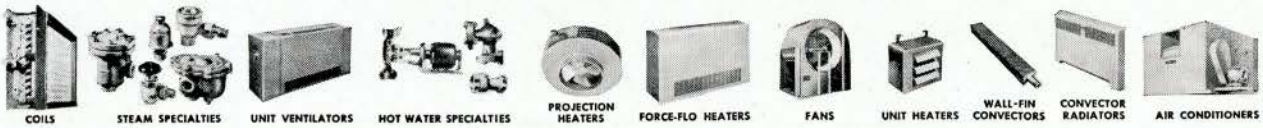
JOURNAL

ROYAL ARCHITECTURAL INSTITUTE OF CANADA

VOL. 26
TORONTO
APRIL
1949
No. 4

THE COMPLETE LINE FOR '49



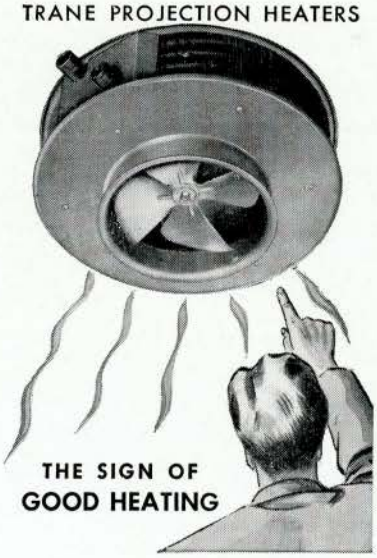
TRANE

THERE'S NO CEILING TO HEATING SATISFACTION

Good heating and heating satisfaction is no accident. Today, as never before, heating is a science—and the emphasis on heating for the factory, the home, the office and for *every* building, requires up-to-the-minute knowledge of the latest in heating equipment and up-to-date information about correct installation methods.

Trane, by continued research activities, have developed new products and introduced improvements in Trane products already established. By advanced mass-manufacturing methods, these products have been brought within the reach of all buyers. New literature, technical and informative, keeps all posted on new developments. By working with architect, consulting engineer, builder, heating contractor and user, Trane representatives aim to help make heating a source of satisfaction offering low cost products, low cost installation, low cost operation and low cost maintenance.

TRANE PROJECTION HEATERS



These policies, continued throughout the last 25 years, have given Trane leadership in the heating, cooling and air conditioning field. These same policies, continued today, are your assurance of satisfaction when you specify Trane.

For latest information about heating, cooling and air conditioning, write to Trane Company of Canada Limited, 4 Mowat Avenue, Toronto, Ontario.

HEATING • COOLING • AIR-CONDITIONING

Specify TRANE

1924 25th Anniversary 1949 - - - and still FIRST!

TRANE COMPANY OF CANADA
LIMITED
4 Mowat Ave. Toronto, Ont.

Branch Offices in all Principal Cities

FOR HOMES . . . OFFICES . . . FACTORIES . . . HOSPITALS . . . HOTELS . . . SCHOOLS . . . INSTITUTIONS

J O U R N A L

ROYAL ARCHITECTURAL INSTITUTE OF CANADA

Serial No. 284 TORONTO, APRIL, 1949 Vol. 26, No. 4

PRESIDENT . . . . . A. J. HAZELGROVE (F)

C O N T E N T S

THE INSTITUTE DOES NOT HOLD ITSELF RESPONSIBLE FOR THE OPINIONS EXPRESSED BY CONTRIBUTORS

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

SUBSCRIPTION RATES

Canada — 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.

JOURNAL
R. A. I. C.
APRIL 1949

THE Editorial Board would feel happier about this issue if it had been possible to cover a wider field. It seems that many schools are nearing completion, and many more await the foundation planting so dear to the heart of the school board, but so exasperating for those who run the *Journal*. However, we have a feeling that school building follows a pattern from coast to coast that more photographs would only emphasize. It is true that British Columbia may build more in wood than other less favoured provinces, but the types are the same. This is perhaps due to the fact that problems, unaffected by climate, beset us all. The Committee which reported on the Planning, Construction and Equipment of Schools in Ontario receives kindly recognition from Mr. Balharrie, and it may be that the present uniformity stems from the Committee's report. The Committee drew attention to wasted public funds on porticos and classical or gothic detail, and recommended a one storey elementary school with abundant air and light, and the character of a workshop. No member of the Committee would, we are sure, back down now on the single storey or the advantages of light and air. The workshop is another matter. To the lay observer, many schools have the appearance of factories, and the critical architect must admit that, in some instances, there is justification for such a view. Given the problem of daylight, the solution to the humanizing of the factory-school facade and interior is a difficult one. We admire the Swedish schools as buildings, but their charm comes from the fact that their architects are blissfully unaware of Dr. Harmon and glass blocks, and equally unaware or unimpressed with bilateral lighting. The Swedes are doing schools as we used to do them but with all the charm of their traditional building manner, their skill in detailing, their love of brickwork in broad masses, their beautifully proportioned windows and their delight in fun and colour.

IT may be that we, in Canada, have travelled sufficiently far on the scientific path to realize that beauty and the happiness of children in their work are not as intimately associated with thirty foot candles as we had thought. We are worried, frankly, by signs that the illuminating engineers have not yet finished with us. We understand that no gentleman speaks nowadays of foot candles, and that the light meter is as extinct as the first telephone. The new measurement is glare, and it can be calculated only by an expert. We heard a paper on this subject in St. Louis, Missouri, and the professor from Cleveland, who addressed us, stated that there were not half a dozen people in that city of light who could take such measurements, and those who could were all on his staff.

THERE is therefore the obvious danger that the direction in which we shall travel will not be of our own making, but one in which we are led. The result may have all the charm and gaiety that one associates with the operating room, and all the joys that come from freedom from air borne infections. The Committee did a good job in demonstrating the advantage of the one storey school and the importance of light. A tradition of building which contained all the confused elements of the Romantic Movement was halted in mid-stream, and greater efficiency and economy have been the result. The sixty-four dollar question is where do we go from here? Perhaps Mr. J. A. G. Easton will hand us the answer on a platter when he returns from the grand tour. We await the verdict with great interest.

Editor

Le CORBUSIER AND AMERICAN ARCHITECTURE

By JOSEPH HUDNUT

A Lecture given at the School of Architecture, the University of Toronto, March 9, 1949.

THERE is more than one standard of excellence by which we may measure an architect. We may, for example, appraise an architect by the extent and originality of his invention. In his role as pattern-maker, Frank Lloyd Wright excels all other architects of our day. A stream of new and unique constructions flows from his imagination in inexhaustible variety. Such invention is genius.

It is quite possible, on the other hand, to measure an architect by his technical skill and competence; by his scholarship and taste; by the good sense and practical knowledge which make architecture serviceable in the business of living; or by that intuition and art, somewhat unusual in this mechanized world, which give to buildings a lyrical grace and sentiment not unlike that of poems and symphonies.

There is still another standard which — to an historian, at least — is equally apposite. An architect may be considered great in proportion to his influence. Those architects who have created styles, who have altered the course of architectural development, who have imposed upon a century or so ideas and ways of building discovered in their own experience — these also deserve our applause; deserve it even when time has outmoded the vocabulary and principle of their art or broken into fragments the magic wand with which they enraptured their time.

Palladio was such an artist. We are sometimes at a loss to understand the spell that Palladio cast over Italy, England and the soul of Thomas Jefferson; but the fact of his influence is irrefutable. Mansart imposed a similar authority, as autocratic as that of the king he served, over eighteenth-century France; and in our own country we have not forgotten how Richardson, developing out of nothing at all his perverse and very ponderable style, peopled the thousand cities of our new civilization with towered donjons and impregnable monasteries.

By such a standard Le Corbusier stands first among living architects. First? I am tempted to say that he stands alone, messiah and author of a new Bible of Design. Le Corbusier, who has built fewer than forty buildings, nevertheless turned all the architecture of the civilized world into that channel which it now impetuously follows. The direction to which he pointed will remain the direction of architecture until some new genius, of equal command, appears to give it still another currency.

The secret of this new authority is nothing more mysterious than a frank acceptance of steel as the basis of form in architecture. Our new cities are steel cities, as are also our highways, our ships, and the multiplex inventions with which we have covered the earth. These are shaped, not by sunlight and growth as living things are shaped, nor by logic and law as philosophies and governments are shaped, nor yet by the heart as men shape poems and symphonies. Things made of steel are harsh, angular and infinitely complex in form, hard and shining in their surfaces, inhuman in scale and energy, and in operation wholly alien to the processes with which nature environs us.

Buildings made of steel ought nevertheless to conform to the laws of steel. Whether he likes it or not, an architect must proceed from structure, the inescapable foundation of all form in his art. For a century or more our architects believed that they could disguise the steel core of their buildings under a clothing of ornament; the only consequence was the death of architecture. Le Corbusier accepted the presence of steel not through compulsion, not as a necessary evil, but exultantly, triumphantly, as one might follow an angel sent to deliver mankind. Steel is the chain which ties our architecture to the world which it serves — ties it to engine and dynamo, to steamship, railroad and airplane, to cinema, printing press and radio, and to the giant engines of war — and by that tie lifts it into a language through which the power and splendor of the new world may be made known. The important achievement here is not the invention of shapes and surfaces logical to steel construction but rather the use of that invention to give a new revelance and new life to architecture.

In steel construction the carrying parts (posts and beams) are separate from the parts carried (walls and partitions). Walls and partitions then have no longer any carrying function. They do not support the floors; they do not support anything. The walls of a house then can be considered simply as a screen separating inside space from outside space. Since the wall bears no weight it does not require a greater strength than that which is needed to give it firmness. The wall is a membrane, a screen, hung on a metal frame. There is no need to design the wall in such a way as to receive the loads of regularly spaced beams — these are carried on the steel columns — so that disposition and shape of windows and other openings in the wall are, like the wall itself, free from the structural system.

From this it follows that a facade may be subdivided into as many and as varied areas as a use may require or the imagination of the designer suggest. One may cut holes in the facade, as did the Georgian architects, or arrange the windows in horizontal or vertical bands continued even to the corners of the building; and the facade can be built of glass even to the extent of its entire surface.

This liberation of the facade is not merely a liberation of surfaces. Steel has set us free to create in buildings every shape and every combination of shapes which may drift into our changing dreams. The old materials – brick, stone and wood – bound our buildings to convention and geometry, disciplined their forms within strict and established progressions, and set them solidly upon the earth. Steel permits us to model buildings as a sculptor models clay. We may, if we wish to do so, raise our building from the ground so that it comes in contact with the ground only by means of those points of support which we call *piloti*, thus leaving open the space under the building.

I do not suggest that steel imposes these forms upon us. Symmetry is as congenial to steel as it is to stone. Serenity of line and plane are still among the architect's resources. Le Corbusier can at times subdue his vehemence – and his self-advertisement – to a serene classicism in which piloti, horizontal window, and precise contour are as harmonious elements as Doric entablature and pediment. Neither is it essential, when our buildings are thus lifted from the firm earth, to invent some functional basis for our preferences: to describe the free space under our building, for example, as a solution of the traffic problem, or to console those who roast in glass houses with the indisputable argument that we have at last sufficient light in interior space. We shall be on firmer ground if we say frankly that these are among the expressive media of our art.

We have indeed grievously misunderstood the art of Le Corbusier if we think of it (as many do) as functionalism. No architect ever searched more earnestly for aesthetic values or depended more unequivocally upon deliberate analysis and speculation for the perfection of his forms. Indeed, these are often over-intellectualized – if I may use so awkward a term. His faith in geometric proportion, for example, is as religious as that of the most absolute classicists and that Golden Section – $A:B = B:(A+B)$ – which was the basic form both of the Renaissance and of the master-builders of the Gothic cathedrals is basic also in Le Corbusier. Thus it happens that in each of his designs there exists a development from a fundamental shape which is repeated throughout all the subdivisions of space and surface.

In the facade of the famous villa at Garches, for example, the ratio of height to width in the rectangular surface at the right – the surface developed with alternating bands of voids and solids – is repeated in the

Villa at Garches

linear divisions of this surface, and again in the still smaller divisions of the windows. At the left the deep opening which frames a balcony is also made to conform in outline to this ratio. These are the terms of a continuous geometric proportion as definite – one might even say as arbitrary – as that of the Parthenon. The series of dimensions and relationships which may from measurements of the human body have interested Le Corbusier – as they interested Leonardo da Vinci – so intensely that he has actually developed and patented a formula for such proportions which he believes is capable of guiding every sort of project in the building field. It is somewhat surprising to hear such a process described as *functionalism*.

Perhaps this misunderstanding had its genesis in the plans of Le Corbusier rather than in his facades. The square block of space is subdivided very firmly by the horizontal planes of the floors, but within these strata there appears little order other than that which use might determine. The partitions, having no other purpose than the division of space, are dispersed over the area as if by accident. There is little trace of the precision, exactness and geometric pattern of the facades.

Le Corbusier seems to have accepted this disintegration of space as a necessary condition in modern buildings horizontally stratified, but he has made heroic efforts to overcome this obscurity of form within the limits thus imposed. Space is at times a material of his art as fundamental as structure and surface. He likes to break through the firm planes of floors and roofs with vertical blocks of space – as in a stair-well or a room extending through two or more storeys. He delights in courts into which space flows from all sides; in long ramps with their suggestions of diagonal space and space in movement; and he loses no opportunity to invite outward space into his enclosed volumes through balconies, terraces, and the piloti which raise his structure from the ground. He has a passion for roof terraces; and he will entertain any excuse for

giving to his spaces curved and eccentric contours. A sculptor in space, Le Corbusier takes every advantage of that freedom in modeling, arranging, and combining space which is the most provocative – and the most dangerous – among the gifts of steel to architecture.

From these ideas, then, there was developed that *style Corbu* – described not so much in actual constructions as in the hundreds of careless sketches which sprawl over his pages and in clichés repeated over and over again – which the American student could bring home from Paris in his suitcase. Hung upon a metallic framework, the walls which enclose a building are independent of all function of support; they may be designed without reference to that function. They may be transparent and they need not rest upon the ground.

The spaces these walls enclose are, except for the firm horizontal divisions of floor and roof, as malleable to the hand of the designer who may, within the limits imposed by function, play with space as a musician plays with sound. His play, nevertheless, whether concerned with space or the treatment of membranes and structures enclosing space, is to be directed by mathematical law. He is to invite in all that he does the "ceaseless, inexhaustible miracle of proportion." He is to search out harmonies in line, area and volume and for that same unity in form which was the goal of Athens and Amiens; and, because this unity and this harmony have their genesis and life in the technologies of steel, it may be that they could capture values beyond those of aesthetic preferences. They could be made the basis of a new expression in architecture.

New movements in architecture first make themselves known in the design of individual dwellings. The man who builds a house for himself is less restricted on the one hand by commerce, on the other by the traditions of institutions. In a house for personal use, client and architect may freely construct their private Eden, searching out and exhibiting – like painter or poet – preferences which may be unique to themselves. In a building for institutional use the architect meets the challenge of society. His practice and his theory will have little importance until they are tested on a monumental and with a universal theme.

Le Corbusier has never built a monument but his designs for great institutions and for cities have formed so wide a basis for speculation in these fields of architecture as to give a new character and direction to both. His great design for the building for the League of Nations at Geneva was never translated into steel and stone, and yet it has appeared on the draughting-board of every student wherever architecture is taught, and to this day it holds its unchallenged place in the imagination of every architect. I mean, of course, every architect under thirty years of age.

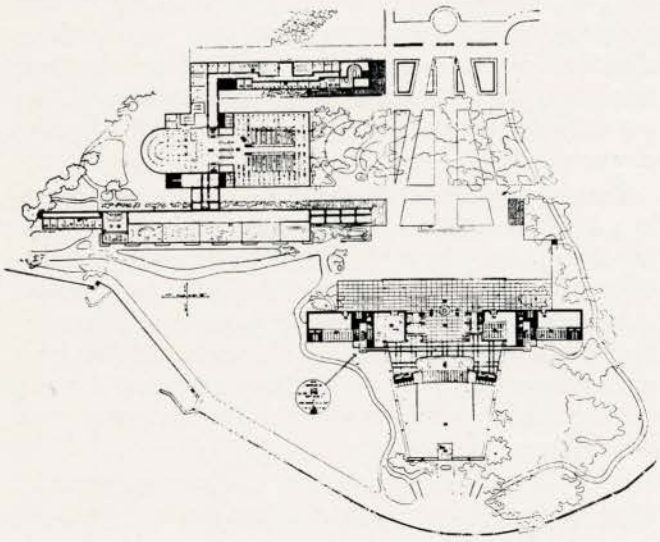
In 1927 Le Corbusier's design for the League of Nations received more votes than any other among the 377 designs submitted in the international competition – and was then rejected after one of the French judges had discovered that his drawings were not rendered in the kind of ink specified in the program. "The motive of my colleague," remarked Le Corbusier, "may have been motivated by something other than a passion for Chinese ink." It is natural that Le Corbusier should believe that the impotence of the League began at that point.

The design comprises two parts: the assembly buildings placed on a wooded promontory projecting into the Lake of Geneva, and a building for the Secretariat. Together these occupy two sides of a court entered from the wide avenue which leads from Geneva to Lausanne.

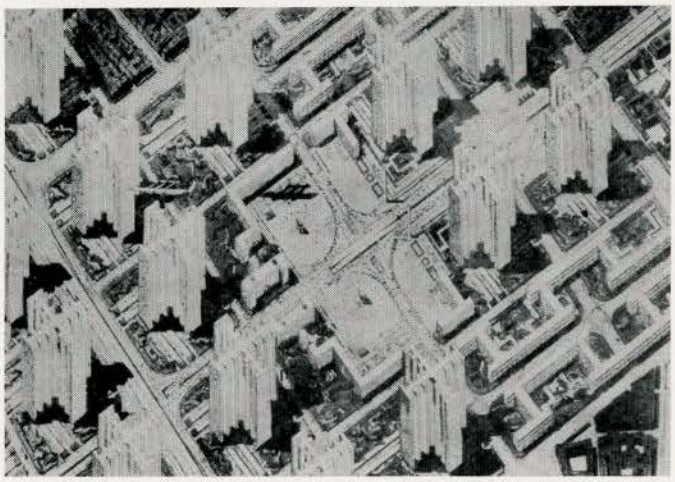
A great theatre, trapezoidal in plan, for the general council of the League is placed on the second floor of the assembly building; the stage, or platform, at the south; a wide gallery at the north. This theatre is raised from the ground on piloti (iron columns) so as to provide an open pavilion, commanding views of the lake, which could be used, together with the park which surrounds it, for social gatherings. A building in three storeys, providing entrance halls, stairs, and committee rooms extends along the north side of the theatre.

The building for the Secretariat is divided into three sections: at the center the square library and the semicircular conference halls; on each side long wings for the two types of minor assemblies and commissions of the league.

The plan is impressive for its common sense. This is essentially a working place *(maison de travail)* raised to monumental dignity and grandeur not by the weight and massive symmetry of peristyle and dome but by the breadth and scale of its pattern and the harmony of its parts. It is distinguished – somewhat to the surprise of those who had known Le Corbusier only as an evangelist and doctrinaire – by extraordinary good sense. It is in every way a practical design – well-



Plan of the League of Nations project at Geneva.



The Ideal City

organized, convenient, economical, capable of expansion; it rests in the most uncompromising fashion on new techniques of planning and construction; and out of these firm and contemporary foundations rises to a grandeur of effect all the more eloquent because it embodies (in the words of its author) the spirit of our own day.

Shortly after his failure at Geneva – if failure it can be called – Le Corbusier fell in love with the skyscraper. To him the skyscraper is by no means an enemy of the city; it is rather a citizen who needs to be disciplined and who, being disciplined, may endow our cities with an organic order not less congenial to the good life than the more abstract order of the classical tradition. Whereupon Le Corbusier set out to demonstrate that conviction in his magnificent designs for modern cities.

It will be seen at once that Le Corbusier proposes no economic or social revolution. He assumes that great industrial cities are necessary to our civilization and that the life they contain will flow for some time to come in channels which are now established. He has no plans for decentralization either in society or in architecture. His conception is surprisingly classical. A Roman order built out of modern invention and usage – if only there were a Caesar to impose such an order on our present confusions.

The skyscrapers in this ideal town are civilized, made to respect their neighbors and their tenants. They rise, widely spaced, out of the open green areas of parks through which the streets are threaded in geometric order. A new kind of street, promising us a new lyricism in city life. I cannot resist here a brief quotation from the architect – all the more so since I may in that way convey a hint of that language which has given such swift wings to architectural idea:

". . . I shall ask my readers to imagine that they are walking in this new city and have begun to acclimatize themselves to its untraditional advantages. You are under the shade of trees. Vast lawns spread out all around you. The air is clear and pure; there is hardly any noise. What, you cannot see the buildings? Look through the charmingly diapered arabesques of branches out into the sky towards those widely-spaced crystal towers which soar higher than any pinnacle on earth. These translucent prisms that seem to float in the air with no anchorage on the ground – flashing in summer sunshine, softly gleaming under grey winter skies, magically glittering at nightfall – are huge blocks of offices. Beneath each is an underground station."

A sheet of glass and three partition walls make an ideal office, wrote Le Corbusier in 1925, but we find him ten years later not a little disturbed. Something more was necessary for the sides of office buildings than "glass and proportion" and he finds the solution in that invention – not new except in its application – which he calls the *brise-soleil* – in English, the sun-shade. The brise-soleil is, essentially, a crate-like screen hung on the side of a many-storeyed building. Such a building retains its wall of glass but the rays of the sun do not fall directly on the glass. The architect, while assuring the tenant light and air, thus mercifully reprieves him from the ordeal of roasting.

The result is a new enrichment in the design of skyscrapers – as if a new color had been laid upon the palette of architecture. The modern architect, without violence to his creed, may now recapture some of that texture of surface which he once achieved by an appliqué of Renaissance or Gothic ornament. Shadow and highlight are restored to his vocabulary. He may lay over his great metallic cliffs a clothing which, entirely congenial to their structure and intent, is yet capable of repetitive patterns capable of wide variations.

The invention was dramatically exploited in a building not inappropriately named *Ministry of Education*, at Rio – a building built under the direct inspiration of Le Corbusier and which more than any other building in the Americas, represents his technique and his philosophy. The brise-soleil is, of course, only applied to the southern wall; its texture is enriched by contrasts with unbroken walls or walls with horizontal or vertical emphasis; and its cellular and linear character clearly affirm its affinity with a structure of steel. To make that affinity the more emphatic the architect makes use of the cantilever – indispensable adjunct to modernity – and of the piloti which raise his building from the firm earth and give it, in the words of Le Corbusier, the character of a six-sided object. Certainly there is no lack of drama in the Ministry of Education at Rio.

There are few buildings in the United States and Canada which have yielded so directly, and with so little compromise, to the authority of Le Corbusier. The buildings which will exhibit his creed are, for the most part, still on paper – or in the minds of the thousand students of architecture to whom he is prophet and missionary. Nevertheless we must not overlook the strength of this influence which saturates the schools

The Ministry of Education Building at Rio.

of architecture. It is strong and its strength is the strength of idea. It is probable that the inventions of Le Corbusier – the horizontal window, the wall free of its supports, the piloti, the brise-soleil – will not find a universal use on this side of the Atlantic, however they may crowd the draughting-boards of our students, but the vision they represent, the way of working which they witness, are already shaping the architecture of our future.

The movement has been more strongly evident in individual houses. In general, the American people resisted in the design of their homes the new vocabulary of free wall, cantilever, horizontal window, ramp and flat roof. These were understood as the elements of a new style which challenged unsuccessfully the long-familiar and comfortable Colonial forms. The imported movement had to make its way as idea and feeling rather than as style.

As idea and feeling, its penetration has been wide: so wide, in fact, that it is scarcely possible to escape it. Our architects are slow to adopt from Le Corbusier the "golden section" of proportion, but the escape which he offered from the oppressions of convention was eagerly exploited. As early as 1925 Colonial houses began to show definite tendencies towards flowing space and the simplification of planes; presently they threw down their walls to admit the sun, and in the end forgot even their prim formalities.

It could be expected that the Museum of Modern Art, in New York City, would build its new house in a modern mode: certainly the most perfect flower in this country of that brief cult known as the "international style." Philadelphia had already raised the first skyscraper in which the presence of steel is clearly acknowledged. The great era of the skyscraper had just ended when this, the final solution of the skyscraper problem appeared: the cellular organization as the basis of form, the steel cage unburdened with "architecture," the walls suspended, the horizontal rhythm of solid and void.

The Medical Center projected for the lower east side of Manhattan is based without compromise on the principles developed by Le Corbusier in his proposals for the League at Geneva, but with even less formalism. A twenty-storey hospital – announced somewhat wistfully as suited to patients in the middle-income group – offers a wide, unbroken facade to the sun; the five-storey University Clinic stems from the side of the hospital; and to the right, also facing the south, stands the Residence Hall for internes, nurses and students. This is a scientific instrument and must gain whatever dignity it may gain from its resolute serviceability.

Of all buildings projected in America, those of the United Nations are most in tune with the ideas of Le Corbusier. His influence among the architects of that project was, if not dominant, at least determinate in the general issues.

I think it a remarkable demonstration of our new vision and awareness that we can think of such buildings as those of the capitol of the world. They are not so much fragments of a new architecture as prophecies of that sentiment out of which architectures are created. They are a kind of poetry into which are translated values less reasoned than felt.

We ought to think of Le Corbusier as a poet. He is so much a poet that he sometimes forgets to be an architect. His buildings are symbols merely of a world of idea which he has created as much in words as in constructions. Our young architects look up from their drafting boards to catch, through a torrent of images and through the sketches that sprawl across his pages, pregnant with ideas, glimpses of a new and radiant universe – and it is that knowledge which kindles them.

It is that prescience and not his strange inventions – his horizontal windows, suspended facades, piloti – that gives importance to the work of Le Corbusier. He promises us a new world, the creation of our giant machines, and an architecture cleansed of cant and superstition in order that it may celebrate that world. He knows how the science has pushed outward the boundaries of our experience and how the machine has set us free. He is not fearful of that experience, nor is he for a moment dismayed by the collapse of that traditional and coded idea which armored us against our freedom. We will not understand his work unless we understand it as a hymn in praise of the future.

TODAY'S SCHOOL IN CANADA

By **WATSON BALHARRIE**

CANADIAN school design seems to be a field of architectural endeavour which has been able to weather the storm of reactionary opinion without crippling compromise. As a result, the theory of functionalism or the scientific approach to the problems of progressive school design that in many cases exist today, is proving itself in the form of safer, and healthier environment for children and teachers; better lighted, simpler, easier to maintain buildings, having the accent on proper relation between activities, rather than monumental facadism, are becoming increasingly evident. Admittedly, changes in teaching methods and objectives have, in most cases, resulted in the need for greater study of spacial relationships, but greater economy, and the educator's demands for better classroom facilities have resulted in a need for greater technical knowledge and awareness of material possibilities. This knowledge and awareness is expressed in new school architectural terms such as flexibility, brightness ratios, light intensities, color dynamics and so on. The sensible application of these terms to the problems of school design points the way towards a fresher and more honest concept of school architecture.

For many years our educational programs have been forced into buildings, the concept for which was dictated by a desire for an academic appearing exterior. But now scientific information on the behavior of the child's body, mind and spirit makes it possible for architects to design buildings on a scientific, rather than an emotional or historic basis.

In a conscientious effort to carry this scientific knowledge into practice, school architects have taken advantage of research on new uses for materials, fenestration types and mechanical equipment, and the architectural expression which has resulted from the new forms can now be observed and studied. The plans with their scientifically conceived environmental amenity, interior circulation, and highly articulated or, in some cases, integrated spacial relationships, are now in use and the merit of the basis upon which these plans were formulated can be assessed in a realistic way.

The one-storey multi-room structure, for example, is no longer an experiment. The long, sprawled-out buildings which seemed to contravene economic and climatic laws, especially in eastern Canada, and which definitely forced some traditional architectural concepts into the discard, have been tried out, and the almost universal acceptance of this type of school indicates that the long, horizontal circulation lines which are the inevitable result of one-storey planning, are not as objectionable as early research might have indicated, and structural and mechanical problems which at first seemed economically unsound, have now been overcome and it is possible to build one-storey schools today which compare favourably in cost with more conventional multi-storey buildings.

In the one-storey school, the terms "multi-lateral," "uni-lateral," "orientation" take on new significance. It is now possible to apply in principal the daylighting types used so efficiently in one-storey industrial buildings. Canada, in its vastness, is divided into many climate regions, ranging all the way from the mildness of Vancouver and Victoria to the sub-zero temperatures and frost conditions of Northern Ontario and Quebec, and the sub-arctic regions. A universal type of architecture, having a system of fenestration, for example, which would be acceptable throughout the Dominion, is not possible. Limitations imposed by climate directly affect the architectural expression. Even in Ontario, which might be considered as one climate region, there is now evidence that the Province itself is sub-divided into climate regions, and liberties taken with roofs and glass areas in or around the Toronto area are not wholly successful even as little distance away as Ottawa and North Bay. Bi-lateral lighting in classrooms arranged on both sides of a corridor, the ceiling of which is lowered to allow secondary light into the classroom, is not unusual in climates where there is little snow, but the resultant trough in the roof simply fills in, in the areas having more rugged winters. It is commendable that, while architects are inclined to blame climate for a lot of architectural design compromises, they bravely tried out the various types of roof and fenestration and, as a result of observations, were able to come to certain conclusions which were put into practice in later designs.

The Interim Report on Elementary Schools, published by the Ontario Department of Education in 1945, did more to help improve school design in Ontario than its authors surely anticipated. Certain minimum requirements outlined in this report allowed architects a new freedom in architectural expression, and a new exuberance was noticeable in school design which followed the publication.

But now, with this initial stimulation worn off, school architects have settled down to the more serious problems of providing scientifically designed space for teaching. They are no longer competing with one another in the use of cliches. Each problem is assessed on its own merit, and the architectural expression which results is not necessarily related to any previous example, either Canadian or foreign.

(Continued on page 128)

UNIT PLANNING OF SCHOOLS IN ESSEX, ENGLAND

By **DENIS SENIOR**

H. CONOLLY, F.R.I.B.A. - - - - *County Architect*
DENIS SENIOR, A.R.I.B.A. - *Deputy County Architect*
E. T. A. SMITH, A.R.I.B.A. - - - *Assistant Architect*
W. C. B. SMITH, A.R.I.B.A. - - - *Assistant Architect*

NO visitor to Canada could have had a more generous and kindly welcome than was given to me by architects and educationalists when I was over from England a few weeks ago. I cannot hope to repay the kindness in any tangible way, but at least I can offer a few words of thanks to any Educationalists and Architects who care to read these notes. Everywhere I met that Canadian spontaneity and friendliness that must be experienced to be appreciated. Important heads of Departments of Education, Professors of Architecture and very busy practising architects gave of their time to help me, an architect from this austere island, to see and understand their work, and in doing this, they produced an atmosphere that made me feel they were pleased to spare their time. That is real hospitality.

Whether conditioned by the welcome or by the interest of the school building work it is difficult to know, but whatever the cause, Canada has one more devotee; a new admirer of a vital and most friendly Dominion.

Many people in Canada expressed an interest in the work we are doing in England and it may be that some notes about Essex School building, giving an idea of our problems and our attempts to solve them, will be welcomed.

Essex is a county to the North East of London. A considerable part of Greater London, the extra Metropolitan area, is in the County of Essex. The population is about 1,400,000 and these people are spread irregularly and most unevenly over about a million acres but by far the greater weight of population is in the near-London region. To the north and north east of the County are many small communities; a lot of them familiar names to Canadian Royal Air Force men who knew these villages and hamlets so well.

This is one of many English Counties; it is not unique and its problems are those met in other parts of Britain, so the conditions here can be used to give some picture of conditions in many other parts of the country. Only the methods of solving the School building programme are our own.

With the end of the war and the return of the men from the services, the programme of house building was started to a plan, or to be more correct, to a series of plans. London, war-scarred but full of life, had to spread some of its load of returning citizens if its replanning was to be effective. This spreading of population is being done by building new communities in the "overspill" areas, and Essex is one of these areas. Already five new dormitory communities are being built here to house some of London's people and there is provision for about 50,000 of these people.

Like other places near London, Essex had some schools completely destroyed and many badly damaged during the war: others were becoming obsolete or partly unsuitable for modern teaching, with the result that it had a legacy of school building problems of several kinds.

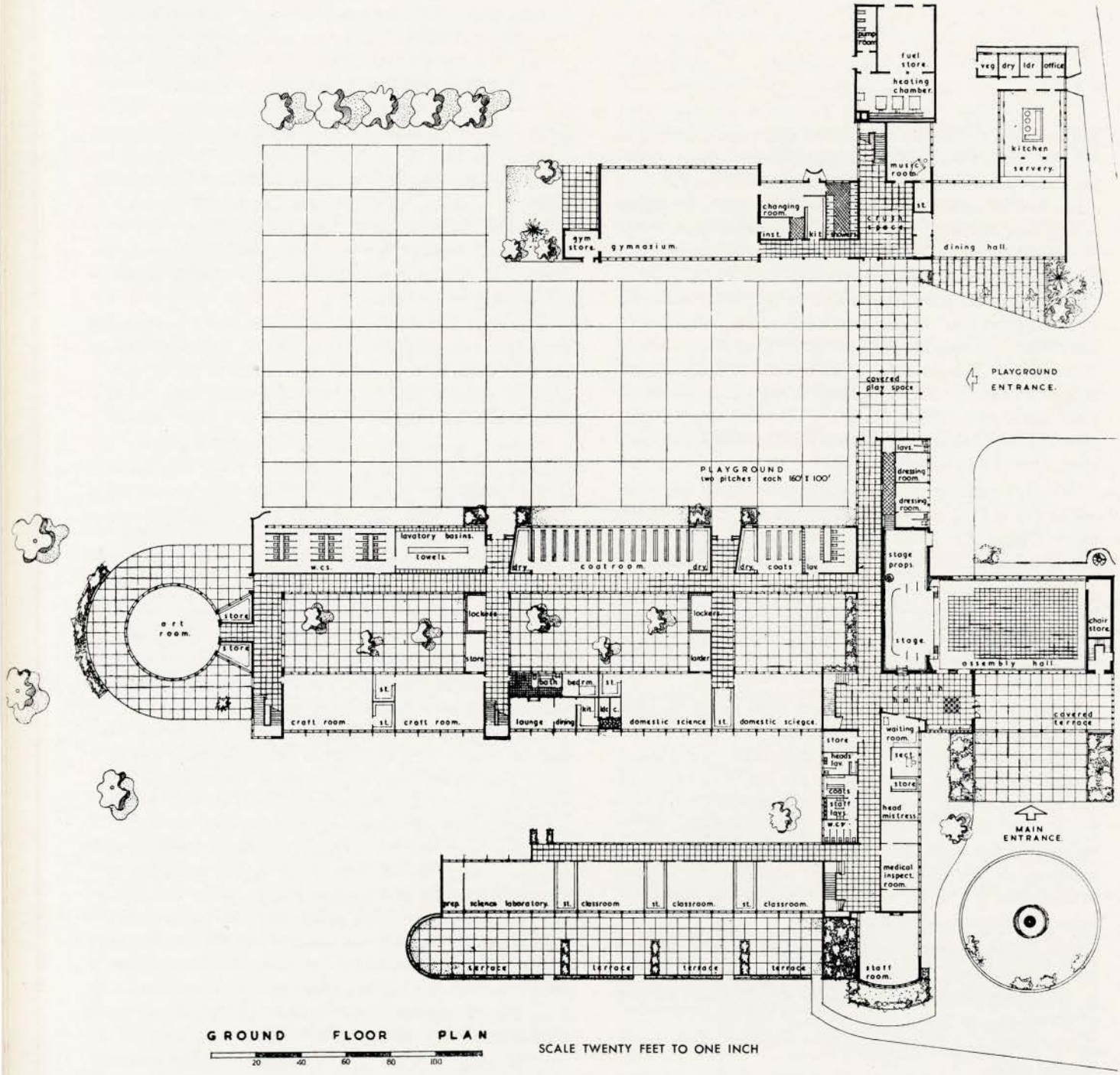
School places were needed desperately (and are needed yet) particularly for the new communities built in the "overspill" parts of the County. The houses were built quickly; how, then could some school provision be made, also quickly?

The first step was taken when a number of prefabricated "huts" were offered to the County by one of the Ministries. The huts were accepted with gratitude and two schools, nominally temporary, were designed and built within a few months, one in the heart of each of two new housing estates. The name "Transit Schools" was used; it was intended that pupils, newly arrived on the housing estates should be received at these schools and be taught for a short time before moving along to more permanent teaching quarters. The schools, however, are in constant use with full staffs for both primary and secondary age children; each school is separated into two units for the two age groups. Considerable thought and attention was given to the grouping and layout of the huts and the landscape design was part of the programme with the result that the garden layout with grass and flowers was ready when the schools were opened. These temporary buildings eased a situation which was acute; but the main problem remained — to build enough permanent schools for the growing school population of the new communities.

Older children can be taken some distance to school by using public and private 'bus services but the younger children should not have to go far from their homes to get to school. Thus the urgency is for more primary

schools: Twenty are needed quickly for the five new communities.

Adequate supplies of material and labour are difficult to find; technical staffs are busy and generally most things needed for building schools are scarce. Some attempt had to be made to economise in the use of technical staffs in architects' offices and of operatives on the site and to do this, one step was obvious — standardisation. This at first suggests dull, stereotyped results; but only at first. The normal building, for example a house or a factory, is made up of a number of standard parts. In Britain, an integral part of most traditional buildings is the brick, to a standard size; similarly, the roofing tile, the concrete walling slab, the sink and so on. All are standard sizes, or are made up of parts of uniform size. The whole school is likewise built

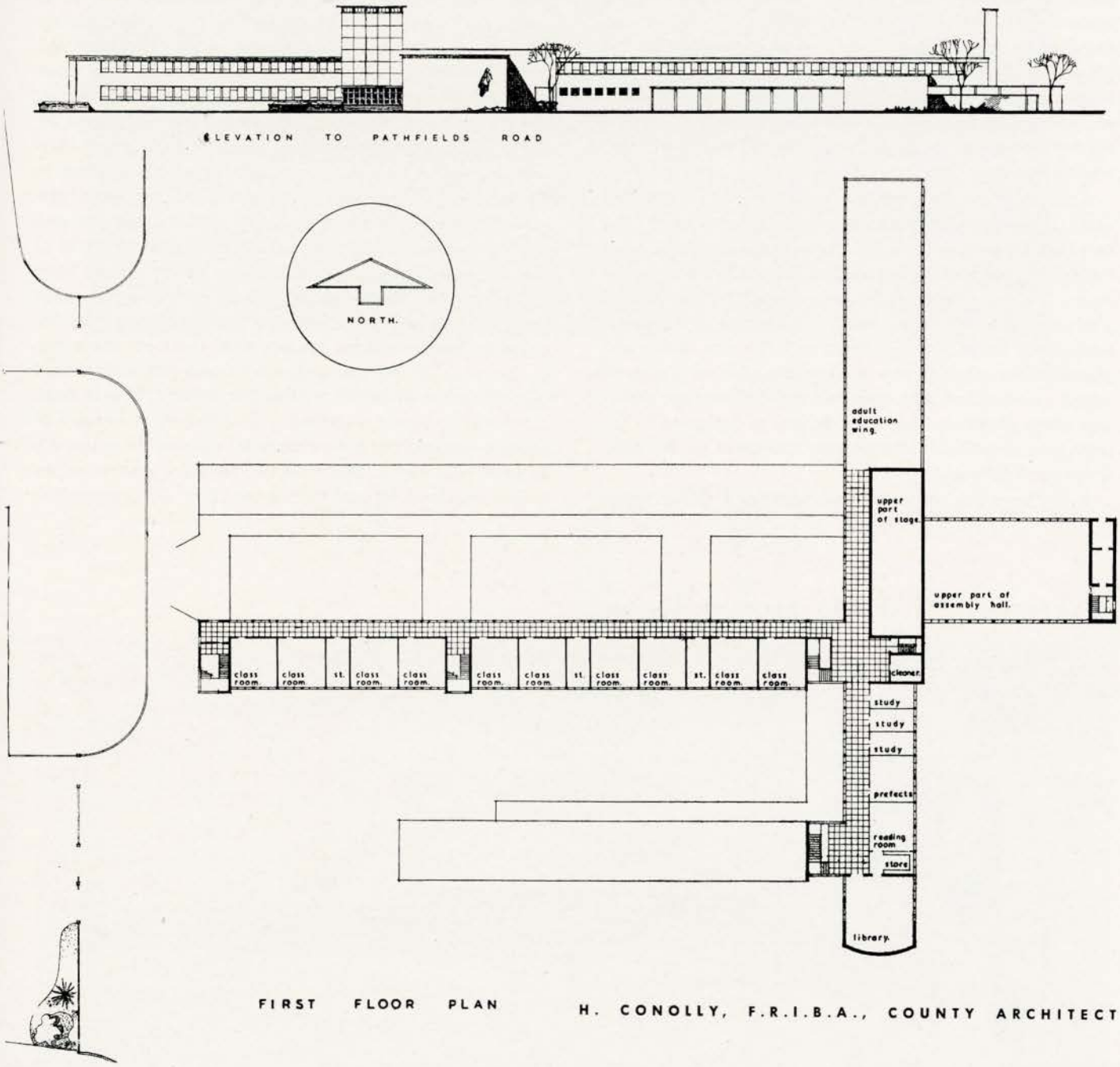


C L A C T O N - O N - S E A

up of a series of plan units, standardised: the most obvious one is the classroom. Normally, the activities in the teaching room of one school differ little from those in a similar room in the next school for children of the same age groups. Similarly, the toilets and coat rooms, again standard shapes and sizes, are needed and these examples could have others added to them but there is no need to go further; the possibility of some degree of standardisation in a programme for a considerable number of schools is clear. It remains to decide the extent of plan standardisation that can be realised without detriment to the merit of the whole school plan, and to its aesthetic effect in any building neighbourhood.

Our research into the functions and activities and their relationship to the accommodation required by the 1944 Education Act shows that, in a primary school, a con-

Clacton-on-Sea Girls' Secondary School, showing the system of "elbow access" planning allowing bi-lateral lighting to the teaching rooms and indicating the type of accommodation included in secondary schools generally.



FIRST FLOOR PLAN

H. CONOLLY, F.R.I.B.A., COUNTY ARCHITECT

GIRLS' SECONDARY SCHOOL

venient arrangement is for a small group of teaching rooms, say two or three, to be on one side of a corridor and for the toilets and coat rooms used by the children in these rooms to be nearby, preferably across the corridor. So here we have a small unit, a "least common denominator" which is essential to all primary schools.

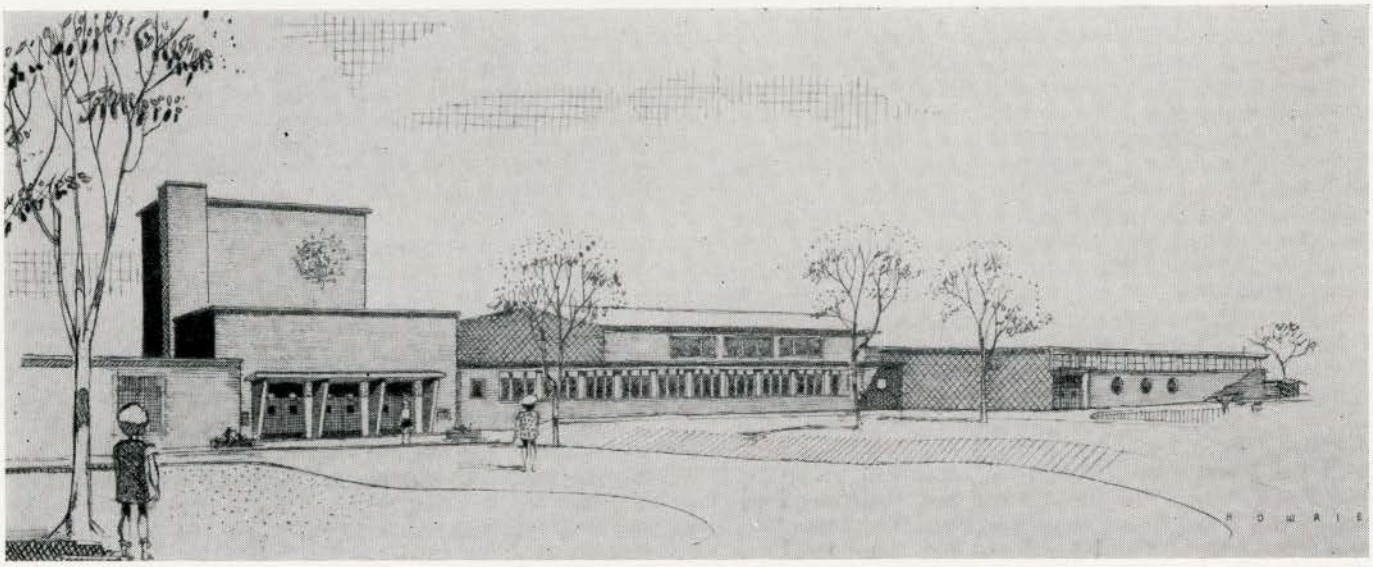
An analysis of the building regulation requirements and of any typical primary school plan reveals that most schools for this age group can be built up quite readily from this basic unit of two or three classrooms and their toilets, with one or two other special units such as a General Purpose room and its stores and one with teachers' and administrative offices. From these minima of two or three units, any school can be designed. If the units are so arranged that they can readily be joined together or can stand on their own as demanded by the plan-form, then the complete school can take almost any shape to build it into the site and landscape and standardisation has no aesthetic disadvantages. The results are not stereotyped and no "stale chocolate architecture" comes from our production lines.

Although the main repetitive elements can be standard units, some features must be separately designed; the entrances may be a link between classrooms and auditorium, it may need a high water tower or a low boiler room. The units may need a right-angle link or a simple short corridor. All these 'special' features are designed separately for each project and with the use of the unit planning for other rooms, a complete plan is produced which is individual and arranged to fit its own site alone. The plans illustrate how each school is designed to the individual needs of its own site and how all the plan shapes are different.

Apart from the obvious advantages of a reduction of drafting time, the unit plan permits the prefabrication of larger numbers of structural elements. Consequently, there is a further economy in the use of manpower.

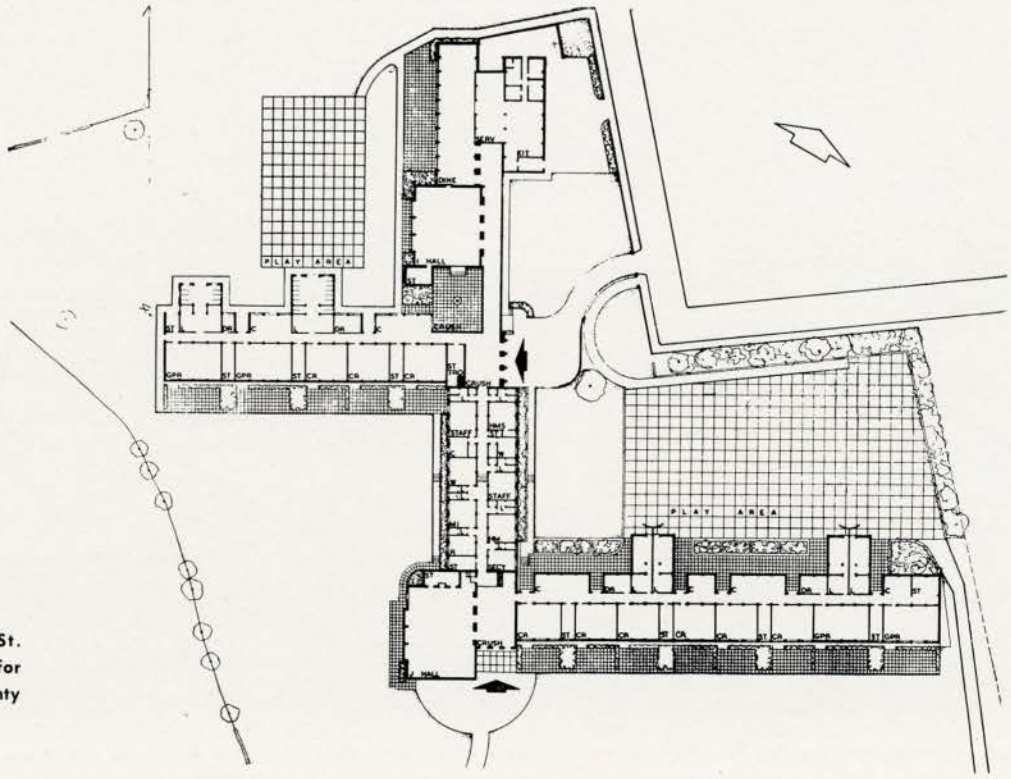
Our first group of schools has a structural frame of precast reinforced concrete, all made in factories away from the site. The choice of concrete was the direct outcome of the shortage of steel. A limited amount of steel is available for school building and this can be spread over a larger number of schools by using it as reinforcement for concrete rather than by using it in a structural frame completely of steel. Not only is there a limited amount of steel but timber can be spared only in small amounts for formwork or shuttering. Thus another factor arises controlling the type of frame and one that directed research towards factory production of precast concrete instead of site poured concrete work. Our precast, factory-made concrete frame for a classroom is in three sections, two posts and a beam, site-bolted together at the point of contra-flexure. The shape is conditioned by the design mechanics and by the need for good daylighting in the rooms. It provides bi-lateral lighting to all teaching rooms and at the main lighting wall, provision is made for fixing lighting control canopies and vertical baffles, all in concrete. The subsidiary parts of the unit plan, for example the toilets and corridors have a similarly designed concrete frame of four parts, again factory-made and bolted on the site. In all, only seven different frame sections are essential and from these can be built up all the main elements of a primary school plan. Another principle guides our design. This is flexibility. Many times a carefully thought out scheme has come to nought because a material obtainable when the scheme originated, disappeared from the market when it was required for use in the building. To ensure that

LOUGHTON ST. NICHOLAS PRIMARY SCHOOL



This school is built on the unit planning system described in the article

Carved brickwork on the water storage tower which overlooks the children's play areas. The carving is direct on the brickwork and is the artist's symbolic expression of the spirit of youth. Flower decorations are reproductions of simple flowers found in the school grounds.



Floor Plan, Loughton St. Nicholas Primary School for Five Hundred and Twenty Children.

some schools should be built despite the shortages, all structural frames are conceived to allow them to be covered with a material at hand when building starts. For example, the concrete frames can support roofs of concrete slabs, aluminum decking, or asbestos cement and the walls can be of precast concrete, sheets of asbestos or of brickwork; this structural flexibility guides the school programme around some of its most difficult obstacles.

The unavoidable limitations of supply have been a spur to our efforts to produce something economical and they have had a salutary effect in keeping our minds on the essentials of simplicity of plan and construction. In our task we architects have had the help and constant co-operation of teachers, a panel of whom criticized our preliminary designs for unit planning, advised us on many important aspects of classroom layout and use and encouraged our efforts to produce schools designed for children; schools designed from the inside outwards. That the results are in some measure satisfactory is evidenced by the fact that the teachers are finding the schools good places in which to teach.

Of vital importance too, is the wide vision of the Education Committee that controls our work of building schools; the members of this Committee have accepted our principle of building for the children and have not expected monuments to civic dignity.

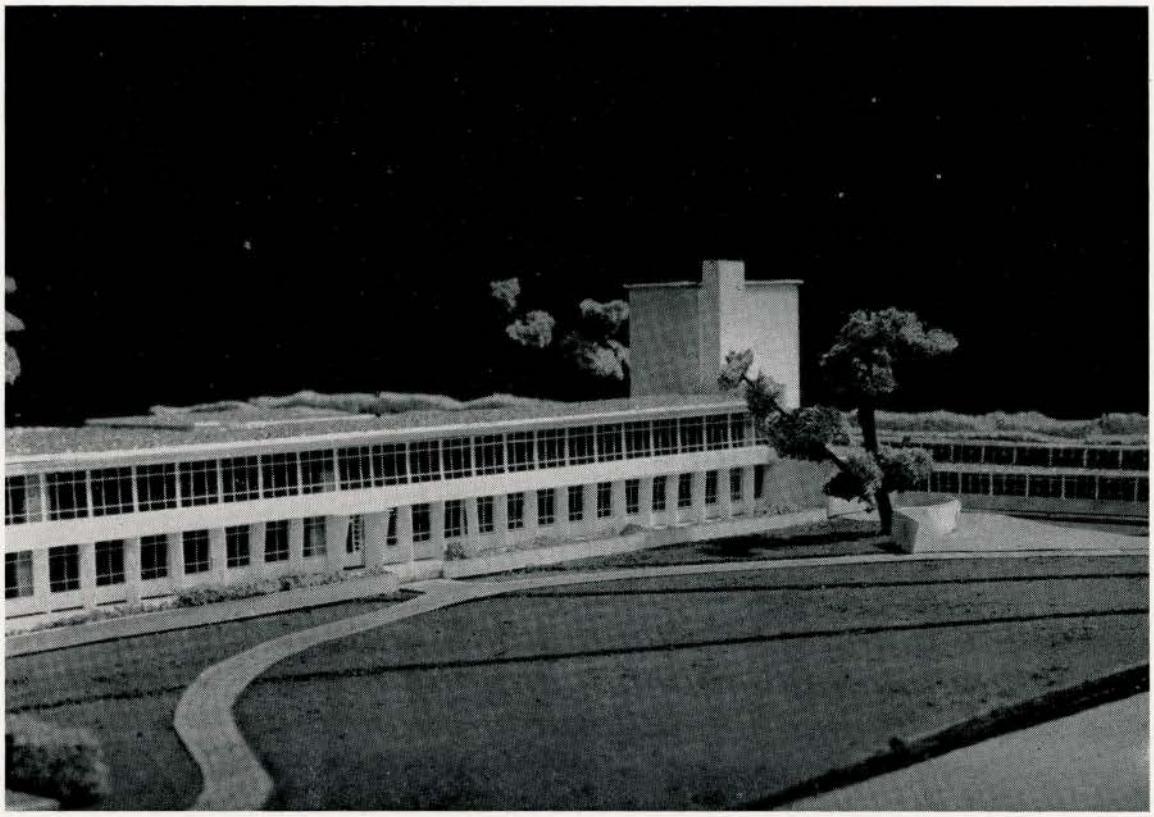
So we think that our "unit planning" and factory-made construction have gone some way to meet the urgent need for schools as quickly and as economically as possible.

Whether our solution of the task set before us is right or wrong can be left for others to assess; meanwhile, we press along with our next school building programme, the schools for secondary age pupils, where we are dealing with different problems in a different way.

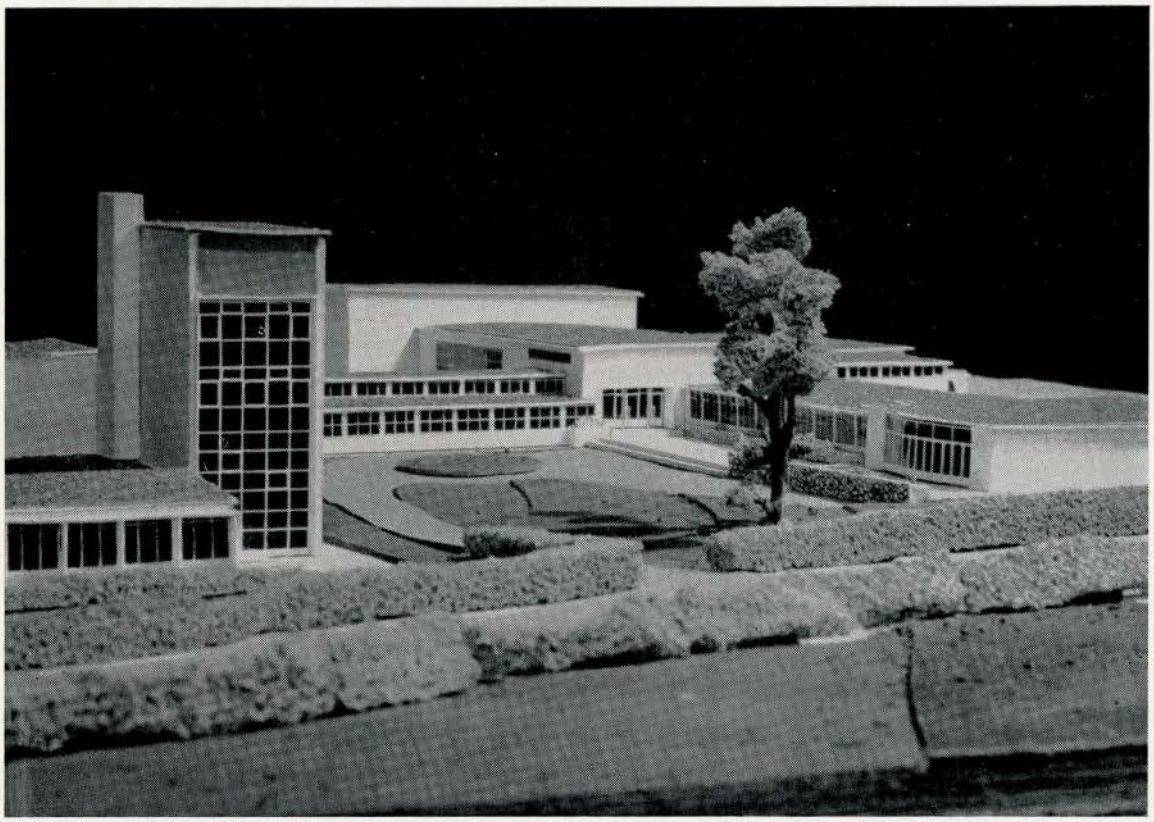
LOUGHTON ST. NICHOLAS PRIMARY SCHOOL

Photographs by Payne

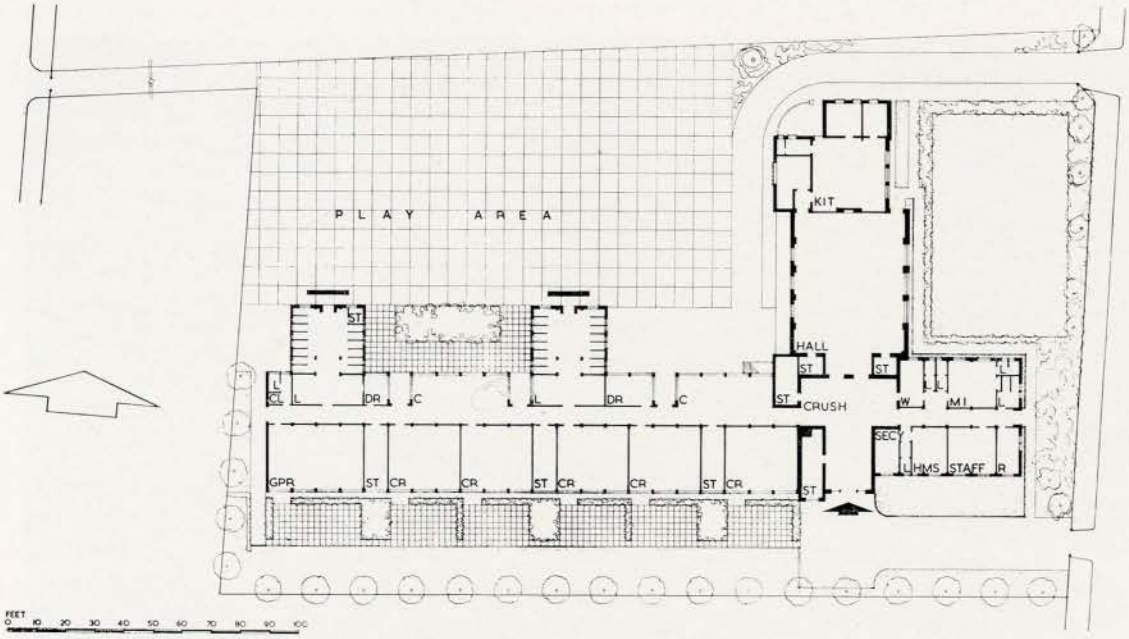
Entrance and classroom wing showing the outside teaching terraces paved with coloured concrete slabs and with flower box and low hedge divisions between each classroom. Also shown are the light control baffles and canopies.



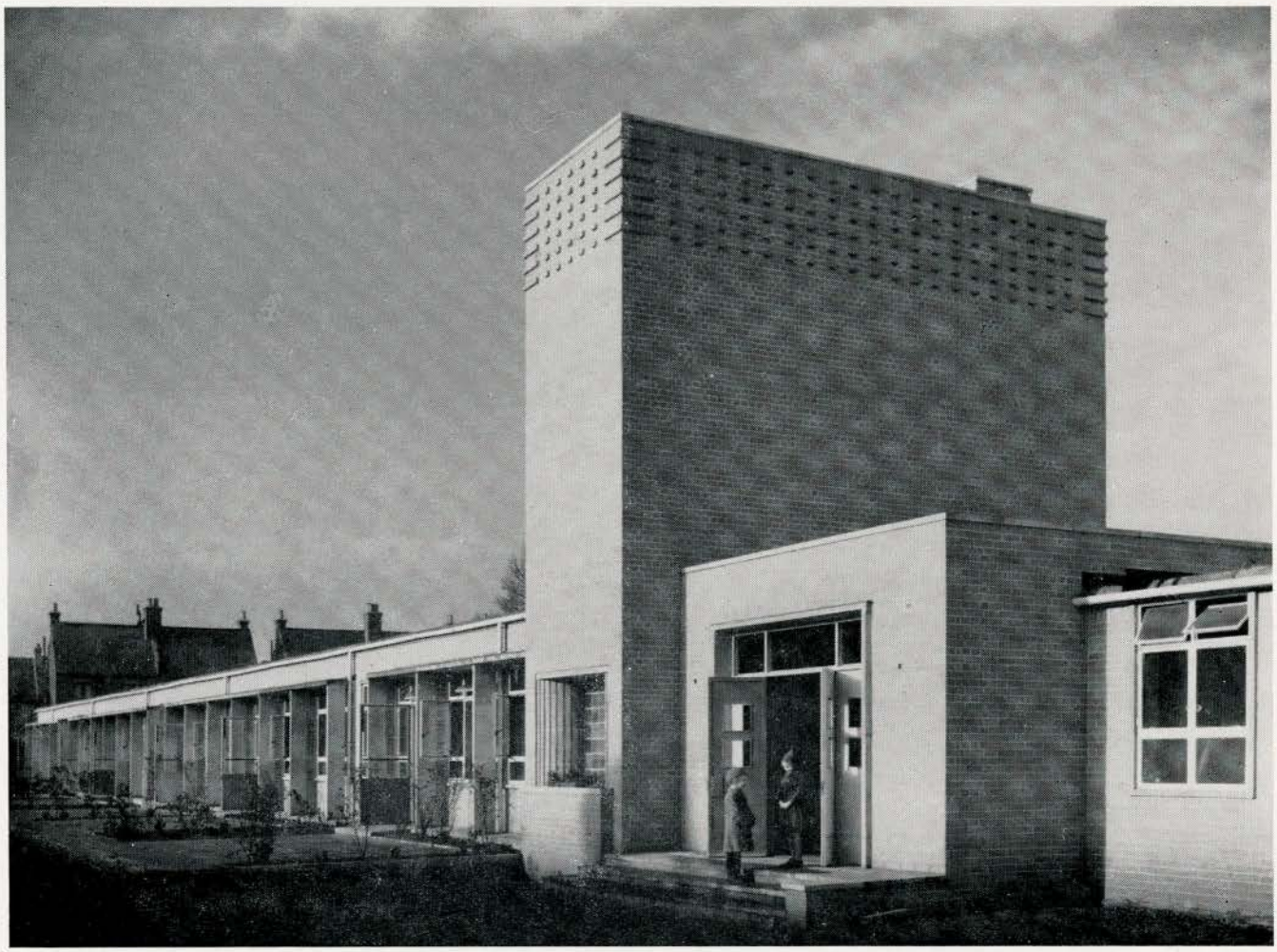
Classroom wing showing cantilevered projection of upper floor with light control baffles. This school is in the process of being built but is not yet completed.



Model showing entrance area with gardens. To the left is the staircase and water storage tower, centre is the auditorium, stage and dining room, and to the right is the adult or community wing.



This school is built on the unit planning system described in the article.



A primary school built on the site of a school completely destroyed by enemy action. The children's entrance, the tower and the classrooms are shown, again with teaching terraces for outdoor instruction.

COLOUR AND CHILDREN

By **GUY DESBARATS**

BOOKS for little children are always in colour, bright colour; and most children like the circus — what would a circus be without colour? Perhaps, then, colour has a value in helping to learn, to remember; the stimulus of colour must be a pleasant experience.

Children spend most of their waking time in schools, and in school the teachers try to instruct as pleasantly, or at least as painlessly as possible.

Does colour belong in the school?

The architect, who is shaping an environment for children, must use all the means at his disposal to create the fittest surroundings for pleasant learning. His means are building materials, and these materials have physical properties which dictate their use and also visual properties of texture and colour. These are the properties that affect the child and that interest us here.

It is for the physicist to study the nature of colour, for the physiologist to study the effect of colour on humans, and it behoves the artist, and also the architect, to use colour. Although there is a great deal to be learned from the sciences on the matter of colour, and it is of great advantage to an architect to be well acquainted particularly with the physiological study, the physiologist has this to say to himself on the application of colour and its influence on humans in art: "Any attempt to apply the scientific principles of colour vision in making a picture, must surely fail if it be not granted at the outset that it is only to a limited degree that those principles can apply. Colour appreciation is as much a psychical as a physiological process. Previous knowledge and training, experience, tradition and association of colour impressions with impressions previously received through other senses and stored away as memories, all play a part in determining the effect which a colour or a pattern of apposed colours has upon us."* Thus, it is mainly on his own sensitivity as an artist that the architect has to rely in his handling of colour; no set of formulae will enable him to create particular atmospheres in the school that he designs. He has at his disposal the means to spread gaiety through a building, and serious quiet, or drab staleness and depressing gloom.

It is the memory of my own school days that prompted this writing, the memory of dark corridors, painted dark, of colourless walls, cheerless and cold. I thought vividly of the colours favoured now in so many schools, endless shades of green; "green is good for the eyes" has become the emphatic doctrine of all unimaginative architects and educators, but are green reflections really so healthy looking on human faces? And then, for a change, one finds a cream shade, cream that is neither white nor yellow, alone, or associated with its almost inevitable contemporary, mustard brown, frequently streaked with yellow, a la golden oak, in a contrast that I am sure you recall well.

It appears that this present colour denial has institutional connotations; schools, charitable institutions, public recreational buildings, with a very few notable exceptions, are the worst offenders in their toleration of unrelieved colour starvation.

Few enterprises that depend for survival on their own merits of attractiveness could hope to survive without offering a pleasant visual stimulus — retailers have never questioned that truth, in fact they have so used, or abused it, that our shopping streets present a front of unrelieved intensity, owing of course to the frantically competitive use of the colour range, causing the greatest stimulus, the excitants. But at least advertisers can be given the credit for providing the only note of cheerfulness along streets that would otherwise stretch very mournfully on grey winter days. But the unrestrained enthusiasm of street advertising exploits the potentialities of colour in a limited way only. There are different moods of colour in church interiors, there is the colour of homes, of cars, of the circus, of toys. It seems strange then, that institutional buildings, and particularly schools should so seldom benefit by studied colour designing, for such buildings offer, owing to their complex nature, an exciting possibility for the use of all the other qualities of colour and of colour contrasts that can be used in creating a succession of mood-spatial experiences. (Again the alert commercial enterpriser is recognizing the re-discovered value of colour in creating subtle atmospheres; for example, in the hotel industry.) Schools, perhaps, don't *have* to sell their wares, but educators agree that any physical or material help in making their process of forceful-feeding more palatable is welcome with open arms.

In all other physical aspects of planning and construction, the architects of many Canadian schools have collaborated with the educators in providing increasingly pleasant surroundings in matters of lighting, in cleanliness, in acoustical control, etc. I have visited many of these schools and felt a new happiness, but I noticed with regret that the architect had not completed his task. I felt that the colouring had just happened — "Oh, yes, the window frames will be green, the class-

* from "The Physiology of Colour Vision" by Heller and MacLeod.

room – pale green, or is it cream" – at any rate, in some such expeditious, even thoughtless way. Here and there a brilliant corner in a classroom, the tackboard, or flower boxes, but the background – non-participant, isolationist.

In industrial plants, alert organizations have carried out research work on the value of colour in preventing accidents, and in lessening occupational fatigue. Should the children in schools be denied the attentions that industry deems essential to its workers?

The colour-design of schools need not be planned exclusively on such a basis of scientifically controlled values as in industrial work, but it should at least recognize the importance of the practical laws, while proceeding beyond a mere literal application to create imaginative mood surroundings, not only designs for optimum light and safety, but also for gaiety, restfulness, excitement or solemnity, thereby completing the controlled environment in all its parts.

The question of using colour as a positive, participant element in design, as a force in education, raises the problem of the delicate handling of that power. As long as the background remained neutral, uninteresting in the true sense, the only consequence possible was a negative reaction, a repulsion, or at least a lack of awareness. Once colour is asserted, it must be controlled so that the psychological effect created will be in accordance with the real needs of the children. It is known that some colours and colour contrasts have a very disturbing effect; for example, the apposition of some shades of green on reds.

However, individual reactions to a given colour cannot be predicted, for colour appreciation is as much a psychical as a physiological process, as mentioned above, and that is one of the hurdles encountered by the architect who proposes a strongly positive colour scheme. I do not thing that the occasional distress or resistance displayed by people as a result of contact with a thoughtfully coloured structure, which is a reaction usually to one specific colour, is any indication that the colour is harmful; it is an inevitable consequence of the nature of our colour perception.

The fact that there has been a reaction at all to an environment is a good sign, rather than the apathy that greets an anonymous, nondescript colouring; and that is one of the most valuable functions of colour, particularly in schools (as in children's books), where it acts as a stimulation of awareness and towards an awakening of the critical faculty; separate realities in the children's environment acquire more distinct identity.

Generally, however, the reaction to particular colours and colour contrasts can be predicted, or at least anticipated quite accurately. The association of green-blue colour is coolness, of an orange-yellow, warmth, etc. And that is the painter's own vocabulary. He could not possibly convey any sort of message if colour had no associational values. As the forms of painting are identified by the area of colour used, so the forms of a building should be related through colour and mutually contrasted.

In practice, the architect, who is sufficiently sensitive to feel the necessity for a thoughtful and painstaking colour development of his structures, suffers, as ever, compared to the painter or sculptor, by the indirect nature of his control over the techniques of execution. The less difficult practical case is encountered in a structure designed with the greatest number of natural or manufactured finishes, for which reliable samples are available.

It is with the use of paints and pigments that the architect meets the most distressing difficulties. The paint catalogues available offer a subtle lure; a complicated schedule can quickly be erected, indicating that a particular shade in one catalogue is required as well as numerous other colours in as many more sample booklets; obviously an impossible bit of information to convey. Then it is necessary to draw up a schedule of actual colour samples – for which it is impossible to indicate the mix with any degree of certainty. The resulting interpretation is liable to much human error.

A thorough standardization of paint specifications is urgently required in the building industry with a recognition by all paint manufacturers of a chart of colours and tones of colour, accurately graded and specified by numbers. To-day, however, there is no substitute for the architect's own attention, right to the actual mixing at the site.

The author's own tribulations were mainly connected with one school in which he got the opportunity to conduct an experiment. A young and enthusiastic school board was trusting enough to approve (with many mental reservations and some anxiety) a colour scheme that he had conceived as a test of the theory that colour must complete the definition of a structure and create throughout a particular sequence of atmospheres, each in harmony with a functional need.

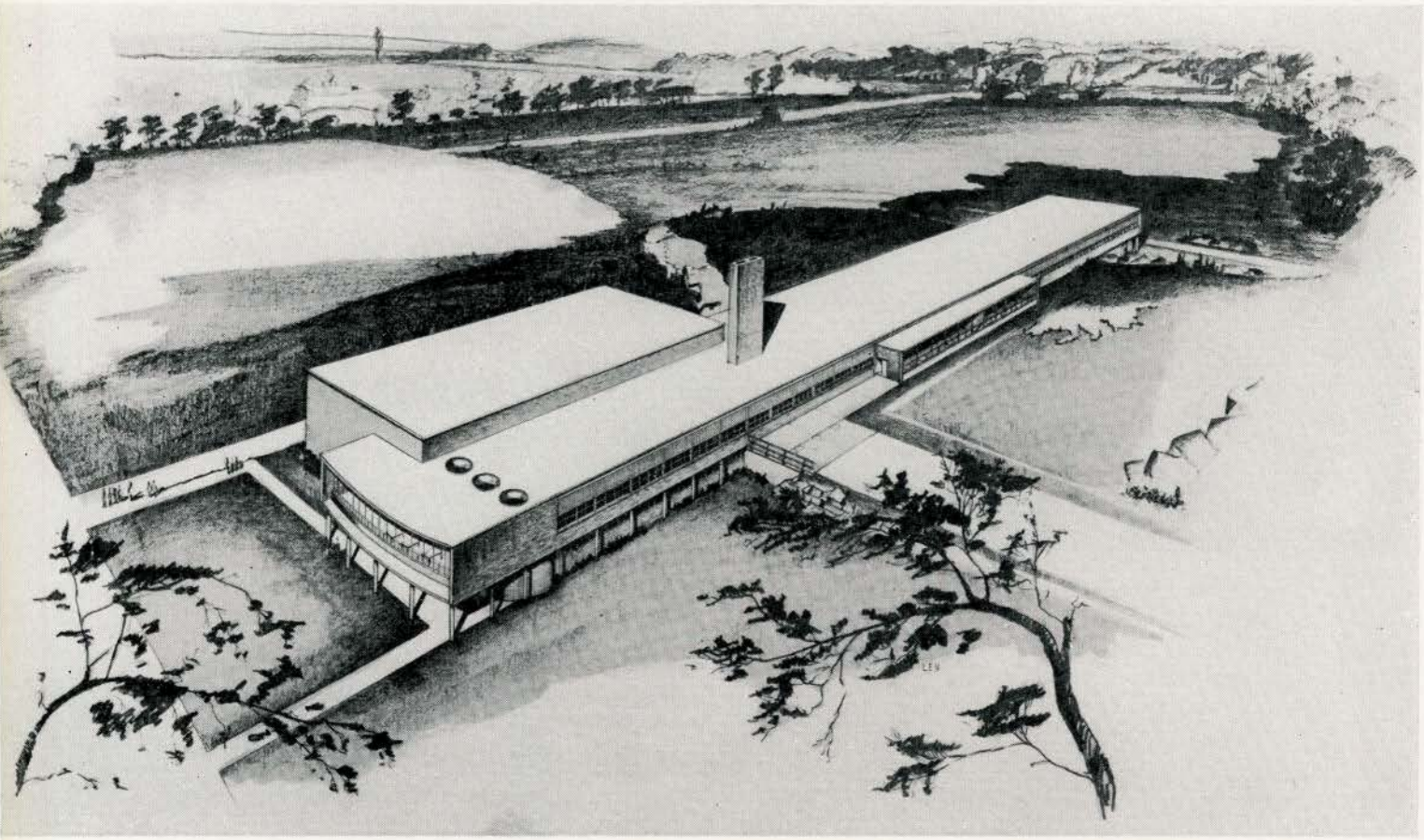
As a result of this theory, classroom colours were chosen to vary from the simplest contrasts of pure colour in the kindergarten, gradating through more complex tones of less distracting colours for the rooms of the older children – the exterior wall of each classroom being painted in the same key colour as the interior walls, so that a child might recognize his own classroom from the outside. All the openings, doors and window sash were painted the same dark, brilliant colour throughout the school, for immediate recognition anywhere. The steel pipe-columns of the covered play shelters were painted red . . . a precaution; the teachers' rest room, in warmer shades of a lower intensity than those in the children's rooms . . . a rest for the teachers from too much exuberance.

(Continued on page 128)

Photographs by Panda

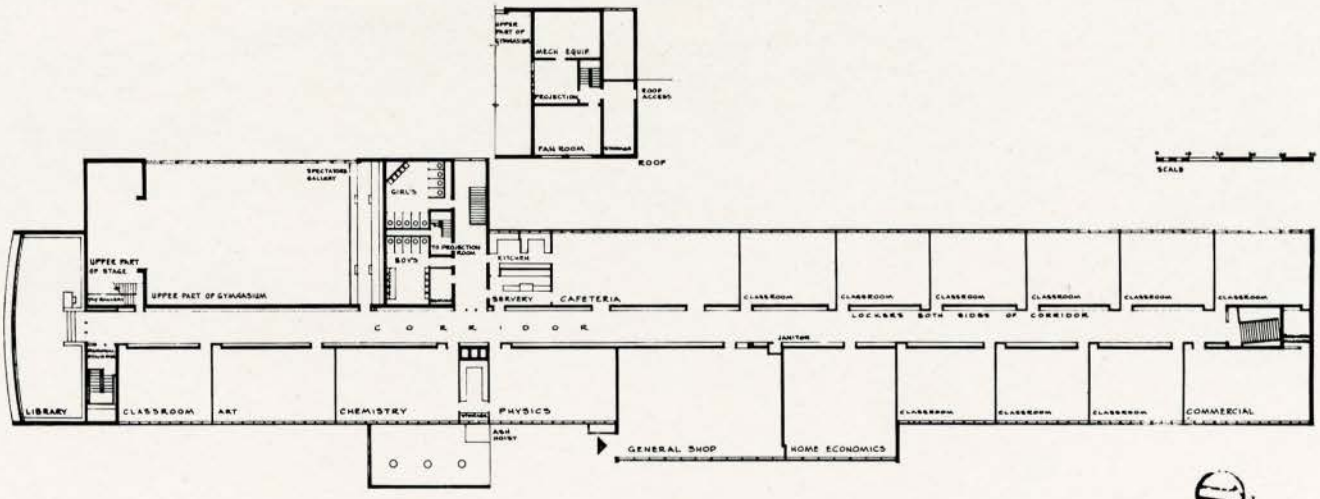
QUEEN MARY SCHOOL,
PETERBOROUGH, ONTARIO

JOHN B. PARKIN ASSOCIATES,
ARCHITECTS

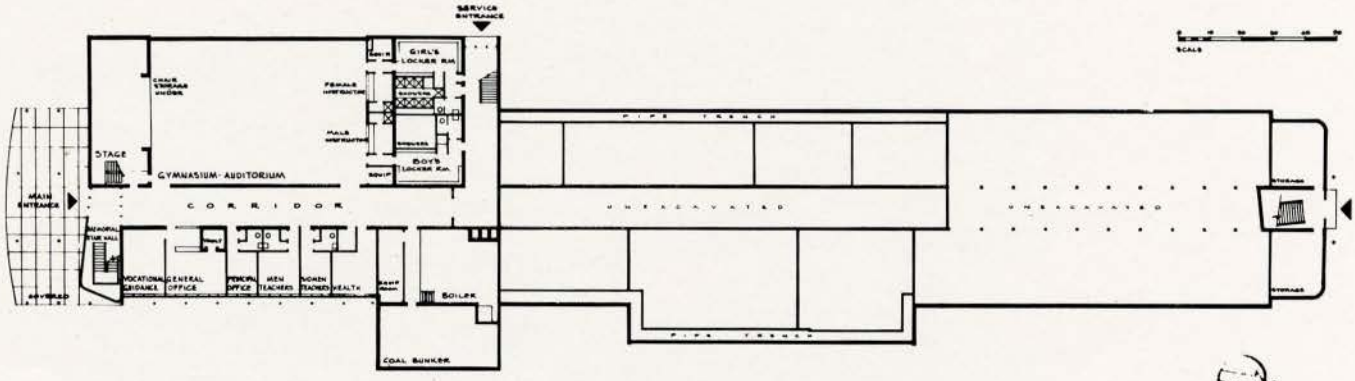


HIGH SCHOOL, PARRY SOUND, ONTARIO

JOHN B. PARKIN ASSOCIATES, ARCHITECTS

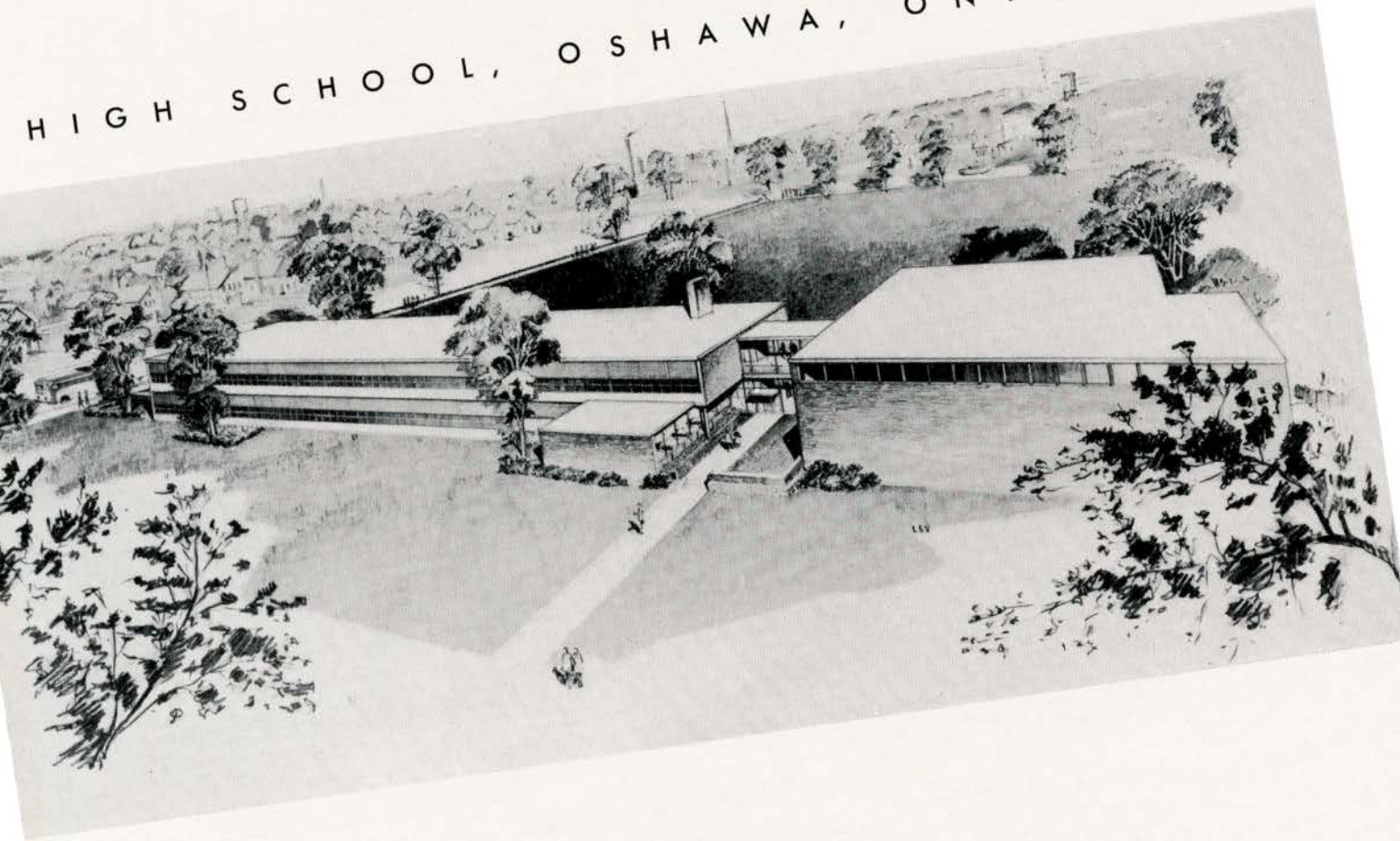


SECOND FLOOR PLAN

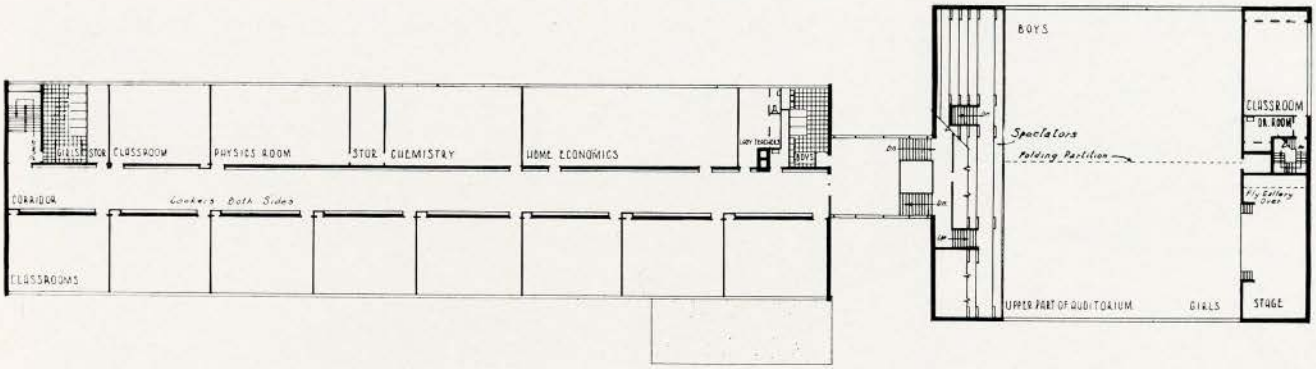


FIRST FLOOR PLAN

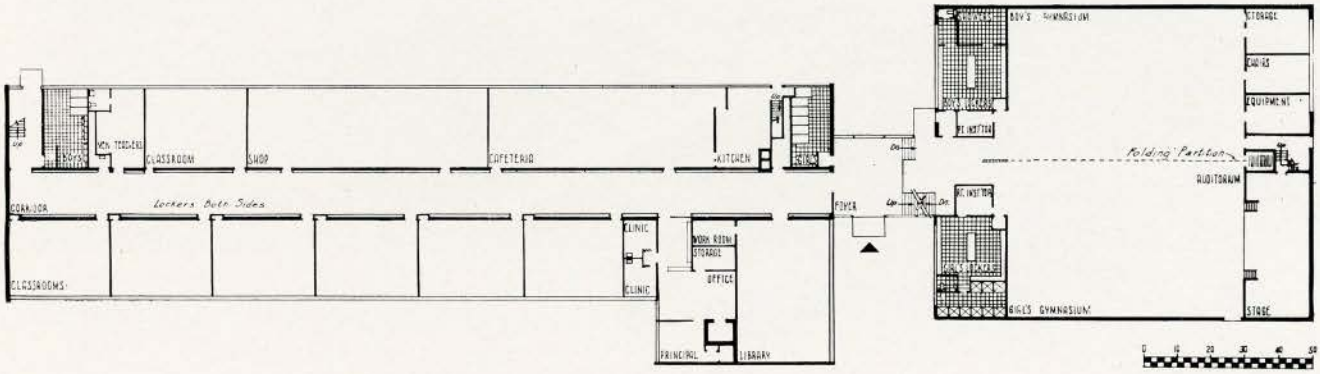
HIGH SCHOOL, OSHAWA, ONTARIO



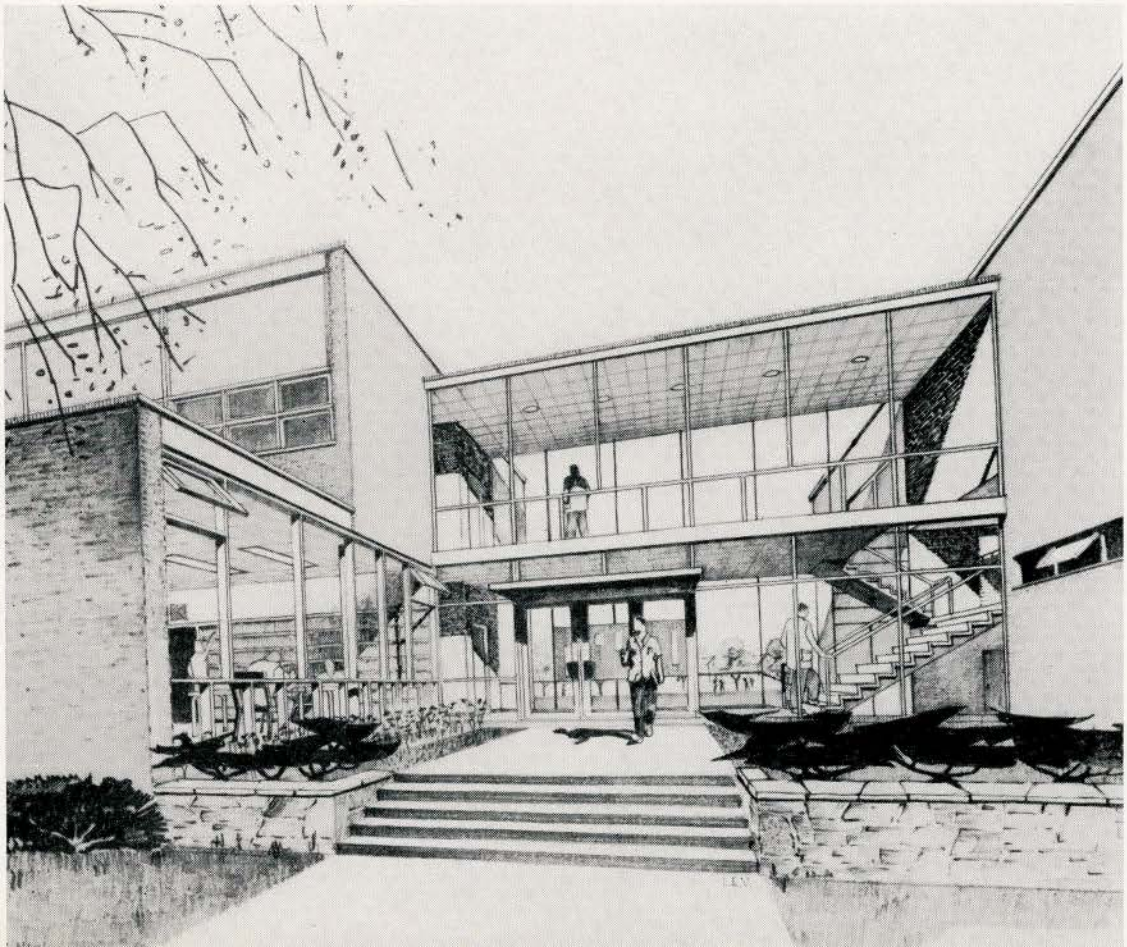
JOHN B. PARKIN ASSOCIATES, ARCHITECTS



SECOND FLOOR PLAN

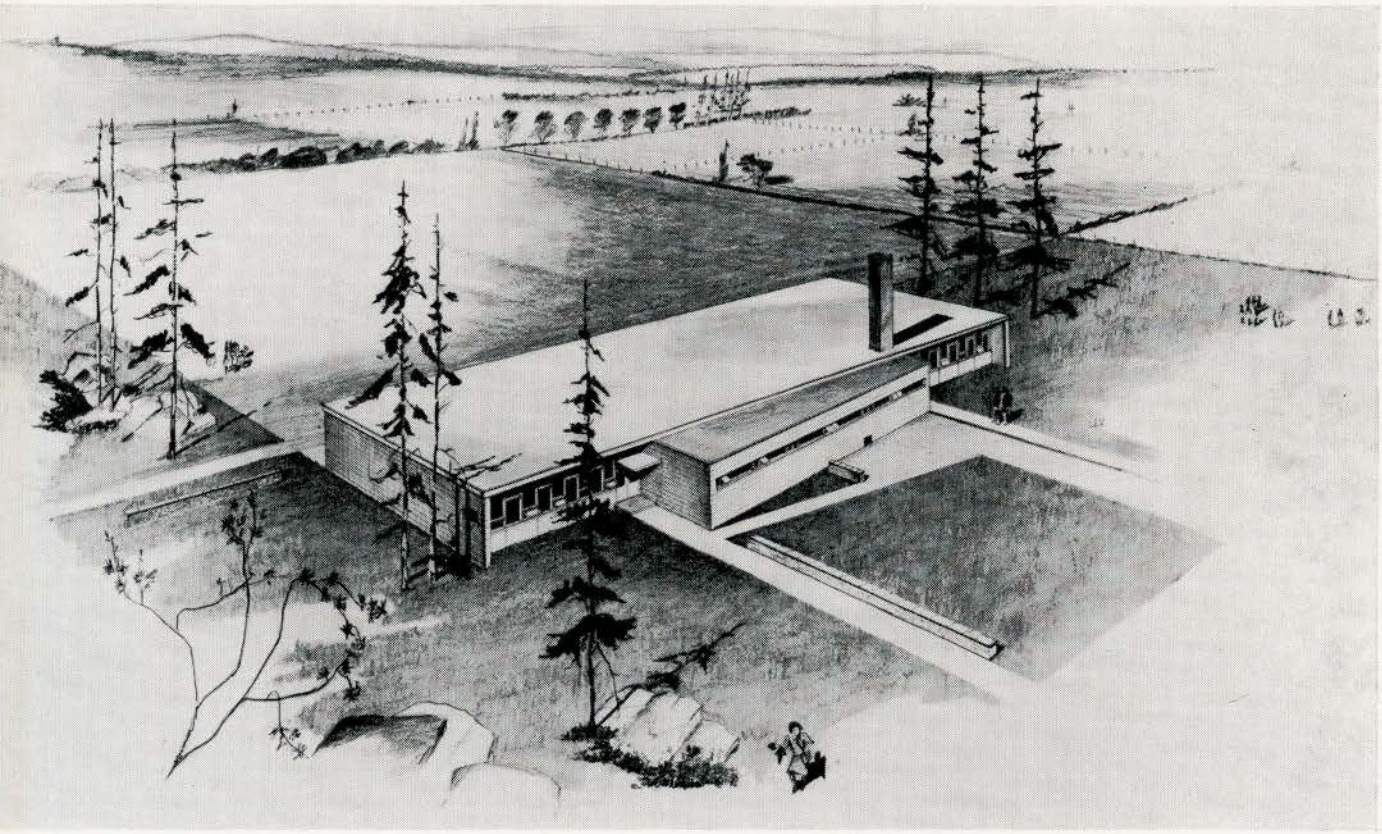


FIRST FLOOR PLAN

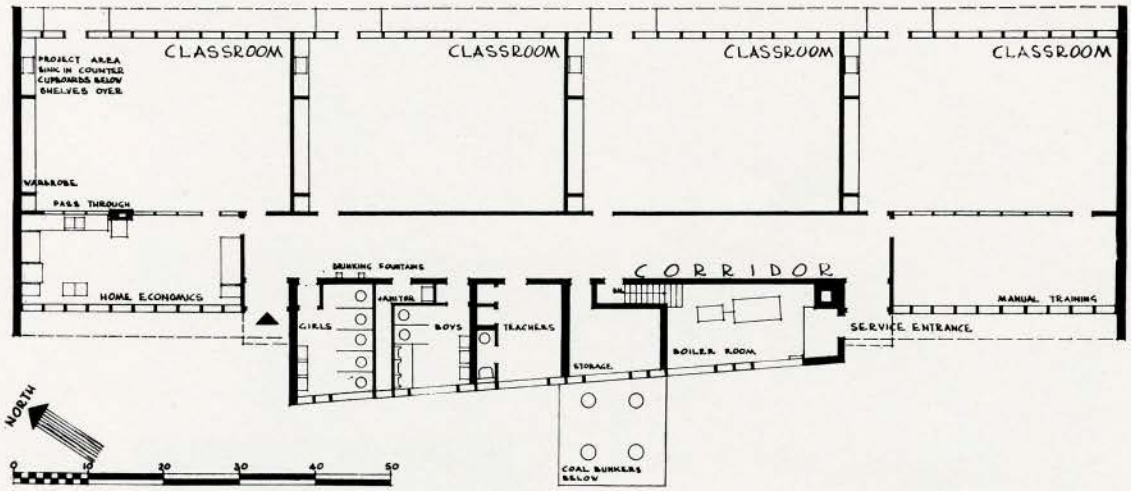


ENTRANCE

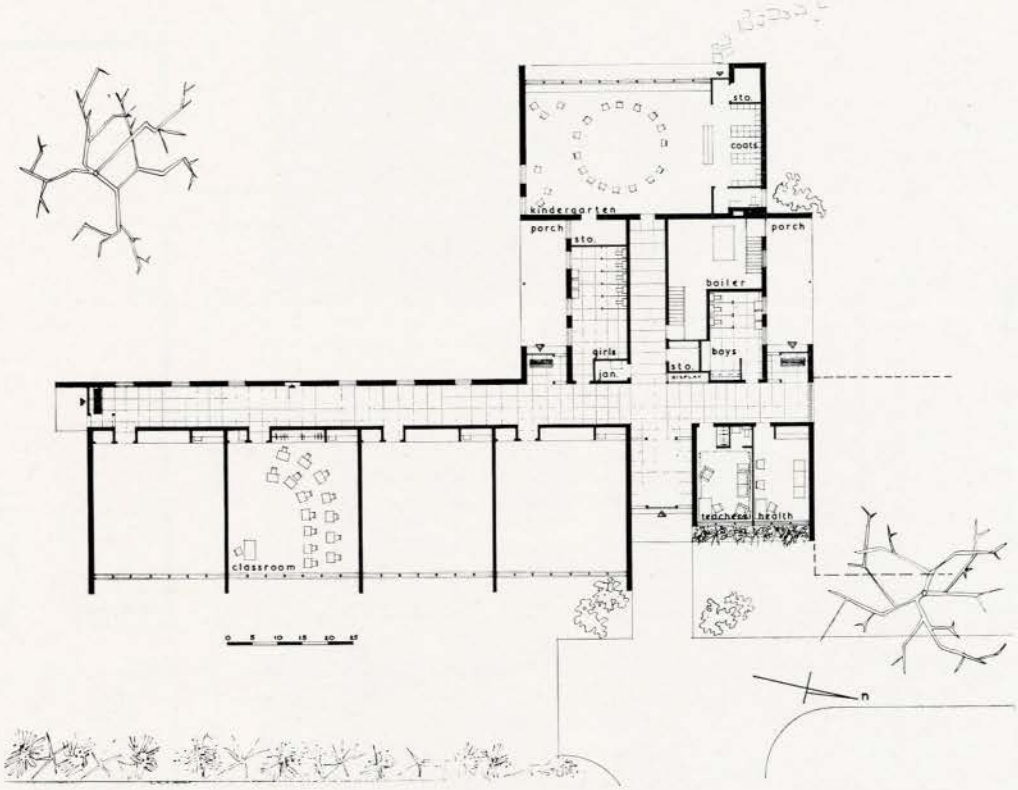
PUBLIC SCHOOL, MAGNETAWAN, ONTARIO



JOHN B. PARKIN ASSOCIATES, ARCHITECTS

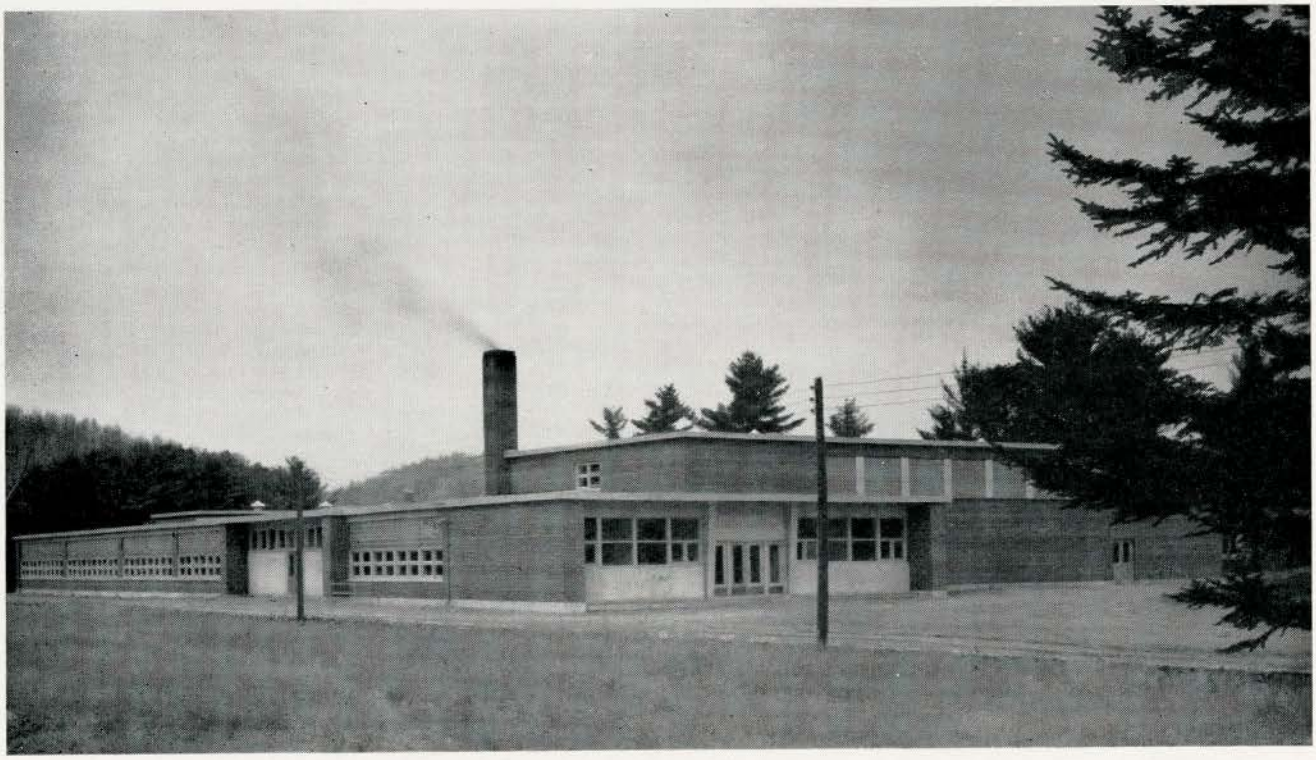


CARLETON HEIGHTS PUBLIC SCHOOL, TOWNSHIP OF NEPEAN, ONTARIO

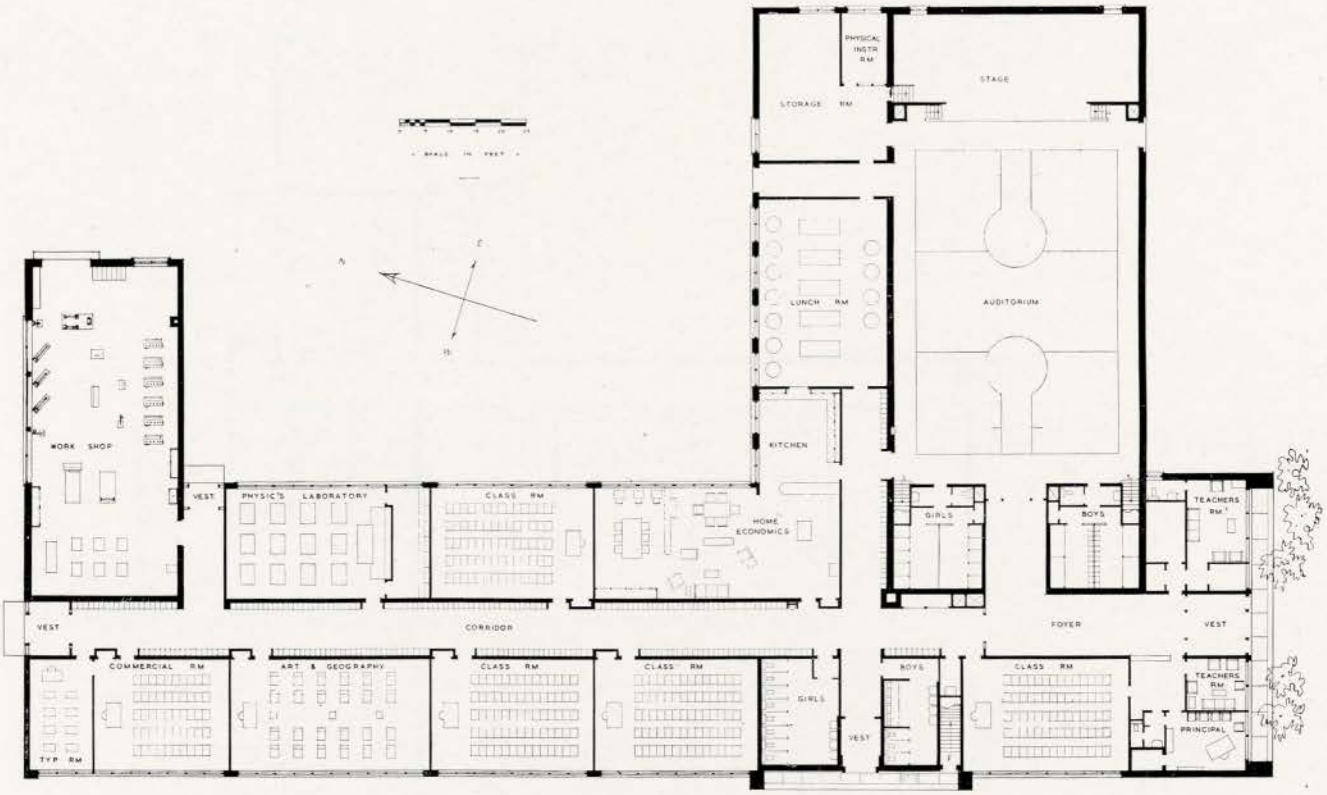


ABRA, BALHARRIE AND SHORE, ARCHITECTS

NORTH HASTINGS HIGH SCHOOL, BANCROFT,



Photographs by Lingard

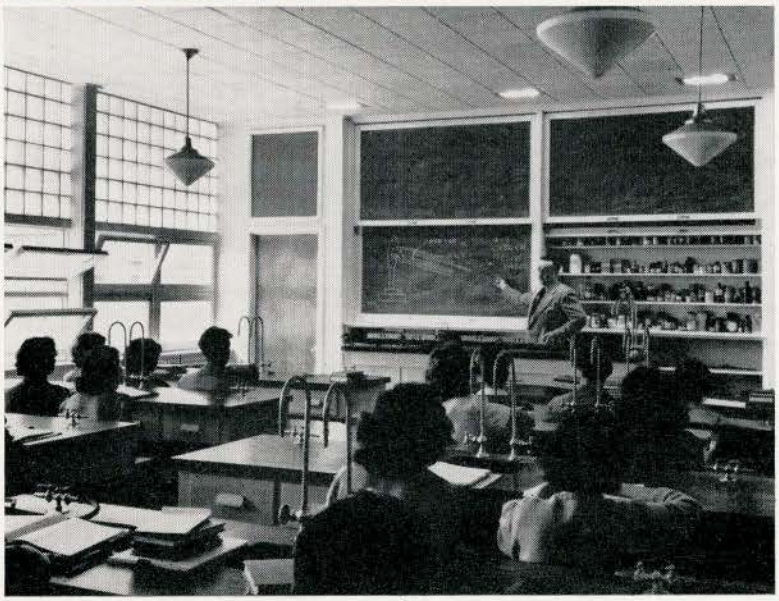


ABRA, BALHARRIE AND SHORE, ARCHITECTS

ONTARIO

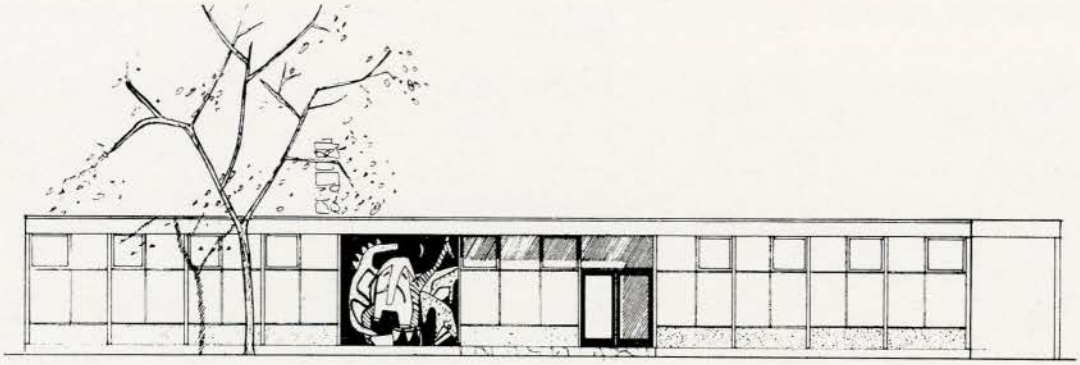
HOME ECONOMICS ROOM

GYMNASIUM AUDITORIUM

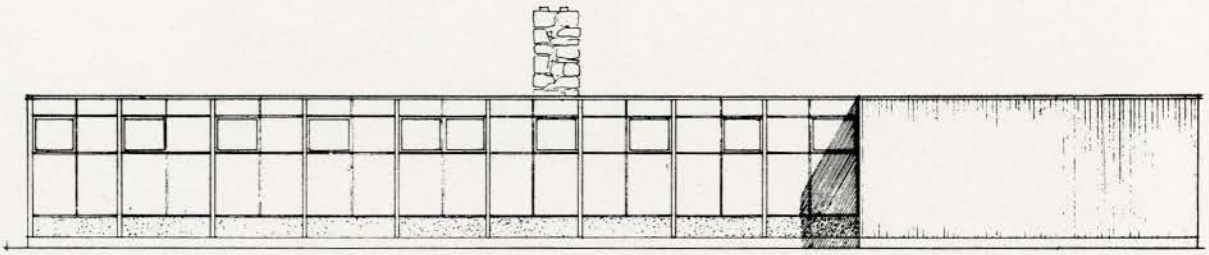


PHYSICS LABORATORY

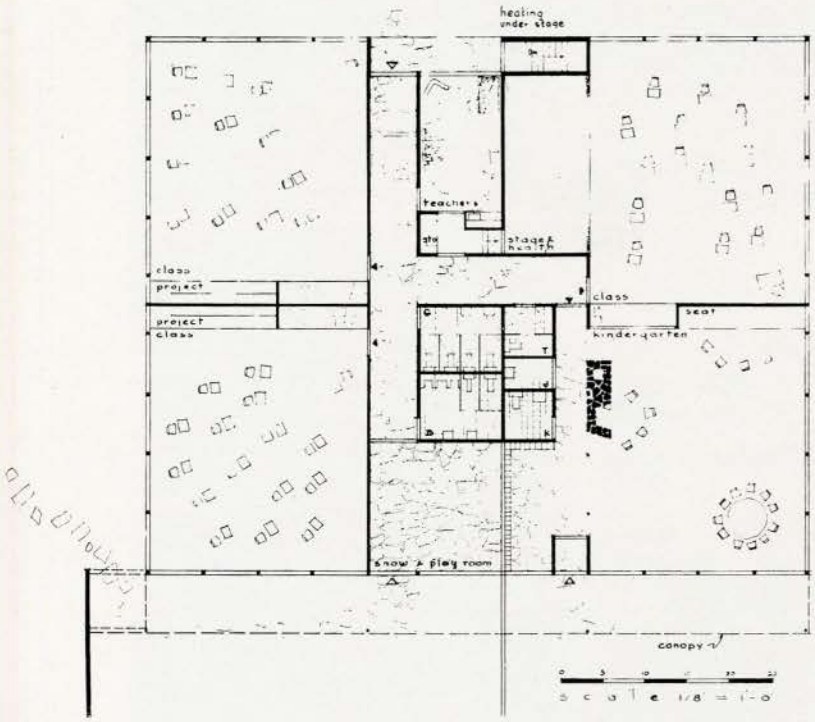
PROPOSED MARYDALE SCHOOL, KINGSTON TOWNSHIP, ONTARIO



VIEW FROM THE STREET



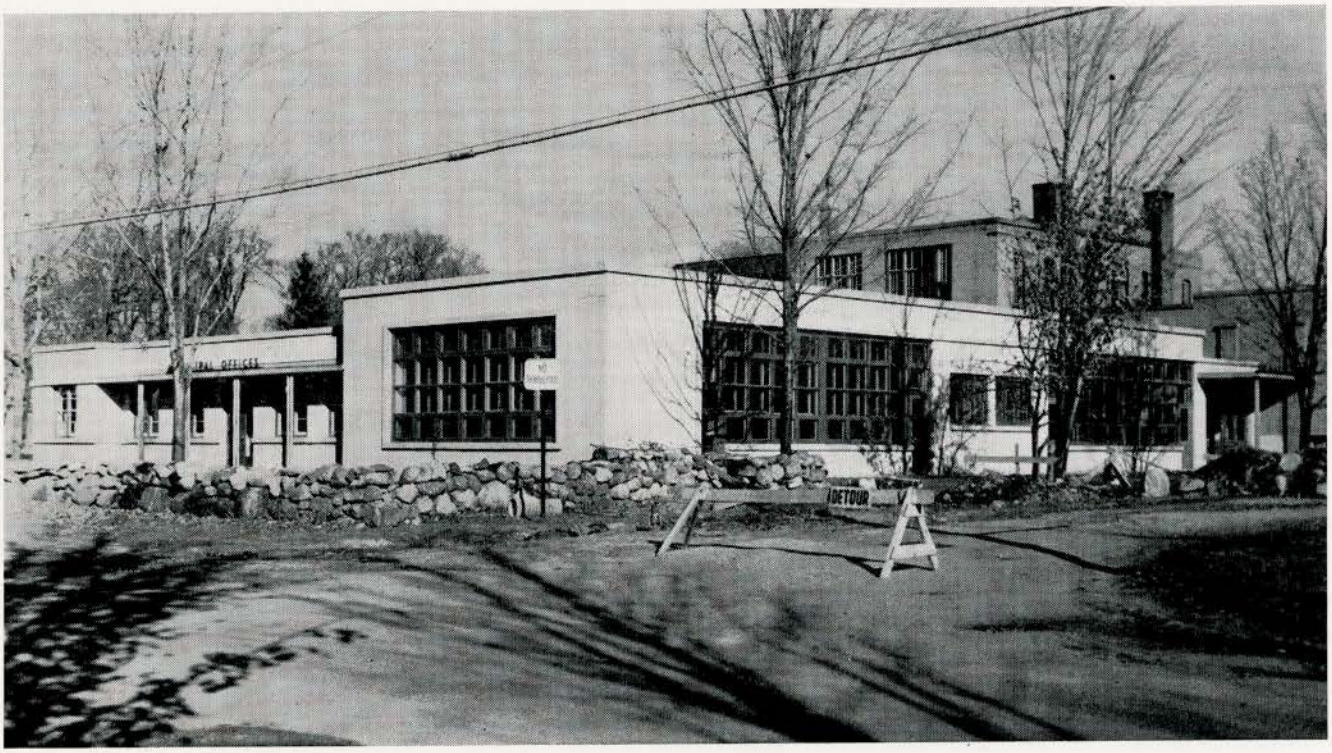
VIEW FROM THE WEST



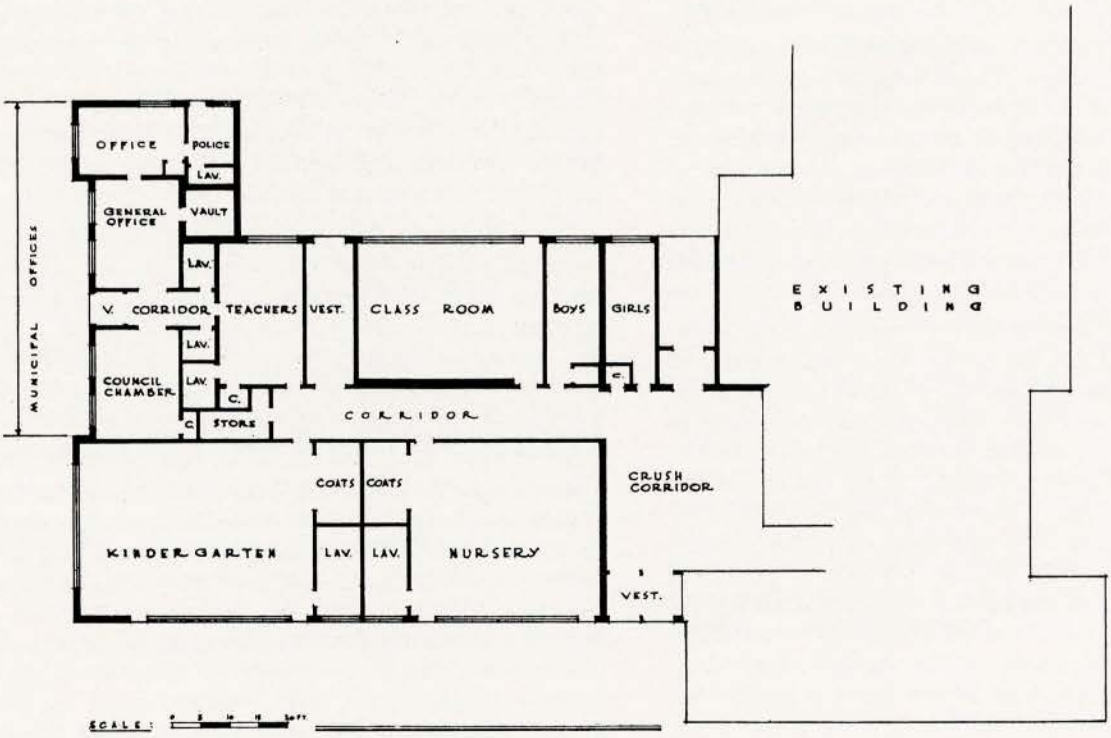
OLDER CHILDREN AND KINDERGARTEN PLAY AREA

ABRA, BALHARRIE AND SHORE, ARCHITECTS

ROCKCLIFFE PARK PUBLIC SCHOOL AND MUNICIPAL OFFICES, ROCKCLIFFE PARK, ONTARIO



Photograph by Cairney



HAZELGROVE AND LITHWICK, ARCHITECTS

THE EFFLORESCENCE PROBLEM

By LANE KNIGHT

ONE of the problems encountered in masonry construction is that of efflorescence. Occasionally it may be so excessive as to cause disintegration and scaling, but principally it is objectionable from an appearance standpoint.

Efflorescence is the deposit on the exterior of the masonry surface of soluble salts, which impart a color to the surface other than its natural color, usually white. Salts commonly found in efflorescence are calcium sulphate, magnesium sulphate, sodium chloride, sodium sulphate, potassium sulphate, and lime. In order for efflorescence to form two conditions must exist. First, water must flow into and out of the masonry or through it. Second, there must be a source of soluble salts.

The first condition may be satisfied by faulty design of the structure, by the use of unduly porous materials, or by defects in construction.

Many faulty construction practices have been described as they relate to leakage and efflorescence. Generally, such practices are those which tend to cause water to be trapped and flow into the masonry wall rather than to be shed from it. Improper or faulty flashing, defective gutters, downspouts or copings, use of projecting ledges which slope inward, and tooling of mortar joints with the slope inward from top to bottom instead of outward from top to bottom, are examples .

In a masonry structure water may penetrate through the materials themselves, that is the brick or the mortar. Except in the case of unusually porous bricks, penetration of water in this way is not generally serious. In the case of the mortar it is desirable to use a mortar of relatively low absorption and preferably one with some water repellent (stearate) waterproofing. If suitable precautions along these lines are taken penetration through the mortar itself should not be serious.

What is more serious is the penetration of water between the brick and the mortar due to faulty construction practices. Use of a mortar which is unsuitable for the particular type of brick employed may cause failure of bond and lack of contact between the brick and the mortar. This has been discussed in an article entitled "The Design of Masonry Mortars" in the December 1947 issue of this *Journal*. Furthermore, excessive volume changes occuring in the mortar may lead to pulling of the mortar away from the brick or cracking of the mortar, especially at the junctions of vertical and horizontal joints, which will again permit the penetration of water. Finally, failure properly to fill the joints is an obvious source of danger.

Soluble salts constituting a source of efflorescence may be derived from the mortar, from the brick, or from an outside source.

Mortar composed of portland cement, lime, and sand contains a large proportion of soluble salts. The lime is completely soluble and the portland cement substantially completely soluble if sufficient water passes though the mortar. Portland cement contains gypsum (calcium sulphate), which is soluble. The sand itself is usually not soluble to any considerable extent but may carry considerable quantities of soluble chlorides and sulphates. These are perhaps a more dangerous source of efflorescence than the cement and lime, since they are more readily soluble and form more concentrated solutions than lime. Most brick are free from detrimental quantities of soluble salts but it is not unusual to encounter brick carrying sufficient soluble salts to cause efflorescence. This is particularly serious if the brick are highly porous permitting the free flow of water in and out.

Even if there were no soluble salts in brick or mortar it would still be possible for efflorescence to occur. Many ground waters, especially in alkali soils, carry considerable concentrations of soluble salts. If these ground waters are drawn up through the wall and evaporate from the wall surface these soluble salts will be deposited as efflorescence.

In an existing structure it may be possible to deduce the source of the efflorescence from its distribution. If it appears on the brick, particularly the central portions, then the brick is probably the cause. If it appears on the joints or mainly the edges of the brick, then the mortar is the probable source. If it is generally or irregularly distributed then the cause may be the brick, the mortar, or an outside source.

The solution to the problem of efflorescence is to make the wall as watertight as possible and to reduce the amount of soluble salts available to form efflorescence to a minimum. It may be doubted that a wall can be made absolutely watertight or that soluble salts can be entirely elminated, but production of a relatively waterproof wall containing a minimum of soluble salts is a reasonable assurance of freedom from efflorescence.

In order to secure a watertight wall the mortar used should be one which is suitable for the brick, as discussed in the article to which reference has already been made. In addition, the water required to produce a workable mortar should be as low as possible to minimize shrinkage during hardening and drying. The mortar itself should be relatively non-porous, which again is related to the water required for a workable mortar, both to prevent penetration of water through the mortar and to reduce volume changes due to wetting and drying. Inclusion in the mortar of a suitable proportion of stearate waterproofing is also helpful, in that

it reduces the tendency of the mortar to suck in the water which may be in contact with the surface of the wall from rain or other causes. In its plastic state the mortar should have high water retentivity to prevent excessive water gain, bleeding and segregation, which tend to develop lack of contact between the brick and the mortar and thus permit entry of water at this point. Good workmanship is necessary too secure complete filling of the joints, but to secure such workmanship it is necessary to have a mortar with a very high degree of workability. Dispersion of the cement and lime in the mortar promote the properties required to secure a watertight wall, in that the dispersion increases workability, water retentivity, and reduces the water requirement for a given consistency, which in turn reduced porosity and volume change.

In order to reduce the available soluble salts in the wall, selection should be made of the most suitable materials. A brick should be selected which does not contain excess quantities of soluble salts tending to produce efflorescence. Similarly, the sand used in the mortar should be reasonably free from soluble salts and the water supply obviously should not contain excessive soluble salts. Use of a pozzuolanic material in the mortar to reduce the solubility of the free lime is also helpful.

In order to determine whether the brick, sand and water are reasonably free from soluble salts, they should be tested prior to selection by a testing laboratory. In many cases where the services of a testing laboratory are not available, it is possible to make some very simple determinations in the office. McBurney and Parsons* have described a "wick test" to determine the suitability of brick from this point of view. This test consists of standing samples of the brick on edge in a pan of distilled or relatively pure water, letting the water come up about 1 inch on the side of the brick, in other words leaving 3 inches of brick above the water line. If these samples are kept in a dry room for about a week deposits of soluble salts will appear on the exposed surface of the brick, if the brick contains sufficient soluble salts to be a probable cause of efflorescence. Sand may be tested for the presence of chlorides by putting a handful of sand into a bottle with distilled water and shaking. This is then allowed to stand for about an hour and small portions of the clear water taken out. A few drops of nitric acid are added to one portion and then a few drops of silver nitrate solution. If the sand contains chlorides there will be a white precipitate and the amount of chlorides will be indicated by the amount of precipitate.

*National Bureau of Standards, Research Paper No. 1015.

A test for sulphates can be made by adding to another portion of the solution a small amount of a 10% solution of barium chloride. Again, a white precipitate indicates the presence of sulphates. Similar tests may be applied to the water to be used on the job by itself.

When a wall is first laid up conditions may be such, for example slow hardening on a cold day with high wind causing a relatively high rate of evaporation, that a bloom appears on the wall face almost immediately. This is derived from the soluble salts which are always present in the mortar being carried to the surface by the evaporation of the mixing water. This bloom is sometimes called efflorescence, but it is not a serious matter. It can be removed by washing down the wall with a dilute solution of muriatic acid, subsequently thoroughly flushed off the wall with water. If the wall is relatively watertight and does not contain excessive quantities of soluble salts, this bloom will not recur. If, however, the wall is not reasonably watertight and does contain excessive soluble salts, then regardless of whether an initial bloom appears or not, efflorescence will form and while washing will remove it, it will recur whenever the wall becomes wet.

Application of a transparent waterproofing to the wall will prevent the recurrence of efflorescence where it is due to the porosity of the brick or the mortar. It will not prevent the ingress of water through cracks, unfilled joints, defective flashing, and similar defects. Transparent waterproofings do not resist weathering well and can therefore only be considered as a temporary measure.

There is no absolute cure for efflorescence, that is, even taking the best known precautions, conditions may be such that efflorescence will occur. It is, however, possible to minimize the danger of efflorescence by taking suitable precautions. These are, selection of materials, particularly the brick, sand, and water, relatively free from soluble salts, combination of the selected materials to provide a mortar adapted to the particular type of brick to be used, and with high workability, high water retentivity, freedom from bleeding, and low volume change and low porosity. Inclusion in the mortar of a cement dispersing agent will be helpful in attaining these properties. Furthermore, inclusion in the mortar of a pozzuolanic material will reduce solubility of the free lime and inclusion of a stearate waterproofing will prevent ingress of water into the mortar. Combined with a structural design which eliminates details which tend to trap rather than shed water, these measures will in most cases insure freedom from efflorescence.

ROYAL ARCHITECTURAL INSTITUTE OF CANADA

OFFICERS

PRESIDENT . . . . . A. J. HAZELGROVE (F)

FIRST VICE-PRESIDENT . . . . MURRAY BROWN (F)

SECOND VICE-PRESIDENT . . . . H. H. SIMMONDS

HONORARY SECRETARY . . . JAS. H. CRAIG (F)

HONORARY TREASURER . . J. ROXBURGH SMITH (F)

PAST-PRESIDENT . . . . . CHAS. DAVID (F)

SECRETARY . . . . . MRS. ANNE M. BARSTOW
1323 Bay Street, Toronto

COUNCIL

H. H. SIMMONDS, F. L. TOWNLEY, HENRY WHITTAKER . . . . . British Columbia

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

FRANK J. MARTIN, JOHN C. WEBSTER . . . . . Saskatchewan

G. LESLIE RUSSELL, J. A. RUSSELL, ERIC W. THRIFT . . . . . Manitoba

Ontario

VICTOR J. BLACKWELL (F), MURRAY BROWN (F), JAS. H. CRAIG (F), A. J. HAZELGROVE (F), D. E. KERTLAND, R. S. MORRIS (F), FORSEY PAGE (F), W. BRUCE RIDDELL (F), HARLAND STEELE (F),

Quebec

L. N. AUDET (F), OSCAR BEAULE (F), R. E. BOSTROM (F), HAROLD LAWSON (F)
J. C. MEADOWCROFT, A. J. C. PAINE (F), MAURICE PAYETTE (F), J. ROXBURGH SMITH (F)

D. W. JONSSON, H. CLAIRE MOTT (F) . . . . . New Brunswick

LESLIE R. FAIRN (F), A. E. PRIEST . . . . . Nova Scotia

EDITORIAL BOARD REPRESENTATIVES

British Columbia: F. S. LASSERRE, Chairman; R. A. D. BERWICK, WILLIAM FREDK. GARDINER (F), PETER THORNTON, JOHN WADE

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

Saskatchewan: H. K. BLACK, Chairman; F. J. MARTIN, DAN H. STOCK, JOHN C. WEBSTER

Manitoba: J. A. RUSSELL, Chairman; H. H. G. MOODY, ERIC THRIFT

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

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), E. J. TURCOTTE

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

Nova Scotia: LESLIE R. FAIRN (F), Chairman; ALLAN DUFFUS, 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

NEW MEMBERS

The Institute takes pleasure in welcoming the following new members of the R.A.I.C.: Claude Beaulieu, 3679 Laval Avenue, Montreal, P.Q., Harold Charles Bishop, A.R.I.B.A., 648 Church Street, Toronto, Ont., Wm. George Bruce, A.R.I.B.A., 4 Mortimer Avenue, Toronto, Ont., Louis Carrier, 34 St. Julie Street, Quebec, P.Q., Henri Desroziers, 194 Prospect Street, Sherbrooke, P.Q., Louis P. Lefebvre, 10 44th Street East, Charlesbourg, P.Q., Vincent Rother, A.R.I.B.A., 1426 Sherbrooke Street West, Montreal, P.Q.

DEATHS

It is with the deepest regret that the Institute announces the loss of these members of the profession: W. S. Bates, 207 Bay Block, Calgary, Alberta, J. E. A. Benoit, 110 rue Champlain, St. Jean, Quebec, Roy H. Bishop, 28 Maple Avenue, Toronto, Ontario, J. Gibb Morton, 150 Indian Road, Toronto, Ontario, George G. Teeter, 509 Lombard Building, Winnipeg, Manitoba, J. Arnold Thomson, 122 Bridge Street, Belleville, Ontario.

AMENDMENTS TO THE MEMBERSHIP LIST

The following amendments to the Membership List are noted for the information of interested members:

ONTARIO:

Changes of Address—H. R. Agnew, 1155 W. Pender Street, Vancouver, B.C., Langton G. Baker, 238 Glenrose Ave., Toronto, A. Scott Carter, 2 Washington Ave., Toronto, S. Devore, 463 Spadina Ave., Toronto, J. G. Elliot, Massey-Harris Co. Ltd., 915 King St. W., Toronto, Louis N. Fabbro, 4 Elgin St., Sudbury, Henry B. Fliess, 136 Albany Ave., Toronto, Charles M. Hare, 2135 Culp Street, Niagara Falls, L. B. Husband, 30 Hunter St. W., Hamilton, J. B. Langley, 566 University Ave., Toronto, J. I. Lawson, 30 Arundel Ave., Manor Park Village, Forbes, J. P. MacLaren, 306 Nelson St., Ottawa, G. A. McElroy, 152 Pitt St. West, Windsor, Hugh D. Robertson, 30 Hunter St. W., Hamilton, J. E. Assheton Smith, c/o George Hardy Ltd., 163 Wickstead Rd., Toronto, Arthur Wm. Wallace, 30 Hunter St. W., Hamilton, George R. Whale, 906 Yonge St., Toronto.

Resignations: Harry Seidler, 342 Elizabeth St., Sydney, Australia (Associate Member), Antoine Monette, 611 Cumberland St., Ottawa, T. C. Pomphrey, c/o R. W. Shearer, 12 Queen St. W., Toronto, R. D. Powrie, Room 401, Windsor Station, Montreal.

QUEBEC:

Changes of Address: Marc Angers, 12, ave. du Golf, Pointe-Claire No. 33, Alan L. Bernstein, 1502 St. Catherine St. W., Montreal, G. Paul Brassard, 1440 St. Catherine St. W., Montreal, Paul Cauchon, 37, de la Couronne, Quebec, Ch. 209-211, Roger Chalifoux, 6275, rue Papineau, Montreal, Franco Consiglio, 1502 St. Catherine St. W., Montreal, Victor Depocas, 3405 Cote des Neiges, Montreal, David Deshaies, 3405 Cote des Neiges, Montreal, Roland Dupere, 14, Place d'Aiguillon, Quebec, Rolf Duschenes, 65 Prince William St., Saint John, N.B., C. Davis Goodman, 1818 Sherbrooke St. W., Montreal, J. A. Goring, 645 Kensington Rd., Garden City, Long Island, N.Y., R. W. Humphrey, 2090 Sherbrooke St. W. Montreal, W. B. Hutchison, 4444 Sherbrooke St. W., Montreal, C. A. Jean, 14, Place d'Aiguillon, Quebec, Maurice Labelle, 3770 Parc Lafontaine, Montreal, Paul-Emile Lapointe, 1415 rue St. Marc, Montreal, Maurice Legare, 6450 Cote des Neiges, Montreal, Harry Mayerovitch, 1502 St. Catherine St. W., Montreal, G. B. Pope, 235 Brock Ave. N., Montreal West, J. B. Soucy, 2084 ave. Bourbonniere, Sillery, Berchmans Tanguay, 539, rue St-Cyrille, Quebec, J. Herve Tardif, 1448 rue Beaudry, Montreal, A. Henri Tremblay, 392 Sixieme Avenue, Quebec, Leo Turcotte, 37, de la Couronne, Quebec, Ch. 209-211, A. Campbell Wood, 4444 Sherbrooke St. W., Montreal.

Resignations: J. R. Gadbois, 3795 Van Horne Avenue, Montreal, Louis B. Magill, 4720 Ridgevale Avenue, Montreal, F. W. Watt, 3 Tourtellot Block, Port Arthur, Ontario.

NORWEGIAN ARCHITECT

The Institute has received a letter from a Norwegian Architect who is anxious to spend eight or ten months in Canada, working as an assistant in an architect's office. He would be free to come to Canada in July or August of this year, and has asked the Institute to assist him in obtaining a position. This Architect is forty-two years of age, and has considerable experience in designing public buildings of all kinds and also in planning schools. He has travelled in South Africa, Italy, France and England, and speaks English and French well.

In order to obtain a visa from the Canadian Ambassador in Oslo, it is necessary for him to have a prospective employer to arrange his entry into Canada. If any member is interested in obtaining the services of this Architect for the period mentioned, he can obtain full details from the Secretary of the Institute.

ALBERTA

In recent years two small volumes have been published summarizing the proposals of Le Corbusier in regard to Architecture and town planning ("The Home of Man"; Le Corbusier and Francois de Pierrefeu, and "Le Corbusier" concerning Town Planning, Architectural Press London). The views of this extraordinary genius have been before the public for a quarter of a century. It is interesting to consider what influence they are having to-day.

In regard to residential districts Le Corbusier's general line of argument is somewhat as follows: We have explored and developed horizontal modes of travel by land, air, water and underwater not indeed to the limit but so far that a corresponding development of vertical travel is now fully due. We have now the ability to travel conveniently, vertically, in high buildings and we have the constructive ability to erect these buildings to great heights. Let us more fully exploit these. This offers us the opportunity to rescue cultivable ground to an appreciable extent, to bring our far-sprawling cities within more convenient dimensions and at the same time to obtain many other advantages. The idea of the individual house for each family of our swarming population is no longer tenable. Residences should be in great apartment buildings thirty or forty storeys high, operated like hotels with restaurants in the midmost storey, recreation facilities at the top and open-sided shelter at ground level – the buildings being erected on "stilts." Each building may accommodate a thousand families more or less. It takes about 200 acres of land to accommodate this number of individual residences. One of the proposed blocks placed on 50 acres of land would place the same population on one eighth of the area. Indeed the area could well be reduced to one tenth or less. All would then be incomparably better provided for. Dwellers in these splendid mansions would be provided with space, air and all the utilities in a way not possible for our present groundling population. They will be nearer to heaven and to heavenly conditions than most of them are likely otherwise ever to reach. There will be enormous savings in length of streets and in extent of engineering services. All the intervening spaces between buildings will be available for landscaping and vegetable cultivation. It will be a "green" district. Instead of a wilderness of petty houses with the necessary maze of streets, with no architectural picturesqueness or significance, we would have a number of tall mansions well arranged in a great park in which pedestrians can regale themselves or intercommunicate with one another in perfect safety; for all vehicle travel will be at second floor level or at other levels as the contours of the ground may require.

Such is roughly the tempting vision which Le Corbusier holds out. Yet in all the town planning that is now proceeding in many countries there is little evidence of its eager acceptance – Is this due to sheer unreasonable conservation? If we accept the premises on which Le Corbusier bases his argument we must also accept his conclusions, for his logic is coherent and incontestable. He is probably quite ready to admit that our present social and economic systems are totally out of line with the carrying out of his proposals but he would answer that that is so much the worse for these systems and that they are consequently due for complete reformation. He looks confidently to the future to compel acceptance of his ideas. But not only would our social and economic systems require reformation, they would require to be based on entirely different principles and it may be that these are contrary to the basic necessities of human nature.

A refutation of Le Corbusier's argument must go back to these fundamentals. The reaction of most people to the question of whether they would like the prospect of being an occupant of one of these splendid mansions is decidedly negative. Is this a true instinct or a mere nostalgic perversity?

Cecil S. Burgess

MANITOBA

We were fortunate to have several good speakers visit Winnipeg during this past winter, Mr. Serge Chermayeff, Director of the Institute of Design in Chicago, who was our last guest, gave a public lecture on, "What is Modern Architecture About?" It proved to be a talk very interesting to the lay man and quite provocative to the Architects and students present. Mr. Chermayeff is a very charming but forthright speaker when discussing his highly regarded theories of architecture and architectural education.

Mr. Lars Marnus, noted Danish Architect, will be the next speaker in March. Mr. Marnus is touring in North America under the auspices of the Danish Government.

Housing is still as important and newsworthy as it has been during the past few years. Recent recommendations by The Winnipeg Housing Committee call for construction of 2,000 low-rent houses or housing units immediately. One thousand of these will presumably be handled by Central Mortgage and Housing Corporation, following the pattern of the existing Wartime Housing for veterans – with the addition of basements.

The second thousand units presumably will be handled by combined resources of province – $1,000 per unit – federal government – $1,000 per unit – and the city – $1,000 per unit to be paid by reduced taxes on the property for 50 years. It is assumed that the federal government will then be asked to loan the remaining money at a low rate of interest over a long amortization period. This accommodation will presumably be in multi-family units available to citizens at low-rental. Demand for housing continues with 3,000 applications in hand and an increase of 75 per month.

Along with the news of demands for further government help in the low-rental field we have had another interesting housing item reported. In Edmonton, at the recent quarterly convention of the Western Retail Lumbermen's Association, a suggestion was voiced to the Government to open low-cost house building to private enterprise. This would entail revision of C.M.H.C. standards to allow private building of minimum housing in smaller communities where N.H.A. does not extend.

The Lumbermen's answer would be in the form of a small 22′ x 22′ unit with partial basement and porch "extension." Accommodation would consist of a living room, kitchen and two bedrooms, all for the price of $3,300. The porch extension could be made to serve

for the bath with "slight" alterations. Such a house would, of course, be for sale – not a low-rental unit.

This would seem to indicate the two extremes in our present housing dilemma. On the one hand, many may fight government subsidy of low-rental housing and yet will not find a better solution to the problem than small, lightly built saleable houses which may have been erected without adequate supervision of construction. This, then, becomes the sole concern of the individual who, in all likelihood, bought under pressure simply because there was no rental property available, and who will want to sell in a few years in a declining market.

Roy Sellors

ONTARIO

The 42nd Annual Assembly of The Royal Architectural Institute of Canada was held at Niagara Falls on February 24th, 25th and 26th, and was a success in every respect, thoroughly enjoyed by all who attended. The registration of Delegates and members from all Provinces compared favorably with past Assemblies and it was delightful to see so many of the wives of the members present. It was a disappointment that representatives from the tenth Province of Newfoundland were unable to be on hand but it is hoped that 1950 will see official Delegates present.

Due to the rather limited train connections providing for arrival at Niagara, the period of the Assembly was shortened by a full half day which necessitated some crowding of the programme. All business and social activities were, however, run off with little difficulty and with a considerable measure of satisfaction.

The Inaugural Session of the 42nd Annual Assembly was particularly well attended and a keen interest was shown in the affairs of the Institute over the past year. The President's report was enthusiastically received and the reports of all Standing Committees were presented for consideration and adoption. Much ground was covered in the general discussions and plans were laid for 1949 which will doubtless insure continued progress and advancement.

Our congratulations are extended to Mr. A. J. Hazelgrove, a member of this Association, on his re-election to the Office of President for 1949. The Institute is fortunate in having on the 'Bridge' a Captain holding the qualifications of Bert Hazelgrove, and those who have been closely associated with him over the past few years fully realize his enormous capacity for hard work and the outstanding contribution he has and is making for the advancement of the profession in all its many ramifications.

Perhaps one of the most valuable meetings ever convened in the long history of the Institute occurred on Thursday evening following the President's Dinner, when accredited representatives from each Provincial Association, under the Chairmanship of Mr. J. Roxburgh Smith, sat down to a round table frank and open discussion of the situation and position facing the profession in each Province. This meeting carried well on into the early hours of Friday morning and it is worthy of note that not a single delegate or member of Council left the room until the discussions were over. The incoming Council and the Executive Committee will take over from where the reports ended and will endeavor to draw together the cords holding the several Provincial bodies in an effort to strengthen our position against the inroads that are constantly being faced.

The report of the Editorial Board of the *Journal* at its meeting was well received and well it might have been, for once again the *Journal* has put the Institute in a favorable financial position due to the success of its operations throughout 1948. The Institute is indebted to the Editorial Board, its Chairman, the Editor and the Publisher for the outstanding contribution that has been made, both financially and intellectually, to the well being of the R.A.I.C. The resignation of the Chairman, Mr. F. Bruce Brown was deeply regretted but under the capable guidance of the new Chairman, Mr. Arthur H. Eadie, the *Journal* may look forward to another year of success and prosperity.

The business session and Convocation of the College of Fellows were both well attended and congratulations are in order to the new Fellows installed, to Mr. D. E. Kertland and to Prof. Emile Venne. The present Officers of the College were re-elected for the ensuing year and will continue in office until their successors have been elected and installed.

At the meeting of the 1949 Council an invitation was extended by the Delegates from British Columbia to hold the Assembly next year in the West and the Alberta members suggested Banff. In these days of general prosperity throughout the profession it is not unreasonable to anticipate a favorable reaction from the members of the Institute to this invitation, but it must be admitted that some obstacles stand in the way and that certain hurdles must be taken before a decision can be reached. The matter was left for the further consideration of the Executive Committee.

The two seminars held on Saturday afternoon were of intense interest to all who attended, and we are indebted to Mr. Gordon Hughes and to Prof. Eric Arthur for their contribution to the success of the Assembly.

The Annual Dinner drew a packed house with an overflow table having to be set up for the late arrivals. The occasion was high-lighted by the outstanding address delivered by The Honourable Sardar Hardit Singh Malik, C.I.C., O.B.E., I.C.S., the High Commissioner for India to Canada. The sustained applause that greeted Mr. Malik upon completion of his address was evidence of the deep appreciation of all who listened so attentively to his story of India. His ready wit captivated his audience and the seriousness of his subject held the interest of all. It is doubtful if the Institute ever had a more gracious and accomplished speaker and his message touched the innermost chords of one's conscience.

Mr. Malik was accompanied by his charming wife and the Institute was honored indeed by the presence of these distinguished guests.

Circumstances prevent the Chairman of the Host Chapter from dwelling upon the outcome of the various social functions, but the members of the Hamilton Chapter acting on behalf of the Ontario Association of Architects feel that they may have made some worth while contribution to the success of this Assembly and are rewarded by the knowledge that all who attended, both members and their ladies, had an enjoyable and pleasant sojourn at Niagara.

The 42nd Annual Assembly of the Royal Architectural Institute of Canada has passed into history but shall remain as one long to be remembered.

W. Bruce Riddell

TODAY'S SCHOOL IN CANADA

(Continued from page 100)

It is notable that most school architects are not entirely satisfied with their own individual solution to school needs. The architect in many cases now meets with teaching staffs and trustees in their new school buildings and finds out first hand from those who use and maintain the structure just where it fails. In this way, regional school problems come to light and are corrected in subsequent efforts. In a practice which extends over several climate regions, this research definitely results in improvement.

But the architect, while contributing a great deal to the general improvement in school buildings, is not alone. He is assisted usually by an enlightened and progressive board of school trustees and a district school inspector. Also assisting, might be members of parent-teacher organizations and community recreational committee representatives. These latter persons, acting in an advisory capacity, contribute in no small way to the solution to the overall school problem, particularly as it relates to community recreational activity.

It is an interesting observation that architects carrying on practices in different cities, and therefore independent of one another, arrive at almost similar solutions to a school design problem, having similar requirements. The thought processes based on intelligent assessment of the design conditions cover the same ground. In other words, both architects recognize the needs and honestly set about to find a satisfactory solution without preconception. It is true, the minimum standards set out by the Department of Education establish certain semi-rigid prerequisites, but the theory evolving around the use of certain types of heating, window arrangements, etc., control of which is not rigidly dictated by regulation, is often identical. The same processes of evolution have been gone over and the same general solution is the result. This is also true from the point of view of economy. Really serious school architects have carried on a program of research into ways and means of simplifying and thereby reducing the cost of structural systems and material uses; as a result the unit costs of school buildings is gradually being reduced. Lavish use of enrichment and exaggerated scale have been replaced with straightforward expression of structures in most cases, and scale that is compatible with the type of occupancy. Gradually, as costs are reduced, through honest exploitation of materials, it will be possible to introduce some aesthetic quality in the form of sculpture or murals having cultural significance.

The fact that these new schools pay dividends in the form of healthier, happier children has now been borne out. Observations and actual student health and efficiency records will indicate that where students have moved into modern schools there has been improvement. Observation will bear out that children seem happier in their new environment.

In Ontario, school legislation is so far advanced that it enables designers to introduce contemporary planning techniques with the assurance that, as long as their designs are in accordance with the few minimum standards, and an effort is made to keep cost down, they do not have to express an architectural style which offers nothing but reminders of decadent past. It is to be hoped that the relations which at present exist between Provincial educational authority and school architects will continue. In this way, we can be assured of a steady progress in school architecture which keeps up with teaching trends and is not dependent on past architectural concepts.

COLOUR AND CHILDREN

(Continued from page 110)

The interior colour design is thus continuous with the exterior's, but produces a different effect, owing to the different points of reference of the beholder; inside he views each space as a separate unit with its own mood, and he sees the mood-changes as a progression. From the exterior he views a synthesis of all the parts that creates a new picture, the very reverse of monotonous, and linked by the purely external features of the structure.

And of the reaction.

There is no gauge that can compare the disposition of the children in the school that is coloured with their possible disposition if the school did not have colour; at least it is sure, in this case, that those who were most skeptical of the scheme at first, are no longer so, because the children notice the colours and like them, sometimes, and dislike them too.

I was talking to one boy, on a week-end, who had been playing in the school yard with a chum. I asked him what classroom he was in, and he replied: "The pink one. I like it, but next year I am going to be in the brown one, and I hate it. I don't want to go into that classroom." The second boy remarked: "Ah, he's a dope; I like the brown one, me."

And there was the difficult chairman of the school board, who fairly detested the brilliant colour used at every door and opening sash, but he had the graciousness to admit that his opinion need not rule, as long as the children were happy.

And the children were happy.

In an interview some months after the school opening, the head master gave the cause of colour a real stimulus: he recognized the full success of the experiment and recommended its development in all future work.

The experiment was not a new one; in detail, perhaps; but in spirit it aimed at the integration of colour with the other architectural means in the creation of a more pleasant human environment, of a kind that has been achieved by architects in many other countries, notably in England and Sweden. It was mentioned here, that it might serve as a reminder of the important function of colour in architecture, and as an encouragement to those who have not yet dared to experiment, though willing to do so.

CONTRIBUTORS TO THIS ISSUE

Watson Balharrie

Was born and lived all his life in Ottawa, where he began an architectural career in the spring of 1929. Registered in the Ontario Association of Architects in 1944. Formed Architectural Partnership with Wm J. Abra in 1944, and is now a member of the firm of Abra, Balharrie and Shore. Was appointed to the staff of the School of Architecture at McGill University in 1946. Member of the Membership and Scholarship Board of the Province of Quebec Association of Architects. Secretary of the Association of Canadian Industrial Designers.

Mr. Balharrie's interest in school architecture is well known, and the Editorial Board is greatly obliged to him for the trouble he has taken in the organization of this issue.

Editor

Guy Desbarats

Was born and educated in Montreal. He is a graduate of the School of Architecture, McGill University, and is at present associated with a firm of Ottawa Architects as Architectural Designer. Mr. Desbarats won the R.A.I.C. Medal in 1948, and has done considerable research on the theory of colour.

Joseph Hudnut

Was born at Big Rapids, Michigan. He was educated at Michigan Military Academy and at Harvard College, where he took a degree in architecture. He was appointed Professor at Alabama Polytechnic Institute in the fall of 1912, and later joined the A.E.F., serving for a year in France. On demobilization he practised for some time under his own name, but returned to academic life in 1923 when he became Professor of Architecture at the University of Virginia. Later, for a time, he was Dean of the School of Architecture at Columbia, but, in 1935, resigned to become Dean of the School of Architecture, Harvard University.

Dean Hudnut is well known as a writer and a lecturer, and members will remember the admirable Address, which he gave at the R.A.I.C. Annual Assembly in Quebec. (See March, 1946 Journal.) The present Address was given at the invitation of the students in the School of Architecture at the University of Toronto.

Lane Knight

Chairman for the past three years of the Exhibitors' Committee at the Ontario Association of Architects Convention and Annual Meeting. Vice-President and General Manager of the Master Builders Company Limited, Toronto. Educated in Canada and the United States, Mr. Knight is an active member of the American Concrete Institute. For the past twelve years he has been engaged in the manufacture and field development of cement dispersing agents and application to concrete and masonry mortars.

During the same period, Mr. Knight has been engaged, in his spare moments, in luring speckled trout out of Northern lakes, and his friends into all kinds of piscatorial escapades.

Italics are the Editor's.

Denis Senior

In the County of Essex, the responsibility for the building of schools and other educational buildings is placed on the County Council's own Architect's Department. The office works as a team of architects under the control and guidance of the County Architect and Deputy County Architect. The author of this article, Denis Senior, A.R.I.B.A. is the Deputy County Architect of Essex. He was trained at the Leeds School of Architecture and College of Art, England, and served several architects in Yorkshire, Cheshire and Hampshire before joining the Essex Office, where he has been responsible for the building of schools, technical and agricultural colleges and for hospital and health buildings.

LETTER TO THE EDITOR

Dear Sir:

Some of your readers may be interested to know that the Association of Canadian Industrial Designers has elected its first officers.

For your information, these include: Honorary President: Rt. Hon. Vincent Massey, C.H.; Hon. Vice-President: Professor H. H. Madill; Hon. Vice-President: Professor E. A. Allcut; President: G. Englesmith; Vice-President: J. B. Parkin; Secretary-Treasurer: Watson Balharrie.

The A.C.I.D. Headquarters are located at 55 Metcalfe Street, Ottawa, Canada.

G. Englesmith

BOOK REVIEW

AMERICA'S BEST SMALL HOUSES

By William J. Hennessey, Architectural & Building Research Editor, The American Home Magazine. Published by MacMillan Co. of Canada Limited, Toronto. Price $5.50.

Another picture book makes a serious attempt to define the best in American residential work. This book is a sincere endeavour on the part of the architectural editor of a widely read U.S. home magazine to contribute to the thinking and taste of the house market. Assuming the very commendable goal of encouraging public appreciation and desire for good residential design in terms of today's living (a goal of tremendous importance in a formative age where skilled eclecticism continues its seductions), and assuming the further goal of supplying adequate practical information on buildability and cost, how does this book rate?

America's Best Small Houses presents forty new houses built in U.S.A., and selected by a jury of eight well known architectural photographers. The book's merits could be listed as superb photography, a thorough four or five page coverage to each house (which degree of completion too infrequently characterizes this type of publication), room sizes are actually shown, an outline specification of materials and equipment is presented and approximate costs are given. Although it is of dubious value for a Winnipegite to see the cost of a Wichita Kansasite's residence, it is somewhat of a guide, and a brave attempt in these days of extravagant prices. Thus in supplying adequate practical information in plan, analysis, construction and cost this book is successful. Your reviewer feels an increasing need for the professional of a thorough book of working details on modern work.

What of the more subtle and important goal of shaping public appreciation and thinking on today's house? Two contributions are made. First, the author has published and presented a goodly selection of modern houses which have been missed to date in other publications wherein recently a certain duplication of selection has been in evidence. Secondly this book further defines the important trend towards America's empiricism matching the most advanced European development in unaffected assured modern design using natural materials, avoiding striving for effects, searching for simplicity and livability. Here, I would mention particularly the houses shown by Paul Kirk, Paul Thiry, Gryffyf Partridge, Carl Koch, Hugh Stubbins, and Mitchell and Ritchey.

In deprecation of its effort to guide public taste, it is disappointing to find in a book of this calibre a selection of traditional houses which must have been included for marketability or the subscription list of the home office. The author says of these selections "they represent the styles of architecture now most popular, including contemporary, traditional or transitional designs." The usual innocuous statements that "there need be nothing static or stuffy about a traditional house" find a place in the book. Presumably a person is convinced about the philosophy of modern design or opposed, and the one precludes the other. However, only nine traditional houses are shown.

In the author's introduction, we encounter the usual tender sympathy for the "person of average budget." The architect has as yet done little for him, and outside of public housing, has done nothing for the half of the nation below the average income – see national income statistics versus housing costs. Even this book's significant little $8,000.00 house by Ramey, Hines and Buchner could only be afforded by the upper third of the nation in our land of "boundless natural resources." We are indeed a luxurious profession, and we and the building industry and books like this are unhappily without significance to the general problem of America's Best Small Houses for Her Best Small People.

J. A. Murray

HEATING AND VENTILATING

by Oscar Faber

E. & F. N. Spon, London. 139 pp. Price 10s. 6d.

As a small volume which offers no pretensions to making an exhaustive study of the problems of heating and ventilating, this book may be recommended as an introductory treatment of the subject. General conditions of comfort, fuels, heating appliances, and piping systems are topics outlined as fully as the scope of the work permits. While admitting, with a wry smile, the Englishman's addiction to the open fire-place (efficiency 20 per cent) as a heating medium, the author goes on to describe the full range of heating and ventilating equipment. The details in which the systems and practices described vary from those of this continent are of minor importance. A simple example of the design of a heating and a ventilating system is given in application of the general theory presented in the earlier chapters.

W. G. Raymore

WOOD ADHESIVES

by Edward H. Pinto

E. & F. N. Spon, London. 180 pp. Price 12s. 6d.

This volume, which is heralded as the only British book covering the whole field of modern adhesives, is authentic for North American readers, acknowledging as it does its indebtedness to the U.S. Forest Products Laboratory for much of its test data.

Adhesives are considered from both the technical and economic point of view, and the book is written with the woodworker and the architect in mind as reader. Factors of adhesive strength, moisture and fungus resistance, working temperature, and cost, which are of interest to the architect, have been treated adequately. The adhesives include the animal, casein, starch, blood-albumen, and synthetic resin types. The processes of impregnation, lamination, and compression of wood are opened out as interesting possibilities in the development of improved woods and in the uses of low-grade stock for building purposes. If you wish to call your glues by their first names, this book should provide the introduction.

W. G. Raymore