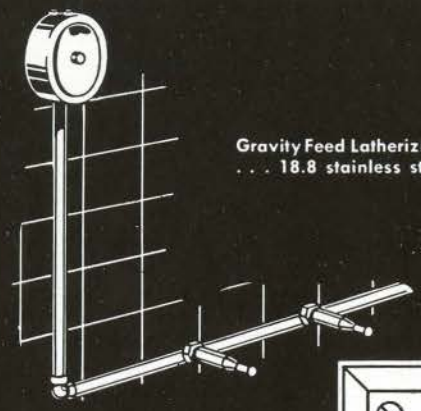
JOURNAL

ROYAL ARCHITECTURAL INSTITUTE OF CANADA

SCHOOLS

VOL. 24 TORONTO, OCTOBER, 1947 NO. 10



Gravity Feed Latherizing Soap Systems . . . 18.8 stainless steel valves.

Chrome-plated Lathurn Liquid Soap Dispenser with 18.8 stainless steel valves provides a rich creamy lather.

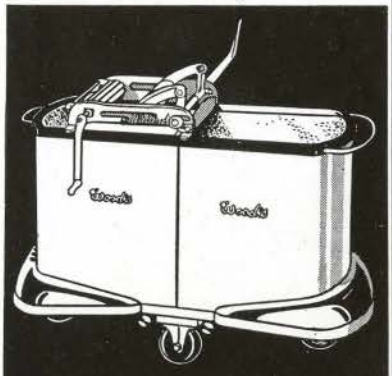
No. 91 Liquid Soap Dispenser. Leak-proof; equipped with stainless steel valves.

No. 94 Liquid Soap Dispenser. Leak-proof; pump action; delivers a measured quantity of soap as required.

Specify

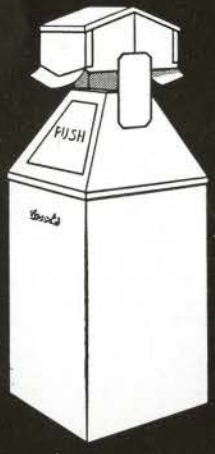
GH Wood's SANITATION EQUIPMENT

- The best equipment for maintaining buildings in the most modern, sanitary manner.
- Wood's has 24 branches from coast to coast and 135 sanitation salesmen.
- May we submit specifications and quotations?

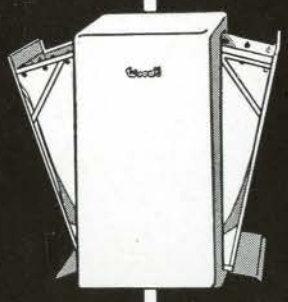


Mop Trucks and Floor Maintenance Equipment. This Mop Truck is entirely self-contained; two 22½ gallon tanks.

Floor Scrubbing and Polishing Machines. Equipped with full 15" brushes. C.S.A. approved.



Self-closing, Fire-proof Waste Receptacles (with or without paper towel dispensers.) Various types and sizes.



Foot-operated Waste Receptacle. Operates from two sides; self-closing. 20" x 20" x 36".

Wood's Electric Water Cooler. Automatic thermostatic conrol assures constant supply of cool water.

G. H. WOOD & COMPANY LIMITED

MONTREAL TORONTO VANCOUVER

Branches throughout Canada

R. HILL

SOFT, warm blends . . . bright, gay tones or distinctive solid colours—whatever the type of architecture or natural surroundings, you can choose a Johns-Manville Asphalt Shingle that is perfectly suited to the particular job. In addition, when you recommend Johns-Manville Asphalt Shingles you can be sure of a weather-tight roof that will give years of service with a minimum of upkeep expense.

Where conditions call for added protection from fire, weather and wear, specify J-M Flexstone Shingles. Made on a base of fire-proof asbestos felt, they minimize the hazards of roof communicated fires—keep maintenance costs low.

With Johns-Manville Asphalt Shingles the colours are a permanent part of the fire-resisting mineral coating and will retain their attractiveness down through the years. This combination of lasting colours plus long life and economy assures your clients of complete roofing satisfaction.

Colourful beauty that blends with any style of architecture

Backed by more than 89 years' experience in the manufacture of Building Materials, the name Johns-Manville on Asphalt Shingles is your assurance of top-flight quality.

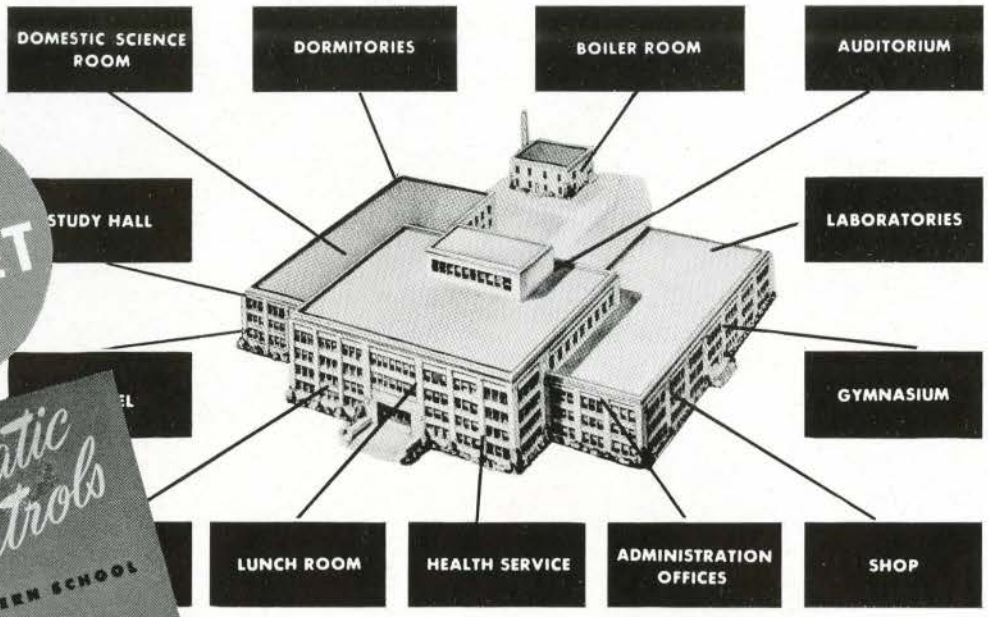
For illustrated folder and additional information on the many styles and colours of J-M Asphalt Shingles, write Canadian Johns-Manville Co. Ltd., Toronto, Montreal, Winnipeg or Vancouver.

Colour-Styled

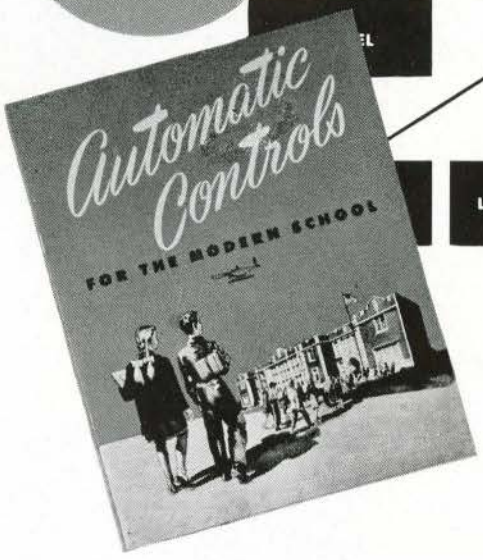
Johns-Manville

ASPHALT SHINGLES

B-529



FREE BOOKLET



AUTOMATIC CONTROLS

FOR THE MODERN SCHOOL

A MODERN control system ensures both comfort for the occupants and efficient operation of the heating plant. The above diagram illustrates the standard and special applications of automatic controls which should be reviewed when drawing up specifications for a new school building. Especially made to meet such requirements are Minneapolis - Honeywell control systems.

Minneapolis-Honeywell has prepared a booklet setting forth in detail facts you should know when planning an automatic control system. The booklet is yours for the asking. Simply clip the coupon and return . . . it may save both money and costly experimentation. Minneapolis - Honeywell Regulator Company, Ltd., Vanderhoof Avenue, Leaside, Toronto 12, Ont. Branches: Montreal, London, Winnipeg, Calgary and Vancouver.

MINNEAPOLIS-HONEYWELL REGULATOR CO. LTD., VANDERHOOF AVE., LEASIDE, TORONTO 12, ONT.

Gentlemen:

Please send me a copy of "Automatic Controls for the Modern School."

Name ..... Title .....

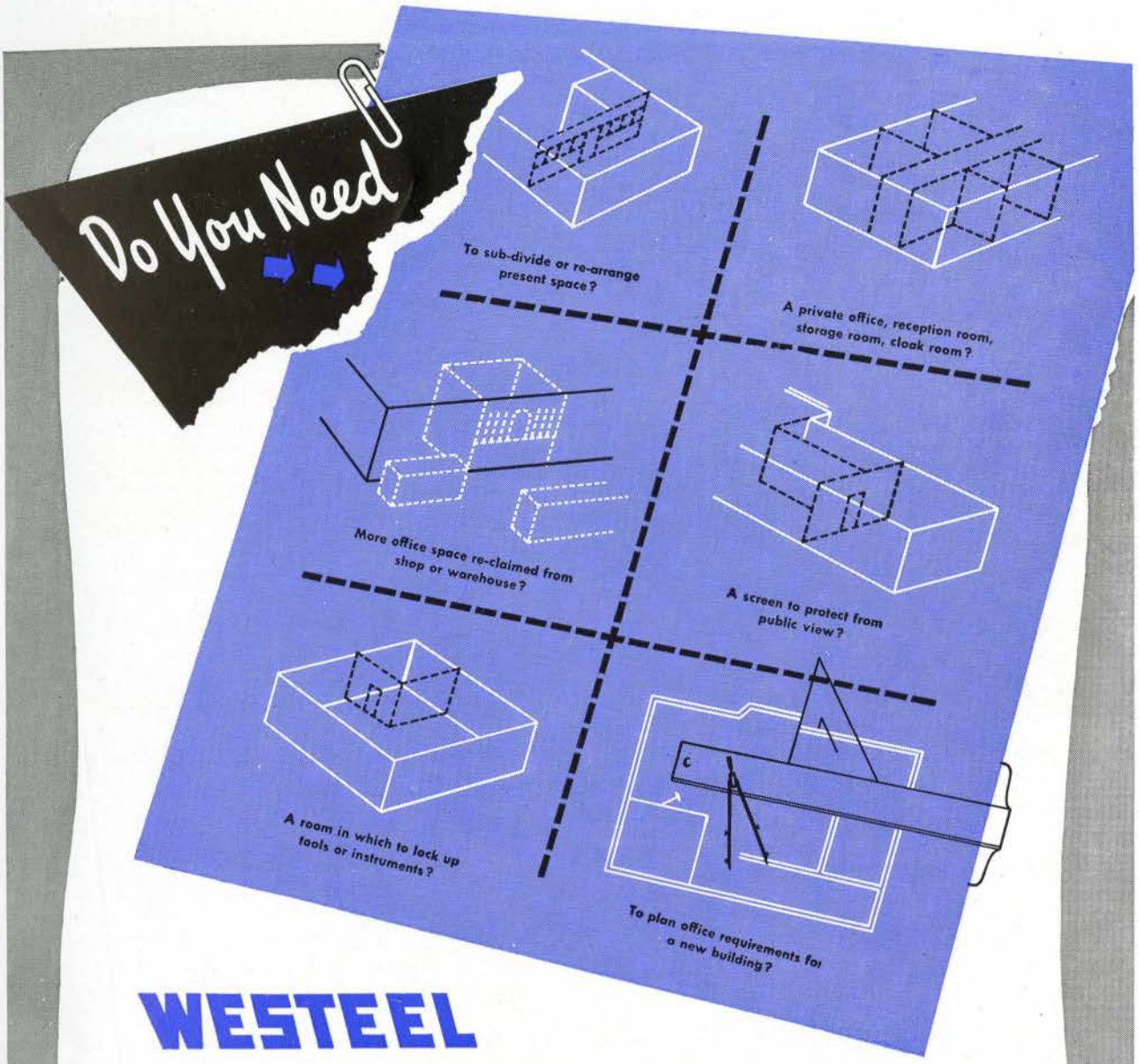
School .....

Address .....

City or Town ..... Province .....

RA-47

MINNEAPOLIS Honeywell CONTROL SYSTEMS



WESTEEL

SECTIONAL STEEL **OFFICE PARTITIONS** CAN BE CHANGED AT WILL . . . *ALMOST OVERNIGHT!*

Westeel Office Partitions are substantial and smart in appearance, yet highly flexible . . . can be re-located in a matter of hours to suit additions to staff, changed conditions, etc. No trouble—no disorder! Will not mar floors, walls or ceilings. Ideal for new buildings, or to modernize old ones.

Send for interesting Catalogue containing detailed information.
Deliveries dependent on steel supplies.

WESTEEL PRODUCTS LIMITED

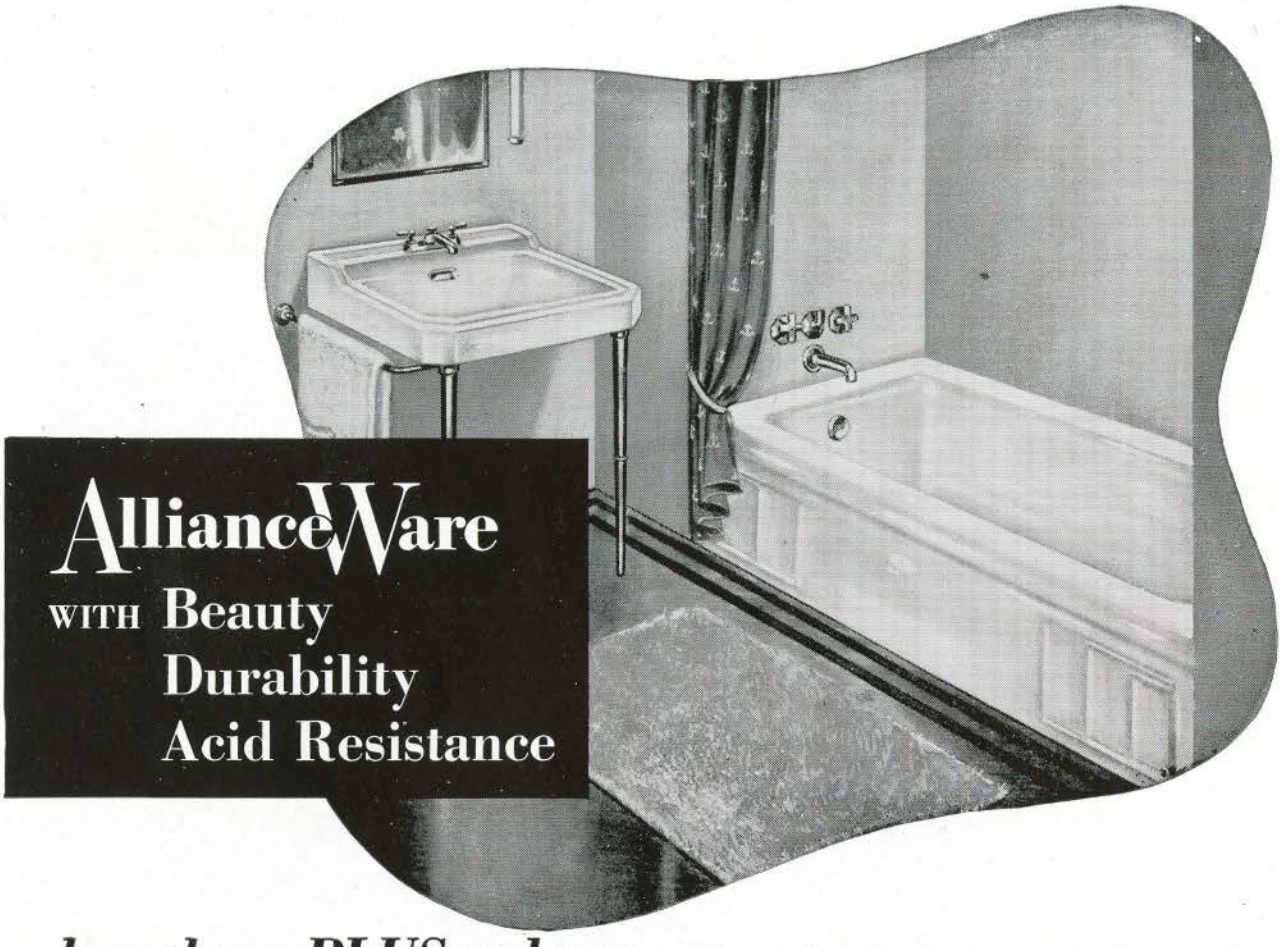
MONTREAL • TORONTO • WINNIPEG • REGINA • SASKATOON • CALGARY • EDMONTON • VANCOUVER

formerly

GEO. W. REED & CO. LTD. MONTREAL

METALLIC ROOFING CO. LTD. TORONTO

WESTERN STEEL PRODUCTS WINNIPEG AND WESTERN BRANCHES



AllianceWare
WITH Beauty Durability Acid Resistance

has these PLUS values:

Greater Consumer Satisfaction

Lower Costs of Installation

Easier Handling

More than 157,000 people who stopped to examine the PLUS values of AllianceWare at a display in the Pacific National Exhibition at Vancouver were delighted with the features of this Canadian-made porcelain-on-steel sanitaryware.

Flat-Rim Sinks in popular shapes and sizes are now being produced for Western Canadian plumbing jobbers at the Vancouver AllianceWare plant. These sinks, like the famous AllianceWare bathtubs, have the same qualities of acid resistance that are of extra importance to housewives.

Lavatory shown in illustration is not yet in production. Very well regarded by visitors at the Pacific National Exhibition, Shelf-top Lavatories of this type will be supplied in the near future.

For information, write

ALLIANCEWARE LTD.
1590 Powell Street Vancouver, Canada

AllianceWare
VANCOUVER, B.C.

Why a Barrett SPECIFICATION* Roof?

Because It Means LASTING Protection

HOW ABOUT your new roof 30 years from today? If it's a Specification* roof, the chances are it will still be giving excellent service. Building records and owner testimonials show that many Barrett roofs have given trouble-free service 30, 40, 50 and more years . . . service far beyond the life of any bond. Some of these roofs actually outlasted the buildings they covered.

That kind of endurance is worth money. Every year of trouble-free service *after* the expiration of the bond is a bonus year. And look at it this way: roof failures are more than likely to mean interior damage, and time lost while repairs are being made. Those inconveniences are yours whether the roof is bonded or not. That's why it is doubly important to have *proved* roof protection.

More sound reasons why building owners, architects, contractors and roofers insist on Barrett Specification roofs.

Barrett Specification* Roofs

QUALITY PRODUCTS · Barrett APPROVED ROOFER · STILL INTEGRITY

This is one of a series of advertisements illustrating the links in the Barrett chain of roof satisfaction.

THE BARRETT COMPANY, LIMITED

Montreal · Toronto · Winnipeg · Vancouver

**Reg'd. trade mark*

GENERAL ELECTRIC

AUTOMATIC OIL FURNACE

Cuts Fuel Bills 25% to 50%

The G-E Oil-Fired Conversion Burner replaces other existing types. It handles present oils better; it's advanced design permits the use of the newer types of catalytic oil efficiently.

General Electric offers five kinds of heating: oil-fired boilers, oil-fired warm air units, gas-fired boilers, gas-fired warm air units, and oil-fired conversion burners. Whether your specifications call for steam, vapor, or hot water, G-E produces the *right* equipment. And G-E Automatic Heating Equipment cuts fuel bills up to 50%—another reason why old oil burners can be replaced economically.

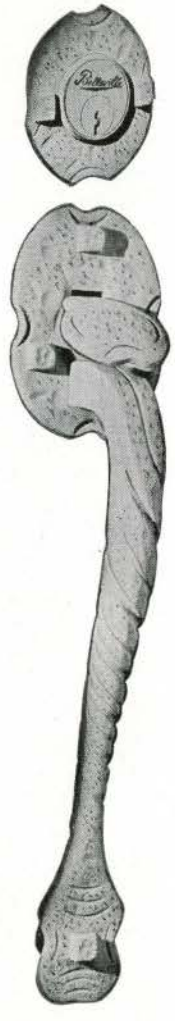
47-P-2

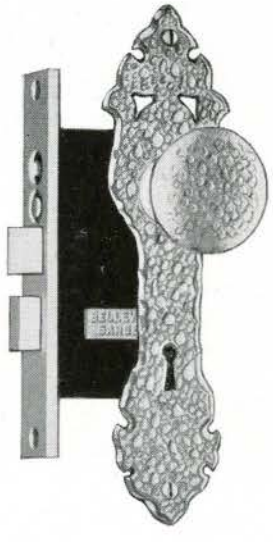
CANADIAN GENERAL ELECTRIC CO LTD

HEAD OFFICE — TORONTO

Matchless

craftsmanship blending with finest materials for beauty to parallel the quality beneath.



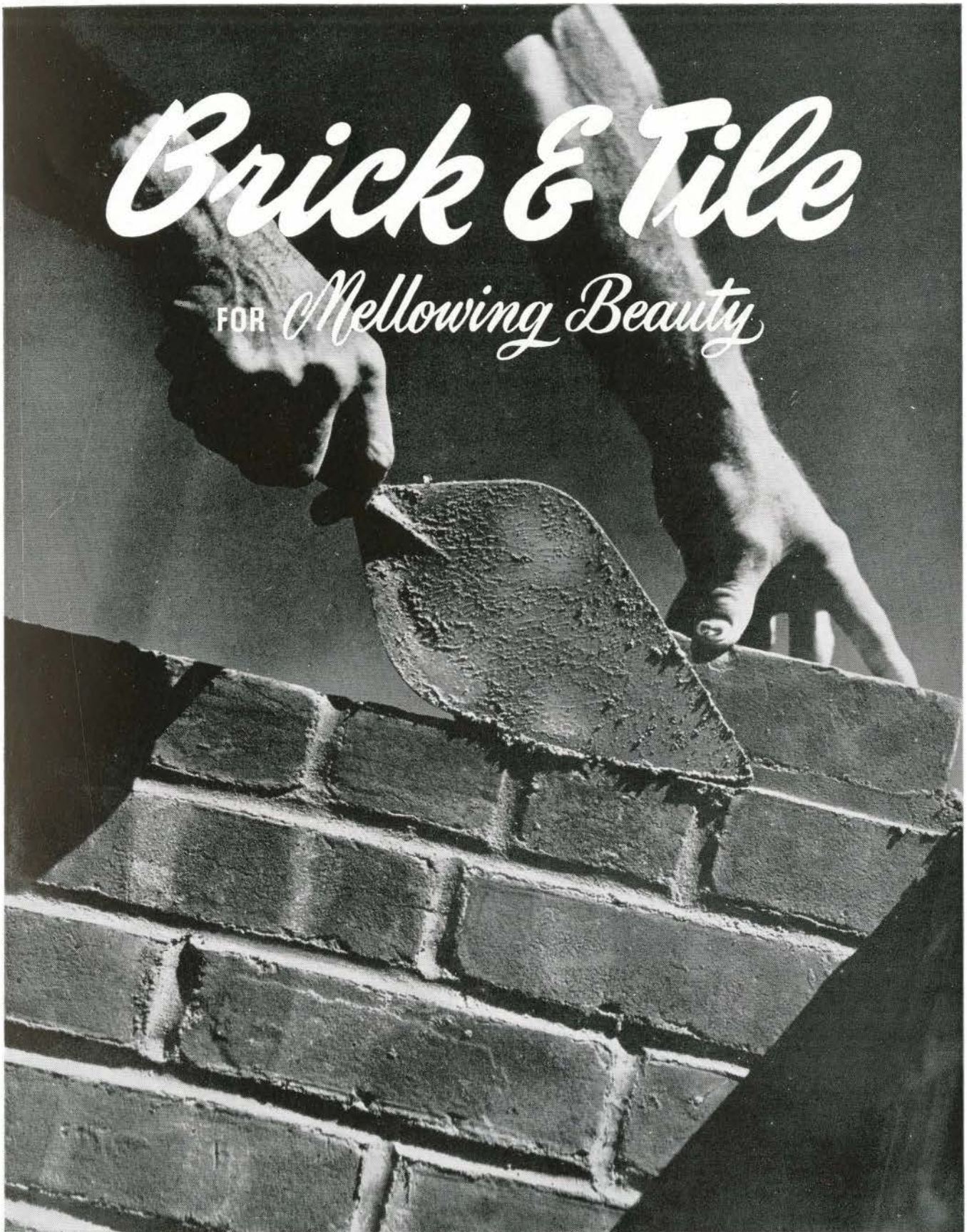


HARDWARE OF DISTINCTION

Belleville

BELLEVILLE-SARGENT & CO. LIMITED

BELLEVILLE • ONTARIO



BRICK & TILE MANUFACTURERS ASSOCIATION
OF CANADA
57 BLOOR STREET WEST • TORONTO 5, ONTARIO

EMCO

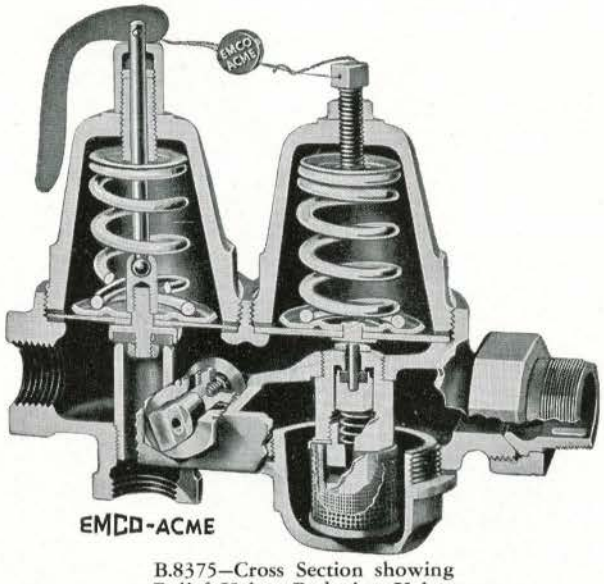
ACME HEAT CONTROL VALVES

For

ACCURATE . . .

POSITIVE CONTROL

BEYOND CRITICISM



B.8375—Cross Section showing Relief Valve, Reducing Valve, Strainer, By-pass and Union Connection.

SPECIFY with CONFIDENCE

EMCO-ACME HEAT CONTROL VALVES are built to such a fine degree of accuracy they have become standard equipment in Homes, Institutions and Industrial plants throughout Canada today.

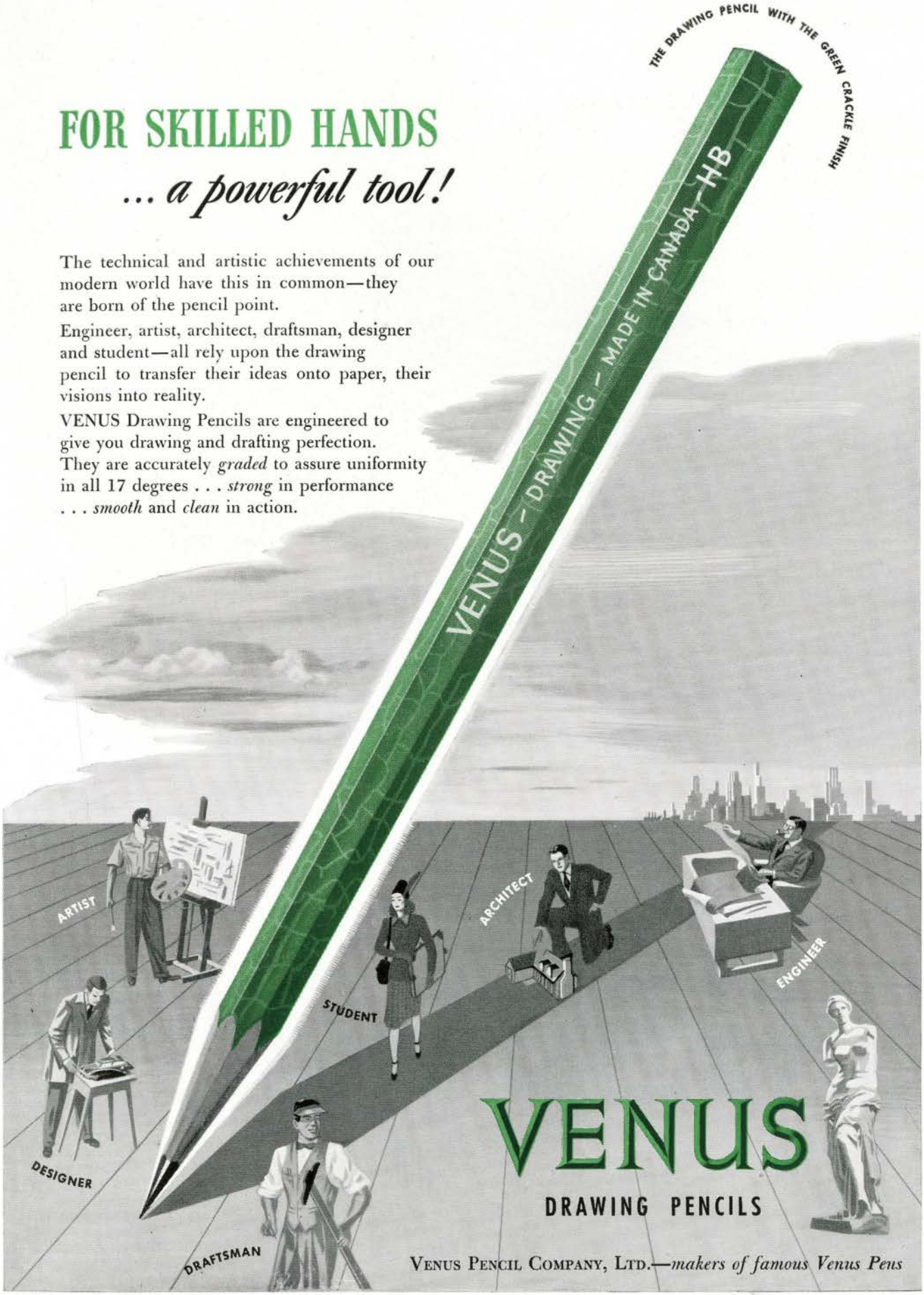
The many Special Features of Emco-Acme Heat Control Valves warrant recommending and installing them.

Specify and help your clients choose EMCO Fixtures and Fittings.

EMPIRE BRASS MFG. CO. LIMITED

LONDON-HAMILTON - TORONTO - SUDBURY - WINNIPEG - VANCOUVER

QUALITY EMCO BRASS GOODS



FOR SKILLED HANDS

... a powerful tool!

The technical and artistic achievements of our modern world have this in common—they are born of the pencil point.

Engineer, artist, architect, draftsman, designer and student—all rely upon the drawing pencil to transfer their ideas onto paper, their visions into reality.

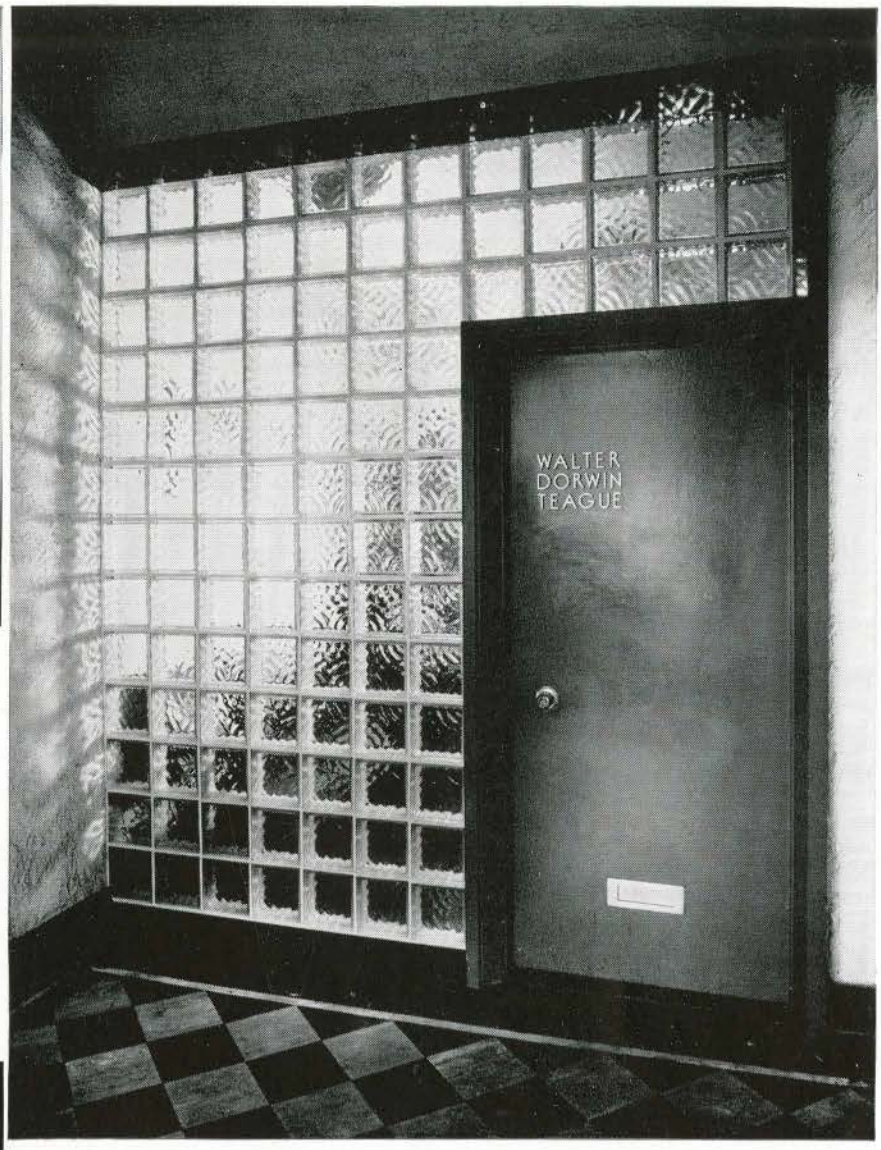
VENUS Drawing Pencils are engineered to give you drawing and drafting perfection. They are accurately *graded* to assure uniformity in all 17 degrees . . . *strong* in performance . . . *smooth* and *clean* in action.

VENUS

DRAWING PENCILS

VENUS PENCIL COMPANY, LTD.—*makers of famous Venus Pens*

Insulux partition provides privacy in reception room of Walter Dorwin Teague's Los Angeles office—adds daylight and more spacious appearance.



→

Walter Dorwin Teague, eminent Industrial Designer's Los Angeles office utilizes Insulux Glass Block in a floor-to-ceiling partition to highlight office entrance.

OWENS-ILLINOIS

INSULUX

GLASS BLOCK

Insulux Glass Block is a functional building material, designed to do many things other materials cannot do. It is available in three sizes, many functional and attractive face patterns. Investigate!

Open the door to better lighting

LET outside light in, yet maintain business office privacy . . . that's one of the many problems architects are solving with Insulux Glass Block.

Ideally suited for residences, apartments and industrial buildings, Insulux Glass Block is easily installed. When construction is completed, panels are permanent, high in insulating qualities and easy to clean. There's nothing to rot, rust or corrode.

In keeping with modern design trends Insulux relieves dark and gloomy spots and allows a new flexibility and originality in planning.

For complete technical data, specifications and installation details, see the "Glass" Section of Sweet's Architectural Catalog, or write Dept. D-89, Owens-Illinois Glass Company, Insulux Products Division, Toledo 1, Ohio.

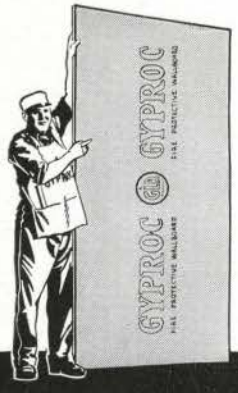
Canadian Representatives: The Consolidated Plate Glass Company of Canada, Ltd. • Pilkington Glass, Ltd.

• A sincere desire to reduce fire risk concentrates attention upon the selection of materials used in building construction.

Use of G.L.A. Gypsum Products assures a high degree of fire protection without necessitating any change in building methods.

Gyproc *Fire-Protective* Wallboard
Gyproc Sheathing
Gyproc Lath and Plaster
G.L.A. Gypsum Partition and Furring Tile
G.L.A. Gypsum Beam and Column Fireproofing Tile
G.L.A. Gypsum Roofs
G.L.A. Tri-Seal Ceilings

Illustrated above is one of a forceful series of G.L.A. advertisements, nation-wide in scope, which direct the attention of house-owners to the very considerable advantages of building into their homes the fire-resistant properties of Gyproc Wallboard.



4-G-47-A

GYPROC
Fire Protective WALLBOARD

HOW MUCH GYPSUM PROTECTS YOUR BUILDING?

G·L·A PRODUCT

GYPSUM, LIME AND ALABASTINE, CANADA, LIMITED

Vancouver Calgary Winnipeg
Toronto 5 Montreal 2

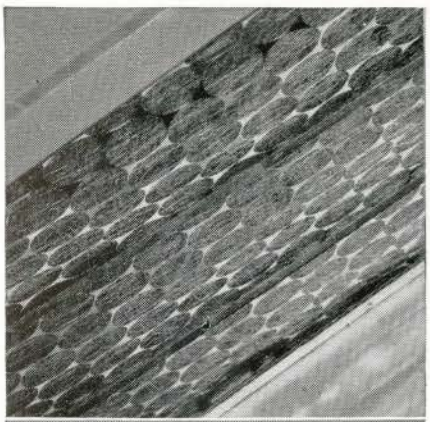
Now—

ECONOMICAL FORCED-AIR HEAT AT REASONABLE COST

with

CHATCO

STREAMLINED COAL FIRED WINTER AIR-CONDITIONER



With confidence select Chatco for your heating jobs. Chatco's Engineering and Product Research Division has designed a winter air-conditioner that will meet the public demand for a well-engineered, streamlined, economical unit for heating, humidifying and circulating clean, warm air using either bituminous or anthracite coal.

CLEAN, HUMIDIFIED AIR

Chatco high quality and dependability throughout. Steel heating chamber is ARC-WELDED eliminating dust, soot, fumes. Removable spun glass filters (at left) purify and cleanse the air. Automatic humidifier adds comfort-giving moisture.

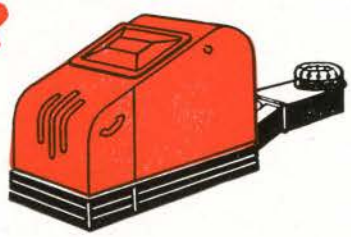
WARM, CIRCULATED AIR

Chatco's thirty years of engineering skill and manufacturing excellence are reflected in the better design, finer workmanship. Fire-brick combustion chamber assures long life. Inner liner insulates and conserves heat, giving optimum heat distribution. Large slow-speed blower (at left) is designed for quiet operation—mounted on rubber. See this finer winter air-conditioner.

SPECIAL ATTRACTIVE DISCOUNTS FOR THE TRADE.

. . . for automatic heat, add a

STOKOL STOKER



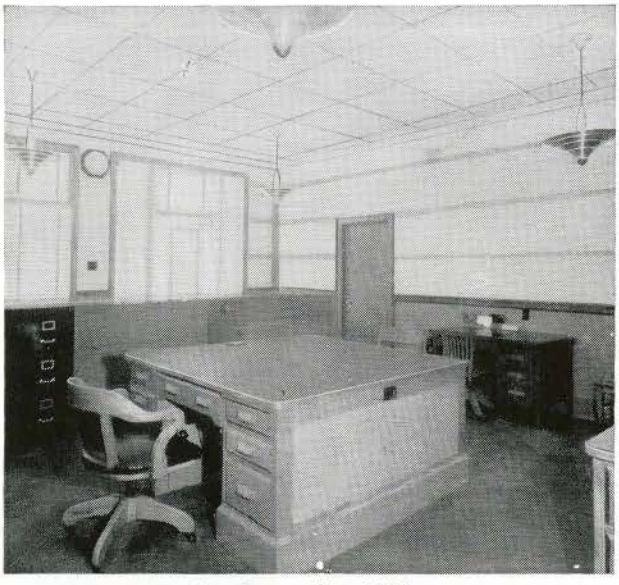
The STOKOL Stoker, distributed in Canada exclusively by Chatco, gives automatic heat at lowest cost! Over 140,000 *satisfied users* testify to its superiority. Write or phone. A Chatco representative will give you full particulars.

CHATCO STEEL PRODUCTS LIMITED

General Sales Office: Tilbury, Ontario

Toronto Branch Sales Office: 69 Yonge Street

An Auto Truck Showroom



An Executive Office

And it's NOT done with mirrors!

There's nothing mysterious about Masonite* Presdwoods.

They're merely one of the most brilliant and useful building-material developments of modern times.

That's why we can show you here three widely varying Presdwood installations . . . just *three* of the *more than a thousand* practical uses for Presdwoods.

All different problems, all different in the effect created . . . and all answered by one super-versatile product, Presdwood.

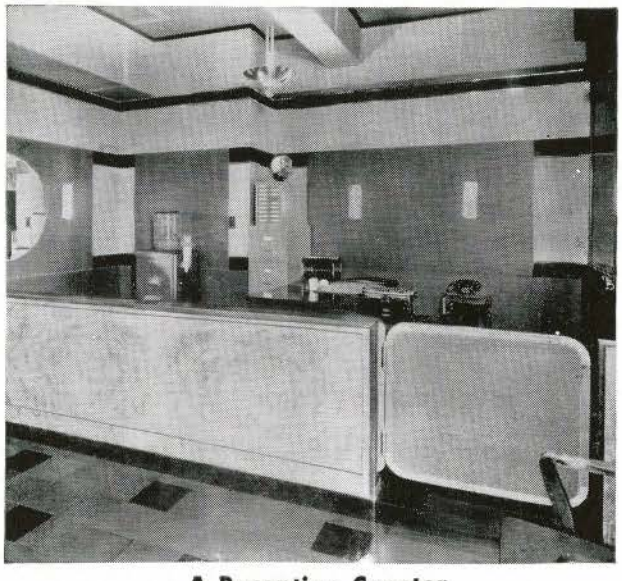
And speaking of mirrors . . . what, other than a mirror, can give the gleaming, glass-smooth surface of Presdwood?

YOU DON'T NEED MIRRORS, EITHER!

But if your clients have building or renovating problems, chances are that they *do* need Presdwoods for the right answer!

What's the problem? Panelling, flooring, tiling, wainscotting, furniture, gadgets? They're all one to Presdwood.

That's because Masonite Presdwoods are strong, durable, tempered for hardness . . . good looking, water-resistant, glass-smooth . . . easily cleaned.



A Reception Counter

With the great demand for Presdwood, it is still in somewhat short supply . . . but everything possible is being done to overcome the shortage.

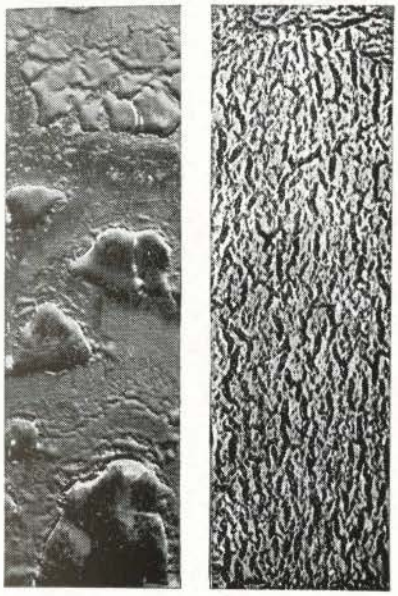
It is therefore suggested that you learn now how Presdwoods can help improve your clients' premises . . . *quickly*, *economically*. Write for free samples, technical data and 48-page booklet, "What you ought to know about Masonite Brand Products," to International Fibre Board Limited, Gatineau, Que., Dept. 103.

THE WOOD OF A THOUSAND USES

Masonite BRAND PRODUCTS

*'MASONITE' IS A REGISTERED TRADE MARK AND SIGNIFIES THAT MASONITE COMPANY OF CANADA LTD. IS THE SOURCE OF THE PRODUCT.

FLINTKOTE STATIC ASPHALT OUTLASTS ALL OTHERS



Ordinary types of asphalt coatings crack, alligator and otherwise deteriorate when exposed to the elements.

Here is an unretouched photo of Flintkote Static Asphalt Emulsion after 10 years' exposure.

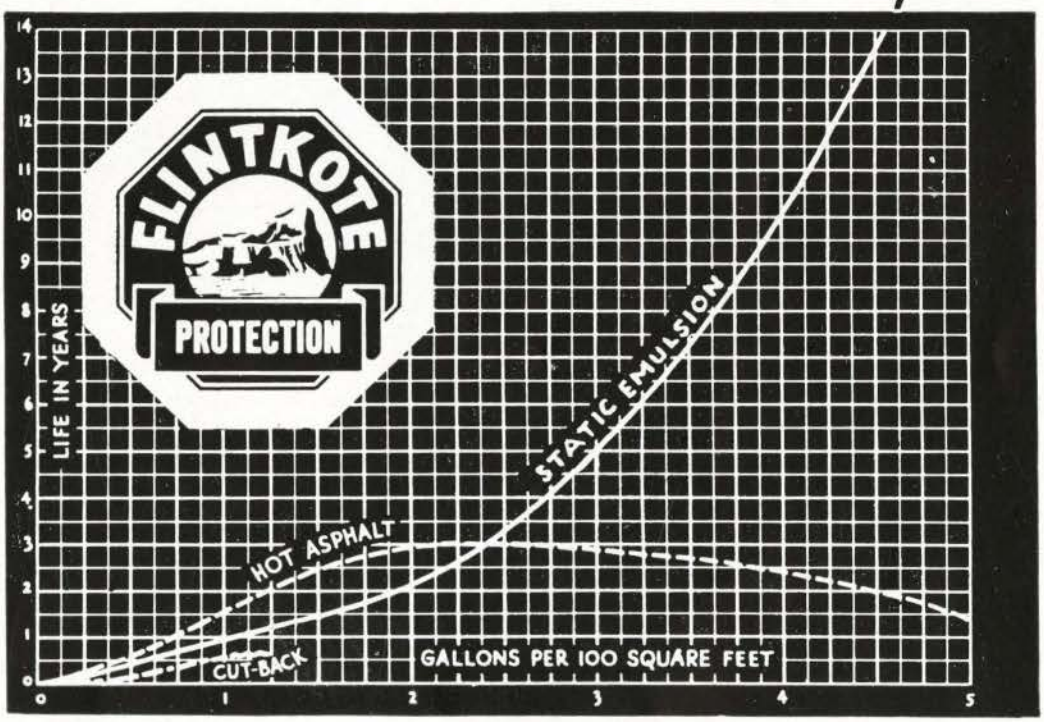
Lengthening *the* LIFELINE*

Flintkote Static Asphalt Emulsions greatly simplify many of your construction and maintenance problems. Non-toxic, applied cold and quickly with trowel, brush or spray, each Static Asphalt Emulsion is a specification in itself – designed for its particular job . . . weather proofing, dampproofing, protective coating against corrosion, mastic flooring or other uses.

Emulsions of this type are characterized by reinforcing in the shape of a honeycomb structure, formed by mineral colloid. Hence they give these advantages over hot asphalt and cut-back types:

1. Eliminate necessity of heating and fire hazard.
2. Eliminate possible impairment of chemical properties of original asphalt.
3. Produce film which resists internal molecular flow under heat.

**The result is a film which outlasts any other known form of bituminous coating.*



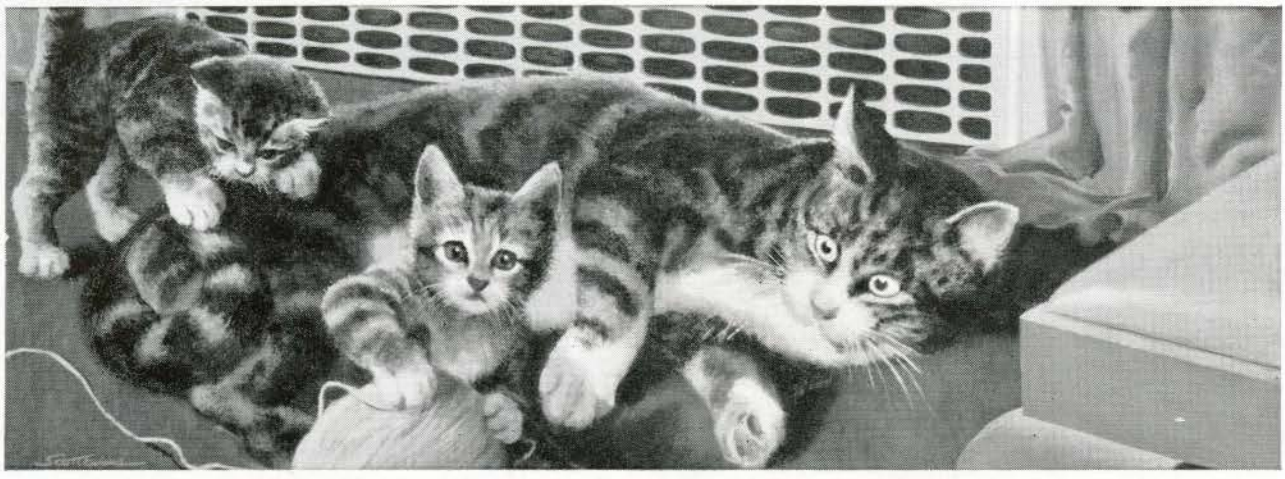
This chart graphically illustrates the average life in years, in relation to thickness of film, obtained from the three types of asphalt coatings.

FLINTKOTE PROTECTION

The FLINTKOTE COMPANY OF CANADA, LIMITED

30TH STREET, LONG BRANCH, TORONTO 14, ONTARIO

Sales Offices: Vancouver • Calgary • Winnipeg • Toronto • Montreal • Sackville, N.B. • Charlottetown



Plan your home for family comfort

1. WITH THE RIGHT HEATING EQUIPMENT

No matter how cold it is outdoors, customers' homes can always be cozy and comfortable if you select and install Dominion heating equipment – "Corto" Radiators and the efficient "DoRaD" or "Arco" Boiler for coal, oil or gas.

2. WITH THE RIGHT PLUMBING FIXTURES

You want convenience for your customers, good looks, and healthful cleanliness in their bathrooms, kitchens and laundries. They will be sure to get them–plus years of dependable service –if you install "Standard" Plumbing Fixtures.

Made in Canada for Canadians by

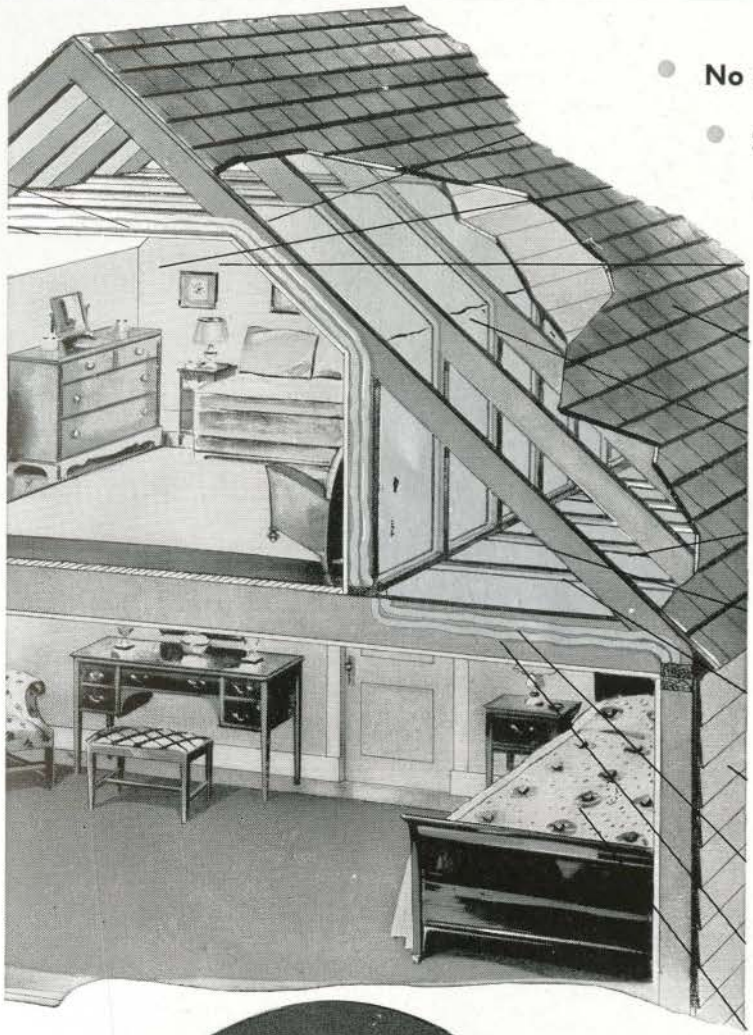
Standard Sanitary
&
DOMINION RADIATOR
LIMITED

TORONTO • CANADA

For modernization work now Time Payments may be arranged through our affiliated Company – Heating and Plumbing Finance Limited.

SPECIFY

"Standard" PLUMBING FIXTURES • DOMINION HEATING EQUIPMENT



- No Shrinking, Settling, Bulging or Warping
- Stops Moisture Infiltration
- Perfect Thermal Seal
- No Sun's Heat Stored Up in Alfol during Hot Weather
- Uniform Temperatures throughout the House
- Unaffected by Roof Leaks Vermin Proof
- Warping or Sagging of Lumber cannot affect Alfol
- Does not Disintegrate
- No Dust, Dirt or Fine Particles to Sift through into Rooms
- Cold Drafts Eliminated in Winter

Alfol is the scientific reflective insulation, designed to meet all the requirements of the Canadian climate, with its extremes of hot and cold, dry and damp. It is the Aluminum Foil fashioned into a reinforced blanket with air spaces between.

ALFOL INSULATION

ALUMINUM FOIL BLANKET REFLECTIVE INSULATION

Alfol's superior qualities have been time-tested and proven, and have made Alfol the favoured insulation with hundreds of builders, home owners, and architects across Canada.

Now available in convenient packaged form, Alfol is easy to handle and can be installed quickly and economically.

See Your Distributor or Write—

ALUMINUM INSULATION LTD.

Head Office: 811 Sun Life Bldg., Montreal, Que.
Sales Office: P.O. Box 614, Ottawa, Ont.

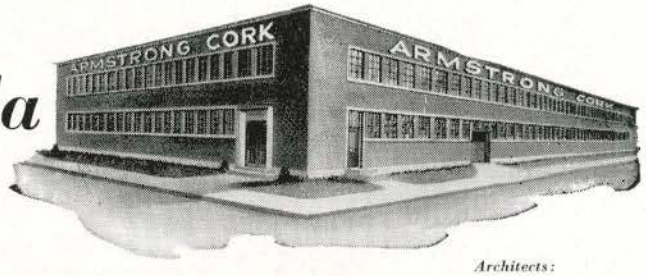
Now...

ARMSTRONG'S

Asphalt

TILE

is made in Canada



Architects:
Hutchison and Wood

Architects will be glad to know that our new Canadian plant is completed and in production on Armstrong's Asphalt Tile. A high quality product, hard wearing and beautifully finished, it is made on the most modern production line that Armstrong's experienced technicians could devise. The tile is being produced in a range of marbleized and plain patterns, providing practically any desired colour effect or design. Prompt deliveries are being made now in reasonable quantity. You can safely specify Armstrong's Asphalt Tile on all future jobs. Armstrong's Asphalt Tile will be sold directly to flooring contractors. Installations will be made by trained and capable men.

Architects—Write for this valuable booklet

"RESILIENT FLOORING IN TODAY'S CONSTRUCTION"

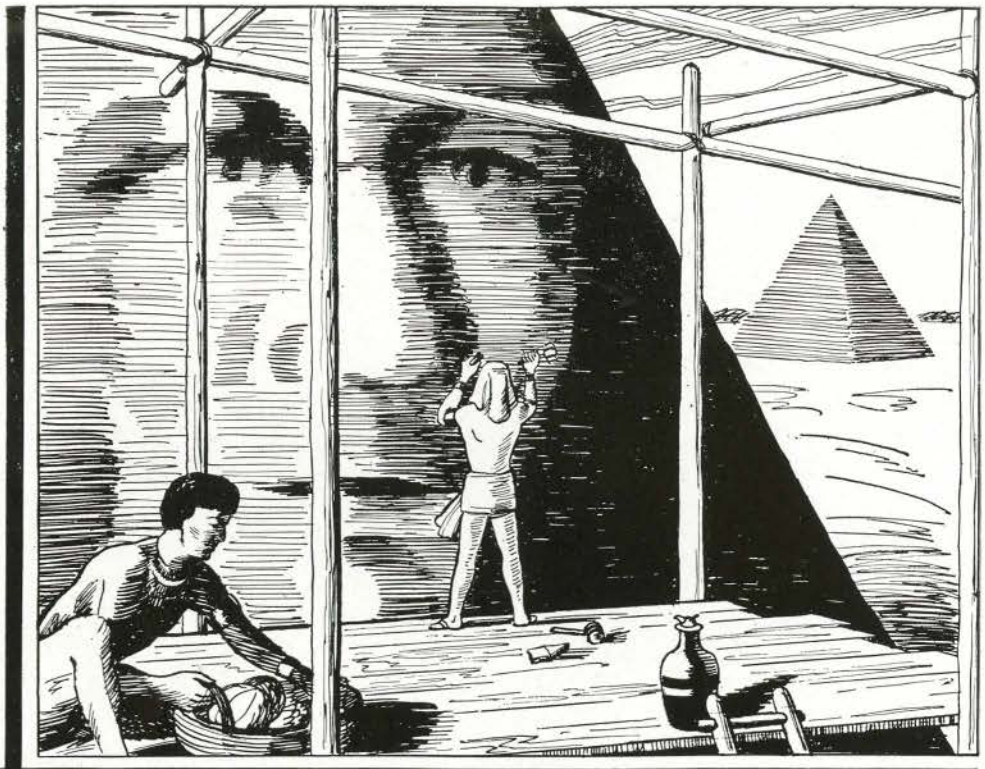
15 pages of useful information for every architect, with illustrations and diagrams, the booklet covers such subjects as Specifications for Resilient Floors, Preparing Old Subflooring, The "Alkali Problem" in Concrete Subfloors, Floors with Radiant Heating, Adhesives for Resilient Flooring, Cove Base Treatments, Functions of Design in Floor Planning. Write today for your copy.

New Canadian Name and Addresses

ARMSTRONG CORK CANADA LIMITED

6911 Decarie Boulevard, Montreal 29, Que.

TORONTO WINNIPEG VANCOUVER QUEBEC



Rock-hewn from an enormous block of granite, the celebrated Sphinx, near the pyramids of Ghizeh, stands a colossal monument of imperishable grandeur. Primary contribution to world architecture, ancient Egyptian sculpture was truly created to endure.

ENDURANCE

Man's record in stone has a *lasting* quality. In sculpture or architecture, his works stand, a substantial and enduring witness to his creative effort for many generations.

Endurance is also a very practical consideration in the mechanical arts. A valve, for example, is preferred for its long-lasting qualities resulting from expert craftsmanship—the kind of skilled workmanship you will find in Jenkins Valves.

By choosing Jenkins Valves, you get extra endurance that means extra economy and lower maintenance cost.

Consult Jenkins on any question of valve design, selection or installation. You'll get lasting satisfaction from *every* Jenkins Valve.

JENKINS
Fig. 470
BRONZE GATE VALVE

Designed for 150 pounds steam or 300 pounds oil, water or gas working pressure.

ONE OF OVER 400 EXTRA VALUE VALVES MADE BY JENKINS VALVE SPECIALISTS

Jenkins Valves

For industrial, engineering, marine and power plant service . . . in Bronze, Iron, Cast Steel and Corrosion-Resisting Alloys.

SOLD THROUGH RELIABLE DISTRIBUTORS EVERYWHERE

TRADE JENKINS MARK
Jenkins Bros

JENKINS BROS. LIMITED
617 ST. REMI STREET • MONTREAL
Sales Offices: TORONTO, WINNIPEG, VANCOUVER.

Crossing the Threshold

Neighbourhoods don't do this any more

Crossing the threshold is shown a ceremonious caller of the last century. This habit persisted into the 20th century, whole neighbourhoods declaring themselves "at home" on a given day of the week. Indeed, in certain fashionable places "at home" days are still a fact.

We are less concerned with the talk of construction crossing the threshold of a new era than we are with focussing an unprejudiced eye on new materials immediately at hand.

As regards these, it is not our intention to dash in where angels fear to tread; but, on the other hand, this Company could not have stayed in business for 65 years if it hadn't been sympathetic to reasonable progress.

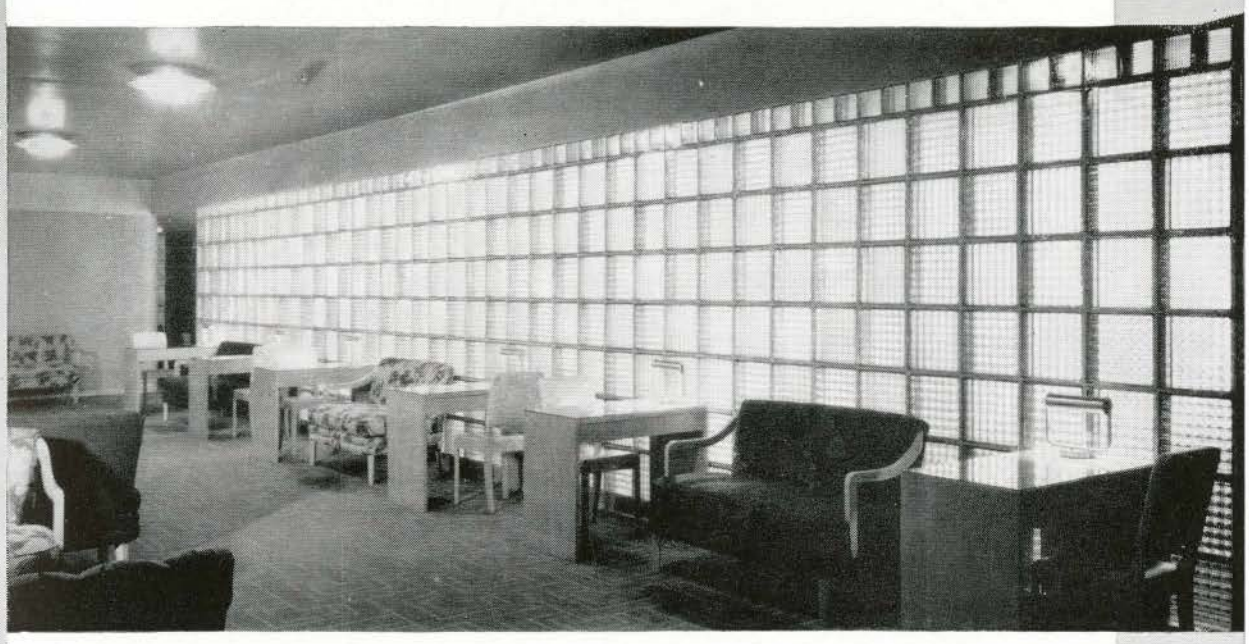
5-47

Peterboro BUILDERS' Hardware

The PETERBORO LOCK MANUFACTURING COMPANY LIMITED

PETERBORO ONTARIO

PLANNING THE FUTURE... *since 1893*



PROGRESS *to Help a Nation*

For over half a century, Consolidated Plate Glass Company Limited has been instrumental in introducing to Canadians the improvements which have made GLASS such an important factor in our way of life. From these fifty years of progress and experience has been gleaned a vast store of technical knowledge in every phase of glass marketing and manufacture.

The largest independent glass supplier in Canada, Consolidated has worked on the construction of many of the largest architectectural projects in this young country. Whether your uses for glass vary from its myriad of decorative and functional home uses, such as practical table and dresser tops, glass shelves, huge picture windows or glass brick for kitchen or bath . . . . . to its ever-expanding possibilities as a beautiful, strong and practical construction material --- whatever you desire in Glass, CONSOLIDATED is best equipped to give you the service you need.

114

THE
CONSOLIDATED
PLATE GLASS COMPANY
OF CANADA, LIMITED

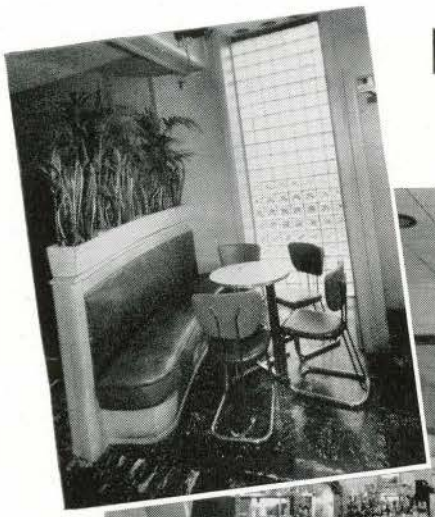
J. W. HOBBS, *PRES.* — F. S. HOBBS, *VICE-PRES.*

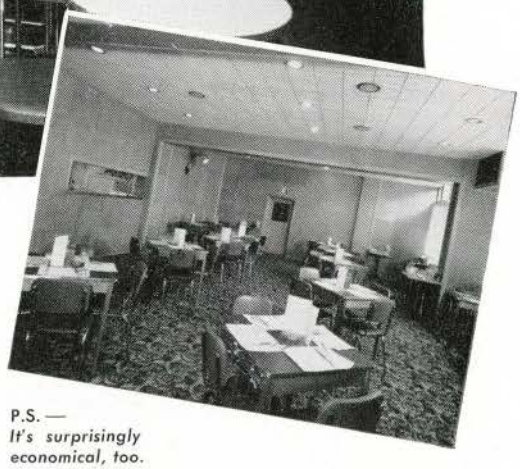
TORONTO
OTTAWA
MONTREAL

BENNETT GLASS CO. LTD., WINDSOR

GLASS SINCE 1893

EVERYBODY LIKES CURVES IN THE RIGHT PLACES





P.S. —
It's surprisingly economical, too.

. . . and architects are certainly no exception. But the curves we mean are the ones that give UNITRIM the smoothest, cleanest trim-line you ever saw. And the right place to display them is, naturally, wherever your plans call for a truly modern, distinctive interior trim.

UNITRIM was developed by architects and plywood experts to fill the need for a NEW interior trim. It's easier to install — the unique, 5 ply, resin-bonded, moulded plywood construction eliminates jambs and extra trim on doors, window stops and quarter round on base — and the sleek lines and wide variety of finishes lend themselves to any interior planning.

Specify* UNITRIM *and you'll reap the benefits of real owner satisfaction.

UNITRIM

THE TRIM LINE OF TODAY AND TOMORROW

Manufactured by Universal Plywood Trim Limited under Can. Pat. No. 520423 and U.S. Pat. Pend. No. 523672.

Write for illustrated booklet

Distributed by

ROBERT BURY & CO. (CANADA) LIMITED

King & Sudbury Sts., Toronto MElrose 3577

Representatives

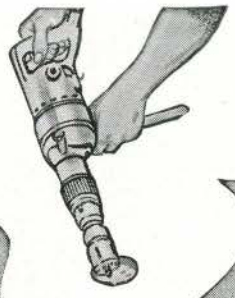
Air-Cell Limited, 1414 Crescent St., Montreal, P.Q.

Roper Agencies, General Trust Bldg., Halifax, N.S.

Heyward Wood Preserving & Supply Limited, 11845-75th Street, Edmonton, Alta.

Shanahan's Ltd., Campbell Ave., Vancouver, B.C.


Quiet as a sunbeam
CHATCO
CHATCO
Chatco unit heaters are the choice of architects and heating experts for three reasons:
first, Chatco unit heaters are quiet operating;
second, Chatco unit heaters are durable . . . long lasting;
third, Chatco unit heaters handle large volumes of air economically with a high coefficient of heat transfer.
With over thirty years' experience in the designing and manufacture of heat transfer equipment, it is only natural that Chatco engineers would develop a better unit heater.
Scientifically spaced spiral fins, rubber cushioned motor base, expansion free heating elements, removable heating core are only a few of the features that make Chatco vertical or horizontal unit heaters the logical choice for a well-designed, well-installed heating system.
General Sales Office — Tilbury, Ontario
Toronto Branch Sales Office — 69 Yonge Street
CHATCO STEEL PRODUCTS LIMITED
CHATCO HEAT-SPEED UNIT HEATERS



A TRICK IN *your* TRADE

Filling in old unproductive light wells or even adding full stories to buildings with safety and cleanliness, without making such noise and mess as to alienate all the tenants, is being done with Robertson steel Q-Floors.

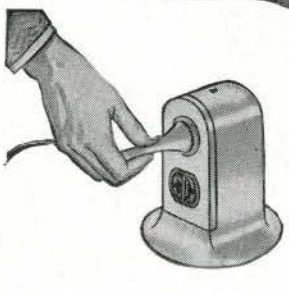
This is because Q-Floor units are delivered to the job cut to fit. Each unit is 32 sq. ft. (max.) and two men can lay it in 30 seconds. It is then welded to the steel framework, providing dry, clean, quiet, noncombustible construction.

The light weight of Q-Floor construction has permitted architects to add many extra additional stories onto buildings originally intended to take only a few of the conventional type. Complete with suspended ceiling, the total dead weight is less than forty pounds per sq. ft.—despite a four-hour fire rating. Another factor is speed. The over-all effect of Q-Floor reduces building time 20 to 30%. This saves you money and you receive revenue sooner.

The electrical aspect of Q-Floor holds another appeal. The steel cells of Q-Floor function as raceways and are crossed over by headers so that an electrician merely drills a small hole to establish an electrical outlet. The spacing of the cells is such that every six-inch area of the entire exposed floor can be tapped for electricity. Outlets exactly where your tenant wants them, a few minutes after he asks for them. No fuss. No trenches.

Electrical Quick-Change is a heavy drawing card in many a present Q-Floor building. Q-Floors protect your investment against electrical obsolescence and justify higher rentals.

The price is right in line. There are no drawbacks. For complete information ask your architect, or call a Robertson representative. But consult your Robertson office for delivery date. Electrical Fittings for Q-Floors can be seen at your nearest Canadian General Electric Sales Office.



H. H. ROBERTSON CO. LIMITED

TORONTO **HAMILTON** MONTREAL

Head Office

BUStribution Duct

. . . FLEXIBLE POWER FOR PLANTS

BUStribution Duct is a system of permanent wiring whose flexibility is practically unlimited. "Plug in" openings (see arrows) on both sides of the Duct, every twenty inches, make current readily available . . . where it is needed . . . when it is needed.

Pre-fabricated, BUStribution Duct can be quickly installed. Standardized parts eliminate cutting, bending and threading. This feature alone saves time and money too.

When it comes to plant changeover, or rearrangement of production lines, BUStribution Duct may be dismantled readily and re-erected elsewhere without any loss of material whatsoever. Besides, new sections may be added without costly shutdowns that hold up production. Investigate BUStribution Duct now and eliminate further "Electrical Distribution" worries. Bulldog BUStribution Duct is sold by your Electrical Wholesaler.

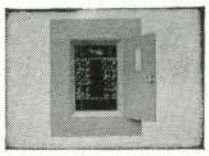
A47-6

A·E· CORP'N LTD.

ENDORSED ELECTRICAL EQUIPMENT

AMALGAMATED

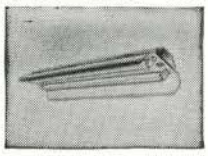
ELECTRIC CORPORATION LTD., TORONTO AND MONTREAL



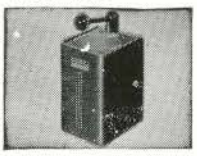
PANELBOARDS

WIRING SUPPLIES

SAFETY SWITCHES



LIGHTING EQUIPMENT



MOTOR CONTROL

SOLD BY RECOGNIZED WHOLESALERS FROM COAST TO COAST

HOW MUCH FOR A ROOF?

Question: **How much will the roof *cost*?**

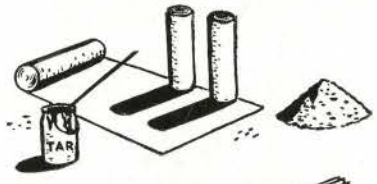
★ **Answer: Labor + material + life = *cost.***

Question: **What roof will *save* money?**

★ **Answer: We *guarantee* a *saving.***

★ ***LABOR***

★ ***MATERIALS***



★ ***LIFE***

THE ROOFERS SUPPLY CO.
ROSCO
TORONTO MONTREAL

ROSCO Bonded Built-Up Roofs are applied only by experienced Roofing Contractors, men whose ability has been proven—who know roofs and roofing materials.

ROSCO Bonded Built-Up Roofs are constructed only with ROSCO Saturated Felts and ROSCO Coal Tar Pitch.

The life of a ROSCO Bonded Built-Up Roof (inspected during installation) is guaranteed by a Bond (which protects your customer). To figure the cost of a roof you must figure its bonded life.

THE ROSCO BONDED BUILT-UP ROOF OFFERS:

1. **Maximum all weather protection.**
2. **Minimum cost.**
3. **Elimination of maintenance costs.**
4. **Bonded guarantee.**

Write us for full information.

THE ROOFERS SUPPLY CO. LIMITED

Toronto - Montreal - London - Ottawa - Quebec

UNIK FLUSHWOOD DOORS

"UniK" Flushwood doors are the superior in every way to other type doors for your home.

Dignified, inviting and exceptionally beautiful, they possess the power to transform an otherwise ordinary room or entrance to one of lasting charm.

Their superior materials and construction makes them Canada's leading value and the logical choice of economy-minded home owners.

Write for catalogue.

TERREBONNE QUE

CANADA FLUSHWOOD DOOR LIMITED

TERREBONNE · P·Q

Baby's Bath and Utility Room in the Maternity Building of a Large Modern Hospital.

Duraclay *

3 Primary Reasons For Specifying It

Whether you are planning a new hospital or laying out expansion of existing facilities, be sure to specify Crane Duraclay.

Three reasons why you can recommend it are:

- Duraclay is resistant to thermal shock—sudden extreme changes of temperature do not affect it.
- Duraclay will stand abrasion and strong acids. It is not subject to staining.
- Duraclay has a hard glazed surface that resists soiling and is easily cleaned with a damp cloth.

**Duraclay* exceeds the rigid tests imposed on earthenware (vitreous glazed) established in Simplified Practice Recommendations R 106-41 of the U.S. National Bureau of Standards.

CRANE LIMITED: GENERAL OFFICE: 1170 BEAVER HALL SQUARE, MONTREAL

Branches in 18 Cities in Canada and Newfoundland

I-7057-R

CRANE

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

NATION-WIDE SERVICE THROUGH BRANCHES, WHOLESALERS and PLUMBING AND HEATING CONTRACTORS

Buttering GLASS for a safety sandwich

No, it's not a bit absurd—not when the glass is specially-ground plate, and the "butter" is transparent plastic cement! Twin sheets of glass are bonded together with their plastic interlayer and become forever one . . . your car's SAFETY GLASS windshield!

Your windshield really began in Paris, many years ago. A thin glass flask dropped ten feet and *didn't shatter.* The fragments clung to the filmy substance that happened to line the flask . . . Add to this nearly half a century of scientific research, and you have Duplate Laminated Safety Glass, brought to you by HOBBS.

Now all the problems have been licked: precision grinding, a strongly elastic bond, complete freedom from discolouration, make Duplate Laminated Safety Glass *right.*

Today glass technicians are perfecting more glass marvels for better living . . . they'll come to you through Hobbs. In Canada—it's HOBBS for glass!

• Glass and plastic are first 'sandwiched' in cold room. Heat and pressure make the bond permanent.

Solid glass doors lure window-shoppers IN!

Yes, you can display the *interior* of your store to window shoppers, with Herculite glass doors and sidelights! Herculite doors have no 'visual barrier' of cross-pieces or frame . . . they invite the public to enter and BUY!

Four times as strong as ordinary glass of the same thickness, Herculite tempered glass has high resistance to heat and impact shock. It has many special applications: in glass doors, partitions, factory machine guards . . . wherever great strength and clear vision are required. Your architect knows Herculite . . . he can advise you on its many uses. For descriptive booklet write to Hobbs Glass Limited, Dept. , London, Canada, or call our local branch.

Come to Hobbs too for: Twindow insulating windowpanes • PC Glass Blocks • Corrugated glass • Coolite glare-reducing glass • Nucite glass chalkboard • Plate glass • Safety glass • Mirrors • Carrara • Plexiglas

Look to GLASS for better living- HOBBS GLASS LIMITED *come to HOBBS for glass!*

SHOWN HERE IS ONE OF A NEW SERIES OF HOBBS ADVERTISEMENTS, designed to promote greater use of modern glass products. These attention-getting ads are appearing nationally throughout 1947. Each advertisement refers readers to architects for further information. To assist you in specifying these glass products, we suggest that you contact any Hobbs Glass Limited branch for technical data and literature, or write direct to Hobbs Glass Limited, London, Canada.

JOURNAL

ROYAL ARCHITECTURAL INSTITUTE OF CANADA

SERIAL No. 266 TORONTO, OCTOBER, 1947 VOL. 26, No. 10

PRESIDENT . . . . . CHARLES DAVID (F)

CONTENTS

EDITORIAL - - - - - - - - - - - - - - 336

MODERN SCHOOL BUILDINGS, R. S. Wilshere - - - 337

ILLUSTRATIONS
SCHOOLS - - - - - - - - - - - - - 344

THE MATHEMATICAL BASIS IN GREEK DESIGN, Bryant Fryer 368

THE INSTITUTE PAGE - - - - - - - - - - - 376

Editorial and Advertising Offices - - - - - - 57 Queen Street West, Toronto 1

SUBSCRIPTION RATES

Canada and Newfoundland—Three Dollars per year. Great Britain, British Possessions, United States and Mexico—Five Dollars per year. All Other Countries—Six Dollars per year. Single Copies—Canada 50 Cents; Other Countries 75 Cents.

R.A.I.C.
JOURNAL
OCTOBER 1947

PROBABLY the greatest victory for modern architecture in Canada has been in the field of school building. Looking back at the achievements of the past, such a victory is remarkable and unexpected. Like the branch library, the school was influenced and bedevilled for decades by that greatest of all menaces to the conscientious designer, the stock plan. In at least one province those plans were the product, a long time ago, of a study undertaken jointly by government departments of education and public works. A pamphlet of plans was the result, and, while a succession of ministers might look askance at them (if they ever saw them), and a courageous individual would, at some stage, cease publication, the little monsters could not be recalled. The fault lay, in the first place, not so much with the architect who designed the stock schools—he, after all, was carrying out the bidding of his minister—but with those who saw merit in the idea of broadcasting plans about a countryside with wide variations of climate, and an infinite variety of sites. The view is widely held among laymen, especially those on public bodies, that they are conferring a great boon on their contemporaries, by recommending and initiating the publication of plans for a wide range of institutional buildings. Schools and hospitals are but two. That they are conferring an evil, rather than a boon, may frequently be the case, but the effect on posterity must, inevitably, be harmful. The stock plan for such purposes presupposes the same level sites, the same climate, the same needs and a static condition in education and hospital care. Only in the one room school can anything like uniformity be imagined, and it is surprising how many variations of the one room school are possible.

WE received, some months ago from a sister province, a book of stock school plans that we believe its authors, or their children, will live to regret. It contained some useful information on the construction of privies for those provinces who have not yet abandoned that abomination. In addition, it showed plans of schools from one to ten classrooms. Such a production would indicate that its authors felt that they had reached the ultimate in school design, whereas actually the flaws accumulated in direct ratio to the number of classrooms; they set a bar to progress in methods of education, and they imagined their schools in a dream world of desert sites in which the North point was always in the same position on the plan. For at least a generation, the young architect with ideas will be confronted with one of these plans by a board who will look with suspicion on every part of a plan he produces where it departs from the false "ideal" of 1945.

THIS number of the *Journal* will indicate the progress made in school design in the last few years. Probably several committees have been engaged in a study of the problem coupled with an investigation into costs. We in Ontario have been so engaged, but reduction in cost has so far defeated us. Our experience may not be unusual, because, while we examined the problem, costs rose in every trade; and what were once minimum amenities in pre-war schools were considered completely inadequate for modern teaching and decent living. Even in the rural school, oil lamps gave way to incandescent or even fluorescent fixtures; privies gave way to indoor washrooms and the Quebec heater, or equal, gave way to a modern furnace. So that with an attack on costs, one was confronted with twentieth century improvements that were costly, but made for better eyesight, better health and greater working comfort. Other provinces are tackling the problem of better schools on the same basic principles, and it is clear, from only a cursory examination of these pages, that school building in Canada is rapidly approaching, if not passing, the work of countries to which we once went for inspiration.

Editor

MODERN SCHOOL BUILDINGS

By R. S. WILSHERE (F), *Education Architect, Belfast*

Read at the Architects' Conference, Dublin, on 13 June, 1947

Reprinted from R.I.B.A. Journal

THE BASIS of all education is tradition, not only by the passing of knowledge from one generation to the next generation, but also by the passing of the accumulated knowledge which each successive generation in its turn contributes. And so in giving a paper on "Modern School Planning and Design" I make no apologies for first giving you a brief historical survey of ideas past schools have provided, and it may be that some moral may be drawn from past achievements in facing the future. I would suggest that the problem of designing a building for educational purposes involves the welding into one unit, three distinct and often very conflicting requirements—education, health and architecture. The balancing of these requirements is by no means an easy one.

At the beginning of the 19th century the standard type plan for a school building was known as "The Lancastrian School". It comprised a large room or hall with a raised platform at one end for the schoolmaster. Desks were placed in the centre and space left all round the desks for children to stand in groups whilst under instruction. A schoolmaster would have control of anything up to 1,000 pupils, his duties really being mostly supervision, the educational theory of those days being largely self instruction by the pupils themselves under monitors.

About 1826, teachers were introduced to assist the principal, and a new type of plan appears, usually called the Stowe System. This school provided:

1. A long gallery at one end of the room.
2. Desks arranged in groups at the sides.
3. Central space left clear.
4. One or more small classrooms with galleries.

In 1846—20 years later—the pupil teacher system was introduced and plans changed. Rooms became long and narrow with desks on one side of the room only, divided by curtains into groups each with its pupil teacher.

In 1870, the Elementary Education Act was passed in England and education for all became a public responsibility and School Boards were created to control education in their own districts. The London School Board at once held a competition for the ideal school building. The Ben Jonson school erected in Stepney in 1872 was the result of this competition. This plan was the famous "central hall" type and comprised:

1. A large central assembly hall.
2. Separate classrooms grouped round this hall and generally opening direct from this hall.

The following new principles became established by this school:

1. All classrooms had left-hand lighting.
2. Each teacher had his own classroom.
3. The central hall became available for special purposes and was no longer used for ordinary class instruction.

For nearly 32 years this plan held the field unchallenged; practically every successful competition was based on this plan and as late as 1902 an eminent authority expressed the opinion that as a plan for school purposes it was unlikely it would be improved upon.

It was in 1902 a new Education Act introduced school medical services, and with it the appointment of school medical officers, which caused a complete revolution in school design. This was largely due to the energy and enthusiasm of two men—Dr. Reid, the School Medical Officer of Staffordshire, and Mr. Widdows, the Education Architect of Derbyshire.

The experiments of Haldane and Sir Leonard Hill had just thrown new light on the problem of ventilation, and had demonstrated ventilation as primarily a matter of air movement; chemically pure air was not of importance; cooling power and movement were the essentials. Dr. Reid saw that ventilation in the central hall was really little better than the back to back house, and with Mr. Hutchings, the Staffordshire Education Architect, evolved a new type of school called the "Pavilion" type. It consisted of a row of classrooms connected by an open corridor, but with a definite scientific basis, ventilation of the classroom by win-

dows opening on both sides of the room, each window having a hopper just above the level of the children's heads.

After some opposition, the Board of Education agreed to an experimental school being built, subject to each classroom having a ceiling outlet to a Boyle type ventilator. After further pressure the Board agreed to the omission of the ceiling ventilators except in one room, on condition these would be provided should the ventilation prove unsatisfactory. The experiment proved completely successful. The rooms were delightfully fresh and free from stuffiness, and it was found the roof ventilator made no difference at all.

Mr. Widdows developed the principle, and as sites in those days were restricted in area, produced some remarkable plans with classrooms jutting in all directions from the central hall, providing each classroom with bi-lateral lighting and cross ventilation. No doubt, the idea of the central hall still maintained its grip. This new principle of ventilation gradually replaced the central hall type, although many architects did not appear to really grasp the underlying principles, but cross ventilation was established and all classrooms tended to become what one might describe as one room thick.

After the somewhat complicated early plans of Mr. Widdows, there suddenly appeared the logical solution, the "quadrangular plan" (1913), which soon became the standard for school design as the central hall type had been in its day. It has become fashionable to condemn the quadrangular plan chiefly because so many quadrangular school plans ignore aspect. Educationally, however, it makes a good working plan, particularly for the semi open-air type of school where it gives protection to the open-air corridors.

The semi open-air school was the result of the remarkable achievements with full open-air treatment of T.B., and undoubtedly provided very healthy conditions. It was in 1914 Mr. Widdows produced his Wingfield School. This school was designed on a definitely scientific basis dealing with:

1. Aspect.
2. Proper natural lighting.
3. Cross ventilation.
4. Open air conditions.
5. Heating.

Lighting was by means of 60 degrees continuous glazed north light. Fully opening glazed doors opened into open verandahs on each side of the classroom. The purpose was to eliminate sunlight with its excessive lighting contrasts and to rely on the even and steady north light. At the same time the glazed doors enabled the sunlight to be seen outside. Cross ventilation was by means of hoppers and heating was solved by underfloor heating. Mr. Widdows claimed this classroom provided a steady light of 5 per cent. of the cill lighting.

During the inter-war years, the break with traditional planning and design and the development of the asymmetrical plan has provided a valuable release enabling a more rational layout to be adopted so necessary to meet the growing requirements of education. The passing of the new Education Act, and the raising of the school leaving age, has still further widened the scope of education; not only have the type and variety of schools been increased, as will be seen from the new Building Regulations, but the whole standard of accommodation and equipment has become much more elaborate.

It will be seen in the earlier plans that methods of instruction directly shaped the plan; later health played a major part. Today educational methods are changing. In the past it may be said pupils were sent to school to be taught, today pupils attend a school to learn. The function of the teacher tends to become more and more that of a guide, philosopher and friend, rather than an instructor pushing definite ideas into their pupils. The pupil is less and less expected to accept what it is taught; the idea behind education becomes more and more to develop the pupils' individuality, but at the same time to make the pupils realize they are members of a community and to adjust their own individuality to the group with which they work. It calls for less regimentation and more freedom for the pupil and for more activity in place of book learning. This new approach is brought out in the new regulations.

It may be said that in the past schools were more or less static, that is, pupils had fixed places in a definite room and the architect's problem was largely to provide rooms to accommodate a given number of desks arranged in a set pattern, only to be moved when the floors had to be scrubbed. Today the classroom tends to become a centre of activity and mobility. Fixed furniture is being replaced by light movable furniture, which can be easily moved to provide different grouping and arrangements, or stacked on one side to leave the floor area clear.

The new regulations revert to the principle followed in the central hall type of school where classrooms of varying sizes were provided. This policy after the 1914-18 war created much difficulty when school accommodation, as today, was inadequate to meet urgent needs and lead to the general practice of all classrooms having the same capacity. The classroom still remains the hub of the pupils' education, and it is from this centre the pupils' activities radiate, but the increasing

use of other rooms and facilities brings the matter of circulation not only by the pupils moving from place to place but also the staff and those in charge.

There has been an increasing tendency for schools to sprawl more and more. This sprawl has been justified on the grounds that "as walking is good exercise this does not matter". A better defence is that it gives a sense of space and freedom, a very desirable quality in any school building.

Today, compared with the past, the pressure of economy on expenditure may be said to have almost ceased to exercise any control, but the last two years have shown us that even if we have unlimited funds to spend this can produce another obstacle, the lack of sufficient labour and materials to meet our demands. The vast demands on the Building Industry envisaged today in every branch of the social services apart from the enormous arrears of normal requirements should be squarely faced.

This tendency to sprawl more and more means that, whereas in a school of the central hall type there are practically no corridors or unproductive areas, and in the average quadrangular school working space to corridors is in the neighbourhood of 2 to 1; in the type of plans now becoming fashionable these figures are revised, being as much as 1 to 2 or even more. This means there is obviously a large amount of building which is in effect unproductive, and I feel we should consider if we can reduce this.

Those who have seen the newer schools round Paris before the war must have been impressed by the sense of space they suggest, although actually they are relatively compact. This sense of space is largely achieved by the skill of the architect, and I would suggest the proper architectural approach is to secure these pleasing conditions by good aesthetic planning and design, as these French architects have done.

BUILDING REGULATIONS 1944

The Ministry of Education's "Draft Building Regulations 1944", and "The Regulations Prescribing Standards for School Premises 1944", lay down in very full detail the requirements that will have to be met in all the various types of new schools that will be erected.

The greater variety of this accommodation and the varying sizes of classrooms add to the difficulties of planning new school buildings, and these difficulties are increased by the adoption of the various functional requirements, which are now being laid down in the Codes of Practice prepared under the authority of the Codes of Practice Committee. The Codes of Functional Requirements of Buildings, to which reference will be necessary, cover Daylight, Sunlight, Ventilation, Space and Circulation, Noise, Fire, Weather Precautions, Services, Water Supply, etc., Heating and Heat Insulation, Corrosion, Dirt and Vermin, Acoustics, and these codes will have to be followed where applicable.

It is not possible to deal with all the new requirements in detail. In the new regulations school meals now become an essential feature of all schools whatever their size. Gymnasium and changing facilities become of more importance. But the assembly hall, the importance of which for dramatic and other purposes has been increasing and the importance of which for outside purposes—until the building situation eases—are very extensive, appears to receive no special consideration that one might expect. The planning of schools will, however, be dominated even more in the future by the so-called functional requirements, and I propose to deal with the more important of these.

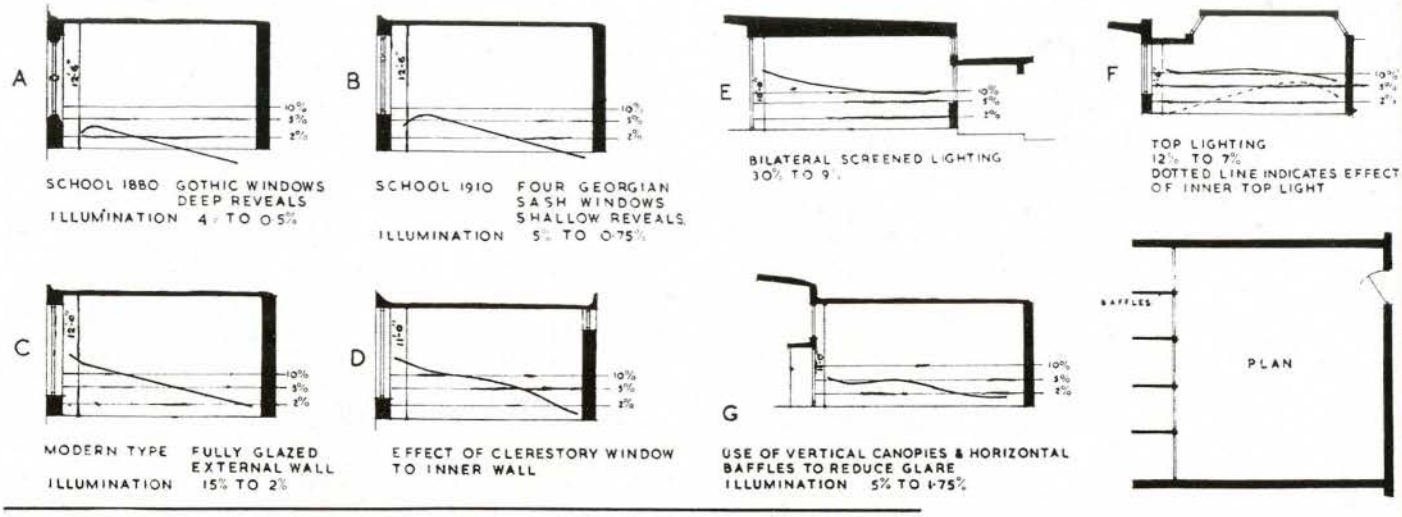
DAYLIGHTING

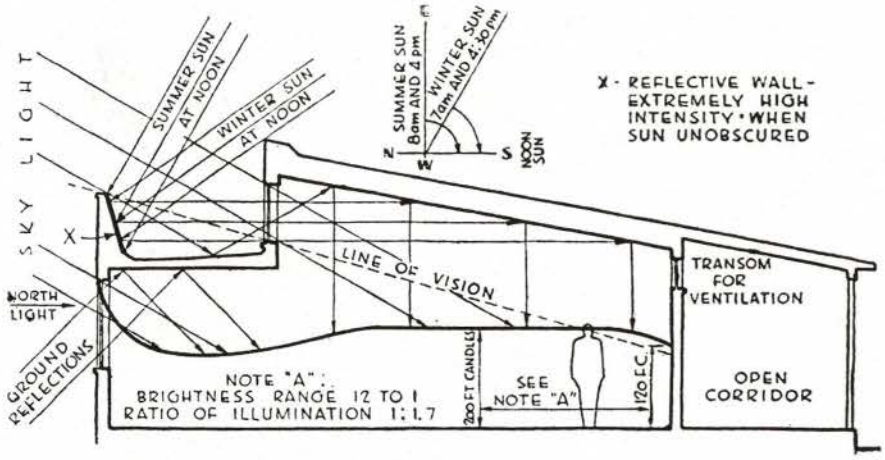
The factor which affects lighting and seeing is not only the amount of illumination but the quality of lighting, whether natural or artificial. The important effects in seeing conditions, both psychological and physiological are glare, diffusion and direction, composition and distribution.

The first practical approach to lighting of classrooms was the introduction of left-hand lighting. The investigation by the N.I. of I.P. carried out in 1931 dealt largely with the influence of lighting conditions on the pupil's work. These investigations showed the rapid diminution of daylight the farther the pupil is seated from the window, and that the quantity of light affected the quality of work.

Daylighting in buildings, and particularly schools, has as a result now received considerable attention, and the Post-War Building Studies, "The Lighting of Buildings", deals extensively with this problem in relation to schools. It had been generally accepted that the tolerable daylight factor in offices was 0.2 per cent. In 1929 Sir Felix Clay had claimed that 1 per cent. was the minimum necessary in schools, which corresponded to a daylight factor of 0.5 per cent., a figure recommended by Mr. Waldram in 1913. The Board of Education in their regulations of 1936 recognized this standard and laid down this figure as a minimum.

The N.I. of I.P. as a result of their investigations in 1931 considered that a daylight factor of 2 per cent. was desirable, and 1 per cent. the lowest permissible figure. The Lighting Committee of the Building





Above — **DAYLIGHT INTENSITIES IN VARIOUS CLASSROOM SECTIONS.**

•

Left — **AN AMERICAN DESIGN OF CLASSROOM LIT WITH REFLECTED DAYLIGHT**

Research Board, however, advocate 5 per cent. as a minimum, and this figure has been recommended as the standard to be aimed at in the Ministry of Education's new Building Regulations with the higher figure of 10 per cent. where rooms are used for drawing, sewing, etc., and at the same time recommends maximum values should not exceed minimum values by more than 1 to 2, but still allow a minimum of 2 per cent. In modern schools with a large expanse of glass on one side, the daylight factor will vary from 15 per cent. down to 2 per cent.

Thus a very difficult problem has been set if the new standard is to be reached, and the only solution at present appears to be some form of top lighting. This very high standard of lighting intensifies the conditions that larger windows have already created, the problem of glare, which it is recognized is not only unpleasant but is also harmful. The Lighting Committee would therefore like more control to regulate daylighting, but any system which is dependent on the teacher cannot be really regarded as satisfactory.

The Post-War Building Studies No. 12 give a number of examples of the amount of light in different types of classrooms. For example in a school of 1850, with Gothic windows, illumination varies from 4.0 per cent. to 0.5 per cent. near the farther wall. It is commented that the lighting could be quite pleasant, the deep splayed reveals reducing glare.

In a school of 1910 with four Georgian sash windows, lighting is slightly better—5 per cent. to 0.75 per cent.

The modern classrooms with one fully glazed external wall lighting varies from 15 per cent. to 2 per cent.

A clerestory window in the inner wall improves conditions for all except those in the worst position next the inner wall.

The best distribution of light is obtained where, in effect, normal vertical lighting is replaced by horizontal lighting. A classroom is also shown which employs a number of vertical baffles and horizontal hoods, and comment is made that the distribution of light is very even and the baffles and hoods would eliminate glare, so that whilst standards of intensity are lower than desirable, I suggest good conditions may compensate for this. I, personally, am not aware of any conclusive evidence that can be said to show this very high standard of lighting is essential to protect the eyesight,

and there are, of course, experts who definitely disagree with its necessity. It may yet prove this excessive zeal for light may have to be modified as have other ideas which have dominated school design from time to time.

Top lighting has many drawbacks, it calls for more elaborate construction and more or less restricts building to one storey; it creates heating problems, provides a maintenance problem both to keep the glass clean and for repairs. Top lighting in schools is not a new idea, and was at one time definitely objected to by the Board of Education. I, personally, have always found top lighting to have a peculiarly depressing effect, but this may be a purely personal reaction. In view of all the complications that arise both in planning and designing a school to provide top lighting, I feel more evidence on this subject is called for. One feels here is essentially a problem to be investigated fully, and that more schools on experimental lines should be built and tested. It may be that bi-lateral lighting is a better overall solution, or that the more free-shaped classrooms popular in U.S. may give a better and cheaper solution.

This daylighting problem has been tackled in the U.S.A. In one design use is made of glass bricks, to diffuse sunlight, whilst low glazed windows still allow the pupils to see outside. This idea is now being developed by using special glass bricks that direct the light to the ceiling, which then acts as a reflector to give even distributed light. Then in a California School a new approach is given; the principle is that the classroom faces north, and sunlight is reflected through a high window into the classroom. It should be noted the pupils sit with their backs to the source of light.

VENTILATION

The number of air changes in each room has now become a "Statutory Rule and Order" under "The Regulations Prescribing Standards for School Premises" and varies from six air changes per hour in classrooms to two air changes per hour in staff rooms, but we are not told how this is to be achieved.

If ventilation was the only problem to be found in planning a school and designing a classroom there is no doubt the principles developed by Dr. Reid in the Staffordshire pavilion school with the low hopper on each side of the room and the open corridor provides a real solution. Mr. Widdows claimed that when this principle was applied by him to the Derbyshire Schools that 10 sq. in. of hopper per child gave ten air changes per hour with a wind blowing at four miles per hour to the face of the building.

The N.I. of I.P. have investigated the problem of ventilation in schools very thoroughly, and no doubt the new standard called for is based on their findings and recommendations. In some early investigations for the N.U.T. a certain classroom was found to have a pocket where there was never any real air movement, and by a coincidence the school authorities had noticed pupils sitting in this part of the room never seemed to do so well either in examination or other work.

There is no need to stress the importance of ventilation, we are all aware of the discomfort we all feel where ventilation is bad.

The N.I. of I.P. recommend that the main school windows should have: top sashes—pivot hung; centre sashes—side hung; bottom sashes—hopper hung; and with a window into the corridor they consider air movement and air change can be satisfactorily controlled. The difficulty, of course, is that the operation of this ventilation falls on the teachers, and where he or she does not like fresh air the system cannot achieve its object.

The N.I. of I.P. appears to be satisfied that with high opening windows directly opposite the main windows, satisfactory air movement will be achieved, but point out that in corner rooms it is not enough to ventilate only from the two adjoining outside walls.

I would still like more evidence that the high level window does make the necessary air movement where it is required; that is, at the children's level, as it seems to me the clerestory window is only a partial improvement on the old-fashioned ceiling ventilators. Of course in theory perfect control could be obtained by mechanical methods, but there is ample experience in the past to realize the superiority of natural ventilation. Natural ventilation reduces the risks of epidemics and respiratory diseases and acts as a stimulus and reduces mental fatigue. Mechanical ventilation tends to slow working output, tends to cause mental fatigue and restlessness; but perhaps the most valuable contribution of natural ventilation is that it teaches children the need to open windows.

ACOUSTICS

I think we should give full credit to Denis Clark Hall for having first focussed attention on the importance of acoustics and sound insulation in relation to school planning. But whilst I personally do not consider this arrangement of classrooms in his interesting design for the *News Chronicle* School are in fact better arranged as regards sound than the orthodox side by side rooms, he has brought out a point which has perhaps not been fully considered in the past, the relationship between noisy rooms and quiet areas.

I have found the one point on which all teachers seem to agree and have in common is the desire for quiet conditions in which to work and freedom from external noise interference. There are three different problems to be met: (1) The acoustic treatment of the rooms themselves; (2) soundproof construction; (3) planning of rooms in relation to each other.

It is now, of course, generally accepted that the assembly hall should be properly treated to provide suitable acoustic conditions. I am satisfied that proper acoustic treatment inside the classroom can definitely provide less tiring conditions both for the pupils and the teachers. We have all experienced the strain of trying to talk or listen against an excessive background of noise—both internal and external, and a lack of good conditions in this matter prevents children from concentrating and they become restless and fidgetty.

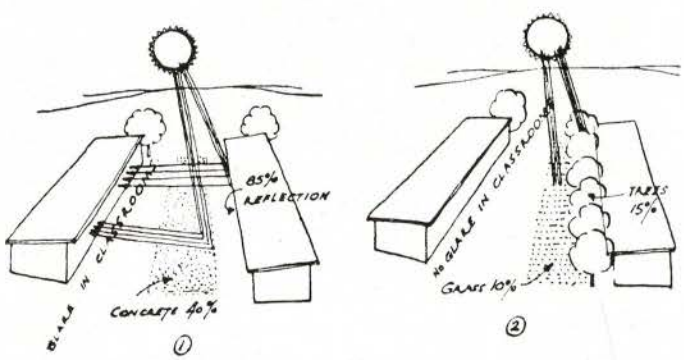
Corridors call for special consideration as they can be excellent conveyors and collectors of sound, and in this respect, of course, the open corridor at one time so popular provided an excellent solution.

It is now possible, of course, to calculate the exact noise level caused by external noises entering an enclosed space, and sound entering by open windows, doors, cracks, heating pipes and vibration of the structure itself particularly in steel-framed building with wall, floor and ceiling panels. The degree of quietness to be aimed at is that noise in a classroom should not exceed 35 decibles, in an assembly hall 30 decibles, and in other rooms up to 60 decibles.

Providing suitable conditions react on our planning and construction, and calls for our enclosing space into what might be described as "Noise Zones". It is well to remember that trees, shrubs and grass all absorb sound and are useful as sound breaks and can assist as a screen between noisy play areas and classroom units.

FLEXIBLE PLANNING

I would like to make it quite clear that in anything I may say with reference to flexible structure I am not condemning the present popular idea of so-called "flexible schools", but I do want to suggest that we should keep a sense of proportion in considering this new idea. Those of us who were active after the first great world war will remember how when the cost of building rose to what we then considered to be fantastic heights, we experimented with prefabrication and various types of alternative construction which were described as temporary or semi-permanent, and then suddenly realized that what in fact we were doing was to spend more money with much less satisfactory results than we should have done with more orthodox construction; we forgot that new materials should be our servant and not our master.



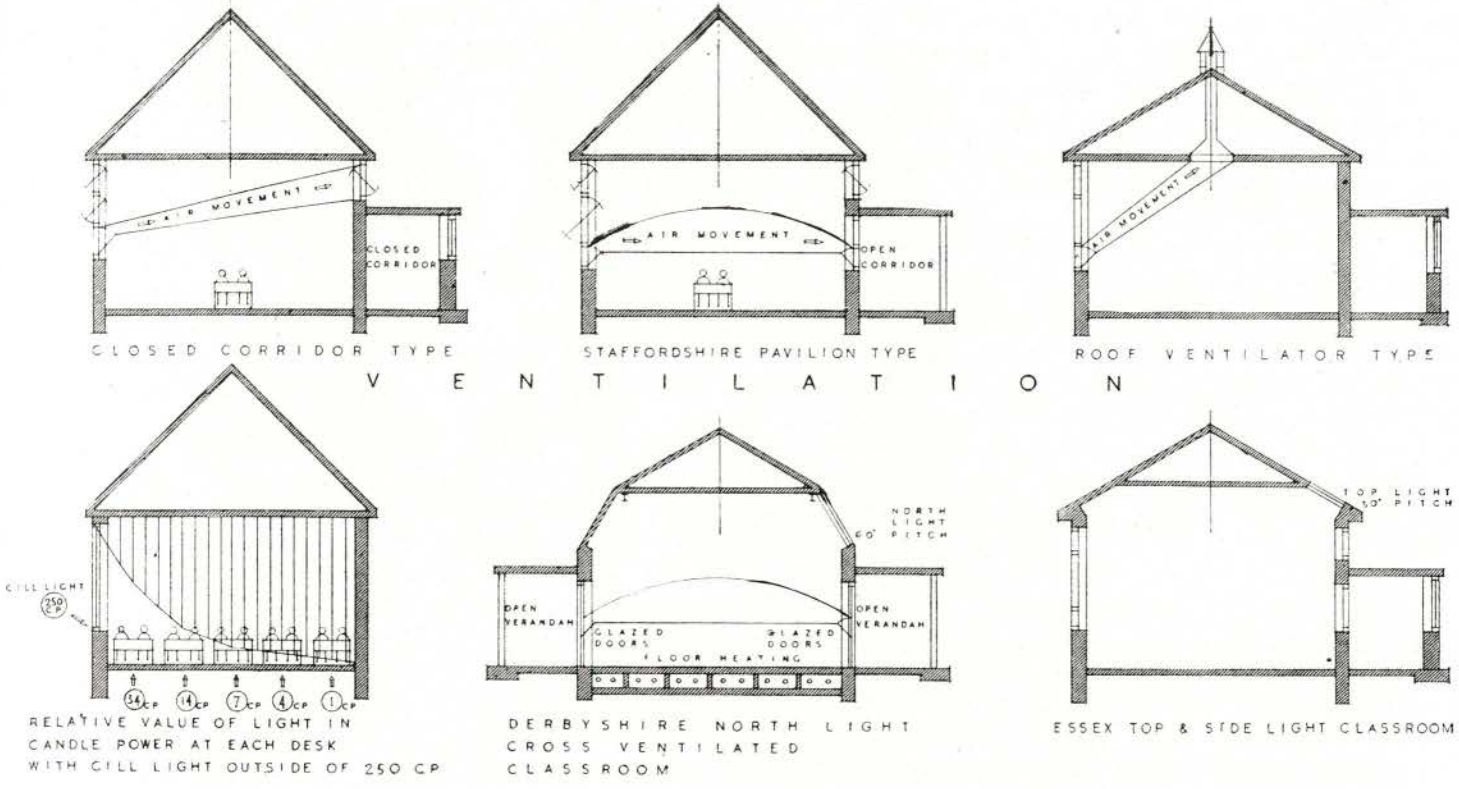
THE EFFECT OF YARD SURFACES AND PLANTING ON GLARE IN CLASSROOMS.

It was Winston Churchill who expressed the opinion that "We shape our buildings and then our buildings shape us". As an architect, I like to think this is a sound observation, and I believe the buildings in which successive generations are educated can play an important part in their education and development. I have frequently noticed that where teachers are working in a temporary school how remarkable is the urge to have such buildings replaced by a permanent substantial structure, and I believe a school building should not only provide beauty and pleasing surroundings, but it is important it should give that sense of stability and security which is vital for the full development of the child. I sometimes think today we forget we belong to an ancient profession; a profession whose most lasting contribution to civilization is architecture.

I have already referred to the three basic requirements which have to be faced in the designing of a school, and whatever our final solution of each building, it will be a compromise and we should be prepared to sacrifice some so-called efficiency, which by our skill should be more than compensated for by the pleasure our building should give. The basis of the architect's contribution should be to temper efficiency with beauty. If material super-efficiency is all that is required we should not waste our time with aesthetics but concentrate all our energies on science and engineering.

It sounds attractive to design a building so that it can easily be altered to meet future needs, but would any of the earlier types of schools I have referred to really lend themselves to this even if built of some light materials? It is possible that in most cases it would be often a better economic procedure to face up to demolition of a building which no longer serves its purpose. So let us be careful how much of our special contribution to the community which it is our privilege to give is sacrificed for an idea which may not be satisfactory in actual practice.

There was once a proverb: "The bad workman blames his tools". Today, of course, this proverb reads: "Give us new and better tools and then we will give you the



VENTILATION AND DAYLIGHTING IN SOME OLDER CLASSROOM SECTIONS

goods". But how many of us really believe that to replace Oxford and Cambridge with a complete set of new and up-to-date buildings would prove to be a real educational advantage? Is the idea that we should build our structures so that they will only last a few years really quite so rational as it sounds where education is concerned? Should there not be at least some permanent nucleus around which a school may develop?

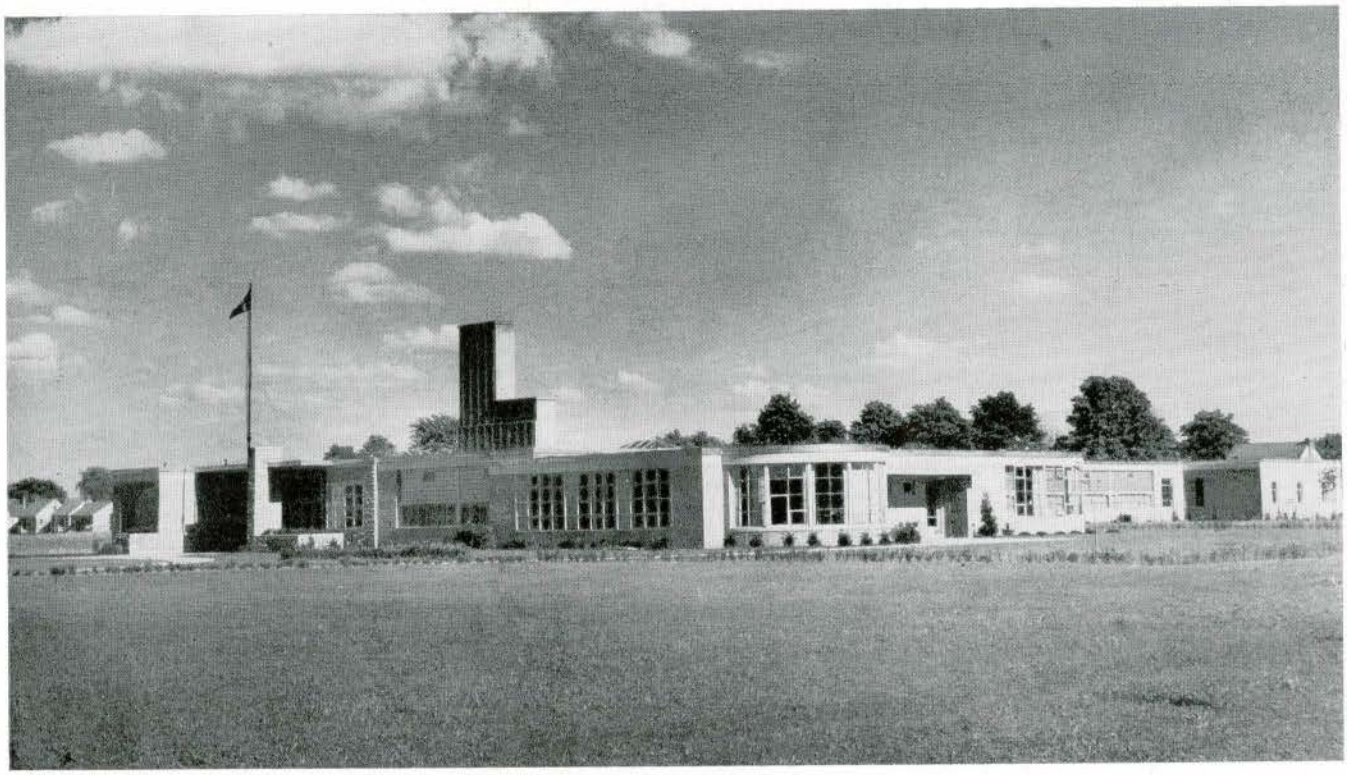
We should weigh very carefully in the balance prefabrication and structures whose only justification is that they may be flexible enough to meet the unknown needs of the future, but equally we certainly should not condemn the idea; it must have its place and purpose, and it is for us as architects to find the true solution.

CONCLUSION

After I had written this paper and I was reading it through, I came to the conclusion it had probably got the wrong title, it should have been "A Cautionary Guide to those about to build a School". But today the school architect is facing opportunities and a scope we could hardly have dared to hope for, and when I look back over the past and remember how often the last word in school design has been reached I am a little alarmed at all the committees, all the reports and Codes of Practice which are now providing the ready-made solutions to all our problems, lest they are going to stifle all real progress and destroy that initiative which has been perhaps more marked in school design than in any other type of building. There is still so much to be achieved before we find a complete and balanced solution to all the factors involved.

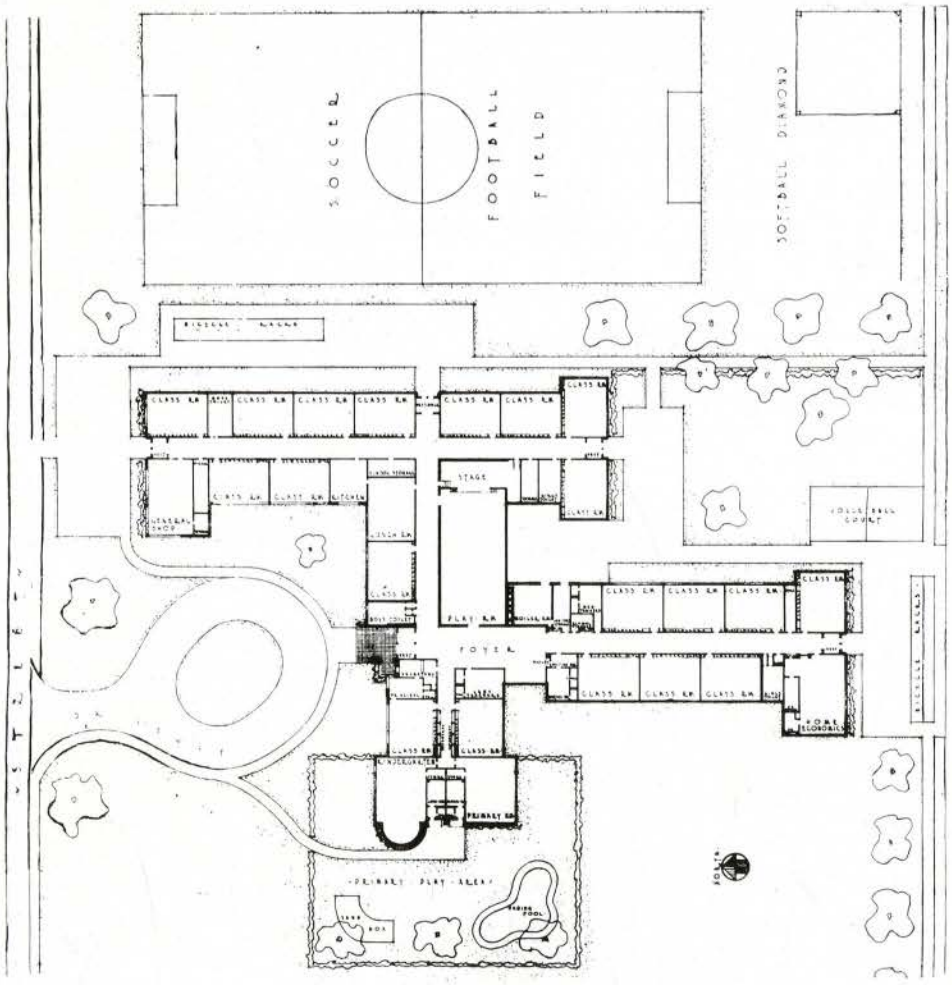
In spite of the admirable desire today that there should be equality of opportunity for everyone, I personally hope this is not to be interpreted that everything is to be standardized. I have a firm belief that every school building should if possible have its own individuality, its own special aesthetic appeal, and if the object of modern education is to develop the individuality of the pupil, should not the architect also give his building individuality?

This does not mean every school should be a different style, but those of us who have tried to add interest in the layout of the temporary prefabricated bungalows know that however well that layout appears on paper, the repetition of the standard building seems to rise superior to all our efforts, and the result still seems to be just a collection of huts, and this is interesting because Dublin, where we are holding this Conference, largely owes its charm and character to repetition—its streets of simple Georgian houses and terraces. Individually these houses are very plain, almost austere and grim, but grouped in masses it gives this city a vitality and charm that makes it a city every architect should visit. Why is it that these Dublin houses give us so much pleasure in contrast to the dull result the repetition of standard units produce? If Dublin can help us to solve this problem, our Conference here will have been more than justified.

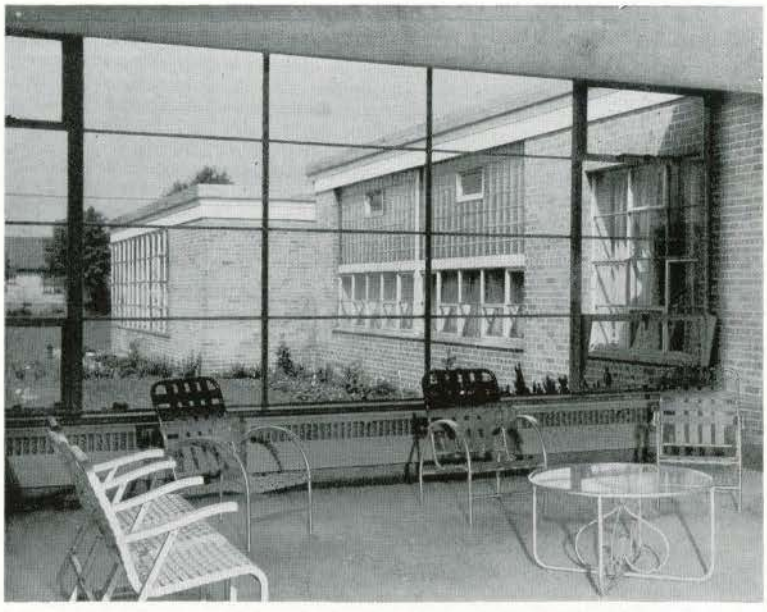


HANNA MEMORIAL PUBLIC SCHOOL, SARNIA, ONTARIO

S. B. COON AND SON, ARCHITECTS



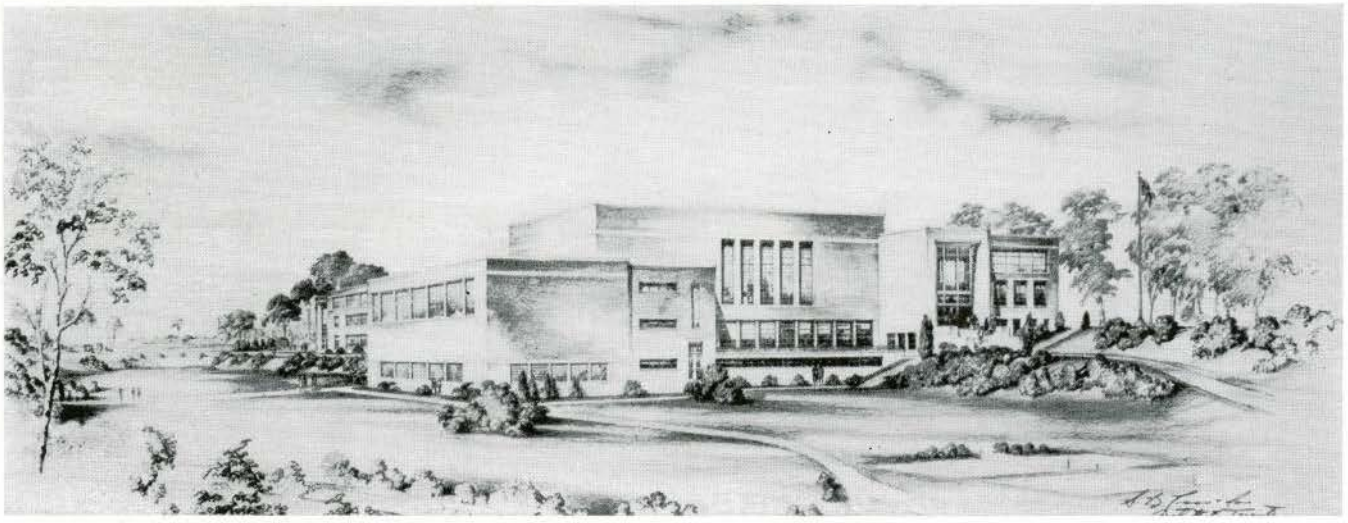
Photographs by Rolf Sherick Studio



FOYER

FOYER AND CORRIDOR

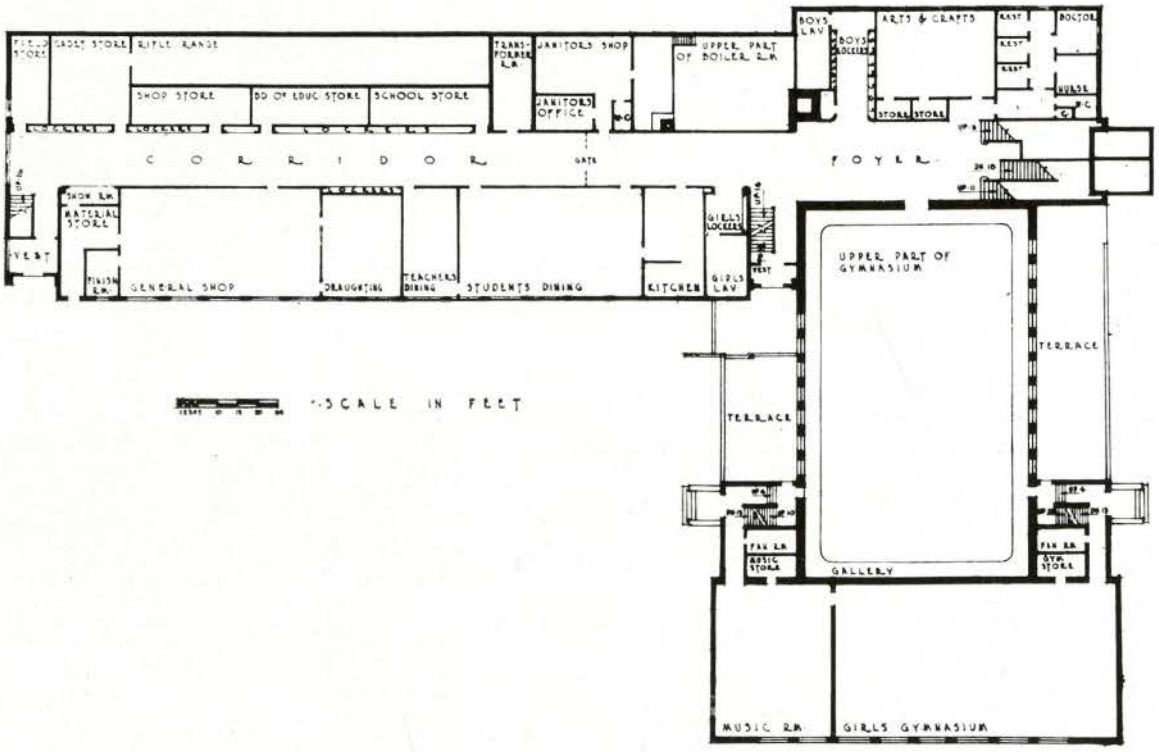
CHILDREN'S SOUTH ENTRANCE



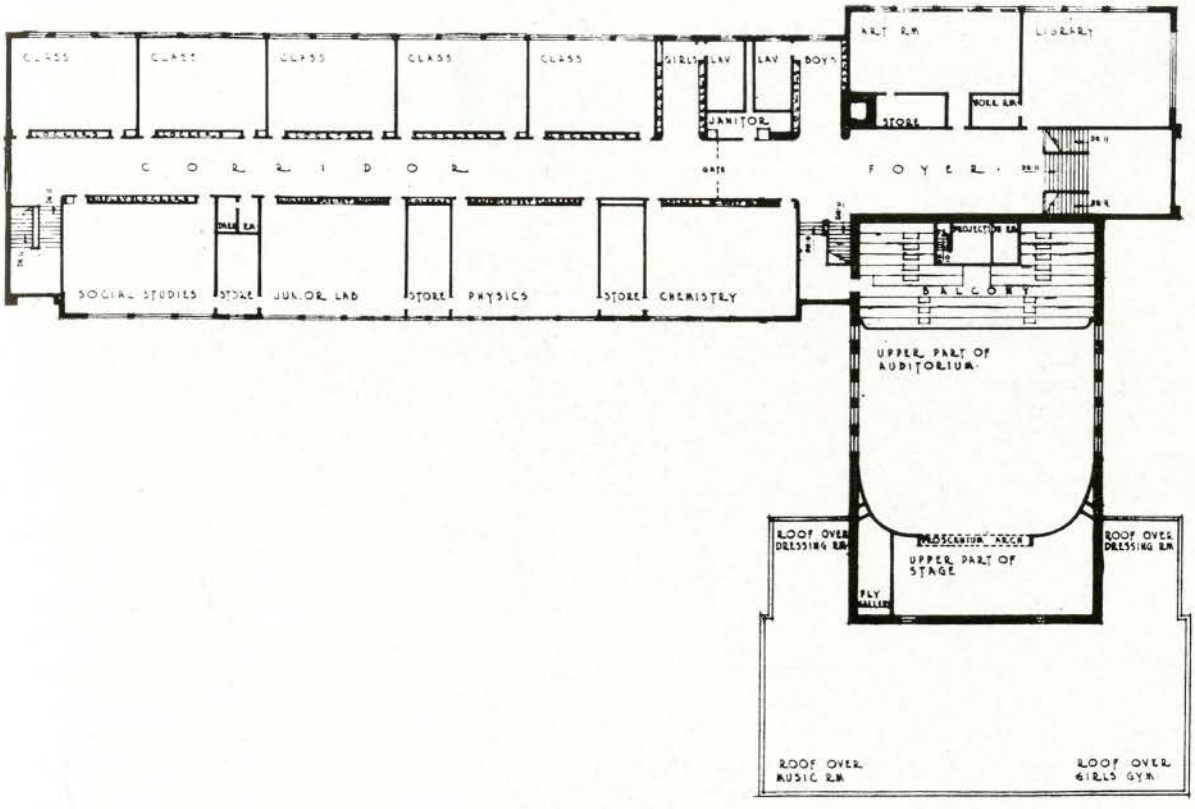
LEASIDE HIGH SCHOOL, LEASIDE, ONTARIO

PERSPECTIVE VIEW FROM SOUTH-EAST

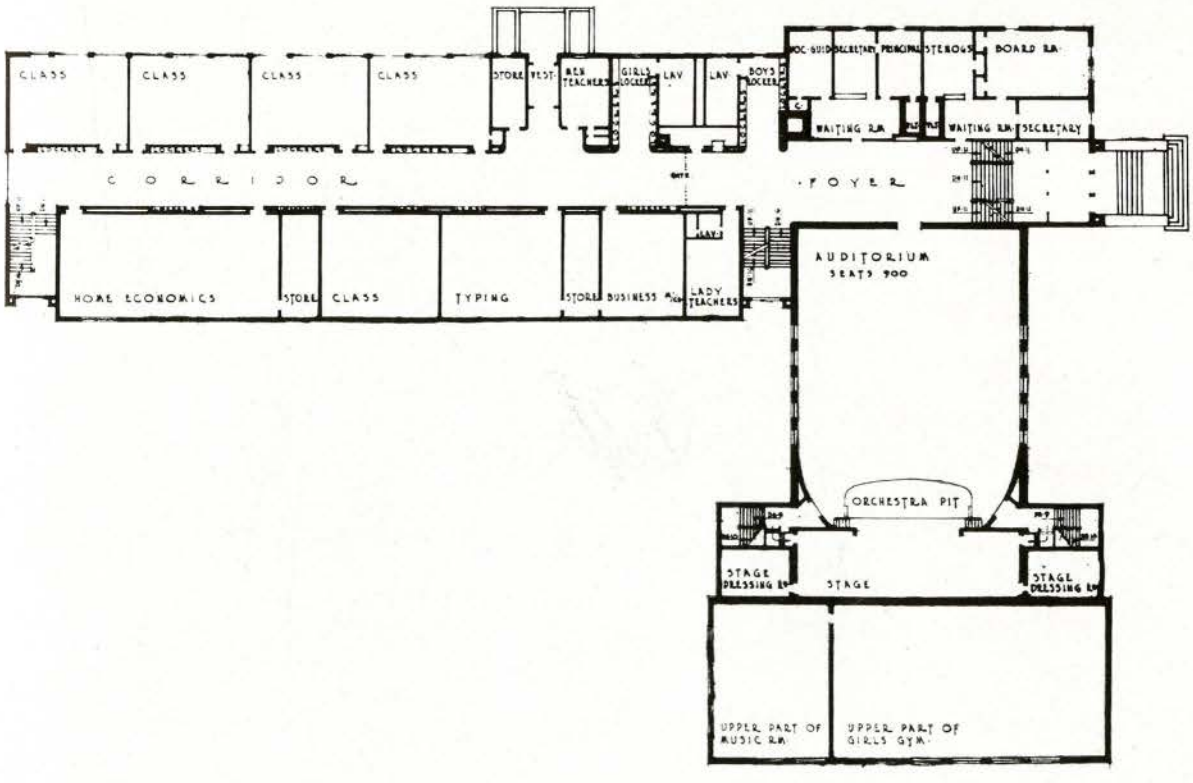
S. B. COON AND SON, ARCHITECTS



GROUND FLOOR PLAN



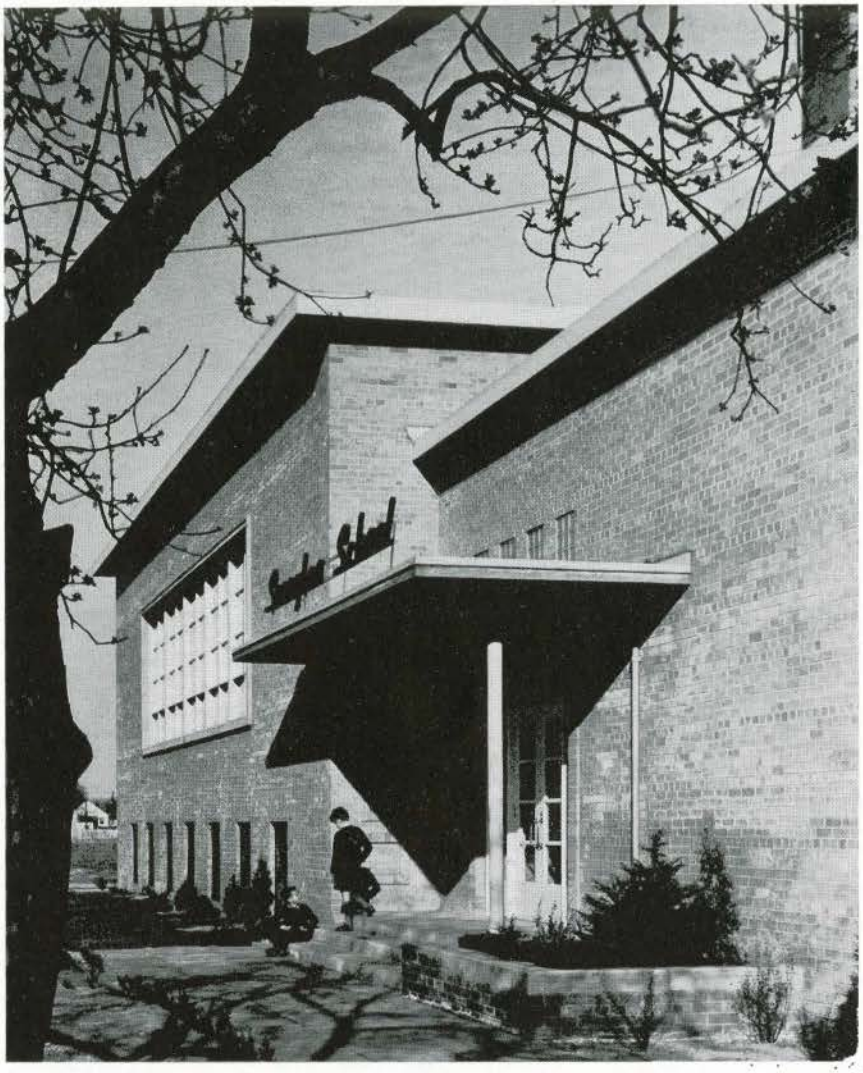
SECOND FLOOR PLAN



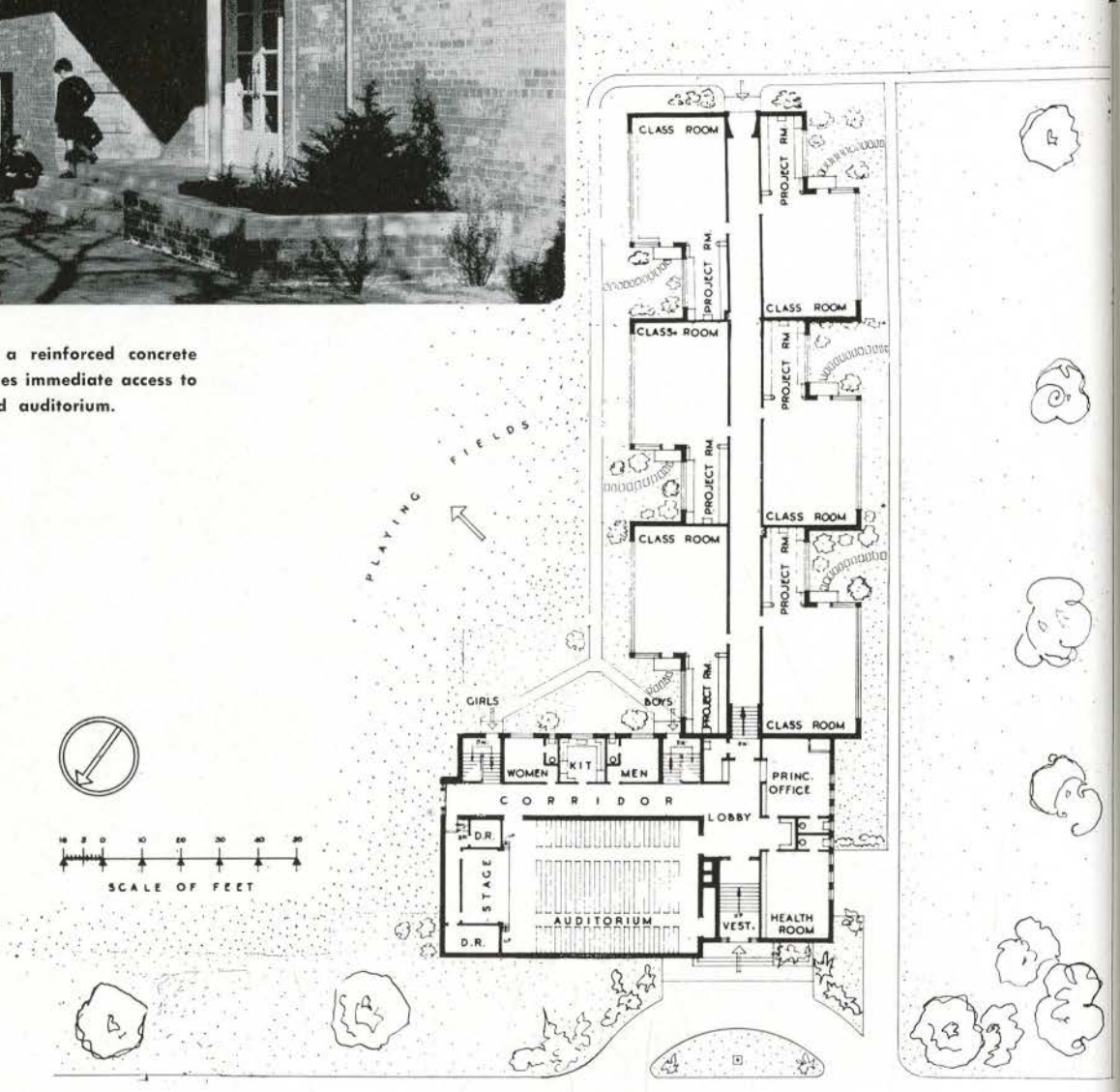
FIRST FLOOR PLAN

SUNNYLEA SCHOOL, TORONTO, ONTARIO

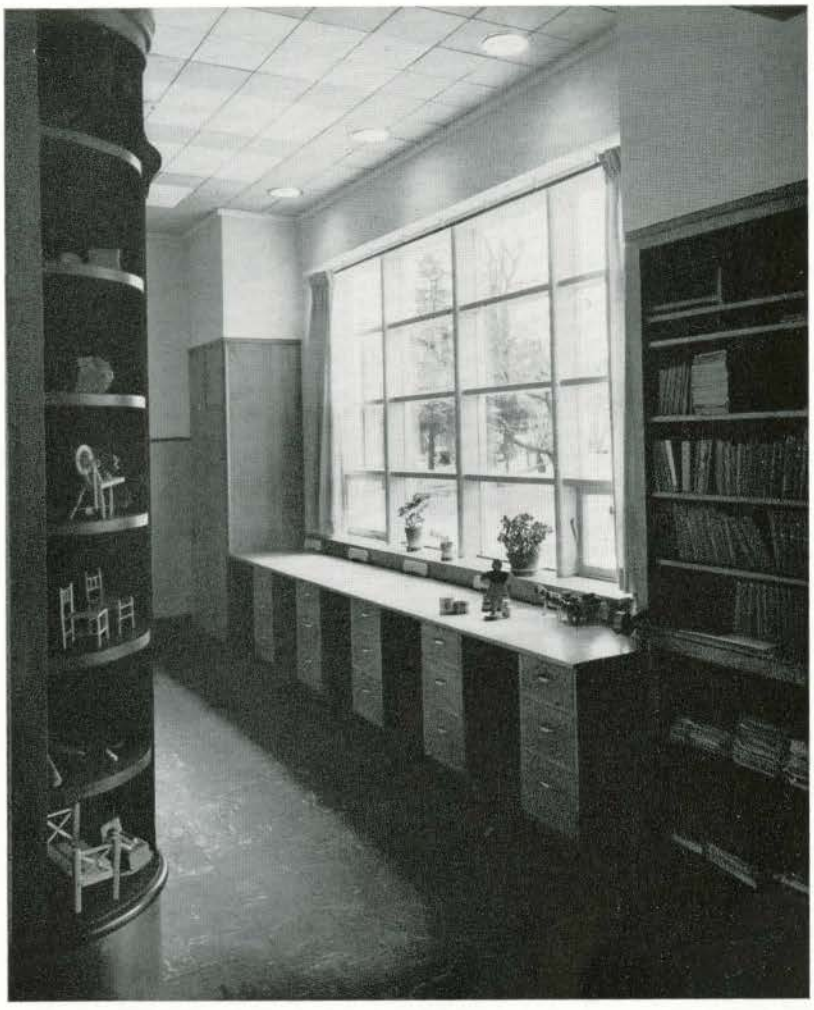
JOHN B. PARKIN, ARCHITECT



The Main Entrance features a reinforced concrete canopy, a flower box and gives immediate access to the administration offices and auditorium.

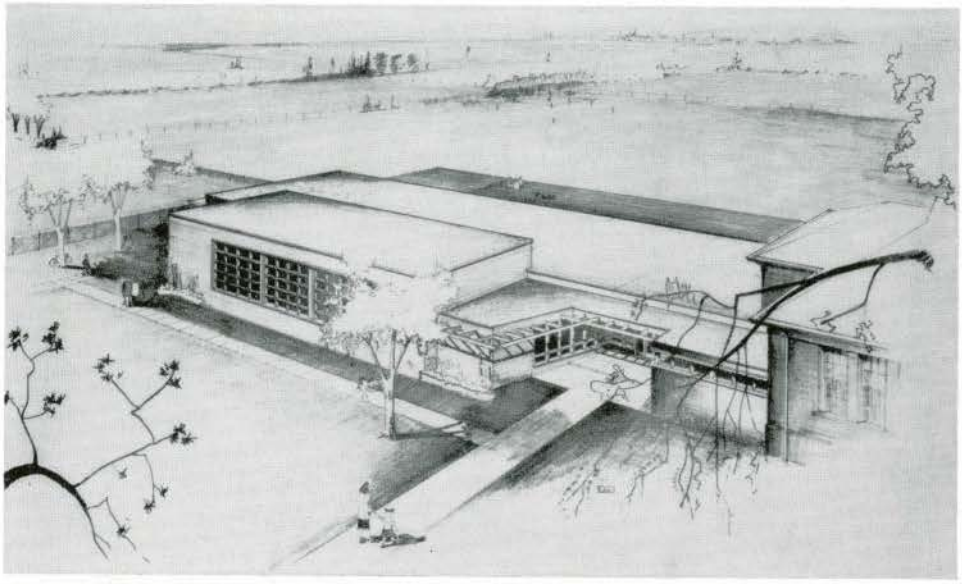


Photographs by Panda

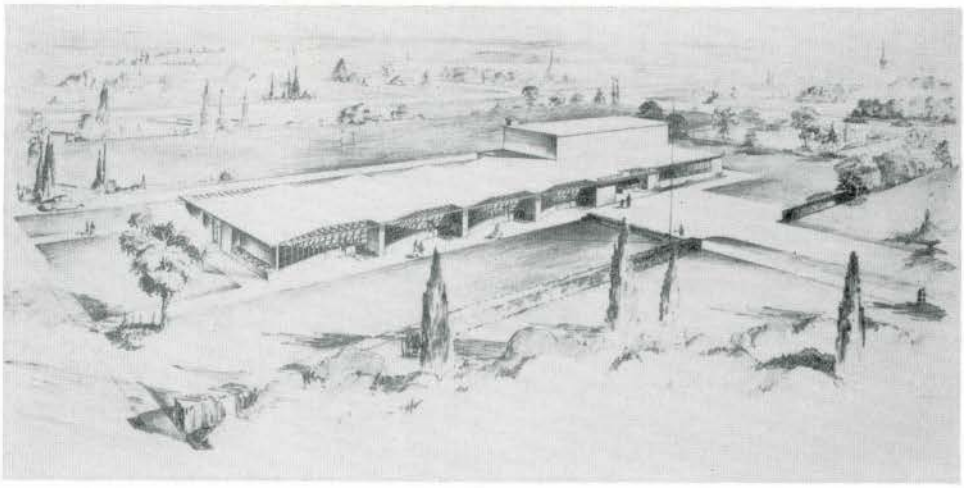


View of Project Room showing work benches, ample storage space and a low counter height placed directly below this large glass area which gives the children of Sunnylea School a pleasant atmosphere for their creative activities.

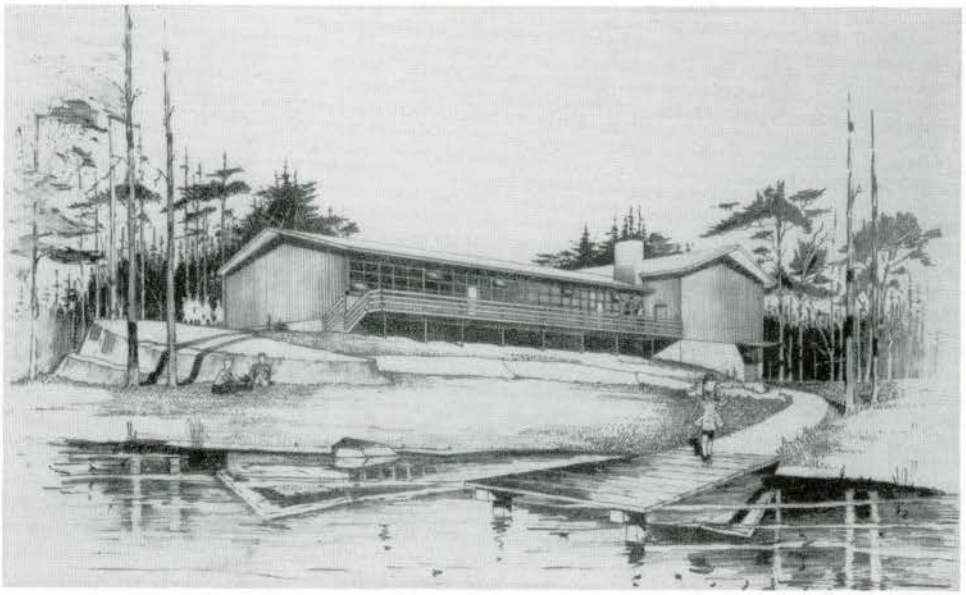
Auditorium — door in left background gives access to main lobby thus facilitating the auditorium's use as a community centre. The door in centre background gives access to the ample storage room where the stack type chairs are placed when not in use.



NORTH OSHAWA PUBLIC SCHOOL
NORTH OSHAWA, ONTARIO
JOHN B. PARKIN, ARCHITECT



WHITBY PUBLIC SCHOOL
WHITBY, ONTARIO
JOHN B. PARKIN, ARCHITECT

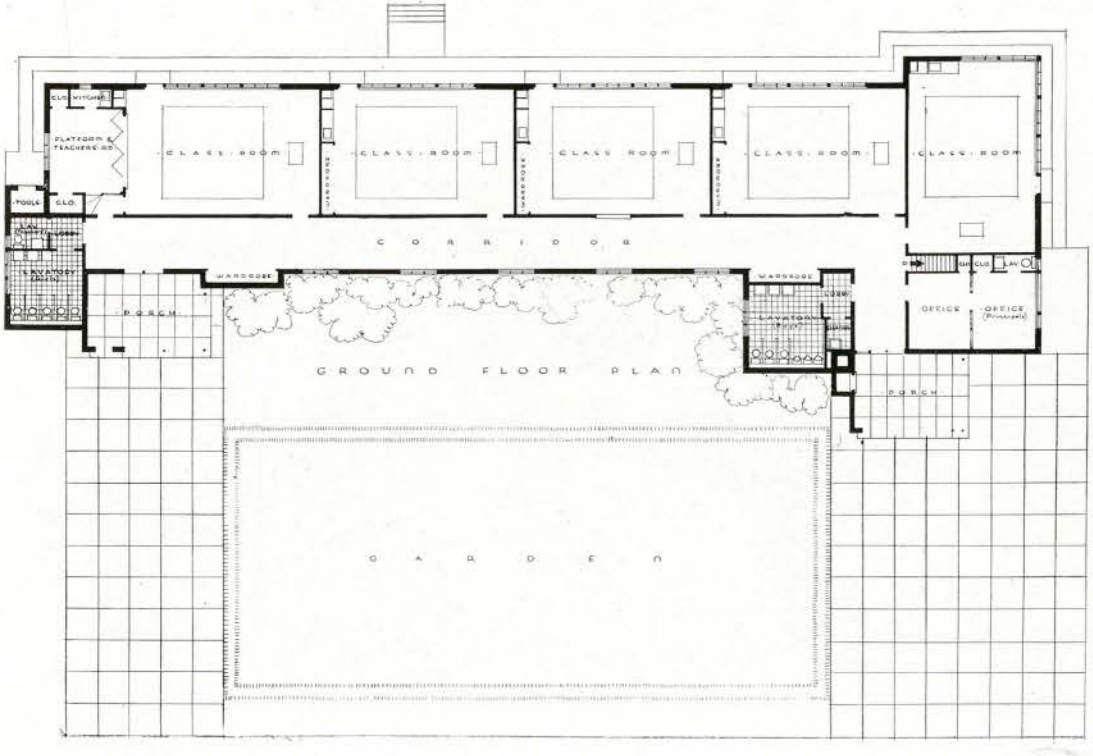


POINTE AU BARIL PUBLIC SCHOOL
POINTE AU BARIL, ONTARIO
JOHN B. PARKIN, ARCHITECT

Photographs by Photographic Arts

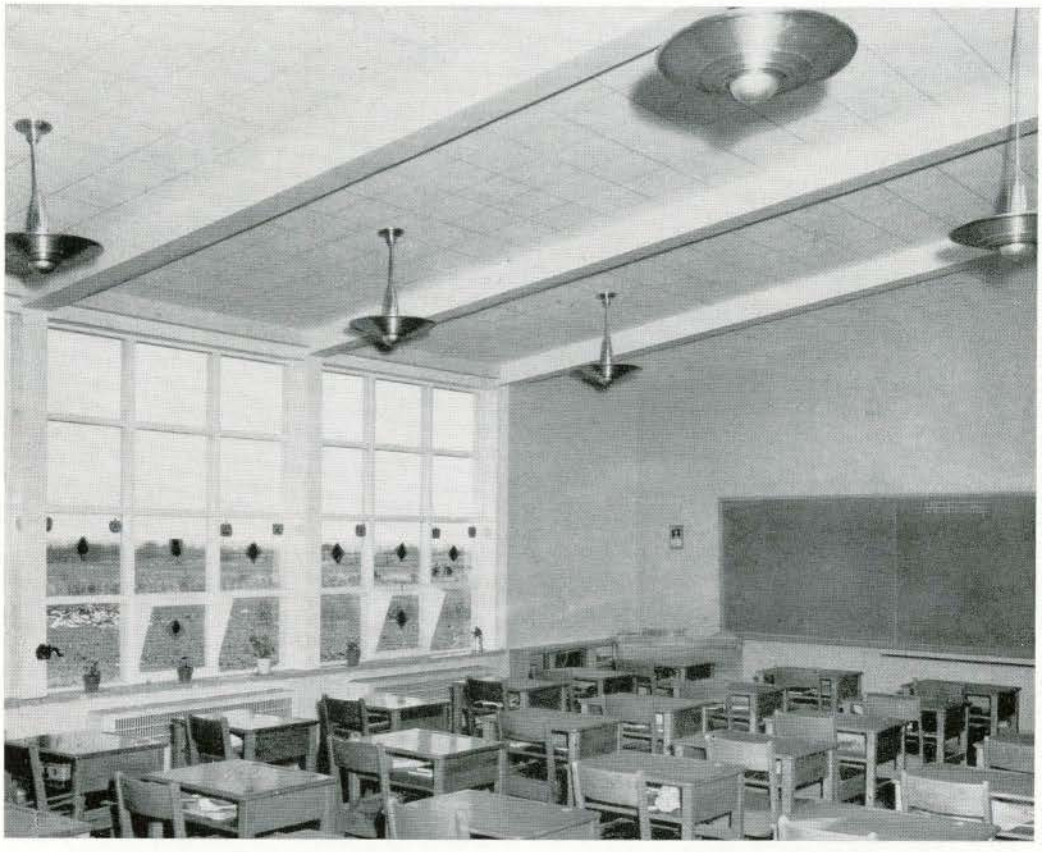
CENTENNIAL ROAD SCHOOL, SCARBOROUGH, ONTARIO

MURRAY BROWN AND ELTON, ARCHITECTS



ELEVATION TO CENTENNIAL ROAD

NORTH PORCH



TYPICAL CLASSROOM

VIEW OF AUDITORIUM CLASSROOM VIEWED FROM COMBINED PLATFORM AND TEACHER'S ROOM

A FLEXIBLE PLAN FOR RURAL SCHOOLS

By R. A. D. BERWICK

British Columbia with its vast area suffers from all the headaches of moving population. In many cases basic logging and mining industries require the establishment of schools that are abandoned after a few years.

In centres where large industries have been established permanently the population has grown from year to year. The demands far exceed the established facilities, and schools have not kept up with the requirements. To add to this, the release of service men from the armed forces has resulted in new residential areas, mushrooming up, generally throughout the province. This problem now has reached an emergency stage.

The present emergency may be divided into two parts: 1. Lack of basic accommodation. 2. General lack of special services required to carry out a complete educational programme.

The problems mentioned in item (2) mainly apply to Junior High and High School educational requirements. Many contemporary well-engineered schools are being planned, but shelved until costs become stabilised, and materials are available. These schools are being planned complete with vocational and industrial facilities, adequate lighting, new type flexible class-rooms, facilities for visual training, etc., far in advance of anything at present established in British Columbia. It is hoped that within three to five years the Province will be well advanced in educational standards and facilities generally.

The real emergency seems to be confined to item (1).

In the writer's estimation present conditions reflect the results of poor planning, lack of new construction over the last ten years, and a complete lack of foresight. In some schools visited, conditions are intolerable — loose floorboards, raw wood without paint, oiled floors saturated with dirt, and many schools up to four rooms are without inside lavatory accommodation. Certainly there is no encouragement for children in this atmosphere.

It is fortunate indeed that the Department of Education is now encouraging good design of small schools in rural areas.

The schools as built in the past, on the square plan, have almost defeated any attempt at addition. One of the most noticeable faults is that the basements are seven feet out of the ground, and usually twelve steps are required to reach the entrance door.

An interesting experiment is now under way at Langley, British Columbia. It has been decided by the Board of Trustees that rather than add one or two rooms to an outdated building, the proper solution is to start with new one or two room flexible schools on the existing sites, and expand from these new units, eventually eliminating the old schools. The principle established is that any small school now built should be capable of expansion at any point. Walls should be removable and no part of the plan should be permanent except the heating plant and lavatories.

As an example a two-room school will comprise: 1. Large, open class-rooms, well designed, using clerestory lighting. 2. Project areas with sink. 3. Well lit cloak areas that can be supervised. 4. Teachers' room. 5. Possible small kitchen. 6. An alcove that can be used as a small stage, for rural community use. 7. Other basic facilities.

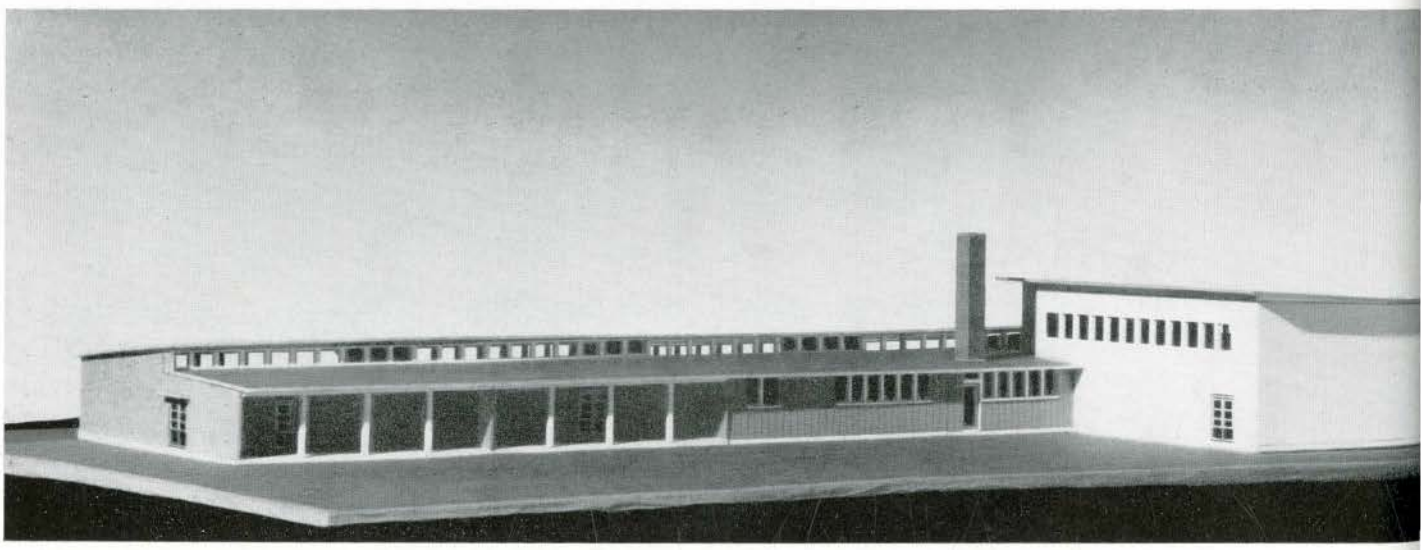
In order to have flexible buildings certain outworn regulations have been relaxed by the Department. When services and structure are properly engineered many of the existing regulations can be withdrawn.

There is no doubt that the conditions at Langley are only typical of many school districts throughout Canada. Schools lend themselves to contemporary design, probably more than any other type of structure. Many of us can remember vividly the dull class-rooms where we struggled through our grades and we will all admit that facilities were generally at a low standard. Many pages could be written on their bad lighting, dull rooms and lack of proper ventilation.

Other school districts are studying the example set at Langley, and the Langley School Board deserves credit for its clear thinking on this problem.

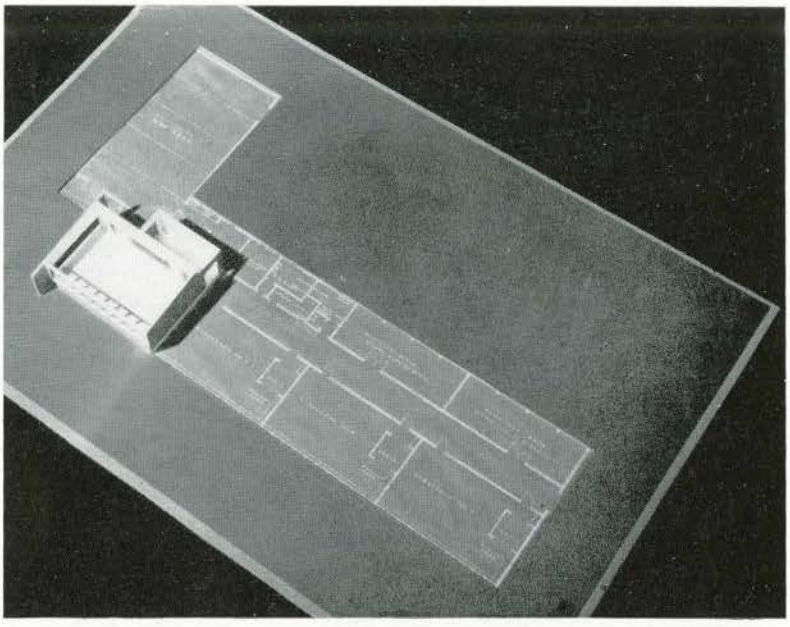
TYPICAL ELEMENTARY EXPANDIBLE RURAL SCHOOL, LANGLEY, BRITISH COLUMBIA

SHARP AND THOMPSON, BERWICK, PRATT, ARCHITECTS



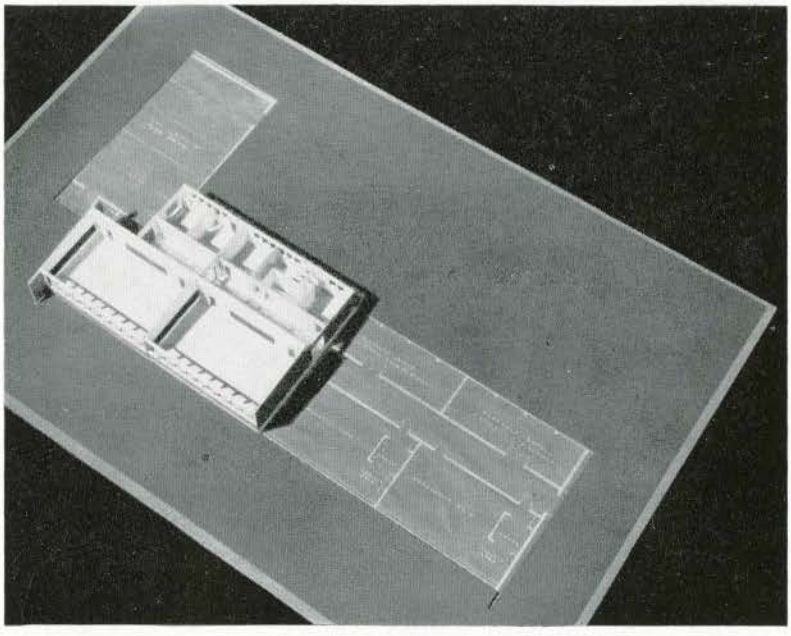
ELEVATION 3. Final four-room unit, from rear, showing covered play areas and clerestory lighting.

Photographs by Tony Archer



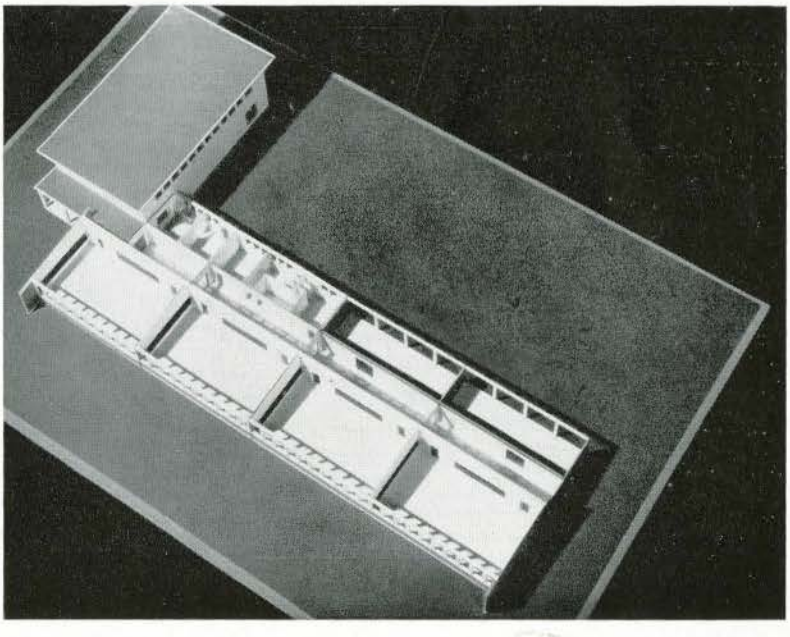
PLAN 1

Temporary Basic One-Room Unit Showing Planned Expansion



PLAN 2

Basic Two-Room Unit Showing Planned Expansion. This basic two-room unit can be erected probably as fast as temporary accommodation and be decidely more desirable. Additional accommodation may be added from time to time as the community grows, on a planned basis. It would be feasible to consider that a school planned in this manner is never finished. The success of the project depends, of course, on the proper engineering of the basic services for future expansion.



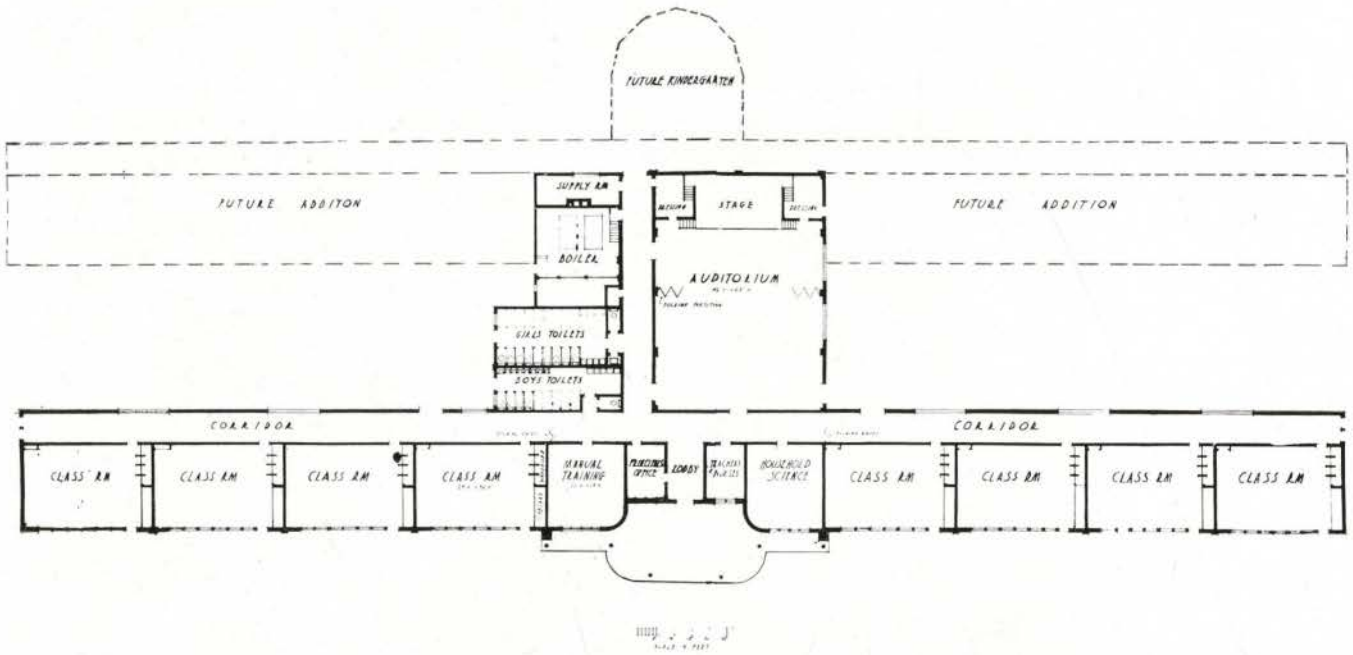
PLAN 3

Final Four-Room Unit with Play Room.

Photographs by John Morris

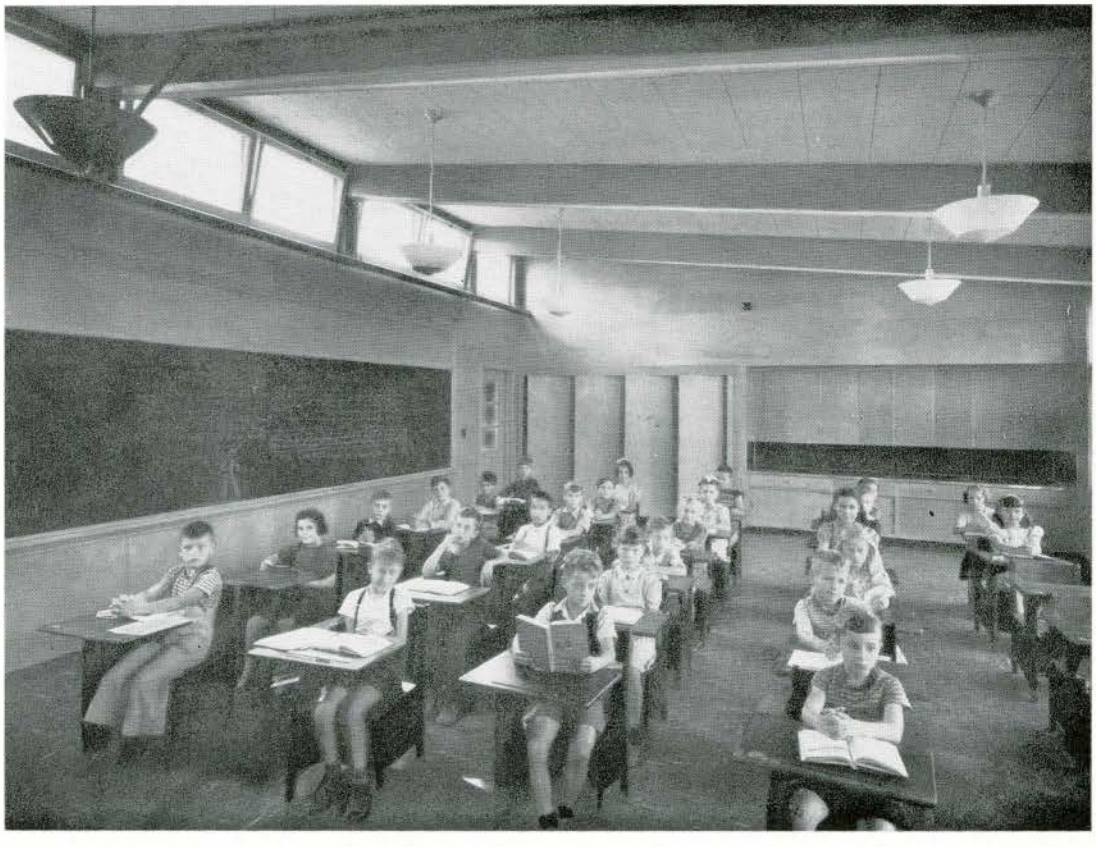
GLENWOOD SCHOOL, NELSON TOWNSHIP, ONTARIO

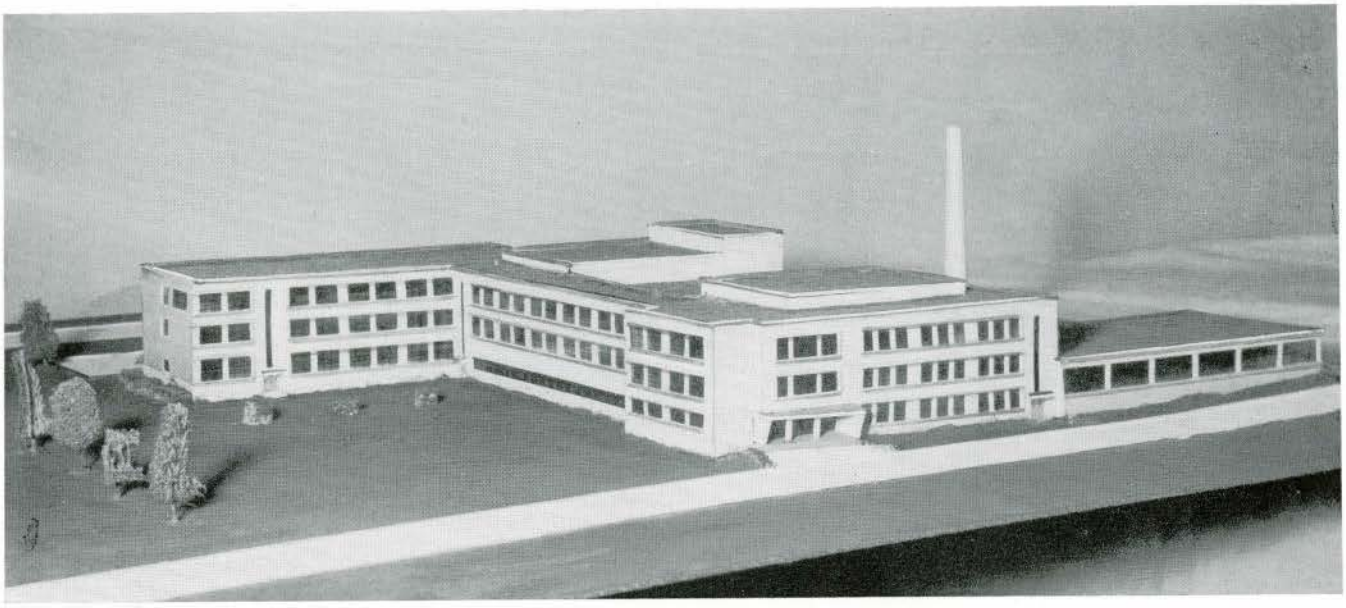
MURTON AND EVANS, ARCHITECTS



CLASSROOM USED AS KINDERGARTEN

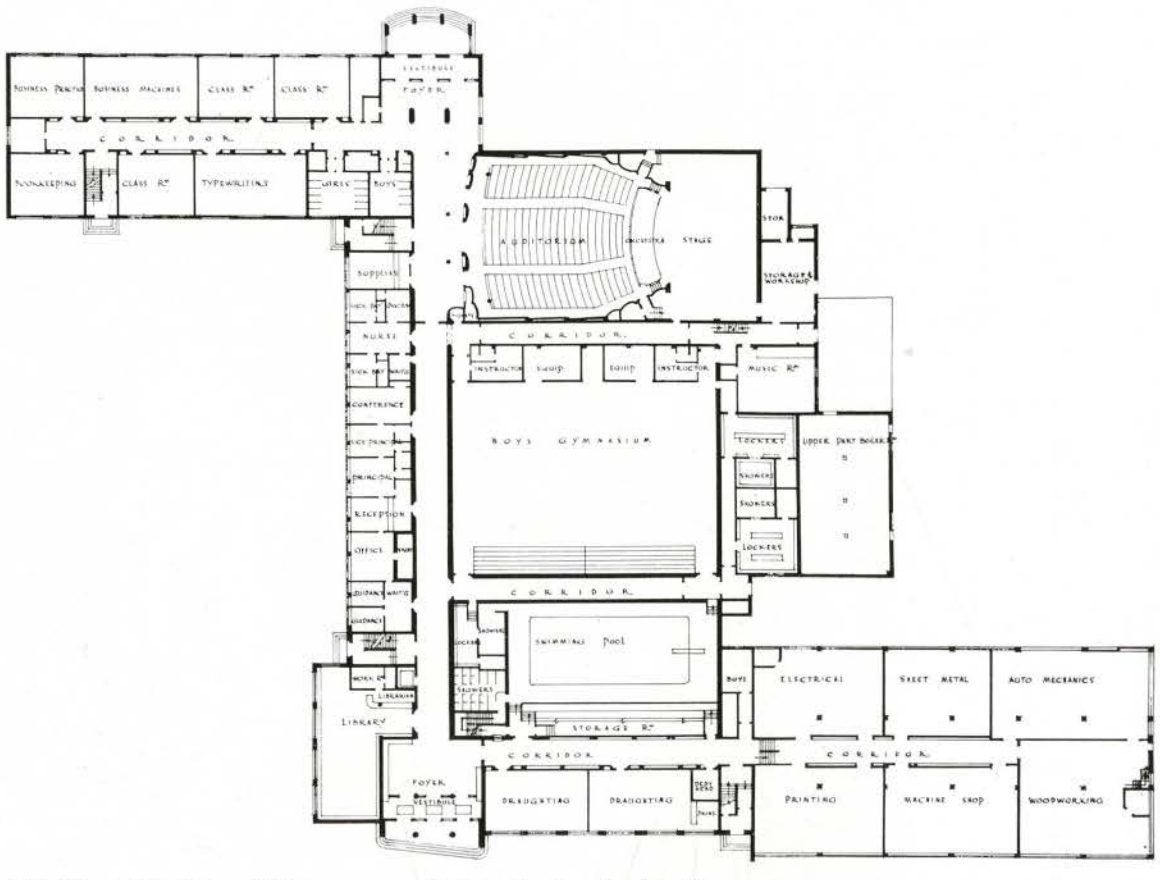
VIEW OF CLASSROOM SHOWING CLERESTORY WINDOWS



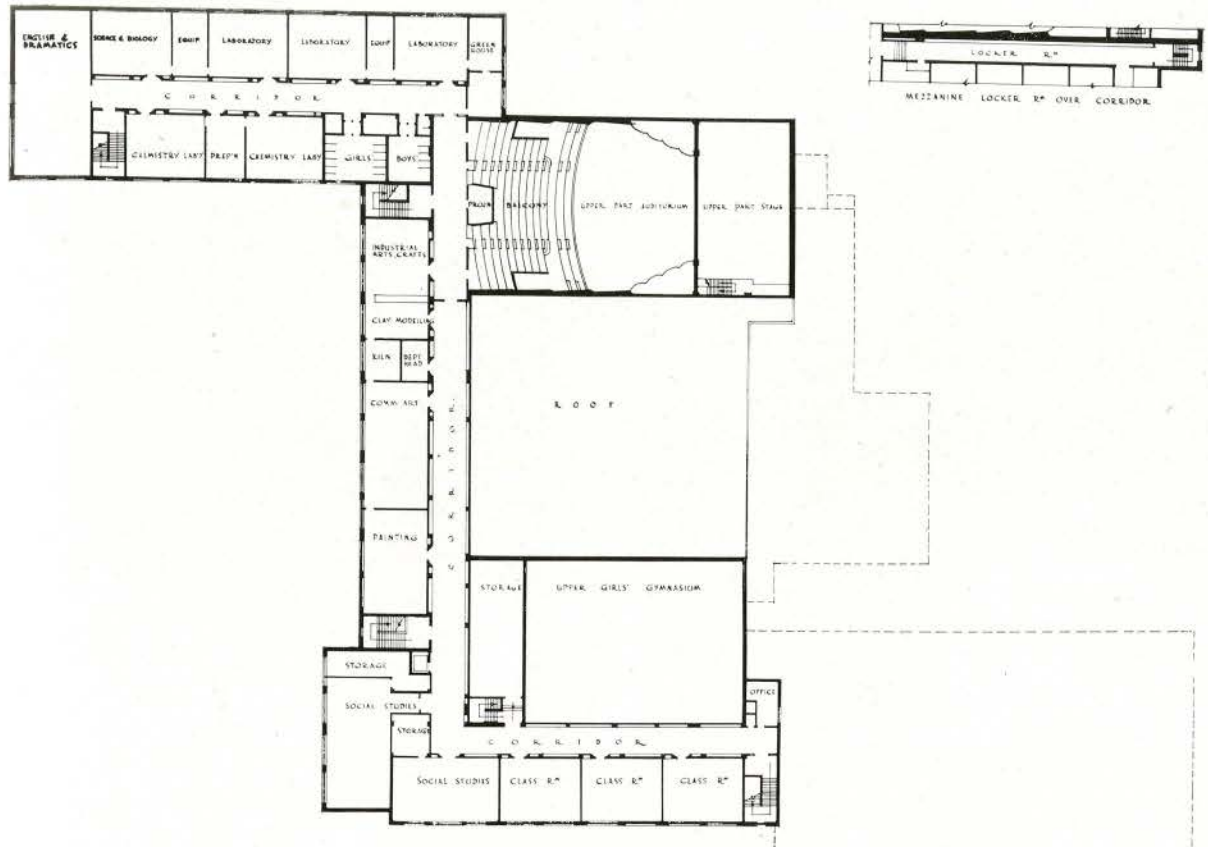


FISHER PARK SECONDARY SCHOOL, OTTAWA, ONTARIO

J. A. EWART AND A. J. HAZELGROVE, ARCHITECTS

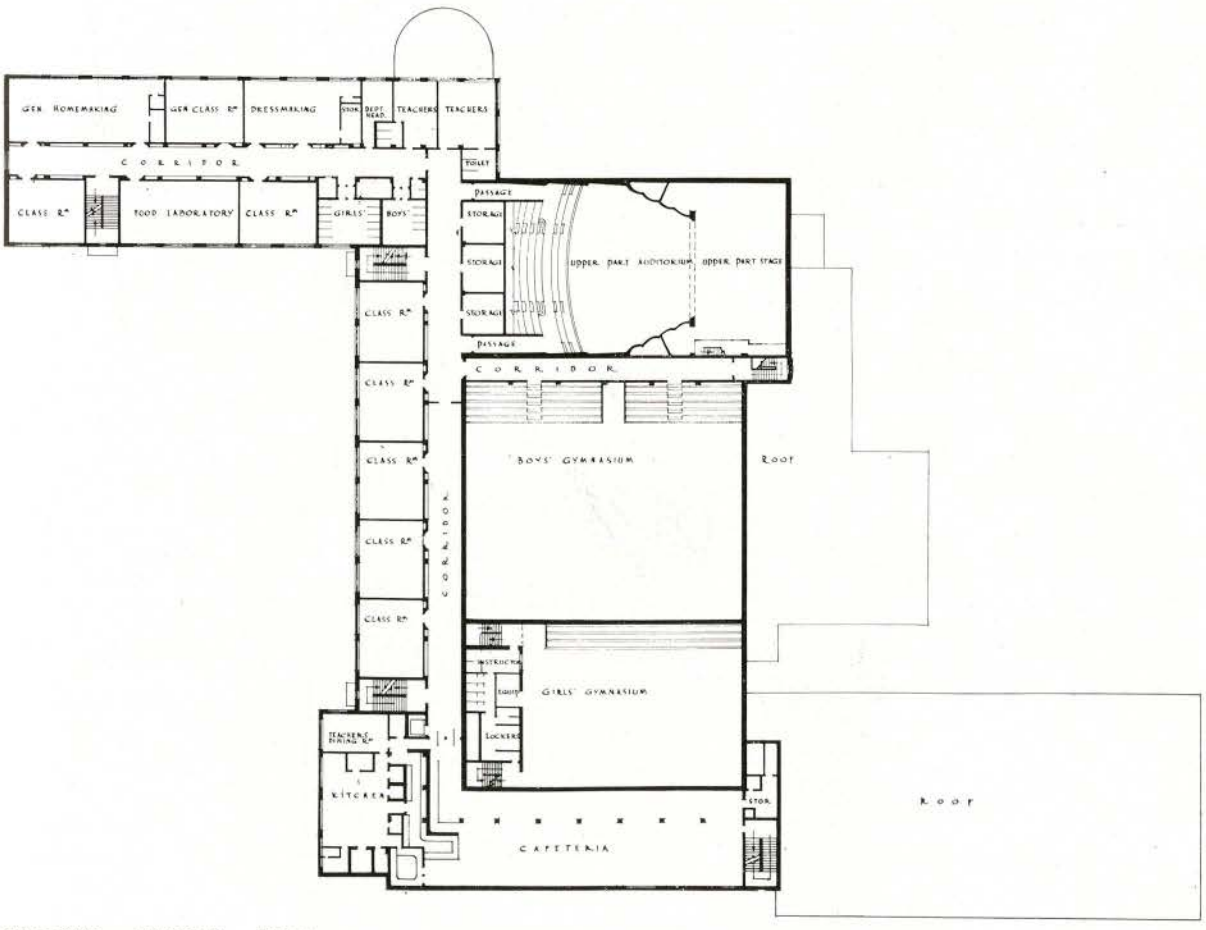


FIRST FLOOR PLAN SCALE



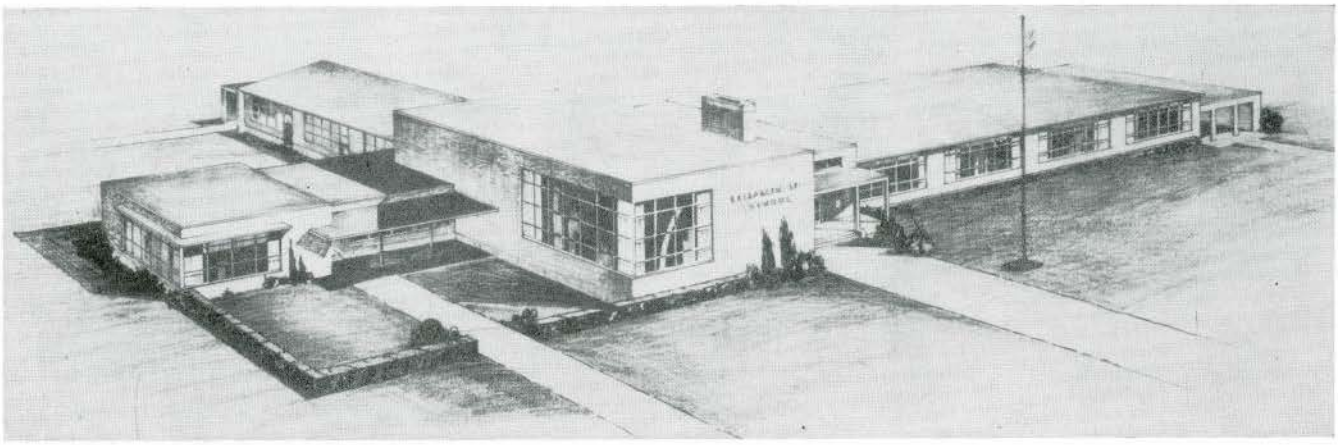
THIRD FLOOR PLAN

SCALE



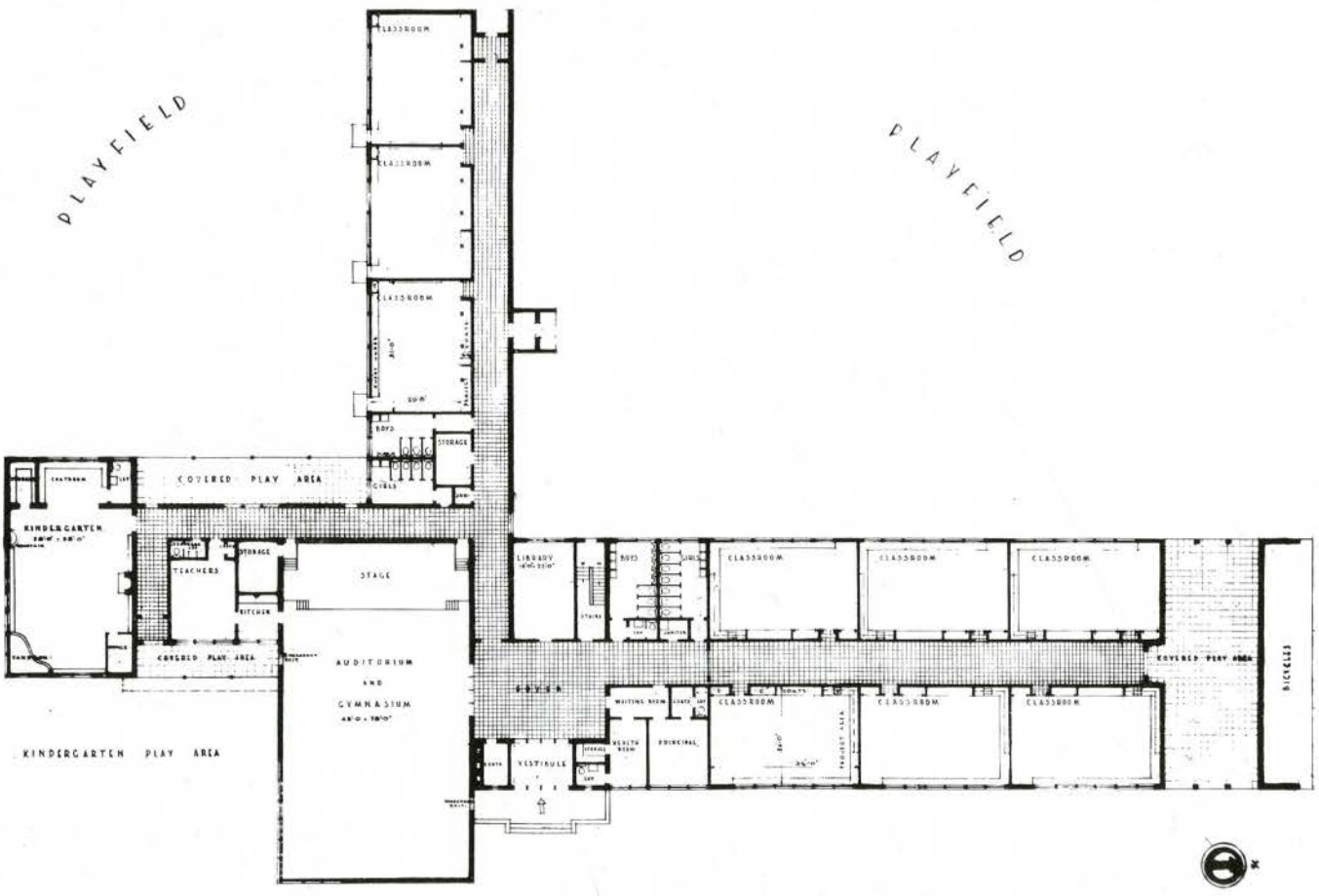
SECOND FLOOR PLAN

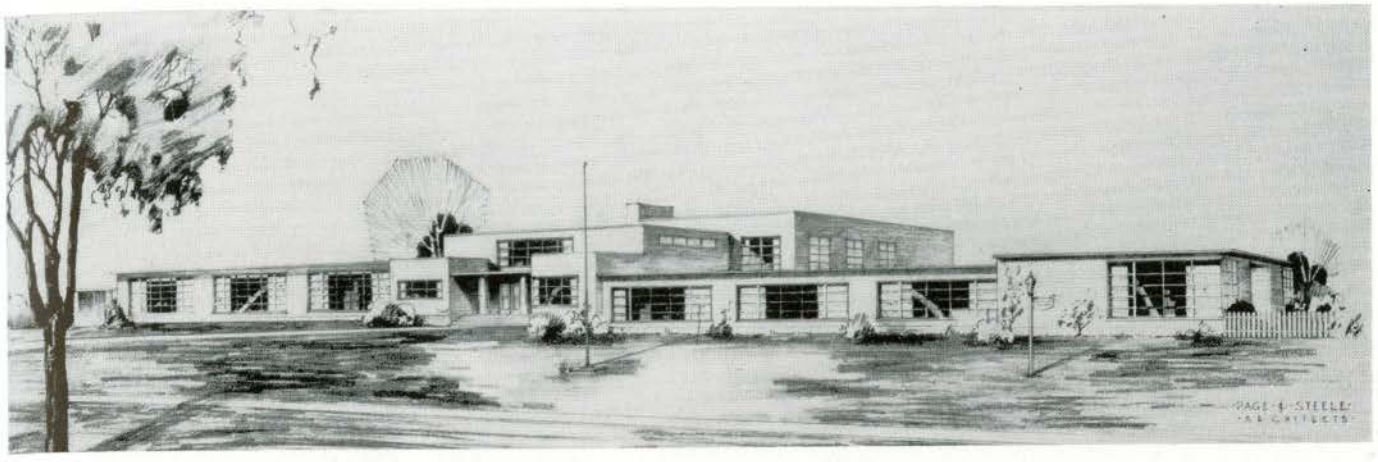
SCALE



SAULT STE. MARIE ELEMENTARY SCHOOL, SAULT STE. MARIE, ONTARIO

PAGE AND STEELE, ARCHITECTS

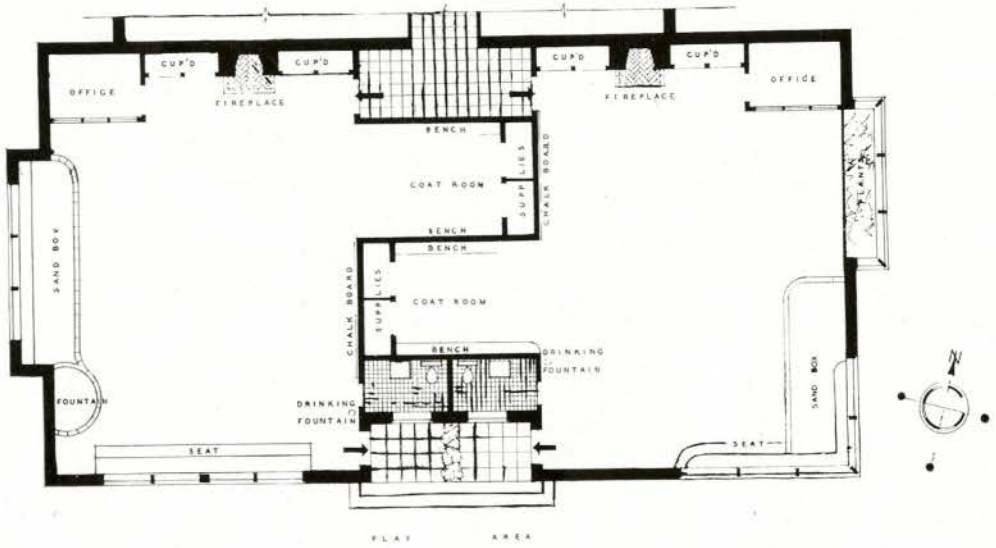


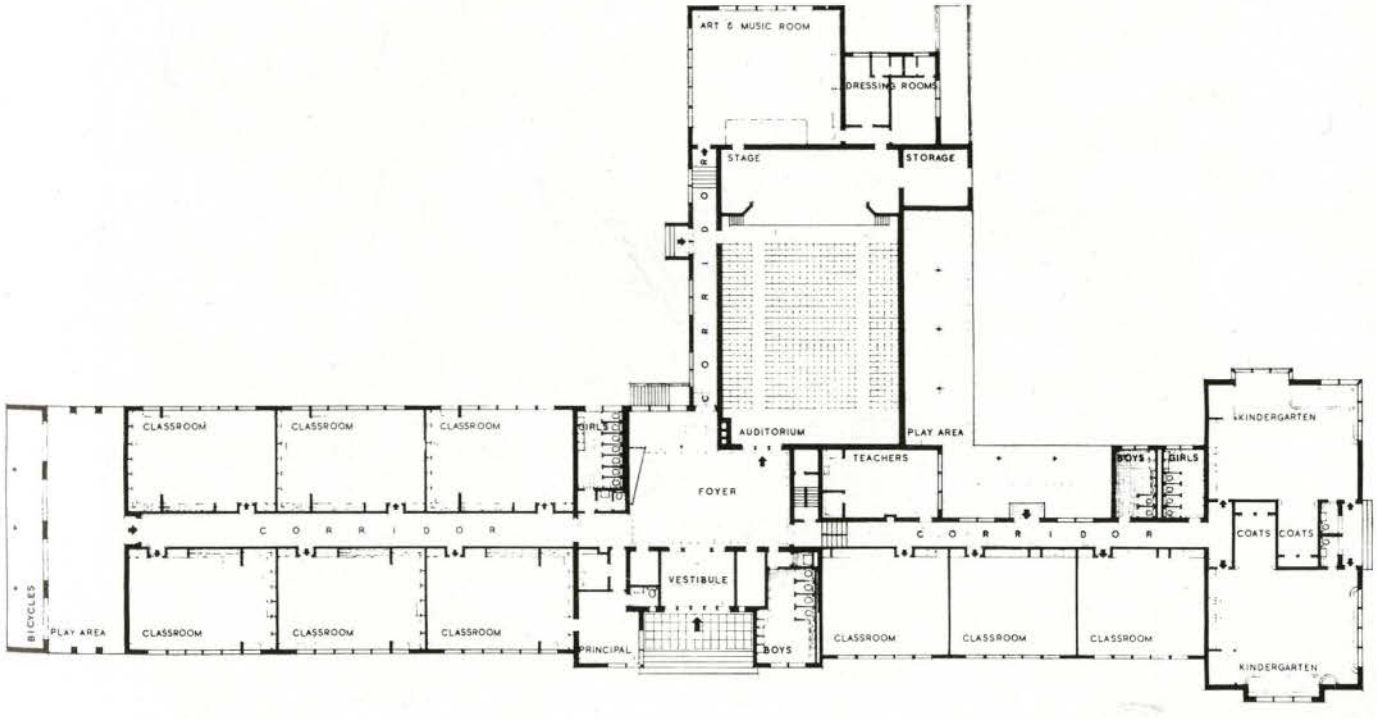


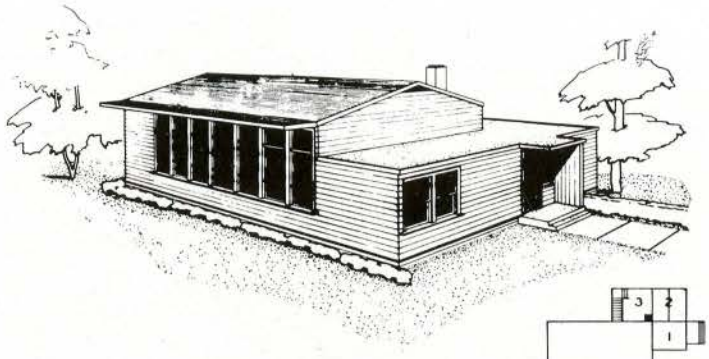
GALT ELEMENTARY SCHOOL, GALT, ONTARIO

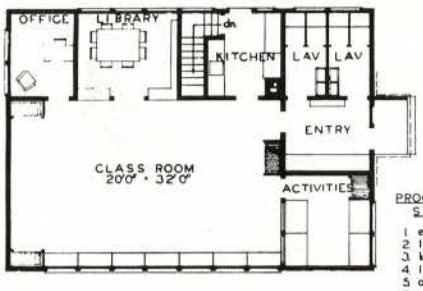
PAGE AND STEELE, ARCHITECTS

KINDERGARTEN

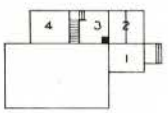


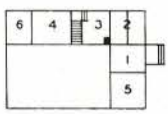






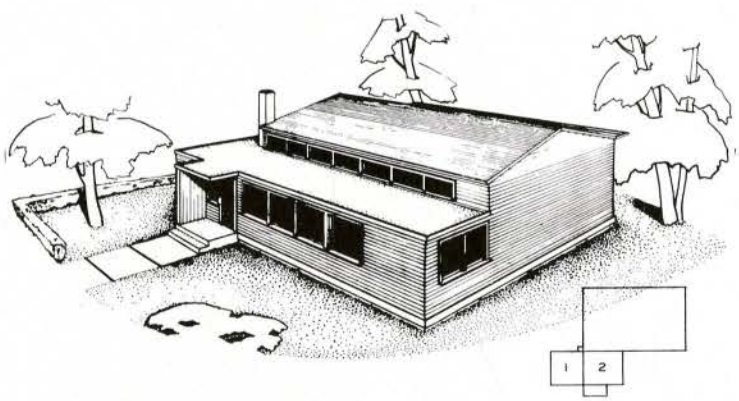
PROGESSIVE STAGES
1. entry
2. lavs.
3. kitchen
4. library
5. activities
6. office

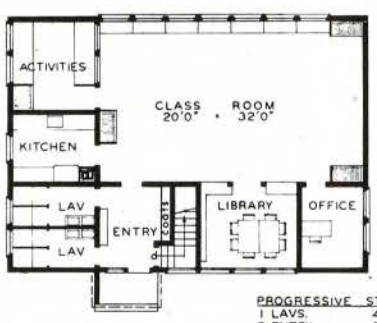


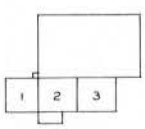


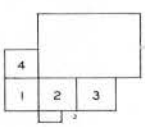
DESIGNED BY KELVIN C. STANLEY, ARCHITECT
FOR THE DEPARTMENT OF EDUCATION
PROVINCE OF SASKATCHEWAN

RURAL SCHOOL UNITS

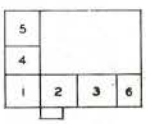




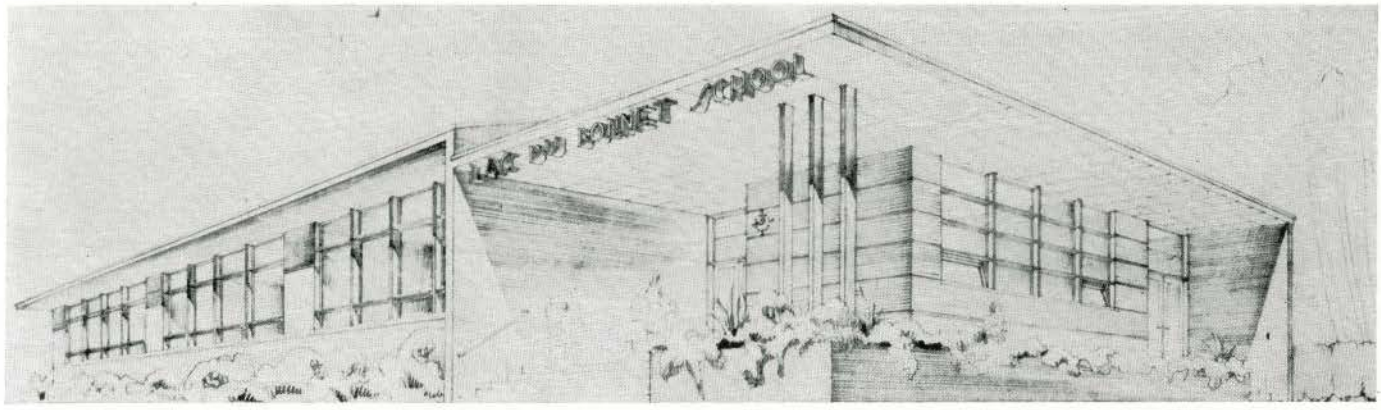




PROGRESSIVE STAGES
1 LAVS. 4 KITCHEN
2 ENTRY 5 ACTIVITIES
3 LIBRARY 6 OFFICE

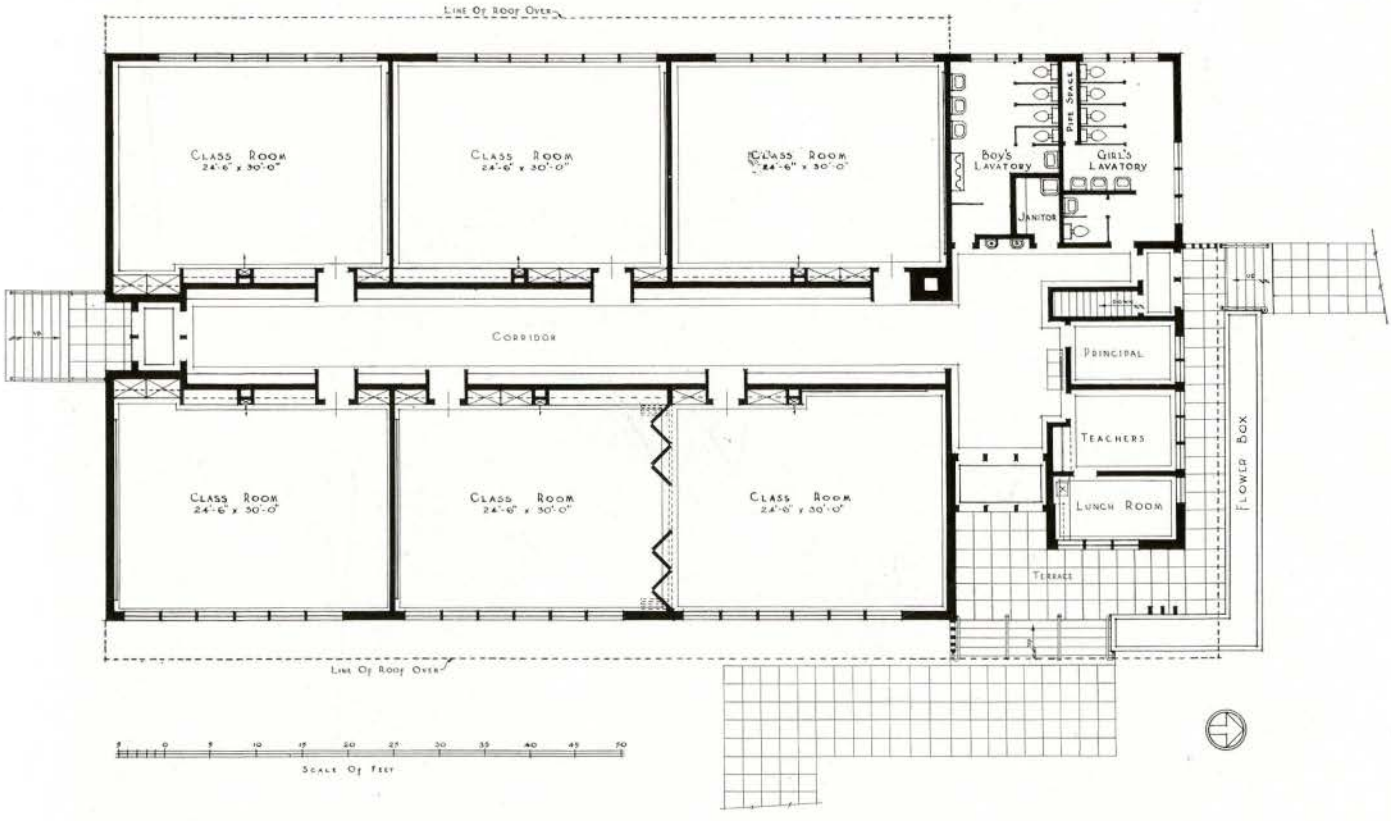


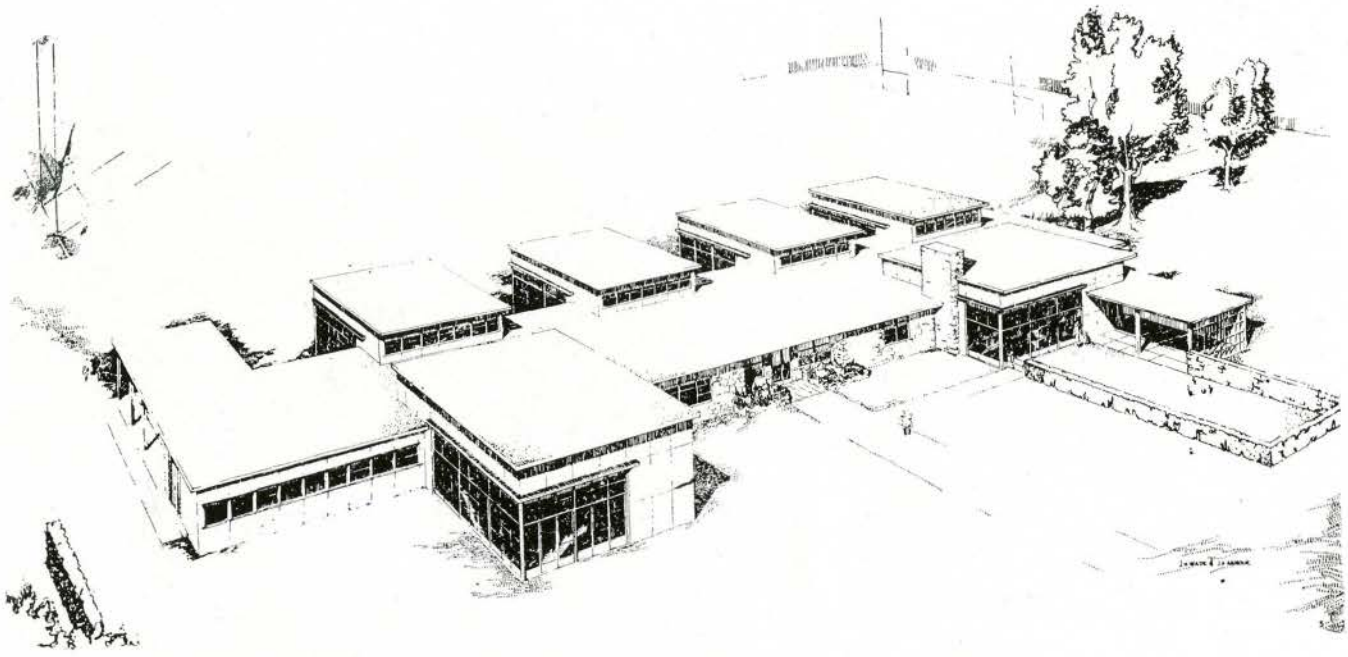
RURAL SCHOOL UNITS



PERSPECTIVE VIEW, LAC DU BONNET SCHOOL, LAC DU BONNET, MANITOBA

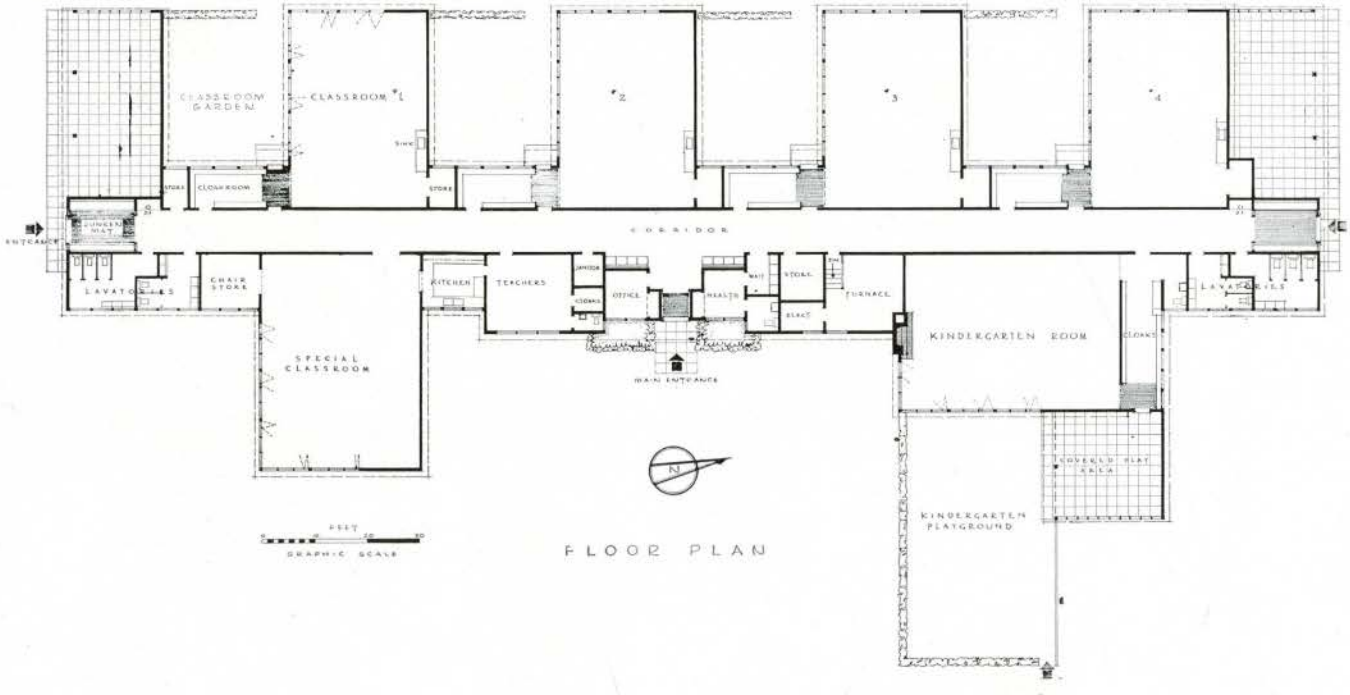
MOODY AND MOORE, ARCHITECTS

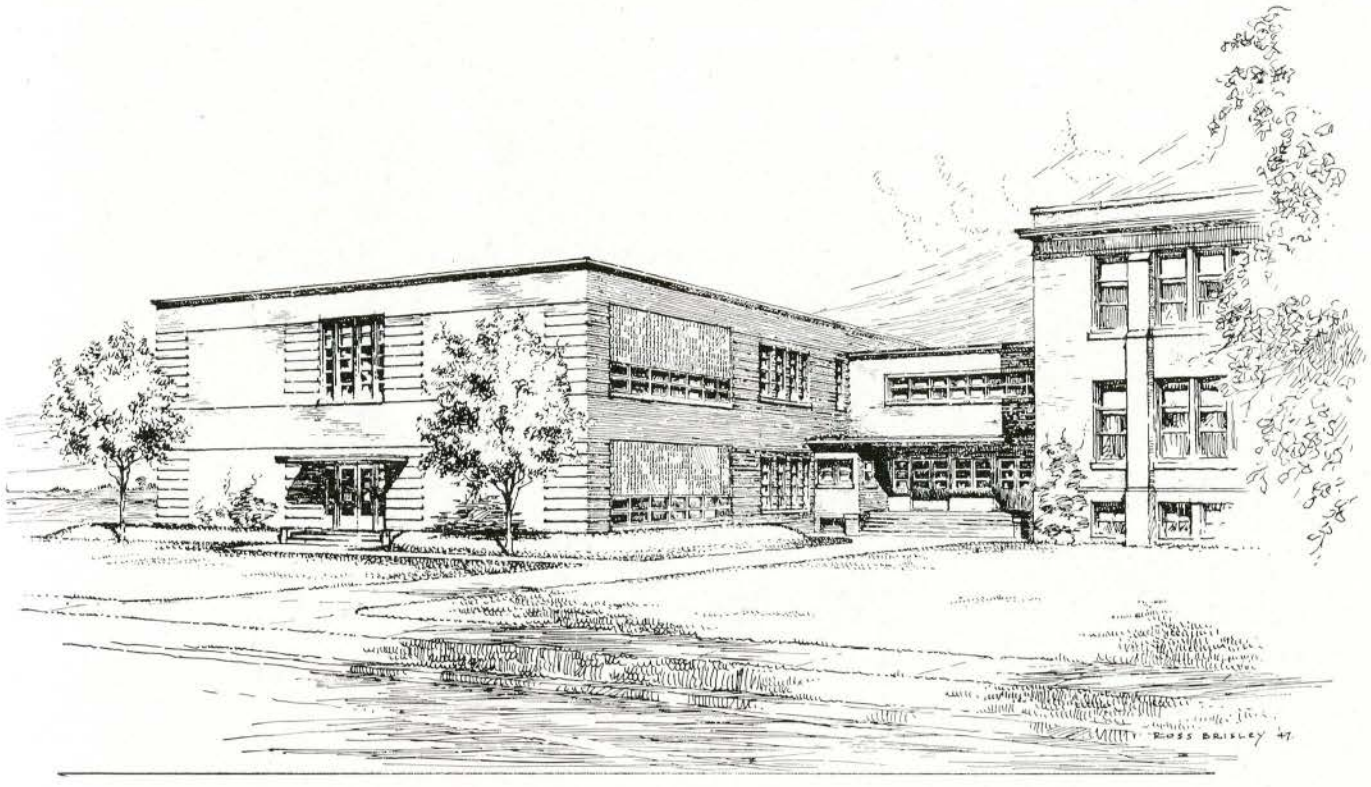




PROPOSED PRIMARY SCHOOL, MACDONALD PARK, VICTORIA, BRITISH COLUMBIA

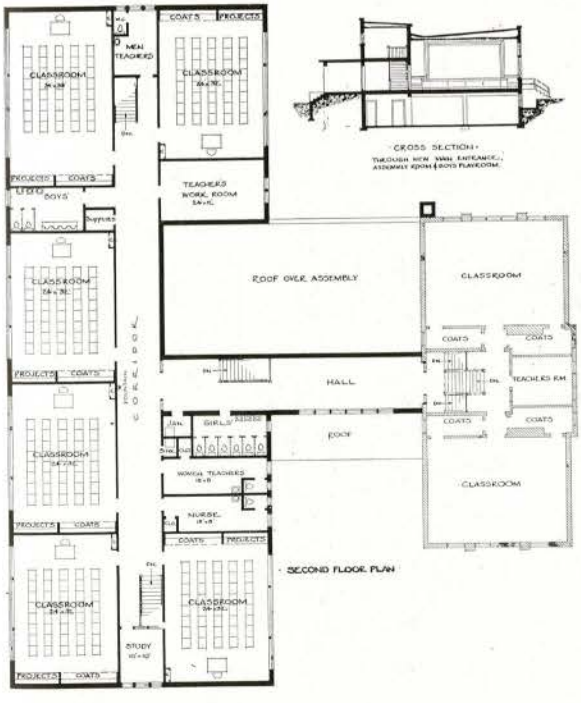
BIRLEY, WADE AND STOCKDILL, ARCHITECTS

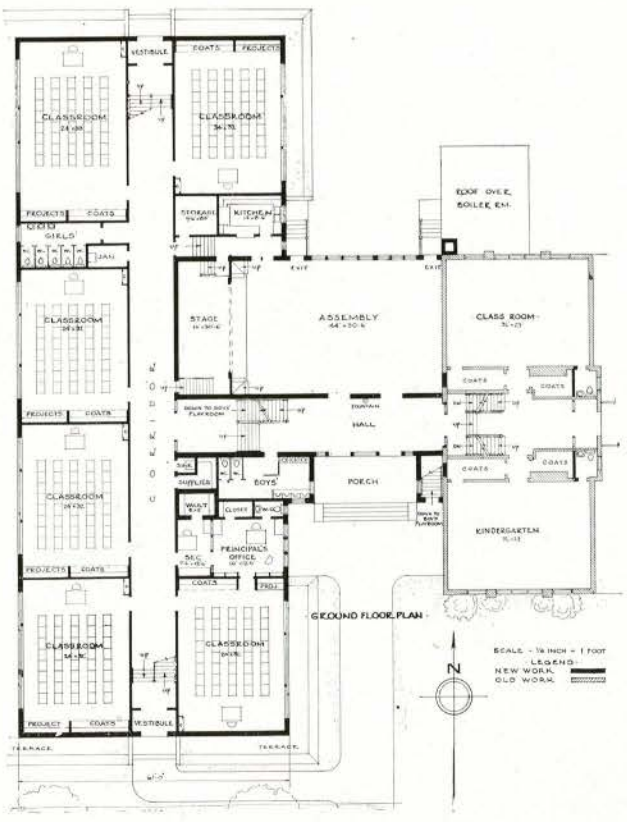


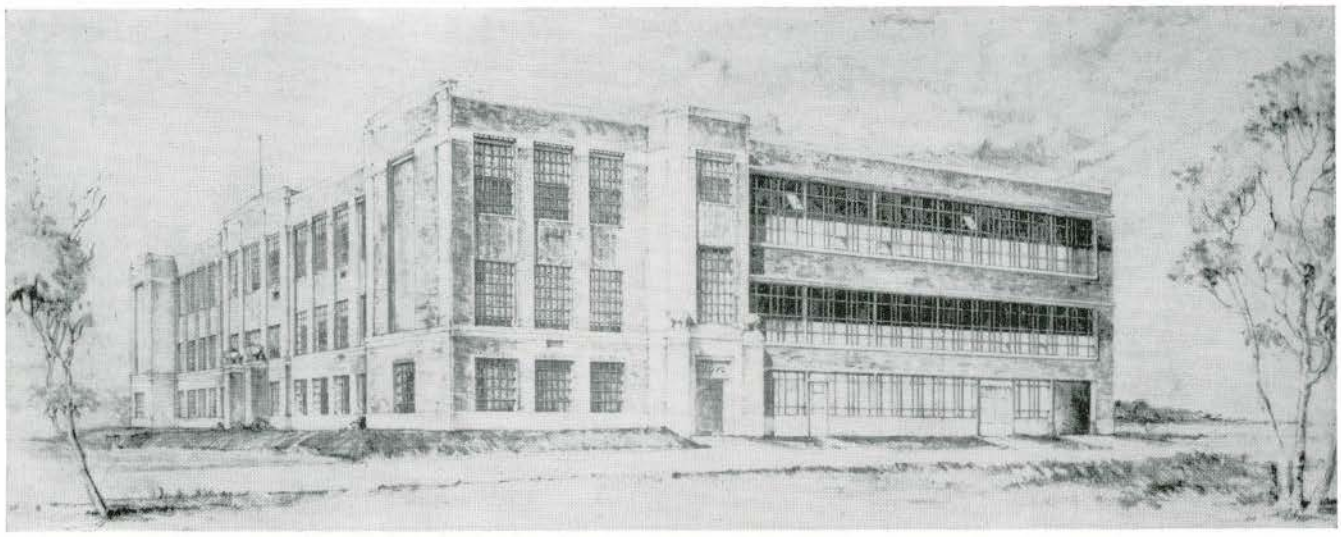


ADDITION TO PUBLIC SCHOOL, NEW LISKEARD, ONTARIO

BRUCE BROWN AND BRISLEY, ARCHITECTS



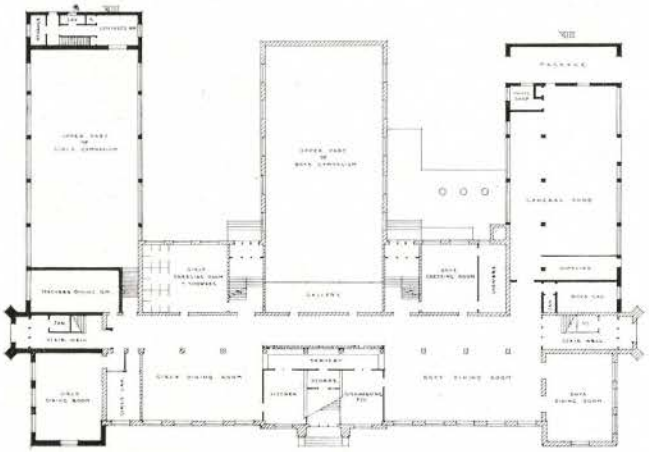




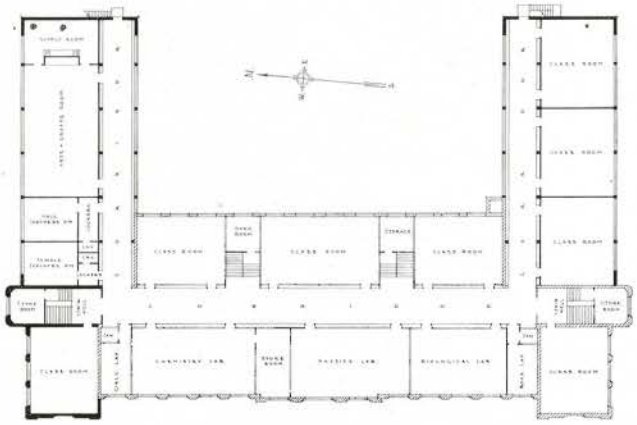
ADDITION TO EARL HAIG COLLEGIATE INSTITUTE, WILLOWDALE, ONTARIO

The drawing shows an added southerly wing and the projection of the northerly wing, which is also part of the additions to the school designed by Craig and Madill a number of years ago. The facade of the building is being completed in the same formal style as the existing building but the new wings projecting to the east show a departure in style in order to provide more adequate light. In the case of the southerly wing, solar screens have been adopted to protect the classrooms on the second and third floors from the direct rays of the summer sun.

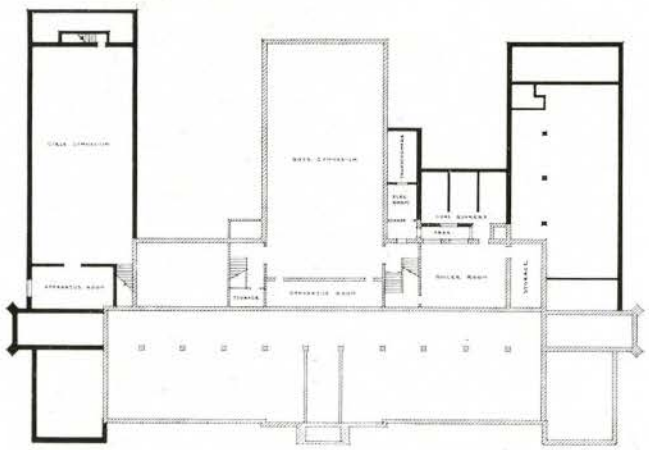
CRAIG AND MADILL, ARCHITECTS



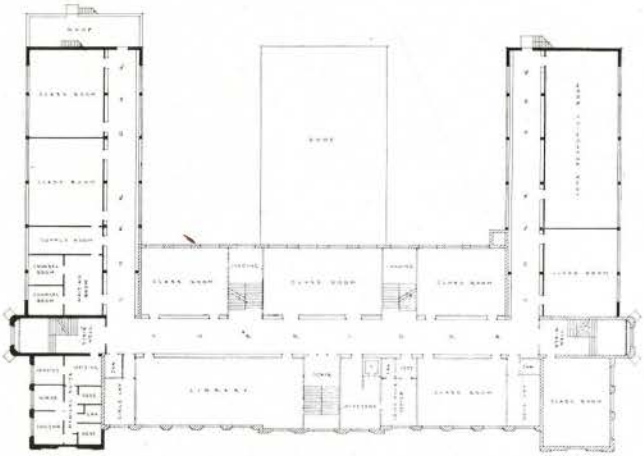
FIRST FLOOR PLAN



THIRD FLOOR PLAN



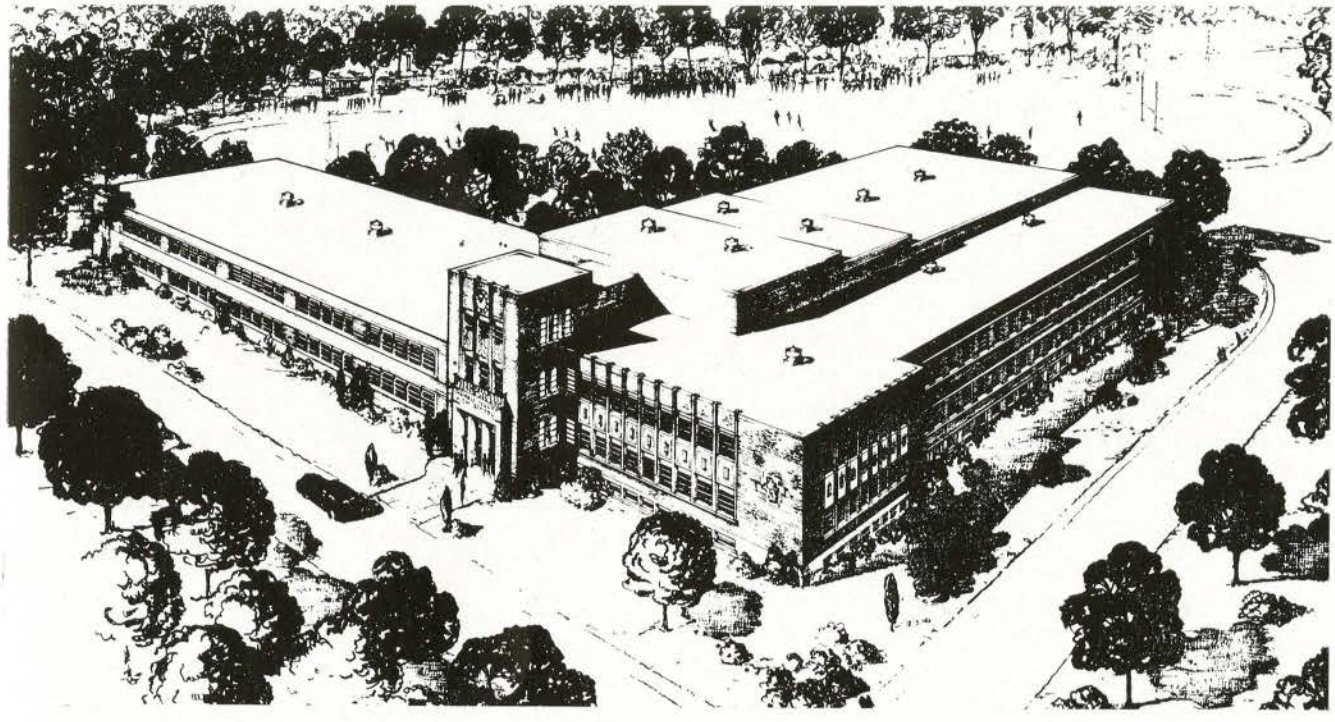
FOUNDATION PLAN



SECOND FLOOR PLAN

LEGEND

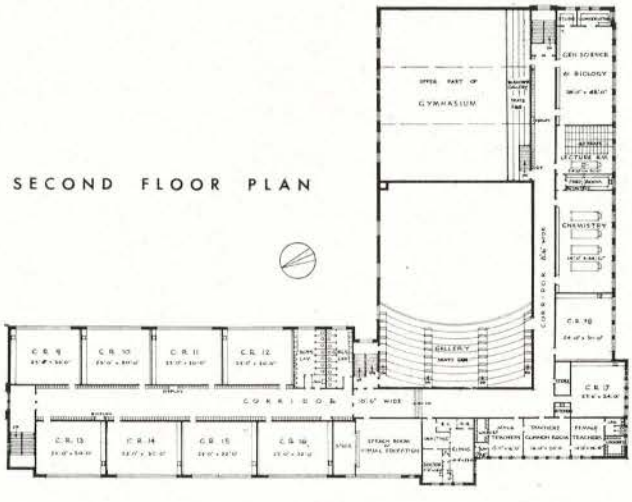
NEW CONSTRUCTION
OLD CONSTRUCTION



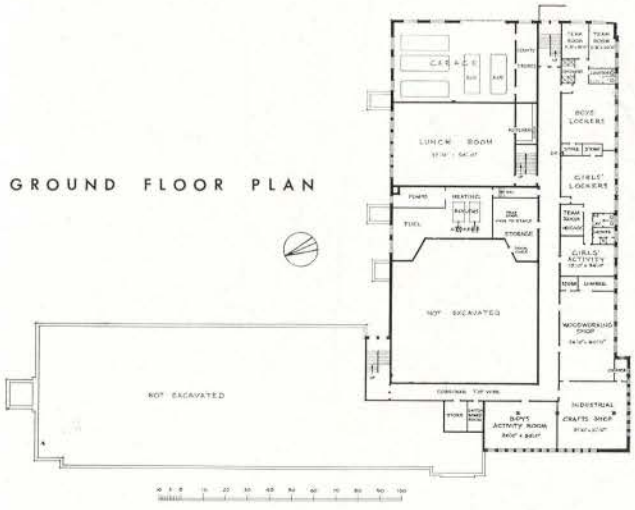
CHAMBLY COUNTY HIGH SCHOOL, ST. LAMBERT, QUEBEC

A. LESLIE PERRY, ARCHITECT

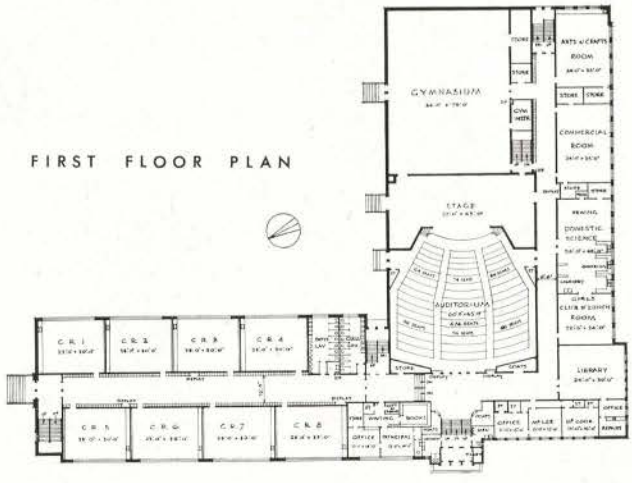
SECOND FLOOR PLAN



GROUND FLOOR PLAN



FIRST FLOOR PLAN



THE MATHEMATICAL BASIS IN GREEK DESIGN

By BRYANT FRYER

THE late Jay Hambidge, in his work on "Dynamic Symmetry" showed that some order and method existed in Greek design, and showed a construction that established a general series of proportion.

Dynamic symmetry, however, did not adequately explain the operation of the method used by the Greeks to obtain the moving curves, which are the real foundation of the greatness of Greek design.

Because a knowledge of such a method, if it existed, and could be described, would contribute to the solution of problems of modern design, and to the understanding of the matter of design in general, an examination of Greek forms was begun by this writer.

It was not long before it was apparent that, in all the forms examined, both architectural and ceramic, a method existed.

The Greek method of determining form and proportion and of originating curves was so arranged that almost any craftsman, without reference to his artistic abilities, inventive powers, or refinement of taste, could with the simple use of compass and straight edge produce masterly designs. It is, however, so flexible that any powers of invention have full play.

It is easy to believe that the master designers would understand the virtue and danger of such a scheme and would take very positive steps to guard its secret.

It may be interesting to note that the application of mathematics to art was not confined to Greece. There is evidence that other ancient peoples, especially the Chinese, in very early times, based their forms on geometric plan. In a reconstruction of Chinese shapes, the use of a method very much like that of the Greeks is apparent. The operation of the two methods is much the same and, in places, identical. The mathematical idea underlying the Greek method was more complex and mature than that of the Chinese.

The differences between the two national forms are quite appropriate to the difference in fundamental idea. The Chinese, building on a simple balanced division of the square, obtained pure and beautiful but static forms, while those of the Greeks, based also on the square, but divided in square root proportions, were moving and dynamic.

Hambidge shows a construction in which intersections of the principal dividing lines originate a series of related proportions. These proportions can be shown to be similar to the logarithmic series. This does not suggest that the Greeks knew logarithms, but were aware of a series, indicated geometrically, much like the logarithmic series, and which presented a set of proportions of aesthetic merit.

The rectangles we discuss can be called "root-rectangles", that is, rectangles in which the short side, representing unity, is to the longer side as one is to the square root of a whole number. The number in Greek design rarely exceeding 5.

Figure 1 shows the Hambidge construction:

In Fig. 1:

ABCD is a rectangle in which AB = unity

AD = $\sqrt{\text{a whole number}}$

AC is the diagonal from A to C and BE is drawn from B perpendicular to AC and intersecting it at F

ab is drawn through F perpendicular to AD

cd is drawn through F parallel to AD

F is a focus within the rectangle through which, by means of *ab* and *cd*, a series of subordinate shapes, all related to the parent shape, are originated.

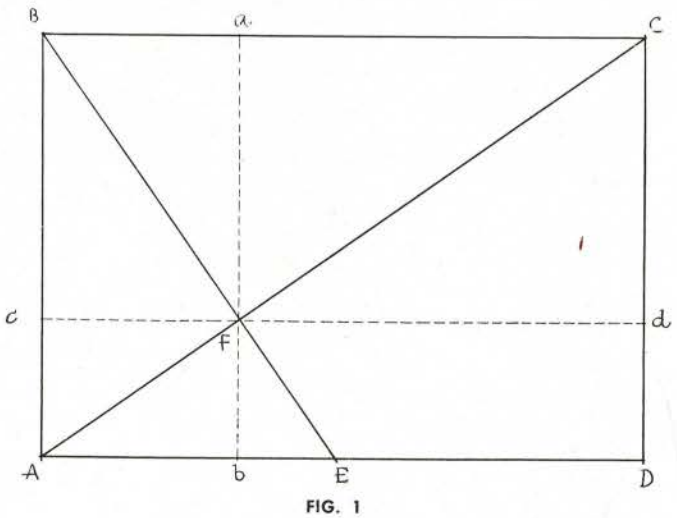


FIG. 1

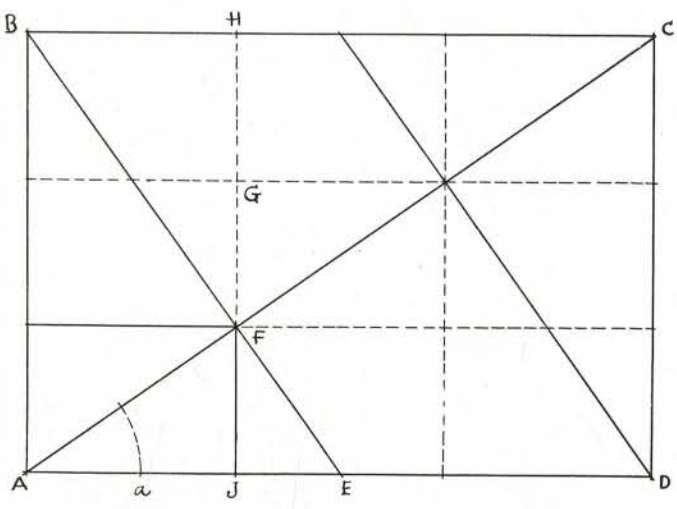


FIG. 2

This is called by Hambidge a "grid", the use of which is said to produce a balanced design. Only root-forms may be divided symmetrically by lines originating from the intersections of diagonals, and perpendiculars to the diagonal.

In **Fig. 2:**

AB and CD = unity, and $\sin a = \frac{CD}{AC}$

$= \frac{1}{AC}$

The angles ABE and CAD are equal.

$\frac{AF}{AB} = \frac{AF}{1} = AF = \sin a$

$\frac{FJ}{AF} = \frac{FJ}{\sin a} = \sin a$

$FJ = \sin^2 a$

If AD = x and x is a whole number $AC = \sqrt{x^2+1}$

and $\sin a = \frac{1}{\sqrt{\text{a whole number}}}$

$\sin^2 a = \frac{1}{\text{a whole number}}$

and the intervals FJ, GF, HG, etc., will be equal and symmetrical.

If AD *(x)* is not the square root of a whole number, the intervals will not be equal.

The curves in Greek design are not abstract or empiric, but are composed of arcs of circles, so related and joined that they form a continuous uninterrupted curve. The centres of these arcs are located upon intersections of the lines of the underlying construction, and their radii are intervals between intersections.

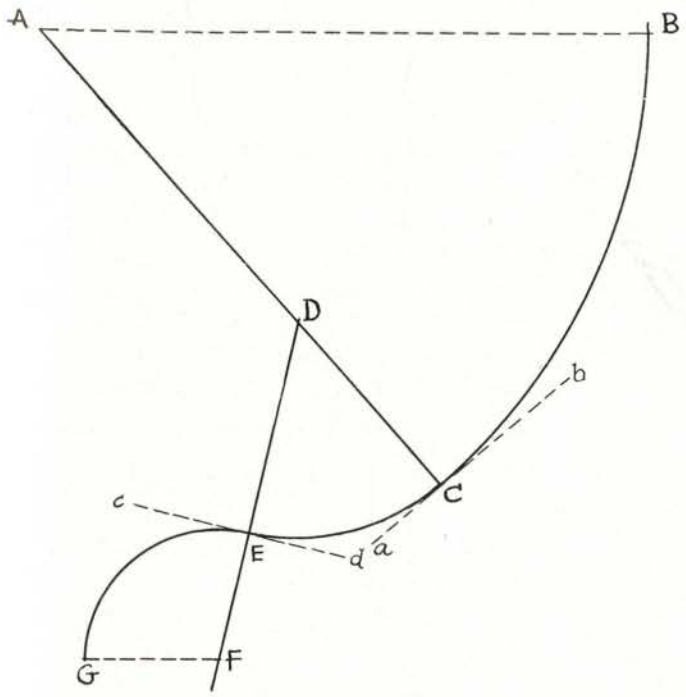


FIG. 3

The principle of the Greek curve may be stated as follows:

"Any two arcs of different radii and in the same or opposite directions will form a continuous and uninterrupted curve if the tangents at the point of juncture are common to both." (Fig. 3)

In Fig. 3:

With centre A and radius AB draw arc BC (of any desired length)

Join AC

D is a point at any position along AC

With centre D and radius DC draw arc CE

Join D and E and produce DE to F (anywhere on DE produced at the opposite side of the curve from D)
With centre F and radius FE draw the arc EG

The curve BCEG is continuous and uninterrupted and changes direction at E. ab is the tangent common to BC and CE at C: cd is the tangent at E common to the arcs CE and EG.

In figure 4 is a construction for drawing the oval which demonstrates both the principle of the joining arcs with common tangents, and the result of a discipline in the location of centres.

In Fig. 4:

ABCD is a rectangle of any proportion and which contains the oval to be drawn.

Draw the diagonals AC and BD establishing the centre at E.

Through E draw FG and HJ horizontal and vertical.
From B draw BO perpendicular to AC and produced to intersect the centre perpendicular at J.

This line intersects FG at I.

Bisect the angle BIF and produce the bisector to meet AC at K.

Join JK and produce it to meet BC.

This completes the construction.

To draw the oval:

1. With centre I and radius IF (F is on AB) draw the arc ab (b is on bisector IK etc.)
2. With centre K and radius Kb draw the arc bc (c is on KJ etc.)
3. With centre J and radius Jc draw arc cd (d is identical with H and on BC).

To complete the oval continue the construction in the other three quadrants.

Concentric ovals may be drawn using the same centres.

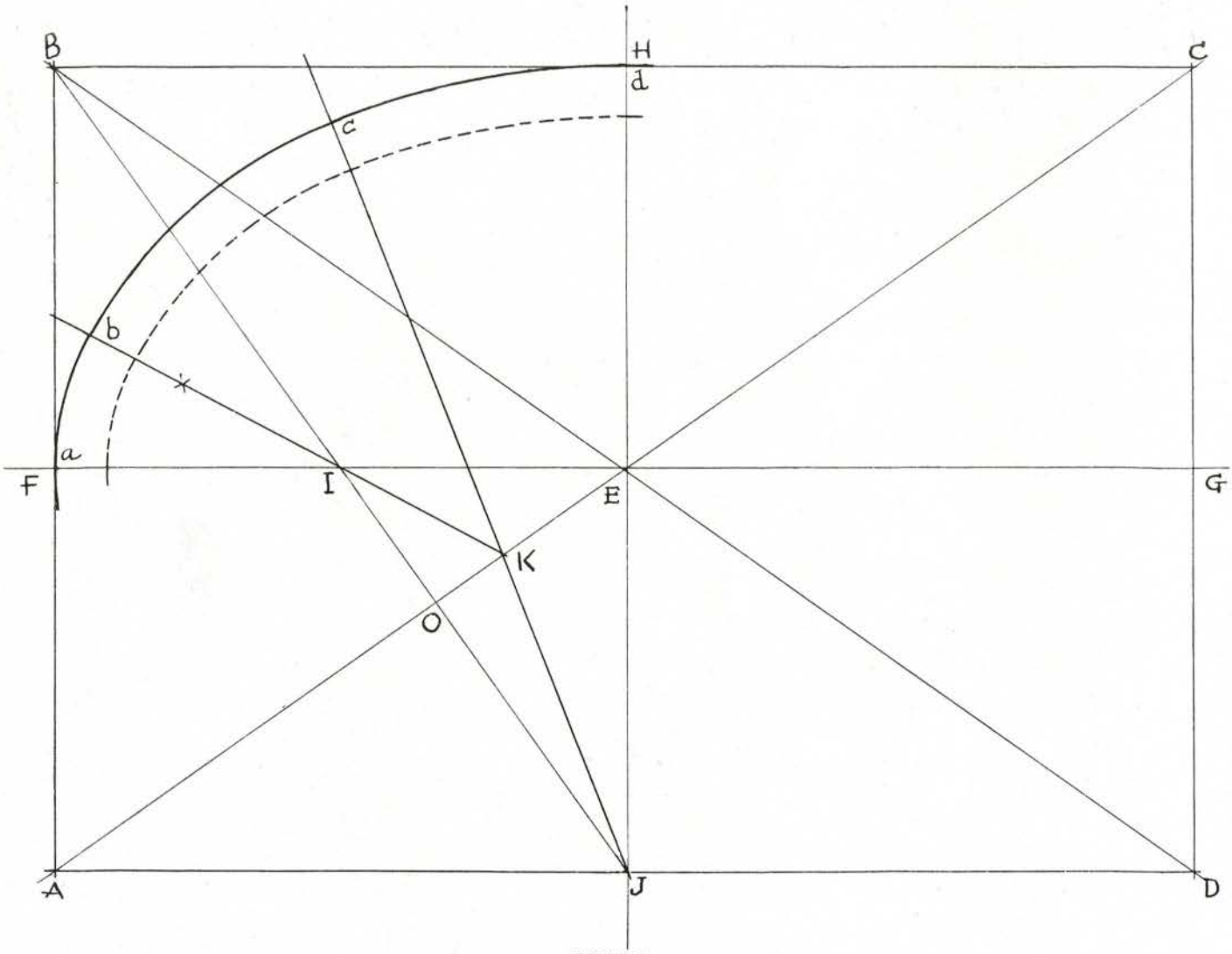


FIGURE 4

Reconstruction of Greek Forms

In the three examples of reconstruction of existing Greek forms given here no attempt is made to set down the reasons underlying the construction, or to explain WHY it is done as it is done. The purpose is to show that they were apparently designed in this way.

In two examples are very different shapes, and the constructions vary between the very complex, in the case of the cup, and the very simple, in the construction of the vase.

In Fig. 5:

This cup, an existing form, is typical and well known in Greek design.

Its outer proportions (in elevation) can be seen by simple measurement to be contained in a rectangle $1 \times \sqrt{10}$.

This shape can be divided into other related shapes:

The rectangle ABCD is $1 \times \sqrt{10}$
ABGH is $1 \times \sqrt{3}$
ABEF is $1 \times \sqrt{2}$

It is necessary to find a construction based on the square that will originate these shapes and divisions.

In Fig. 6:

ABCD is a square and AC is one diagonal.

1. With centre A and radius AB draw arc from B to D. The arc BD intersects AC at E.
2. Through E draw FG parallel to AD.
   The rectangle AFGD in which AF is unity is $1 \times \sqrt{2}$.
3. Draw AG the diagonal of AFGD intersecting the arc BD at H.
4. Through H draw JK parallel to AD.
   The rectangle AJKD in which AJ is unity is $1 \times \sqrt{3}$.

To avoid confusion of line, Figure 7 is a continuation of the construction in Figure 6.

In Fig. 7:

5. Draw JD the opposite diagonal in AJKD, intersecting AG at L.
6. Through L draw NO parallel to AD and intersecting AK at M.
7. Through L and M draw RP and SQ perpendicular to AD.

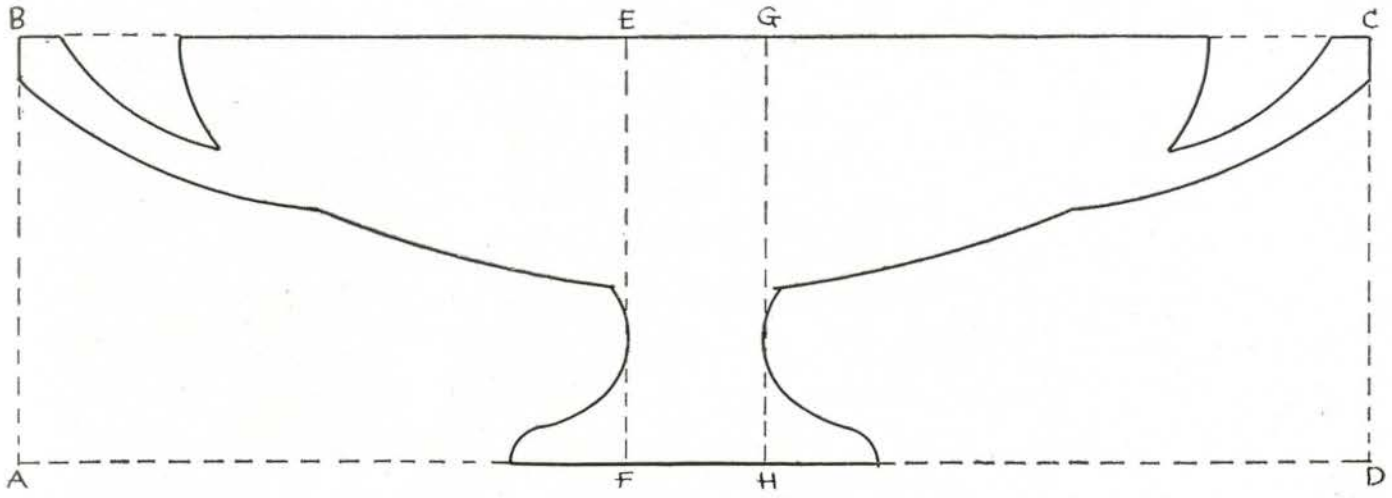


FIGURE 5

The rectangle ANOD will be found by measurement to be identical in proportion with the rectangle ABCD in figure 5, and the proportions originated by LP and MQ are also identical.

Figure 8 shows the construction with the curves completed. The process is more easily seen in figs. 8a, 8b, and 8c.

In Fig. 8a:

With centre S and radius SN draw arc ab (refer to Fig. 8).

In Fig. 8b:

Draw AR the diagonal of $\sqrt{5}$ rectangle ABRP intersecting JK at 4.

Draw FP the diagonal of AFF_1P intersecting NO at 2 and AR at 3.

Draw diagonal AC intersecting JD at T.

With centre 2 and radius 2 to T draw arc cd

With centre 3 and radius 3 to T draw arc gd

With centre 4 and radius 4 to M draw arc ef

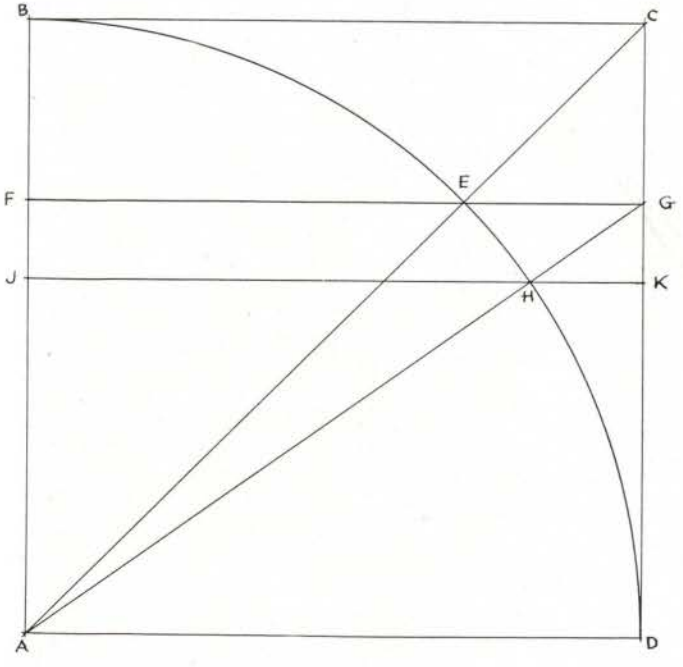


FIG. 6

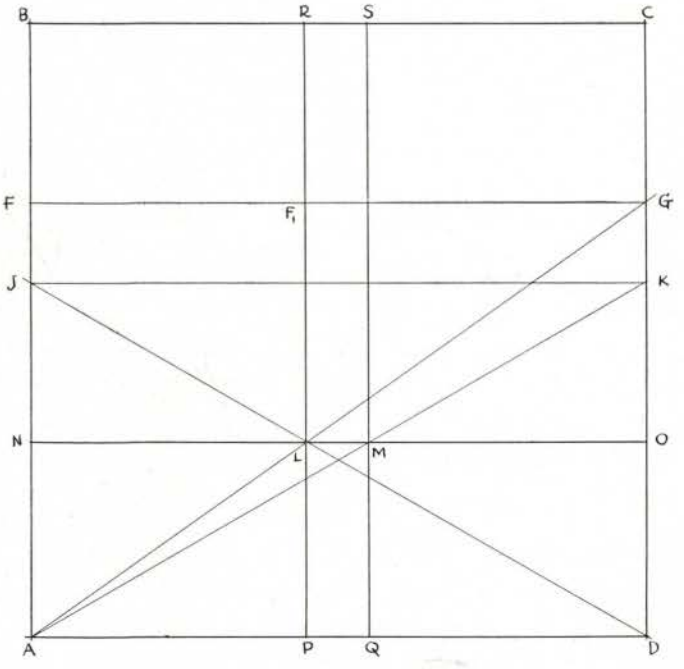


FIG. 7

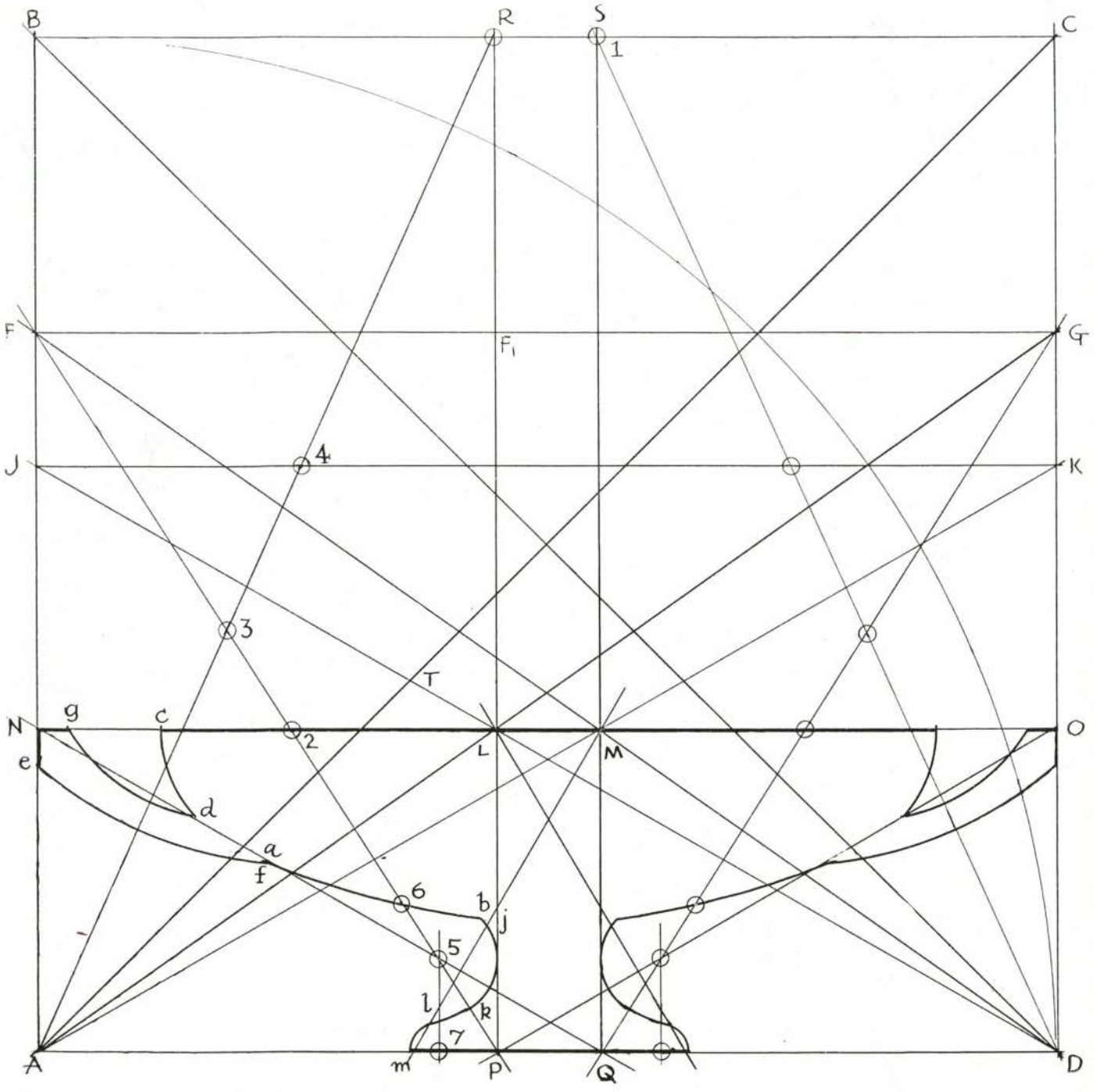


FIGURE 8

The centres for the curves at the base are shown in Fig. 8.

Centre 5 is on the intersection of NQ and FP.

Centre 6 is on the intersection of arc ab and FP.

Centre 7 is on AD on a perpendicular to AD through centre 5.

With centre 5 and radius 5 to 6 draw arc jk.
With centre 6 and radius 6 to k draw arc kl.
With centre 7 and radius 7 to 1 draw arc lm.

This construction results in a characteristic Greek form and is identical with the original.

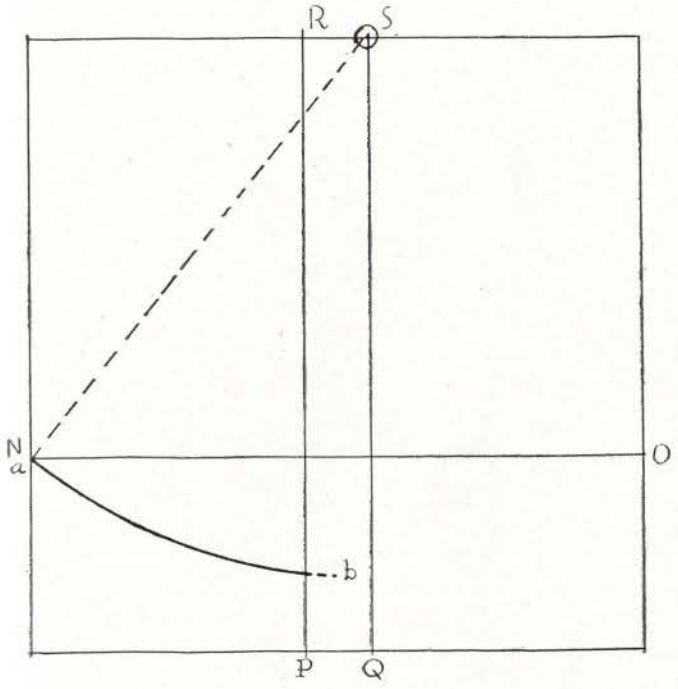


FIG. 8a

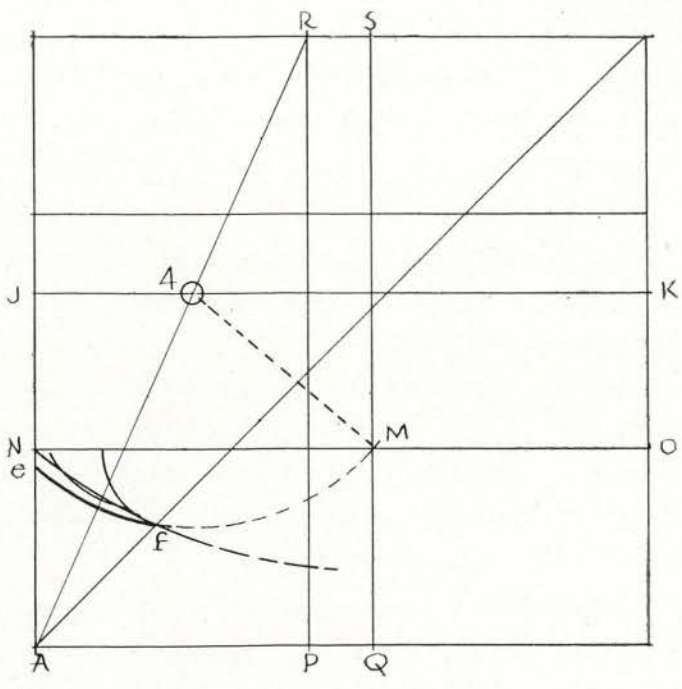


FIG. 8c

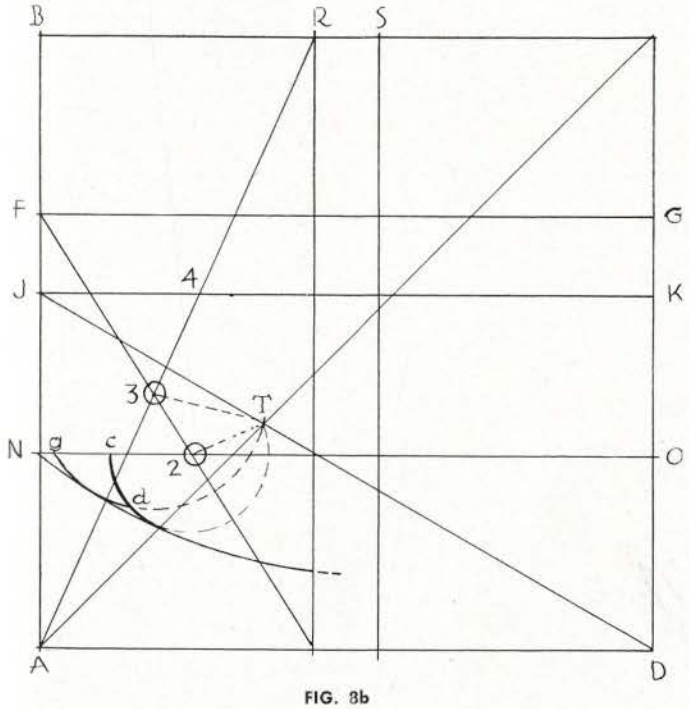


FIG. 8b

Reconstruction of Vase

It may be noticed that this shape resembles some of the typical Chinese forms. This resemblance is not odd because the construction underlying the curves is derived from a simple division of the square closely resembling the Chinese method. The designer, however, has avoided the completely static form by the use of unusual centres. Note specially centre 5 figure 10. A lesser man might have chosen as centre 5 the point O or for centre 6 point H. If these centres had been used the result would have been much less lively.

In figure 9 the outside proportions are contained in a rectangle 1 x 2 and the construction consists of a series of diminishing squares divided into fourths and ninths. (See figure 10.) In figure 10 the construction should not be difficult to follow. It will be noted that an extension of the square is used to obtain the centre for the arc de of long radius. Also to be noted is the construction for centre 5, one third of the side of a square, which is also used in projection for centre 7, the curve at the base.

Figure 11 shows a reconstruction of an existing Greek cup, (F 124: Louvre) together with measurements made from the cup itself.

The reconstruction reproduces the proportions and curves accurately, with allowance for small shrinkage in firing. The design scheme based on the same division of the square as the vase in fig. 10, that is, squares divided and subdivided into fourths and ninths.

In fig. 11 the centres of the arcs are circled with their numbers touching the circles and their arcs numbered correspondingly at each limit.

The variation of the main design theme, that is, the basic division of the square, or other parent shape, into equal parts, root shapes or combinations of both, produces much variation in the finished form.

Variation in the detail of curve is obtained by transposition of centres and radii. The pattern for the disposition of centres for any basic shape does not seem to change greatly.

The Greek method, with its flexible curve, and with the discipline of the underlying construction applied to that flexibility, might well show the way to new and better forms in modern design.

Simplicity is a great virtue. Greek design lost something of its original purity when the Greeks became sophisticated, and their designers abandoned the simple themes for those based on more complex mathematical conceptions.

The point of the matter is, not that the Greeks did thus and so, but that their design was planned logically, or, if you will, mathematically, on a simple basic idea. It gave expression to the grandeur that can repose in a fine conception of form and proportion.

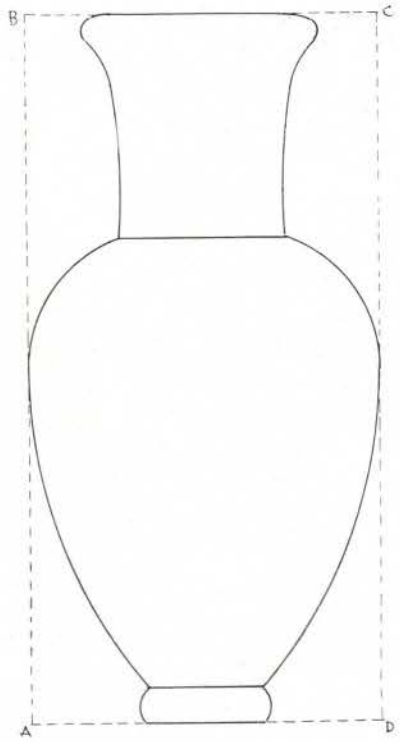


FIG. 9

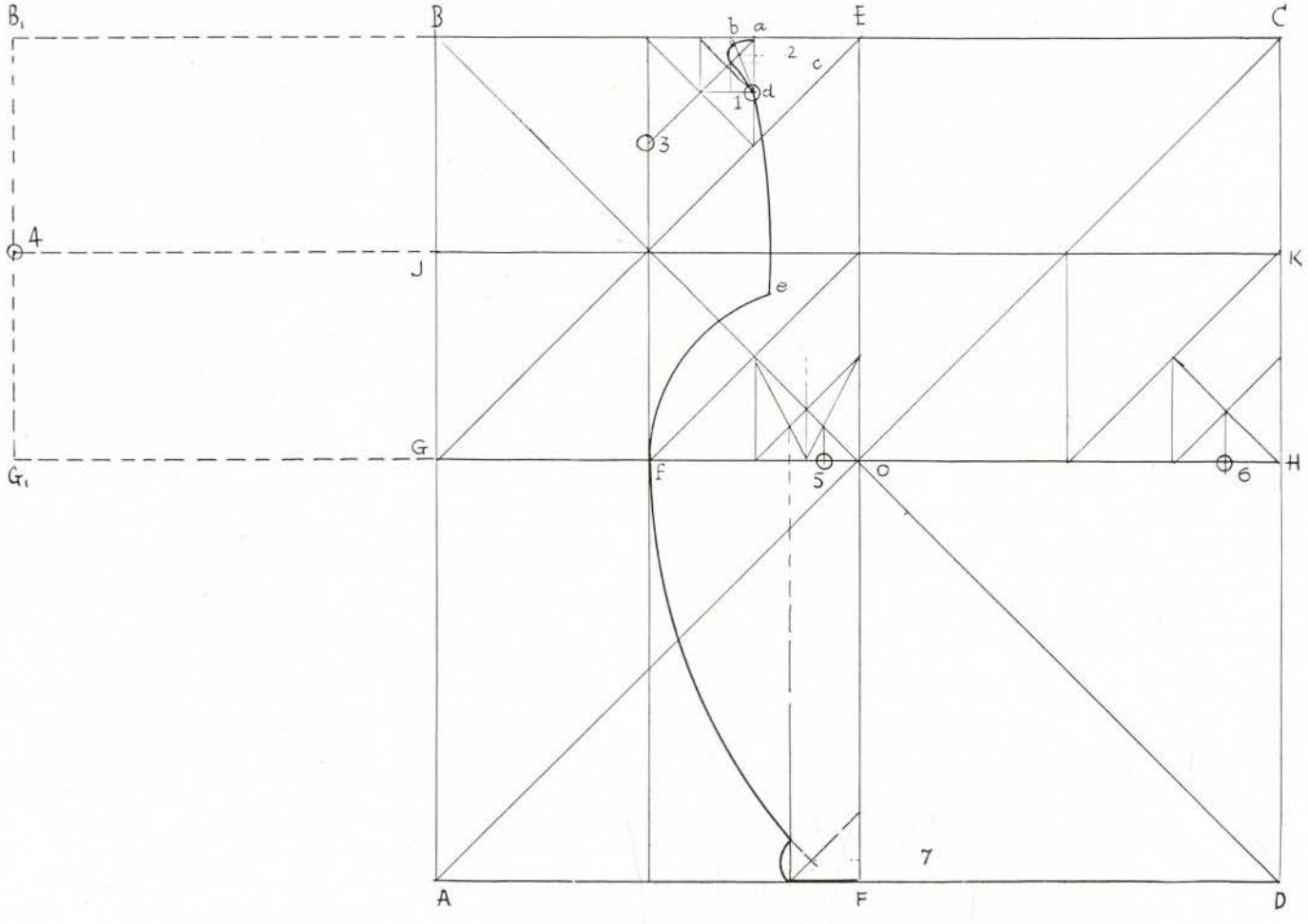
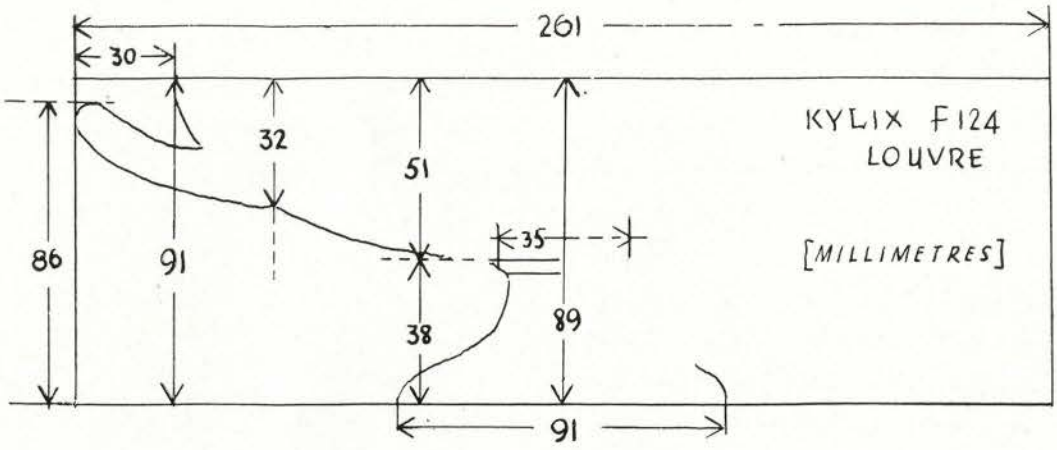


FIGURE 10



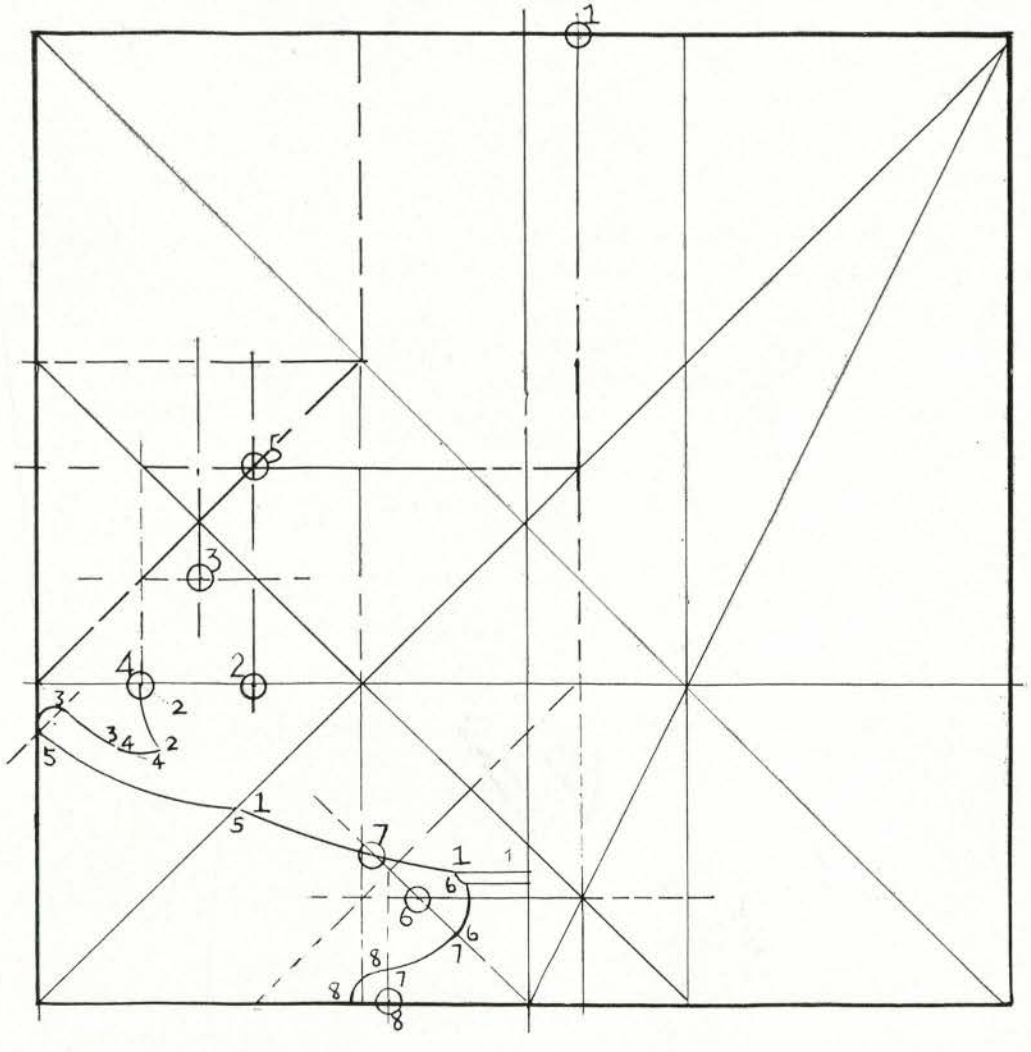


FIGURE 11

ROYAL ARCHITECTURAL INSTITUTE OF CANADA

OFFICERS

PRESIDENT . . . . . CHARLES DAVID (F)

FIRST VICE-PRESIDENT . . J. ROXBURGH SMITH (F) SECOND VICE-PRESIDENT . . . JOHN S. PORTER

HONORARY SECRETARY . . . MURRAY BROWN (F) HONORARY TREASURER . . A. J. HAZELGROVE (F)

PAST-PRESIDENT . . . . . FORSEY PAGE (F)

SECRETARY . . . . . MISS ANNE CORY
74 King Street East, Toronto

COUNCIL

P. L. JAMES (F), JOHN S. PORTER, P. C. UNDERWOOD . . . . . British Columbia

M. C. DEWAR, G. K. WYNN . . . . . Alberta

E. J. GILBERT (F), FRANK J. MARTIN . . . . . Saskatchewan

NEIL K. BROWN, H. H. G. MOODY, J. A. RUSSELL . . . . . Manitoba

Ontario

W. J. ABRA (F), MURRAY BROWN (F), JAS. H. CRAIG (F), A. J. HAZELGROVE (F),
A. S. MATHERS (F), R. S. MORRIS (F), FORSEY PAGE (F) P.P., W. BRUCE RIDDELL (F)

Quebec

OSCAR BEAULE (F), CHARLES DAVID (F), EUGENE LAROSE (F), HAROLD LAWSON (F),
MAURICE PAYETTE (F), GORDON McL. PITTS (F) P.P., J. ROXBURGH SMITH (F)

H. CLAIRE MOTT (F), G. W. WILSON . . . . . New Brunswick

C. A. FOWLER, A. E. PRIEST . . . . . Nova Scotia

EDITORIAL BOARD REPRESENTATIVES

British Columbia: R. A. D. BERWICK, Chairman; WILLIAM FREDK. GARDINER, H. C. PERRAM, JOS. F. WATSON

Alberta: C. S. BURGESS (F), Chairman; M. C. DEWAR, PETER L. RULE

Saskatchewan: E. J. GILBERT (F), Chairman; H. K. BLACK, F. J. MARTIN, F. H. PORTNALL (F)

Manitoba: J. A. RUSSELL, Chairman; NEIL K. BROWN, H. H. G. MOODY

Ontario: JAS. A. MURRAY, Chairman; WATSON BALHARRIE, L. Y. McINTOSH, ALVIN R. PRACK, HARRY P. SMITH, J. B. SUTTON, A. B. SCOTT

Quebec: RICHARD E. BOLTON, Chairman; O. BEAULE (F), JOHN BLAND, P. H. LAPOINTE, HAROLD LAWSON (F), J. CAMPBELL MERRETT, PIERRE MORENCY, LUCIEN PARENT (F), J. ROXBURGH SMITH (F)

New Brunswick: H. CLAIRE MOTT (F), Chairman; W. W. ALWARD, J. K. GILLIES

Nova Scotia: LESLIE R. FAIRN (F), Chairman; A. E. PRIEST, J. H. WHITFORD

INCORPORATED BY THE DOMINION PARLIAMENT 16th JUNE, 1908, 1st APRIL, 1912, AND 14th JUNE, 1929

NEWS FROM THE INSTITUTE

ANNUAL MEETING

Arrangements have now been made to hold the 1948 Annual Assembly of the Institute in Ottawa, at the Chateau Laurier, on February 23rd, 24th and 25th. Every effort is being made to prepare an interesting and varied programme for the three days of the convention, and several innovations are being introduced which should add to the success of the Meeting. One of these innovations will take concrete form in January, when every member of the Institute will receive an advance copy of the Programme, together with a printed copy of the Reports of the Standing Committees. These Reports can then be discussed at the Assembly without the necessity of a preliminary reading during the course of the meeting. Several other suggestions offered by members are being incorporated in the Programme, and it is hoped that the 1948 Annual Assembly will be an outstanding event for members across Canada.

SPECIFICATION:

The Institute has received a Specification for Mineral Wool from the Canadian Government Purchasing Standards Committee, which is reproduced below for the information of any interested members.

No. 29-GP-1-1947
Issued 29 August, 1947.

CANADIAN GOVERNMENT PURCHASING STANDARDS COMMITTEE

Specification for MINERAL WOOL — Insulating, for Buildings

1. Scope:

This specification provides minimum requirements for thermal conductivity, fire resistance and apparent density of three types of mineral wool for use in the insulating of dwellings and other building structures, and also defines the forms, standard sizes and dimensional stability of these products.

2. Definition:

For the purpose of this specification mineral wool used in the manufacture of building insulation is rock, slag, or glass, processed from a molten stage into durable and permanent fibrous form.

3. Types:

This specification applies to the following types of mineral wool:

(a) *Type I, Batts* — Batt insulation shall consist of mineral wool fibres fabricated in felted form with or without membrane facings, to approximately uniform thickness. Adhesives and bonding materials used to attach membrane facings, shall be substantially insoluble in water.

(b) *Type II, Loose Fill* — Loose Fill insulation shall consist of mineral wool as originally processed and collected in a fluffy mass without regard to form or dimensions.

(c) *Type III, Granular or Nodular Fill* — Granular or Nodular Fill insulation shall consist of mineral wool fibres mechanically processed into nodules.

4. Thermal Conductivity:

The thermal conductivity (k) of the mineral wool in the as applied condition shall not exceed 0.30 British Thermal Units per hour, per square foot, with a temperature gradient of one degree Fahrenheit per inch thickness, when tested at a mean temperature of 75°F. Method A.

5. Fire Resistance:

When tested in the manner specified the mineral wool shall be fire-retardent. Method B.

6. Lubricant or Binder:

The material shall contain mineral oil, asphalt, wax or binder, in minimum quantity required to control dusting, and in the case of Batts to provide dimensional stability.

In no case shall the type and quantity of oil, asphalt, wax or binder used be such as to prevent the material from complying with the requirements for fire resistance. Method B.

7. Apparent Density:

(a) *Type I* — The apparent density of Batt insulation including support membrane, if any, shall be specified by the supplier. Method C-1

(b) *Types II and III* — The apparent density at which all Type II and Type III mineral wool is to be applied shall be specified by the supplier. For all but horizontal surfaces this value shall be not less than the apparent density determined by the specified method. Method C-2

8. Forms of Batt Insulation, Type I.

(a) *Type Ia Batt Insulation* — Type Ia Batt insulation shall consist of mineral wool Batts without membrane facing.

(b) *Type Ib Batt Insulation* — Type Ib Batt insulation shall consist of mineral wool Batts with a membrane facing resistant to the passage of water and vapour affixed to one principal face. (Note 1). The membrane facing shall extend at least one and one quarter inches beyond the insulation on the two longitudinal edges so as to provide nailing flanges.

(c) *Type Ic Batt Insulation* — Type Ic Batt insulation shall consist of mineral wool with enveloping membranes. On one principal face of the Batt, the membrane shall be resistant to the passage of water and vapour (Note 1); on the other face of the Batt and enclosing the longitudinal edges, the membrane shall be vapour permeable. The two membranes shall be joined along the longitudinal edges, to form nailing flanges at least one and one quarter inches wide.

9. Standard Dimensions, Type I Insulation:

Batt insulation shall be supplied to the following standard dimensions, with permissible tolerances as indicated:

(a) *Thickness* — 2 in., 3 in. and 4 in. (± ¼ in.).

(b) *Width* — 15 ± ¼ in.

(c) *Length* — Type Ia, 24 ± ½ in.
Types Ib and I c, 24 in., 48 in. or greater lengths (± ½ in.).

Note 1: The water and vapour transmission shall not exceed 0.5 gram per square meter, per 24 hours, for each millimeter of mercury vapor pressure difference.

10. Dimensional Stability:

The density cohesion, and dimensional stability of mineral wool Batts shall be such that under normal conditions they retain their original position in a vertical wall without settlement. (Note 2).

11. Sampling:

Samples shall be taken at random from unbroken packages which have not been damaged or mistreated in any way whatsoever.

(a) *Type I, Batts* — Three packages shall be taken at random from each lot of 1,000 packages or less.

(b) *Types II and III, Loose and Granular Fill* — At least three packages shall be taken at random from each lot of 1,000 packages or less. The contents shall be dumped, thoroughly mixed and quartered down to provide a 25 pound sample.

12. Methods of Testing:

The methods of testing shall be as described in the following paragraphs:

(a) *Thermal Conductivity* — The thermal conductivity shall be determined in accordance with ASTM Method C177: Method of Testing for Thermal Conductivity of Materials by Means of the Guarded Hot-plate.

(b) *Fire Resistance* — The fire resistance shall be determined in accordance with the procedure described in Section VI of United States Commercial Standard CS131-46.

Note 2: Standard testing procedures are being developed and will be specified as soon as they have become available.

(c) *Apparent Density — C-1 Type I, Batts* — The Batts shall be removed from the packages and allowed to stand for at least four hours before measuring. Density shall be determined by means of ASTM Method C167: Method of Testing for Thickness and Density of Blanket Type Thermal Insulating Materials. C-2 Types II and III, Loose and Granular Fill — A rigid open box weighing approximately nine pounds, and having inside dimensions of 12 by 12 by 12 inches shall be filled loosely with insulating material which shall be screeded flush with the top of the box. The box shall be dropped on a cement floor from a height of 6 inches. This operation shall be repeated three times, filling the settled space again loosely with material and screeding flush after each drop. After the third drop the box and contents shall be weighed and the tare weight of the empty box deducted. The net weight of the insulation material thus determined shall be taken as the apparent density of the mineral wool in pounds per cubic foot.

Correspondence regarding this Specification should be addressed to The Secretary, Canadian Government Purchasing Standards Committee, National Research Council, Ottawa.

☆ ☆

ALBERTA

There is a saying that Art is essentially one, meaning that all arts have the same ultimate aim and function. The arts, however, are various in their methods and the various types of artists are not noticeably given to associate together. In any one form of art there is apt to be several "schools" in apparent variance and even in some degree hostile one with another. It may be asked which art gives the lead as one phase follows another; whether literature, painting, architecture, the drama or some other. Probably in this matter each makes its own peculiar contribution.

In towns across Canada we have the most frequent exhibition of paintings and the graphic arts. Architectural exhibitions are comparatively rare. But buildings, whether they be works of architecture or not are always with us. Literary works are soon broadcast through public libraries and in private purchase. These are discussed in private and publicly in reviews.

Works of architecture are probably, of all the arts least subjected to criticism. We have need of a school of criticism—itself a high form of art requiring as much skill as any. So little are works of architecture discussed and in such lame fashion that the conclusion can scarcely be avoided that there is little public interest in the art. Buildings themselves are of general interest inasmuch as they are perpetually and everywhere in use. The chief criticism which the general public will take upon itself concerns the relative utility of arrangement in plan of a building. Many people are capable of observing an arrangement that clearly interferes with the common use of a building. Even fairly competent architects may occasionally be guilty in this respect. They may be led into mistakes through faulty or imperfect instructions. It is part of their duty to ascertain that their instructions are full and complete. This is not always easy. The dreams of clients may require some prophetic ability for their true interpretation into form.

On looking over an exhibition of pictures one may ask oneself what lessons are to be found there for architects. Such exhibitions generally present a bewildering medley of subject matter and of presentation. An architect will naturally examine such pictures as include some views of buildings. Of these the painters generally select the most dilapidated and decayed examples that they have been able to discover in the most out-of-the-way-places. This seems to have suggested an article in the issue of last September of the English "Architectural Review" by John Piper on the beauty of decay. Amongst other examples are illustrations showing the picturesque effect of scaling stone on some of the eighteenth century buildings in Oxford.

Do works of architecture really look their best when new or when in stages of decay? Plutarch attributes as a great merit of the Parthenon that, even in his day it preserved a "certain sort of flourishing freshness" as if still new. Several writers have endeavoured to enhance the reputation of the great medieval cathedrals by conjuring up their image as they first stood "fresh from the mason's hand". The grime of industrial cities has blackened the work of many a mason's hand. In the period between wars a process of steam cleaning was applied to a number of old buildings. This was done in the interior of Henry VII's chapel at Westminster. This, with the addition of brilliant colour and gold to the many carved bosses of the vaults and to coats-of-arms, certainly gave a "certain sort of flourishing freshness" to that building, and this met with very wide approval. An architect will rightly refuse to select a stone that will readily scale or to design a really convincing version of a slum.

In our exhibitions of pictures we meet with something more modernistic than the cult of picturesque decay. There are many efforts to employ the fascination of geometric forms in some complexity of combination—in surface pattern or in three dimensional masses. Not infrequently amongst these abstract or mechanical shapes there appear some fragments of humanity, an eye or so, two, or three odd legs, or something dimly suggestive of a human body disguised by emphatic malformation. Perhaps this sort of thing aptly expresses suffering humanity hopelessly entangled in the cogs and wheels of its own invention. This, indeed, seems to be the case in which our generation unfortunately finds itself. The expression may be true but it conveys little beauty to the eye and the architect will find it difficult to derive inspiration for his own sphere of art from this. Geometrical form indeed he handles in plenty. We have to make the best of rectangular sites and our general social economy directs us in straight vertical and horizontal lines. These, even if they do rather tightly tie us, at least keep us out of bewildering entanglements, impose an order and preserve us from chaos. The typical plans of the most academic school of architecture, cleanly laid out in black and white produce a pattern which, if placed beside many of this modernistic school would, quite apart from the meaning behind them, shine forth as objects lovely to the eye. Is not the eye the ultimate judge of beauty? Is not beauty one of the ultimate values?

Cecil S. Burgess.

BRITISH COLUMBIA

The school building program in B.C., delayed by depression and war, has received impetus from the adoption of the Cameron report, by which the Provincial Government assumes half of the approved expenditure for new schools and alterations, including the cost of equipment.

This eases the financing of schools, especially for the cities which heretofore received far less provincial help than rural districts. The Vancouver School Board plans a big building program, giving priority to junior and junior-senior high school accommodation. Thus the senior students from the elementary and the junior students from the secondary schools will be drawn into the new buildings, relieving the overloading in both. The Bureau of Measurements (V.S.B.), charting births in the city, estimates that Vancouver's growing population will require additional school plant by the year 1956 of 958 rooms.

The shifting of family residential communities has resulted in some of the older schools having vacant classrooms, whereas others are overloaded and have been forced to give up rooms devoted to libraries, etc., to accommodate extra classes. Two small elementary annex schools have recently been built to take care of this overloading, these being frame buildings which

fit well into the new residential communities, and are esteemed by teachers and pupils. Some auditorium-gymnasium additions to older elementary schools are also under construction.

The cost of school buildings is mounting steadily, making cost estimating in the planning stage increasingly difficult. The conditions imposed by the Provincial Government grant require a fixed sum contract, not now a popular form with contractors owing to unstable wage and material cost rates. Also a school is becoming a more complex building, providing services such as a cafeteria, a library, counsellor's office, technical shops, custodian's receiving room, visual education room and such like, which make it difficult to give a pat answer to the "how many classrooms" question.

Mr. E. D. King, the Vancouver School Board Architect, has recently returned from a cross-continental junket, which he and two B.C. educationists made for the purpose of observing vocational training schools. The constantly reiterated advice his party received was first to integrate closely the training program with laobur and management organizations, and, second, to develop a flexible plan, particularly with regard to services such as power. Mr. Dean Goard, a technical school teacher with industrial experience, is now organizing trade committees which will be advisory to Vancouver's Vocational Training School. The response of labor and management indicates considerable demand for such education.

The location of a large school to train or to upgrade tradesmen must be as central as possible, with due regard for the industries it will serve. The present Technical High School, an excellent school on an adequate site, serves the eastern portion of the city, but enrolment indicates a "geographical lethargy" among young people suitable for skilled trade training, and it draws far more from adjacent high schools than from distant ones. In general, it can be said that the recommendations of the Vancouver Town Planning Commission with regard to school sites agree with the planning program of the school board.

Two excellent studies have been made by the Vancouver teachers on modern school building requirements. The "Report of the Elementary Schools Building Committee, June 1944," and a similar study for Secondary Schools dated June 1945, are a very useful reference in our office.

Very helpful in school design is the willing exchange of information between architects, and the guidance of the Provincial Department of Education will prove more and more valuable as the financial assistance program develops. Visitors to school systems in the U.S.A. and Canada have been accorded universal kindness, and the Vancouver School Board makes every effort to reciprocate this co-operation. *G. W. Peck.*

MANITOBA

September, the month of clear breezy days and frosty nights, was no exception this year on the prairie. With the sudden termination of summer, the usual acceleration in tempo has taken place in almost every phase of community life: the one exception is our return to "slow time"! Already, the winter programme of meetings, concerts, and exhibitions is in full swing. Almost over night the students have flocked back to the University leaving the architects to adjust themselves to greater limitation of staff within the office, while feverishly trying to get the "job" enclosed before the real cold weather sets in.

After its summer recess of three months, the Council of the Association has resumed its monthly meetings. In September several applications for membership were reviewed and accepted and plans for the coming season were discussed. It is expected that the revised requirements for entrance to the Association by examination will be completed shortly for ratification and adoption.

Dr. B. Ifor Evans, vice-chairman of the Arts Council of Great Britain spent three days in Winnipeg during his tour of Canada under the auspices of the United Kingdom Information Office. He addressed a large public meeting in the Winnipeg Art Gallery as well as two luncheon meetings. The Manitoba Association was represented at a dinner meeting arranged by the Federation of Canadian Artists for the purpose of motivating the co-ordination of the eighteen creative art organizations into a provincial arts council. This opportunity of informal discussion with Dr. Evans proved to be both helpful and stimulating.

The end of the month saw the members of the Federation of Canadian Artists busily arranging for their third annual Non-Jury Show at the Art Gallery. Each year this show arouses keen interest amongst the painters and the gallery public as well as giving encouragement and inspiration to new artists.

At the School of Architecture, the month has been an extremely busy one Many alterations have been necessary in the two army buildings which have been added to accommodate the school. These, together with the installation of fluorescent lighting in all the drafting rooms, should result in greatly improved conditions for work. At the moment of writing it is impossible to forecast accurately the enrollment in the School. It is expected that, with a smaller entering class and with an unusually high failure rate in last year's freshman class, the enrollment will be somewhat less than last year's. This will enable the increased staff to give more personal attention to the individual student development. We are very fortunate in having a staff every member of which has excellent qualifications and, at the same time, is most enthusiastic about the task of co-ordinating and improving the

various elements of architectural education. The combined educational background of the thirteen full time and four part time members includes training at the London Architectural Association, Harvard University, University of Minnesota, Rennselaer Polytechnic Institute, New York University, University of Illinois, Columbia, Vassar, the Art Institute of Chicago, and The University of Manitoba.

J. A. Russell.

ONTARIO

Scarborough Township: below the cliffs, the shimmering multi-coloured sweep of Lake Ontario; beyond, from a dip in the far-off hills, the perpetual cloud of Niagara Falls. How could a region set in such beauty be so full of problems?

Nearer at hand one sees small children playing "choo-choo," and adolescents on bicycles. Problem number one: the provision of adequate schooling.

Scarborough is about twice the area of Toronto, with some twenty-six thousand people settled in scattered communities; but since Toronto is almost built up, the larger centres are rapidly joining together to form ribbons from the city.

Owing to wartime restrictions and uneconomic costs of individual homes, many "dolls' houses" were built here in the last few years. The assessment on these is far too low to begin to pay for the erection and running of schools needed for the new swarms of children. We have found that small houses alone cannot support schools. Industrial and commercial enterprises can and do take a large share of the costs. Unfortunately for Scarborough it was only within the past two years that a Planning Board was established, replacing the struggling Zoning Committee. Consequently houses are scattered all over the countryside, and when a commercial building is proposed, the residents in the area often band together, and sometimes force it out of the district. They then wonder why the more houses, the higher the taxes! Being a member of this Planning Board, the writer knows how uncomfortable these deputations can make one feel. One said, "You're a bunch of half-pint Hitlers!" However, we are evolving a plan by degrees. Tentative industrial areas have been mapped out, an attempt to control ribbon development has been made, residential areas have been set aside, and so on. The conditions are somewhat different from those faced by similar boards, chiefly because of the great area to be studied. We are trying to resist the scattered cutting up of the farm lands beyond the water and sewer areas. We examine plans by the dozen. If a well and septic tank are needed, the Province requires a lot of at least 12,500 square feet per house—to mention one item to be checked. For subdivisions, we reject lots that are far too deep for their width, and require, in large projects, that an area of up to 5% be given to the Township for recreational purposes. Curved and winding streets, though attractive, are frowned upon, because we do have a climate. Snow ploughs go in straight lines. So do pipes.

E. M. Coleman, Architect, is also a member of this Board. The firm of Carter and Coleman made a first-class plan for an urgently needed extension to Scarborough Collegiate. This school is housing over twice as many pupils as it was built for years ago. As the taxes would have been affected, the matter of building was put to the vote. The writer, being a voter, arranged to have the facts placed before a citizens' organization, made independent inquiries before the vote, and checked afterwards to find out why the public rejected the project. With a light vote, the ratio was about two to one against, in most districts.

The Province pays part of the school cost, although the municipality takes full responsibility for debentures. Because of this Government interest, they will not pass a plan until their own requirements are met, regardless of the advice of the local School Board. In Scarborough's case, the Province demanded far more than the people felt the present tax base could support. As a consequence, no one had anything. The general opinion was, "At a time like this, with only a few industries and excessive building costs, why do we have to have a Vocational Guidance Room, a second gym, and other costly frills? We must wait until we can afford them." A considerable group of voters felt that the first section of a new building on another site should be erected. This idea had been rejected by the Trustees. At a public meeting, the School Board were left to argue alone, without the help of an expert from the Government, to explain why these "frills" are a necessity for a school to-day. The minority generally felt that contribution of a few extra dollars a year each towards a first-rate school would be a very worthwhile investment indeed. The School Board was bitterly disappointed. There will be new developments, as the situation is fast becoming imperative. The Township is in excellent financial condition, by the way, and is going to extend some of its services for new industry and housing. Two smaller schools costing about a hundred thousand dollars each were financed recently.

Many of the school tax difficulties would be mitigated for the province in general, in the considered opinion of one official, if the Government took over all educational costs. They should then translate the total amount into an average cost per pupil for the whole province. Each municipality would be charged according to the number of its pupils. This general levy of fifteen or so mills would be added to the local general tax rate in place of the present unsatisfactory arrangement. The suggestion came from an essentially practical man who knows his subject.

The July Letter by Mr. Cox impels me to take issue with at least some of his views, which, after all, was what he asked for. First, Mr. Cox, anyone can see that the meetings are efficiently guided by architects who have had years of experience with building projects. If you find a meeting quiet, blame yourself! In the second place, publicity. Mr. Cox, you have us there! Where was the O.A.A. exhibit at the C.N.E.? What an opportunity missed! Third, the schools. "Let us teach theory for a few short years—students can spend the rest of their lives being practical." Look at the results—the versatility of the grads—as shown in the July issue. We have seen their well-designed buildings, so look, say, at Parkin's jolly helicopter and other designs of such pure beauty that old Ictinus would say, "Well done."

J. H. W. Bradfield.

QUEBEC

It is difficult to write a letter which would pretend to include news from the whole province when so much is happening close at hand. The McGill School of Architecture has pulled up its roots and moved from the Engineering Building into two houses on University Street. Anyone who has moved household effects will understand the hardship of packing and the confusion of moving, and will appreciate how shabby the dear old furniture looks when it is brought out into the daylight and piled on a truck. Moving, however, provides the opportunity for a fresh start.

Those who remember the old school when it had about fifty students may be surprised to learn that we have had one hundred and nine students in the last four years. The first year is common with the engineers. Consequently we could not fit in our old accommodation and we have been given new quarters in two old buildings which had been used originally as houses, then for Law, Physical Education, the McGill C.O.T.C., the School for Graduate Nurses, and, during the war, as the International Labour Office. The rooms are very pleasant, smaller than the old school rooms, but we feel that the domestic scale is charming, and here and there a piece of soulful decoration in the form of a slightly pointed plaster arch will be a good environment for those of us who are mechanically minded.

There will be space for workshops, a photo studio and dark room, things which were very inadequately accommodated previously. "Focus" the exhibition room is replaced by another not quite so interesting in shape but with more usable walls for pinning up drawings. We hope this room will be used every day of the session and that its exhibitions will be a useful campus activity. The new lecture room will seat about fifty. It is on the ground floor and we hope that it will be used by campus groups interested in social and artistic matters. Our new buildings make possible integration and a unified spirit which are important in a school of architecture, but we do not intend that they should lead to isolation.

This year, with the confusion of moving and the confusion of registration, comes the Community Planning Association's first national conference which we hope to attend in our spare moments.

The Planning Conference coincides with a special meeting at the Engineering Institute and will be followed directly by a National Conference on Housing. It seems a good idea to have meetings of various national associations coinciding in this way as interests overlap and it becomes possible for a man from distant parts of the country attending one to attend another. Perhaps in future it may be possible that the architects as well could have their annual meeting at the same time and place as these other associations.

John Bland.

CONTRIBUTOR TO THIS ISSUE

Bryant Fryer: Graduate of the Ontario College of Art. Studied design and painting at the Art Students' League of New York and under Laurens and Peughon at the Academie Julien in Paris. Made motion pictures in New York with Tony Sarg and in Hollywood. Served in both World Wars with the Royal Air Force and the Royal Canadian Air Force. In the recent war he designed and executed a great number of murals for the Visual Link Trainers, and designed the equipment and settings for the Overseas Entertainment Units of the R.C.A.F. At present completing a book on "Basic Design".

NEW PARTNERSHIP

The formation of a new partnership has been announced by J. Cecil McDougall, Architect and Engineer, Montreal. The principals in the new arrangement will consist of : J. Cecil McDougall, B.Sc., B.Arch., F.R.A.I.C., F.R.I.B.A., A.M.E.I.C., P.E.Q.; J. Roxburgh Smith, F.R.A.I.C.; R. P. Fleming, B.Arch., M.R.A.I.C. The title of the firm will be McDougall, Smith & Fleming, Architects. They will continue to practise at the present address: 1235 McGill College Avenue, Montreal 2, P.Q.

NOTICE

English-speaking Dutch Architect, now in London, with extensive French, Dutch and Swedish experience, desires position in architect's office with large work in hand.

Please reply, stating salary and prospects, to Journal Office, 57 Queen Street West, Toronto.

Facts by Pilkington about Glass
FOR ARCHITECTURAL STUDENTS

NO. 13 **MIRRORS** PART 1

USE OF GLASS MIRRORS TRACED TO 2000 B.C.

Of all Decorative Glass the mirror is the most important. The first requisite of a mirror is that the glass should possess perfect planeness and parallelism. For this reason the development of the mirror depended on the development of Polished Plate Glass. Though of course not so universally used as today mirrors were known in quite different parts of the world several thousand years ago.

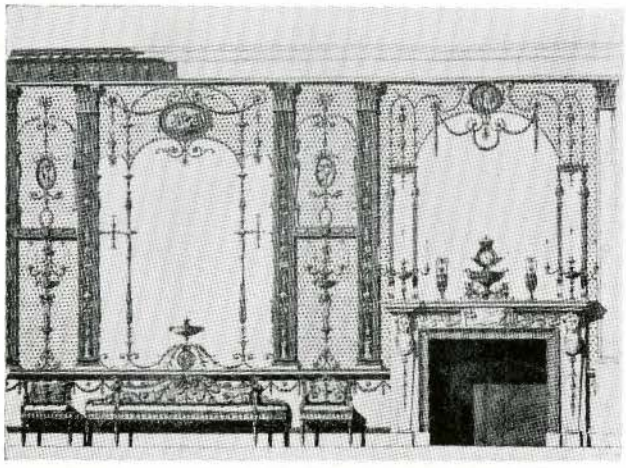
The Chinese seem to have used mirrors even of glass, more than 2,000 years B.C., although this information is gleaned from Chinese Classics, it is unfortunate that details are unknown. Among the Japanese the metal mirror had a most prominent place and was thought so important as to have been almost an object of worship. Egypt is a land whose mirrors are the best known of the ancient cultures. Obsidian was employed as well as metals and glass. From the Egyptians the art of mirror making passed to the Hebrews. In Ceylon there are records showing that "Mirrors of Glittering Glass" were carried in procession in 306 B.C. Mirrors are to be found in ancient Burmese and Hindu idols. Pliny mentions that the use of glass mirrors at Sidon in the occidental culture sphere had its origin here rather than in Egypt. In Greece, the miraculous properties ascribed to mirrors made them attractive not only to Poets and Magicians, but also to Philosophers. Socrates (469 - 399 B.C.) employed a mirror for moral instruction. The Greek tragedians about the same time frequently mention mirrors. Praxiteles, the Sculptor, taught the manufacture of mirrors in the year 328 B.C. It is assumed that the Greeks became acquainted with mirrors about 600 B.C.

Similar to the Greek mirrors were those of Etruria in the middle west of Italy. The Romans, well acquainted with the Greeks and Etruscans, produced, as a rule, similar mirrors to these. Their mirrors were chiefly made of a mixture of copper and tin, of zinc or silvered copper and sometimes of pure silver: — others were made of glass. Wherever Roman civilization spread the use of mirrors was introduced.

A mirror found in Cornwall, now in the British Museum, shows that the Celtic population of England had adopted the form and substance of the mirror from their Roman conquerors.

We find that for ten centuries, that is up to 1500 A.D., there was no noticeable change in the manufacture of mirrors. The year 1500 A.D. or thereabouts saw the birth of the modern mirror when the Tin-Amalgam process was introduced.

To be continued in November Issue.



The Glass Drawing Room in the wing of Northumberland House, London, designed by Robert Mylne, appears to have shown not only consummate decorative use of mirrors but a decorative use of glass that we can hardly surpass, even only quantitatively, to-day. It was demolished, along with the rest of the house, in 1874.

The use of the mirror wall for doubling the size of an interior and giving its design a symmetrical completion is well illustrated in this example. The shallow 'beton-translucide' dome, for instance, has been designed to play up to its own reflection.

Published by

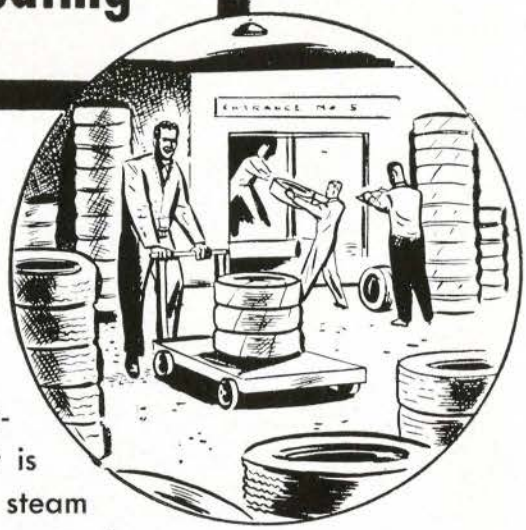
PILKINGTON GLASS LIMITED

HALIFAX HAMILTON TORONTO CALGARY
MONTREAL ST. CATHARINES WINNIPEG EDMONTON
KINGSTON FORT WILLIAM REGINA VANCOUVER

The Mark of Distinction

STEAM

High Pressure for Processing
Low Pressure for Heating



Where high pressure steam is generated for processing, it is a simple step to reduce steam pressures, to the required low or sub atmospheric pressure . . . easily controlled and regulated by the Dunham Differential System for efficient comfort heating. It accomplishes this without the discomforts and fuel losses attendant upon "on and off", pulsating or cycling systems . . . regardless of outside temperature.

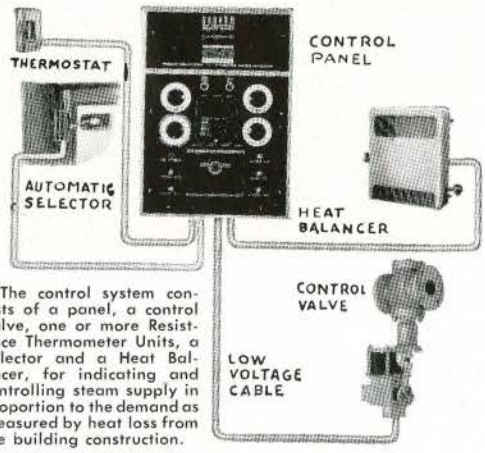
If you require steam for heat comfort and manufacturing or other services, let Dunham engineers collaborate with your consulting engineers or architect . . . for complete information on Dunham Differential Heating. C. A. Dunham Co. Ltd., 1523 Davenport Road, Toronto 4, Ontario. Offices from coast to coast.

TRUE HEATING COMFORT

Heat-comfort requires a constant balance of the steam supply against the requirements for warmth. The requirements are variable, the steam supply should likewise be variable, but not intermittent. Only Dunham Differential Heating has the necessary flexibility to fully meet this variable requirement because no other system provides a continuous steam flow, with automatic control of both steam temperatures and steam volume at sub-atmospheric pressures.

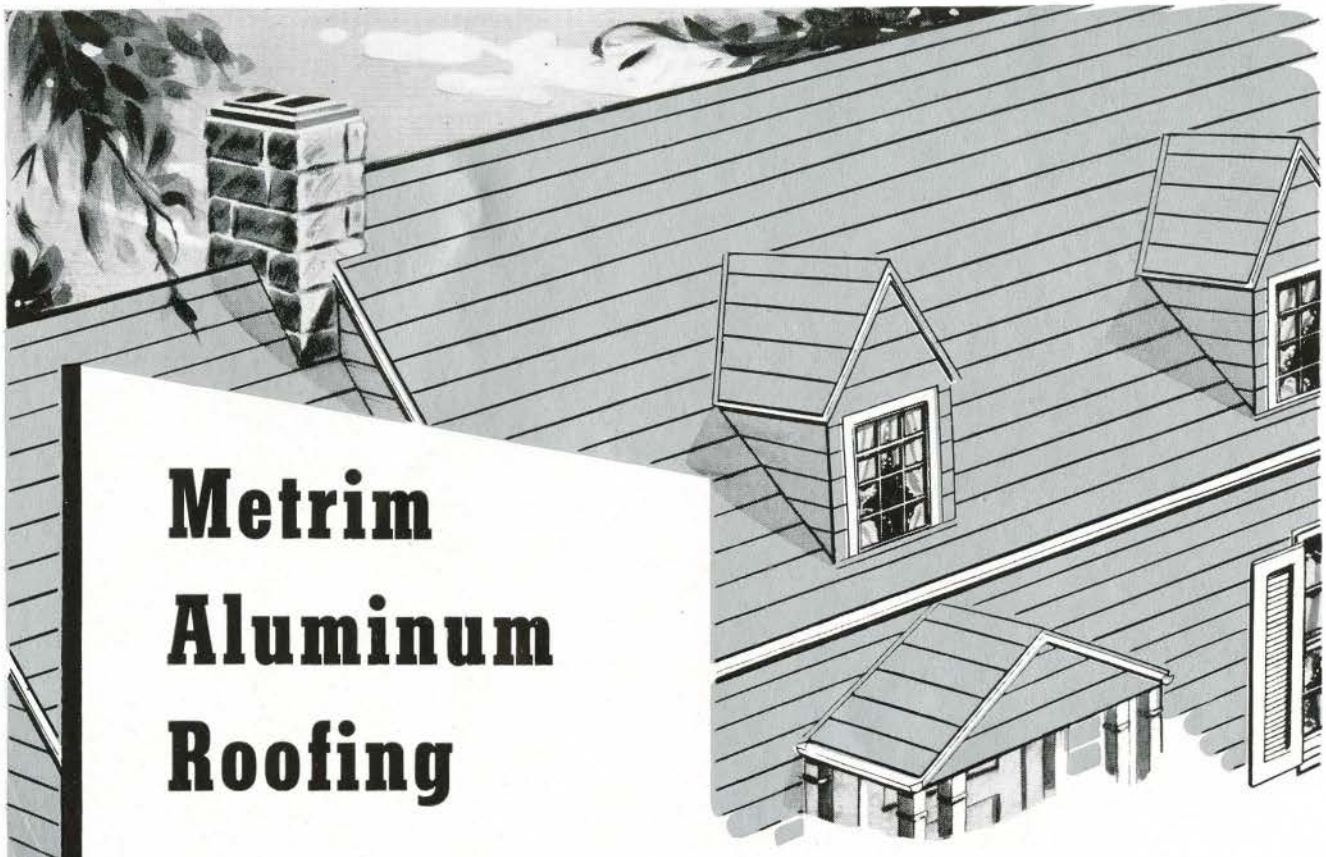
UNDIVIDED RESPONSIBILITY

The owner of a Dunham System is protected against the annoyances and expense caused by the divided responsibility in an "assembled" system of devices built by different manufacturers.



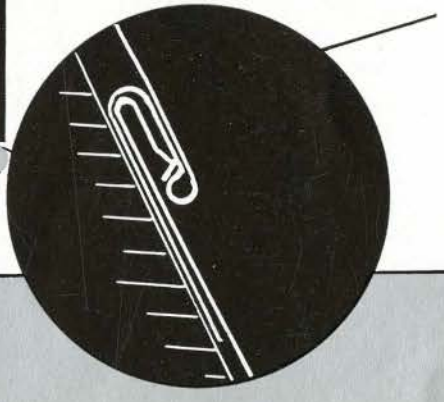
The control system consists of a panel, a control valve, one or more Resistance Thermometer Units, a Selector and a Heat Balancer, for indicating and controlling steam supply in proportion to the demand as measured by heat loss from the building construction.

The DUNHAM HEATING SERVICE



Metrim Aluminum Roofing

—*the Biggest Value in Permanent Roofing*



A MODERN roof offering greater year-round comfort and protection . . . Metrim Aluminum Roofing reflects heat to a large degree. Thus are you assured of coolness in Summer, and the conservation of Winter Heat.

Metrim Aluminum Roofing is light in weight (approximately one-third of a pound per lineal foot) — fire-proof — rust-proof — rot-proof — vermin-proof. It is easy and economical to apply . . . and, because it is laid from the top downwards, it is not damaged during application.

- ***Handsome in Appearance***
- ***Easy to Apply***
- ***No Maintenance***
- ***Styled and Built for the Roof of Today and Tomorrow***

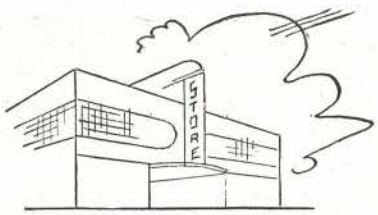
IMPORTANT FEATURE

Special attention has been paid to the design of the joint of Metrim Aluminum Roofing. All joints are made by interlocking sections and do not require soldering. There is a pin point contact at the joint where one section is locked into the other. (See detail drawing.) This minimizes the possibility of capillary attraction and at the same time eliminates the danger of water freezing and backing up, expanding and opening the joint.

CRESSWELL-POMEROY LIMITED

2150 Oxford Ave., Montreal, Que.

989 Bay St., Toronto, Ont. | 17 d'Auteuil St., Quebec, Que. | General Trust Bldg. Halifax, N.S. | Royal Bank Bldg., Winnipeg, Man. | 10306-124 St., Edmonton, Alta. | Credit Foncier Bldg., Vancouver, B.C.



THERE'S sales invitation in a floor of linoleum.

Customers do appreciate its glowing beauty. They like the restful resiliency of linoleum that cushions their steps, saves them shopping fatigue, makes them want to come again—often.

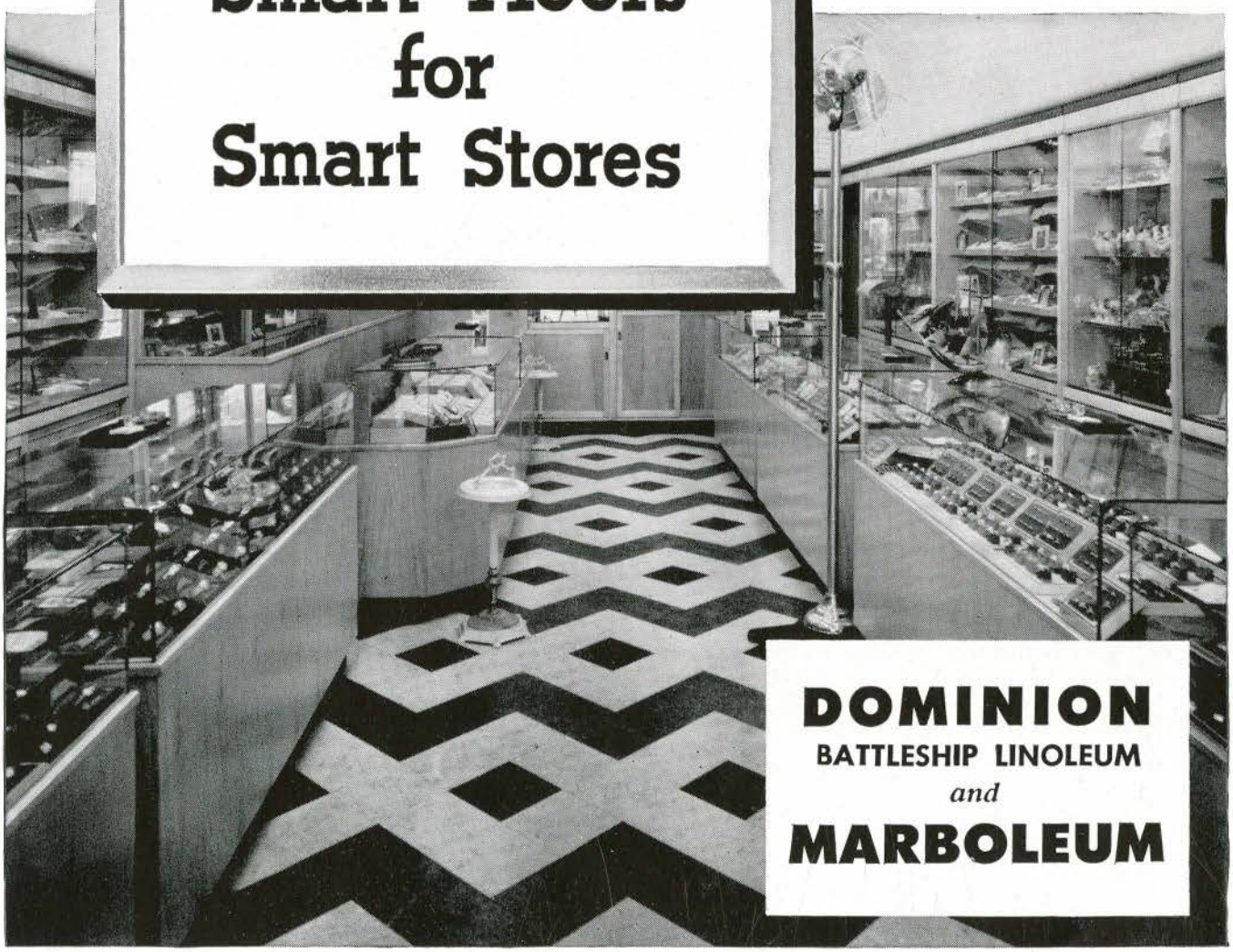
Assuredly linoleum is the floor to fit your remodelling or store renovating plans. It's so bright and colourful and it keeps its good looks through the years in spite of heavy traffic. You'll like linoleum, too, for the time and labour it saves in cleaning.

75 Years of Progress...This year Dominion Oilcloth & Linoleum Company, Limited celebrates 75 years of progress. From a very small beginning in 1872 this company has grown to become one of the most important industrial concerns in Canada. Its products, famous for their quality, are known from coast to coast.

LINOLEUM is still in short supply...
due to scarcity of raw materials, but it would be well to plan those smart new floors *now*. Keep in touch with your linoleum contractor or dealer.

DOMINION OILCLOTH & LINOLEUM
Company, Limited **Montreal**

Smart Floors for Smart Stores



DOMINION
BATTLESHIP LINOLEUM
and
MARBOLEUM

Right Amount of Heat-Where and When You Want It

Architects: ROSS AND MACDONALD
Associates: SPROATT AND ROLPH

rite for Performance Facts
ntaining 268 Case Studies of
dern Steam Heating Installation

Darling Brothers Limited

140 PRINCE ST. - *SINCE 1888* - MONTREAL, CANADA
HALIFAX - ST. JOHN - QUEBEC - OTTAWA - TORONTO
WINNIPEG - CALGARY - VANCOUVER - ST. JOHN'S NFLD.

Lighting PLANNED FOR PRODUCTION speeds work...improves morale

GENERAL ELECTRIC LIGHTING SERVICE

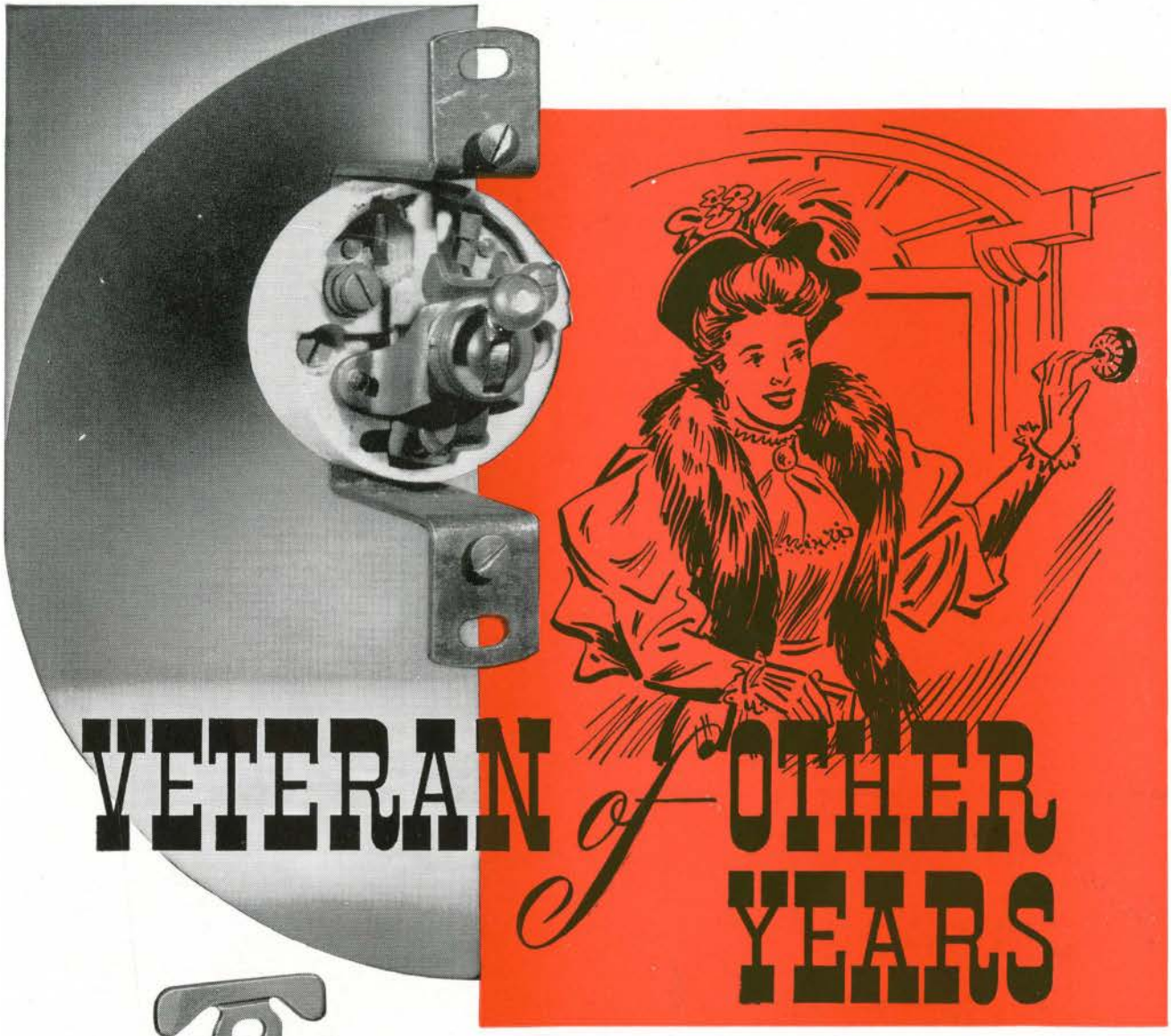
Production is directly influenced by correct lighting. Correct illumination levels over working surfaces...good general illumination . . . the elimination of glare . . . these three improvements will bring about marked production increases. They aid more accurate seeing, reduce strain and fatigue, improve morale and promote more efficient work.

For further information consult the Lighting Service Department through your nearest C.G.E. office

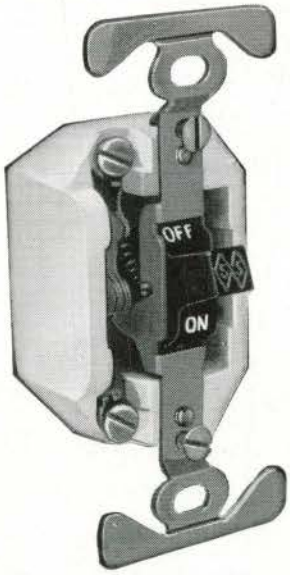
WLS-247

CANADIAN GENERAL ELECTRIC CO LTD

HEAD OFFICE — TORONTO



VETERAN of OTHER YEARS



The single pole toggle wall switch used years ago was open in construction, allowing dust to get into the mechanism, thus causing stiffness of the toggle.

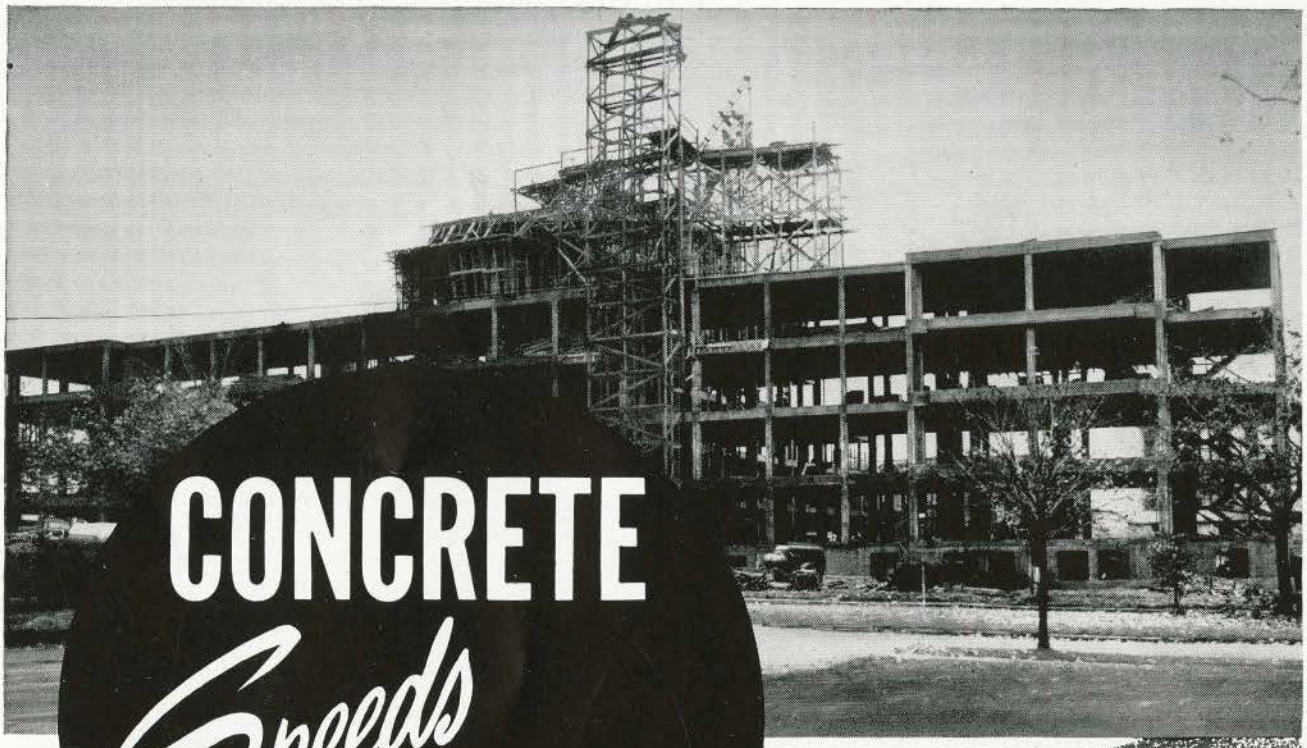
The Smith & Stone 1821 single pole toggle switch is lighter to operate and has a smoother action. This modern switch gives a quicker break in the circuit, thereby reducing the arc. The various component parts of the 1821 switch are better insulated than in the old type.

This switch illustrates how every Smith & Stone device is constantly under study by our designers. We are always looking for ways to make our devices safer, longer-lasting, more convenient to use, easier to install.

SMITH & STONE LIMITED

FACTORY AND HEAD OFFICE: GEORGETOWN, ONTARIO

Sales Offices: Montreal, Toronto, Winnipeg, Calgary, Vancouver



CONCRETE *Speeds* ERECTION

OF THIS NEW HALIFAX HOSPITAL

Concrete provides the very features vital to the construction of the modern hospital. Here is permanence and durability, here is fire safety and sanitary cleanliness. Lasting beauty, too, and the low upkeep cost that puts concrete in the forefront of really economical building material. The new Camphill Hospital at Halifax is a typical example of the application of concrete in modern building construction. Concrete was chosen for its versatility, its ready adaptability and for the speedy construction which it makes possible. Write us for full information about the advantages of concrete as a building construction material.

Contractors: E. G. M. Cape & Company, New Birks Building, Montreal.

Architects: Ross, Patterson, Townsend and Haughan, 1010 St. Catherine St. W., Montreal.

4723

CANADA CEMENT COMPANY LIMITED

Canada Cement Company Building Phillips Square Montreal

Sales Offices at: QUEBEC MONTREAL TORONTO WINNIPEG CALGARY

What is the hidden Eldorado quality?

You cannot see it, but you can feel it in the way Eldorado works for you—easily, almost effortlessly.

And you can see its results in your drawings and blue prints.

It means crisp, sharp, even lines every time, all the time.

It means non-feathering, non-crumbling leads, standing up under pressure.

The hidden quality is TYPHONITE! Drawings made with *Typhonite* Eldorado leads insure clean, easy-to-read blueprints. Made in 17 degrees 6B to 9H. Order Dixon's *Typhonite* Eldorado pencils from your regular source of supply.

DIXON'S

TYPHONITE

ELDORADO

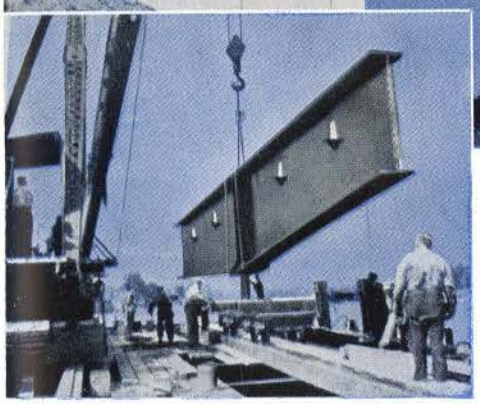
Eldorado Pencils are favourites with engineers and draftsmen everywhere. If you would like a sample, just send your name and address and the degree of Dixon Typhonite Eldorado Pencil you would like to try.

Made in Canada by

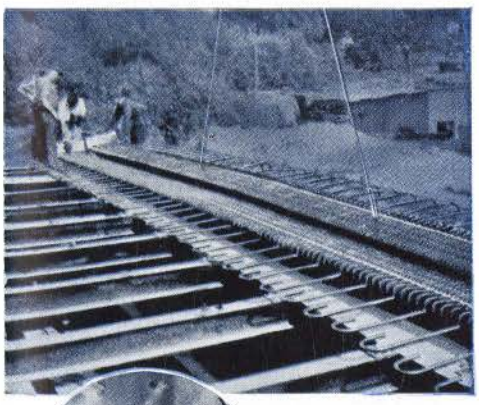
DIXON PENCIL COMPANY LIMITED

MONTREAL - NEWMARKET - TORONTO - VANCOUVER

New bridge across the Rivière des Mille Iles at St. Rose, Quebec.
Owners: Dept. of Public Works, Quebec. General Contractor: Dufresne Engineering Co., Ltd.
Steel Fabrication and Erection: Dominion Bridge Co., Ltd. Consulting Engineers: Baulne and Leonard.



Girder being lowered into position to form part of bridge deck.



Finger-type expansion joint—used at bridge ends only.

Welding of girder field splices. A special technique was evolved to eliminate locked-up stresses.

The Longest

WELDED CONTINUOUS-GIRDER BRIDGE

The latest in the series of welded continuous-girder bridges to be built by this Company is illustrated in these pictures, and is believed to be the longest of its kind in the world. (1550 feet between abutments).

The new bridge forms a vital link between Montreal and the Laurentian Mountains, whilst adding a feature of architectural beauty to the Quebec countryside.

It is typical of the modern trend of bridge design and strikingly illustrates the flexibility of this new method in building bridges of aesthetic merit.

Illustrated article on St. Rose Bridge, available on request. Please ask for publication Nos. SDA 100

STRUCTURAL DIVISION
DOMINION BRIDGE
COMPANY LIMITED
Established 1882

PLANTS AND OFFICES IN PRINCIPAL CITIES OF CANADA

ERNEST CORMIER, *Architect*
J. E. CARON, *Construction Superintendent.*

PLANNED by Ernest Cormier, designer of the University of Montreal and other fine public buildings, the new Hôtel-Dieu Hospital in Sorel, P.Q. embodies the most recent advances in hospital construction.

The three wings of this 150-bed hospital are laid out in a "Y" pattern to ensure a maximum of sunlight in all the rooms. Operating rooms are located on the fourth floor, private suites on the fifth. The outside walls, 30 inches thick and faced in Beldon brick, are thoroughly insulated; tile, both asphalt and vitreous, is used extensively throughout the building.

Interior walls and woodwork are finished in C-I-L Paints. In paint as in other materials, hospitals *have* to be choosy! Appearance, resistance to detergents and wear, lasting freshness, hygiene are all important factors. That is why so many public buildings use C-I-L Paints!

The Paint and Varnish Division of C-I-L is constantly keeping abreast of new developments in construction materials and techniques, creating new finishes to meet new requirements—new products to beautify and protect homes, factories and public buildings.

You can specify C-I-L Paints, Varnishes and Enamels for all interior and exterior finishing with full assurance of rigidly maintained quality, appearance and durability.

A FINISH FOR EVERY PURPOSE CANADIAN INDUSTRIES C-I-L LIMITED PAINTS **IN HOME AND INDUSTRY**

CANADIAN INDUSTRIES LIMITED

PAINT AND VARNISH DIVISION

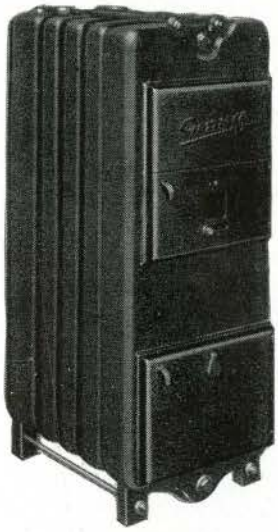
HALIFAX MONTREAL TORONTO WINNIPEG REGINA CALGARY VANCOUVER

Gurney HOT WATER BOILERS AND RADIATORS

Gurney Can Supply You With Square Boilers from 270 to 9200 Feet Water Rating

- **MODERN**—Designed and engineered to meet modern requirements—combining appearance that gains instant approval with the maximum in heating efficiency and economy.
- **TIME-TESTED**—Every unit produced by Gurney is backed with over one hundred years' experience in the manufacture of dependable heating equipment.
- **APPROVED**—by architects, heating engineers, builders and home-owners who have learned from past experience that "BUILT BETTER BY GURNEY" means exactly what it says.

You Assure Satisfaction When You Specify Gurney



NO. 1 SERIES
270-660 Ft.
Water Rating

NEW BRIGHT IDEA SERIES
930-9200 Ft.
Water Rating

NO. 518 SERIES
480-1450 Ft.
Water Rating

CAST IRON RADIATORS

A Great Name — Built Better by Gurney — *for Over 100 Years*

The GURNEY FOUNDRY CO., LIMITED

TORONTO • MONTREAL • WINNIPEG • VANCOUVER

1½ TONS

MAKE CHATCO A MORE EFFICIENT CONVECTOR

In order to assure an absolutely tight bond between convector tube and fin, Chatco hydraulically expands the copper tube with one and a half tons per square inch water pressure. This assures rigid contact between tube and fin at ALL POINTS on the periphery . . . with maximum heat transfer. The copper tubes are solidly brazed to the *bronze* headers. Galvanized iron side strips are fitted to protect the fins during shipment.

Chatco Convector Cabinets are available in floor models, semi-recessed; or flush panel models to meet every installation problem whether in homes, public buildings, hospitals or offices.

Beautiful in design, they are simple to install and economical in operation.

Write for the catalogue "Chatco Convectors"

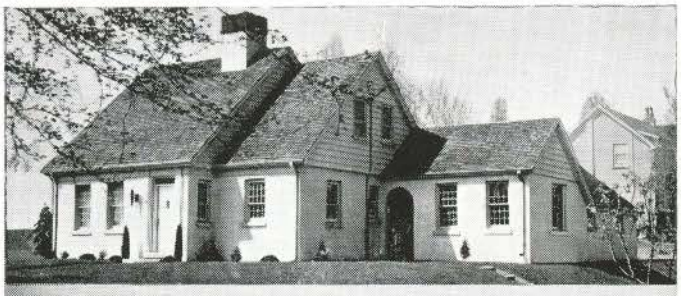
CHATCO STEEL PRODUCTS LIMITED

GENERAL SALES OFFICE — TILBURY, ONT.

TORONTO BRANCH SALES OFFICE — 69 YONGE STREET

CHATCO STEEL PRODUCTS LIMITED

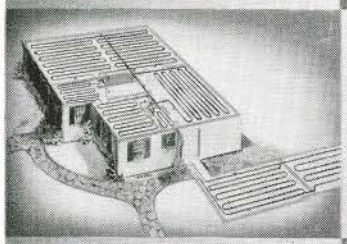
CHATCO HEAT-SPEED CONVECTORS



The Pipe-Line to Comfort
in this new home is

PAGE-HERSEY
CONTINUOUS WELD PIPE

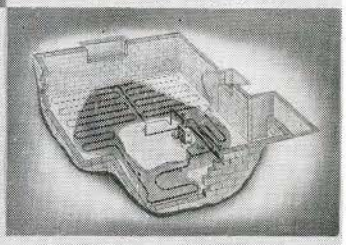
Sectional view showing pipe embedded in top floor ceiling.



OWNER: Gilbert A. Milne, Toronto, Ontario
ARCHITECT: Royal Berry Wills, Boston, Mass.
HEATING CONTRACTOR: T. B. Smyth & Co. Ltd., Toronto, Ontario
GENERAL CONTRACTOR: Gordon Haddinott, Toronto, Ontario
PIPE SUPPLIER: Bennett & Wright Limited, Toronto, Ontario
TYPE OF PIPE: Page-Hersey Continuous Weld Steel Pipe

Sectional view showing pipe embedded in first floor ceiling and garage floor.

installed for
RADIANT HEATING



Sectional view showing pipe embedded in recreation room and basement floors.

Among the many features that will be enjoyed in this house are:

- Even temperatures from floor to ceiling
- Air freshness and cleanliness
- Warm floors
- Completely concealed heating system
- Low fuel costs
- Life-long satisfaction with Page-Hersey Continuous Weld Pipe

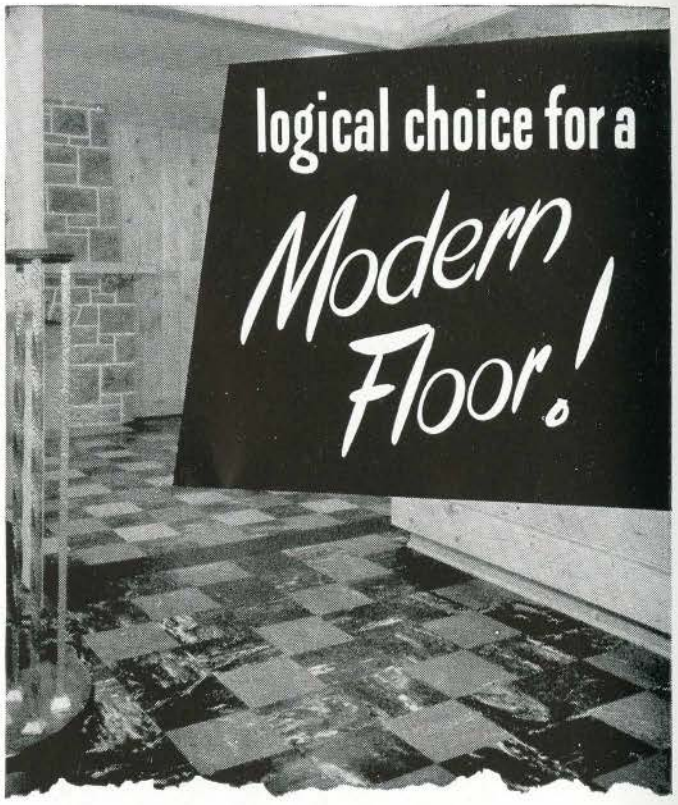
PAGE-HERSEY
CONTINUOUS WELD PIPE
FOR RADIANT HEATING

Send for this Free Booklet

It covers the most recent information on the application of Page-Hersey Continuous Weld Pipe for radiant heating in all types of buildings. Detailed and illustrated.

PAGE-HERSEY TUBES LTD. 100 CHURCH ST., TORONTO, CANADA
Branches — Vancouver • Winnipeg • Montreal • Halifax

THE LARGEST MANUFACTURERS IN CANADA OF PIPE AND TUBULAR PRODUCTS, WELDED AND SEAMLESS



Whether the sub-floor be wood or concrete, you can specify B.P. Asphalt Tile Flooring with confidence — because it has been specially developed to be laid over *either*.

Its qualities meet every floor requirement. It is—

- Resilient for quietness and foot comfort.
- Fire-resisting and waterproof.
- Tough and durable.
- Easy and economical to clean and maintain.
- Available for your specification in an attractive variety of colours and designs.

Laid by an Approved Flooring Contractor, it assures years of satisfactory service — whether in public buildings or institutions — or in hallways and rooms throughout the home.

B.P. ASPHALT TILE FLOORING

DURABLE • ATTRACTIVE

"B.P." — First in Canada to make an asphalt tile to suit Canadian conditions.

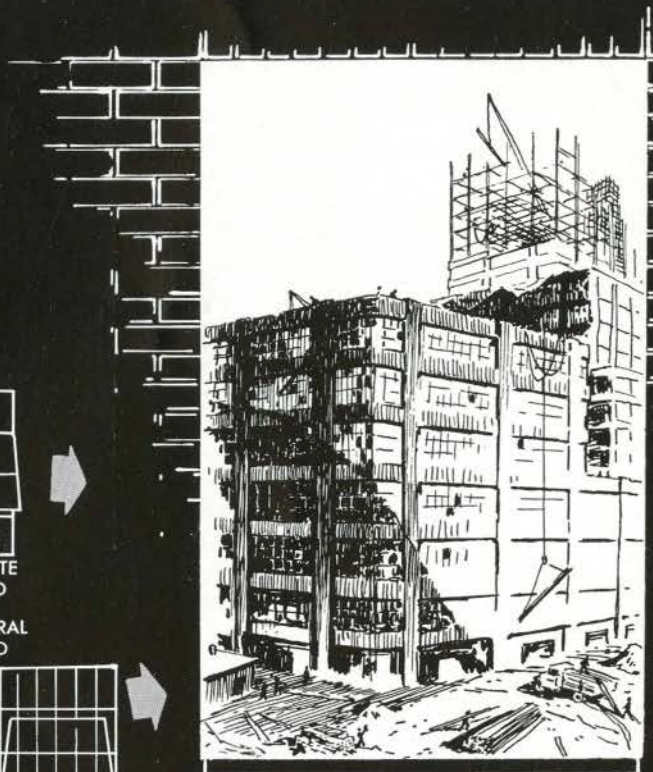
Samples and complete information on colours and sizes gladly supplied. A "B.P." representative will be pleased to call at your request.

BUILDING PRODUCTS LIMITED
MONTREAL TORONTO HAMILTON WINNIPEG
ROOFING • SIDING • INSULATION • FLOORING

BUILDING PRODUCTS BP LIMITED PRODUCED IN CANADA

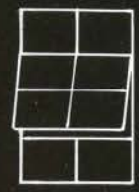
Fenestra

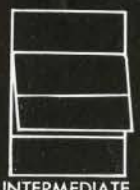
MODULAR SIZES SPEED CONSTRUCTION

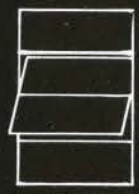



INTERMEDIATE COMBINATION WITH PROJECTED IN SILL VENT


INTERMEDIATE COMBINATION SIDE HINGED VENTS ONLY


COMMERCIAL PROJECTED


INTERMEDIATE PROJECTED AND ARCHITECTURAL PROJECTED


PIVOTED

SECURITY


PSYCHIATRIC

In co-operation with other members of the Metal Window Institute, Canadian Metal Window and Steel Products Limited announces that most types of Fenestra Steel Windows will be manufactured in modular sizes.

Some of the types and sizes of Fenestra windows are shown, these and other types are included in Fenestra's Blue Book catalogue.

Dimensional Coordination OFFERS IMPORTANT ADVANTAGES.

Formerly, each window manufacturer had his own extensive size range, without relation to the wide range of slightly different sizes offered by other makers. The new module of 20″ wide by 16″ high fits in with the accent on horizontal lines in building design with a sufficient range of sizes to give the architect plenty of scope in design and utility.

Changes in make or type of windows after plans are drawn will not affect the dimensioning of the window openings which are standardized. Thus, if it should be necessary to change to windows of another make to meet delivery requirements or to change the type of windows, this may be done after plans are completed.

CANADIAN METAL WINDOW AND STEEL PRODUCTS LIMITED

160 River St., Toronto • Montreal Address: 6565 Durocher Ave., Outremont

FOR HOME OR INDUSTRY

Fenestra

STEEL CASEMENTS

Architects... FOR EYE COMFORT... Plus eye efficiency...

A typical example of office lighting with Curtis Fluorescent Troffers, assuring high-level, glare-free illumination for maximum eye comfort and efficiency.

SPECIFY Curtis Lighting

High-level illumination without glare, and with minimum shadow and contrast, helps office workers to do more with less fatigue. Curtis lighting, planned for the purpose, assures fast, accurate, comfortable seeing.

Actual tests with improved lighting showed a 20% increase in stenographic production . . . a 27% drop in clerical errors.

Curtis Lighting adds efficiency and reduces error in every type of office work. Human eyes need light to see. The better the light, the more speed and accuracy . . . and speed and accuracy pay *high dividends.*

Whatever your lighting problem, there is a Curtis product and Curtis Lighting engineering to solve it.

Types of Curtis Lighting are as varied as the needs for them. There are scientifically styled office units as illustrated; rugged units to properly light the shop or factory; X-Ray reflectors for show window and other lighting; the new "Forty-Sixty" fluorescent luminaires, and others.

Curtis LIGHTING
of Canada Limited
195 Wicksteed Ave., Leaside, Toronto 12, Ont.

CONSULT CURTIS LIGHTING FOR ALL TYPES OF EFFICIENT ILLUMINATION

Specially suited to School requirements

VICEROY
WHALE-BONE-ITE
RUBWOOD
TOILET SEATS

This cross-section

SHOWS *WHY* RUBWOOD TOILET SEATS ARE GUARANTEED FOR 25 YEARS

Rubber Covered Fittings

Five layers of plywood . . . placed with grain crossed . . . are bonded together with alternate layers of rubber and vulcanized together under tremendous heat and pressure . . . making a core that will not warp, twist, crack or break.

A thick, hard rubber cover, when vulcanized to this core, forms a unit that is practically indestructible. This covering, polished to mirror smoothness, does not absorb moisture or odors. It can be thoroughly cleaned with soap and water . . . is not affected by acids and will withstand the strongest disinfectants.

Viceroy Rubwood Toilet Seats retain their richness of finish and sanitary features indefinitely.

Consider the importance of these features . . . *long life* and *low maintenance cost* . . . value that endures.

SMARTLY STYLED
Toilet Seats that
RETAIN THEIR RICH FINISH & SANITARY FEATURES

SPECIFY: 5-PLY HARD RUBBER Covered Seats

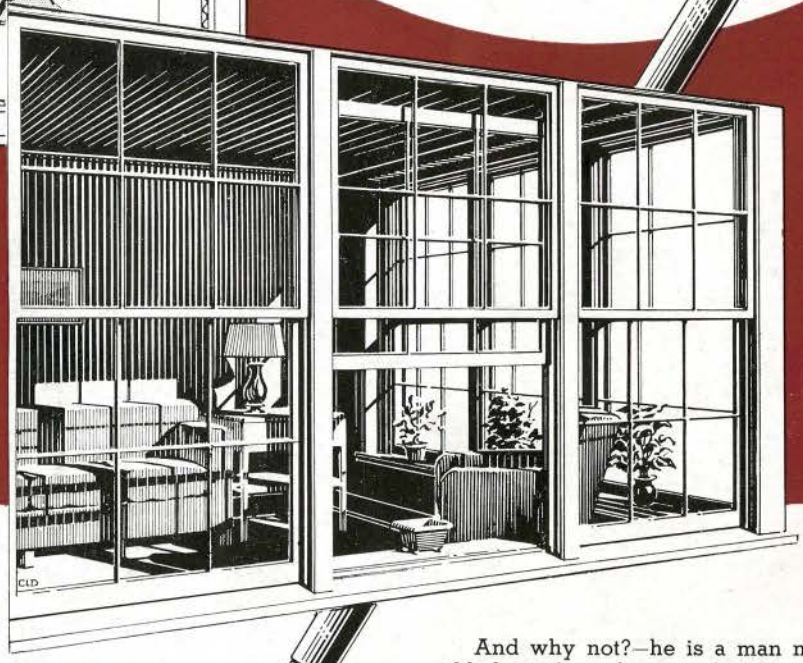
For information regarding designs and specifications write to:

MONTREAL
TORONTO

VICEROY
MANUFACTURING COMPANY LIMITED

WINNIPEG
VANCOUVER

Portrait OF A *Satisfied Client*



And why not?—he is a man now enjoying the added comfort, charm and utility derived from the installation of Unique Narroline windows in his home.

He will proudly point to the vast improvement in both the exterior and interior design of his home that will come with the intelligent usage of these well-proportioned windows.

He will show you the increased angle of vision and increased sunlight from these windows, and will specially call your attention to the smooth, easy operation that comes with the installation of Unique Sash Balances in *both* the upper and the lower sash.

He will probably sum this up with the statement that anyone contemplating building would be well advised to consult *his* architect, who saw to it that he, Mr. Client, had these features to enjoy—truly the portrait of a satisfied client.

Technical information for architects available upon request.

UNIQUE SASH BALANCE COMPANY LIMITED

604 De Courcelles St., Montreal, Que.

Distributors

1341 Dundas St. W., Toronto, Ont.

WINCO PRODUCTS

604 De Courcelles St., Montreal, Que.