and can be washed frequently, water having no effect upon it. MOORAMEL is as white as the whitest, and does not discolor with age.

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Exterior Spar, the highest grade of finish for exterior use, is pale in color, dries dust-proof in eight hours, and hardens in two or three days. It may be rubbed to a dull finish if desired. IX.—Preservative, really an Interior Spar, has great durability and toughness, will not scratch or mar white, or display hair cracks after long period of wear. It is not affected by hot or cold water, and can be rubbed to a dull finish or polished as desired. XX.—Rubbing and Polishing. This Varnish is made expressly for the finest interior and cabinet work that is to be rubbed and polished. The material used in its composition is carefully selected, and the finished product is pale in color, flows and levels perfectly, dries in about four hours, and can be rubbed and polished in about three or four days.

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is the most scientific and practical coating in use for the treatment and decoration of all concrete, cement, stucco, plaster or brick surfaces, both interior and exterior. It thoroughly fills the pores of such surfaces and forms an absolutely water proof coating, to which no dampness can penetrate. It dries quickly and in time becomes hard as stone, forming a bond with the surface to which applied, assuring perfect protection from all disintegrating influences. MOORE'S CEMENT COATING will not peel, scale or rub off, and is proof against the alkali action of cement surfaces by which merits necessary for the finest decorations. It is made in white, sixteen tints be equalled. When the floor is treated with a suitable coating it prevents the constant powdering and dusting of the surface from wear, with consequent damage to merchandise, machinery, health, etc.

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TARRED

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Insulate your new home with Black Diamond Tarred Felt. It means comfort and economy. An expenditure of a few dollars in this way will reduce your fuel bill by 30 per cent. This, in itself, is pretty well worth while, isn't it? Besides it makes your home beautifully cool and comfortable in summer.

Tarred Felt to the house is as oakum to the ship. However excellently the ship may be constructed, it is imperative that this last inexpensive step shall be taken to render it absolutely serviceable. So must the properly constructed house have its Tarred Felt lining. It prevents the little leaks that make the heating and ventilating system imperfect.

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Etc., Etc.				

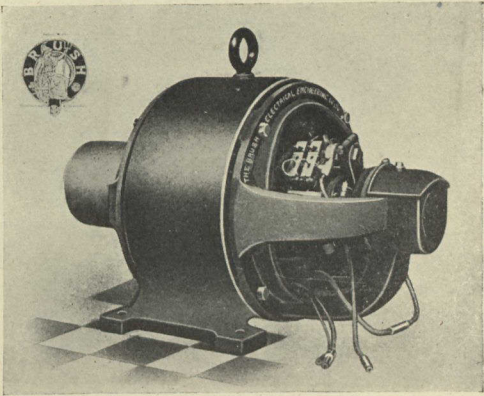
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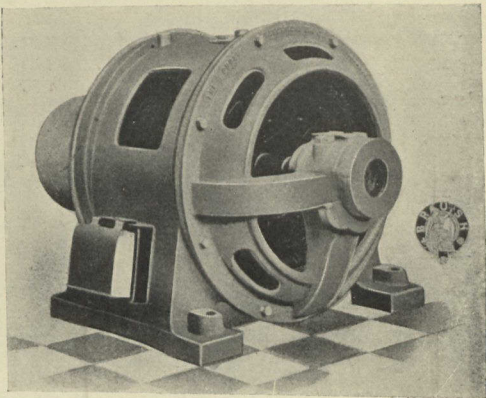
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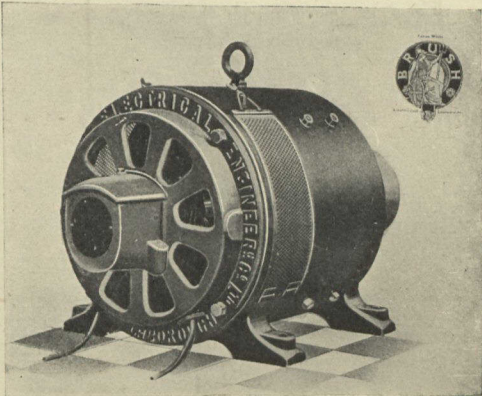


The Dependability of Electric Power Apparatus is Measured to a very great extent by the Reputation there is Behind it.



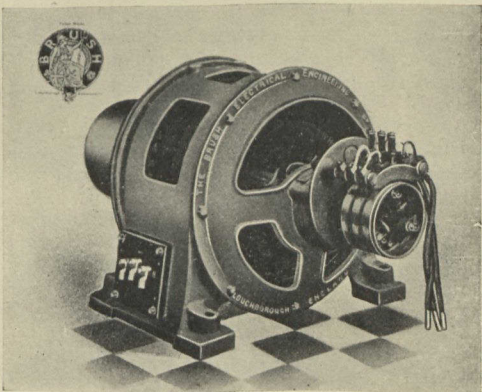
THE motors, dynamos, transformers, etc., of the *BRUSH ELECTRICAL ENGINEERING CO., LTD.*, whose Canadian Head Office we are, are remarkable for their absolute soundness, for the excellence of workmanship and materials, and above all, for their dependability. In the manufacture of this machinery, the designer applies the science of the most efficient employment, of the most appropriate materials. The workman applies his skill to the fashioning of those materials.

Electrical Machinery that will do honest work for many years, and will never give occasion for anxiety, can never be built by cheap and hasty methods.



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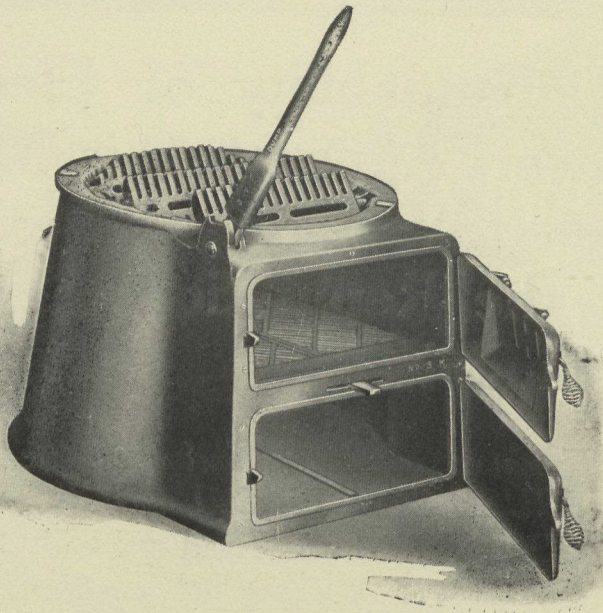
which we can at all times ship are still to be found doing sterling service, after twenty years of hard work. The *BRUSH COMPANY* has the longest experience in the manufacture of electric machinery in the world, and its designs are always the newest. We are prepared to install your entire elevator and lighting plant, after the latest and most up-to-date designs and most reliable workmanship. In placing the products of the Brush Company before the Canadian building and engineering public, we are satisfied that we are prepared to supply the best. Remember, there is no kind of machinery that carries more responsibility than electric generators, motors and transformers.



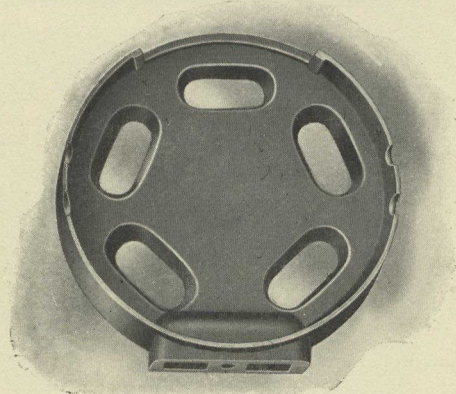
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WATER SECTION, SHOWING FLUES LARGER AT BOTTOM THAN TOP.



THE "KING" BOILER. NOTE THE CONVENIENT SHAKING LEVER AND LARGE ASH DOOR.

Our New "KING" Boilers A Economic H

NOTE THESE POINTS

When your client admits the superiority of Hot Water as a method of heating his building, it is your duty to him, as well as to yourself, to specify a make of boiler that gives ample heat, utilizes every particle of fuel, and is quickly responsive. This we are able to offer in the

"KING" BOILER

It has several distinctive features of superiority—points you should know about—features that are important enough to warrant your paying a visit to our showrooms for the purpose of seeing what a truly wonderful advance is shown in this new offering of ours. Here are some of them:

(1) The wide corrugation extending around the entire inner surface of the Fire Pot adds one-third more live heating surface than a plain surface would offer. The Water Wall, which follows the line of corrugation, insures complete combustion around the outer edges of the fire, a feature which makes quicker circulation, enabling the user to obtain full heat returns from fuel consumed.

(2) The specially arranged and ample combustion chambers in Fire Pot and Flues (which are staggered) permit all gases being burned and forces the intense heat to come in contact with all direct heating surfaces before escaping to the chimney.

(3) Rapid water circulation with a minimum fuel consumption is attained by removal of friction in the thin Water Ways of Fire Pot and sections.

"Fenestra" Sash gives perfect ventilation, multiplies your factory light, and is both fire and weatherproof.

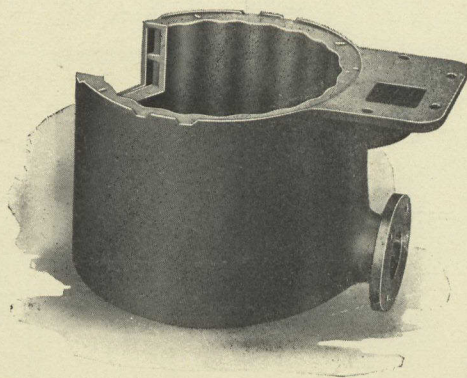
"Steelcrete" Lath, fireproof and artistic, should be included in all specifications requiring the use of reinforcement.

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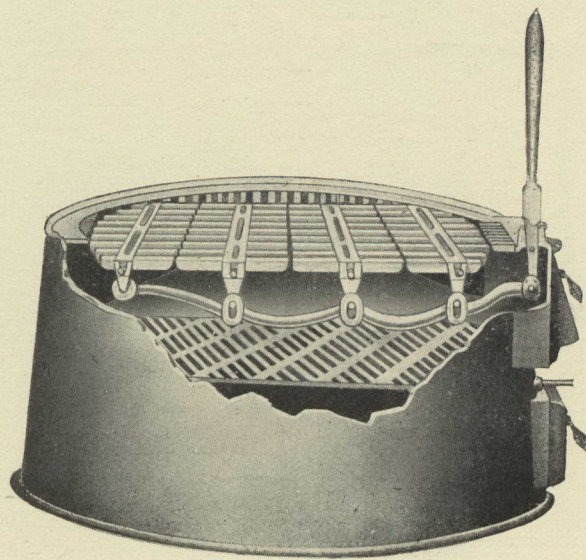
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CORRUGATED WATER WALL IN FIRE POT.



SHOWING CONNECTING BAR AND GRATES —AN EXCLUSIVE FEATURE.

Are Proven Factors in Heating

FACTORS OF SUPERIORITY:

(4) The water openings between the Sections, Fire Pot and Water Post are large and present a minimum obstruction to the streams of water going and coming, thus inducing an easy flow of water which makes circulation faster.

(5) **Special Features of the KING Shaking and Dumping Grate:**

- (a) They are made heavy and strong on the latest approved slicing principle.
- (b) They may be dumped by reversing the handle, which is always in position and of convenient height for shaking without stooping.
- (c) **No Bolts, Nuts or Pins** to unfasten and put into place. The bars may be removed through the Fire Door by simply lifting them out, and replaced by dropping into open socket, "locking automatically."
- (d) **No Lost Motion**—the slightest movement of lever operates the Grates
- (e) The connecting bar, placed at one side, does not obstruct the draft. This insures perfect and complete combustion of the fuel, which burns out to a clean ash.

(6) The ashpit is large and roomy, with doors full width of Boiler, permitting, if desired, the use of Ashpan, whilst making the ashes easy of access.

(7) The large Clean-out Doors, making KING Boilers easy to clean. The Fire Door is wide and placed high in the Fire Pot, which permits easy charging and the carrying of a deep bed of fuel. All doors are perfectly fitted.

(8) "KING" Boilers are made from Iron Patterns, which do not, like "wooden patterns," contract and expand under different conditions of damp and heat. Iron patterns mean an even metal line, reducing to a minimum the possibility of defective sections.

(9) "KING" Boilers are made in half sizes, making it possible to specify closely to actual requirements.

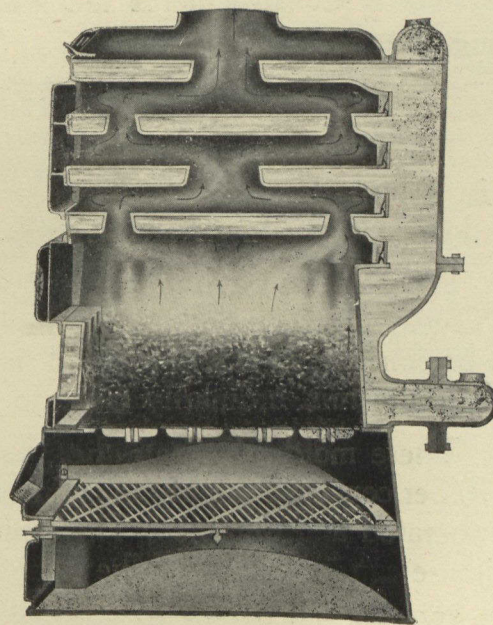
(10) Each section of the KING Boiler is subjected to cold water tests of 100 lbs. pressure, after which the assembled boiler is again put under the same test. Each boiler is rigidly inspected before leaving works.

GUARANTEE.

(11) The rated capacities of KING Boilers are based on actual tests made under varying conditions according to accepted standards, and we guarantee them to be correct, and that they will carry the amount of heating surfaces, as per catalogue ratings.

KING RADIATORS.

"King" Radiators have, by their many exclusive features, won a place above and beyond all other makes—they are considered by most architects and engineers as the only safe radiators to specify, and when installed with King Boilers, make an ideal heating system.



CROSS-SECTION OF "KING" BOILER, SHOWING ARRANGEMENT OF FLUES IN WATER SECTIONS TO SECURE MAXIMUM RESULTS FROM HEAT. NOTE THE LARGE AMOUNT OF HEATING AREA PRESENTED TO THE FLAMES.

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"STEEL AND RADIATION" Products in all the Leading Cities of Canada.



Solid Reinforced Concrete Residence erected by the American Building Corporation at Montclair, N.J.

Monolithic Concrete Houses

A System of Construction that Produces a Fireproof, Repair-proof, Artistic and Durable Dwelling at a Surprisingly Low Cost.—The Concrete House is the House of the Future.—Our System of Construction is the Most Scientific and Economical Known to Modern Building Science.

THE HOUSE OF THE FUTURE

The above house is one solid piece of concrete construction — walls, partitions, stairs, balustrades, mantels, floors and roof. There is no wood in the house, except the doors and window frames. It is absolutely fireproof and indestructible.

We have secured from the American Building Corporation the exclusive rights for Canada for their perfected system of molds with which houses of solid concrete can be constructed at a lower cost than with any other material, and a house can be built in the time ordinarily taken to make and put together a set of molds.

These molds eliminate the present heavy cost of concrete molds, which is usually 30 per cent. or more of the entire cost of the building. They are inexpensive, easily operated and durable. The same molds can be used repeatedly, and any design of house can be built with the same set of molds.

We are sub-letting the rights to use these molds in different districts on a royalty basis and will send full particulars on request.

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BITUNAMEL PREVENTS CORROSION

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We recommend BITUNAMEL for coating iron and steel surfaces as a sure preventative against corrosion. BITUNAMEL is an ideal coating for foundations of buildings whether of stone, brick, or cement, rendering them absolutely waterproof. It has great covering capacity, possesses great elasticity and tenacity. Will not peel off, crack nor blister. It is gas proof, alkali proof, acid proof, and hardens with enamel-like surface. BITUNAMEL is being specified by the leading architects and engineers throughout the world.

GIVES WATERPROOFING RESULTS.

From Sproatt & Rolph, Architects,
Toronto, Can.
The Ault & Wiborg Co., Ltd., Toronto,
Ont.:

Gentlemen,—We have much pleasure in letting you know of the good waterproofing results we have had from BITUNAMEL.

We have given it several practical tests, using it for all the foundation work for the new Victoria University Building, which are built in quick-sand.

We also propose to use it for all the work in connection with the new University of Toronto Group of Buildings.

Yours truly,

SPROATT & ROLPH.

PERFECTLY GOOD AFTER NINE YEARS.

From Henry Lea & Son, Consulting Mechanical Electrical Engineers,
Birmingham, Eng.

Messrs. Ault & Wiborg Co., Toronto, Can.

Gentlemen,—We are in receipt of yours of the 15th inst., and in reply we do not know that we can say anything stronger than we have already said. "Our fresh water tanks were coated nine years ago with Bitunamel, and are still perfectly protected and good."

Yours very truly,

HENRY LEA & SON.

RECOMMENDS BITUNAMEL.

From A. Weller & Co., Ltd., Builders and Contractors, Toronto, Can.

Messrs. Ault & Wiborg Co., Ltd., Toronto, Ont.:

Dear Sirs,—We have pleasure in stating that we used your Bitunamel in connection with several contracts executed by us here, and have found it to be an excellent preparation for waterproofing walls, for foundations, and other surfaces exposed to dampness. We shall be glad to recommend.

Yours truly,

A. WELLER & CO.

USED FOR YEARS ON BRIDGES.

From Liverpool Overhead Railway Company, Engineer's and General Manager's Office, Liverpool, Eng. E. J. Neachell, M.I.Mech.E.; M.I.E.E.; Engineer and General Manager.

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Dear Sirs,—In reply to yours of the 15th inst., would say that Bitunamel has been used on this railway for many years, and has given entire satisfaction.

Yours faithfully,

E. J. NEACHELL.

NINETEEN YEARS AND IN GOOD CONDITION.

From Smith's Dock Company, Limited, Dockowners, Shipbuilders and Engineers, Pontoons Department, North Shields, Eng.

Messrs. Ault & Wiborg Co., Varnish Works, Toronto, Canada:

Dear Sirs,—We are duly in receipt of your letter of the 15th inst., and in reply we have the pleasure in stating that we are perfectly satisfied with Bitunamel, which has been on one of our steel pontoon docks for nearly nineteen years. Up to the present we have found the steel in perfectly good condition, and we have not yet had occasion to renew a single plate in the whole structure.

Trusting the above information is what you require, we remain,

Yours very truly,

SMITH'S DOCK CO., LTD.

COATED FOURTEEN YEARS AGO—STILL PERFECTLY PROTECTED.

From Pattinson & Stead, Laboratory and Assay Office, Middlesbrough, Eng.

The Ault & Wiborg Co., Ltd., Toronto, Can.:

Dear Sirs,—It is quite true we have made observations re Bitunamel referred to by you. When applied the plate was dry and the enamel hot. It was only when the enamel chipped off that rusting could be observed after fifteen years.

We remain, yours truly,

PATTINSON & STEAD,

Per J. E. Stead.

THE AULT & WIBORG COMPANY
OF CANADA, LIMITED
VARNISH WORKS

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GET OUR QUOTATIONS

before placing orders elsewhere for reinforcing steel. Results prove conclusively that no steel reinforcing is superior in strength, efficiency, convenience and economy to

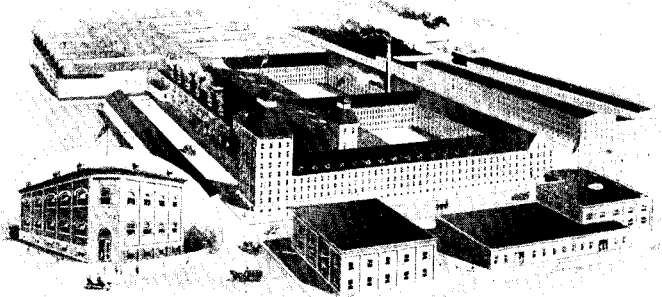
Greening's Steel Wire Reinforcing

It is made of hard drawn double crimped wire mesh, in any strength or length desired. It gives the long length and continuous bond required for large areas of floor and roof. And the convenience with which it can be handled makes it particularly desirable for use in arches, drains, sewers, tunnels, tanks, silos, and work of similar character. Quality considered, our prices are the lowest obtainable.

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FOR EVERY UP-TO-DATE PAINTING REQUIREMENT.

THE TIME has come for Canada to demand something superior to lead paint or distemper. PARIPAN GLOSSY gives a smooth finish in white or any color to woodwork, plaster or metal. It is as washable as a sheet of glass; it does not fade, crack or discolor, and is described by our countless customers as "everlasting." FOR HOSPITALS it is indispensable as it is better in every way than glazed tiles and costs only a few cents per square yard for material. Specify Paripan, glossy or flat (dull finish) for all walls, woodwork and ceilings, in living rooms, bedrooms, bathrooms and kitchens in private houses.

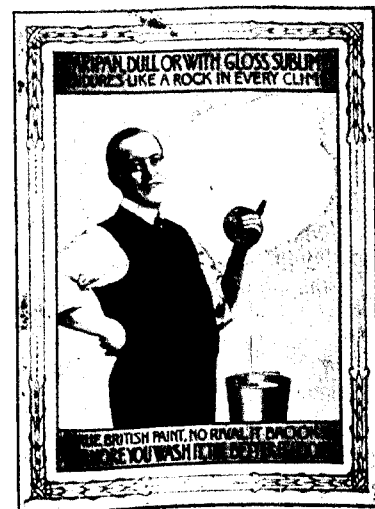
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Send to us now for full particulars and samples.

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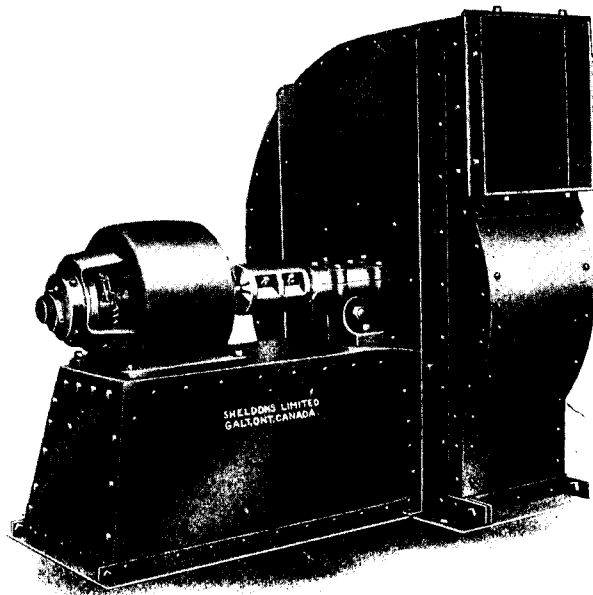
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EFFICIENT NOISELESS
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**Specially Adapted for Ventilating Public
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CANADA



D. B. HANNA'S RESIDENCE, CASTLE FRANK ROAD
TORONTO

Munroe & Mead, Hamilton, Architects

THE accompanying illustrations show some of the possibilities of Roman Stone. It can be used for Residences, Apartment Houses, Schools, Colleges, Office Buildings, Churches, etc.; in fact, for every type of high-class structure where stone may be used. For stone trimmings in all moderate-priced and high-class residential work it has no equal. Roman Stone has also been used by Canada's most prominent architects in Bank Buildings throughout the entire Dominion for monumental construction, where dignity and character were required.

ROMAN

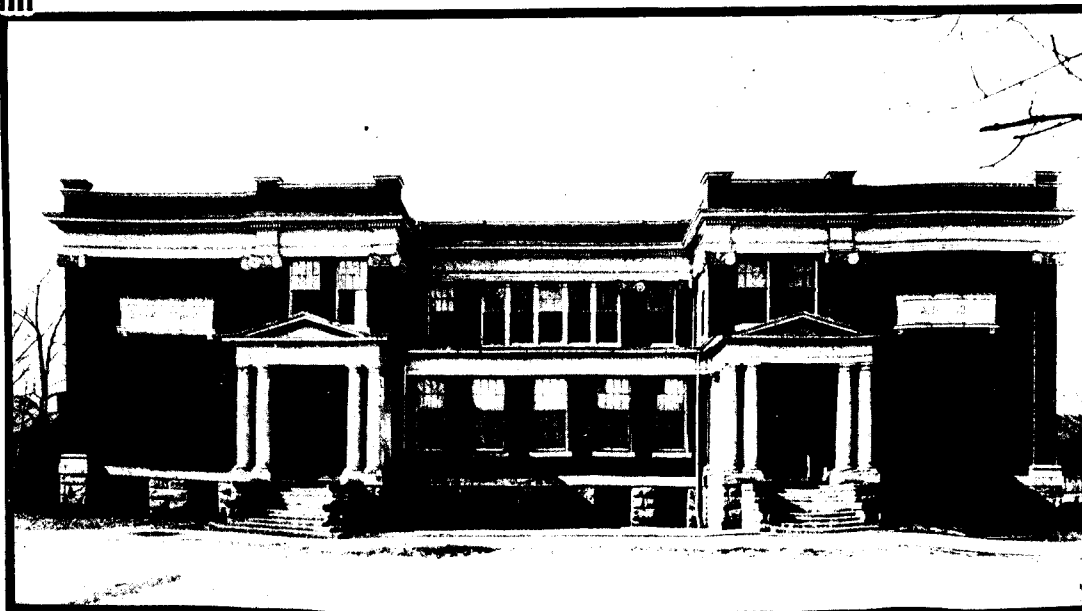
Trade Mark

The Stone of Quality

Roman Stone requires no waterproofing. It is the stone of the same composition throughout, no facing material being used. The popularity of "Roman Stone" is increasing with architects in every section of the Dominion for all work where a superior quality of stone is required. It has proven that it can withstand the effects of the elements for years and has proven its superiority in retaining its beautiful color and texture better than natural stone. The older it gets the better it is, no crumbling, cracking or crazing with age.

BROWN SCHOOL, AVENUE ROAD, TORONTO

City Architects



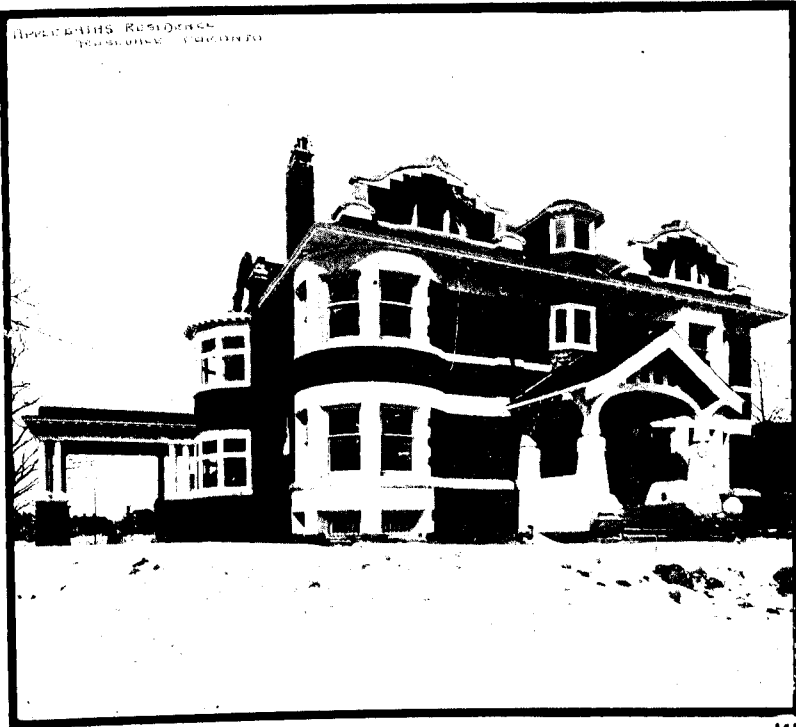
**ROMAN STONE CO.,
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504 and 505 Temple Bldg.

Toronto Weston

OUR plant is the largest and most elaborately equipped in Canada. We are the oldest and most reliable manufacturers of artificial stone in the country. Roman Stone has established itself as a standard product during the past decade. We employ the best skilled workmen, and have the most modern and up-to-date appliances for turning out the highest class stone. We are in a position to carry out work in every portion of the Dominion with promptness. Our staff of draughtsmen is always at the service of the architect to aid him to economically carry out his design.



JESS APPLGATH'S RESIDENCE, GLEN ROAD
TORONTO

Henry Simpson, Architect

STONE

The Same Quality Throughout

The different types of structures in which Roman Stone has been used proves beyond question that it can be used to better advantage and with less cost wherever stone may be used. Any architectural effect the architect may desire to produce in stone can be produced in Roman Stone at a cost substantially less than that of natural stone. There is no natural stone that is stronger or whose color or texture is more beautiful or that retains its color better than Roman Stone. Roman Stone is uniform and in addition to having all the qualities of natural stone it has the snappy, crisp effects of clay modelling which are always present in its execution.

WARRINGTON APARTMENTS, AVENUE ROAD, TORONTO

Forsy Poge, Architect



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ACME No. 85

This is an excellent combination for private installation. Special bent wood Tank with side lever, lined with heavy copper, and our patent elevated high pressure ball cock and valve saddle seat, piano polish.

UNCONDITIONALLY GUARANTEED

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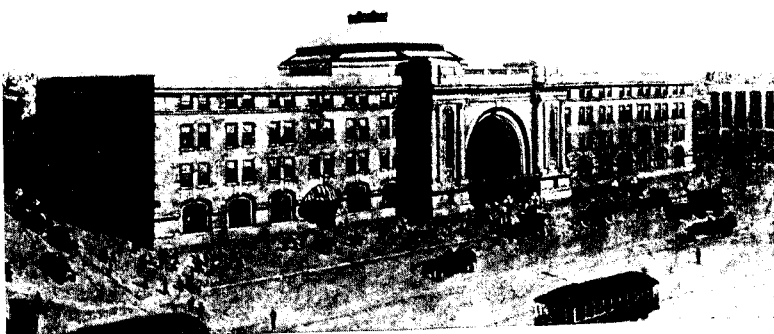
ST. JOHN, N.B.

WINNIPEG, MAN.

SAFFORD RADIATORS

Heated throughout
with

Safford Radiators



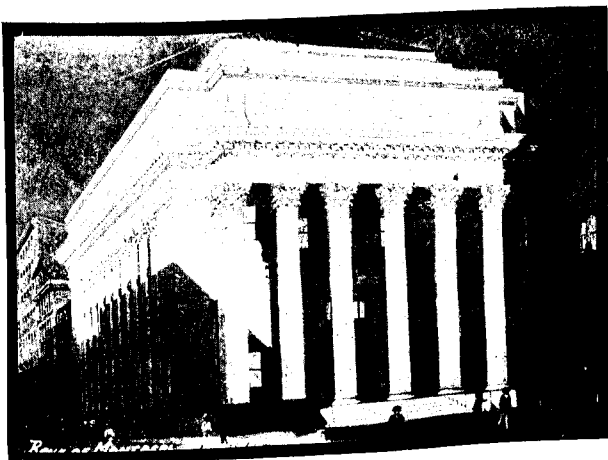
Facade of the New Fort Garry Union Station, Winnipeg, Man.

35,000 square feet of Safford Radiation used in the warming of this magnificent station building and viaducts.

Architects: Warren & Wetmore, New York, N. Y.
Heating Contractors: James Ballantyne & Co.,
Winnipeg, Man.



Rotunda, New Fort Garry Union Station, Winnipeg, Man.



The New Bank of Montreal Building, Winnipeg, Man.

8000 square feet of Safford will be installed in this splendid new banking building. Total cost of building about \$1,250,000.

Architects: McKim, Mead & White, New York, N. Y.
Heating Contractors: James Ballantyne & Co., Win-
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THE MANUFACTURED BY

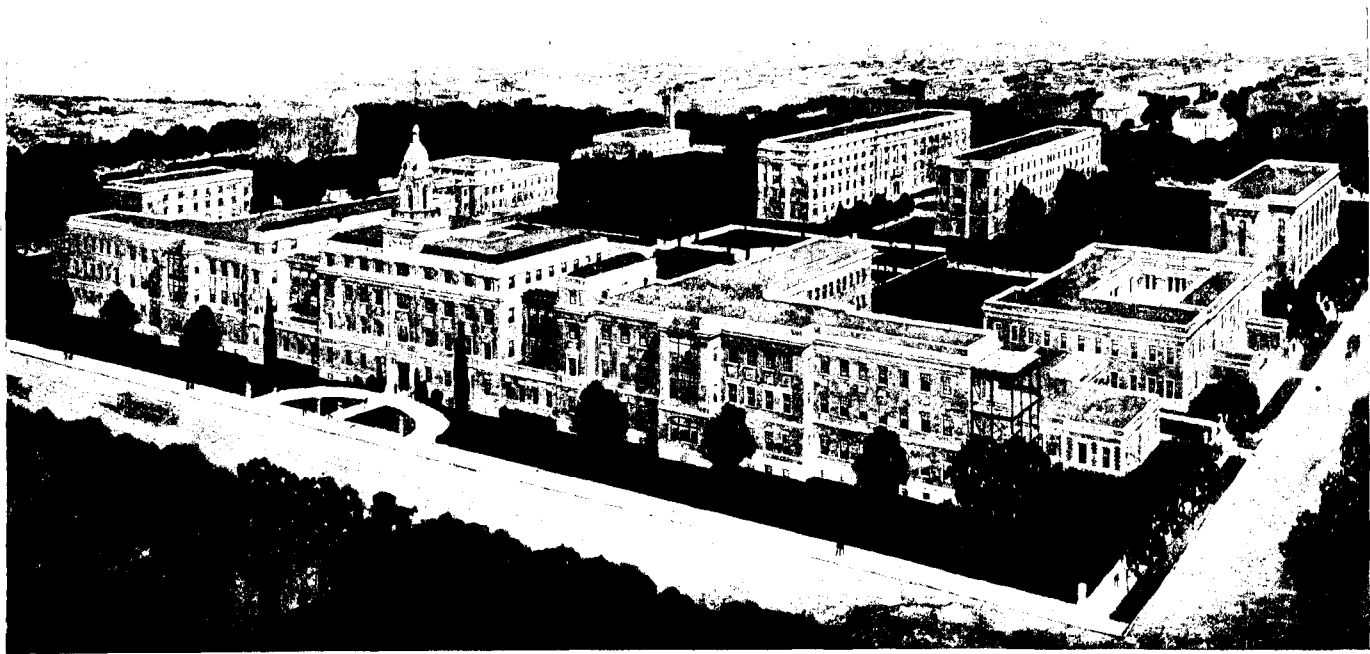
DOMINION RADIATOR COMPANY

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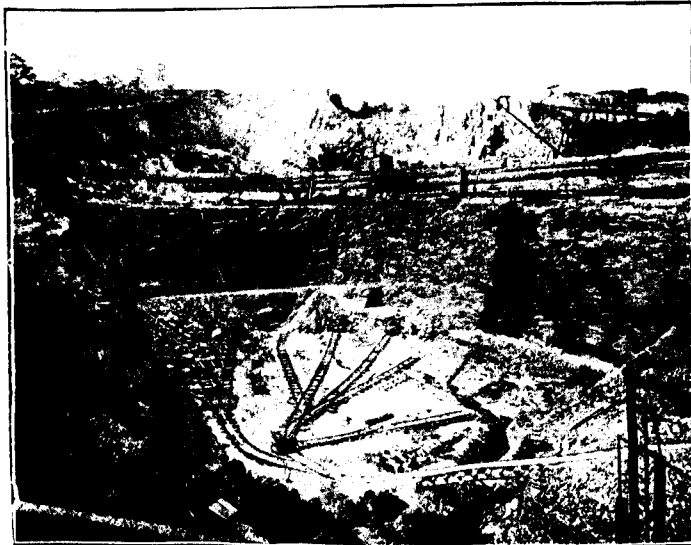
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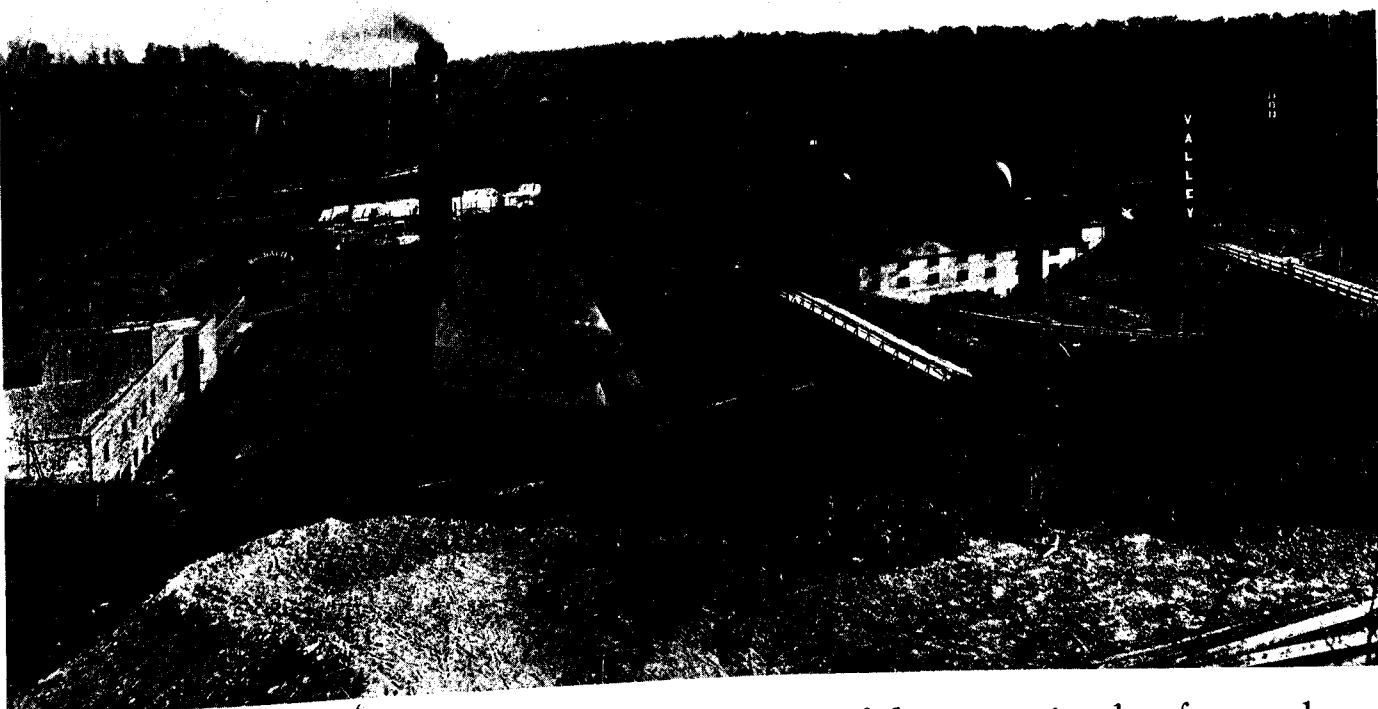
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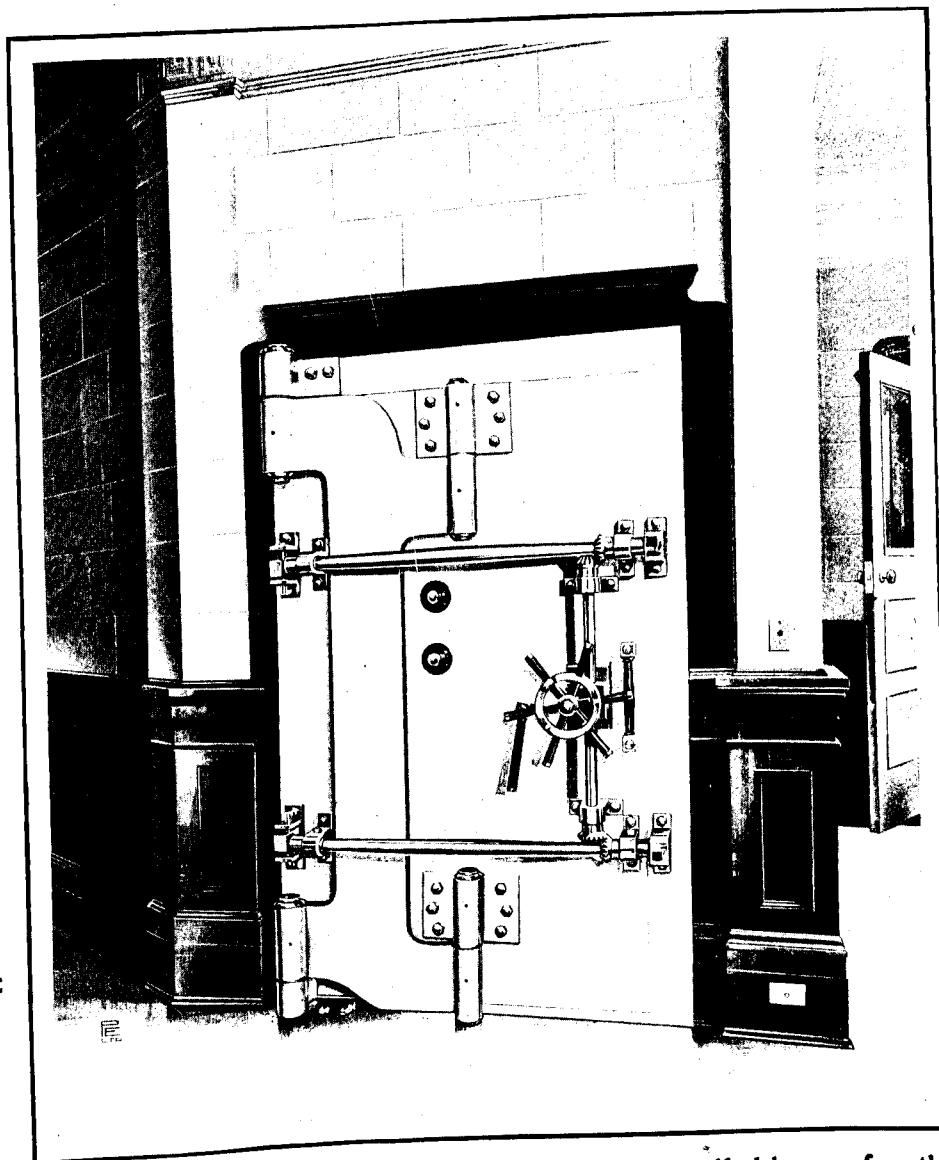
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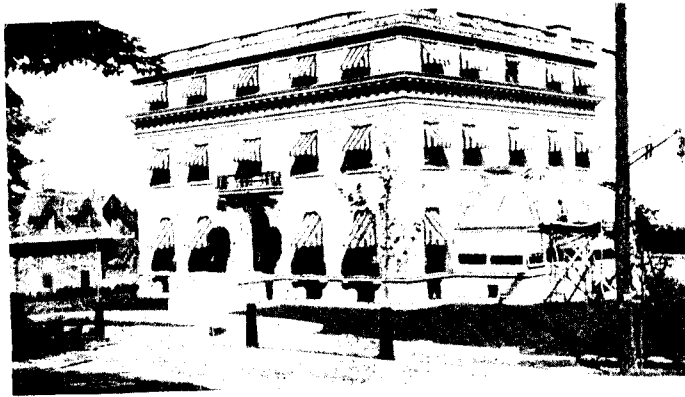
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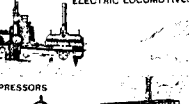
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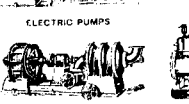
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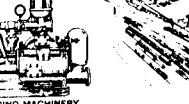
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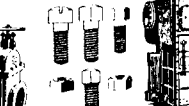
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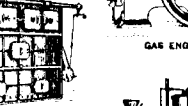
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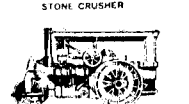
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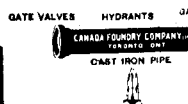
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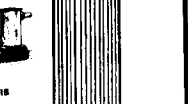
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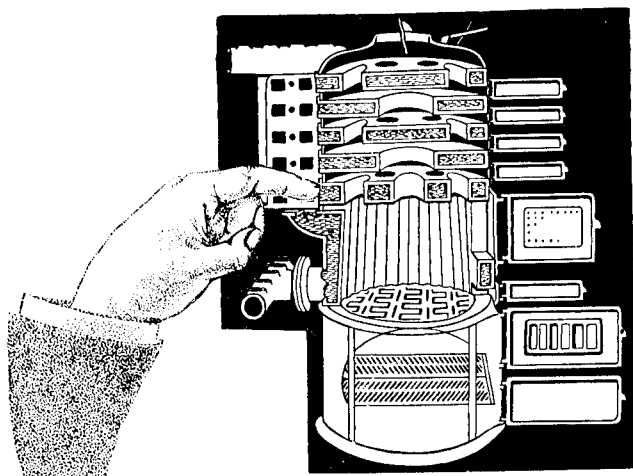
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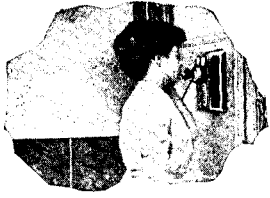
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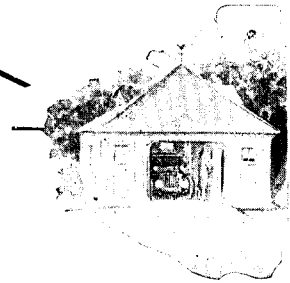
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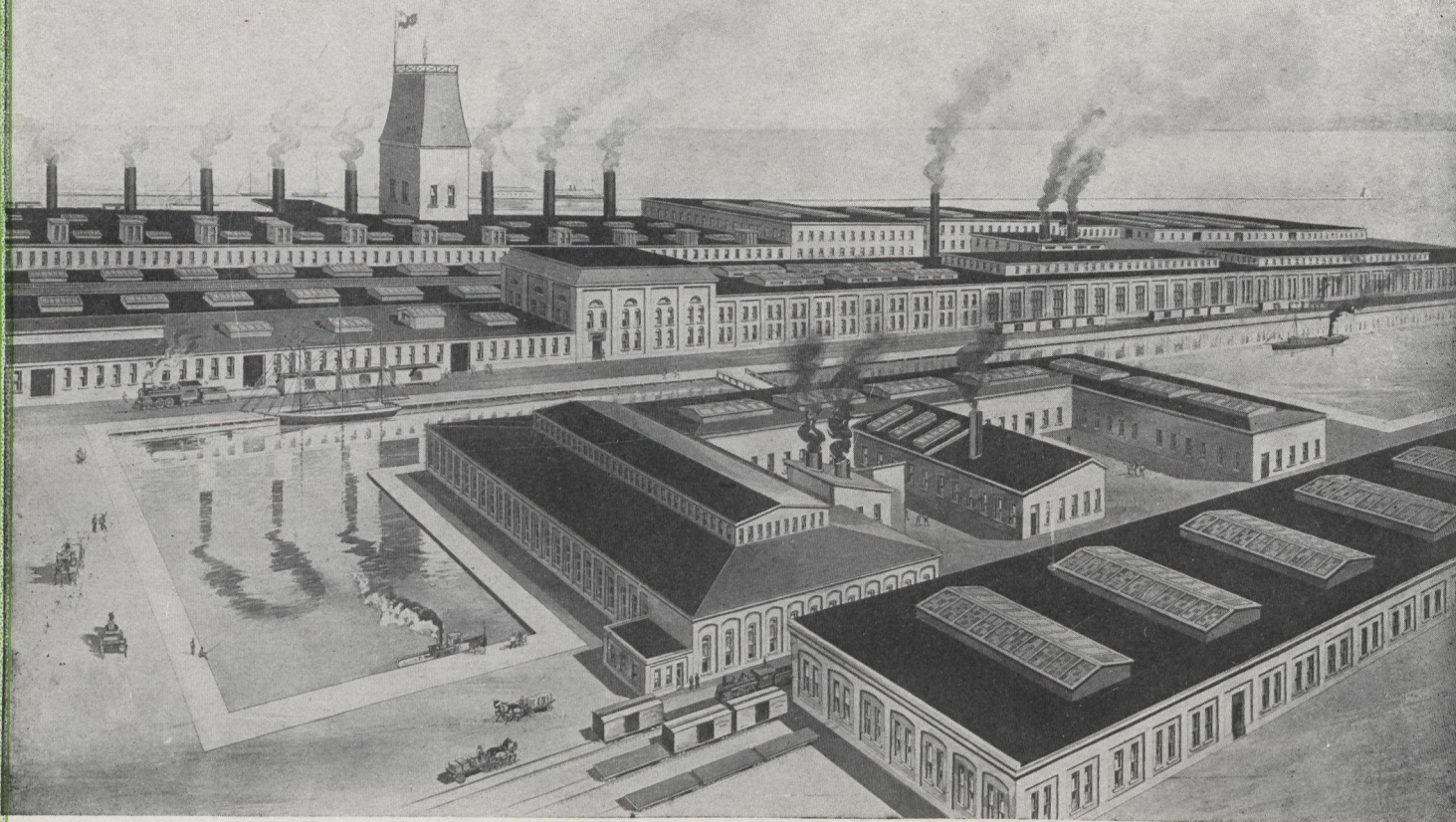


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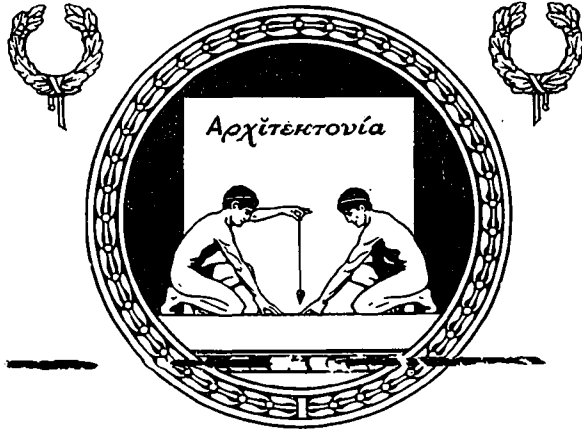
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Vol. 4

TORONTO, MAY, 1911.

No. 6

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Saturday Night Building

TORONTO CANADA

BRANCH OFFICES

MONTREAL—Board of Trade Building. LONDON, ENG.—Byron House, 85 Fleet St. E.C.



Perspective View of the Transportation Building now in Process of Erection at Montreal, and Which Will be a Notable Addition to the Many Imposing Buildings of the Business District. It will Occupy a Site Bounded by St. James, St. Francois Xavier, and Notre Dame Streets, Covering an Area of Approximately 20,000 Square Feet. The Building is to Be As Fireproof as Modern Science can Devise, with Steel Frame and Semi-glazed Terra Cotta Exterior. The Entire Ground Floor, Together with a Mezzanine, is to be Finished in Marble, and has Been so Arranged as to give Ideal Accommodations for Banking and Office Purposes. A Feature of the Plan is a Broad Arcade Extending Through the Ground Floor from St. James St. to Notre Dame Street, with an Intersecting Corridor Leading to the St. Francois Xavier Street Entrance, and Having a Monumental Staircase, Giving Easy Access to the Upper and Lower Floors. Carrere and Hastings and Ross and MacFarlane, Associate Architects.



Building returns for March—Some very substantial individual gains and consistent steady growth in general characterize the month's development.

DOUBLING THE INVESTMENT of the previous month and noting an average gain of 8 per cent. over the corresponding period, the building situation, as indicated in the returns for March submitted to CONSTRUCTION reflects a development which if not proportionately as great as that noted in the early part of last year, shows a state of progress at least equal to that which has existed heretofore. An element of spectacularism as regards certain individual gains, and a consistent, steady, growth in general, both characterized the trend of operations for the month. Of the twenty-six cities reporting, eighteen steered a straight-ahead course, exceeding in some instances their former figures by a tremendously wide margin. Four of the more important places went \$1,000,000 or better, seven other registered totals ranging from \$100,000 up; while in a number of lesser centres, though the volume of work was not as great and the investment not quite so pronounced, the advance made was such as to give every assurance of a much more prosperous condition than existed in the previous corresponding period.

Winnipeg's heavy decrease (60 per cent.), was by far the biggest offset for the month, and this together with the set back of 38 per cent. experienced in the case of Ottawa, as well as the respective declines of 32 and 53 per cent. noted in the case of Lethbridge and London, put a big crimp in an average gain that otherwise gave every indication of being most promising. As it was, the situation throughout the country, gave the builders little or no reason to complain. Toronto's investment of \$2,210,770, netting a gain of 39 per cent., reflects a state of enormous activity; but hardly is the total noted in this case of more striking dimensions than that recorded by Vancouver, where the work projected amounted to \$2,147,798, as against \$1,806,106 in the same period last year. Unless a false impression prevails, both of the places are about to pass through a year of wonderful expansion, one in

fact that will be well worth noting from month to month. Calgary also has designs on big things, as is evidenced by her total of \$1,012,260, which is just 143 per cent. better than her previous corresponding amount. Edmonton, which has a gain of 3 per cent., although less active, nevertheless registers a substantial amount, while Medicine Hat, in the same province, by an advance of 1700 per cent., has the biggest proportionate increase noted in the list. Other Western gains are: Victoria, 14 per cent.; Moose Jaw, 25 per cent.; and Regina 65 per cent., the investment in the latter place amounting to over half a million dollars.

Besides the two losses previously referred to, Ontario sustained decreases in both the case of Peterboro' and St. Thomas, although the falling off in either place, considering the comparative figures, really amounted to little. Aside from this the province in general witnessed a vastly improved condition. Fort William advanced 80 per cent.; Hamilton gained 21 per cent.; and Kingston is ahead by 29 per cent. Gains were also made at Port Arthur and Stratford to the extent of 176 per cent. and 38 per cent. in order named, while Berlin submits a total of \$29,295, which is definitely known to represent a larger volume of work than was undertaken in the same period last year.

The province of Quebec is represented by the figures of Montreal and Quebec City, and although the latter failed to furnish comparative amounts, the total registered is such as to indicate good headway. Montreal shows the same unremitting progress that has characterized her remarkable development during the past two years. Permits were issued for new work amounting to \$1,101,577, as against \$676,804 in the same period last year, the total noted being the third highest amount recorded for the month. East of these points, Halifax and Sydney are respectively in the arrear to the extent of 49 and 30 per cent., and St. John again fails to report. However, there are a number of towns in the maritime section, not included in the list, that are carrying out quite a representative amount of improvements.

As regards Winnipeg, it might be said that with such buildings as the Hudson Bay Company's new department store and a 14 storey structure to be

built by an English syndicate in prospect, the outlook is most encouraging. In fact, a spirit of optimism prevails in general, and this in itself is a reliable indication that all sections are moving ahead under full steam and with the throttle wide open.

	Permits for March, 1911.	Permits for March, 1910.	Inc. Per Cent.	Dec. Per Cent.
Berlin, Ont.	\$ 29,295	.....	.....	.....
Brantford, Ont.	43,445	\$ 11,470	278.77	.....
Calgary, Alta.	1,012,260	415,800	143.45	.....
Edmonton, Alta.	276,825	266,585	3.84	.....
Fort William, Ont.	166,850	92,585	80.21	.....
Hallifax, N.S.	22,000	43,800	.....	49.77
Hamilton, Ont.	350,300	289,390	21.05	.....
Kingston, Ont.	19,172	14,850	29.10	.....
Lethbridge, Alta.	81,500	120,420	.....	32.32
London, Ont.	65,638	139,700	.....	53.02
Medicine Hat, Alta.	78,450	4,460	1,700.00	.....
Montreal, Que.	1,101,577	676,804	62.76	.....
Moose Jaw, Sask.	74,100	58,825	25.96	.....
Ottawa, Ont.	134,475	219,350	.....	38.70
Peterboro, Ont.	6,655	10,327	.....	35.56
Port Arthur, Ont.	14,810	5,365	176.05	.....
Quebec, Que.	47,350	.....	.....	.....
Regina, Sask.	545,025	329,650	65.33	.....
Stratford, Ont.	8,580	6,210	38.16	.....
St. Thomas, Ont.	8,650	15,500	.....	44.20
Sydney, N.S.	12,440	17,935	.....	30.07
Toronto, Ont.	2,210,770	1,583,165	39.64	.....
Toronto, Ont. ....	.....	.....	.....	.....
Vancouver, B.C.	2,147,798	1,806,106	18.92	.....
Victoria, B.C.	279,945	244,760	14.37	.....
Windsor, Ont.	60,250	27,225	121.30	.....
Winnipeg, Man.	1,007,400	2,543,150	.....	60.39
	\$9,805,550	\$8,943,432	8.79	.....

Toronto Society of Architects dine—Members discuss employment of foreign architects by Canadian corporations—Exhibition of Canadian work to be arranged shortly.

A MOST SUCCESSFUL and enjoyable dinner was held by the Toronto Society of Architects at the National Club on Thursday, April 6th, at which about fifty members and guests attended. The discussion of the evening dealt mainly with "the employment of foreign architects on Canadian buildings," and the general feeling shown with regard to this important subject made unmistakably plain that Canadian architects feel very strongly on this subject.

The chair was occupied by the President of the Society, Mr. Acton Bond, who in addressing those present, dwelt upon the advisability of the employment of Canadians as designers of buildings to be erected in Canada. Mr. Bond called upon Mr. John M. Lyle to open up the subject of the evening, and, to say the least, his remarks were most pointed. Attention was called to the oft repeated words of Canadian people that Canadian architects have not had experience in designing large structures, and that it was therefore necessary to go to the United States to secure architects who have established reputations as designers of great buildings. In criticizing this contention, Mr. Lyle asked if all big work to be executed in Canada is to go to foreign designers, how can we ever expect to have Canadian architects who have had experience in designing large buildings? He pointed out that the attitude in no other country in the world was so unmindful of the advantages to be obtained through the establishment of national architecture as that shown

by Canadian people. Canada, it was true, was a new country, and although it had not possibly developed in the arts to a degree equal to that of the older countries of the world, at the same time it was necessary to make a start. Art must be encouraged and an architecture developed, and that architecture should be of our own making, and reflect our own national life. This subject proved to be pretty much of a live topic, and the talk of Mr. Lyle was further enlarged by additional remarks from the following guests: Prof. Mavor, of the Chair of Political Economy, Toronto University; E. Wylie Grier, Pres. Ontario Society of Artists; Mr. A. F. Wickson, Pres. of the Ontario Association of Architects; R. Dinnis of the Builders' Exchange; A. Munro Grier, K.C.; C. W. Jeffries, Mr. J. E. Middleton, and Ivan S. Macdonald.

Mr. Wickson referred to the cordial and friendly feeling that existed between the Ontario Association and the Toronto Society of Architects, and he expressed the hope that both would keep working to a common end, and co-operate with each other in striving to promote a better architecture.

Mr. Lyle further on in the evening, announced that an exhibition of the work of Canadian architects would shortly be held in the new Art Galleries under the auspices of the Toronto Society of Architects, to give the Canadian public an opportunity of viewing the work of architects in Canada. This project brought forth a strong expression of approval from those present.

In all, the dinner was a most successful one. The speeches were short, crisp, and to the point, and most of them full of witticisms.

Mr. Edison makes extravagant statement regarding buildings of the future—Condemns brick and steel and predicts much for concrete.

IN A RECENT ARTICLE in one of the popular American magazines, Mr. Thomas A. Edison makes some astonishing prophecies as to the improvements that will be brought about during the next fifty years. He tells us that books will be made of nickel paper. That in a book two inches thick there will be 40,000 pages. That these nickel sheets will be more opaque than paper, and will be more easy to print upon. He tells us that all furniture in the future will be made of steel. He further tells us that steel construction will be a thing of the past. He tells us that the "age of steel" about which we brag so much is nothing to brag about. He says we brag about it because we don't know any better. He has also something to say about bricks. He says ancient Egyptian builders used sun-dried bricks, that the sun was too slow for us, and that we built fires to dry out bricks, and that we clung to bricks and stone. But he still goes further, yes, so far that, even though it is a statement by the wizard, we cannot accept it with any great degree of credulity. He says "men are lunatics to

keep on building with brick and steel. Reinforced concrete is better and cheaper than either. Builders who stick to brick and steel are behind the times. Men who put up wooden structures are worse than lunatics. It is because we use such building material that fire losses amount to almost \$5,000,000 a year. To think what a waste of materials and labors this sum represents. It is all unnecessary. Reinforced concrete is not only cheaper than brick and steel, but is fire-proof. A reinforced concrete building will stand practically forever. Within thirty years all construction will be of reinforced concrete, from the finest mansion to the tallest sky-scraper." He stated that he could reproduce the fifty story Metropolitan tower in concrete, and that an earthquake could not overturn it.

We are prepared to concede that Mr. Edison is an exceedingly well-informed man on many subjects, but had he been more conservative in his remarks with regard to the comparative value of reinforced concrete and other buildings now in use, they would have carried with them very much greater weight with those who know. There is no question but that reinforced concrete has become a very strong factor in modern building construction, but to say that men are lunatics to build of other materials than reinforced concrete, seems rather ridiculous. With regard to bricks, Mr. Edison surely knows the history of the manufacture of brick, why the Egyptians first made brick. Knows about the brick revival by the Byzantines, who established a particular type of architecture. Also of the further revival in Italy, and about the revival that again has taken place in England and is to be seen in America now. There is more than structural value to be considered in a building. If not so, we might all be content to live in mud huts providing they were strong enough and would last long enough.

Reinforced concrete for the structural frame work of a building is becoming more and more popular. First, because of its fireproof character. Second, because of its vibration proof and corrosion proof advantages. But the architectural possibilities of brick are such that at no time can concrete, stone, or any other material, absolutely replace it. Brick, it is true, is not used to-day as a structural material nearly as much as it was twenty years ago, but a concrete skeleton must be clothed, and the most comely clothing that the architect can put upon a concrete skeleton is brick. Mr. Edison talks entirely of monolithic construction, and the facts of the matter are that men who sell reinforcement, men who are in touch with the profession, relative to these matters to-day, sell and recommend a monolithic structure. The disadvantage of building monolithic concrete walls is the cost of the lumber and labor necessary in making the forms into which the concrete is to be deposited. In some cases it is common knowledge that the form work has cost as much as the concrete itself. In other respects, the cost is often more than brick work, and unless it forms a backing to stone or brickwork, it has to be floated or rough-cast externally. It is true, for build-

ings of some magnitude, of a plain character, free from irregularities of plan, and of a simple design, such as warehouses, farm buildings, and factories, it can be used in most cases to advantage, so far as regards cost, while it may possess much greater strength and durability and freedom from the necessity of repairs, more so than ordinary brick walls.

To quote from a paper written by Mr. Teapotter before the Concrete Institute of London, "it is too early to affirm how long monolithic Portland cement concrete buildings are going to last, but there is not much doubt on that point. The oldest in England probably does not exceed from 45 to 50 years. But, with regard to monolithic concrete walls being weather-proof, I have never known an instance of their being otherwise, if they were cemented or rough-cast externally. As to the immediate future of concrete for buildings and other purposes in large towns, its present use seems to indicate that it will be confined principally to floors and roofs, and in connection with skeleton steel frame construction, and in skeleton reinforced concrete construction. Monolithic reinforced walls will possibly not find much favor. They certainly do not with the architect at the present time. There is the difficulty of external surface treatment, the cost of temporary forms and minor difficulties. The walls of factories, workshops, warehouses, and a similar class of buildings where no architectural treatment is designed, and which are simple in plan and arrangement, can possibly be built at a less cost than with brick or stone, and for farm buildings, concrete is still better adapted, as it is applicable not only to walls, but to pavings for live-stock places and for floors, and almost the entire fitments. Mangers, feeding-troughs, water-troughs, tanks for storing rain-water, stable stall divisions, channel gutters and manure pits are better executed with concrete than with any other material, and at a less cost."

In view of these facts, we do not see that the most enthusiastic practical cement or concrete expert can agree with Mr. Edison, in his most sweeping statements. Mr. Edison undertook to build a monolithic concrete house from a set of iron moulds. His house, he claimed, could be built in a day. We have had no demonstration as yet to prove the practicability of his scheme. Possibly, Mr. Edison's remarks were intended only for the lay public, but they surely sound far fetched to the engineer and architect.

Tax exemption to encourage erection of buildings—Western Canada cities lead in enactment of tax legislation affecting new improvements.

IT SEEMS by a comparison with other countries that some of Canada's Western cities are leading the way in the enactment of tax legislation to promote building, and according to the "Architectural Record," in commenting upon the subject, architects cannot be indifferent to the growing move-

ment in favor of exempting from taxes, improvements upon land, or at least of taxing vacant land at a higher rate than improved property. It is pointed out, for example, that in Vancouver—which is the metropolis of British Columbia, and a city of about eighty thousand population—there is no tax on improvements, and that it is enjoying one of the greatest real estate and building booms ever known. Victoria and other towns in the province assess improvements at 50 per cent. or less of their value, while the law calls for full value assessment of land. Edmonton, the capital of Alberta, has exempted improvements for a number of years. In the province of Ontario, it is stated that two hundred and fifty municipalities have petitioned Parliament for power to assess land values at a higher rate than improvements. Other countries within the British Empire are also legislating this way. In New Zealand, nearly one-half of all improvements are exempt from taxation. In New South Wales improvements are not taxed anywhere practically, except in Sydney, the capital, and it is expected that they will shortly be exempted there. It is reported that a great building boom is in progress through New South Wales as the result of this action. In the United Kingdom, over five hundred local taxing bodies, including London, Glasgow, Liverpool and Manchester, are stated to have petitioned Parliament for power to make land values the basis of local taxation. The German Empire is applying this principle to its colonies; and Italian cities levy a special tax on vacant lots, while exempting improvements from taxation for a period of two years.

The rapidly increasing use of wood for residence interiors renders it necessary to employ some sort of fireproofing compound to minimize the danger from fire.

THE DISTRESSING CIRCUMSTANCES surrounding the fire in a residence on Indian Road, Toronto, resulting from ignition of a beamed ceiling from the gas jet, stands as an argument in favor of the use of fire-resisting compounds to be applied on interior wood finish. The interior woodwork in the modern residence (very often of a Southern pine) is invariably soaked and saturated with varnish or stain, the principal constituent of which is either turpentine or gasoline. It would seem only reasonable at this time, when such extraordinary precautions are being taken in the fireproofing of the modern business building, that some consideration should be given to the application of methods in house construction that would, at least, not encourage the spread of fire. Owing to its great convenience, economy and pleasing appearance in building construction, timber will probably remain one of the most generally used construction materials so long as a supply is available at reasonable prices. It is desirable, however, in deference to modern views on fire-resisting construction, that timber should no

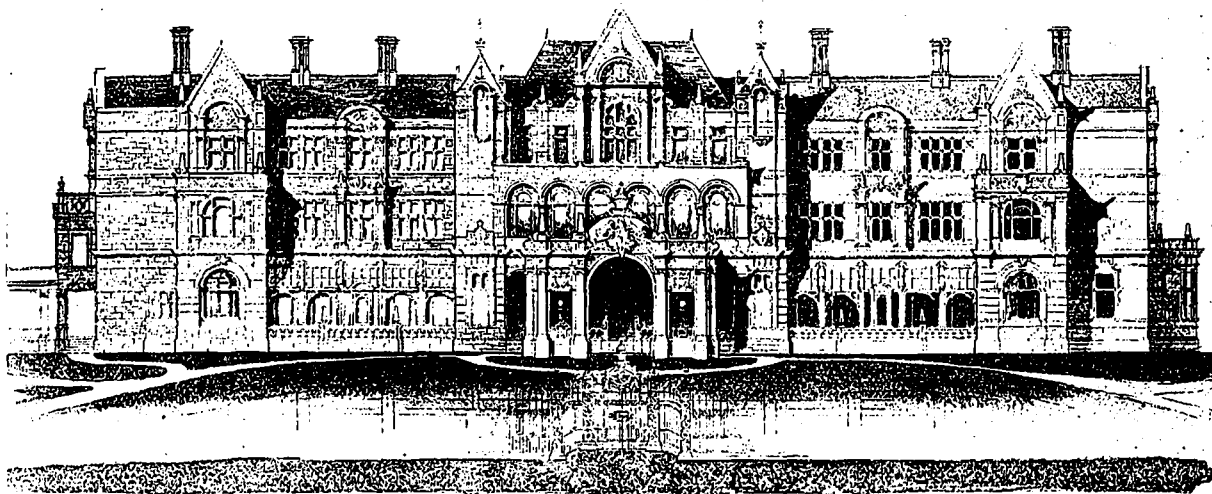
longer play the part of welcoming every outbreak of fire in buildings and of providing excellent fuel for flames.

A process, adopted by a firm in England, consists in submitting wood to vacuum treatment in a closed steel cylinder, where air, moisture, and sap are removed and a chemical solution is forced into the pores and fibres under hydraulic pressure, the timber being afterwards dried in a kiln.

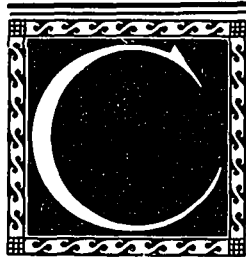
Timber so treated retains its normal strength and quality; it can be worked, painted, polished, nailed, or glued in precisely the same way as untreated wood, from which it differs only in the respect that the stable and non-volatile impregnating crystals impart such resistance to fire that splinters taken from a sample may be held in the flame of a Bunsen burner or in an electric arc without more than local carbonization at the point of contact. No flame is spread, and on removal of the source of heat the charring ceases.

It should be recognized that the object of fire-resisting wood is not to compete with materials calculated to withstand great heat without serious injury. On the contrary, its purpose is to prevent any small outbreak of fire from growing into a serious conflagration. Apart from papers and textile fabrics, ordinary timber is the substance chiefly responsible for feeding the infant flames of a building fire. The timber floors, wainscoting, stairs, doors, window-panes, and other details of the average building constitute the real danger of a conflagration, because when once the woodwork is fairly alight it goes on burning with increasing violence until finally the whole structure is enveloped in flames. It is evident, therefore, that anything calculated to remove or minimize this danger is of much public importance, and for this reason we have pleasure in calling attention to the process briefly described in the present note. We may add that the cost of impregnation is by no means prohibitive, and that wood so treated has been largely used in England by the Office of Works, several county and municipal authorities, railway companies, and industrial firms in building construction and other works.

THAT A YEAR of remarkable railway development lies immediately ahead of the country seems certain from the number of important announcements made by the transportation companies within recent date. The West in particular will witness a period of pronounced activity, and several important projects in that section are already underway. In addition to grading and track-laying, it is stated that the Grand Trunk Pacific will build 140 new stations, and that Canadian Pacific will open fifty new towns on its new lines during the coming summer. The improvements projected will tend to substantially improve the existing lines, besides opening up considerable new territory that has heretofore been undeveloped. In all, the various projects will represent the expenditure of a huge sum.



Front Elevation Facing Bloor Street, Competitive Design, (Awarded First Prize), of Architect George W. King, for new Government House, Toronto.



COMPETITIVE DESIGNS FOR ONTARIO GOVERNMENT HOUSE

Illustrations and descriptions outlining features of preliminary studies submitted by five of the eleven competing entrants for new Lieutenant-Governor's Residence, Toronto

PUBLISHED in this connection are several available designs submitted in the recent competition conducted by the Department of Public Works of the Province of Ontario for the proposed new Government House, which was previously commented on editorially in these columns. Although the conditions of the competition were not generally approved of by the profession, certain of the individual schemes presented for consideration are so comprehensively conceived and so commendable developed from the view point of preliminary study, as to warrant the assumption that the reproduction of the accompanying designs, together with the description of the entrants concerning the features of their respective plan, will prove of no little interest to the reader.

Architect George W. King's Design

The design submitted by Architect George W. King, Toronto, which was awarded the first prize, is described by its author as follows:—

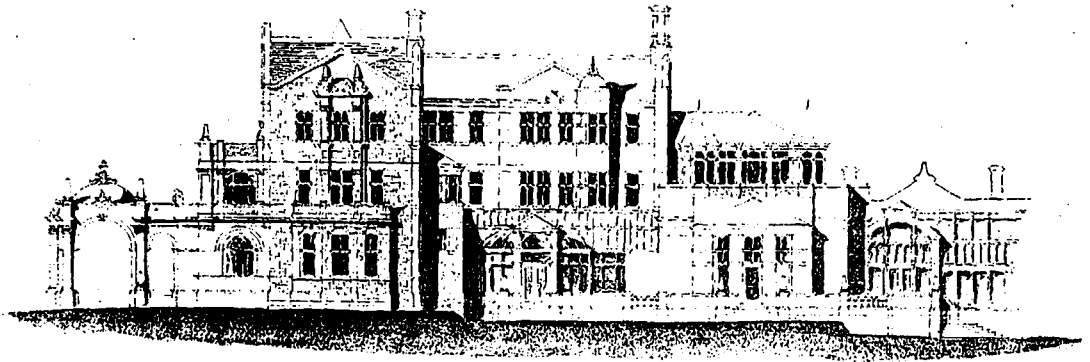
According to the final instructions of the programme, providing for a ball room which could also be utilized for dining purposes and other forms of entertainment, an arrangement is necessary which affords direct communications from this room to both the kitchen quarters and the state and private dining rooms.

While this requirement has brought about a some-

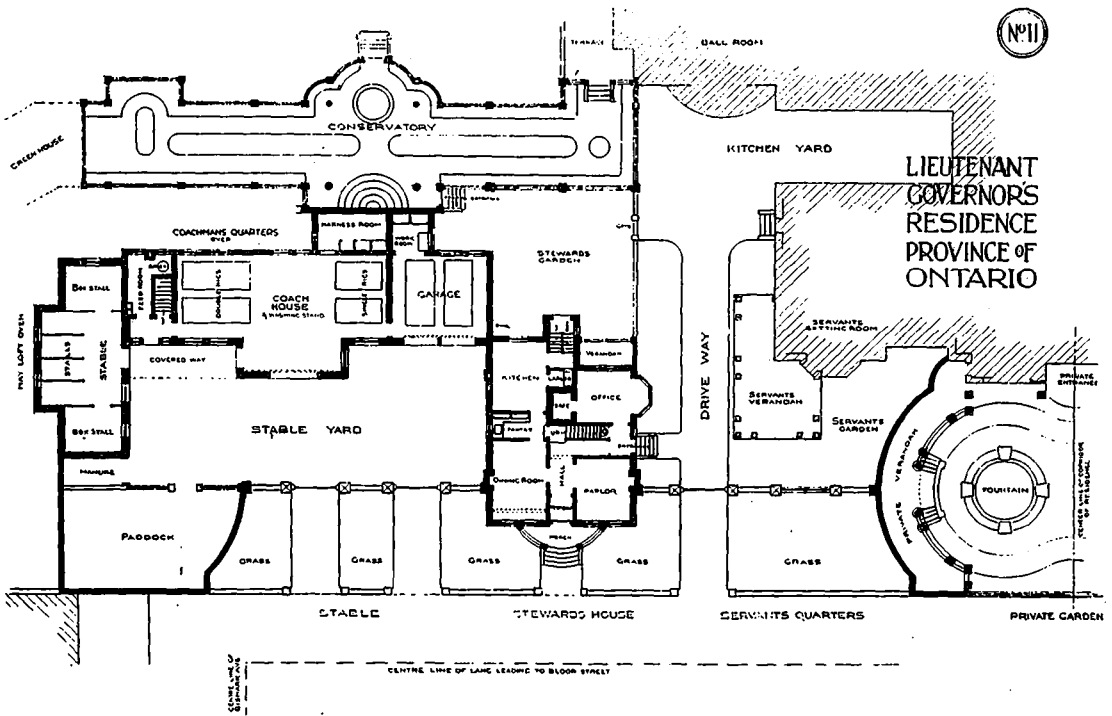
what unusual plan for such a large residence, and has to a certain extent upset the symmetry at the back of the building, it will be observed that all the state rooms can be conveniently utilized either separately or in conjunction one with the other for such functions as the occasion demands, and in connection with the terraces at months of the year when the weather permits. The remaining rooms have been arranged so as to provide direct access to the secretary's office from the hall through the Lieutenant-Governor's private office opening off the library.

It is proposed to put a door across the hall at the grand staircase, so that the private rooms may be entirely shut off at times when gentlemen only are entertained. The arrangement is such that the Lieutenant-Governor's family will be in no way interfered with on occasions of this character. The private entrance, verandah, conservatory and stair-case leading to the bedroom suite allotted to their use and placed immediately between the state rooms and servants' quarters, further assists in this respect. The colonade verandah at the north of private garden shuts off the view of the servants' quarters, and adds to the attractiveness of the scheme on that side of the house, as well as obscuring the garden from public view.

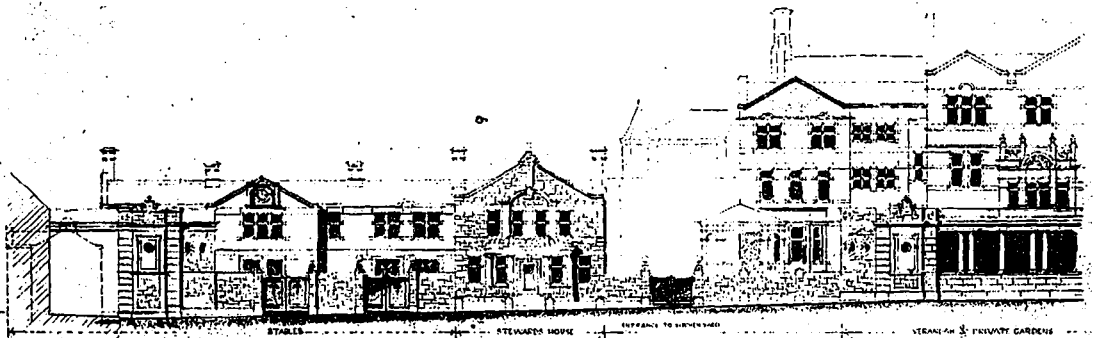
The stair-case at the east end of the corridor is designed specially for the use of the honored guests, and leads direct to the state bedroom apartments.



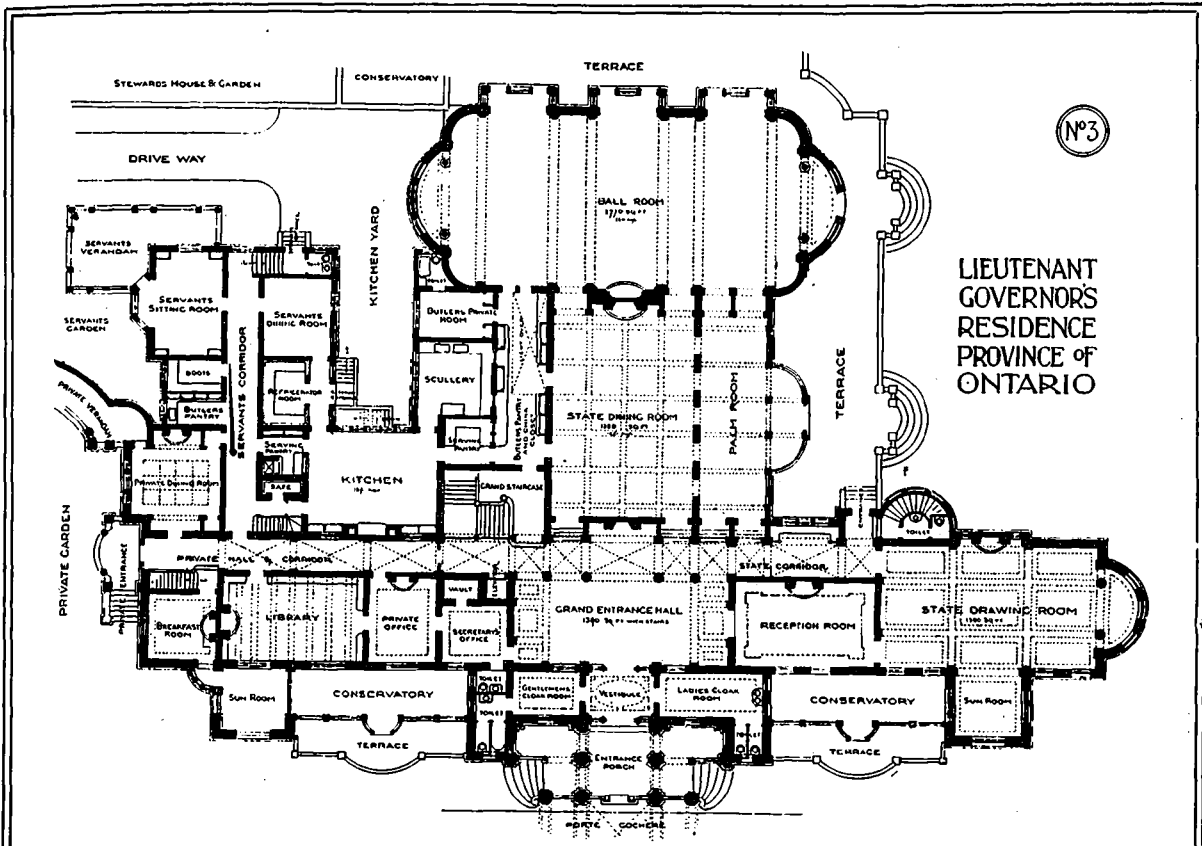
East Elevation, Competitive Design of Architect George W. King, for new Ontario Government House, Toronto.



Plan of Steward's House, Stables and Garage, Competitive Design of Architect George W. King for new Ontario Government House, Toronto.



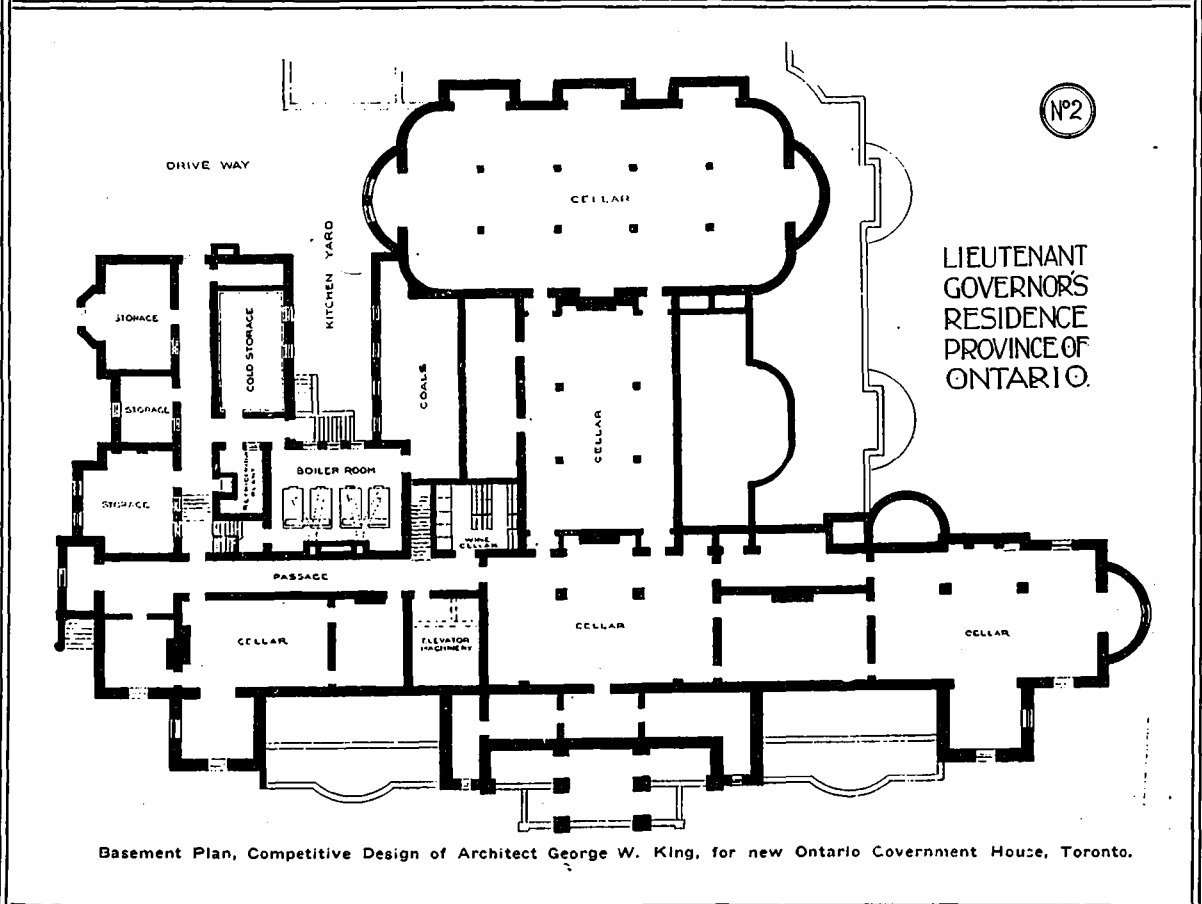
Elevation on Lane, Competitive Design of Architect George W. King, for new Ontario Government House, Toronto.



№3

LIEUTENANT
GOVERNOR'S
RESIDENCE
PROVINCE OF
ONTARIO

Ground Floor Plan, Competitive Design of Architect George W. King, for new Ontario Government House, Toronto.

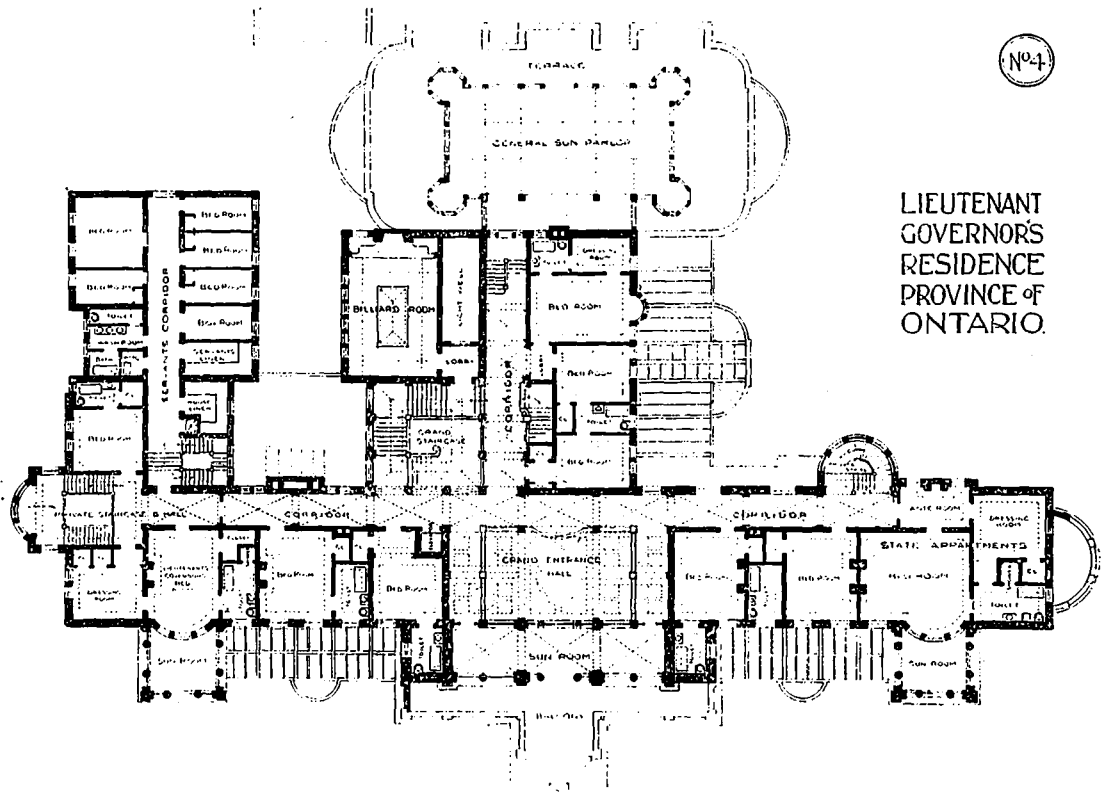


№2

LIEUTENANT
GOVERNOR'S
RESIDENCE
PROVINCE OF
ONTARIO.

Basement Plan, Competitive Design of Architect George W. King, for new Ontario Government House, Toronto.

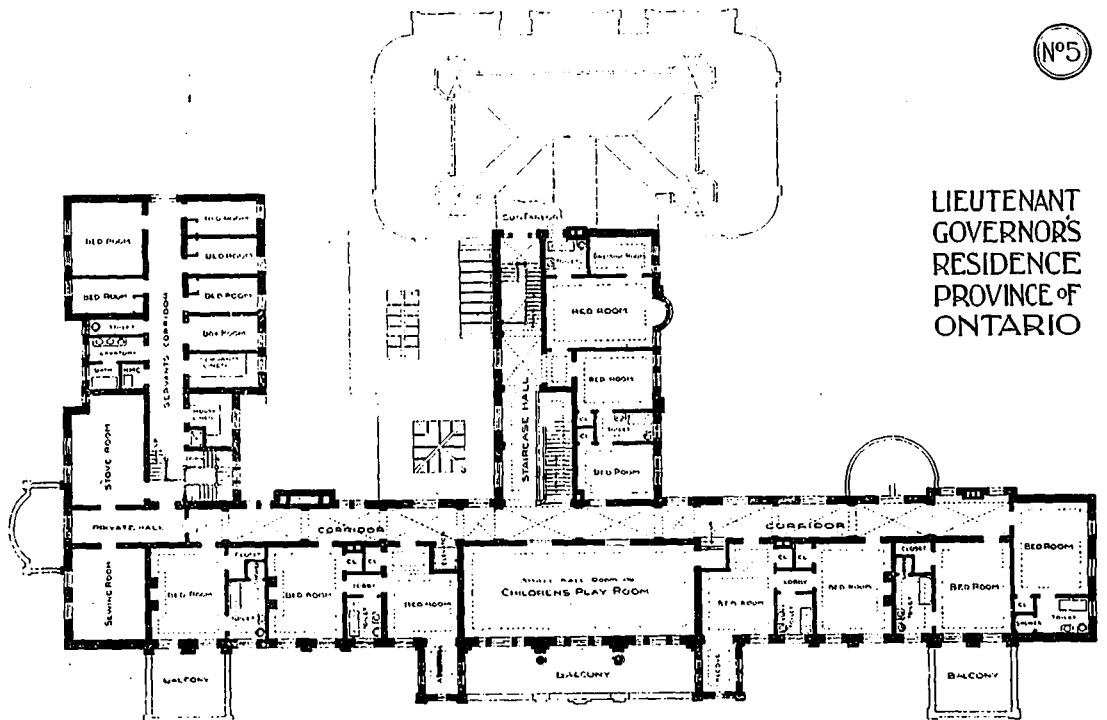
NO. 4



LIEUTENANT GOVERNOR'S RESIDENCE PROVINCE OF ONTARIO

First Floor Plan, Competitive Design of Architect George W. King, for new Ontario Government House, Toronto.

NO. 5

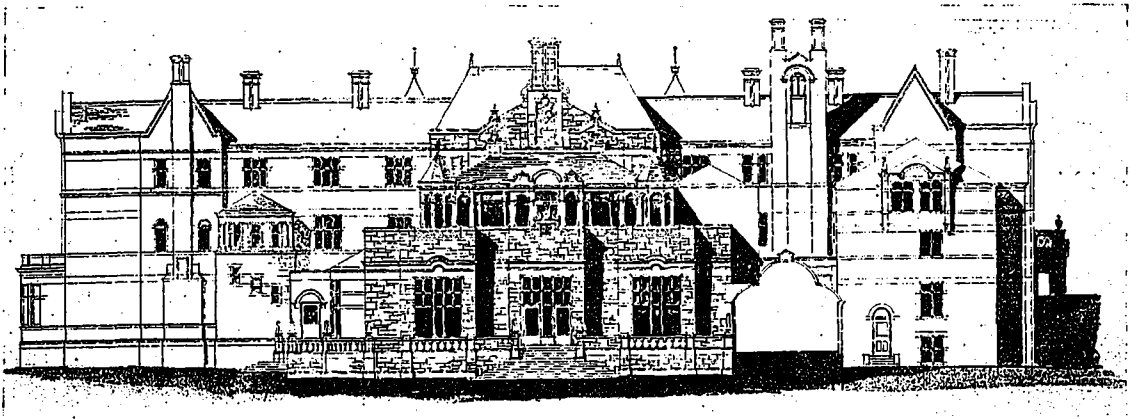


LIEUTENANT GOVERNOR'S RESIDENCE PROVINCE OF ONTARIO

Second Floor Plan, Competitive Design of Architect George W. King, for new Ontario Government House, Toronto.

Another feature to which attention is called is the position of the billiard room. This is so placed that the entrance is off a landing of the grand stair-case,

and by the main hall-way. The rear windows facing the north would be screened by leaded cathedral glass.



North Elevation, Competitive Design of Architect George W. King, for new Ontario Government House, Toronto.

and is isolated entirely from the bedrooms by both the well lighting the serving pantry and china closet,

In addition to the full bedroom accommodation an extra room has been provided on the second floor. This could be utilized as a small ball room or children's room. Two of the sun-rooms provided are for the private use of occupants of the rooms which they adjoin.

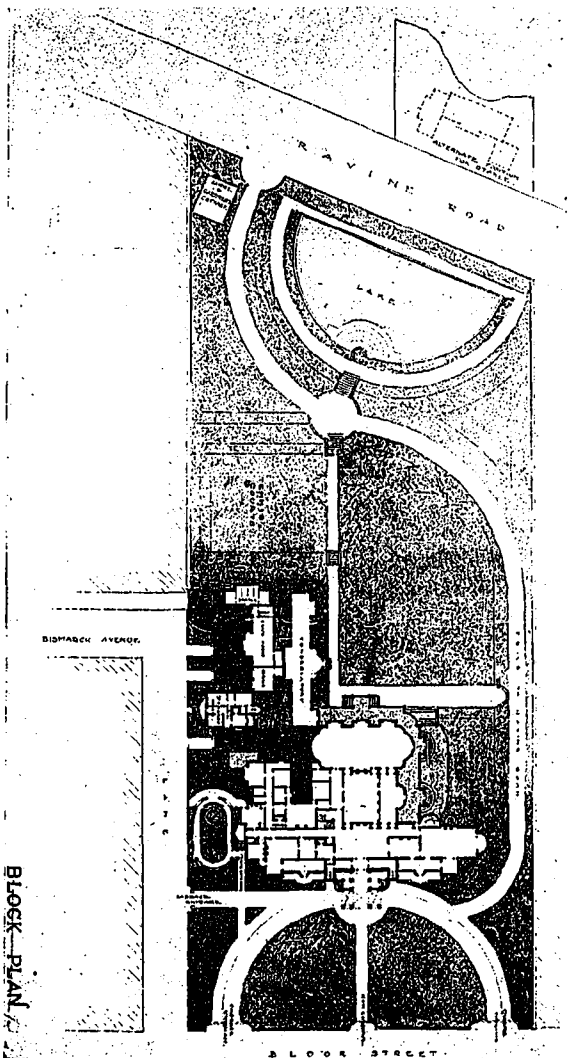
The servants' bedroom quarters are on two floors. These are arranged for direct communication, and are well lighted and easy of supervision.

The steward's house is advantageously placed on the grounds, and permits of ready supervision over the service department and the stables and garage which are self contained. The gardener's cottage which is similar in plans to that of the steward's house is situated to serve as a lodge at the rear entrance gate.

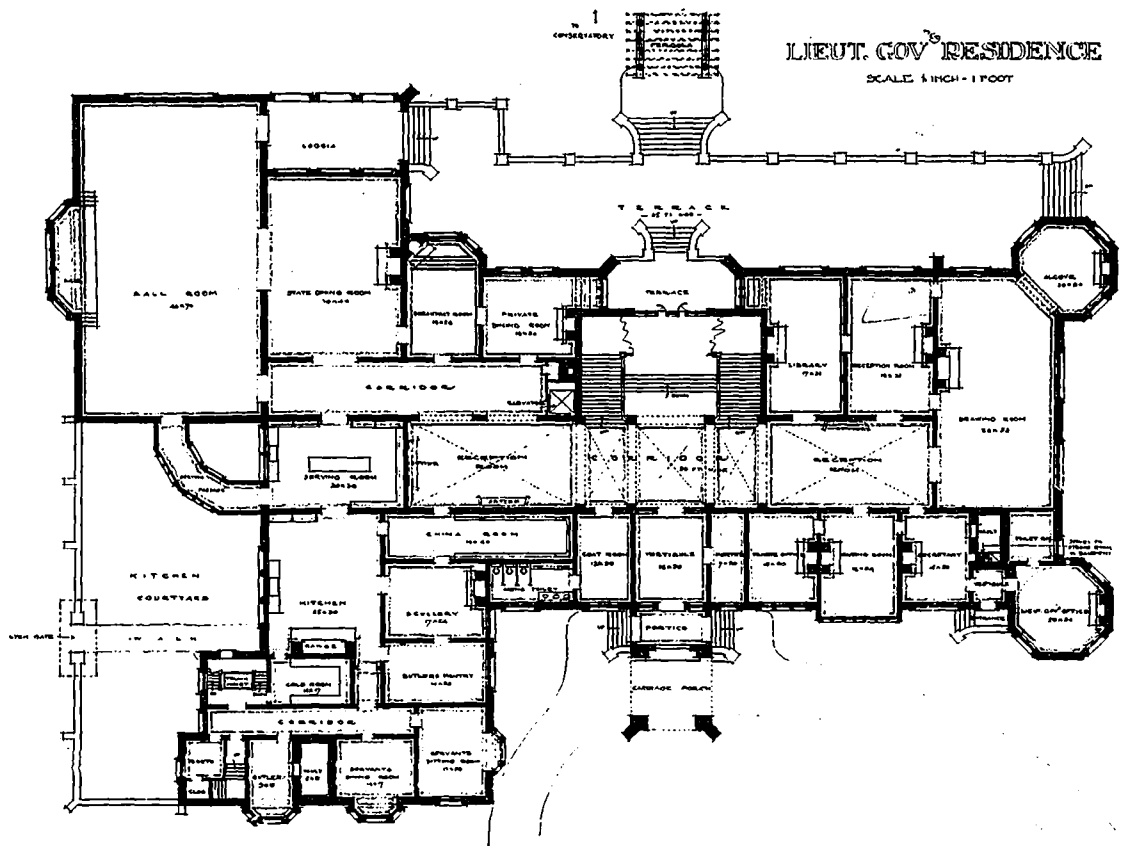
The stables have been placed off the lane, but should it be desired these can be located on that portion of the property across the ravine road, the same plan being adopted as is indicated by dotted lines in block plan. If this change should be effected the space now occupied would be added to the lawn, the conservatory forming an "L," obscuring the same from view of the steward's house. The outlay of the grounds has only been suggested, as its development would require the service of a landscape architect.

Architect Geo. W. Gouinlock's Design

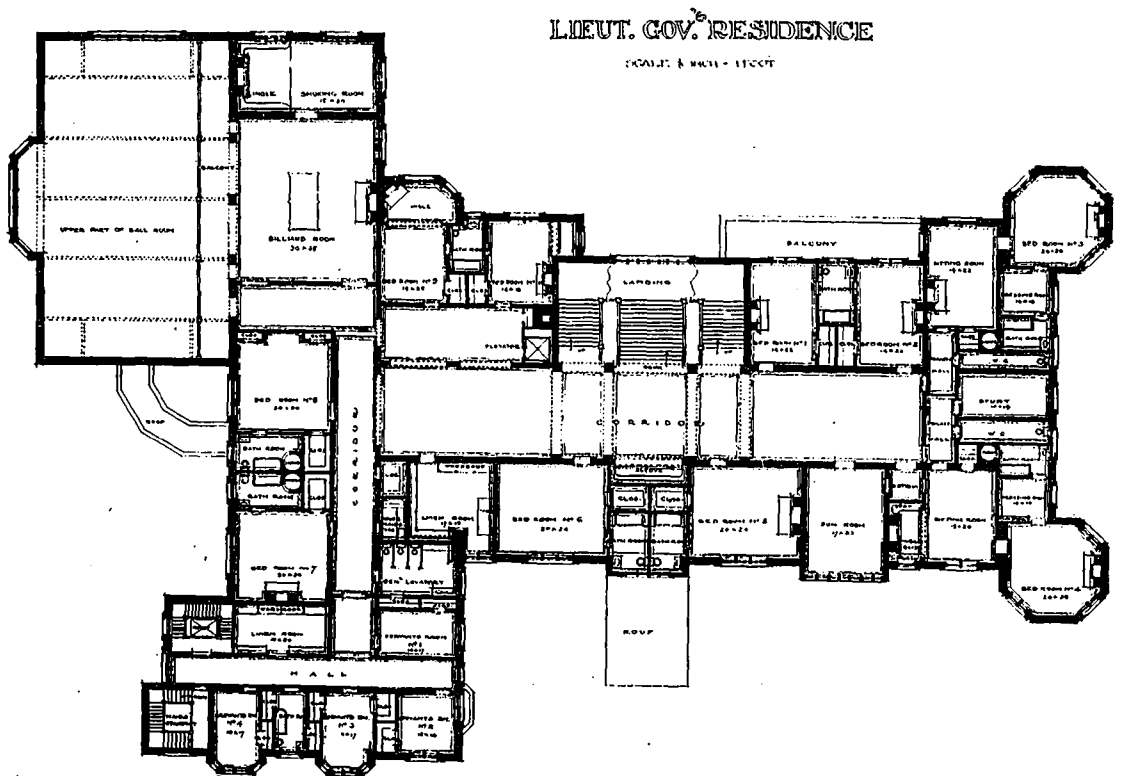
The design submitted provides for a baronial mansion in the Tudor style, with the exterior wall of light gray stone. The main entrance and Lieut.-Governor's offices are arranged to face Bloor Street (south) and the principal living rooms are so situated as to obtain the full advantage of the picturesque outlook along the ravine, at the north and north-east points. Attention is drawn to the arrangement of the ball room and banqueting hall, which are placed on the north west side; and also to the kitchen and service department situated in a westerly position, to which direct access can be obtained from Bismark Avenue. In addition to a private entrance



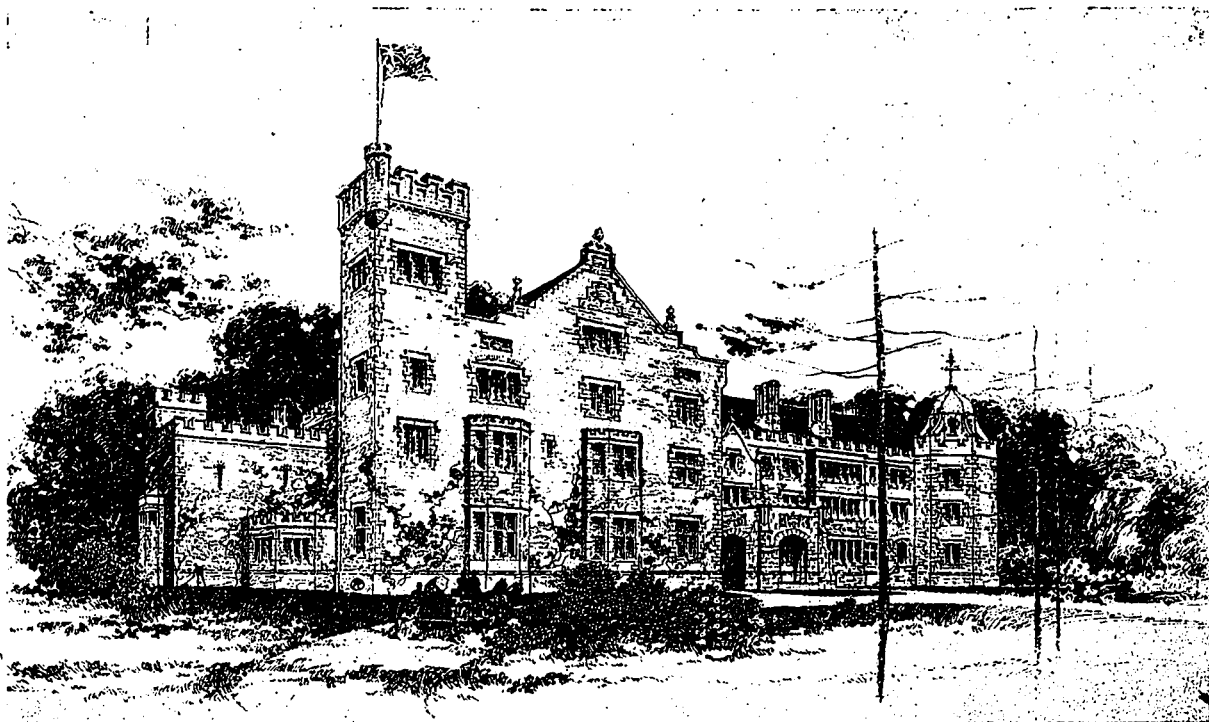
Block Plan, Competitive Design of Architect George W. King, for new Ontario Government House, Toronto.



Ground Floor Plan, Competitive Design of Architect George W. Gouinlock for new Ontario Government House, Toronto.



First Floor Plan, Competitive Design of Architect George W. Gouinlock for new Ontario Government House, Toronto.



Perspective View From South-West Point, Competitive Design (Awarded Second Prize) of Architect George W. Gouinlock, for new Ontario Government House, Toronto.

from Bloor Street, the Lieut.-Governor's offices connect with the corridors of the main hall. Briefly, the general arrangement and communicating features of the plan seem eminently suitable for the private and semi-public needs of a residence of this character. The second floor is taken up entirely with bedrooms having adjoining baths. These include two private suites, one of the Lieut.-Governor and one for State guests.

It is intended that the garage and stables should be located down the hill on the Rosedale Ravine Road with the approach from these buildings by the way of Park Road and Bismark Avenue. The residence and subsidiary buildings, it is estimated, can be built at a cost of \$250,000.

Architect John M. Lyle's Design

In this design an endeavor has been made to make the buildings comprising the group, simple in plan, domestic in character and at the same time dignified and semi-public in appearance. Taking into account the fact that the buildings are intended to serve as the official home of Ontario's highest dignitary and in accordance with the accepted custom be opened to the public on state occasions, it seems important that these three considerations should essentially form the key note of the general scheme.

The style selected is the Georgian, which is both decidedly appropriate for a building of this purpose, and particularly well adapted to local climatic conditions. This style has all the simplicity and domestic charm that is associated with the homes of England, and is capable of being invested with great dignity by the judicious use of columns and cornice treatment. The provision of the programme—restricting the cost of the building, together with the

laying out of the grounds, roads, walks, etc., to a sum not to exceed \$225,000, has been thoughtfully considered, as have also the specified requirements regarding accommodations in both the Government House proper and subsidiary buildings; and while it would be possible to carry out the entire work mentioned at the amount stipulated, the type of construction would necessarily have to be of the plainest and simplest character. In this connection, the opinion is ventured that in such a large and important residence as this, which houses a large number of people, the construction should be fireproof in character, and that an additional appropriation sufficient to cover the increased cost necessitated in this respect, would greatly be to the advantage of the investing party.

Subjoined is a brief outline of what is considered some of the more noteworthy features of the plan and general scheme.

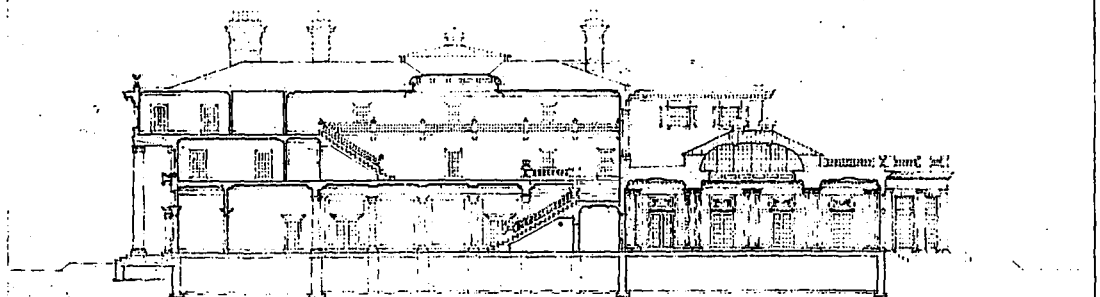
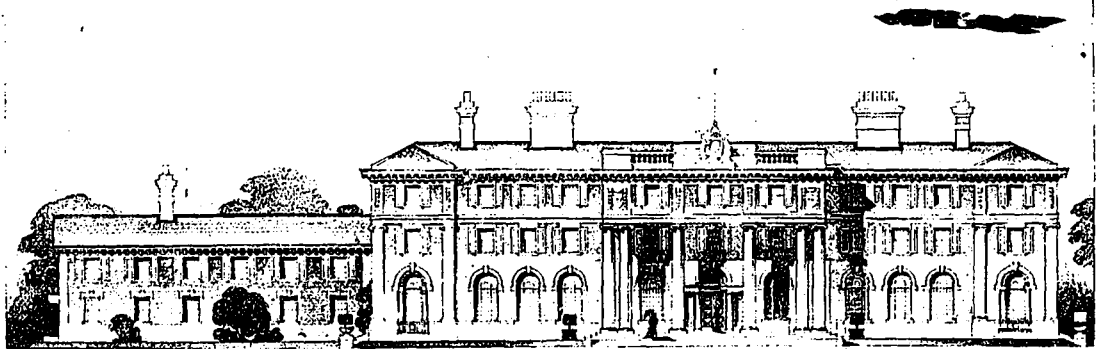
1. Arrangement of Service: Special service, connecting between ball room, breakfast parlor and State dining room. Convenience of service wing to lane.

2. The lighting of the main hall and first floor halls.

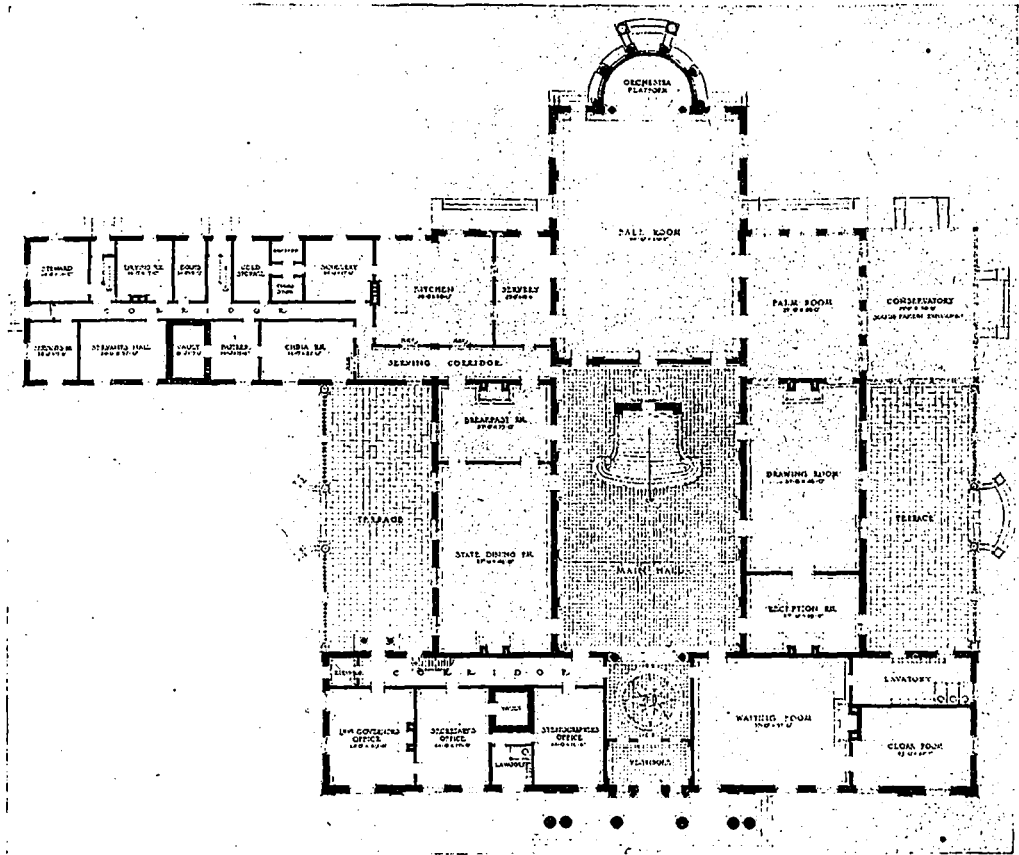
3rd. Second bedroom storey not treated as attic storey, so giving a bed room floor equally as good as the floor below.

4th. Stable and Garage placed in ravine lot, so avoiding objectionable odors in the immediate neighborhood of the main building. (Connected by 'phone).

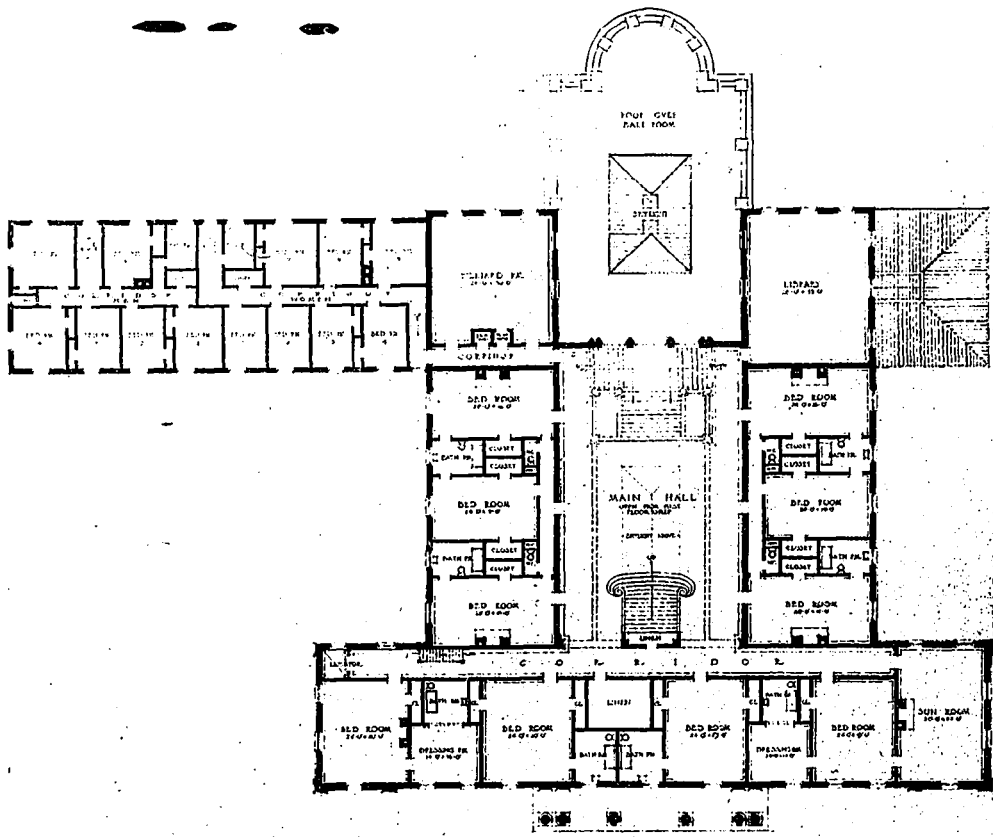
5th. Kitchen yard to be walled in with corresponding rose garden on opposite side, so giving attractive lawn and terracing on the garden side.



1.—Perspective View from Bloor Street. 2.—Garden Elevation. 3.—Front Elevation. 4.—Section on Centre Line—Competitive Design of Architect John M. Lyle for new Ontario Government House, Toronto.



Ground Floor Plan, Competitive Design of Architect John M. Lyle, for new Ontario Government House, Toronto.

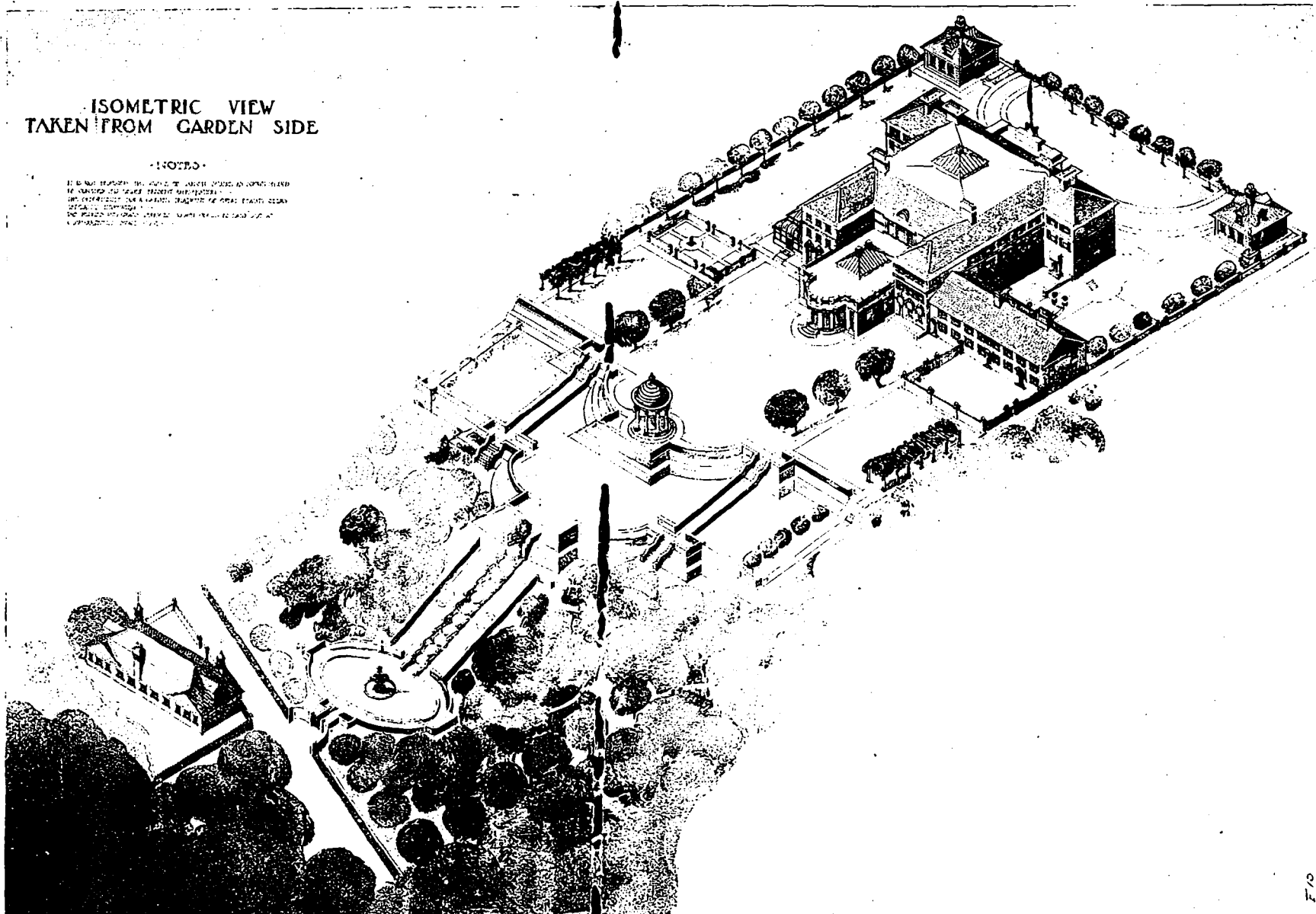


First Floor Plan, Competitive Design of Architect John M. Lyle, for new Ontario Government House, Toronto.

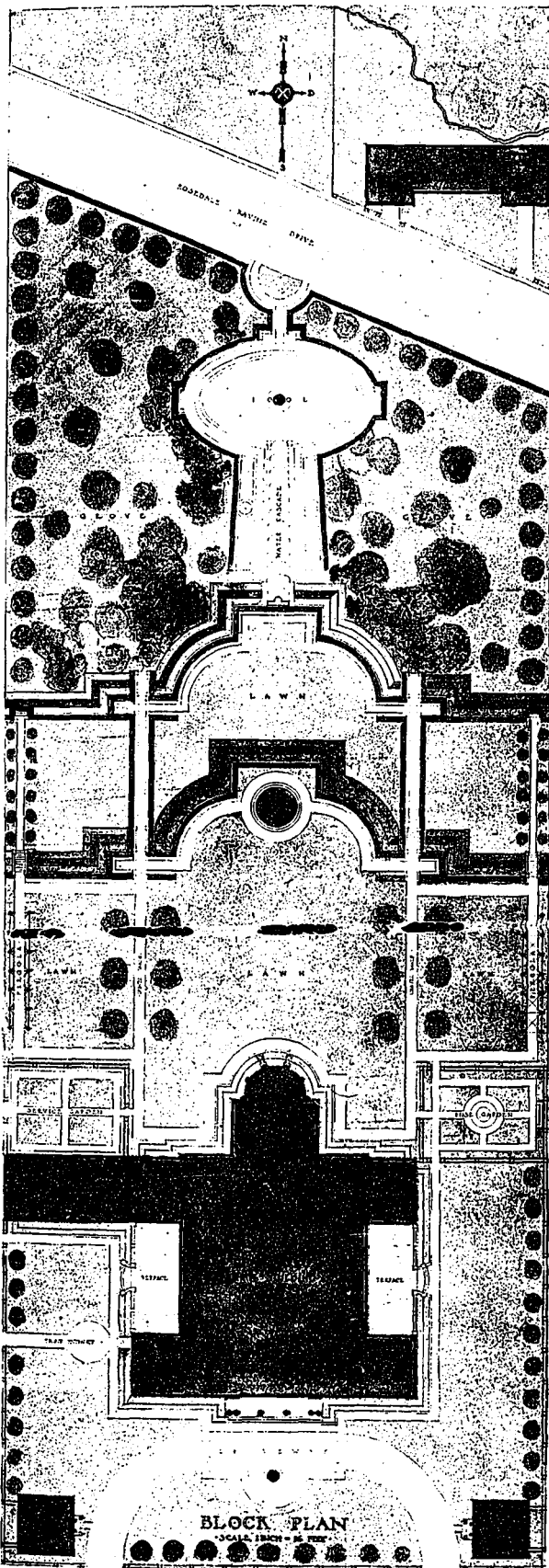
ISOMETRIC VIEW
TAKEN FROM GARDEN SIDE

-NOTES-

IT IS NOT NECESSARY TO SHOW THE GARDEN SIDE OF THE BUILDING IN THIS VIEW.
THE GARDEN SIDE OF THE BUILDING IS SHOWN IN THE ISOMETRIC VIEW.
THE GARDEN SIDE OF THE BUILDING IS SHOWN IN THE ISOMETRIC VIEW.
THE GARDEN SIDE OF THE BUILDING IS SHOWN IN THE ISOMETRIC VIEW.



Isometric View from Garden Side. Competitive Design of Architect John M. Lyle, for new Ontario Government House, Toronto.



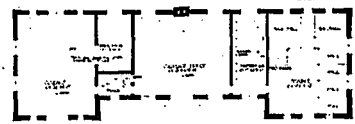
Block Plan, Competitive Design of Architect John M. Lyle, for new Ontario Government House, Toronto.

6th. Trunk entrance allowing trunks to be placed directly in elevator.

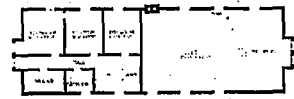
As regards heating, it is suggested that a hot water system be used, and that a fan system be installed to ventilate the principal rooms:



ELEVATION



GROUND FLOOR



FIRST FLOOR

PLANS AND ELEVATIONS OF SEARLES' COACH HOUSE AND GARAGE



GROUND FLOOR



ELEVATION



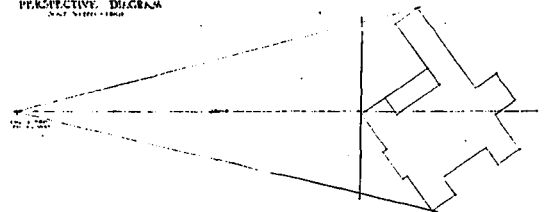
FIRST FLOOR

PLANS AND ELEVATIONS OF GARDENER'S AND STEWARD'S COTTAGES

Plans and Elevations of Gardener's and Steward's Cottages—Competitive Design of Architect John M. Lyle, Toronto.

Upon examination of the accompanying drawings, it will be observed that special consideration has been given to the garden side of the scheme. As the site lends itself particularly to a formal arrangement with a chateau d'eau effect, the development at this point logically coincides with the natural advantages offered; hence the treatment of the terraces

PERSPECTIVE DIAGRAM

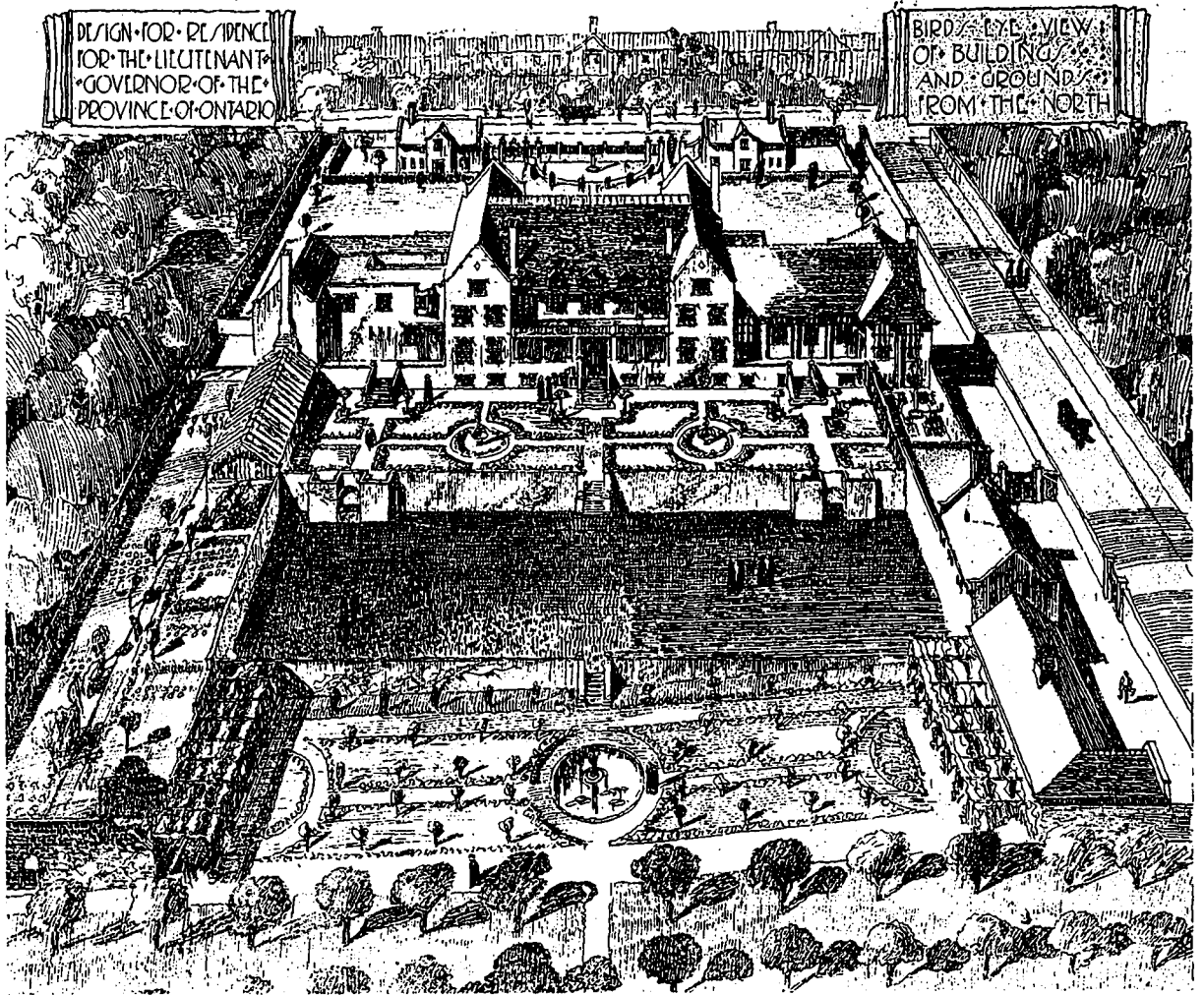


Perspective Diagram, Competitive Design of Architect John M. Lyle, for new Ontario Government House, Toronto.

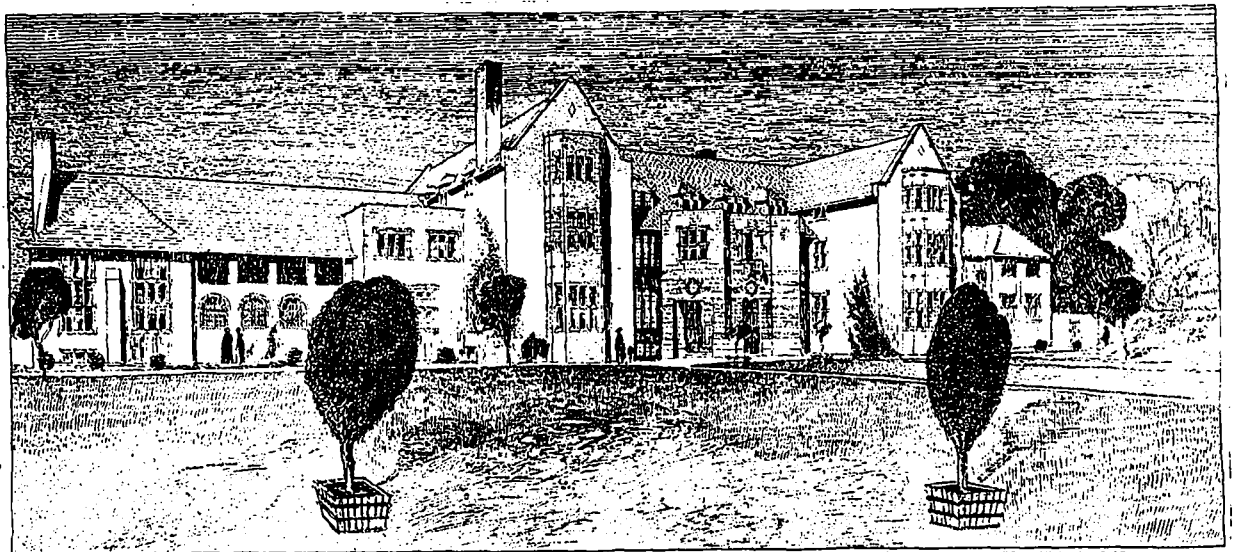
and garden side of the building were regarded as even more important than the front elevation.

Messrs. Bevan & Moore's Design

This design, illustrated by the accompanying drawings and perspective views, is based on the requirements issued to the competing architects. From a careful study of the site and levels, it was felt that the residence should not be placed too far



Isometric View from the North, Competitive Design of Messrs. Bevan and Moore, for new Government House, Toronto.



DESIGN FOR RESIDENCE FOR THE LIEUTENANT-GOVERNOR OF THE PROVINCE OF ONTARIO AT TORONTO - VIEW OF BUILDING FROM SOUTH

Perspective View from Bloor Street, Competitive Design of Messrs. Bevan and Moore, for new Ontario Government House, Toronto.
CONSTRUCTION, MAY, 1911.

back from Bloor Street East, but should be so situated that while allowing sufficient setting to ensure

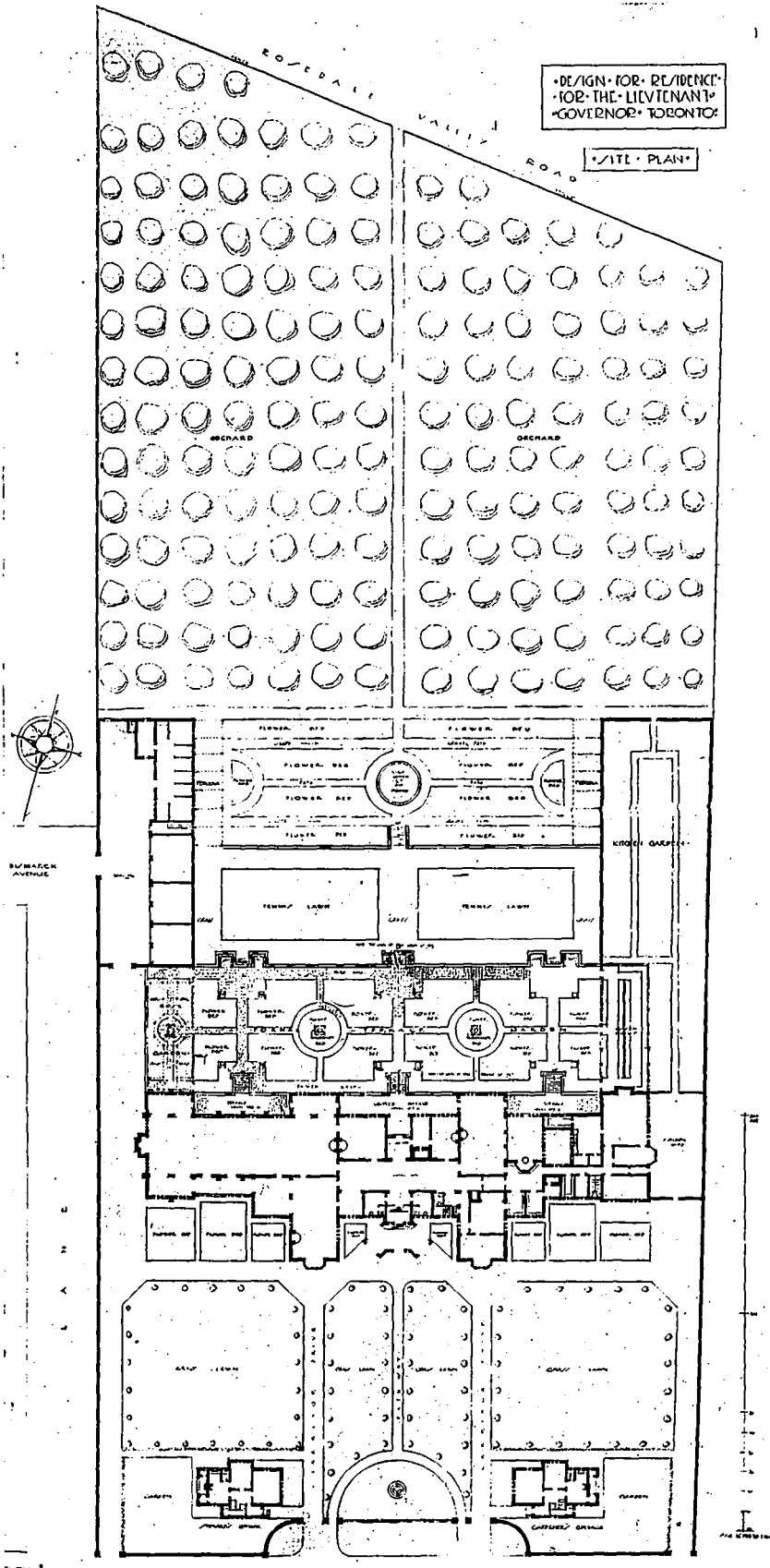
dignity and privacy, yet that access should be gained to the stables, not only from the front entrance,

but also from Bismark Avenue and lane. Upon reference to the site plans, it will be seen how this has been accomplished. At the entrance from Bloor, the steward's and gardener's cottages have been placed, acting as lodges to the entrance gates. The residence would be centrally situated, flanked on the west and east by the ball room, and kitchen and servants' wings respectively.

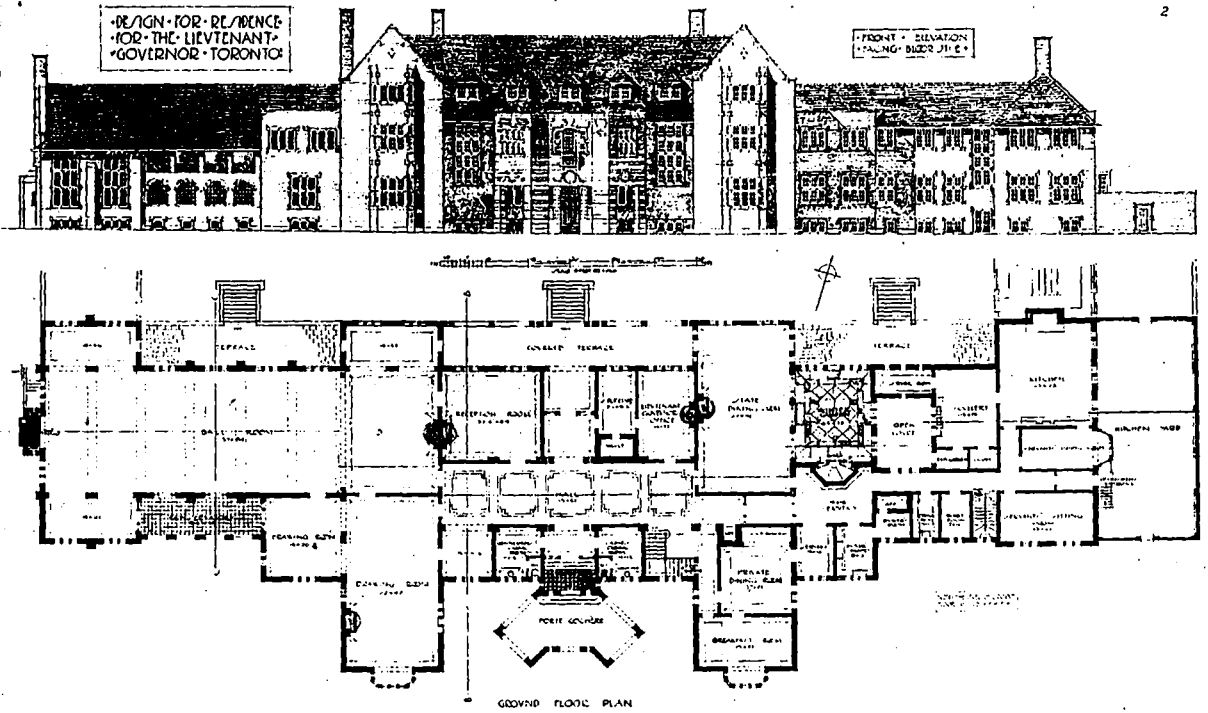
To the north of the residence a spacious formal terrace garden is proposed, flanked in similar manner by the rose garden and greenhouse, while a flight of steps would lead at a lower level to the tennis lawn or bowling green, which would be enclosed on the west side by the coach house and garage, and on the east by the kitchen garden wall. This lawn in turn would open onto a flower garden, having a lily pond and pergolas, and flanked by the stables and kitchen garden, and thence to the orchard, thus leading gradually from the formal to the less formal setting. The formal disposition and the broad and simple treatment of the scheme should impart a fine and dignified effect to the whole, while the terraces, flights of steps and flowers should make an attractive and picturesque setting for the residence.

The endeavor has been to take full advantage of the site by careful study of not only that part upon which the residence would stand, but of the whole site, its aspects, character, contour, etc.

"To leave a house exposed upon the site, unscreened and unterraced, is not to treat the site of the house fairly," has been said by a late eminent architect and authority on such matters. The charm of



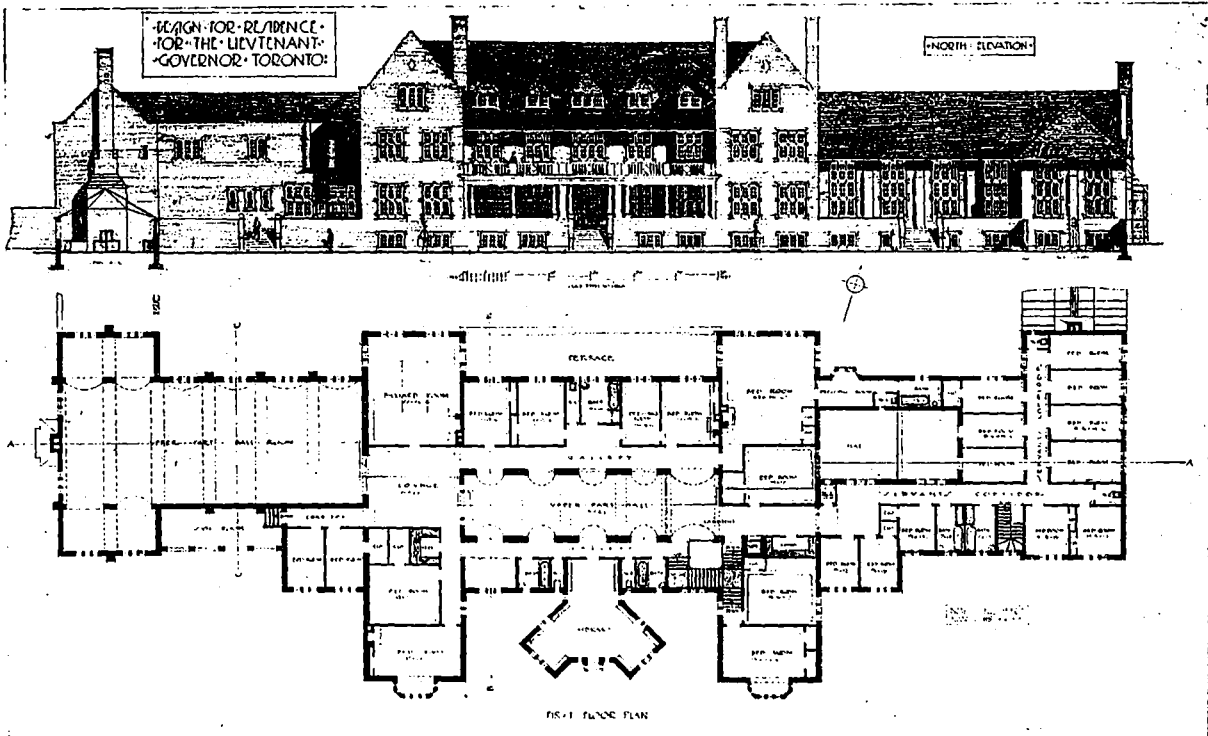
Block Plan, Messrs. Bevan and Moore's Design, for new Ontario Government House, Toronto.



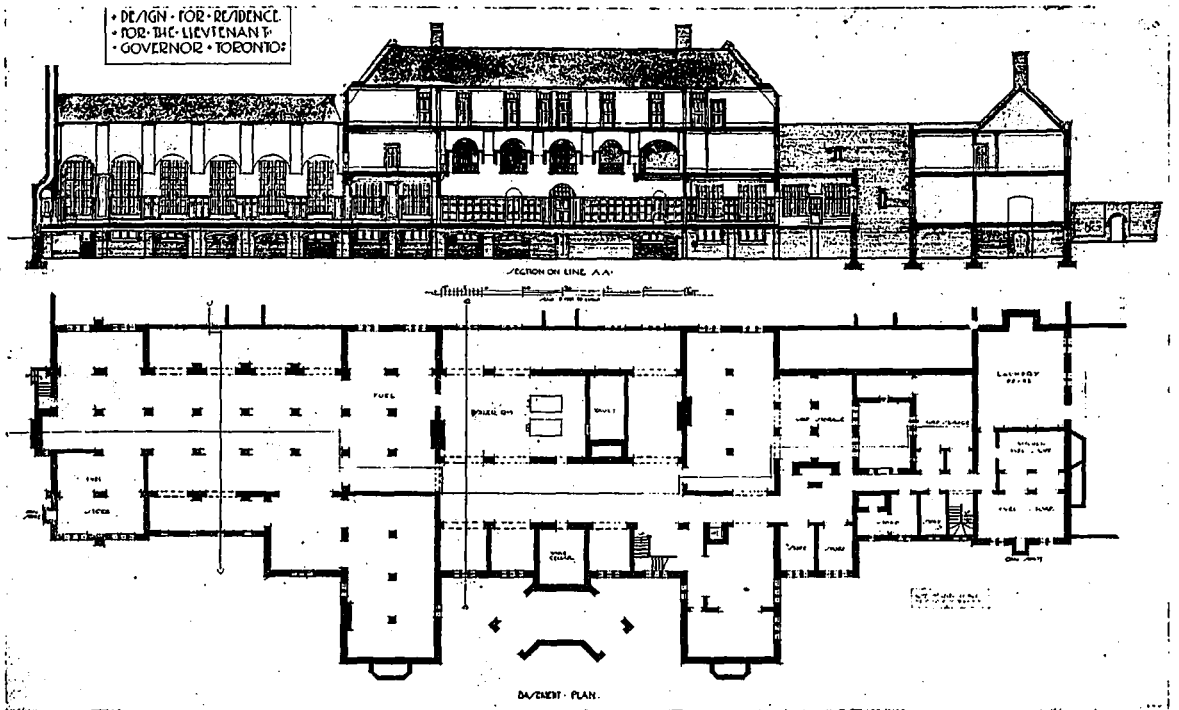
Competitive Design of Messrs. Bevan and Moore for new Ontario Government House, Toronto.

the old manor and stately house of England, where the art of domestic architecture had reached its highest perfection, is to be found in the architectural setting of terraces, steps, etc. Again, in Italy, no residence of importance was complete without its formal garden and terraces, and in a residence of such importance as that under consideration, and on

a sloping site, there could be no question that some such treatment was not only desirable, but really essential. The bird's eye perspective gives some idea of the proposed scheme, but in the absence of color much is undoubtedly lost of the effect which would ultimately be secured. The treatment of the sloping



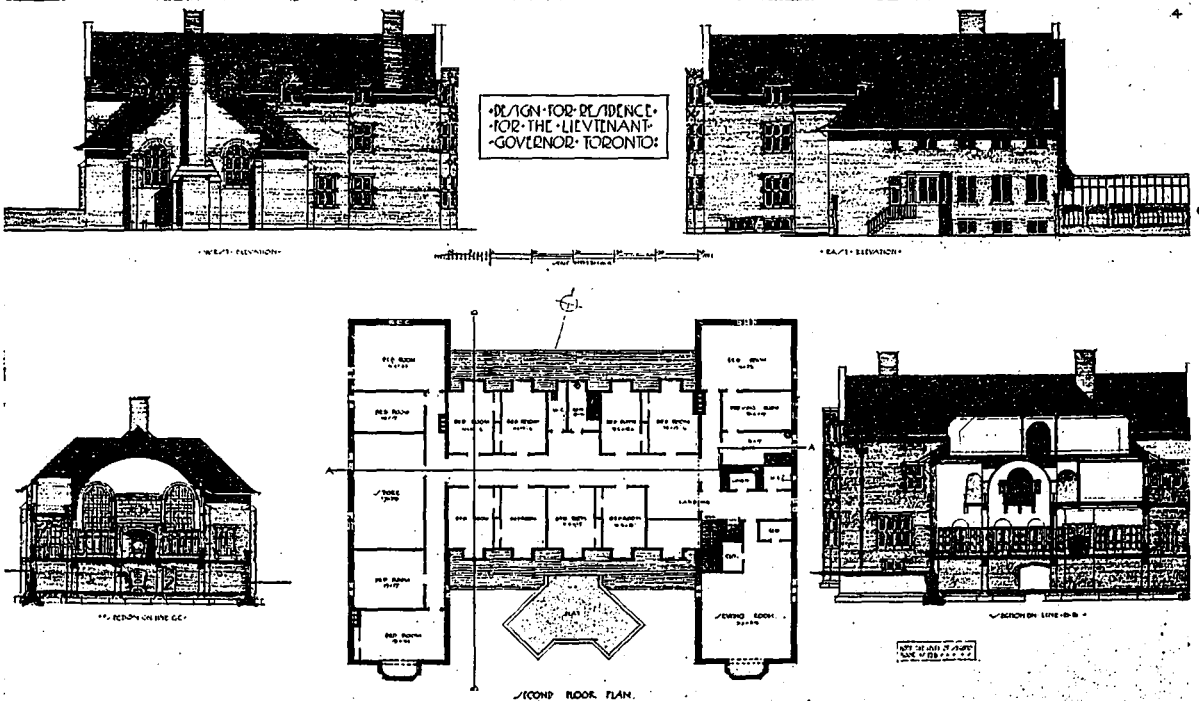
Competitive Design of Messrs. Bevan and Moore for new Ontario Government House, Toronto.



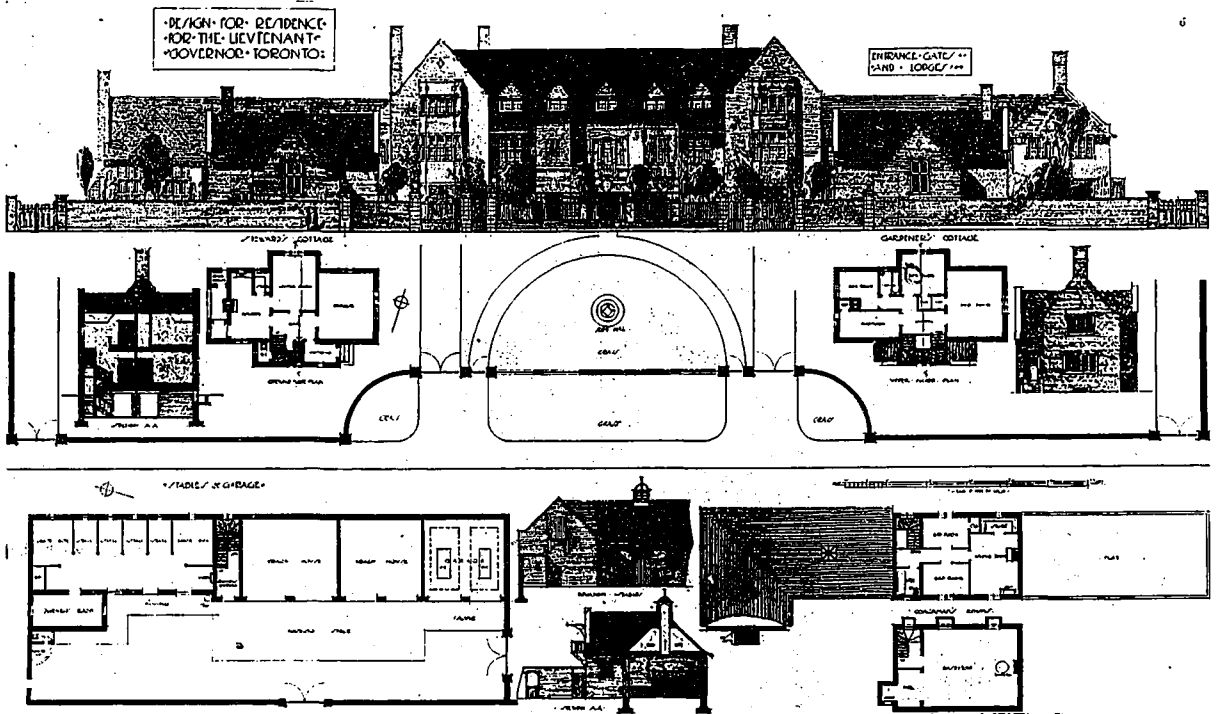
Competitive Design of Messrs. Bevan and Moore for new Ontario Government House, Toronto.

hillside by a system of terracing and gravel walks and steps of easy gradient suggested itself in the preliminary studies, but was abandoned in favor of the planted arrangement, owing to the increased cost. If deemed advisable, and by an additional expenditure, this idea could still be carried out either as a part of the present scheme or as a development of the future, when the ravine itself has received proper attention.

The plans fairly explain themselves, but one or two points might be worth mentioning. The entrance to the residence is under a porte-cochere over which is placed the library, and immediately on either side of the entrance vestibule would be found separate lavatories and cloak rooms for ladies and gentlemen. The hall, which is immediately entered from the vestibule in the centre of the south side would be a spacious and lofty apartment, and with its panelled



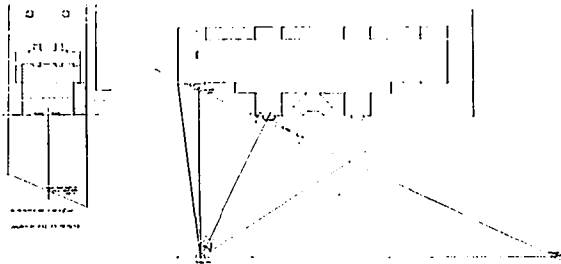
Competitive Design of Messrs. Bevan and Moore for new Ontario Government House, Toronto.



Competitive Design of Messrs. Bevan and Moore for new Ontario Government House, Toronto.

walls, arches and balconies and coved and plastered ceiling, and lighted by two large and lofty windows, should prove a striking feature immediately on entering the residence.

The reception room is in front on the other side of the hall, and adjoins the ball room. The ball room would also form an important feature in this scheme, with its lofty windows, enriched semi-circular ceiling, and stone ingle fire-place at the end; moreover,



the recesses at the ends of the room would tend to enhance the effect and give an idea of spaciousness. Access could be gained to the terraces and garden on the north from this room, while to the south the drawing room could be entered directly or through a conservatory. A small peep could be obtained into the ball room from the lounge on the first floor, and it is here the orchestra could be played, should occasion require.

The drawing room is so situated that it would get the morning sun. At the other end of the hall is placed the state dining room, opening into a winter garden or palm room, also on to the terrace. The winter garden, with its colored marble floors, walls

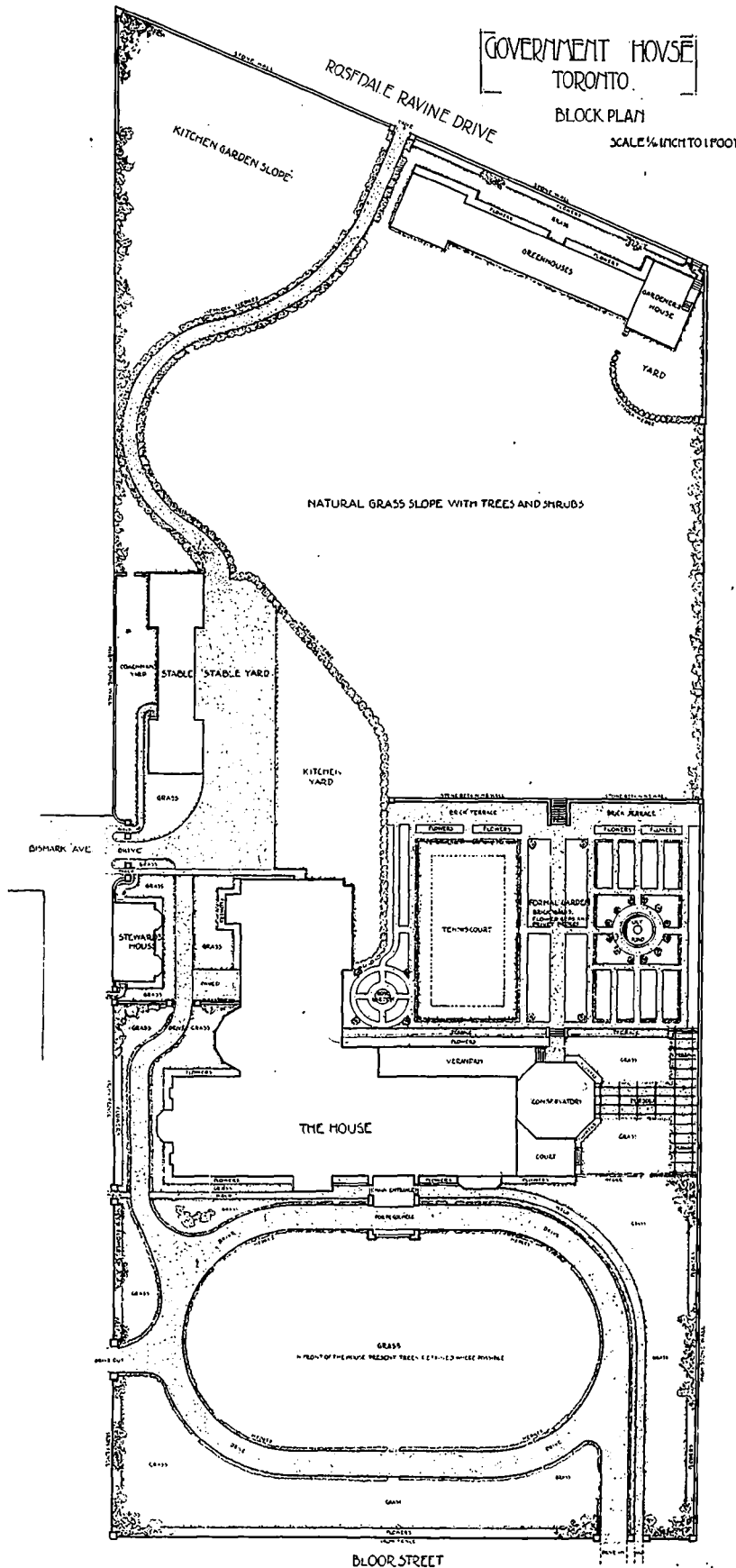
and fountain, should prove an attractive and welcome addition to the residence. The servery is so placed that it would serve both the state and private dining rooms and has butlers' rooms, etc., arranged in connection therewith.

The Lieut.-Governor's room and Secretary's office are also entered from the hall on the north side and the breakfast and private dining room on the south. The former room would get the morning sun. A covered verandah is provided to the north. The kitchen and servants' rooms, their bedrooms on the floor above and separate tradesmen's entrances have all been kept together in the east.

On the first floor is placed the library and billiard room. From the latter access would be gained to a balcony over the covered verandah below. The sun room is placed to the south over the conservatory at the side of the ball room and the various bedrooms planned as shown. The second floor is devoted to bedrooms, sewing and store rooms.

If it were considered desirable to place the servants on this floor, and give the whole of the first floor to bedrooms, it could easily be arranged by a slight modification of the plans. In fact, there are many possibilities in the planning of internal arrangements in such a scheme, and it is reasonable to presume that personal contact and consultation with the promoters in the final study, would lead to an ideal arrangement.

The stables and garage are detached from the residence and kept sufficiently far away to avoid any unpleasant odor, but not so far as to be at an inconvenient distance, and would, as planned, greatly help in the general composition and lay out of the scheme. The arrangement of stables, coach house and garage, opening onto a common yard, and yet

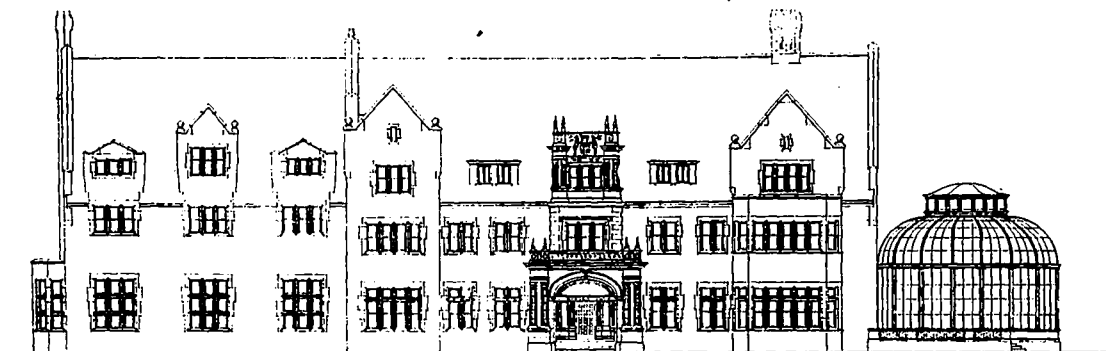


quite separate for their respective purposes, should prove commendable from every standpoint. Suitable cottages for the steward and gardener are provided at the entrance, each with its garden, but screened from the lawns of the residence by hedges.

The type of architecture adopted is a simple treatment of the Elizabethan period, when domestic work reached its perfection, and would rely on its good outline, handling of materials, and colors for its effects, rather than on the elaboration of unwarranted and expensive detail. While considering the question of style, it was felt that in order to meet the requirements as to cost, and at the same time give results commensurate with the architectural possibilities of the site, the adoption of simple and dignified lines in the architecture of the buildings was absolutely essential; consequently there has been a conscientious endeavor to solve the problem in a logical and straightforward manner, keeping within the limit of expenditure. The type selected, it is found, lends itself more readily to present needs in a house of this character, than severe classic or renaissance, which is not so pliable.

It is proposed to erect buildings of (1) gray stone, the wall faces to be broken ashlar and the trimmings of cut stone, or (2) No. 1 pressed brick laid up in Flemish or English bond, with a struck white or raked gray mortar joint. Cut stone trimmings would be combined for use in sills, jambs, mullions, heads, moulded work, etc. The roofs would be covered with gray green slate. The interior finish would be in hardwood; that in the servants' wing of Georgia or white pine; ceilings and walls plastered, oak dadoes in ground floor rooms, with the exception of reception room, which would be finished in Circassian walnut; plaster ceiling of ball room constructed on metal ribs and furring; ground floor fireplaces of cut stone with the exception of of reception room, drawing room and state bedroom, which will be of marble, other fireplaces of brick and tile. The floors of basement would be in cement,

Block Plan, Competitive Design of Messrs. Chadwick and Beckett, for new Ontario Government House, Toronto.

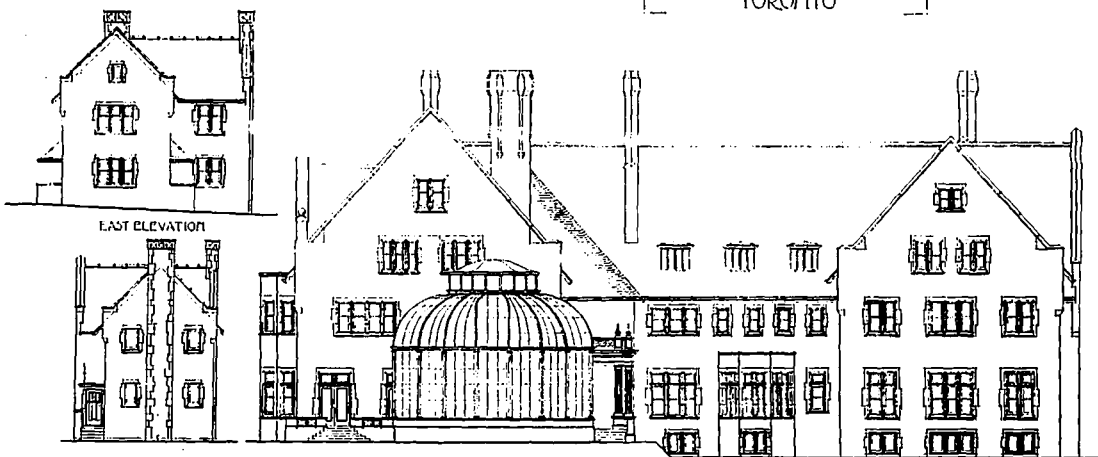


SOUTH ELEVATION

SCALE 1/4 INCH TO 1 FOOT.

South Elevation, Competitive Design of Messrs. Chadwick and Beckett, for new Ontario Government House, Toronto.

GOVERNMENT HOUSE
TORONTO



EAST ELEVATION

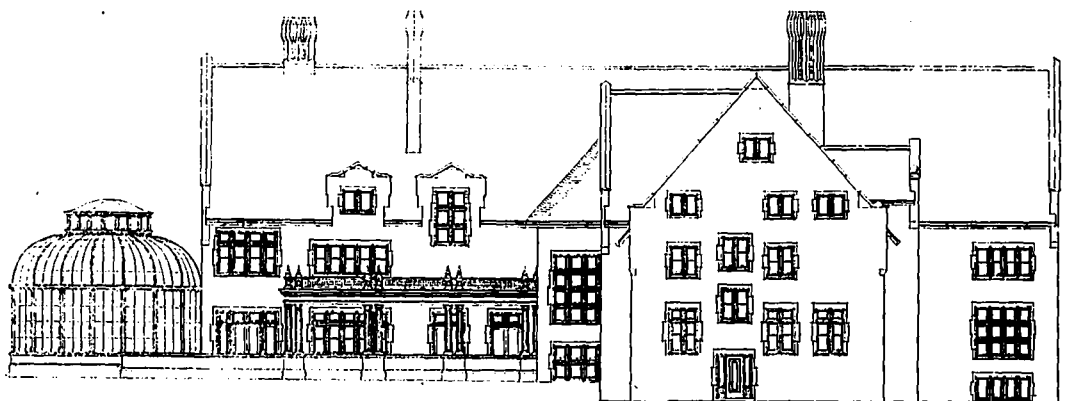
NORTH ELEVATION

GARDENER'S HOUSE

EAST ELEVATION

SCALE 1/4 INCH TO 1 FOOT.

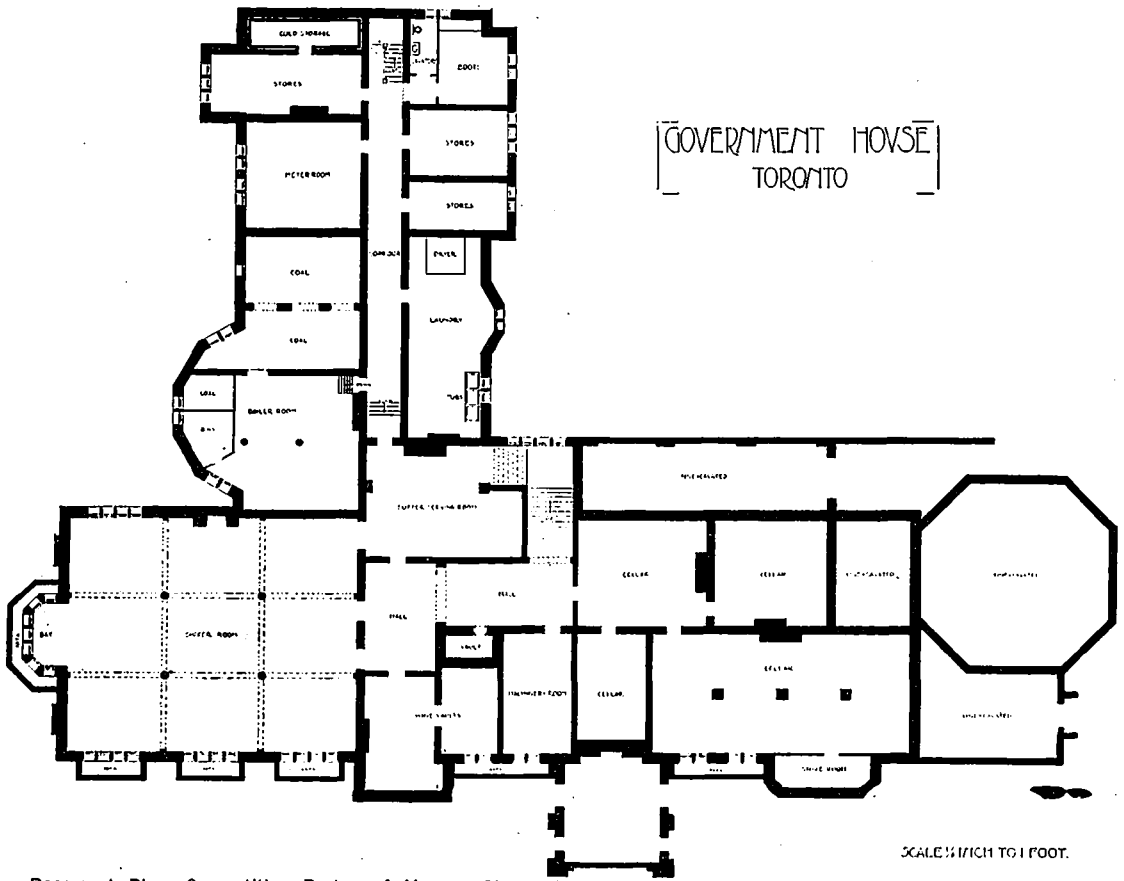
East Elevation, Competitive Design of Messrs. Chadwick and Beckett, for new Ontario Government House, Toronto.



NORTH ELEVATION

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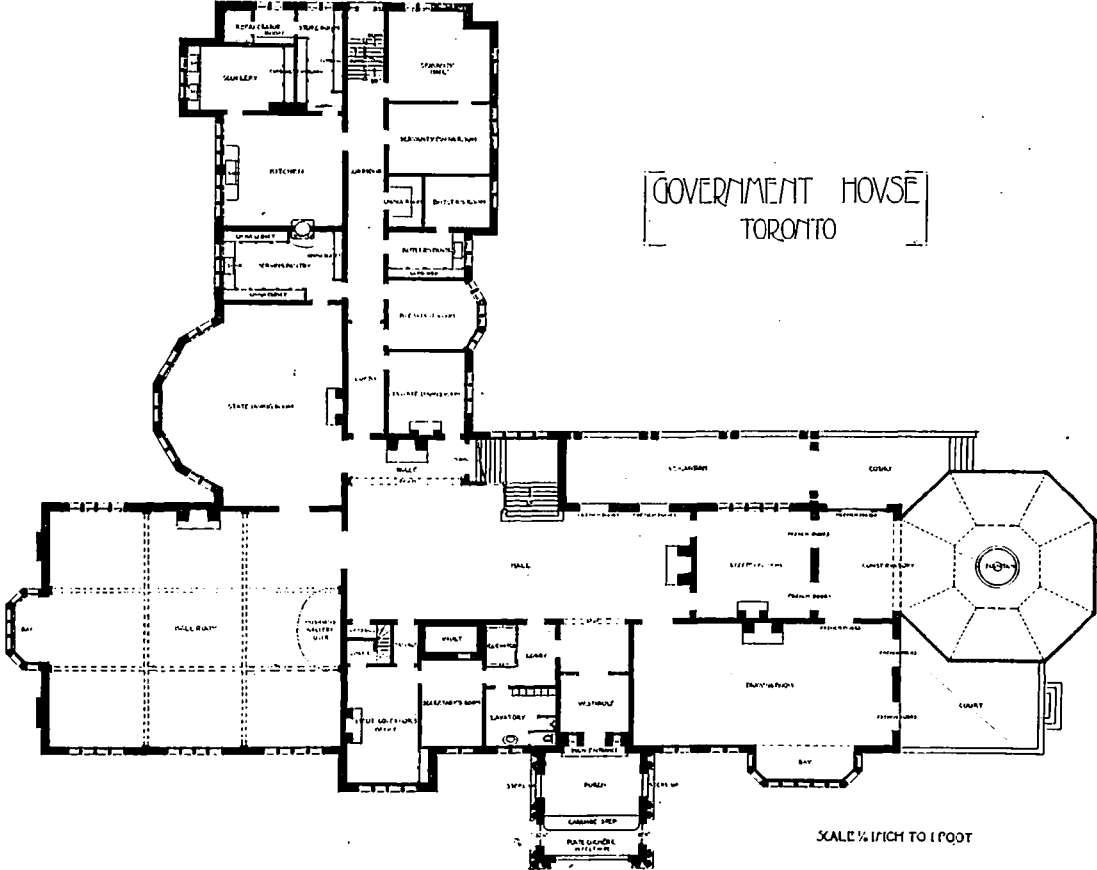
North Elevation, Competitive Design of Messrs. Chadwick and Beckett, for new Ontario Government House, Toronto.



GOVERNMENT HOUSE
TORONTO

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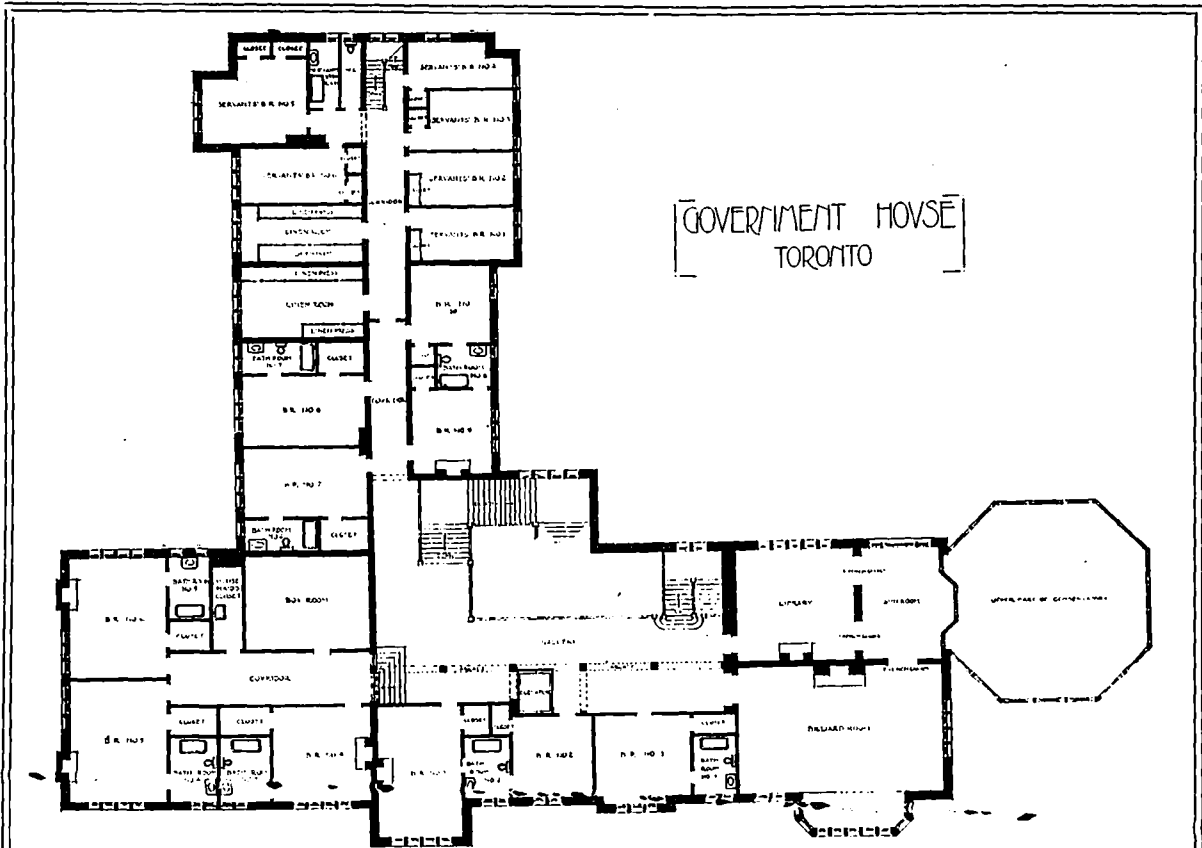
Basement Plan, Competitive Design of Messrs. Chadwick and Beckett, for new Ontario Government House, Toronto.



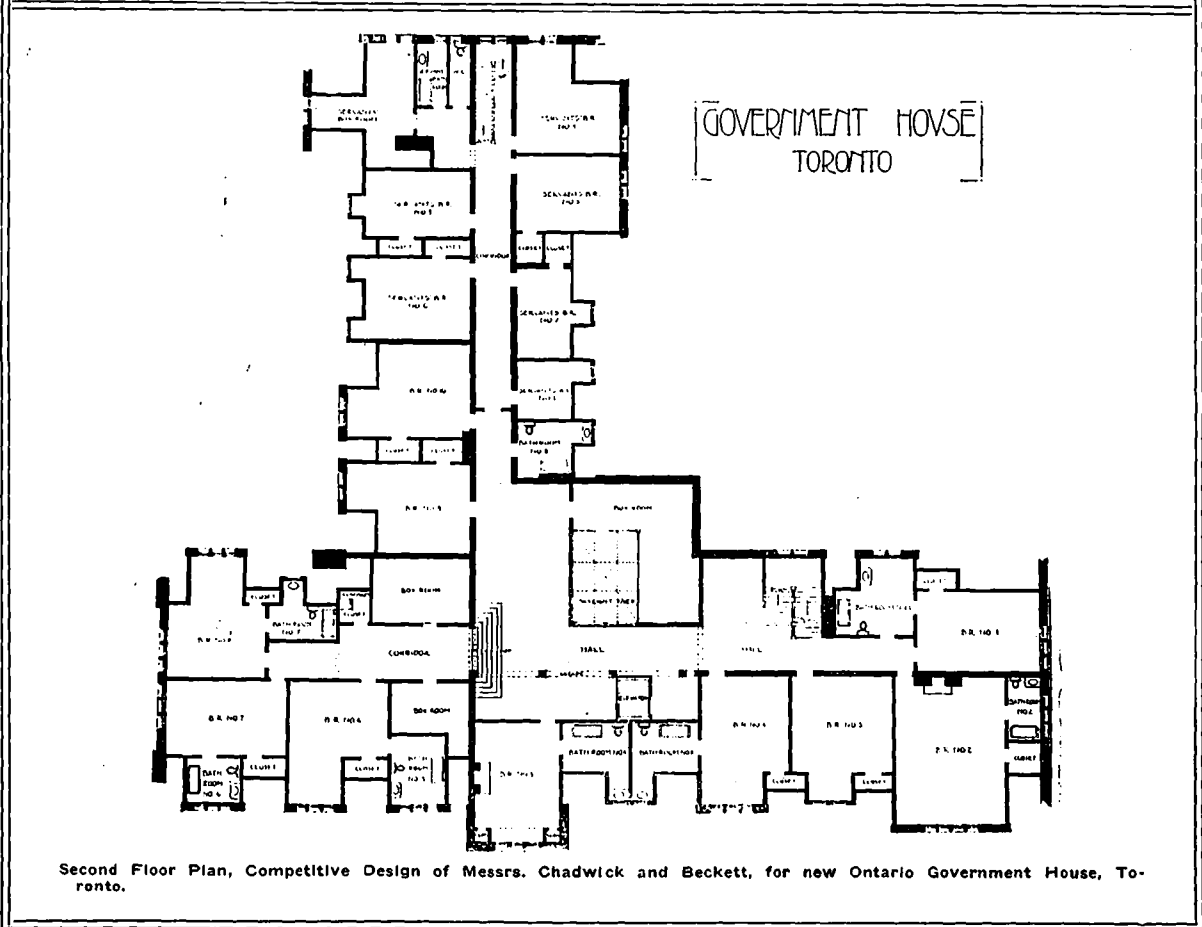
GOVERNMENT HOUSE
TORONTO

SCALE 3/16 INCH TO 1 FOOT

Ground Floor Plan, Competitive Design of Messrs. Chadwick and Beckett, for new Ontario Government House, Toronto.



First Floor Plan, Competitive Design of Messrs. Chadwick and Beckett, for new Ontario Government House, Toronto.



Second Floor Plan, Competitive Design of Messrs. Chadwick and Beckett, for new Ontario Government House, Toronto.

those in the servants' quarters of rift sawn Georgia pine or birch, and the remaining floors of highly finished oak in narrow widths, with the ball-room floor waxed and polished. This latter floor would be constructed with wooden joints on steel girders attached to springs. The hall floors could be of marble.

As regards windows, these are to be filled with wooden casements and weather stripping, or metal frames and sash with double hung sash in exposed locations.

Large stone flags are to be used for the exposed terrace walks and Welsh Quarry tile for the verandah floors and terraces, the other walks being carried out in gravel and concrete.

It is proposed to heat the buildings by the hot water system, the radiators to be supplied from a series of cast iron sectional boilers located in the basement and cross connected so that one or more boilers can be utilized to do part or whole of the work as the conditions require. A certain amount of ventilation would, of course, be included in this scheme, consisting of direct and indirect radiation in the differ-

produce an atmosphere, gay and inviting, yet stately and dignified, and possessing that architectural charm and flavor which was characteristic of the Elizabethan period and made the work undeniably national in character.

The halls, state dining room, galleries, bedrooms, etc., also give exceptional opportunity for artistic treatment.

In the halls and state dining room heraldic ornaments and mottoes would be introduced, and the walls of the dining room could be treated in tapestry, which, with the enriched ceiling, stone fireplace and stained woodwork, would be quite in keeping with the character of the room. Opening off the state dining room, the palm room or winter garden would be treated in colored marbles and ornamental plaster ceiling pierced by ceiling lights glazed in a heavy metal frame. In the recesses at the south end of this room, would be a small fountain, which with the potted plants and flowers, should make a pleasing feature.

The bedroom treatment would be quiet and domestic in character with refined cornices and ceilings



West Elevation, Competitive Design of Messrs. Chadwick and Beckett, for new Ontario Government House, Toronto.

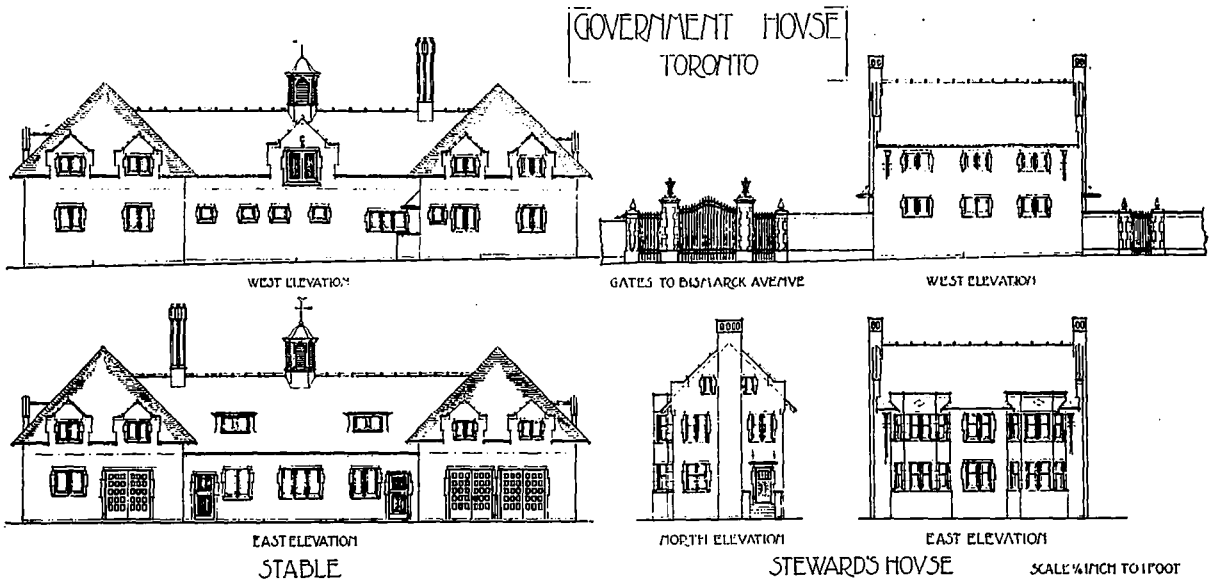
ent rooms where necessary, the ventilation being accomplished by fresh air being drawn through grilles in the walls and passed under and up through the radiator and controlled by dampers. It is considered advisable that the air be exhausted from the kitchen, smoking rooms, etc., by means of a small propeller fan operated by electric power. The installation of an elaborate and complicated heating and ventilation system is not contemplated; the adoption of the hot water system, being based upon simplicity of operation, effective results and minimum of cost of installation and maintenance.

The interior of the residence is designed to lend itself admirable to decorative treatment, and the opportunities offered for color schemes and lighting effects are many and varied. The ball room, with its broad expanse of floor, panelled walls, lofty mulioned windows and arched semi-circular ceiling, together with its broad plaster surfaces divided and given scale by panelled and enriched ribs and modelled ornaments picked out in color, and the whole lighted by hanging electroliers, is well calculated to

finished in paint of water color, and the walls papered or hung. The lighting fixtures and hardware throughout the principal portions of the house would be specially designed to harmonize with the architectural scheme; and every item or detail of the entire work would be studied and considered so as to insure a perfect consonance throughout.

Chadwick & Beckett's Design

The buildings are designed in the Tudor style of architecture, and are arranged on the property as shown in the accompanying "block and garden plan." The exterior is necessarily very simple, in order to keep within the amount specified in the conditions. With the object of minimizing any noise or vibration occasioned by the trolley lines and traffic in the neighborhood, the Lieutenant-Governor's residence is located well back from Bloor Street. This also assists in effecting a plan which gives the principal drawing rooms, living rooms, etc., the greatest amount of sun light, and the best views possible along the ravine.



Subsidiary Buildings, Competitive Design of Messrs. Chadwick and Beckett, for new Ontario Government House, Toronto.

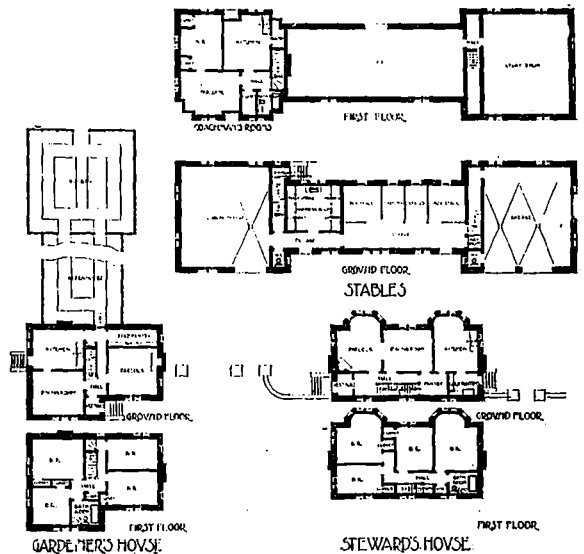
The drives are laid out with an entrance from Bloor Street and an exit into the lane to the west, in order that conveyances can be lined up without interfering with the traffic on Bloor Street. The service entrance is through a double gate from the end of Bismarck Avenue, and a winding carriage path is arranged from the Ravine drive up to the stable yards. Immediately in the rear of Bismarck Avenue are the stables, with the steward's house to the south of the entrance from that street. The gardener's cottage and green-house are placed at the north-east corner of the property along the Ravine drive; enough practically level land being available for two lines of green-houses, if such should be required.

In front of the house the present trees and shrubbery are to be retained as far as possible, with flower borders along the house and fences, while in the rear such of the fruit trees are to be preserved as will not interfere with the laying out of a formal garden (placed in the north-east angle between the two wings of the house) and the stable and kitchen yards. The formal garden is to be graded up and the north side enclosed by a stone retaining wall, finished on top with a ballustrading, and with steps to the lower level of the slope, which is to be sodded and planted with trees and shrubs to suit the ground, terraces being arranged if necessary. The kitchen garden to be arranged in terraces or on a slope, and located north-west of the drive to the Rosedale Ravine.

It is proposed to enclose the property along Bloor Street and up the lane on the west to a point in rear of the State dining room by a low iron fence with stone posts; the east side of the property to have a high stone wall as far north as the rear line of the formal garden, and from there to the Ravine drive a simple iron fence screened by shrubbery. The stable yard and steward's garden are to be enclosed with high stone walls, from the house to the lane to the west, and along that lane to the rear of the stables. From there on a wire fence and shrubbery

similar to the east side will extend, with a stone retaining wall in the north-west corner. A low stone wall, with posts, is to be carried along the Rosedale Ravine drive, and the kitchen and stable yards and gardener's yard are to be screened from the rest of the property with hemlock hedges.

The buildings are preferably to be constructed of hammer-dressed grey rubble stone, with cut stone or terra cotta trimmings, but the designs are adaptable



Floor Plan of Subsidiary Buildings, Competitive Design of Messrs. Chadwick and Beckett.

for construction in cut stone, with stone or terra cotta trimmings. If constructed of brick with cut stone or terra cotta trimmings more exterior ornamentation should be introduced. The roofs are to be of red slates, the cornice and exposed rafters of oak or Southern pine, stained brown, and the gutters and down pipes of copper.

The principal rooms contain the floor area mentioned (Concluded on page 78.)

CONSTRUCTION

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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.

Vol. 4 Toronto, May, 1911 No. 6

CURRENT TOPICS

THE ARGENTINE GOVERNMENT has issued a decree approving of a plan for constructing dams in the Province of Jujuy, at a cost of \$9,000,000.

* * *

A NOVA SCOTIA LUMBER FIRM, with mills at Caledonia, has completed a survey and made preliminary arrangements for the construction of a railroad from that point to the sea at Port Midway, a little over 28 miles. The road, in addition to hauling lumber, will be used for general freight and passenger purposes. The country to be served is rich in lumber and somewhat settled, but at present the several mills operating in the interior are compelled to haul their output 28 miles by ox teams.

* * *

THE IMMENSE CLOCK shortly to be installed in the sixteen story office building now in course of erection for the Royal Liver Friendly Society at Liverpool, England, will outrival in size any of the famous tower timepieces of which the world can now boast. It will have three dials on one turret and one on another 300 feet away. The hands will have an average length of 14 feet and will be driven at each separate face of the clock by individual motors.

CEMENT AND SLATE DUST, to quote a builder in the United States, makes a concrete of an exceptionally fine, hard and serviceable quality. The proportions are: One part of the former to nine of the latter, with a moderate quantity of water. Only a high grade Portland cement should be used.

* * *

ACCORDING TO THE ESTIMATE of the Department of Mines, Ottawa, Canada produces in year 1910 structural materials valued at \$105,040,958. Some of the items mentioned are: Portland cement, 4,753,957 barrels, valued at \$6,414,315; clay brick, valued at \$1,669,390; sand-lime brick, \$18,492; lime, 5,721,285 bushels, valued at \$1,131,407; sand and gravel exported, 624,824 tons, valued at \$407,974; slate to the value \$18,492, and gypsum to the extent of 513,313 tons, valued at \$93,838.

* * *

WHAT IS CREDITED as being one of the most unique and artistic fireproof curtains yet devised, is being built in New York at the present time for the National Theatre in the City of Mexico. It consists of a great bronze frame set in with mosaic panels of favrille glass in iridescent hues. The mosaic work is embedded in a concrete composition which furnishes a firm resting place for the myriad pieces of glass depicting the romance of Princess Iztaccihuatl and her lover Popo, a popular Mexican legend. The curtain was designed by Adamo Boari. It is fifty feet square and weighs twenty-seven tons.

* * *

SIMULTANEOUSLY to the announcement of the awarding of the contract for the new Quebec Bridge comes word from New York that plans are in preparation for a similar structure of great magnitude to be built across Hell Gate, the turbulent straits that connect Long Island Sound and the Harlem with the East River. Preliminary work, it is said, has already been started. The structure will be erected and operated by the New York, New Haven and Hartford and Pennsylvania roads. It is to be two miles long, including its approaches, and will be one of the highest railway bridges in the world.

* * *

RAILWAY EXTENSION WORK involving the expenditure of \$17,000,000, is about to be started in the West along the right of way of the Grand Trunk Pacific. The scheme of improvements includes the following projects: Calgary branch, 143 miles; Battleford branch, 59 miles; Melville, Regina branch, 68; Alberta Coal branch, 72; Biggar to Calgary, 50 miles. Other undertakings are the laying of 265 miles of main line track and further grading to the extent of 200 miles on branch lines. All of the above work, according to the contract terms, is to be completed this year. Arrangements, it is also understood, are also being made for the erection of 140 station buildings and 100 hotels.

AN APPLICATION is now before the Governor-in-Council, Ottawa, asking that the Minister of the Interior be authorized to consummate the sale of a tract of land to the Alberta Brick and Terra Cotta Company. The land adjoins the plant which the company established about three or four years back, and consist of a clay that is of suitable quality for the manufacture of brick and similar products. The company agrees to turn out 50,000 bricks per day.

* * *

WHAT IS CONSIDERED in many respects as the finest example of a academic work in South America, has just been completed in the new building which will house the Faculty of Law and Mathematics at Montevideo, Uruguay. The structure has been some four years building, and was erected at a cost of approximately two and one-quarter million dollars. It occupies a site of over 17,400 square yards, with imposing frontages on two main thoroughfares. As the accommodation provided is greatly in excess of present requirements, part of the building will be temporarily utilized to lodge the National Museum and Library until these have a building of their own, which is intended to be the case in a few years.

* * *

THE DEVELOPMENT of another of Canada's natural resources is likely to be the outcome of the accepted offer of Mr. J. K. Cornwall, M.P.P. for the Peace River district, to pave, free of cost, a portion of one of the streets in the business section of Edmonton in order to demonstrate in a practical way the value of the crude asphalt deposits so plentiful around Ft. McMurray and the north country. Numerous places, it is said, are to be found throughout an area 1,400 miles long and 300 miles wide, where tar springs bubbling into fine sand produce asphaltum of a rare and valuable quality; and it is with the object of pointing out the necessity of building for the purpose of opening up this territory that Mr. Cornwall's venture is designed.

* * *

A VERY CURIOUS architectural member in Greek architecture, says *The State Trade Gazette*, was the acroterion which was set on the gables, sometimes one and sometimes three. These were not late ornamental additions, but they seem to have been essential and important features from an early age. Primitive builders seem to have made much of the point of the gable by crossing the rafters, or by setting there some animal's head. The developed form is usually much in the shape of a lyre with two horn-like branches, one on either hand, turning into scrolls and palmettes. It seems possible that they may be derived from horns of consecration. Roofs were either covered with tiles, that is, large pantiles with covered rolls, or by marble copies of the same, wrought and adjusted with amazing precision. They either dripped along the eaves, or they were turned up at the bottom into a sort of low parapet, lated the cymation, having at intervals jutting spouts like toy cannon, or lions' heads with open mouths.

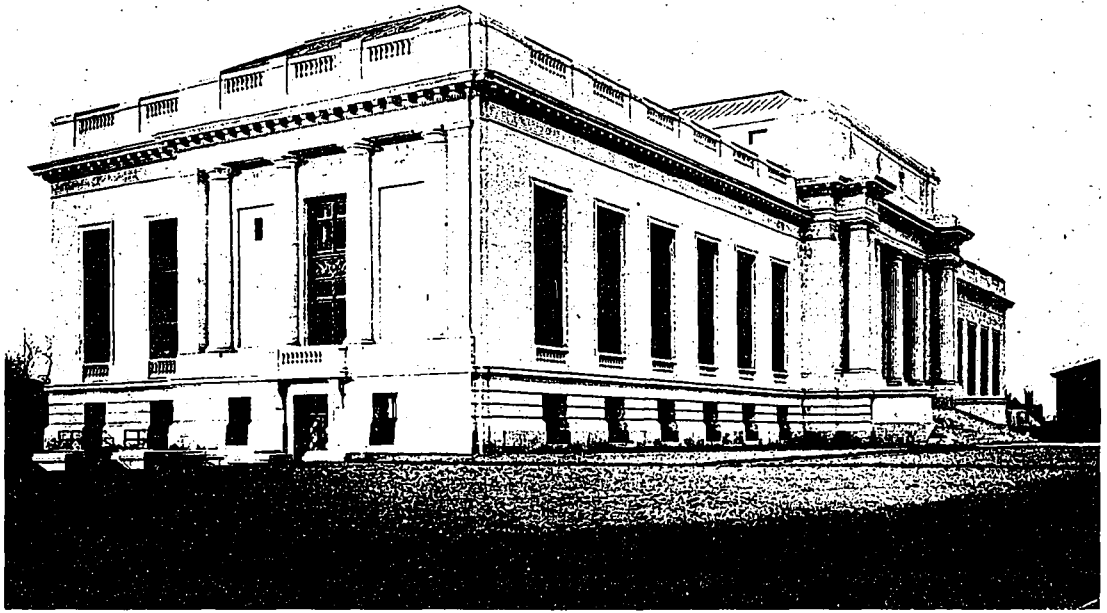
REPRESENTATIVES of the Associated Portland Cement Company of London, England, in the persons of H. K. Bamber, managing director, and H. D. Anderson, a stockholder, have been touring Canada with the object of investigating the opportunities this country offers for investment. It is said that the company is contemplating the establishment of a number of plants in the Dominion, and that the territory about Vancouver has already been looked over for a suitable site. The plans under consideration, it is understood, involve the expenditure of a sum that reaches up into the millions.

* * *

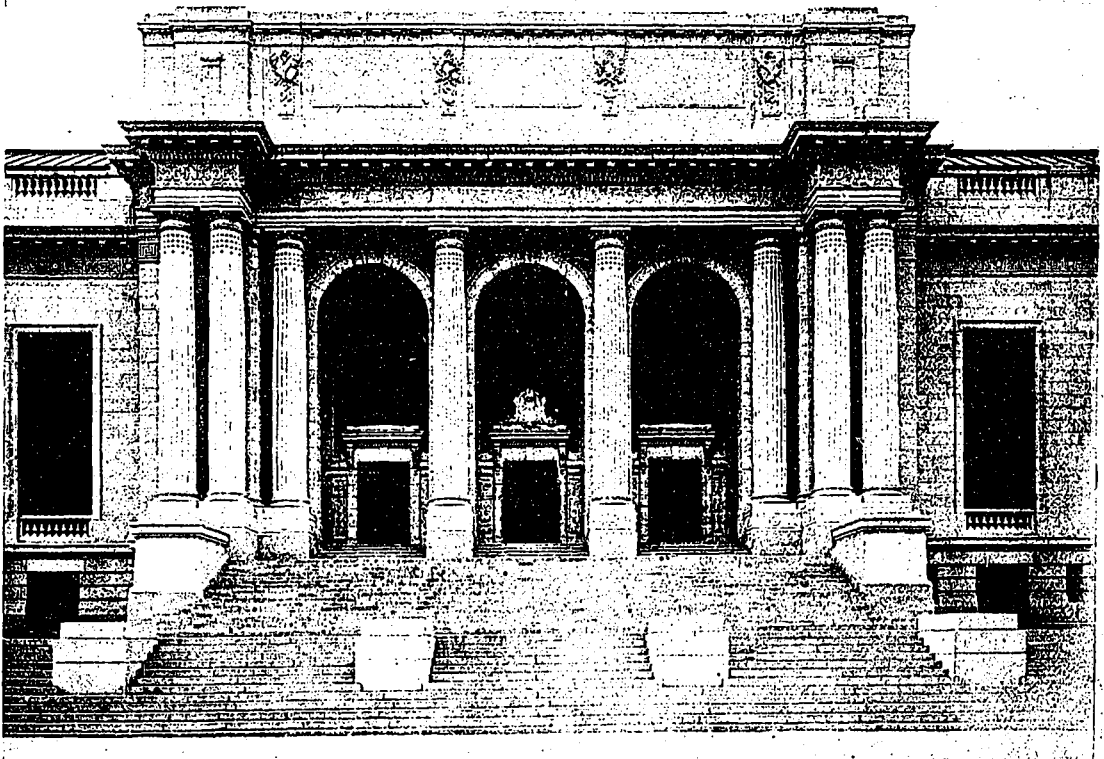
PROSPECTIVE BUILDING WORK in the Western Provinces this year include an unusually large number of important structures. One is a 14-storey office building to be erected at Winnipeg for an English syndicate. Lyall and Mitchell have the contract and as soon as the plans are approved the work will proceed. Another is the \$2,000,000 Bay Company, while a third is the large modern store to be built at the same place for the Hudson hotel which the G.T.R. will construct in Edmonton at a cost of \$1,000,000. Other projects include the Saskatchewan University and several smaller colleges. There is also some talk to the effect that the T. Eaton Company has in contemplation the erection of a large department store in Calgary, but as to whether or not this latter undertaking will materialize is still somewhat conjectural.

* * *

AN INTERESTING APPLICATION of electricity was recently carried out in connection with the wrecking of a wooden bridge which was to be replaced with a steel structure erected on the old piers and abutments. The county authorities purchased the bridge from its original owner, who agreed to remove it in thirty days. Several wreckers declared that it would be impossible to pull the structure down in the time without damage to the piers, which would probably have been injured if dynamite had been used, whilst if the bridge had been burned, probably the masonry would have been injured by the heat. At the expiration of the thirty days, an extension of one week was secured. About this time an electrician proposed to burn the structure apart by means of wires heated by electricity. Each span was composed of nine chords of three timbers, and the plan was to cut each of these twenty-seven sills simultaneously, so that the span would drop into the river between the piers. Fifty-four of these loops were employed to wreck each span, and the work was done a single span at a time. Sufficient current was used to heat the wires to a cherry red. One hour and forty minutes elapsed from the time the current was turned on until the span fell, the timbers falling into the water well inside the piers. The whole occupation occupied a few hours; the current was first turned on at 5 a.m., and at 2 p.m. the last span fell into the river.



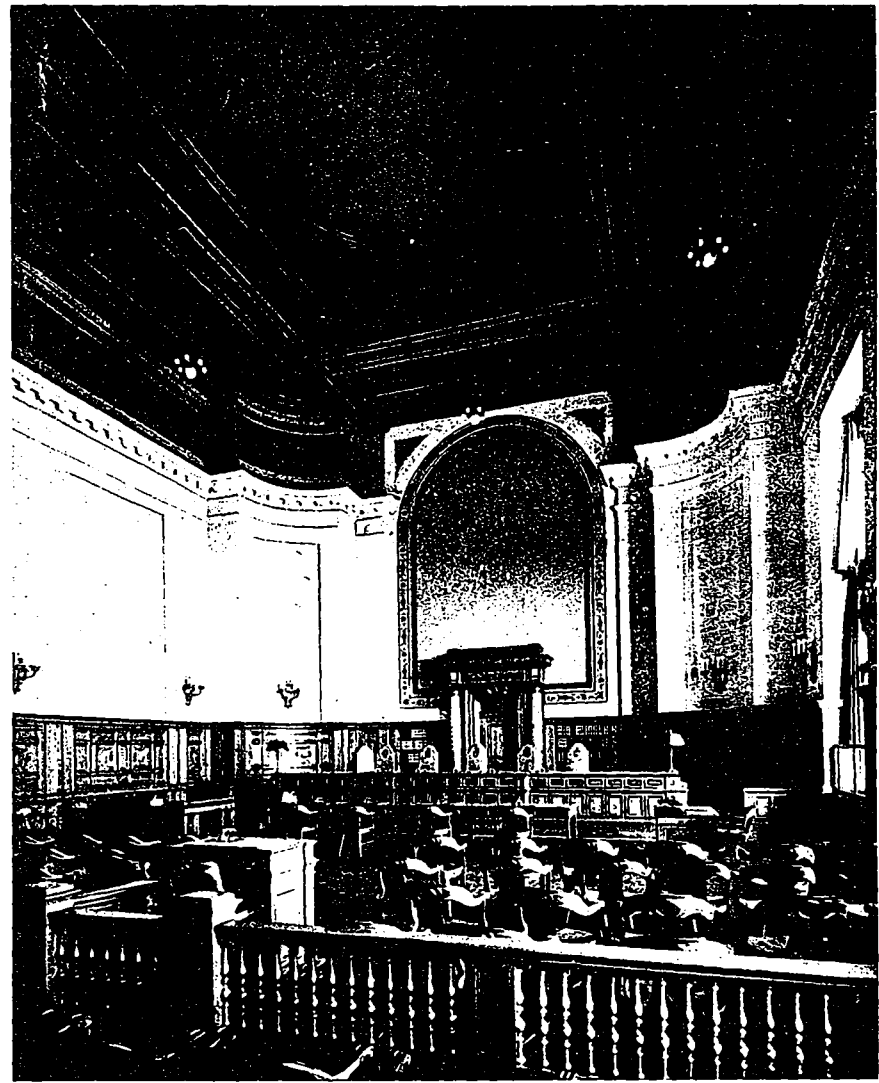
Connecticut State Library and Supreme Court Building, Hartford, Conn. Donn Barber, Architect.



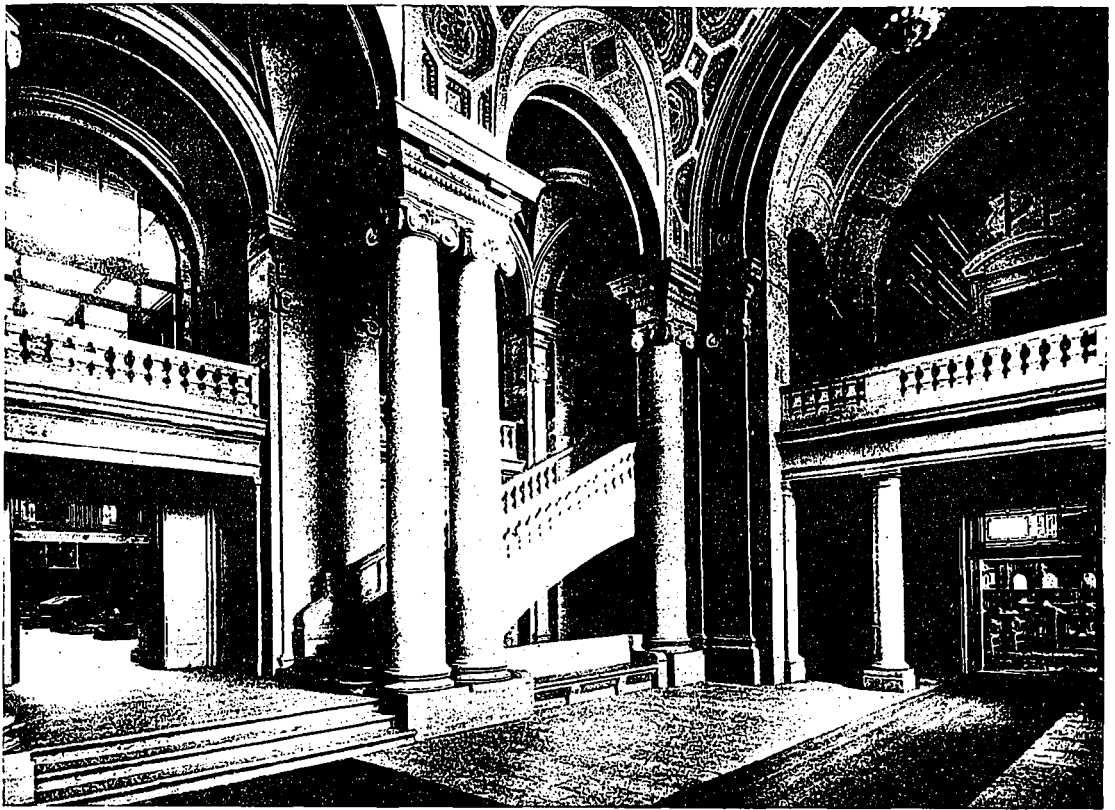
Detail of Entrance, Connecticut State Library and Supreme Court Building, Hartford, Conn. Donn Barber, Architect.



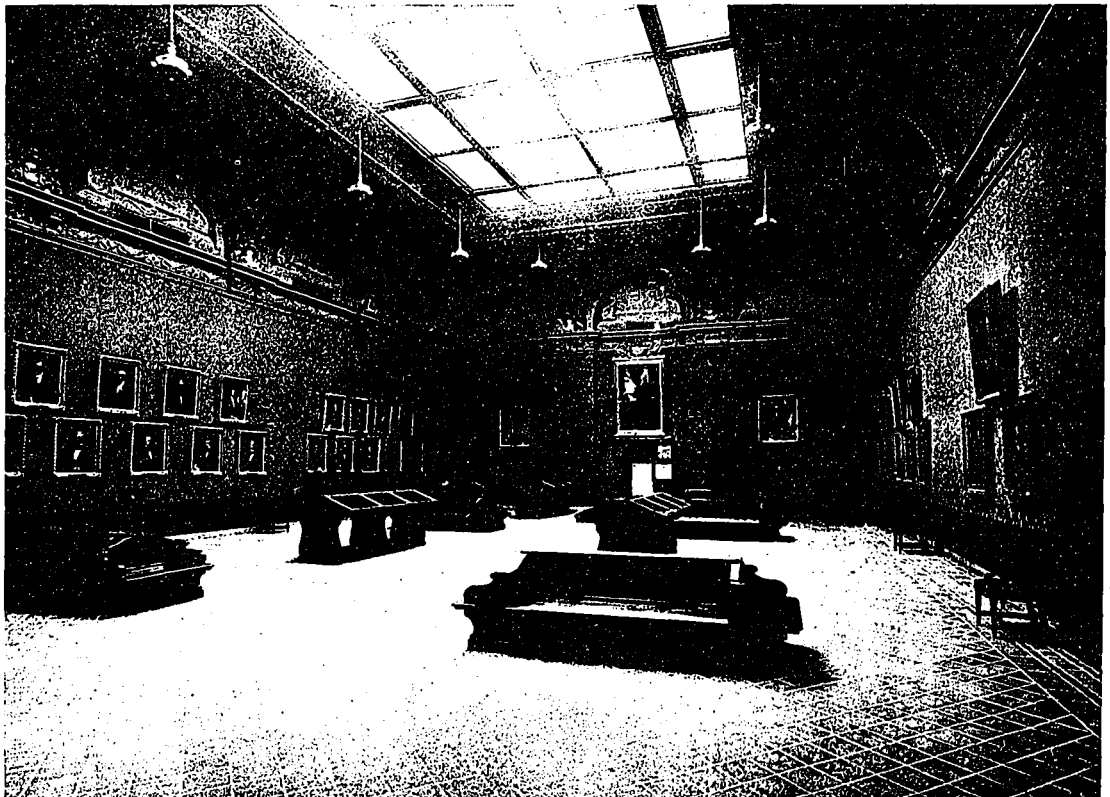
Section of Library, Connecticut State Library and Supreme Court Building, Hartford, Conn.
Donn Barber, Architect.



Supreme Court Chamber, Connecticut State Library and Supreme Court Building, Hartford, Conn.
Donn Barber, Architect.



View of Rotunda, Connecticut State Library and Supreme Court Building, Hartford, Conn. Looking into the Memorial Hall on the Left and the Supreme Court Chamber at the end of Corridor. Donn Barber, Architect.



Memorial Hall, Connecticut State Library and Supreme Court Building, Hartford, Conn. Donn Barber, Architect.



CONNECTICUT
STATE LIBRARY AND
SUPREME COURT BLDG.

An imposing public structure which presents an interesting study in unembellished mass and simple line adjustment.

WHILE INTERESTING as a recent example exhibiting the *beaux art* influence so common to the present day American architectural trend in public building design, it is not so much this as it is the exquisite adjustment of exterior lines that makes the Connecticut State Library and Supreme Court Building, illustrated in this issue, a structure so pre-eminently noteworthy. Few buildings are there to be found in the United States to-day so decidedly devoid of exterior surface embellishment, that still attain such a high degree of architectural excellence. In the design, indeed, there is an approach to simplicity that verges on the austere, and yet avoids that severe ablatitiousness which usually characterizes the latter quality. Such ornament as is used is kept in low relief, refined in detail, and placed only where essential, so that the building depends principally upon its unadorned mass, harmony of scale, and general balance for the admirable effect that has been produced. The beauty of poise, symmetry and pleasing dignity of the resultant composition, reflects in no small way the artistic competency of Mr. Donn Barber, (New York) from whose design the building was erected. In less skilled hands it is doubtful if an attempt at a treatment so direct would have been productive of so satisfying a result.

Regarding its more individual features and the minor details of plan, a criticism appearing in an architectural contemporary has this to say: The coupled columns which form pylons at each side of the triple entrance, appear to have no vital function but when the statuary, evidently intended to surmount them, is in place, this objection will be removed. The cornice treatment on the portions of the building other than around the entrance is of an extraordinarily interesting character, and one which seemingly is peculiar to the French school alone. It is by no means uncommon to use the architrave and cornice combined, but the frieze and the cornice without the architrave, or with the architrave reduced to a simple molding, is one which without seeing the executed work would seem impossible to properly treat, but in place is most convincing.

Perhaps the most thoroughly satisfactory part of the entire building is the delicate beauty of the columns round the main entrance, in proportion somewhat more slender than the usual Doric type with the flutes decorated toward the top. They are about as happy in proportion and as exquisite in detail as it is possible to conceive, while the architrave, frieze and cornice, which they support are of just proportion to them. The decoration of the frieze, by the way, over the coupled columns is unusually interesting, thoroughly in character with the building,

and of a detail which is novel and gives the same gray as the frieze around the remainder of the building. The three functions housed in the structure are suggested by the triple entrance doorway, and appropriately enough the frieze is inscribed over the door adjacent to each of these portions with its proper title. The monumental entrance steps, built in three levels, are agreeably diversified, with pedestals for statuary and assist in raising the building so as to create the subtle impression of dignity, essential in public work. The plan is simple, ample in space and arranged to afford excellent circulation. It seems unfortunate that the library should be broken with stacks introduced into the reading room itself, but this was almost certainly due to the requirements external to the architect's original conception of the plan. After all, the impression of utility (not utilitarianism) made by this intrusion into the general space is by no means as bad as might be expected since one feels instinctively that this is a working and not a showroom.

The supreme court is housed in a room appropriate to the dignity of its function, convenient, spacious, airy, calculated to inspire the attendant upon that court with something of that awe which is too often absent in chambers of tribunal. The rich severity of coloring and form of this room can hardly be bettered, while the ceiling is treated in a manner indicative of careful study and worthy of as careful study from those interested.

The Memorial Hall is not quite so successful, the problem of high and bare wall spaces, lighted from above, is inevitably a difficult one, and it is somewhat open to question as to whether the semi-vault treatment used here is the best which can be obtained. There is no doubt but that an increase in the number of pictures filling and enriching the lower surfaces will notably help out the room, and it is probably this which the author had in mind in designing it. Taking the building as a whole, it seems one of the finest public buildings in the United States, not alone because of its exterior, but because of the thought, care and skill which have been lavished upon even insignificant details. Mr. Baker, the designer, stands well at the head of his profession in the United States, and has a number of important competitions, including the one for the new Department of Justice Building to be erected at Washington, to his credit. In the building under consideration, he has not only produced a structure that is worthy of the highest commendation, but one that should be gratifying and a lasting source of pride to the State which has made its existence possible.

AMONG CONCERNS recently incorporated is the Standard Quarries, Limited, with head offices in Montreal. The company is organized for the purpose of producing stone, lime and the like, and carrying on a general business in building material line. It is capitalized at \$325,000.

M O D E L H O M E S F O R W O R K I N G M E N

Ottawa Association inaugurates movement to bring erection of laboring-class houses under architectural influence and direction.

THE MODEL HOMES Association of Ottawa has been recently formed under distinguished patronage, for the purpose of taking practical steps towards the improvement of the working class houses in that city. It is felt that up to the present time no distinctive type of house, suitable for the Canadian workman, has been evolved; and that the existing examples are either shacks or miniature editions of the more expensive houses, designed without either consideration of fitness or with a view to economy of management. This is due, in the opinion of the Association, to the fact that the providing of proper housing facilities for the laboring class in this country has not heretofore come under architectural influence and direction.

In other countries some of the most eminent architects have been devoting their talent and their time to the solution of the cheap house problem, and it is felt that in Canada also, where this is such a live issue, architects and sanitarians can be relied on, in the interest of the public and the country, to rise to the occasion and give the question some thought and study.

The architects of Canada are therefore invited to send non-competitive designs to Mr. Albert J. Hazelgrove, Hon. Secretary of the Association, 126 Sparks street, Ottawa.

It is proposed in this connection to distribute \$540 in prizes in a competition open to draughtsmen and students, and while the prizes are not large, the Association feels that the problem should appeal to the public spirit of the younger members of the profession. It might be pointed out that the plans in one class will in many cases evolve directly from plans in another class, hence the work to a great extent will be simplified. When a good selection of designs has been obtained, it is the intention of the Association to supply blue prints of the same for a nominal sum to cover cost of reproduction, to people about to build this class of house. The Association also proposes to use its influence in every possible way to see that houses are built according to the plans, and it is hoped that a marked improvement will speedily take place in this class of property.

It is not proposed to confine the circulation of the designs to Ottawa alone. On the contrary, it is intended that the movement will be widespread in scope, and residents in other localities will be equally as welcome to the use of the plans as those in the Capital city.

The Association is neither commercial nor philanthropic. It simply aims at the improvement of the small houses in our Canadian cities, and is deserving

of the co-operation of both the architect and layman. Once started, the movement should spread rapidly and become national in character, and in this manner effect a sociological and economic betterment that will be of immeasurable benefit to the country at large. The Patrons of the Association and those identified with the furtherance of the movement are:

Patrons

- His Excellency the Right Honorable Earl Grey, G.C.M.G., G.C.V.O.
- Hon. W. L. Mackenzie King, Minister of Labor.
- R. L. Borden, Esq., M.P., Leader of the Opposition.
- Hon. Clifford Sifton, M.P., Ex-Minister of the Interior; Chairman, Commission of Conservation.

Committee

- Hon. N. A. Belcourt, Senator.
- Dr. P. H. Bryce, Chief Medical Inspector, Immigration Branch, Department of Interior.
- Gerald H. Brown, Assistant Deputy Minister of Labor.
- Noulan Cauchon, Consulting Engineer.
- Morley Donaldson, District Superintendent, Grand Trunk Railway.
- Patrick M. Draper, Secretary-Treasurer, Trades and Labor Congress of Canada.
- Theodore St. Germain, President, Greater Ottawa Development Company.
- R. L. Haycock, Consulting Engineer.
- Albert J. Hazelgrove, Architect (Honorary Secretary).
- J. E. Macpherson (Honorary Treasurer), Manager, Bell Telephone Company, Ottawa.
- T. D. McFarlane, President, Ottawa Builders' Exchange.
- Colborne P. Meredith (Chairman), Architect, Commissioner, Ottawa Improvement Commission.
- Norman Smith, President, Ottawa Free Press, Limited.
- L. Pennings Taylor, Architect.

Outline of Competition

The Committee of the Association, in inaugurating this competition, desires to briefly outline the objects and aims of the movement, in order that competitors may better understand the nature of the requirements.

The Model Homes Association, Ottawa, has been formed for the purpose of taking some practical steps towards the improvement, both in economic planning and in external beauty, of the cheaper houses in this city. It is felt that if the movement meets with success it will be rapidly taken up in other cities with good results.

A great many small houses are springing up in and around Ottawa, many being built by working men in their spare time, others by working men on a speculative basis. It is the aim of the Association, by education, and by the scheme of designs, outlined below, to raise these dwellings above the class of shacks, and to demonstrate to their owners that simplicity does not necessarily imply crudeness, that form and line can be successfully obtained in the smallest mass by a proper disposition of material, and that a carefully planned and economical house can be built which is much more suited to their needs than the present series of box-like rooms.

This class of work, owing to lack of means on the part of the builders, has heretofore not come under architectural influence.

The Committee, in inviting designs, feels that the public spirit of the profession, draughtsmen and sanitarians throughout Canada should respond, not for the sake of any financial gain to be obtained thereby, but in an honest endeavor to do something for the public benefit.

The architects are asked to submit schemes, on a non-competitive basis, while the large number of prizes offered to the draughtsmen and students should offer some inducement to compete, especially as the problem, though fascinating, is not a large one.

When a selection has been made it is the intention of the Committee to supply blue prints of any particular design to the prospective house builder at a nominal sum to cover the cost of reproduction.

The subject is one which should be of universal interest, and it is not the intention of the Committee to restrict the circulation of the designs to Ottawa, as persons resident in other places will be quite at liberty to avail themselves of the scheme. The Model Homes Association is not a philanthropic association, but it aims purely and simply at helping the small home-builder to help himself.

The designs will be adjudicated upon by a sub-committee composed of the following gentlemen:—
Colborne P. Meredith, Architect.
L. Pennings Taylor, Architect.
Noulan Cauchon, Consulting Engineer.
Dr. H. P. Bryce.

Conditions

Classification of Designs.
Designs are required for houses suitable for the needs of a workingman's family, at prices as follows:—

1. Single houses with pitch roof.
 - Class 1—To cost \$1,000.00
 - Class 2—To cost 1,200.00
 - Class 3—To cost 1,400.00
 - Class 4—To cost 1,600.00
 - Class 5—To cost 1,800.00
 - Class 6—To cost 2,000.00

Class 7—To cost	2,500.00
2. Pair of houses with pitch roof.	
Class 8—To cost	\$1,500.00 the pair
Class 9—To cost	2,000.00 the pair
Class 10—To cost	2,500.00 the pair
3. Single house with flat roof.	
Class 11—To cost	\$1,000.00
Class 12—To cost	1,200.00
Class 13—To cost	1,400.00
Class 14—To cost	1,600.00
Class 15—To cost	1,800.00
4. Pairs of houses with flat roof.	
Class 16—To cost	\$1,500.00 the pair
Class 17—To cost	2,000.00 per pair
Class 18—To cost	2,500.00 per pair

Prizes.

Prizes will be awarded in each class as follows:—

To design placed first	\$15.00
To design placed second	10.00
To design placed third	5.00

The Committee reserve the right to withhold prizes in any class should the entries be deemed of insufficient merit.

Competitors may enter designs in any or all classes, and their designs should be clearly numbered to indicate in which class they are entered.

Size of Lot and Accommodation.

The customary sizes of lots in Ottawa are 66 feet frontage by 99 feet deep, and 50 feet frontage by 100 feet deep. The majority of such houses are built on half lots, 33 feet by 99 feet, or 25 feet by 100 feet, the latter being the more common size in the newer sections of the city.

The character of the accommodation and the disposal on the lot is left to the discretion of the competitor, as it is hoped that by this competition some original schemes will be evolved for the solution of the problem. All designs, however, should include bathroom and inside w.c., and wherever practicable, an open fire-place.

Basement.

Wherever the design lends itself to such treatment, the competitor should dot or the basement plan the position of piers, should the builder wish to proceed without a basement at the outset, with a view to constructing it later. (This is a condition likely to be frequently met with.)

Clearness Essential.

It should be clearly understood that elaboration of drawings is not required; competitors should bear in mind the fact that the probable builders will not be well versed in the reading of plans, hence simplicity is essential, especially in regard to figuring.

Flat-Roofed Houses.

Special attention is directed to the competitions for flat-roofed houses. These are at present the especial abomination in this class of property, but the Association, while not wishing to perpetuate this type among the builders, recognizes that the flat roof is the result of economic conditions which have to be met. It is therefore hoped that some satisfactory schemes will be forthcoming to solve this problem.

Drawings.

Drawing required for each house are as follows:—

Floor-plans for each floor, four elevations, roof plan, outline section, a small sketch to give the builder a clear idea of the general appearance of the house.

Scale

All drawings must be made to a scale of 8 feet to 1 inch. Drawings shall be in ink on tracing linen, 30 inches by 22 inches, if possible.

Specifications.

Competitors are required to submit with their designs brief typewritten specifications of materials and construction.

Figuring.

Drawings shall be clearly figured.

Materials.

The choice of materials is left to the competitor. This class of building is at present chiefly brick veneered, clapboarded or shingled. A schedule of current prices on building material is appended. Competitors should bear in mind that important economies can be effected by using standard lengths of lumber and stock material.

Delivery of Designs, Etc.

Designs shall not be signed, nor have any mark of identification thereon, but shall be accompanied by a sealed envelope containing the competitors' name and address. On receipt by the Association, the designs and envelopes will be similarly numbered, and the envelope will not be opened until the designs have been adjudicated upon.

This condition does not apply to architects submitting non-competitive designs. All drawings subsequently used will have the designer's name and address printed thereon.

All designs submitted must be received on or before Saturday, May 20th, 1911, addressed to Mr. A. J. Hazelgrove, Honorary Secretary, Model Homes Association, 126 Sparks Street, Ottawa.

Drawings should be rolled, not folded.

Schedule of Rates for Materials

	Per M.
	B.M.
1 in. X culls	\$13.00
1 in. O culls	15.00
1 in. No. 2 Mill culls	17.00
1 in. x 12 No. 1 Mill culls	19.00
2 in. x 3/4 in. x 12 in.—16 ft. Hemlock	18.00
2 in. x 3/4 in. x 12 in.—16 ft. Spruce	19.00
2 in. x 6 in. and 8 in. Hemlock	18.00

2 in. x 6 in. and 8 in. Spruce	19.00
2 in. x 10 in. Hemlock	19.00
2 in. x 10 in. Spruce	22.00

Over 16 ft. lengths special price.

1 in. Spruce Flooring and Clapboards	24.00
1 in. Pine Flooring and Clapboards	26.00
1 in. Spruce V-joint and Beaded	25.00
1 in. Pine V-joint and Beaded	28.00
Shingles, \$5.50 per square, laid, including paper.	
Stock Door, 2 ft. 6 in. x 6 ft. 6 in., each	2.25
Stock D.H. Window, complete, each	4.00
Patent Roofing, per square	2.25
1 in. No. 3 T. and G. Spruce	19.00
1 in. x 6 in. or 1 in. x 12 in. T. and G. Pine, M.C.	20.00
1/2 in. x 12 in. Rough	12.00
1 in. x 2 in. Furring, per length .....	.04
8 in. x 8 in. Pine, Dressed	40.00
8 in. x 8 in. Hemlock, Dressed	25.00
Ordinary earth excavation, per cubic yard .....	.50
Brickwork at \$13.00 per thousand.	
Concrete at \$7.00 per cubic yard.	
Masonry at \$10.00 per toise of 72 cubic ft	

	Per
	Sq. Yd.
Plastering on lath	\$.32
Plastering brick .....	.20
Cement Plastering on Brick .....	.40
Cement Plastering on wire lath .....	.75

COMPETITIVE DESIGNS FOR ONTARIO GOV'T HOUSE—Continued from Page 70

ed in the conditions of the competition and a trifle more in some cases.

As there is so much more space in the basement of the main residence than can possibly be required for ordinary purposes, a large supper room and serving room have been arranged, which can be used for large entertainments, thus making the State dining room available as an adjunct to the ball room. In addition to the rooms called for in the conditions, the plan provides for a laundry with clothes dryer; a servants' lavatory, rooms for machinery (one of which would contain a dustless cleaning system), a ventilating system, etc.

On the ground floor an inner lobby has been arranged between the vestibule and the hall, with access therefrom to the elevator, so that in case of entertainments guests can be taken up to the dressing rooms without crossing the hall. The Governor's and Secretary's offices also communicate with this lobby, together with cloak room and lavatory. The reception room, drawing room and conservatory are placed in intercommunicating order at the east end, and the ball room and State dining room (with connecting doorway) are situated at the west of hall, so that the two may be used in conjunction for large entertainments. At the east side of the north wing are the private dining room and breakfast room, so placed as to gain the benefit of the morning sun, and in close proximity are the kitchen, pantries, sculleries, etc., and servants' quarters, all arranged so that the work of the house can be carried on with a minimum number of servants.

The billiard room, library and sun room are arranged east of the gallery on the first floor, and the State bedrooms are placed directly over the ball room. Ten bedrooms and eight bathrooms are provided on this floor, besides the servants' quarters, with six bedrooms, bathroom, and two linen rooms, which are situated in the rear.

The second floor contains ten bedrooms and eight bathrooms, and in the rear portion four servants' rooms, servants' box room, sewing room, and bathroom. A large ceiling light has been arranged over the main hall, with a sky light above in the roof.



"Fallingbrook," the Suburban Residence and Estate of Sir Donald Mann, Kingston Road, Toronto. Warren and Wetmore, Architects.



Gate-Keeper's Lodge, Estate of Sir Donald Mann, Kingston Road, Toronto. Warren and Wetmore, Architects.



Garden Front, Residence of Sir Donald Mann, Kingston Road, Toronto. Warren and Wetmore, Architects.



Main Hallway, Residence of Sir Donald Mann, Kingston Road, Toronto. Warren and Wetmore, Architects.



Living Room, Residence of Sir Donald Mann, Kingston Road, Toronto. Warren and Wetmore, Architects.



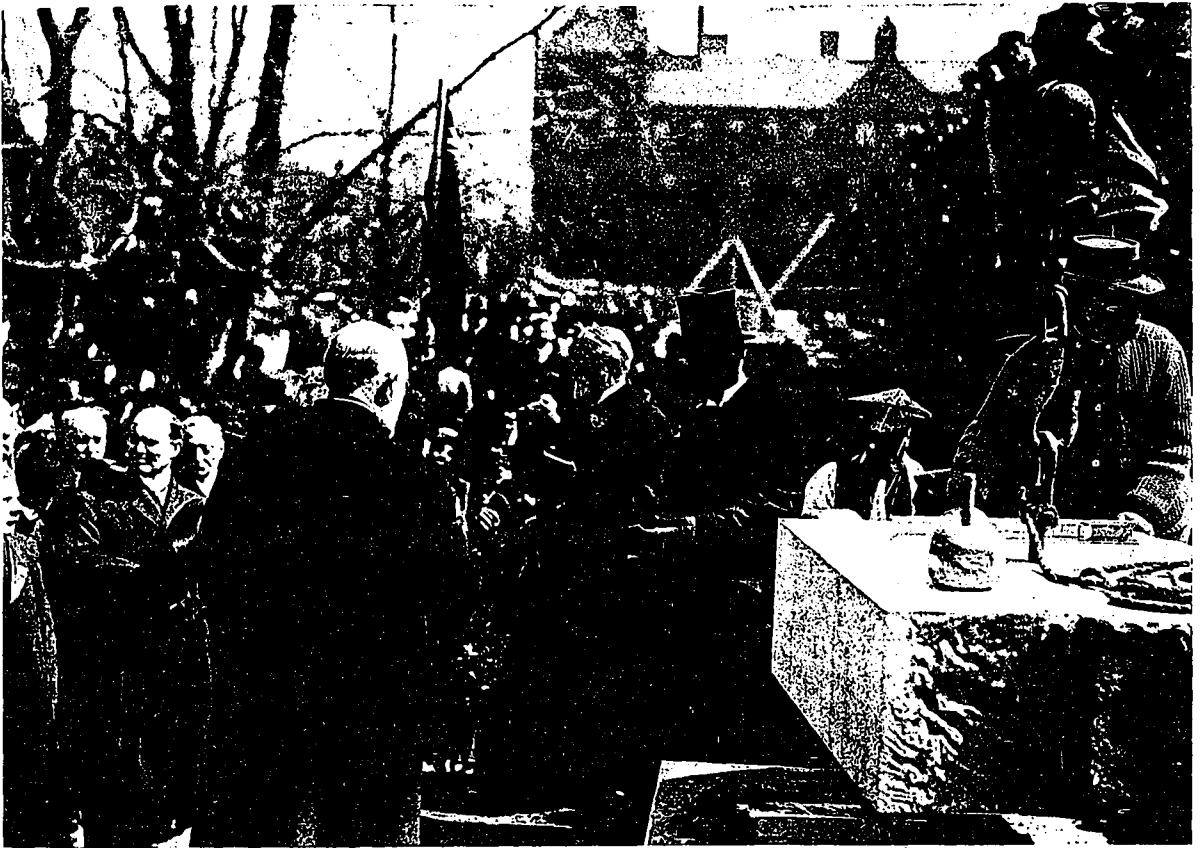
Reception Room, Residence of Sir Donald Mann, Kingston Road, Toronto. Warren and Wetmore, Architects.



Dining Room, Residence of Sir Donald Mann, Kingston Road, Toronto. Warren and Wetmore, Architects.



Library, Residence of Sir Donald Mann, Kingston Road, Toronto. Warren and Wetmore, Architects.



Gathering of Notables at the Ceremony Attending the Laying of the Corner Stone of the new Toronto General Hospital. His Excellency Earl Grey, Who Has Just Accepted the Silver Trowel Preparatory to Lowering the Stone in Place, is Seen at the Centre of Picture. The Buildings Comprising the Group Cover a Ten-acre Site, and are Being Erected from Designs by Architects Darling and Pearson, at a Cost of \$2,000,000. When Completed Toronto Will Not Only Have an Institution that is Ideal in its Equipment for Hospital Work, but One Which in Connection with the Toronto University will Afford Opportunities for Medical Research Such as Will be Unsurpassed by Any Similar Establishment on This Continent.

THE NEW GENERAL HOSPITAL TORONTO

Impressive ceremony attending laying of corner stone by His Excellency Earl Grey. Speakers emphasize importance of project and the vast good it is destined to accomplish

IF THERE HAS BEEN anything lacking heretofore to impress upon the public the great importance attached to the erection of the new Toronto General Hospital, the ceremony attending the laying of the corner stone, which took place on April 11, served to completely fill the void. The statement of His Excellency Earl Grey, who officiated, that he would always consider the privilege of placing the stone the greatest of the many honors accorded him during his Governor-Generalship in Canada, is in itself sufficient to indicate the vastness of the project and the great part it is destined to play both in humanitarian work and in the advancement of medical science. It was an event to which the governors of the hospital, as well as everyone concerned with the care of the sick and afflicted in Toronto and the Province, looked forward with great interest and eager anticipation, as it not only signalized the result of years of tireless

effort, but marked a new epoch of development in hospital work in the Dominion. Aside from His Excellency, who was accompanied by Lady Evelyn Grey, those on the platform erected for the occasion included His Honor Lieutenant-Governor Gibson, Sir James Whitney, Mayor Geary, Chief Justice Sir Charles Moss, President Falconer of the Toronto University, Hon. Robert Jaffray, Hon. W. J. Hanna, Hon. Dr. Reaume, Hon. J. S. Duff, distinguished members of the clergy and medical profession, and a large representation of men and women prominent in the business and social life of the city and Province.

In introducing the speakers, Mr. J. W. Flavelle, who as chairman of the Board of Governors, presided at the ceremony, stated that he wished to express on behalf of the trustees their appreciation of the kindness shown by the co-operating bodies which had made the enterprise a success, the Mayors of Toronto, the Chancellor and Governors of the University, the Legislature and the people of the Province, by whose authority the Governors of the University were enabled to give important financial aid to the hospital, and the people of Toronto, who by their votes and by subscriptions had given every possible assistance to the hospital. Mr. Flavelle also paid a tribute to the surgeons and physicians who year after year rendered their services with no re-

muneration whatever. The site of the new hospital, he said, comprised ten acres, and the building under construction would cost \$1,400,000. Contracts would shortly be let for three other structures, thus bringing the total cost for buildings alone up to \$2,000,000.

Following Mr. Flavell's remarks, Dr. Falconer, President of the Toronto University, emphasized the momentous nature of the occasion. It was due to the liberality of the citizens of Toronto that they were enabled to be present to take part in the ceremony. He pointed out the tremendous rate at which medical science had advanced during the last century. Speaking of the structure, he told the gathering that nothing had been undone in order that the plans and the equipment should be of the very best. The present was an age of philanthropy and also an age of science. He voiced his appreciation at the union between the University and the hospital, and stated that as far as the University was concerned the new institution would have its deepest care and best knowledge.

Other speakers were Sir James Whitney, who in a short speech wished the promoters godspeed in their work; and His Honor Lieutenant-Governor Gibson and Meary Geary, who dwelt upon the great benefits that such a modern institution would bestow on both the citizens of Toronto and the community at large. Prior to lowering the stone into place, His Lordship Bishop Sweeny, who was present in his episcopal robes, invoked a blessing, and the Rev. Dr. Carman, head of the Methodist Church in Canada, read the 23rd Psalm. At the conclusion of the ceremony, Earl Grey expressed his gratitude for being invited to officiate at so important an event, and he hoped that the Government, the City of Toronto and the University would continue in their effort to further so worthy a work.

As an undertaking made possibly by the people of the city and Province, and the munificence of private individuals, Toronto will indeed have an institution of which it can be justly proud. Aside from being ideal in its equipment for hospital purposes, it will offer opportunities for medical research work in connection with the Toronto University which cannot be surpassed on this continent. Probably no scheme of buildings so comprehensive in scope, designed for a like purpose, has ever before been undertaken at any one time on this side of the Atlantic. The magnitude of the project is best evidenced by the fact that the brick and masonry contract is the largest single undertaking of its kind under way in Canada at the present time. The bricks, which are being furnished by the Don Valley Brick Works, are of a special grade, and the manufacturers were obliged to install specially designed machinery in order to promptly fill the demand and to produce a material that both in texture and quality would be particularly adapted to the architectural scheme of the buildings, as worked out by the designers, Messrs. Darling and Pearson. Work on the buildings is progressing rapidly and their completion, which is to be effected within two years' time, will be a tribute to Canadian enterprise, and

denote to a high degree the philanthropic tendency and broad spirit of those who have made its existence possible.

ABBREVIATION OF FACTS.

THE FOLLOWING LETTER has been received from Mr. Peter Gillespie, Lecturer of Applied Mechanics at the Toronto University, and President of the Canadian Cement and Concrete Association, with the request that it be published:

April 1, 1911.

The Editor, Construction, Toronto:

Dear Sir,—I desire to call your attention to a pamphlet being distributed in Canada by the Hercules Waterproof Cement Co., of Buffalo and New York, which gives a summary of tests made by me last summer on some of their Hercules Strengthening and Waterproofing Compound. In the first place, I am incorrectly described therein as "Dr. Peter Gillespie, Dean, Department of Civil Engineering in the University of Toronto." In the second place, in justice to the public and myself, I wish to state that certain parts of my report have been omitted, and that, in consequence, the impression obtained by the reader of the summary of tests in the pamphlet is quite different from what the public would receive from reading the report I submitted to the company. I have notified the Hercules Company that I object to the summary of the report as set out in the pamphlet, and I have requested them to discontinue its publication. The Ontario Lime Association, ~~the agents of the Hercules Compounds in Canada,~~ inform me that they are in no sense responsible for the contents of the pamphlet.

Very truly yours,

PETER GILLESPIE,
Lecturer in Applied Mechanics,
University of Toronto.

AN IMPORTANT CONTRACT for material was recently awarded to E. F. Dartnell, the well known building supply dealer, 157 St. James Street, Montreal. It calls for about 160,000 white porcelain faced brick to be used in the exterior of the Dominion Express Building, now being erected in that city, after plans by Messrs. E. and W. S. Maxwell. This is one of the largest orders for enamel or porcelain brick ever placed in Canada. Satisfactory progress in the construction of the building is being made by P. Lyall and Sons, who have the general contract.

* * *

THE MISSISQUOI MARBLE Company, Phillipsburg, Que., has increased its capital stock from \$500,000 to \$1,000,000. It is understood that the company will make a number of enlargements at its property in order to meet the growing demand for its product, which is richly veined and regarded by architects and builders generally as one of the highest grade marble quarries.



THE HEATING AND VENTILATING OF SCHOOL BUILDINGS

Factors in class-room hygiene and the importance of their neutral adjustment to sane and natural needs.

THE IMPORTANCE of the heating and ventilating problem in its relation to class-room hygiene, and the part which these factors play in assisting or retarding the physical and mental development of the scholar, forms the basis of an instructive article by Curtis Tobey, architect, in a recent issue of the "Building and Industrial News." The arguments set forth are reasoned from premises which assume that the question of lighting has been properly considered, and are advanced with the object of clearly indicating the necessity of the neutral adjustment of these elements to sane and natural needs.

For the healthy and natural development of the mind of the child and scholar, says the writer, it is absolutely necessary that its body is healthy and natural. Under this condition, he forgets that sickness and nerve fatigue exist. He is not acquainted with his stomach, for it never bothers him. He is entirely unconscious of his environments and source and element of provision. All is neutral to the senses but the one desire of the moment, and that is intense and its satisfaction keen and enjoyable. It is this neutrality of the senses to these physical environments and provisions, this absolute forgetfulness of insensibility, that permits the undivided and eager attention of the scholar in his studies, and it is therefore absolutely necessary that this neutrality be secured and maintained in the class-room if best and lasting results are expected from his training. Let us see what our modern class-room offers or provides to meet the needs and requirements in the matter of atmospheric temperature and purification.

In a room 26 feet by 36 feet, a large class-room, there are usually two entrance doors with pivoted transom sash over one or both. At the rear and at the left of the scholars as they are seated are placed the window openings. The lower two-thirds of each opening is fitted with double-hung sash balanced with weights to enable each sash to be raised or lowered at will. The upper one-third of each opening is provided with a bottom-hinged transom sash controlled by adjustable transom lift. Each sash is glazed with ordinary 21 or 26 ounce glass representing a thickness of about one-eighth of an inch of separation between the temperature of the outside atmosphere and that of the class-room. The front and right-hand walls are blank partitions forming part of the interior construction of the building. This gives us, then, two outside walls with about half their area of only one-eighth of an inch in thickness, and two inside walls plastered on both sides and usually containing sound deadening ma-

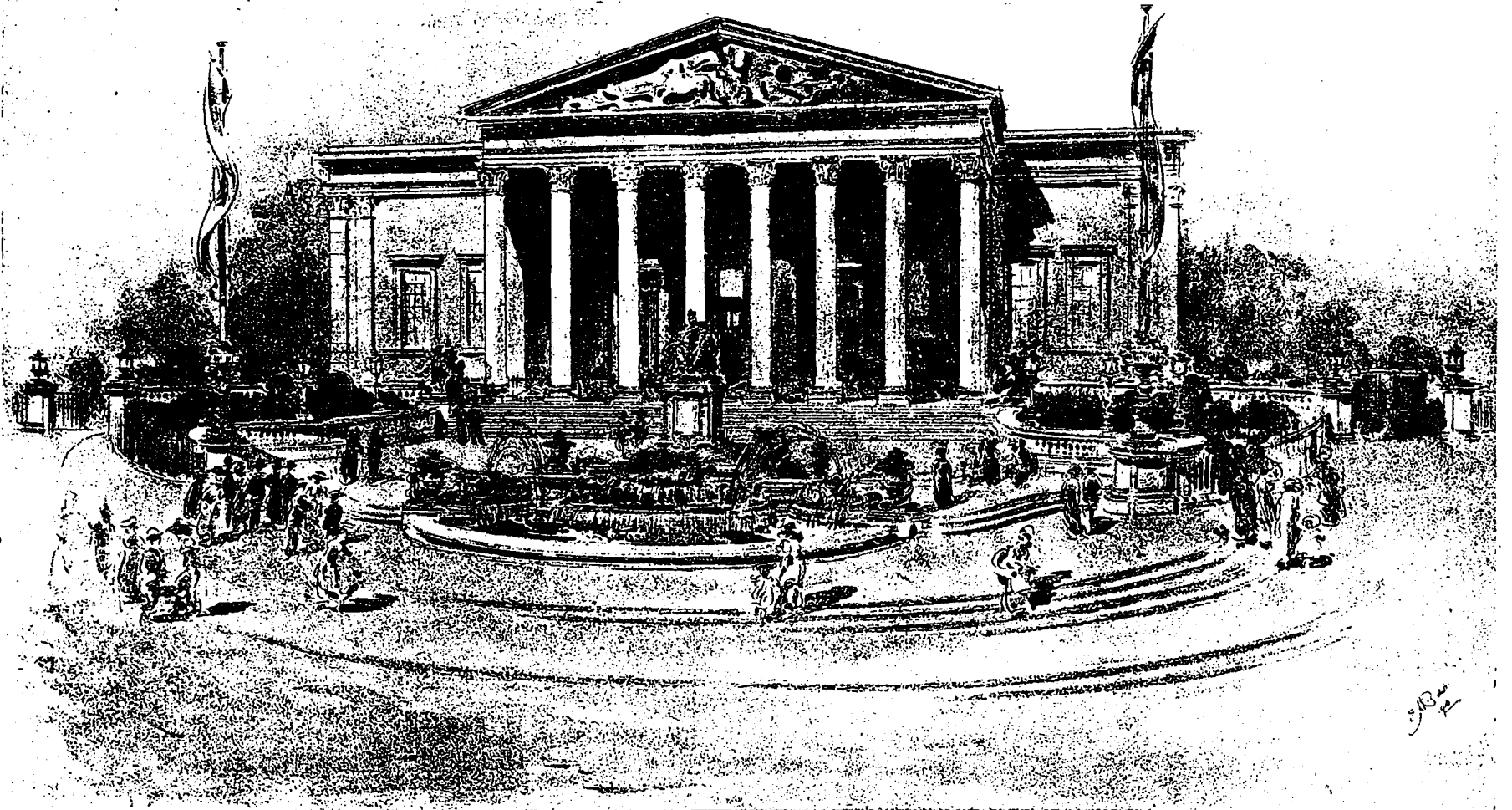
terial between the studs. The ceiling is plastered which, together with the lath, should give a thickness of about three-quarters of an inch, but, as it is customary with plasterers to "skin" the ceilings, this thickness is very often not over one-half an inch. The floors are doubled with deadening effect between the rough and finished floor.

To maintain a uniform temperature and a uniform ventilation within a space so unevenly inclosed and so poorly insulated from the effects of the elements, is a practical impossibility. To correct this condition, steam, hot water or hot air radiators are placed on or near the floor and below and in the centre of each set of windows. Fresh air inlets are placed below or in back of these radiators and, like the radiators, are controlled by hand at the will of the teacher, or, as is very customary, by one of the scholars assigned to that duty. Ventilators are placed in the ceiling or in the walls near the ceiling for the purpose of venting or carrying off the impure air through galvanized iron vent pipes that connect with a large exhaust stack extending above the roof of the building. This stack is in most cases equipped mechanically to cause a forced draft calculated to exhaust the air of each class-room within a given time. The draft or suction in this stack is sometimes left to the natural tendency of the air to ascend, due either to its gravity or both to gravity and induced suction at the top through louver terminal. This latter method is never uniform and is not to be recommended, except where made necessary by the lack of sufficient funds. To facilitate the intake of fresh air and the outlet of impure air as occasion demands, windows and transoms are opened and adjusted to best secure results.

This description is necessarily composite, but it applies very accurately to the newest and best of our public school buildings. The older buildings contain many recognized faults and practically few merits. They are, unfortunately, so fundamentally crude, as compared with modern design and equipment, that many of them must be relegated to and considered in the class of temporary housings.

Before we start to criticize or to make suggestions for the improvement or alteration of the present class-room and its modern methods for securing and maintaining uniform and evenly distributed temperature and ventilation or rejuvenation of its air, we must first understand and determine the nature of air itself both in the relation of fresh or pure air to the noxious or impure air that is the result of contact with the body or that which has been exhaled from the lungs, and in its action as a fluid body within definite confines. Primarily, air is composed of oxygen and nitrogen; oxygen representing, in ordinary terms, Life and Animation, while nitrogen, which comprises in volume nearly four-fifths, representing Substance. The cleansing action of air upon the blood and tissues of the body at each respiration is similar to the cleansing action of water upon soiled linen at each washing. The dirty or foul air expelled from the lungs is laden with used up or oxidized energy in the form of carbonic acid gas.

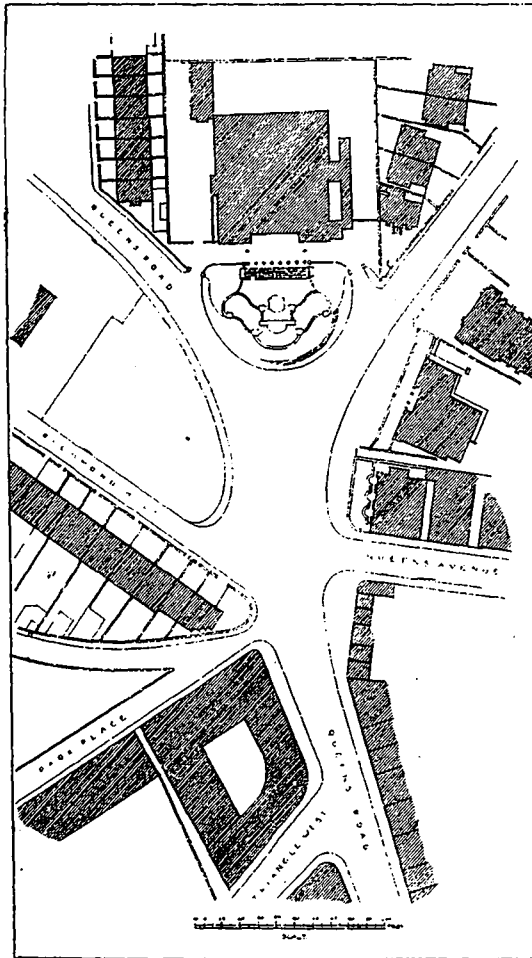
KING EDWARD VII MEMORIAL, BRISTOL.



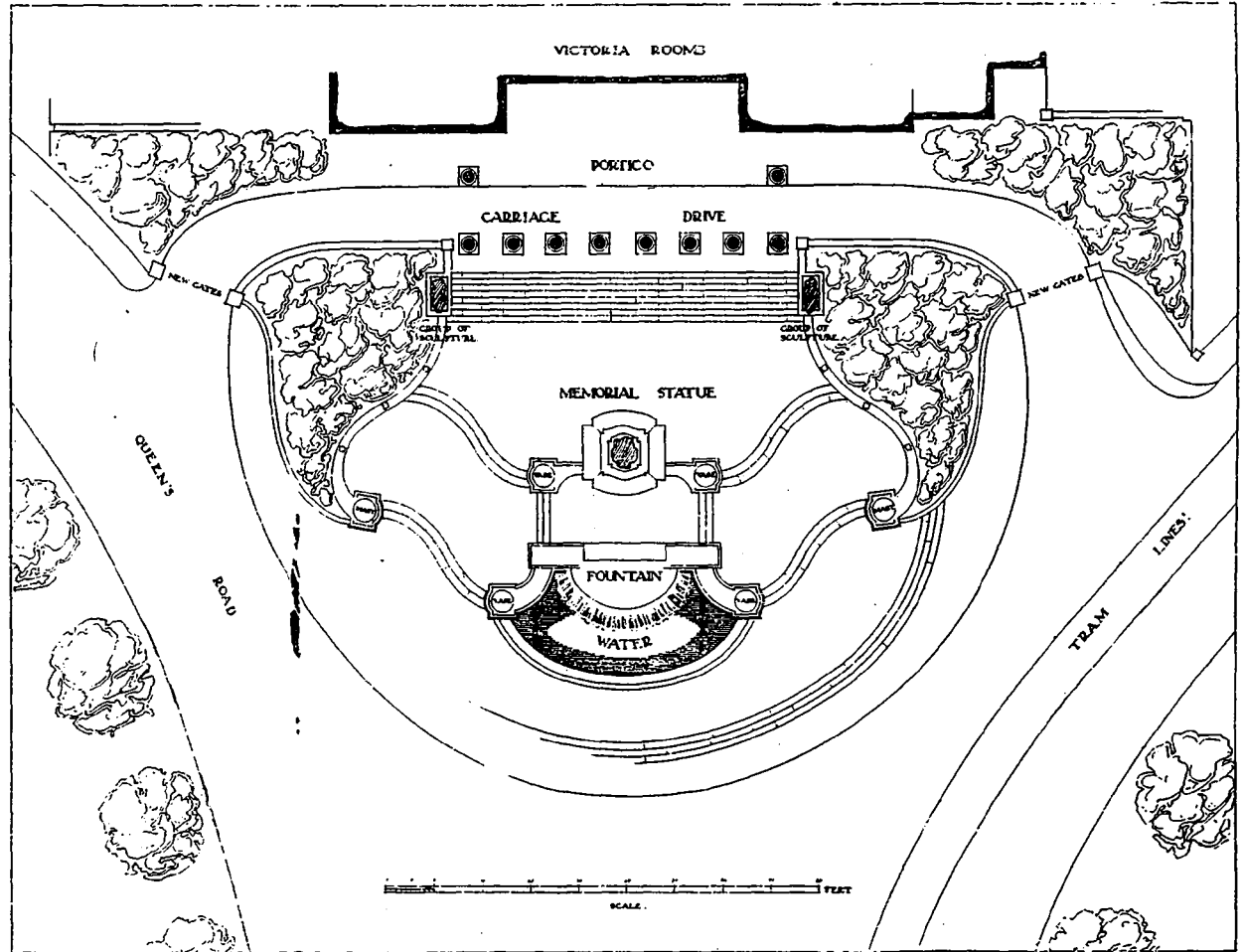
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Design for King Edward VII. Memorial and Fore-ground Scheme of Victoria Rooms, Bristol, England. Messrs. Lanchester and Rickards, F.F.R.I.B.A., Architects.

CONSTRUCTION, MAY, 1911.



Plan of Site.



Plan of Memorial.

Practically every City and Town of any Importance in the British Isles are Taking Steps at the Present Time to Perpetuate in a Substantial Way the Memory of King Edward VII., and already a Number of Elaborate Schemes have been Projected and Worked Out. Notable among these is the Proposed Memorial to be built in Front of the Victoria Rooms at Bristol, after a Design by Messrs. Lanchester and Rickards, which is illustrated herewith. The Site Chosen is an Ideal One, being at the Summit of a Hill which Rises from the Heart of the Town. The Monument, which Will have a Building of Dignified Design for its Background, will Form the Terminal Feature of Queen's Road and Overlook College Green and the Statue of Queen Victoria at the Foot of Park Street, which Forms a Continuation Further Down. The Victoria Rooms are Private Property and the Existing Driveway and Terrace Walls are to be Preserved Intact, with the Exception of the Broad Flight of Steps in Front of the Portico, which is to be Slightly Altered. In Front of this, however, the Whole Site is to be Remodelled in Accordance with the Accompanying Scheme, the Existing Triangular Enclosure being Thrown Open Within the Lines of the Curved Balustrades Terminated by the Venetian Masts, which are Designed to Contrast with the Sweeping Lines of the Design. The Decorative Fountain, which is an Integral Part of the Scheme, is Placed on a Slightly Lower Level to the Front of the Memorial Statue, and is Intended to Obviate the Effect of Isolation that Might Otherwise Obtain.

This exhaled air with its load of carbonic acid gas is much heavier than pure or fresh air, just as dirty water, with its load of earthly matters held in suspension, is heavier than clean water. Thus, assuming that the air contained in a room is still and of even temperature throughout, the foul or heavy air would drop or gravitate to the floor while the fresh and lighter air would remain toward the ceiling. The air body in the average class-room, however, is not still, nor is it of even temperature, and, although the tendency of the foul laden air is always downward, the air currents keep it in constant motion and in constant assimilation or mixture with the fresh air. Instead, then, of the scholar breathing and working in fresh air, the same that is injected into the class-room through the fresh air inlets, he is breathing, again and again, air that contains more or less of the impurities not only of his own body but of every other body in the room. It is obviously impractical to provide each scholar individually with an independent and separate supply of fresh air direct from the outside. Such a contrivance is possible, of course, but its application and use would involve so many other problems that its application is necessary only in classes under medical treatment. For the normally healthy child and scholar, a high percentage of purity is all that is required, but he is entitled to as high a percentage of pure air at each respiration during his study hours as is possible to secure for him, and this, too, with no more distraction or exertion than he would experience in the open. In point of fact, no body of air is ever absolutely quiet, not even within its own particular mass. In the class-room, the currents of the air are accelerated by the great differences of temperature at various points. In winter time, it is warmest at the heating radiators and coldest at the windows and exposed walls; while in summer time, the reverse is the case, the windows radiating outside heat. In summertime, also, the circulation of air in the class-room is greatly increased by the opening of the windows and transoms. This latter, although perhaps productive of excellent ventilation, is nevertheless severe upon a weak constitution and particularly so if the scholar is within line of the draft. If the windows and transoms are not thrown open, both for better ventilation and for purposes of cooling the room, then the ventilating system must perform its function. It is unfortunate but true that there is scarcely a modern school house in which its heating and ventilating system performs its functions in entire satisfaction of demands, nor what is even more rare, a school house or a class-room whose atmospheric temperature remains the same in summer as in winter, not only as the thermometer registers at the heaters or ventilators, but as it registers at every corner and section of the class-room.

Summer heat, with its dry, sultry and dust-laden air, is no more conducive to active brain development than is the shivering cold of winter. The climate or temperature of the class-room must be equal

and uniform, and maintained at a degree of physical comfort to each scholar so nearly perfect that the existence of temperature environment is forgotten. The same is as true of the ventilation. The supply and exhaust of air should be so equalized and so carefully adjusted to meet the requirements, not only of the room, but of each scholar in the room that it calls for no consideration or attention. With a class-room made first practically noiseless with its thick, shellaced linoleum floor covering; the window sash fitted with the thick prism glass accurately adjusted to disperse soft, clear and shadowless light; the climate or temperature evenly distributed and perpetually maintained; and the air continuously but unobtrusively admitted and exhausted without draft or noticeable circulation the attention of the scholar to his work must be the best, his attack upon difficult and intricate problems must be with keen interest and pleasure, and he must, under such favorable physical environments, produce the best results possible.

It is a simple matter to review any situation, see and understand its good and its bad points and to criticize results. Neither is it altogether difficult to offer valid suggestions for the betterment of conditions as they exist, but it is decidedly difficult, and sometimes hazardous, to attempt to prescribe a "cure-all" remedy, more particularly, if in the application of the remedy, all precedent is to be upset. Progress, however, is the fruit of rational experiment and the results sought are sufficiently important and necessary, as in the case of the surrounding elements of the class-room, that it may not be deemed a breach of conservatism to offer suggestions and to propose a system of heating, cooling and ventilating which, in its installation and operation, would be directly opposed to the systems now in vogue.

In the case of indirect light, the direct rays are so diverted and refracted that the room has the effect of light without a source. This is exactly what is required. The strength, quality and direction of the light thus obtained for the class-room was secured by a careful study of natural out-of-door conditions. Nature supplies correct examples and "modus operandi" of all principles. The source of light and heat is above and not below, as in the case of ordinary floor radiation within a building. Now, if the natural source of heat and cold is above, the ceiling and not the floor should be the source of heat and cold for the class-room. It should, also, be the source of pure air, and the floor, and not the ceiling, the point at which the heavy and foul air is exhausted.

In the basement of office and other buildings where, for mechanical reasons, radiators have necessarily been placed on the ceilings, it has been discovered that the temperature of the rooms is much more even and the heat more uniformly distributed throughout the entire space than is the case where the radiator is located on the floor. Another instance of the application of "top" heat is found in the mechanical incubator and brooder for the

hatching and care of chicks. This instance is, of course, not exactly parallel to the needs of a class-room, but it serves to illustrate the theory of "top" heat and air, inasmuch as the method has been tried out and adopted as the best and most natural, as well as the most successful in point of results.

The matter of equipping a class-room for "top" or, as in the case of light, "indirect" heating and cooling, and for the supply of fresh air, once its theory is understood by the mechanic, there is no difficulty in its application. At each of the four corners of the ceiling and about four feet each way from the walls, hang a radiator of sufficient capacity equal to one-fourth of the total radiation required. Directly above each radiator provide the fresh air inlet. An inch or two below the radiator, hang a permanent metallic distributing pan, so that as the fresh air strikes into the radiator it will be deflected horizontally and distributed over the ceiling. At each corner of the room, and if possible, at other points in the base board, provide exhaust openings for the heavy and foul air. Both the supply of fresh air and exhaust should be operated and regulated mechanically by means of pressure and suction appliances. The radiators should be controlled by a thermostat placed in a screened recess of the wall about three feet from the floor and set to operate the control at normal temperature.

Under such an arrangement, with the system designed to meet full requirements, and with all windows and doors closed, the heated fresh air that is distributed evenly over the entire upper portion of the room would gradually descend upon the scholars uniformly and in its original purity, take up its burden of body impurities as thrown off at each respiration and finally fall to the floor to be sucked into the exhaust vents and out through the stack to the roof. The inequalities of building insulation against the external or outside elements would have but slight effect upon the uniformity of internal temperature or at least a far less effect than it has upon the internal temperature of the class-room under present methods of heating and ventilating.

During the summer months, when the heating of the building is not required, the fresh air supply should first pass through a cooling process before it is supplied to the class-rooms and is distributed horizontally over the ceiling. Uniform temperature is maintained in warm weather by this means as regulated by the thermostat the same as it is regulated in cold weather, and also without the necessity of opening doors and windows or causing injurious drafts.

The additional expense of installation and maintenance of this system of "top" or indirect heating, cooling and ventilating is but slightly in excess of the ordinary systems, the additional expense centring upon the power plant and cost of operation. The advantages gained, however, are so great from the student's standpoint that this extra expense is but trifling and should not be considered as in the least obstructive.



COLOR

EXPERIMENTS

IN CONCRETE

Results of investigation covering a series of important tests made in body and surface coloring to determine the value of different pigments.

TIMELY TO THE PROGRESS that is being made in the use of concrete, are the results of a series of color experiments recently conducted by Prof. Charles E. Pellew for a New York architect engaged in the erection of a number of cottages of this material in the neighborhood of that city.

The general problem of coloring concrete, the investigator says, naturally separates itself into two main divisions, body coloring and surface coloring. In the first the pigment is incorporated in the body of the concrete before mixing, and forms blocks of even color all through. In surface coloring, on the other hand, the coloring material is applied to the surface of the block, after the concrete has set, and thus forms only a thin film or coating on the outside.

These methods of applying the color each have their special disadvantages, due to the nature of the material. The free lime in the concrete has, when moist, a strong and generally injurious chemical action upon most of the ordinary pigments, and comparatively few coloring matters are able to resist it, especially when mixed right in with it. It has at the same time a strong action upon many kinds of organic matter, such as linseed-oil, used in paint. Then, too, the compact but friable surface of concrete makes it difficult to force a stain or paint into the pores far enough to prevent it from being easily brushed or rubbed off.

For our particular problem, as it happened, the question of expense was of vital importance; and this limited us still further in our range of possible pigments. In the matter of first cost it is evident that some form of surface coloring would be cheapest. But, unless great pains are taken to have a thoroughly hard, permanent surface for the pigments to adhere to, and to obviate as far as possible the use of linseed oil, the body coloring is probably the most satisfactory.

It is proposed to sketch, briefly, the various materials that can be used for body coloring. Our experiments hitherto have been directed towards the following colors: Brown, red, yellow, buff, black, and green, and we shall take them up in that order:

Brown. Some experiments with a vegetable brown made from partially carbonized organic matter gave results which were unsatisfactory, as the colors were hard and uninteresting. We then made a series of experiments with two mineral dye-stuffs, long known and used for staining and coloring textiles, but not, we believe, used hitherto for coloring cement or concrete. These were the orange-brown iron-rust color and the manganese brown.

(a) *Iron-rust.* This color is the same as that known

to our ancestors for dyeing homespuns, and is still used for coloring fishing boat sails on the Mediterranean. It is based on the formation in the concrete of a reddish brown deposit of ferric hydroxide by the action of the lime of the cement on a soluble salt of iron, like ferric chloride or ferric sulphate. First we tried ferric chloride as the coloring agent, but we found later that strong solutions of ferric sulphate could be obtained from the chemical manufacturers at a low price, far less than any other soluble ferric salt.

Unfortunately, it takes a very large amount, twenty-five to thirty per cent. (of the weight of concrete) to get at all a decided color with this compound, and this is a serious drawback for our purposes.

(b) *Manganese Brown.* This color is based on the formation in the concrete of brown manganese hydroxide by the reduction of the salt potassium permanganate. The latter possesses a strong rich purple color, which in the presence of oxidizable material, such as organic matter, turns to a full seal brown.

In staining concrete the organic matter must be supplied in the form of glucose or sugar, which in quite small quantities will change the deep purple color of the permanganate into a rich seal brown. To get a full, deep color in our experiment we were obliged to use some twenty-four and a half per cent. (by weight of the cement) of permanganate and about half per cent. of glucose. The price of permanganate is about eight cents a pound, and the glucose can be obtained in the form of a thick, concentrated syrup at a little less than three cents a pound.

Red. The only red colors practically available for body coloring are the various forms of red oxide or iron, some of them natural, finely ground hematites from Europe or this country, and others artificial, usually a residue from the distillation of copperas for fuming sulphuric acid.

These colors differ greatly in shade, price, and coloring power, and it is impossible to cover more than a few of the innumerable varieties of red oxide that can be obtained for this purpose. In general, the cheaper colors are either native oxides of rather unsatisfactory shades and low coloring power, or else are more expensive and powerful pigments mixed with a neutral adulterant, like gypsum. As a pigment adds nothing to, and, indeed, distinctly detracts from, the strength of the concrete, it is evidently best to get the desired shades by a small amount of a strong, though high-priced, color than by using a cheap and weak color in proportionately larger quantities.

After experimenting with twenty or more different colors from various manufacturers the best results were obtained from a red color at $2\frac{1}{2}$ d. a pound, from seven and a half to ten per cent. (of the weight of cement) being needed to give a full shade. The addition of small amounts of permanganate brown, as described above, modifies the bright red color and gives a more pleasing shade, like red terra cotta.

Yellow. For this color the only available pigment

is some form of yellow ochre, which can be obtained both strong and cheap. The best results that we have had came from the use of a strong, bright color, which, when used to the extent of eight per cent. of the cement, gave a bright tan color. This yellow can be used for shading the red, but it is not so effective for this as the manganese brown.

Buff. The same yellow ochre, when mixed with small amounts of the permanganate brown, will give various shades of yellowish brown or buff color. Pleasant shades are obtained by using five per cent. of yellow ochre and two and a half per cent. of permanganate.

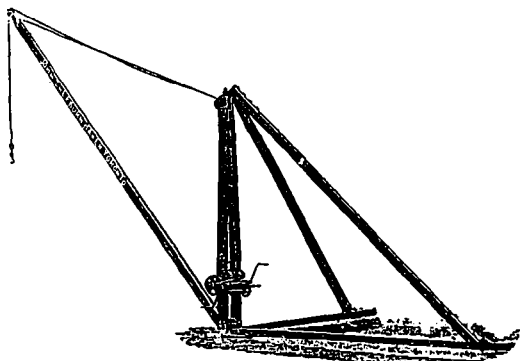
Black. In case black shades are desired, they can be obtained without difficulty by using some of the carbon or lampblack. For a bluish shade of black we experimented with some success with a black iron oxide, imported for the use of gas works. Full shades would need some eight or ten per cent. of the pigment.

Green. The high price of chromium oxide, the only green mineral pigment which will stand the action of lime, prevents its use for body coloring. In the absence of a strong blue which will stand the action of lime, it is not possible to obtain a good green by modifying the color produced by yellow ochre. Ultra-marine blue is, indeed, fast to lime; but possesses a very low coloring power when mixed with other pigments, while the strong blue, Prussian blue, which is commonly used as a constituent of green paints, is very easily attacked by the cement.

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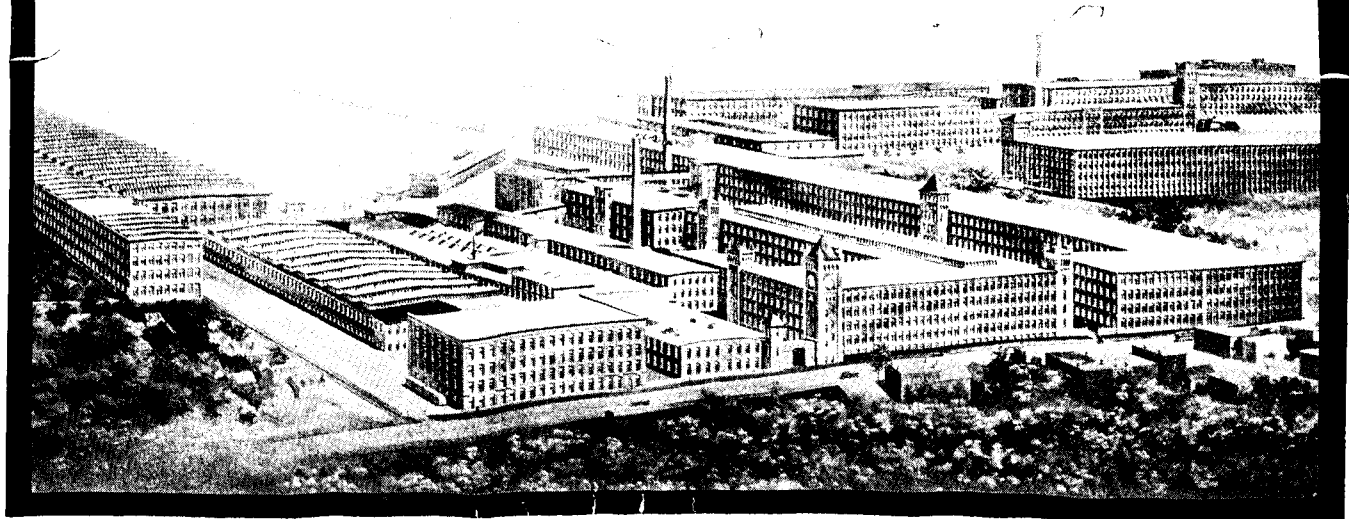
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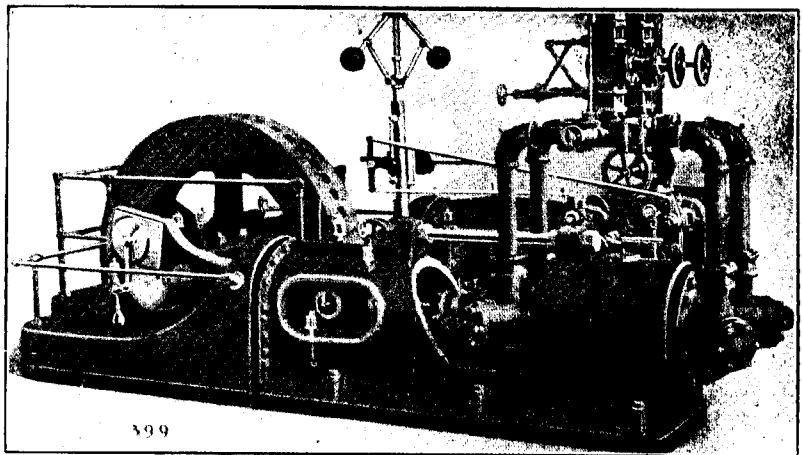
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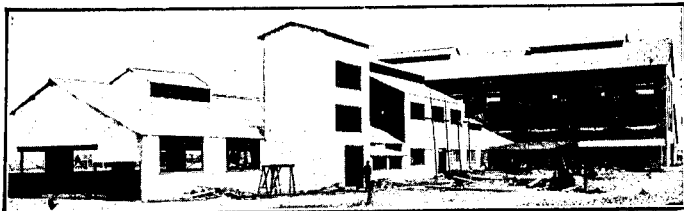
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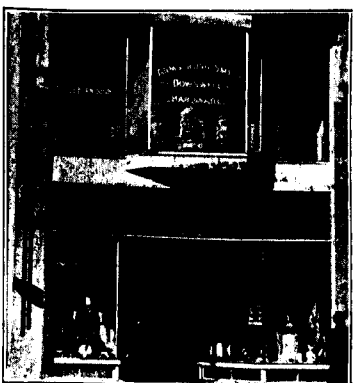
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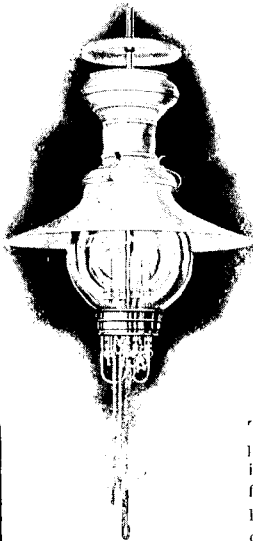
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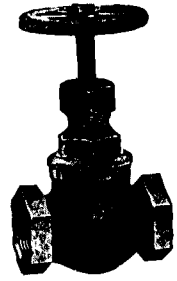
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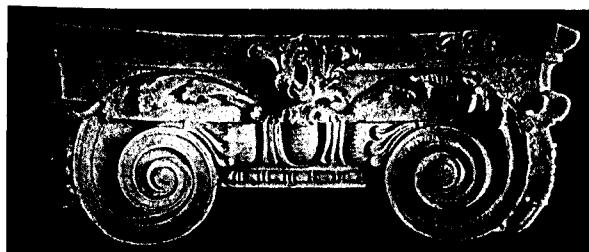
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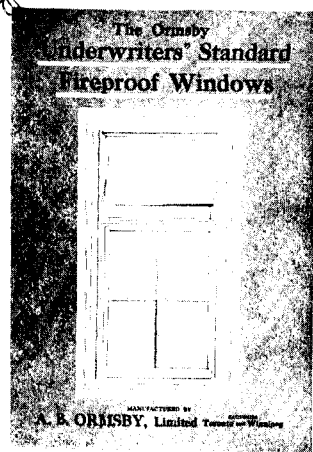
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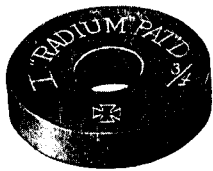
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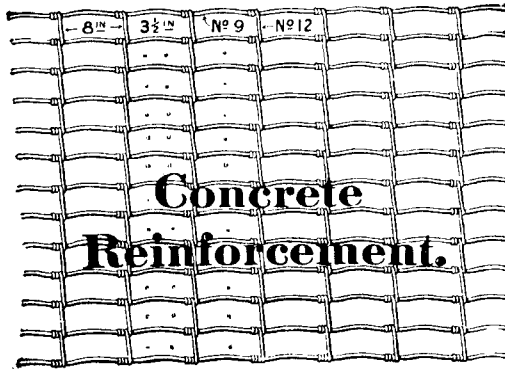
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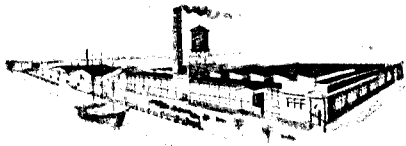
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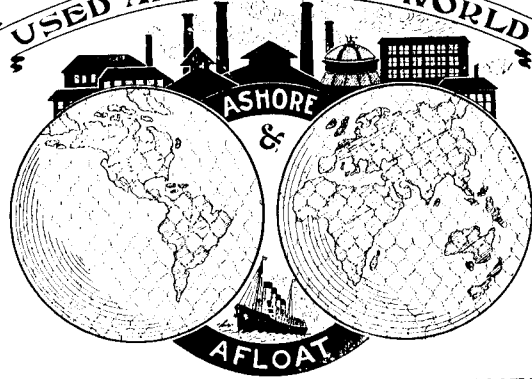
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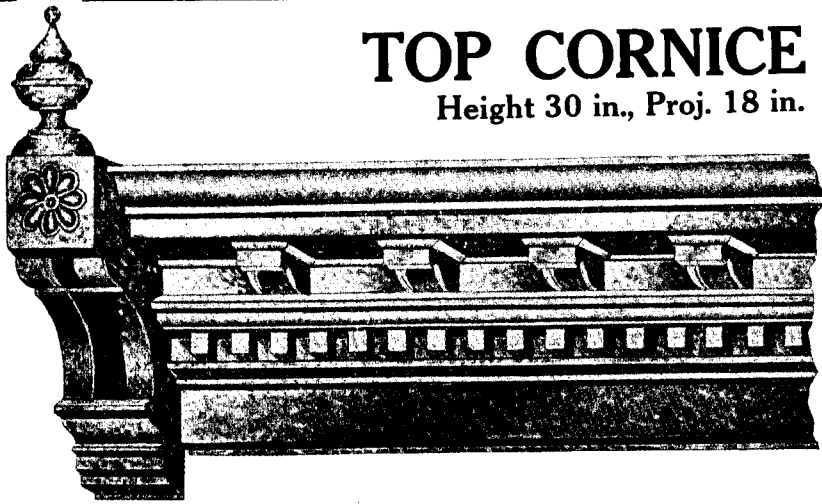
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