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PRESIDENT . . . . . CHARLES DAVID (F)

C O N T E N T S

EDITORIAL, F. Bruce Brown, Chairman, Editorial Board . . . 314

PAINT AND PAINTING, J. C. Keeley 315

PRE-STRESSED OR PRE-COMPRESSED CONCRETE, V. S. Murray 319

ARCHITECTURAL EMPLOYMENT — CONDITIONS IN CANADA . 323

ELI LILLY AND COMPANY (CANADA) LTD. TORONTO, ONTARIO, Mathers and Haldenby, Architects 324

THE RIDLEY COLLEGE GYMNASIUM BUILDING, ST. CATHARINES, ONTARIO, Marani, Lawson and Morris, Architects . . . 328

THE INSTITUTE PAGE 333

INDEX TO VOLUME 23 339

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DECEMBER 1946

IT has been a tradition with this *Journal* for the President of the Institute to write the December editorial, and for the Chairman of the Editorial Board to write the editorial for January. This year our positions are reversed. The President will write the forward looking editorial for January and no doubt will have a word to say about the Annual Assembly to be held in February. It falls to the chairman of the Editorial Board to attempt an appraisal of the past twelve months.

AS suggested by our Editor recently there seems to be a parallel between the Phony War and the first year of Peace. Forecasts of what would happen have failed very largely to materialize in both instances. We frequently hear it said that we have won the war but that we have not won the peace. Although its meaning is clear, this is not an accurate statement. We have not in fact won the war until we have gained those objectives for which we engaged in war, and until we have succeeded in constructing a peace to insure the fulfilment of these objectives. We had not won the war on VE Day or on VJ Day, but we had accomplished the first essential step. We had gained the military decision.

THE story of international conferences held since the culmination of the Military phase has been one of high hopes followed by a sense of frustration and disillusionment. Whether it is because of the approach of the birthday of the Prince of Peace one cannot say, but at the moment of writing the negotiators at Lake Success seem to have overcome their most serious stumbling blocks. At last progress toward Peace and disarmament, progress toward composing conflicting national policies, and progress toward solution of the problem of the atomic weapon has taken a decided step forward. In spite of many past disappointments and in spite of several ominous clouds which remain on the horizon we cannot restrain a sober satisfaction that the prospect is brighter at this season for "Peace on earth, good will to men" than it has been.

PARALLEL with these political uncertainties we have been confronted with economic and social disorders. Not only international relations but social relations within the nations have undergone a great strain. We have had to learn the lesson that push button return to normal is impossible after five long years of total war, and that the obvious physical losses and disruptions whose amelioration can be calculated are perhaps easier to restore than the moral and spiritual wounds that have been inflicted.

AT a time when building materials are in short supply and when experienced help is in the same category, Architects find themselves faced with a demand for their services exceeding anything within the memory of the majority now practising. At such a time, when members of the R.A.I.C. are measuring up to strenuous demands upon their physical and mental resources it is the privilege and duty of the *Journal* to keep pace, if not the lead, in the field of Architectural thought. As a *Journal* we have cause to be humbly thankful. We have made gains during the year. We have grown in size, in circulation and in strength financially. It is our hope that we shall continue to bring to all members of the profession an increasing measure of intellectual and spiritual inspiration.

F. BRUCE BROWN, *Chairman, Editorial Board.*

PAINT AND PAINTING

By J. C. KEELEY

THE writer, in this article, proposes to confine himself to some elementals that enter into the work of plain painting, and also to give brief descriptions of the principal materials used in that work.

The average paint coating is only about three one-thousandths of an inch thick, and yet this thin coating has to stand from three to four years, sometimes longer, against expansion and contraction of the underlying surface, against rain and snow, the summer sun and the winter cold. It must have both hardness to stand to a reasonable extent, the surface wear, and yet sufficient elasticity to meet internal strain and to conform to the changes of the underlying surface. It must also penetrate and cling to the surface to which it is applied.

There is no such thing as a good general purpose paint. A paint that is classed as a good paint, and no doubt is, for the purpose for which it was designed, may prove a failure when used elsewhere. Each coat has to be tempered and conditioned by the vehicle used. (It should be mentioned here that the term vehicle, means the liquid used, and pigment, the solids with which it is mixed.) If the surface is inclined to stickiness, plenty of turpentine should be used, if chalky, of which more later, oil should be used freely.

The drying time of paint is an important factor in its length of life, especially on exterior surfaces. As soon as the paint leaves the brush the volatile oils begin to absorb oxygen; this process goes on until the paint is dry on the surface, but the oxidation goes on until, failing repainting, the paint has entirely disintegrated. Now a pigment which has a metallic base, and linseed oil and turpentine, are natural driers, but they do not dry fast enough to meet existing conditions, so the drying has to be hastened by the addition of certain metallic salts. These have to be used with discretion, because though quite necessary, they do tend to shorten the life of the paint.

White Lead

The most important of all pigments used in the painting trade is white lead — basic carbonate of lead. It is ordinary metallic lead, more refined than the lead used in pipes and such things, and is corroded by subjecting it to the action of acetic acid and carbonic acid gas. It goes through processes of washing and grinding until a fine white powder is produced, which, when ground in linseed oil, becomes the white lead of commerce.

White lead has been used as a pigment for centuries. The Greeks and Romans used a native carbonate of lead called "Cerusse"; this pigment was only found in small quantities, so it is no wonder that a method for its artificial production should have been found.

It is not known when the first white lead was produced, but the Dutch, or "Stack" method, is about three hundred years old. The white lead produced in this way was of a much better quality than the one described above, but was more costly to produce. Some American corroders claim that they still use the latter method.

It is sometimes charged against white lead, that it "chalks", that is, that after a certain length of time, according to the conditions to which it is exposed, it loses its gloss and powders off. If this happens, under normal conditions in less than three years, then the vehicles used are probably at fault. The vehicle in a finishing coat on exterior work should be 90% linseed oil, and the remainder pure turpentine.

In any case, paint has to wear out sometime: if it chalks, it is a perfect ground for repainting. The alternative is chipping and scaling, which is bound to happen if a paint keeps its gloss too long; nothing can be done then, except to burn it off.

It should be pointed out that the above applies to exterior work only.

When exposed to light, white lead keeps its colour, but when exposed to sulphurous gases it darkens, but will, however, change again if exposed to the sun's rays. It can safely be used with any colours except those containing sulphur, such as ultramarine and cadmium yellow.

Zinc Oxide

Zinc oxide is an important pigment in the making of paint. It is produced from zinc metal and is a product of combustion; the zinc metal being burned in a furnace combines with oxygen and changes to a fine white powder. Zinc oxide is not affected by any gases present in the air; neither has it any effect on any colour with which it may be used; indeed, it is rather striking to note the purity of a colour mixed with zinc, as compared to any other white pigment. It is harder than white lead, just as zinc metal is harder than lead metal.

Used alone with linseed oil as an outside paint, it becomes too hard and will eventually scale, besides which it is not sufficiently opaque; but when used with a softer pigment it makes a good paint. It is used by manufacturers in many ways, among them, the making of enamels. When ground in water it is much more opaque than in oil, and is known to users of water colours as Chinese White.

Lithophone

Lithophone is the pigment mostly used in flat white, though there are others. It was introduced in England about seventy years ago under the name of Charlton White.

Lithophone is described as precipitation of barium sulphate and zinc sulphide. When, about thirty years ago, production was commenced in the U.S. it became the pigment used in the manufacture of the then, new, flat white paint.

Titanium

Titanium is a white pigment made from an ore found in most parts of the world. It has great hiding power, more, in fact, than any other white pigment known. It is gas proof and does not darken under any conditions; it is extremely soft and when used in paint, it is necessary to add a harder pigment such as zinc oxide.

Barytes

Barytes, while not used by the painter in its natural state, is a constituent of many of the materials used by him. It is mined quite abundantly in many parts of England and Wales, in the form of large crystalline masses which have only to be ground into powder. Barytes is chemically inert and can be mixed with any pigment; it is used as a base in the manufacture of "lake" and other colours, and as an adulterant of white lead, as both barytes and white lead have about equal specific gravity. It is only fair to add though, that some chemists claim that a small percentage of an inert such as barytes, does no harm to white lead.

Whiting — Calcium Carbonate

Ordinary calcimine is made from whiting mixed with water, with glue as a binder. It is quite transparent when mixed with oil. One of its principal uses is in the making of putty, the latter being simply whiting, ground to a stiff paste in linseed oil. It is used too, as an "extender" in cheap ready mixed paints.

Red Lead

Red lead, like white lead, is a product of lead metal. The lead is melted in open kettles and kept molten until it takes up sufficient oxygen from the air, when it slowly changes to a fine red powder. It, also, has been used for a very long time and has been found among pots of colours in the remains of Greek and Roman cities.

Its value as a metal paint is well known. It is unsuitable for use as a tinting colour, or for decorative purposes, for many technical reasons as well as the fact that it fades when exposed to light and is affected by sulphurous gases. None of these defects, however, affect its preservative qualities.

Bronze Powders

All metallic powders, whether they be gold, bronze, or aluminum, come under this heading, though aluminum is the most used and perhaps the best known. They are not chemically changed to make a powdered pigment, but rather, the very thin sheets of metal are broken up into powder, actually small flakes. These powders do not mix with their vehicle as ordinary pigments do; instead they are put into their vehicle and kept in suspension by stirring while being brushed on; thus the vehicle, flowing over the surface, carries these flakes so that they level out and "leaf" over each other.

Some years ago aluminum was advertised as a primer for everything, wood included. Excellent as are its many uses, it does not fulfil the requirements of a good wood primer. The best primer for wood is a mixture of lead, oil and turpentine; the vehicle should be tempered according to the hardness or softness of the wood; the paint should be just thin enough so that some of the pigment is carried into the grain, and enough left on the surface to give a "tooth" for succeeding coats. If the primer is too heavy, the vehicle will be absorbed into the grain without carrying sufficient pigment to anchor it to the surface. That is what happens in the case of a bronze powder being used; the vehicle is immediately absorbed into the grain, leaving insufficient on the surface to bind the particles together.

If the wood is sappy, or full of resinous streaks, a coat of aluminum makes a very good sealer, but it must be remembered, that if the wood is to be finished in light colours, it cannot be expected to take the place or do the work of a coat of light paint.

Linseed Oil

Linseed oil is and has been, the principal oil used by artists and house painters as long as there is any record of painting. It is obtained by crushing flax seed in steel roller mills. After the oil has been squeezed out, it is allowed to settle, so as to remove the mucilagenous matter. It is very much improved by being allowed to age, but unfortunately, there is no time for that nowadays.

Boiled Linseed Oil

The raw oil was placed in open kettles and heated to a temperature of about 700°F., during which time, driers were added. It became heavier in body, slightly darker in colour, and dried with a tougher and more glossy film than did the raw variety. It is very doubtful if there is any oil on the market now that is really boiled, although "boiled" oil is still sold.

China Wood, or Tung Oil

This oil, though known for a long time, has in recent years, largely taken the place of linseed oil in the making of paints and varnishes. It is obtained by crushing the seeds of the fruit of the Tung tree, which originally grew only in Central China. It has since been cultivated in Florida and other places. Tung Oil is not suitable for use in its raw state because it dries with a matt wrinkled finish; but is this is overcome by the heat treatment it receives in varnish making, which is used, in turn, in the making of both flat and glossy paints.

Turpentine

Turpentine is a clear white volatile liquid made by the distillation of the sap and gum of the pine tree; the residue that remains is resin.

Turpentine in paint, performs at least three services; it helps to secure penetration of the paint into the grain of the wood or the underlying coat of paint; promotes drying, and makes a harder flatter ground for a glossy finishing coat.

Varnishes

Great changes have come about in the making of varnishes in recent years. The old types were known as "long oil" varnishes and were made from natural fossil gums, which were obtained chiefly from West Africa, New Zealand and the Philippines. The process of making was as follows: the gum was melted, the linseed oil was boiled; then the melted gum was added to the boiling oil, then both were boiled together, after which turpentine was added and the mixture was allowed to settle and age. These varnishes were elastic and had great lasting qualities. They are still used in the finer qualities of English enamels.

Now most varnishes are made from synthetic resins, the oils used being Tung, de-hydrated Castor, Oticia and Cocoanut. These varnishes are more simple in the making because the synthetic resins dissolve in the oils without being first melted. This type of varnish is quick-drying and stands exposure satisfactorily.

Flat varnish is ordinary varnish, though made thinner. The flat effect is obtained by dispersing microscopic particles of Aluminum Stearate, Zinc Stearate, or Magnesium Stearate, which give the flat effect by diffusing reflected light.

Glyptal

Glyptal is a trade name for a synthetic resin originally produced as a heat hardening plastic, to take the place of bakelite. It was used for cementing electric lamps into their connections; then it was found that by using a fatty acid, the resin became soft and pliable. Glyptal, modified in this way with fatty acids of non-drying oils, such as Castor, Cottonseed, and Cocoanut, was introduced as plasticiser for cellulose lacquers. Further modification of Glyptal resins, produced resins suitable for varnish manufacture.

Finishes made from Glyptal resins have great durability, chiefly owing to the fact that they resist the action of ultra violet rays, which, scientists tell us, are the principal causes of the breakdown of paint film.

Nitro Cellulose Lacquers

Nitro Cellulose Lacquers are known under various names, Cellulose lacquers, Celluloid Varnishes, and Pyroxylin lacquers, and have numerous uses; i.e., metal lacquers, bronze paints, leather finishes, imitation leather, toys, cheap enamels, and high grade furniture and motor enamels.

Cellulose, which is obtained from cotton plant fibre, is nitrated, or nitrogen added to it by treating the cotton in a mixture of nitric and sulphuric acid. This nitro cellulose is then dissolved in a combination of solvents, to enable spreading; gums are added to give thickness of film, plasticisers to give softness and toughness, and pigments to give opacity and colour. In direct contrast to oil finishes which dry by oxidation, lacquers dry by the complete evaporation of the solvents used.

Shellac Varnish

This is of very little use as a finish as it scratches easily, and when in contact with water turns permanently white. It is made from a fossil gum dissolved in methylated spirits. It dries and hardens by evaporation, as does lacquer. It is used chiefly as an undercoat for varnish and for sealing knots in new woodwork.

Casein Paints

In the making of Casein paints, skim milk is precipitated by the addition of an acid, but is not soluble in water until it is alkalised; this is done by adding lime, when it mixes freely. On being exposed to the air it becomes carbonate of lime, and insoluble in water. Pigments are added according to the uses to which it is to be put. Among its many uses are, wall coatings, wall paper coatings, leather dressings and textiles.

The wonder is, that this material was not produced before, because for centuries English farmers have made their whitewash from a mixture of lime and skim milk.

Colours

The Chromes are a very important group of pigments, varying in colour from a pale yellow through deep yellow and orange to bright red. The base of all these chrome pigments is Chromate of lead.

Ochres and Siennas, are among the most used too; they are earth colours and can be used with any other pigment or vehicle, also, they never change colour. They vary in colour according to where they are found. There are Oxford, Derbyshire, Welsh, and French Ochres, but the best Siennas come from Italy. They are more transparent and make clearer tints when mixed with white than do the ochres. Owing to this transparency they make good glaze colours.

Burnt Sienna is prepared by calcining the raw Sienna at a moderate red heat until it has acquired the desired shade. It varies in colour according to the raw Sienna used.

The Umbers too, are earth colours, and are found in about the same places as the siennas and ochres, except that the finest qualities come from Cyprus. The process of converting raw umber to burnt, is exactly as that used with the siennas.

Natural Vandyke Brown is an earthy deposit, but differs from the ochres, siennas and umbers, in the fact that it is largely from organic sources such as peaty matter mixed with earthy matter. The Commercial Vandyke, now mostly sold, is a mixture of burnt umber and black, and while the colours look exactly alike, the false variety has not the clarity of the natural colour when put to use.

True Chrome Green is a very valuable pigment, not only on account of its brilliance, but also of its permanence, being, in fact, the most permanent pigment known. The best qualities are pure oxide of chrome. This colour is not to be confused with the mixture of Prussian blue and Chrome yellow, usually sold as Chrome Green, as the latter does not retain its colour when exposed to light.

Iron Oxide is the base of a large number of pigments which are sold under the name of rouge, light red, Indian red, red Oxide, Venetian red, scarlet red, and others. The red oxides rank highly as pigments on account of their good colour and performance.

Prussian blue is probably the most used of all the blues. It is a very strong colouring pigment, and mixes well with any other pigment. Its one defect is that it fades when exposed to sunlight.

Ultramarine, blue, the use of this colour is somewhat restricted owing to the fact that it contains sulphur, and therefore does not combine with white lead. It can, however, be used with any other pigment.

Lake Colours are more nearly akin to dyes than to ordinary pigment colours. There are a great many of them, and the methods of making are long and complicated. Early Italian dyers used to gather the scum that formed on the top of their dye vats, dry it, and sell it to artists. This they called "lacca" from which the term Lake is obviously derived. Briefly, lakes may be defined to be compounds of an organic colouring principle, with a metallic base. Though the colouring principle was originally such substance as Persian berries and cochineal, now coal tar colours are used. They have to be made on a solid base, and for this, some inert, usually barytes, which has already been mentioned, is used.

PRE-STRESSED OR PRE-COMPRESSED CONCRETE

By V. S. MURRAY

Bridge Engineer, Department of Highways, Ontario

THE disadvantages of conventional concrete design have been known for many years. Concrete is a material with great ability to resist compression but with little ability to resist tension. As a result reinforced concrete is essentially a grouping of materials wherein the concrete takes the compressive stresses and the steel is designed to take the tensile stresses. This is true of any type or shape of reinforced concrete subject to external loads.

A few figures readily illustrate this condition. The crushing strength of good concrete might easily be in the neighbourhood of 5,000# per sq. in. (and very often is much higher) while the tensile value is hardly ever above 10 per cent. of the compressive value. As a result the tensile value of concrete must always be omitted in any calculations because of its low value and uncertain action. The strain or elastic elongation of a concrete member is equal to about .00015% before it breaks while that of steel is approximately four times as great at 20,000# per sq. in. It is therefore obvious that in no case is the concrete in a member subject to tension capable of following the steel up to its working load; long before the working load is reached hair cracks have developed.

The most serious aspect of conventional design is, however, the considerable width that must be added to any beam carrying heavy loads over long spans. This is true even when reinforcing carries the greatest part of the diagonal tension produced. The result is a high dead load to live load factor.

It is evident therefore that much further progress cannot be expected as long as the working stresses of steel and concrete are controlled by other than the best physical properties of these materials.

The remedy for the inherent weakness in concrete has been known for many years, i.e., the suppression of plastic deformation of concrete in tension. Prestressed or pre-compressed concrete construction attempts to eliminate tensile stresses under normal load conditions. The designer then is in a better position to utilize the higher compressive strengths of modern concrete and the excellent tensile value of cold drawn steel wire.

The principle of the remedy is similar to that involved in moving a number of books from one shelf to another by applying pressure of the hands at each end of the row of books. The pressure of the hands produces a beam out of materials that have no tensile value whatsoever. It is readily understandable that if a considerable pressure is applied this beam would carry a load.

The tensile weakness in concrete could be overcome in much the same manner i.e., by applying pressure by means of jacks to the concrete. This of

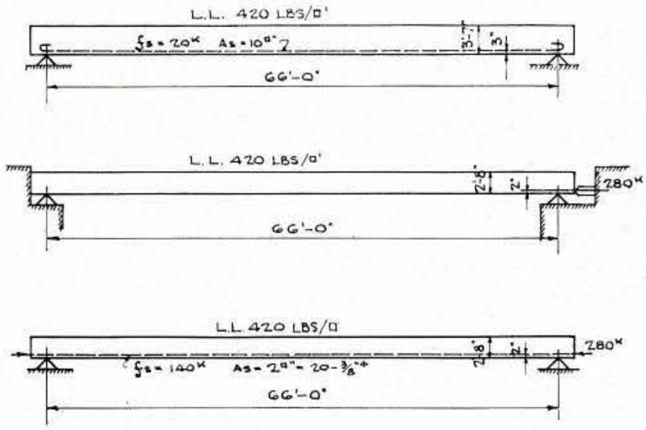


Fig. 1

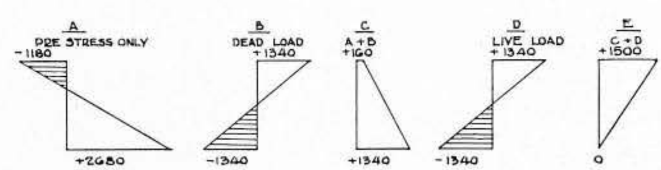


Fig. 2

course is highly impractical but it is suggestive of the application of external forces to overcome the tensile stresses produced in concrete subject to external loading. The practical application of the principle is to use high quality reinforcing to react with the concrete and so produce a beam with the concrete continually under pressure, a technique known as pre-stressing or, as some prefer to call it, pre-compressing.

A simple example (Fig. 1) readily illustrates the advantages of pre-stressing. Assume a beam of 66′ 0″ span to carry a live load of 420 lbs. per sq. ft. If we consider a depth of 43 inches and a width of 12 inches we will require 10 sq. in. of steel and will produce a concrete stress of 1,500 lbs. per sq. in. and a shear of 84# per sq. in. Now assume a beam pre-stressed by pressure only. A depth of 32 inches under a pressure of 280,000# applied two inches from the bottom fibre would give stresses as shown in Fig. 2. The maximum concrete stress at the top fibre is also 1,500# per sq. in., but there is zero stress in the bottom fibre. If we now assume that the force of the jack can be replaced by applied tension in the reinforcing it is apparent that with a conventional stress of 20,000# per sq. in., 14 sq. in. of steel would be required.

Such a large amount of reinforcing would not only be impractical but for several other reasons would not work. Plastic flow of concrete under sustained stress and shrinkage would release the greater part of the stress in the rods and there would be an additional loss due to creep in the reinforcing. These losses might cause a loss of as much as 20,000# per sq. in. in the steel. Insomuch as plastic flow and shrinkage cannot be controlled when we use cement as it is now manufactured, the only remedy is a much greater elongation of the steel. This, of course, is impossible with ordinary reinforcing steel but it is quite easily achieved with high tensile steel wire which can readily sustain a load up to at least 140,000# per sq. in.

Such wire is available in cold drawn high carbon steel in diameters up to about 0.40 in. As produced in Canada it has an ultimate strength of about 210,000# per sq. in. with an initial yield point of about 175,000# per sq. in. Using an initial and maximum stress factor of 80% of the initial yield point we would only require 2 sq. in. which can be provided by 20 ⅜″ rods. These rods can be stressed to the desired tension by any one of several methods.

It will be noticed in Fig. 2 that the pre-stress force alone produces tension in the upper fibres. At the centre of the span this is counteracted by the dead load moment. This is not the case at the support, where the moment is zero. As a result one-half of the reinforcing should be parabolic; this will produce maximum eccentricity at the centre of the span and

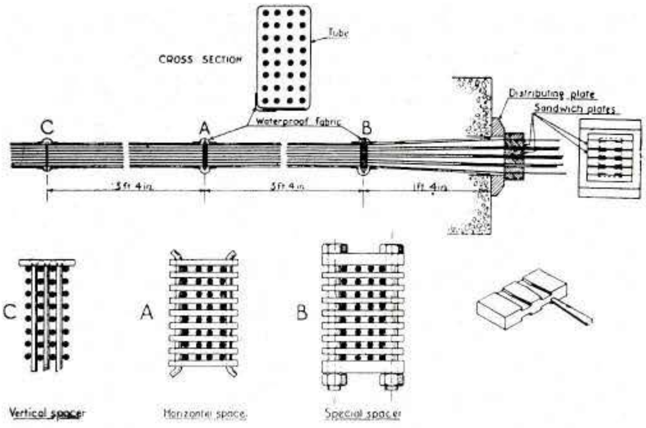


Fig. 3

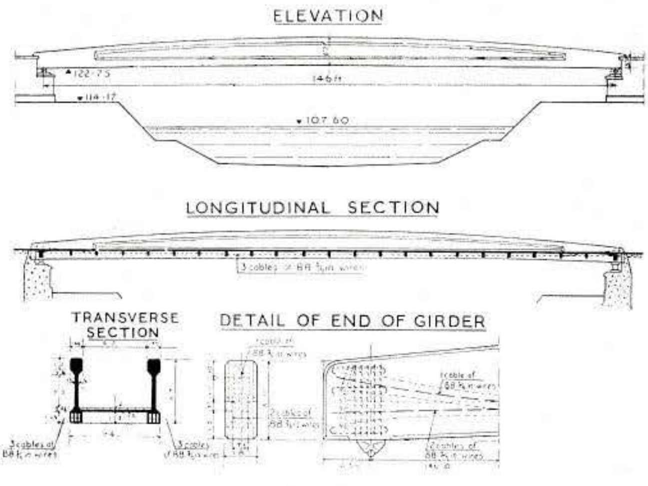


Fig. 4

uniform compression at the ends of the beam. Besides avoiding tensile stresses at the end of the beam, shear is introduced that is of opposite sign to that produced by external loading and the resulting diagonal tension is reduced.

Even under load the steel stress in a pre-stressed beam is nearly constant. In an ordinary beam the stresses may vary as much as 50% between a loaded and unloaded condition. In our beam it is a simple matter to prove that the variation in steel stress between a loaded and an unloaded condition is only about 3%.

The first practical applications of pre-stressed concrete were developed by the eminent French engineer Freyssinet. The Freyssinet process required the use of elaborate steel forms that allowed intense vibration, pressure, heat, alloy steel wire, special anchors and special jacks. This process was responsible for a great deal of remarkable work in France prior to 1939 but proved to be too cumbersome for general acceptance.

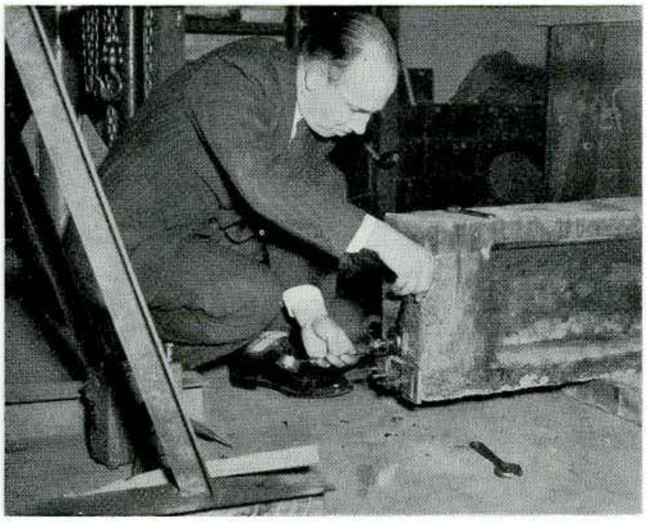


Fig. 5. — The author adjusting the anchor nuts as the heated rod expands in a laboratory test of an electrically expanded beam.

In Belgium, Prof. G. Magnel of Ghent University in conjunction with Blaton Aubert of Brussels developed a system that is relatively simple and well suited to heavy members. This system is illustrated in Fig 3. The wires are fixed in pairs to a steel plate that accommodates 8 wires. The wire is first stressed by a jack and then held in place by simply driving a wedge between the wires which are located in a grooved plate.

Figure 4 illustrates a small foot bridge designed to use this system. A considerable amount of construction work is being carried out in Belgium using this principle and it would appear to be very satisfactory.

On this continent two processes have been developed—The Schorer System which is based on pre-stressed wire units and the Bilmer Electrical System.

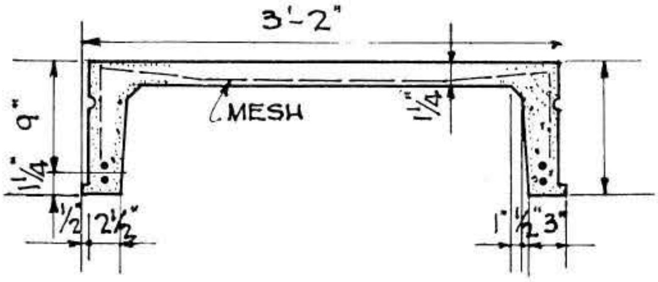
The Schorer units are composed of two groups of wire wound helically in opposite directions around a centre core. The wires are kept apart from one another and from the rod by spacer disks which are spaced close enough to permit the length of the rod between the spacers to be considered a short column. The wires are then stressed and anchored.

Units can be manufactured in various sizes depending on the size of the wire and the core rod. The completed units are then handled as are ordinary reinforcing rods. When the concrete has set sufficiently the anchors are removed and the stress is transferred to the concrete. The central rod is then removed and the hole grouted. The advantage of this system is a factory made unit that is easily handled in the field. Mr. Schorer has done a considerable amount of research on this system but as yet the units are not commercially available.

In the Bilner electrical system the rods are first coated with a thermo plastic and then may be handled as ordinary reinforcing rods. When the concrete has hardened sufficiently an electrical current of about 300 amperes and 2 volts per ft. length of rod is applied to the rod. The rod as an element is heated, melting the thermo plastic and then expanding. When it has extended the desired amount the nuts or anchorage is fixed and the current shut off. The operation takes about two minutes. This method is simple, practical and economical.

Where wire of ⅛" diameter is used no anchorages are required. The wires once extended will anchor themselves in about two inches of concrete up to very high stresses.

The advantages of pre-stressed concrete are many and there would appear to be no good reason why Canadian architects and engineers should not make use of them. In the field of bridge design there are great possibilities. The maximum economic deck span (beam and girder type) is now in the neighbourhood of 100' 0" with a span to depth ratio of 12 to 1 and a dead load to live load ratio of about 4 to 1. Pre-stressing makes it practical and economical to span at least



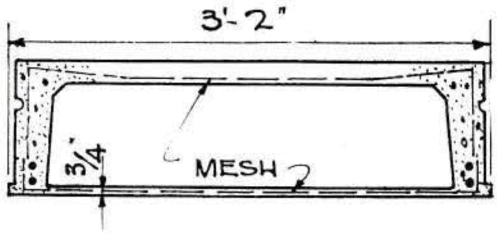


Fig. 6

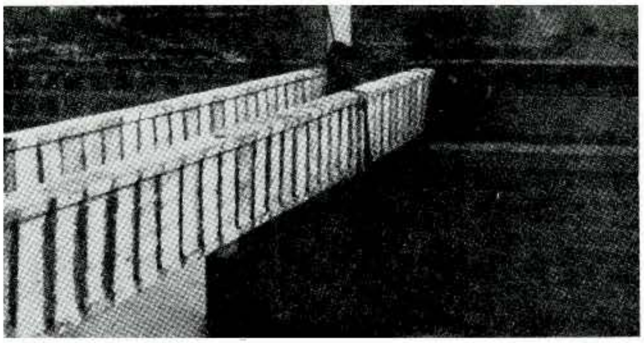


Fig. 7

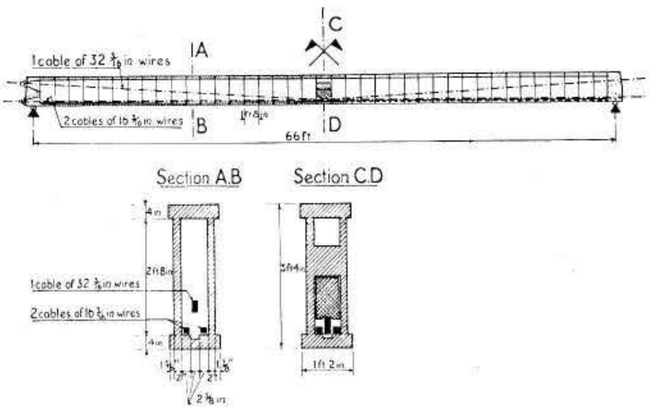


Fig. 8

200' 0" with a span depth ratio of 24 to 1 and a dead load to live load ratio of 1 to 1 or less. The same benefits could well be applied to the building field; much longer spans with no increase in depth. The high shear resistance of pre-stressed sections make pre-fabricated floor sections as in Fig. 6 readily available to span a considerable greater distance than is now possible. It is a simple matter to design sections with a span depth ratio of 40 to 1 to carry normal floor loadings. The advantages of such products are easily seen in fewer columns, lighter footings as well as some saving in head room. Under loading pre-stressed beams of any type appear to have a reasonably straight line relationship between load and deflection. In designing such members, it is found that the economical shape of any unit does not necessarily coincide with conventional design. The high shear value in pre-stressed members allow much thinner webs than is normally the case and as a result flanged or box girders are found to be most advantageous.

Of interest to Canadians is the fact that the Royal Canadian Engineers built two bridges over the Ghent to Ternuezen Canal in Belgium, Fig. 7, to carry four pipelines. Each bridge was comprised of two girders made up of hollow concrete blocks of the type shown in Fig. 8. The girders were assembled on shore and erected by a crane.

The use of hollow pre-stressed blocks offers many interesting possibilities in the pre-stressed field. Such blocks can be manufactured with factory precision and merely assembled and stressed on the job. This method readily lends itself to the building of tanks, silos, poles, piles, floor beams, columns, etc.

Pre-stressed concrete columns can be loaded at least as high as the applied pre-stress force, which might be 2,000#/□", as long as the rods are in touch with the concrete. In a recent test a 4-in. x 4-in. x 20 ft. column was loaded to the crushing strength of a short prism before buckling or failure occurred. This would indicate that there need be no fear of buckling in long, narrow pre-stressed beams.

Concrete poles and concrete piles would have much to gain by pre-stressed design. Due to the initial compressive stresses such members offer excellent resistance to deterioration in both air and water as well as great resistance to abuse in handling. Tests on pre-stressed poles by reversed bending show them to have an almost indefinite life while the conventional pole is destroyed in a few thousand cycles.

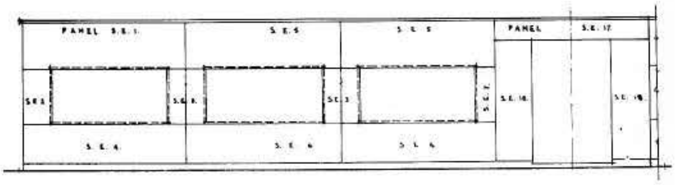


Fig. 9

A field that is as yet untouched is large pre-stressed building panels. Such panels can be made up in a great variety of sizes and shapes. Fig. 9 illustrates their possible use in a warehouse. Such units would be fireproof and permanent and should be economical. A pre-stressed wall unit would eliminate any possibility of cracking and would require little or no maintenance. The same scheme could of course apply to any type of building. A combination of long clear spans, relatively light weight floor and roof units and large wall panels would seem to have much to offer.

Pre-stressing is as yet an undeveloped field in Canada. The work that has been done in Europe would indicate that its practical application is both advantageous and economical.

ARCHITECTURAL EMPLOYMENT—CONDITIONS IN CANADA

From many different points in the Empire, enquiries are being received by the Royal Architectural Institute of Canada and its members, regarding the prospects of Professional employment and opportunities for practice in Canada. The general outline which follows is an attempt to answer these enquiries.

At the present time, the situation is as elsewhere, rather unsettled and some hesitancy is evident. There is a fairly large volume of work in prospect, which includes the accumulated back-log from the war years.

There is a shortage of experienced draughtsmen. There is also scarcity of both essential materials and skilled workers in some branches of the Building trade. The rapid increase in the cost of construction is causing apprehension, especially in the field of housing. Such are the present conditions. The construction industry anticipates a period of much activity when present difficulties are overcome.

As to the prospects for the newcomer on the scene, it is but fair to point out both the possibilities and the difficulties.

The four Canadian Schools of Architecture are crowded with students. In the natural course of events, most of the graduates of these schools will find places as practising members of the profession, and the numbers should fulfil population demand.

It must be pointed out that Canadian practice follows American rather than English practice, and therefore, both Architects and Architects' assistants emigrating to Canada must be prepared to adapt their background of knowledge and competency to conditions which will have to be thoroughly assimilated if the newcomer expects to succeed.

The conditions referred to include building methods, unfamiliar materials, presentation of drawings and details, the law as it affects architects and building contracts, details of construction as developed to meet climatic conditions, the relation of the Architect and the Contractor, all of which differ in whole or in part from English practice. Knowledge of such things can of course be gained by enrolment in one of the four Architectural Schools, but for the practitioner already qualified in another country, the only practical way to gain sufficient experience of Canadian requirements to qualify for practice in Canada, is to work under a Canadian Architect.

It is not the intention of these remarks to discourage those who are interested, but it would be unfair to minimize the difficulties. Many Architects now practising with success in the Dominion came from other countries, but of these very few came as fully fledged Architects. Most of them were in their twenties on arrival, and with a thorough background of Old Country training they were not too old to assimilate that knowledge which is necessary to success in any special area of application.

It must also be said that of the Architects of more mature years and experience who emigrated to Canada, some found the way both hard and discouraging because their advanced experience proved a handicap to the necessary adaptability.

Let not these warnings be misunderstood – Canada owes much to Architects from older lands and is not unreceptive to their latter day skills and techniques, which so amply demonstrate that architecture still lives as a creative art. But – the mere transplanting of such skills and such techniques to Canadian soil is not enough. There is a body of sound Canadian practice which has been built up on a basis of local knowledge hardly gained, and any transplanting must be nurtured with the application of that knowledge.

To sum up: Opportunities for the right parties are without doubt present in Canada, but this opinion must be qualified by the warnings before mentioned.

The choice of location is something which only experience and temperament can determine. No country on earth offers a wider choice of climate and amenities.

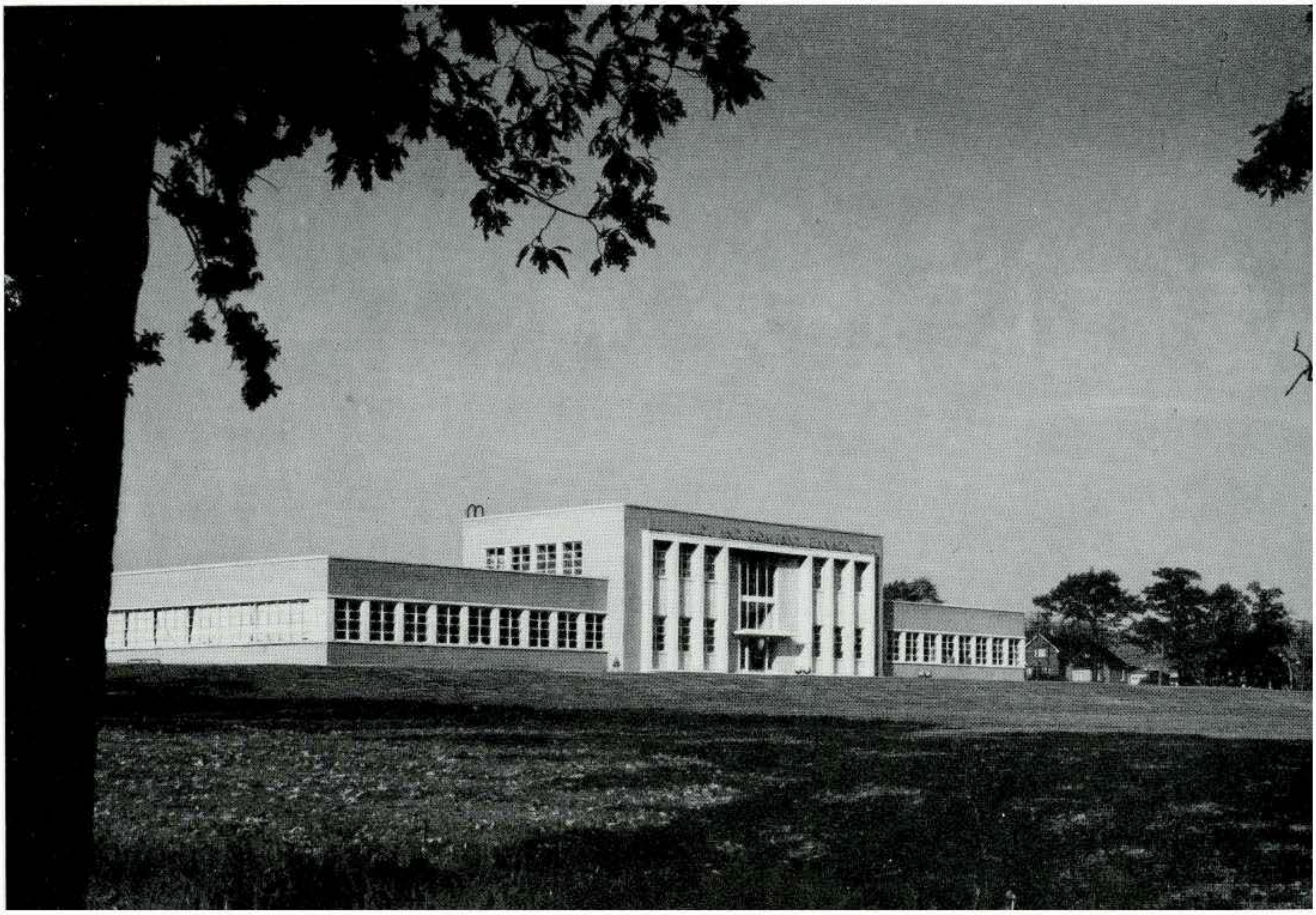
Architects like other groups include all sorts and conditions of men. Canadian Architects are no exception, but it may fairly be said that the profession as a whole offers a welcome to well trained respresentatives from all parts of the Empire.

In the final analysis, ability, character, hard work, and a faculty for adjustment are the requirements for success in the practice of Architecture in Canada, as in every other field.

In all Canadian provinces the practice of architecture is governed by regulations set up under provincial law. There are variations in such laws, as between provinces.

It is most desirable that architects holding certificates to practise in other parts of the Empire should make preliminary enquiry as to their status, if proposing to settle in Canada. Such enquiry should be addressed to the Secretary of the Royal Architectural Institute of Canada, 74 King Sreet East, Toronto, Ont., Canada.

The proposed location in Canada should be mentioned and the Institute will then refer the enquiry to the appropriate Provincial Association of Architects for reply.



Photography by R. E. Heise

ELI LILLY AND COMPANY (CANADA) LTD. TORONTO, ONTARIO

MATHERS AND HALDENBY, ARCHITECTS

The Toronto Laboratory of the Eli Lilly and Company (Canada) Limited, illustrated in this issue, houses the production processes of the company which produces a line of ethical pharmaceuticals. Because of the nature of the products, great cleanliness was a primary requirement for the building both inside and out.

As an insurance against dust and dirt from streets and neighbouring properties an unusually large site was acquired which permitted the building to be set well back from all boundaries.

Inside, all walls and partitions including those in the office section are faced with glazed structural tile in a shade called Eye-Rest Green.

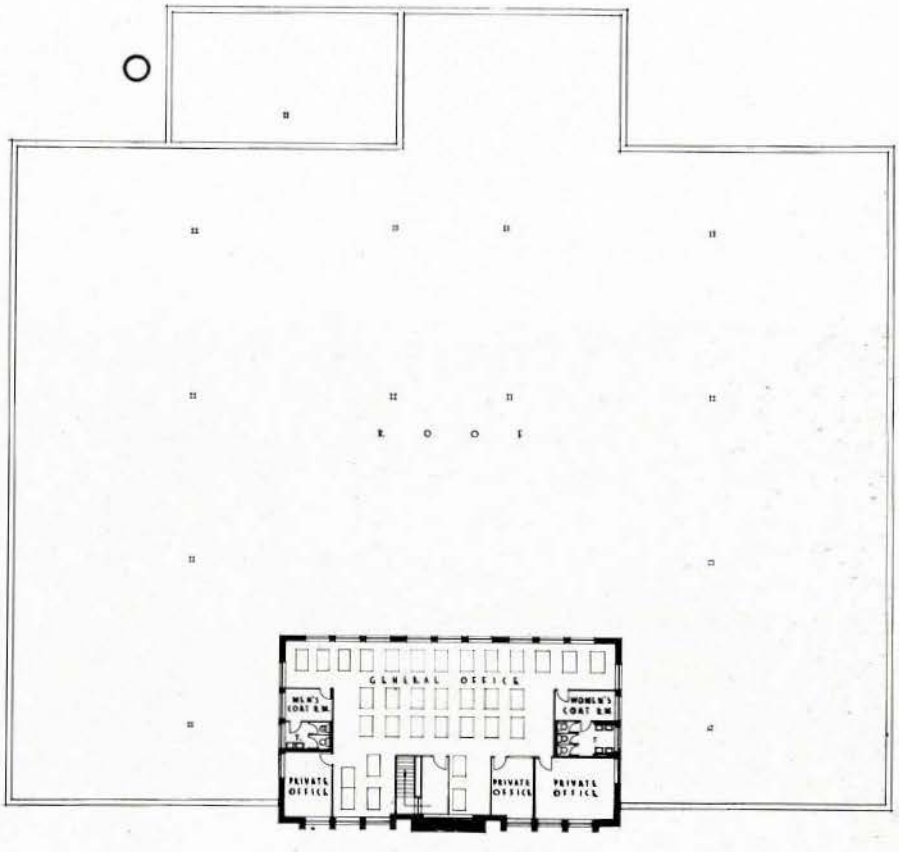
All ceilings throughout are plastered and enamelled. The floors excepting in certain rooms are of concrete finished smooth by machine and treated with a non metallic hardener. Lighting is by fluorescent fixtures.

The Entrance Lobby and the General Manager's Office are finished in lime oak veneer and a terrazzo floor in buff and green has been used in the Entrance Lobby. The floors of the Offices, Cafeteria and Recreation rooms are of asphalt tile. A quarry tile floor was laid in the Kitchen.

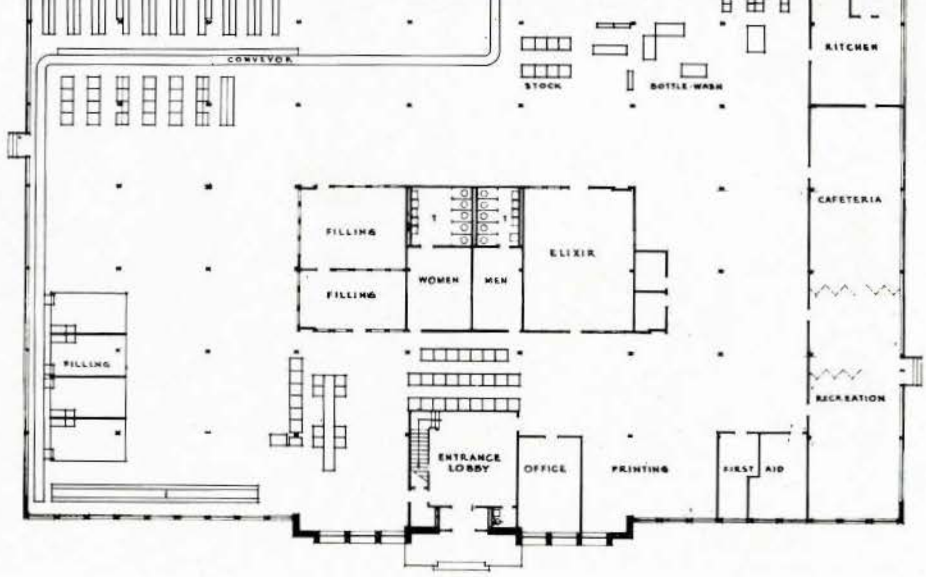
Exterior walls are of red pressed brick laid in English bond and trimmed with buff Tyndal stone. All windows are of steel of the commercial projected type. The structural frame is of structural steel carrying a precast Haydite roof slab insulated with 1" of fibre board and covered with 20-year bonded felt and gravel roofing. All flashings are of sheet copper.

Provision has been made for lateral expansion of the building at both ends and for extension of the office section to the north.

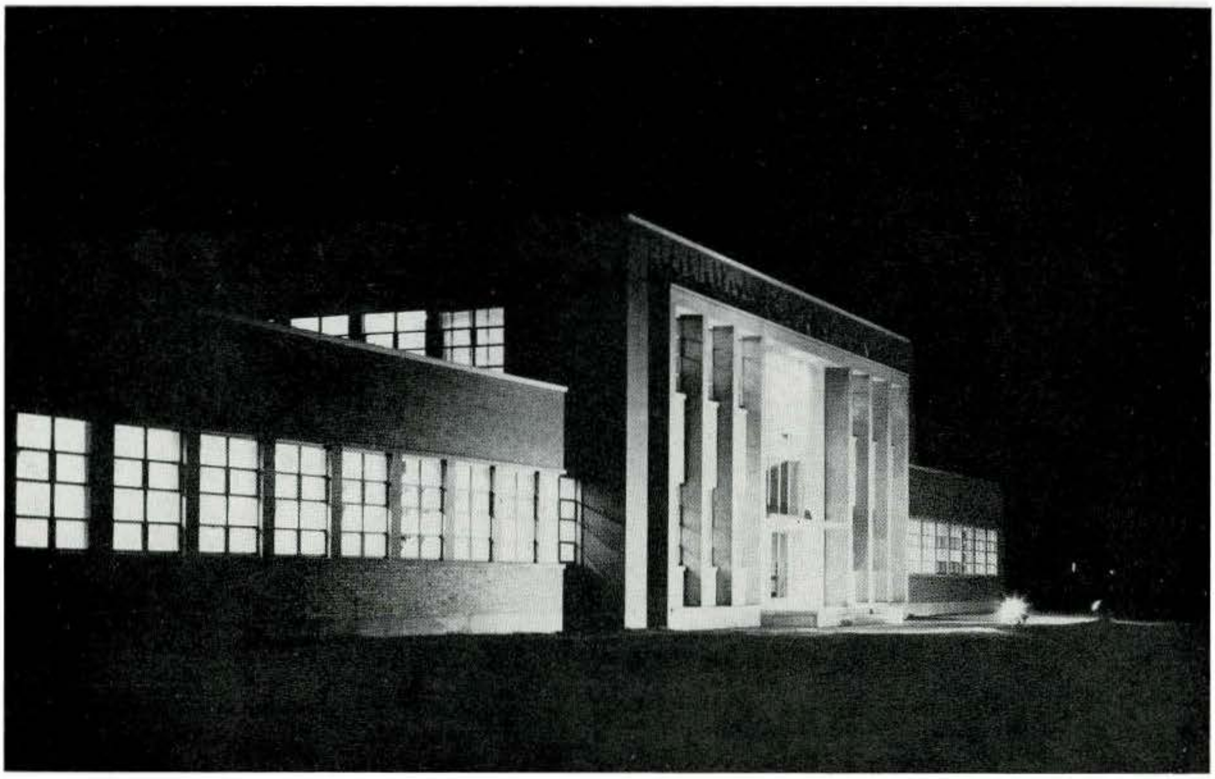
The general contractors were Anglin-Norcross Ontario Limited.



SECOND FLOOR PLAN



FIRST FLOOR PLAN

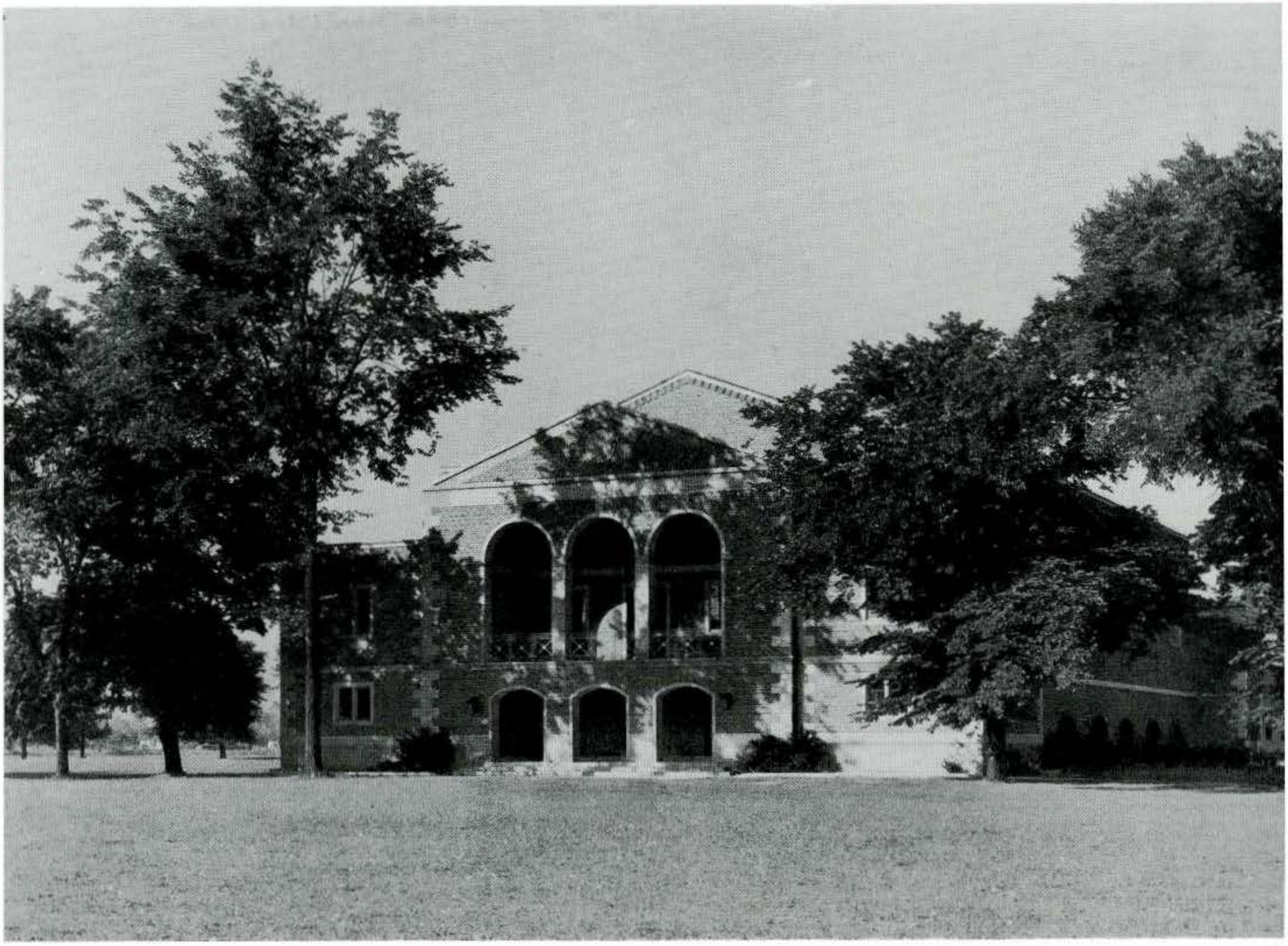


EXTERIOR FLOODLIT

DETAIL OF MAIN ENTRANCE

GENERAL OFFICES, SECOND FLOOR

ENTRANCE LOBBY, GROUND FLOOR



THE RIDLEY COLLEGE GYMNASIUM BUILDING, ST. CATHARINES, ONTARIO

MARANI, LAWSON AND MORRIS, ARCHITECTS

Ridley, a boarding school of about three hundred and twenty boys, is situated on a plateau some one hundred and thirty feet above the valley of the Twelve Mile Creek which here formed a part of the original first Welland Ship Canal. Across this valley, the third or possibly the fourth generation of Ridleians may now pause to glance at the distant spires and roofs of the City of St. Catharines.

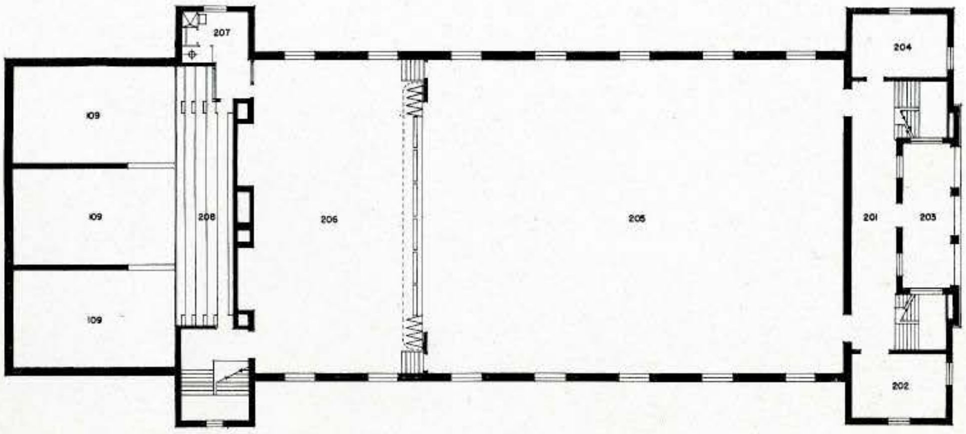
The plateau provides more than ample space for the extensive playing fields, but convenient building sites are very restricted because of the ground contours, the nature of the clay subsoil and the lack of early planning.

The original Gymnasium Building, built in 1909, was placed so as to be convenient for the use of both Upper and Lower Schools. When after thirty years this building became outgrown and obsolete, it was necessary to demolish it, as this was the only convenient site for the new building.

The instructions of the Head Master were that as many activities as possible should be provided for as many boys as possible in the new building. Basketball — Badminton — Squash — Swimming — Boxing — Fencing and Wrestling may all be going on at one time, or alternately a P.T. or Gym class may use the main Gym while amateur theatricals, deck tennis or badminton are being practised on the stage or small Gym. At this time, the boxing space may be used for rifle practice.

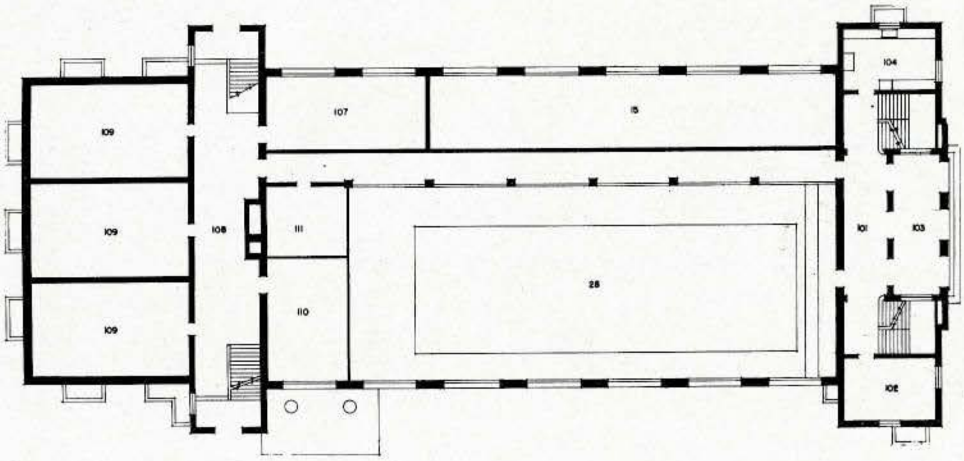
As well as the usual dressing rooms, showers, etc., accommodation is provided for a Cadet Corps Armoury, an Orderly Room, a Kitchen for serving tea either on the Campus or in the building, and stage and apparatus store room. Folding chairs for five hundred or more spectators are stored under the stage which, although normally used as a small Gym, is equipped with all the necessary lighting and tackle for theatrical work.

The exterior of the building is designed to harmonize in scale and colour with the other buildings on the grounds, all of which, with the exception of Sproatt & Rolph's famous stone chapel, are of a mellow red brick trimmed in limestone.



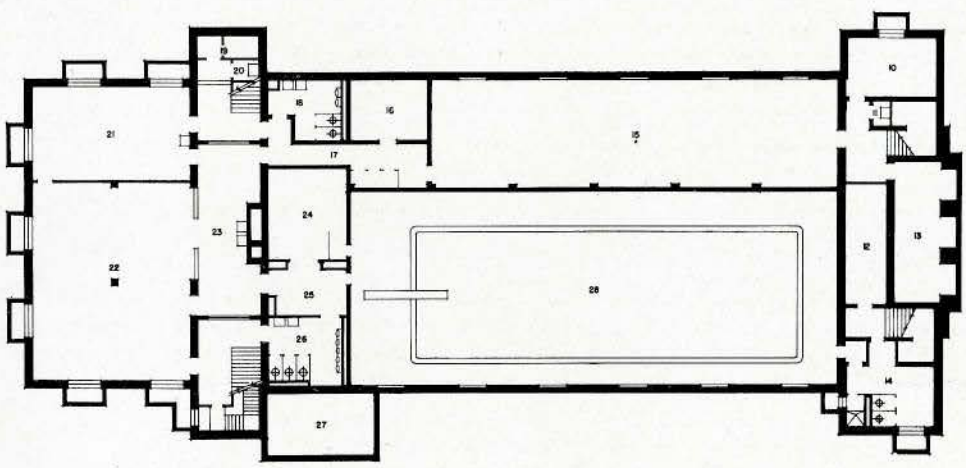
SECOND FLOOR PLAN

201 Hall
202 Apparatus Storage
203 Balcony
204 Orderly Room
205 Gymnasium
206 Gymnasium
207 Instructors Room
208 Gallery
209 Upper Part of Squash Courts



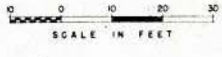
FIRST FLOOR PLAN

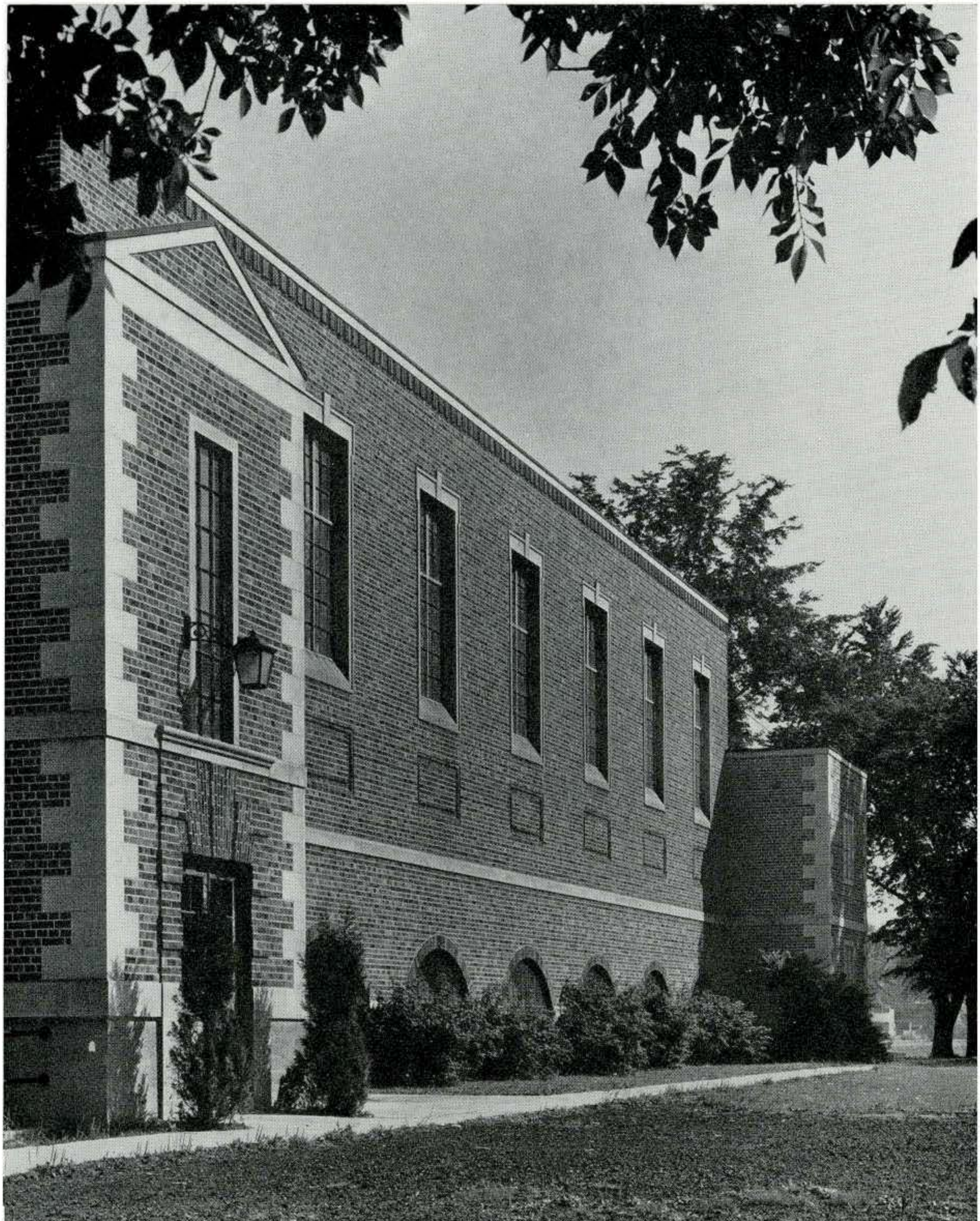
101 Hall
102 Office and Coat Room
103 Portico
104 Kitchen
15 Upper part of Recreation Room
28 Upper part of Swimming Pool
107 Cadet Corps Storage
108 Hall
109 Squash Courts
110 Storage
111 Instructors Room



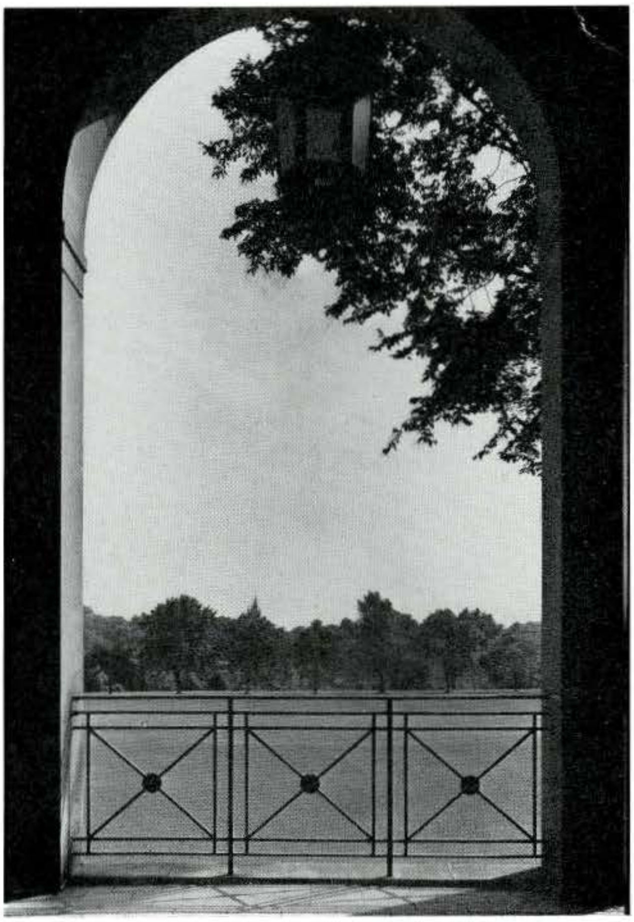
BASEMENT FLOOR PLAN

10 Storage
11 Janitors Closet
12 Storage
13 Ladies Coat Room
14 Ladies Dressing Room
15 Recreation Room
16 Drying Room
17 Corridor
18 Toilet
19 Tranformer Room
20 Janitors Closet
21 Dressing Room
22 Dressing Room
23 Hall
24 Shower Room
25 Passage
26 Toilet
27 Coal Bunker
28 Swimming Pool

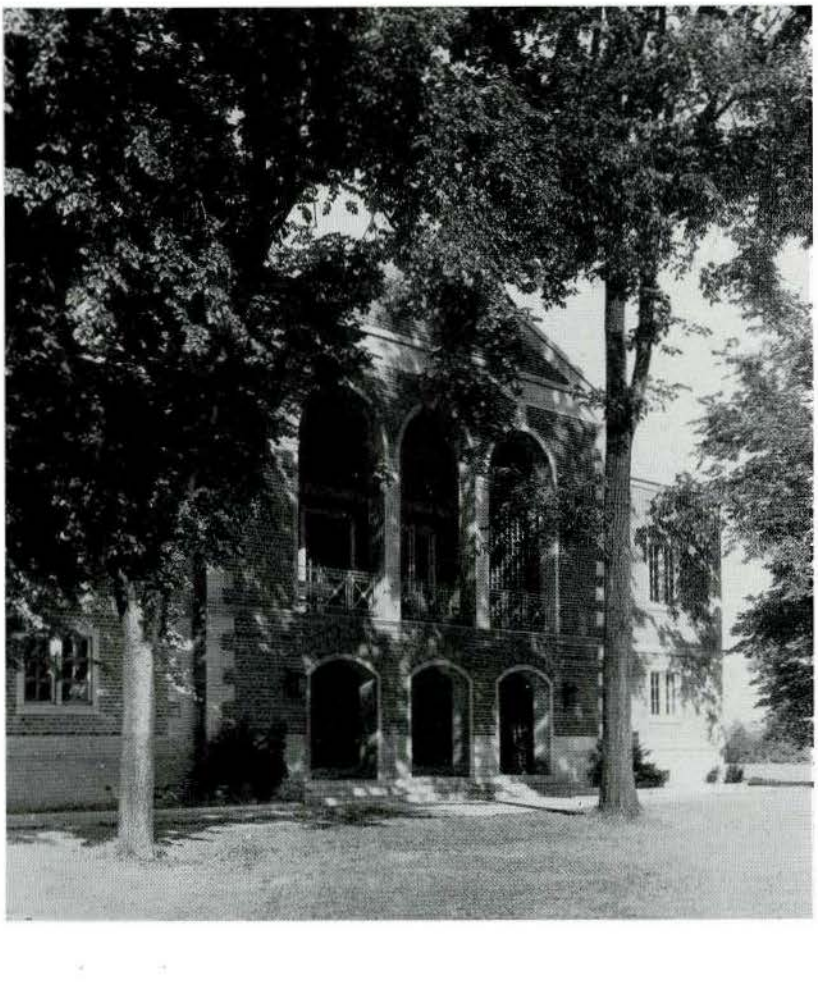




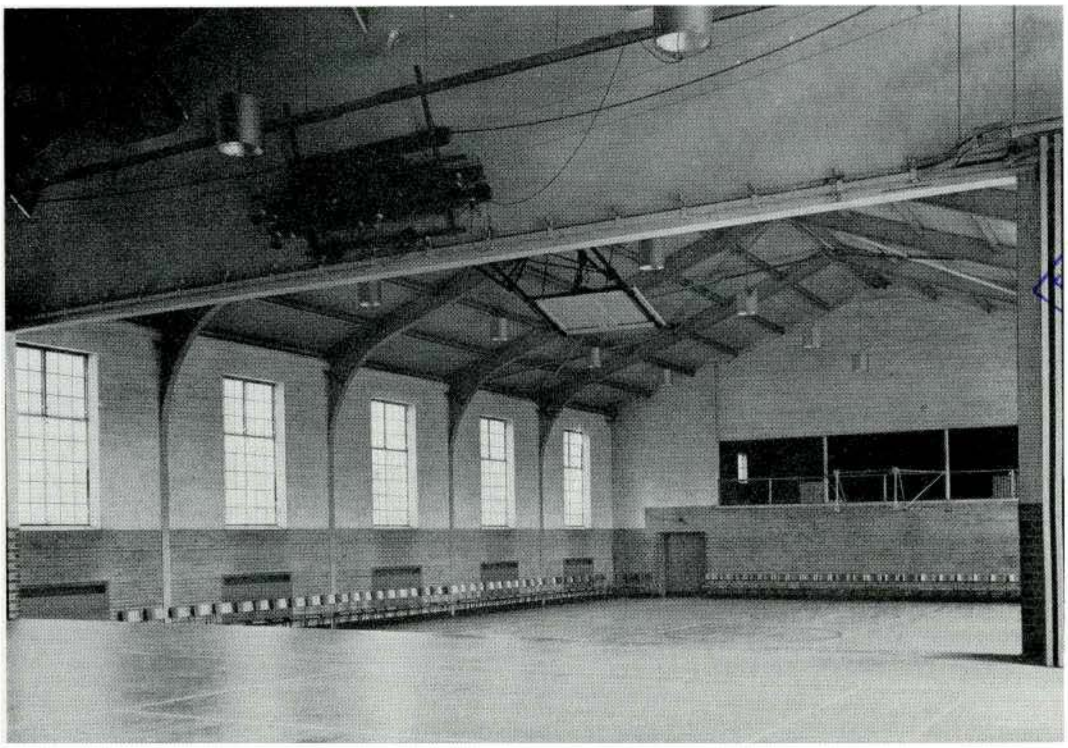
SIDE ELEVATION



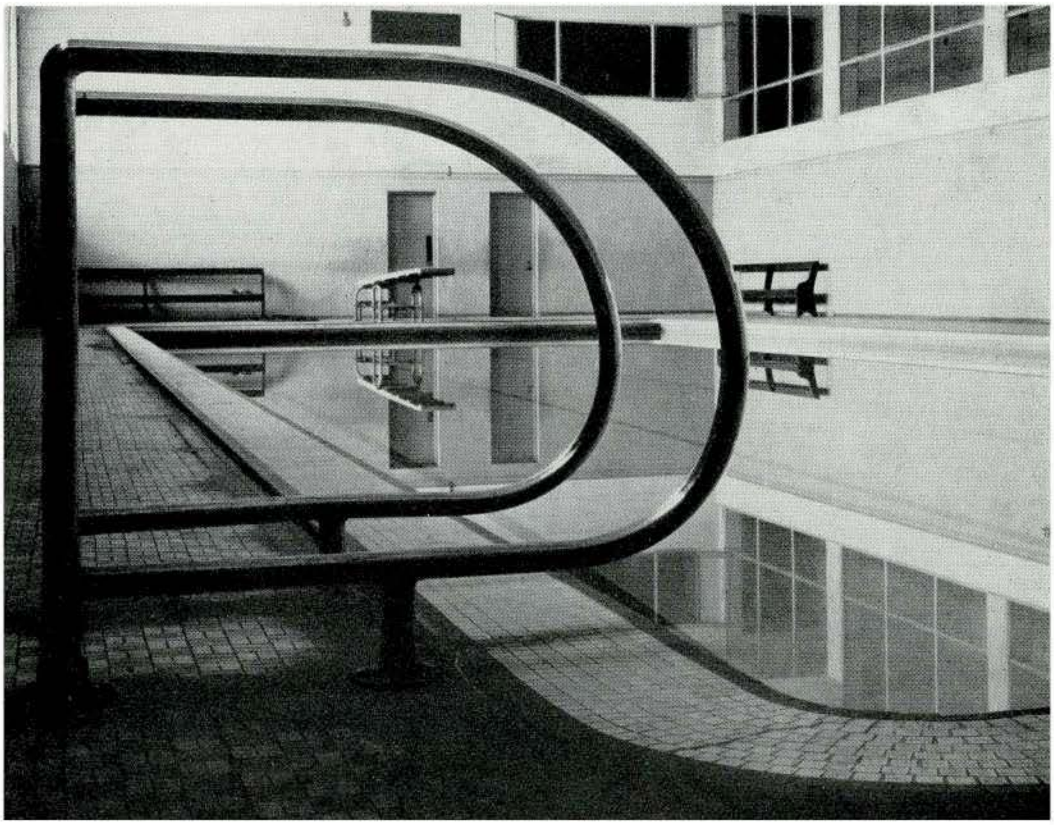
VIEW OVER MAIN CAMPUS FROM BALCONY



DETAIL OF MAIN ENTRANCE



VIEW OF GYMNASIUM FROM STAGE



SWIMMING POOL

ROYAL ARCHITECTURAL INSTITUTE OF CANADA

☆

INSTITUTE NEWS

Despite the counter attraction of football and all outdoors calling, a well attended meeting of the Executive Committee of the Council was held in Montreal on November 18th.

With the President in the chair, a varied and interesting agenda was dealt with.

There follows a synopsis of matters of general interest.

Civil Service Commission and The R.A.I.C.

During the tenure of the immediate Past President, Mr. Forsey Page, an arrangement was effected with the Civil Service Commission, whereby the President was consulted when applications were under consideration for the appointment of Architects to the Public Service. It being desirable to carry on with a good work well started, the Executive Committee requested Mr. Page to continue to act as the Institute Representative in this matter.

Canadian Council of Professional Engineers and Scientists:

Despite the somewhat ponderous title of this organization, the R.A.I.C., as a component member has been happy to co-operate with representatives of other professional bodies in the consideration of matters of common interest, Mr. W. J. Abra, recently appointed as the Institute Representative on the Canadian Council, submitted a report and request for guidance on several points.

The C.C.P.E. & S., is preparing a pamphlet for student guidance, and requested material on Architecture as a profession. Since the R.A.I.C. brochure on "Architecture as a Vocation" is now in the hands of the printer, it was decided that there should be no overlapping, especially as the brochure will be readily available in the quarters where it is most needed.

The request from the C.C.P.E. & S., for the Institute reaction to the report of the Royal Commission on Administrative Classifications in the Public Service was referred to Mr. Gordon Pitts for study. Arising out of this request, there was considerable discussion regarding the use of the title "Architect" in certain graded Civil Service classifications. This is not a new matter; representations were made some years ago as to the curious situation whereby the use of the title "Architect" is restricted by Provincial Law in respect to those in private practice, whereas in Government Service there are such classifications as Junior Architect, Assistant Architect, Senior Assistant Architect and so on. The incumbents of such positions may be Architects registered with a provincial association, or they may not. The Executive Council felt that the time is opportune for a renewed approach to the Civil Service Commission. It is anomalous, to say the least, to have people classified as some grade of Architect in their public capacities, and unrecognized as such in the outside world. A simple transposition of words would effect a remedy except in the case of the "Junior Architect". The Assistant Architect could be designated as the Architect's Assistant, and the Senior ditto, as the Senior Architect's Assistant.

National Film Board Library:

The Executive Council considered a report from the Editorial Board, relative to the proposed Agreement between the N.F.B., and the R.A.I.C. Some doubt was expressed as to the possibility of persuading commercial photographers to surrender their negatives for inclusion in Library files, but a solution of this difficulty was indicated in a letter from a member in which he stated that it was possible to obtain duplicate negatives at nominal cost.

Since no objection had been raised by the Editorial Board, the Executive Committee decided to complete the Agreement on behalf of the Institute.

Duty on Plans:

Under a recent amendment to the Customs tariff, certain engineering plans are admitted to Canada from the United States free of duty. The President reported that he had received a communication from one of the Provincial Associations regarding this matter. Representations are being made to the Government by those directly and adversely affected. When the amendment was introduced, the responsible Minister, Mr. Abbott, assured the House that the Regulations did not refer to architectural plans. In view of this assurance, there appears to be no ground for action by the R.A.I.C. Of course if any clear cut contravention of the amendment should be revealed, with respect to architectural plans, the Institute will take action at once, on receipt of detailed particulars.

Public Information:

A further report by the Chairman of the Public Information Committee, Mr. J. Roxburgh Smith, had been forwarded to all Committee members and to the Secretaries of Provincial Associations on November 12. It contained full information regarding the proposed organization within the Provinces for the lecture tour by Mr. Oswald P. Milne, F.R.I.B.A. The suggested plan as outlined in the report was that the members of the Public Information Committee in each Province form a sub-committee for the purpose of arranging the details of the tour within their Provincial boundaries. These sub-committees should make the necessary contacts with the educational authorities within the Province, decide which centres in the Province should be visited, arrange for lecture halls, supervise the release of prepared publicity concerning the tour and the lecturer, and generally prepare the itinerary for that Province.

Annual Meeting:

Annual Meeting arrangements held an important place on the Agenda. The meeting is to be held in Montreal on February 20th, 21st and 22nd, 1947, and tentative arrangements have been made to hold some sessions at the University of Montreal. It is hoped that visiting delegates will be housed at the Windsor Hotel. The Annual Exhibition of Students' work will be on view for the duration of the Assembly. The Executive Committee approved the usual grants to the Provincial Associations, to assist in sending delegates to the Annual Meeting.

Other Business:

Several other matters of interest were presented to the Meeting. The President read a letter which he had forwarded to the Minister of External Affairs, requesting that Canadian Architects be appointed to design any legations or embassies which the Canadian Government planned to erect in foreign countries. Mr. Smith reported that he and the President had attended a recent meeting of the Canadian Arts Council to bid farewell to their President and their Secretary-Treasurer who were leaving to attend the UNESCO Conference in Paris.

The last meeting of the Executive Committee for the current year is scheduled to be held in Montreal on December 14th.

A. J. Hazelgrove

ALBERTA

An exhibition of Dutch architecture, modern and historical, has, after being exhibited elsewhere, been shown in Edmonton by the Edmonton Museum of Arts who are to be congratulated on the way in which they have done this. The exhibit was prepared by the government of Holland. It gives what might be called the concentrated essence of Dutch architecture. In comparatively small space it covers very efficiently a wonderfully wide range of subjets. It shows the historic evolution of architecture in Holland, the characteristic national treatment of public, of industrial and of residential buildngs, their applicatons of modern methods of construction and materials, the handling of low cost housing, the advances in planning of cities and suburbs. All these and more are set forth in small space and illustrated by photographs, drawings and statistical information in a way that he who runs may read. This fairly corresponds with that definition of a good museum as a connected series of labels giving complete information and accompanied by illustrative objects. It is a model of good exhibition.

Holland here claims to have been first in the field with several modern methods — the open-air school in Amsterdam by P. Bijvoet and J. Duiker with the first application of radiant heating in ceilings, and a factory at Rotterdam in 1929 by J. Brinkman and L. C. Van der Vlugt with complete external curtain wall construction.

Old buildings range from the church of St. Servaas at Maastricht of 900 A.D. to recent times. The town hall of Middleburg of 1502-1513 is shown in its complete and in its present war devastated condition. With this one may compare the modern town hall at Hilversum by W. M. Dudok with its uncomprisingly square forms yet with a picturesque arrangement that gives it appeal to a wide range of temperaments. By the same architect a public school at Hilversum surprises and delights one with its plain white walls and a thatched roof. Beside this another of his schools is built of brick and is flat roofed. In this case the thatched roof steals the show.

Of special interest at this time is Holland's handling of the low cost housing question. Low cost appears to have been achieved largely by a reduction in size to an extent that would not be permitted under the Canadian National Housing Act. Our act requires that at least one bedroom shall have a floor area of 110 sq. ft. and a minimum for others of 80 sq. ft. with 9 and 7 ft. as minimum widths. Some of these Dutch examples show smaller and larger roms at 6.6 ft. in width and 13.4 and 9.8 ft. in length giving about 90 and 63 sq. ft. respectively. None of the buildings shown has a basement. This is probably impossible in a country where they say, "God made the sea and we made the land." In the low cost houses bathrooms are not provided. W.C.'s are arranged internally. Laundering, clean-up and general storage appears to be done in the kitchens which in some cases are of the 63 sq. ft. area. This compression of accommodation would apall the average Canadian housekeeper and is probably a high tribute to Dutch efficiency in housekeeping. We demand more space. Actually thousands of our people are being crowded into far less adequate living room.

In one low-cost series of row-houses the frontage of each house is 12.8 ft. Within this is provided a lower floor with living room and kitchen and an upper floor with three bedrooms all with built-in closets. Another shows frontages 21.4 ft. in width. But in this case 3-bedroom and 1-bedroom houses alternate and that frontage covers one of each type ingeniously interlocked. This makes an average width of frontage of a figure that I refuse to put down in print lest I be told that I am lying. Figure it out for yourself.

Amongst the exhibits are three studies of the town planning of Amsterdam. These are a model of how to go about such work that it would be hard to excel. I leave the exhibition with the impression that the best stuff is put up in the smallest packages.

Cecil S. Burgess

BRITISH COLUMBIA

Vancouver has a God-made setting and a God-chosen location if ever any city had. So thinks, I am sure, every one of the 105,750 new citizens which have made Vancouver their new home since 1941.

In a nut-shell I have stated the planning and architectural challenge which has faced the city and is facing it now more than ever. The speedy growth of this whole region has demanded skills directed towards speed of execution. The result has been impressive in terms of accomplishment, disappointing in terms of standards.

We now have a city whose planning is strangled by a grid-iron pattern of the most ruthlessly callous type. Regard for contours, aspect and orientation played no role in its layout. To improve and to bring up to date the plan of the city is the task of the Planning Commission ably advised by Harland Bartholomew and Associates, Town Planners from St. Louis. Hard is the task to convince the electorate and the City Council of the urgent need for improvement and change. The need would seem to be obvious but the remarkable achievements in having built such a vast city within the short span of 60 years has tended to shunt the emphasis from quality to quantity. The recently formed Community Planning Association of Canada will probably have a large and active branch in B.C. Interest in organizational meetings has been encouraging. This Association shall be very helpful to the Planning Commission by fostering an interest, on a community basis, of planning in its broader implications.

A high degree of zoning has been established but I would say that it has been rather stifling to a normal healthy development of the city. Regardless of the nature of the site or of its location the same type of building had to be placed on it as on all of its neighbours. Even mixed residential districts do not seem to exist. Combining the grid-iron with miles of houses of the same size and of approximately the same finish on lots of the same width presents a sensitive problem to-day — a potential slum problem to-morrow.

The younger architects have moved into a field which had been well plowed and cultivated by the older members of the profession. They have been able to sow seeds which have quickly germinated, grown and borne fruit. Some seedlings had to be painstakingly nurtured and coaxed. The, trend however, was inevitable and thanks to the pioneering work of such younger men as Bob Berwick, Peter Thornton, R. R. McKee, Ned Pratt and Harry Barratt, thanks to the stimulating examples of contemporary work by C. B. K. Van Norman and thanks to the active interest and propaganda of a group of artists, the Art in Living group, largely under the able architectural design guidance of B. C. Binning, we now can see a high standard of contemporary work being built in British Columbia not only from designs by architects but also by speculative builders. This feature is most significant and most encouraging. It shows that the roots are deep.

Into this arena has appeared a Department of Architecture at the University of British Columbia. The students are keen and aware of the responsibilities awaiting them. They see the grim miles of the city with its traffic chaos, with its damaged landscape, with its unconcern at nature's surrounding gifts, with its unaccented physical and communal dullness. They sense the challenge.

They react with enthusiasm at the new architecture which they see springing up. Keenly they observe the solutions to contemporary problems by the use of contemporary materials in a contemporary manner. The future which lies before this Province and the city of Vancouver is written in terms of ever increasing housing and building demands. The challenge here is clear and they eagerly absorb these contemporary solutions, for it will be their great responsibility to further develop and integrate this new architecture to needs and surroundings.

Lastly they also show concern at the blight which Vancouver's rapid growth is spreading over its beautiful surrounding land, mountains and sea shore. A few private efforts are made to control development in certain estates. A need for regional planning, and for the developing of planned suburban communities is urgently making itself felt. The aspiring architects hope to meet this ever aggravating challenge before the harm done will be irreparable.

The students have formed a club, which is sponsoring films, exhibitions, broadcasts, lectures and visits to buildings of interest—finished or under construction. At all times the widest publicity is given to these activities and as many outsiders brought in as possible. This way they hope to put architecture, community and regional planning more before the eyes of the university body and more before the eyes of the public.

The Department's task is to provide adequate training for these eager and virile architects of the future so that they may meet the challenges which now face their profession. It also has to maintain and stimulate the crusading spirit of the youthful student so that it will not die, but rather gain in conviction and passion. The Department also has its challenge to meet.

Fred Lasserre

ONTARIO

I was talking to a young man the other day who was one of a second year class of ninety-six students of the School of Architecture. Bill is his name. He comes from Fort William and is a quiet unassuming lad about twenty-three years old, with an academic record well above average. His clothes suggest that his expense account is sailing close to the wind, and his daily appearances at the school are associated with the same crumpled suit and the same ill-fitting post-war shirts. His background is vastly more impressive: forty-two operational flights over the continent with the R.C.A.F., and the D.F.C. and Bar.

Bill thinks for himself with his own brand of experience. A lot of his ideas may seem a little on the pink side, but the things he represents are impossible to condemn and difficult to ignore. Many hundreds like himself are returned servicemen who are endeavouring to get a professional education while at the same time they wonder if conditions in Canada will ever provide the opportunities to justify their efforts. Bill says things like this:

"You know, a guy doesn't want to advertise his service record in box car letters a foot and a half high, every time he opens his mouth, but sometimes I wonder if veterans are getting an even break with the boys who put their shoulders to the wheel at home. Take housing for instance. The end of hostilities meant that Canada's fighting heroes would return to their native land, but in most cities it was evidently a signal for cashing in victory bonds and investing in real estate. I pay $10 a week for a lousy room on Huron Street, and as far as I can make out the city is packed with rooming-house sharks bent on discovering what the market will bear. Mind you I'm ready to take my chance with the next man, but I still remember that bilge about the tribute of a grateful nation during the war, and now all I can see is a big "no vacancy" sign, while the same people are talking glibly about the next war, and we send a highly advertised expedition up north to make sure its not too cold. I'll bet my last two bits that the squatter movement has done more in three months to provide a Government housing policy, than all the Parliamentary Committees have accomplished in the last six years. It seems that price ceilings on building materials were intended to keep down the cost of builders' supplies and "encourage" more house construction in the country. We are dismayed to learn that price ceilings have achieved exactly the opposite result, and even Government housing has scrambled for its materials on the so-called Black Market."

Those were the words of a man who says what he thinks, and who, in my opinion has more than ample right to sound off on the matter. In a large measure I share his impatience with the state of affairs in Canada which has permitted the lack of adequate housing to outgrow a condition of crisis and develop to a state of scandal. As long as those of us who are professionally trained to provide leadership and technical assistance, refrain from voicing too critical a point of view, the eventual solution to the housing problems will be such that architects will be without right of authorship, and will have lost their claim to criticism. The present housing shortage in its driest terms is merely a symptom of post-war readjustment, but the whole question is not so easily explained, as any analysis of conditions will show. We have devoted too much time to costly researches, discovering the nature and statistical extent of the housing deficit, and too little time in applying good Canadian "know-how" to the real physical problem. Forums and conferences on housing matters, while admittedly necessary and valuable, are becoming pathetically familiar gatherings occasioned by too much reiteration on the subject of existing conditions and the obstacles attending them. It would seem more profitable to accept conditions which are ten times discovered, work out possible solutions to the more evident problems, and weigh these against what objections exist.

I would welcome a more forthright show of action on the part of the profession to take up the whole question of housing and what to do about it. By way of personal confession, it should be noted here that I was asked some months ago to assist in forming a committee of Architects with the intention of formulating a programme of research and recommendations on low-cost housing. At that time I was too busy to undertake anything, yet it seems now that too many of us are proffering this excuse, and I regard myself as one of the more culpable in this respect.

Robt. Fairfield

QUEBEC

My compliments to E. H. Noakes for his excellent article — Housing and Prefabrication — in the September *Journal*. In spite of all that has been written before on this subject, I would like to see Mr. Noakes, when he has time, develop the eight points listed under Methods of Prefabrication. In so doing he may bring out ideas which might stimulate others to carry on further.

Everyone agrees that some of our construction methods are archaic and that there is considerable waste and inefficiency in some trades. Wood offers an outstanding example of waste in achieving a finished product. A third of the tree is wasted in the forest and another third in the saw mill. There is further waste in the planing mill, the finishing mills and on the construction. Think about this for a minute, and it will be realized how little of the tree is finally useful as a part of a building. All of Mr. Noakes' eight points could be put to work on this problem. Perhaps something could be done by manufacturing where the trees grow and using every part of the tree.

It seems absurd to me that large buildings should have exterior walls consisting of many small units, such as blocks or bricks, placed by hand on the scaffold beside the bricklayer and laid by hand in the wall, requiring much plumbing, levelling and cleaning. Would it not be simpler to attach large laminated panels to the structural frames of buildings; an outer layer for protection against weather, a middle layer for insulation, and an inner for finish? It has been done in spandrels, and with single ply on industrial buildings. Why not use this method for the whole envelope of city buildings, large or small? If the outer surface is of stone in large but thin slabs there need be no shocking departure from conventional design.

In this day and age when plastics can be made for any purpose is it necessary to use ordinary mortar where large panels require relatively few joints? Why not use non-staining mastic ribbons of suitable consistency? With a little study horizontal joints can be kept from compressing and large panels held in alignment by devices similar to those now existing.

A laminated wall of large units should not be more expensive than a conventional wall of many small units when the experimental stage is passed and trade opposition overcome. It should be cheaper.

These ideas have been simmering in my mind for some time and Mr. Noakes' article has been effective in causing me to outline them briefly. There will be ten to object for each who approve, but these few suggestions may, at least, help to stimulate some interest in more economical and efficient construction methods.

Harold Lawson

SASKATCHEWAN

Robert F. Duke, for many years Saskatchewan's Representative on the Editorial Board of *The Journal*, is no longer with us. That does not mean he is dead. He moved to Alberta before many of his Saskatoon colleagues knew of his departure. All will wish him every success in his new position as Assistant City Architect at Edmonton.

The amount of Saskatchewan material which appeared in *The Journal* is no criterion of the effort expended by Bob. He worked hard but got very little co-operation. On occasion he made a personal contribution which will be hard to equal. Saskatchewan is sorry to lose him.

On November 25th, the annual meeting of the Saskatchewan Association was held in Saskatoon. Following are the officers for the ensuing year: President, E. J. Gilbert; Secretary-Treasurer, Frank J. Martin, Saskatoon; both re-elected: First Vice-President, W. G. VanEgmond, Regina; Second Vice-President, Norman L. Thompson, Saskatoon. The foregoing together with Dan H. Stock, Regina, John C. Webster and Dean R. A. Spencer, Saskatoon, will form the Council for 1946-47. Dean Spencer represents the University of Saskatchewan on the Council and is Chairman of the Examining Board. The President and the Secretary were appointed to the Council of the R.A.I.C.

An application for membership was received from a student who will sit the final examinations: several other students were registered as studying in offices in Regina and Saskatoon. They will write the Association examinations as prescribed, the final coming after five years' studentship.

In the evening a dinner was held at which the City Building Inspector, Prof. A. R. Greig and all the draughtsmen and students of Saskatoon were guests of the Association. The Guest Speaker was Prof. A. Michalenko of the University of Saskatchewan, who delivered an interesting address on high level illumination. The evening ended in an informal round-table discussion on various topics. The next annual meeting will be held in Regina.

E. J. Gilbert

CONTRIBUTOR TO THIS ISSUE

V. S. Murray graduated in Civil Engineering from Queens University, 1928. He has been with the Department of Highways for the past fifteen years as a bridge engineer, and recently made an extensive study of pre-stressed concrete, particularly as it might be adapted to bridge design and construction. He hopes to see the first pre-stressed concrete bridge on the continent built next year.

APOLOGIES MR. DOUGLAS HASKELL

Sincere apologies are due to Mr. Douglas Haskell, Senior Associate Editor of the Architectural Record. In the article "In search of Modern Architecture — the North-East States", in the September issue, the writer failed to credit Architect Haskell for the Children's School, which we visited at Lake Placid, and in which Mr. Henry S. Churchill was Associate Architect. Mr. Harwell Hamilton Harris designed only the Headmaster's house, which was illustrated in the article. We who visited the School, were most enthusiastic about this bright, cheery, sensible imaginative building.

James A. Murray

OBITUARY

GUY BULLER-COLTHURST

It is with sincere regret that we record the death of Mr. Guy Buller-Colthurst of Windsor, Ontario, which occurred on November 8th, 1946, as the result of a level crossing accident. The car, which Mr. Colthurst was driving, was struck by an Essex Terminal Railway engine at a level crossing at Ojibway, Ontario.

The late Mr. Colthurst received his education in England and commenced practice in London, England, with the firm of Colthurst & Gott, in 1908. He came to Canada in 1910 and first practiced with the firm of Thompson, Daniel and Colthurst in Saskatoon, Sask. Later, Mr. Colthurst moved to Windsor, Ontario, and since 1918 has carried on the practice of Architecture in that City until the time of his death.

Mr. Colhurst had a keen interest in the work of the Windsor Chapter, O.A.A., and served as a valued Member of the Council of the Ontario Association of Architects during the years 1941, 1942 and 1943. He also served for many years as a Member of the Council of the Royal Architectural Institute of Canada.

The funeral was held on November 11th, 1946, and the Members of the Windsor Chapter attended in a group.

THE PUBLIC SERVICE OF CANADA
CIVIL SERVICE COMMISSION, OTTAWA

requires

An **ARCHITECT, $2,580-$3,000,** and a **SWINE HERDSMAN, $2,124-$2,280,** for the Department of Agriculture at Ottawa.

HON. JAMES G. GARDINER
Minister of Agriculture.

There was a time when architects
As every school boy knows
Did mix with peers and even kings
And spurned to be their hirelings,
— or so the story goes.
It's lucky that they're mostly dead
and cannot read what Gardiner said.

Think of the days of Ancient Greece,
Of Mnesicles the Beau,
Then none was thought of highlier
Than builders of Propylaea.
Whole governments would go
If they did join in public ads
Us Architects with Swineherd lads.

O quail you piglets' nurse before
Our great profession's past.
Irruptions of Vesuvius
Would wilt before Vitruvius
Contempt at being classed
A mere 300 bucks above
The tender of some trough.

Today our swineherds graduate
In sterilizéd sheds.
But none of us can long endure
The smell of oldish pig manure
That hangs about their heads.
(The treatment of this odium
is sulphuretted sodium)

But science is a wondrous thing,
A leveller of classes,
With hogs induced to procreate
With rays of ultra-violate
By members of the masses.
We must get off our Stylobate
And bring ourselves more up to date

"There comes a time in the affairs of men"
another poet said
"Which taken at the flood (I think)
leads on to Victory". We sink —
The Mistress Art is dead.
If we now let our social status
Stand as low as Gardiners rate us.

A.P.C.A.

JOURNAL
ROYAL ARCHITECTURAL INSTITUTE OF CANADA

INDEX

VOLUME 23, 1946

Month and Page

Aedificavit, Robert D. Berwick .... June p. 152
" H. K. Black .... Aug. p. 202
" Cecil Scott Burgess .... May p. 122
" E. Fitz Munn .... Jan. p. 17
" John U. Rule .... Mar. p. 71
" George G. Teeter .... Feb. p. 44

Aesthetics in Modern Architecture, Harry Seidler .... Oct. p. 245

An Address by Maurice Hébert at the 39th Annual Assembly .... June p. 126

An Appreciation: Milton S. Osborne, John A. Russell .... Aug. p. 193

An Exhibition of the Work of Le Corbusier .... Jan. p. 16

An Experiment in Community Education for Co-operative Economic and Social Work, Dr. Alma Paulin-Driscoll .... June p. 130

Architect and the Post-War World, The, Ralph Walker .... Feb. p. 21

Architectural Employment — Conditions in Canada .... Dec. p. 323

Auditorium and Stage in Your Community Centre, The, John A. Russell .... July p. 157

A World Centre for the United Nations, Lewis Mumford .... Oct. p. 235

Book Review, British Architects and Craftsmen, E. R. Arthur .... Feb. p. 46
" " Design, J. B. Langley, ... Feb. p. 46
" " Heating and Ventilating for Architects and Builders, Karel R. Rybka .... Aug. p. 205

Canadian Arts Council, The, Herman Voaden .... Mar. p. 69

Changing Concepts in Hospital Function, A Vital Consideration in Design, Dr. Harvey Agnew .... Apr. p. 75

Colour Conditioning, Wilfred D. Sinclair .... May p. 116

Community Planning Association of Canada, The, P. Alan Deacon .... Nov. p. 268

Community Planning in Canada, The, Rt. Hon. C. D. Howe .... Nov. p. 267

Design in Industry, D. W. Buchanan .... Sept. p. 228

Division of Mechanical Engineering of the National Research Council, Ottawa, Ontario, Aeronautical Facilities, H. Gordon Hughes .... May p. 105

Editorial .... Feb. p. 20; Mar. p. 48; Apr. p. 74; May p. 104; July p. 156; Aug. p. 182; Oct. p. 234; Nov. p. 266

Editorial, F. Bruce Brown, Chairman, Editorial Board .... Jan. p. 2; Dec. p. 314

Editorial, Charles David, President .... Sept. p. 206

Etobicoke, Ontario, Town Planning Consultants Limited .... Nov. p. 293

Example of Logical Method of Calculating Compression Reinforcement in Reinforced Concrete Beams, W. B. Hackett .... Aug. p. 205

Month and Page

Greater Winnipeg, Manitoba, Eric W. Thrift .... Nov. p. 272

Guelph, Ontario, Town Planning Consultants Limited .... Nov. p. 294

Halifax, Nova Scotia, Harold Lawson .... Nov. p. 299

Hamilton, Ontario, Town Planning Consultants Limited .... Nov. p. 279

Heating, Forsey Page .... Jan. p. 3

Houses are not Coming, The, Fred Lasserre .... July p. 175

Housing and Prefabrication, E. H. Noakes .... Sept. p. 207

How Building and Planning are Organized in the USSR .... Sept. p. 224

How Much Housing Does Greater Toronto Need? Humphrey Carver .... July p. 171

In Search of Modern Architecture—The North-East States, James A. Murray .... Sept. p. 219

Institute Notes, Correspondence, etc., The .... July p. 178

Institute Page, The, ... May p. 122; June p. 152; Aug. p. 202; Sept. p. 230; Oct. p. 260; Nov. p. 307; Dec. p. 333

Kenora, Ontario, Town Planning Consultants Limited .... Nov. p. 288

Letter to the Editor, N. L. Irwin .... Aug. p. 204

Letter to the Editor (C. N. Mitchell) Lieut.-Col., R.C.E., Commandant .... June p. 154

L'Ile d'Orleans, J-Barthélemy Renaud .... June p. 124

Natural and Artificial Lighting of Industrial Plants, E. L. Dodington .... Feb. p. 26

News from Harvard, John Cresswell Parkin .... Apr. p. 100

Obituary, Francis S. Adamson .... Apr. p. 103
" Guy Buller-Colthurst .... Dec. p. 338
" Ernest Irving Davidson .... July p. 180
" Alfred Holden Gregg .... Jan. p. 18
" Professor James Burn Helme .... Feb. p. 47
" Stafford Merrill Hodder .... Nov. p. 313
" J. Graham Johnson .... May p. 123
" John M. Lyle .... Feb. p. 47
" George Allen Ross .... Apr. p. 103
" J. H. G. Russell .... Mar. p. 72

Paint and Painting, J. C. Keeley .... Dec. p. 315

Panel Heating, Karel R. Rybka .... Feb. p. 41

Peterborough, Ontario, Town Planning Consultants Limited Nov. p. 284

Plans for Eight Communities, E. G. Faludi and Anthony Adamson .... Nov. p. 276

Political Art of Architecture, The, Joseph Hudnut .... Mar. p. 53

Pre-Stressed or Pre-Compressed Concrete, V. S. Murray .... Dec. p. 319

Month and Page

Processes and Craftsmanship in Stained Glass, Yvonne Williams ..... Aug. p. 199

Professional Opportunities for the Architect in Canada ..... Aug. p. 198

Programme for the R.A.I.C. Annual Assembly ..... Jan. p. 14

Provincial Page ..... Jan. p. 17; Feb. p. 44; Mar. p. 71; Apr. p. 101

Recent Developments in Education and Schools in England, Pegeen Synge Dryer ..... Apr. p. 79

Regina, Saskatchewan, Town Planning Consultants Ltd. ..... Nov. p. 277

R. I. B. A. Prizes and Studentships ..... July p. 163

Saint John, New Brunswick, J. Campbell Merrett ..... Nov. p. 296

School Architecture from the Educational Administrator's Point of View, Dr. J. G. Althouse ..... Mar. p. 49

Month and Pag

Simplified Specification for Unit Masonry, A. James D. Beacham ..... Aug. p. 19

Specification Surgery, Ben John Small ..... Aug. p. 18

St. John's, Newfoundland, Harold Lawson ..... Nov. p. 30

Stratford, Ontario, Town Planning Consultants Limited ..... Nov. p. 28

Terrace Bay, Ontario, Town Planning Consultants ..... Nov. p. 29

Thirty-Ninth Annual Assembly of the R.A.I.C., The ..... Mar. p. 5

Tourist Industry in Ontario, The, G. A. Robb ..... Aug. p. 18

Town Planning at Work, Donald B. Strudley ..... Nov. p. 27

Travelling Exhibit on Community Planning, Alan H. Armstrong, Chairman, Architectural Research Group, Ottawa Feb. p. 4

Windsor, Ontario, Town Planning Consultants Limited ..... Nov. p. 28

ILLUSTRATIONS

Month and Page

Alliance Ware Limited, Vancouver, B.C., Sharp and Thompson, Berwick, Pratt, Architects ..... Feb. p. 38

Aluminum Company of Canada Limited, Main Office Building, Arvida, Que., Fetherstonhaugh and Durnford, Architects ..... Feb. p. 30

Aluminum Laboratories Limited, Research Building, Kingston, Ont., J. C. Meadowcroft, Architect ..... Feb. p. 33

Bank of Montreal, Toronto, Ont., Chapman, Oxley & Facey; Marani & Morris, Architects, K. R. Blatherwick, Associate Architect ..... Mar. p. 64

Barret Bob Pin Company Limited, Toronto, Ont., Page and Steele, Architects ..... Feb. p. 36

Bromo-Seltzer Limited, Toronto, Ont., Earle C. Morgan, Architect ..... July p. 170

Canadian General Electric Company Limited, Small Appliance Plant, Barrie, Ont., Beck and Eadie, Architects ..... Oct. p. 254

Division of Mechanical Engineering of the National Research Council, Ottawa, Ont., Aeronautical Facilities, H. Gordon Hughes, Architect ..... May p. 107

Dominion Rustproofing Company Limited, Vancouver, B.C., Sharp and Thompson, Berwick, Pratt, Architects ..... Feb. p. 38

Eli Lilly and Company (Canada) Ltd. Toronto, Ont., Mathers and Haldenby, Architects ..... Dec. p. 324

First Baptist Church, Saskatoon, Sask., Webster and Gilbert, Architects ..... Mar. p. 68

Garage, Toronto Branch, The Canadian Red Cross Society, Toronto, Ont., Page and Steele, Architects ..... July p. 168

George W. Crothers Limited, Leaside, Ont., Gordon S. Adamson, Architect ..... Aug. p. 194

House of Mr. J. A. Gairdner, Oakville, Ont., Marani, Lawson and Morris, Architects ..... Sept. p. 212

Irvington Varnish and Insulator Company of Canada Ltd., Hamilton, Ont., Prack and Prack, Architects ..... Oct. p. 258

Month and Pag

Kennametal Tools and Mfg. Company Ltd., Hamilton, Ont., W. Bruce Riddell, Architect ..... Oct. p. 25

Massey-Harris Company Limited, Foundry Building, Brantford, Ont., Allward and Gouinlock, Architects ..... Oct. p. 25

Noorduyn Aviation Limited, Cartierville, Que., H. Ross Wiggs, Architect and L. A. and P. C. Amos, Architects ..... Feb. p. 4

Perspective Drawing of Showroom and Plant for Mitchell Bros., Vancouver, B.C., C. B. K. Van Norman, Architect ..... Feb. p. 3

Perspective Sketch, Building for Sidney Roofing & Paper Co. Ltd., Victoria, B.C., McCarter and Nairne, Architects Feb. p. 3

Photographs by Mr. George A. Driscoll of L'Ile D'Orleans and its Inhabitants ..... June p. 14

Prize-Winning Designs from the General Motors Corporation for Automobile Dealer Establishments ..... Jan. p.

Research Laboratory, Research Enterprises Ltd., Toronto, Ont., Allward and Gouinlock, Architects ..... Feb. p. 3

Rich's-Progressive Architecture Competition, A Realistic House for a Family in Georgia, Watson Balharrie, Second Prize Winner ..... July p. 16

Ridley College Gymnasium Building, The, St. Catharines, Ont., Marani, Lawson and Morris, Architects ..... Dec. p. 32

Saint Therese Church, Beauport, Quebec, Adrien Dufresne, Architect ..... Mar. p. 6

Student Drawings, École des Beaux-Arts de Montréal, Que. Apr. p. 9

" " McGill University, School of Architecture, Montreal, Que. ..... Apr. p. 9

" " University of Manitoba, School of Architecture and Fine Arts, Winnipeg, Man. ..... Apr. p. 9

" " University of Toronto, School of Architecture, Toronto, Ont. ..... Apr. p. 8

Transmitter Building, Radio Station CHUM, North York Township, Ont., Earle C. Morgan, Architect ..... Oct. p. 25