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R . A . I . C
JOURNAL
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THIS page has been reserved beyond the deadline for publication so that we might write our impressions of the Assembly in Quebec City. We have now been back a day, and look forward to a long period of adjustment such as many thousand servicemen are experiencing after six years of war. The cause of our unsettlement is three days of comparative peace in which we did not use the telephone, or were called by it, and three days of extraordinary evidence of French-Canadian friendliness, generosity, kindliness and hospitality. We have also spent three days in one of the most beautiful and romantic cities in the world. The period of adjustment is likely to be long.

WE don't suppose that any annual assembly carried on with such apparent ease, and without noticeable evidence of the immense amount of teamwork and organization that must have been necessary to make it a success. For our own part, when we needed anything, we invariably found M. Beaulé in the lobby, or on an elevator at the critical moment when he was required. M. Brassard, M. Jean, M. Fontaine or Mlle. Griffith would appear miraculously in the same manner. If there were a room from which information could be disseminated, we did not hear of it, and it was not required.

IT would be unfair to our English-speaking colleagues to go into too great detail of our private excursions into Bohemia with Mr. Roxburgh Smith, M. Brassard, M. Morrisette and M. Duquet—the presence of Mr. Roxburgh Smith is sufficient evidence of its respectability. We all entered into another world, even if it were not Bohemia. There was the city itself, in which history seemed to be present in every stone. A new world of possibility was opened up to us by M. Maurice Hébert in his moving and well told story of St. Pierre and Mrs. Driscoll; a story of patience, foresight, love and well rewarded effort. To this listener that was an experience that will not be forgotten. Mr. Hébert's address will appear in the *Journal*, but we doubt whether the printed word can be an adequate substitute for the spoken word. The presence of Mrs. Driscoll herself, though she did not speak, seemed to give reality and an added dignity to the story itself. With Dean Hudnut we were in a not dissimilar world, the world of the spirit. This also will be published in the *Journal* and we can say in advance, that it is an honour to print it that we acknowledge with deep gratitude to Dean Hudnut, and to the Institute that invited him to Quebec.

IN introducing M. Gréber, Mr. Page, in a graceful speech, spoke for all members when he said that the hatchet of Canadian professional prestige was buried deep in the ground, and that M. Gréber could rely on the support of the Royal Architectural Institute of Canada for all the talent and assistance that we, as a group, or as individuals, could give him in the planning of the National Capital. M. Gréber spoke clearly and at length, in English, on his proposals for Ottawa, and on his views on modern design. We were greatly struck (being in Quebec) with his story of Rouen. He showed how Rouen over six centuries had a beauty and a homogeneity, because of, rather than in spite of, its periods of "modern" architecture —first mediaeval, then Renaissance—each with its different manners. To him, as to us, it was perfectly seemly and proper that contemporary architecture should now be built even in the Cathedral Square.

AS all this was apropos of M. Gréber's views on the new Ottawa, it was encouraging to think that we had an ally in high places who could speak for modern architecture. We are quite frank to admit that his voice as an outsider would carry greater weight than a native Canadian. We look forward to a test case in which we can promise him our support.

Editor

THE ARCHITECT AND THE POST-WAR WORLD

By **RALPH WALKER**

An Address given at the Fifty-Sixth Annual Meeting of the O. A. A.

One of the best known analects of Confucius goes as follows: "Men of superior mind busy themselves in getting at the root of things and when they have succeeded in this, the right course is open to them." I would like briefly to discuss our times as I see them—criticize the architectural revolution which has occurred and propose its further development, fully aware, however, that as Lewis Gannet has said: "Nice people do not make revolutions". The American way of life, however, developed in and through revolutions.

The theme to be developed is that the serious problem facing mankind is not the solution of a control to atomic energy, but it is to give to the everyday living of average people dignity, security, and delight. We need to counteract the position in which man finds himself in modern industry, which requires of him an impersonal interest in the work at his hand.

There is no question that a great war acts as a period to an era. We have been passing through a time in which the world, strongly in transition has hastened its pace to become revolutionary. We must recognize it as a time of continuing revolutions. We architects, attempting to keep up with this rapid change, have largely concerned ourselves with being modern, forgetting that we may, in so doing, have missed the possibilities of leading in a life of self-fulfillment. To be modern, for the moment, is so engaging our attention that both middle-aged and youthful architects alike are slightly ashamed of our recent and necessary existence in the past. We would seem to prefer to float nebulously, ever pioneers just in front of tomorrow. We prefer to treat all our problems as if they never existed before.

For the moments just past the arts of our civilization have developed in a nervousness of the immediate rather than in a deep appreciation of our cultural foundations, those which exist under even the youngest of people. While we see the obvious and apparent differences between today and yesterday, we tend to overlook yesterday's foundation under today's accomplishment. One may laugh at the "Horse and Buggy Age", but the terrific death toll, caused by drivers immature in the nature of speed, is conclusive that we are mentally still well within it; that a "Horse and Buggy" judgment in space timing still persists.

Those parts of yesterday which cling to us, regardless of our desire for being modern, have within them, I believe, basic qualities of proportion; qualities which if we do not inherit we adopt early in our lives. Vidal de la Blache, the famous French geographer, said: "A nation, whether large or small, is a distinct personality. Its characteristics like those of other things are subject to the change of time. But it always retains the essential traits developed in the region of its original settlement".

The qualities of proportion desired by a free people, whose roots belong in the growth of a common culture, are inherent throughout change and are to be seen in word, in picture, in structure, in sentimentalism, if you will, and regardless of momentary aberrations, will continue to be seen in the future as well. These proportions may also have the same emotional appeal to the senses of people whose cultural inheritance started historically in the Mediterranean Basin just as other proportions entirely different will have an emotional appeal to oriental peoples. Emotionally, the oriental must be amazed at what a western modern thinks as being an abstraction whereas the occidental will find only realism in what the east thinks as withdrawn from fact. It has been stated in this manner. "A heritage is not transmitted: it must be conquered. And, moreover, it is conquered slowly and unpredictably. We do not demand civilizations made to order any more than we demand masterpieces made to order." (Andre Malraux) ("The Dozing American Tradition" by Max Lerner in *The Saturday Review of Literature*, January 12, 1946.)

In the twentieth century, the natural optimism of the American way of life was expressed in the contrasting skyscraper and suburb, while the depressed values in Europe, together with the appreciation that an earthquake was constantly underneath, caused in the same period a type of architectural aesthetic, which, as the uncertainty spread from Europe throughout the rest of the world has also gripped the emotions of that world; it, quite naturally, lacked any spirit except an expression of materialism and a starved craving for the sun.

So in the interim between the two great wars there developed an architectural revolution against the past, one so ardent, so influential, that in a score of years it has spread the world over. The ready acceptance of its cliches by the youth of the world, regardless of their local significance, gave it an international quality and title. This revolution tended to sweep the accumulated taste-barnacles of the past completely away and thereby rendered a great service to architecture as a whole. It, however, decried anything good or bad that had been done before its time and it endeavoured to proclaim and set up a new terminology of space and volume concepts; which in time was to develop an engineer aesthetic.

Its main credo that shelter is a machine; that it must operate and appear like one has taken its place in our consciousness as one of those dangerous evidences of a *half culture* in which but part of man's creative qualities are used; and which several times during his history have thwarted his search for a full life. This stress upon the shelter machine came at a time, it is interesting to note, when the philosophy of perfection through mechanization, the mechanistic explanation of the universe, the hope of attaining the age-long desired utopias by mass production and the machine alone had come into some speculative disrepute. The architect, awkwardly, without much humanity, with but little science, has tried to establish the house "as a machine", as something wholly and only useful. This was in line with the complete misunderstanding, expanding in our times, of man's emotional and spiritual needs, for it came with the growing mass irresponsibility developed in our so-called push-button civilization which is so aptly described by Ortega y Gasset in the "Revolt of the Masses"; wherein the mass man looking only for security no longer craves independence and freedom. He, himself, is all too content to become impersonal, to be negative, like a machine, and to respond only to the stimulus of some leader, the real button-pusher.

To any observer it is obvious that the mass man has little interest in the humanities. I believe this concept of shelter as a machine, of an architecture of functional utility and of one in which material values are stressed to the omission of all else, must bear its burden of question as to whether it too has not contributed largely to the brutality of modern man, a brutality so evident in this war. It must be a common interest to all of us concerned with the good life that one who can be made so calloused as to burn a fellow human-being with a flame-thrower will not hesitate long in seeing pleasing flowers, also, in atomic bursts.

The other day blurting out from a printed page, came this phrase—"shrewd blows to genteel tradition" and these words were used in praise of an insensitiveness in modern thought, of a brutality in modern art, and a vulgarity in modern writing. As part of this insensitiveness, I have seen carpenters, mechanics

of all kinds destroy with deliberate intent the work of other men. One might doubt whether a craftsman would have such disregard for the efforts of others.

No one can look at the architecture of this period without sensing two things: one, the great break with the past was not only in structure but further in the philosophy of what a full life, as possible in architecture, could mean; and also in the philosophic denial, by restricting their limits and their usages, of the nature of man's skills. There developed as a result an architectural style which was stripped bare of all enrichment, and in which two words especially took on a symbolic meaning far in excess of their actual aesthetic worth. Both were given virtues and standings in design thought far beyond their quality. These words, "cleanliness" and "simplicity" when used together, as "clean simplicity", have created a mumbo-jumbo of great power. It symbolizes the design expression par excellence of today. It can be used as a meed of great praise, or its lack is seen in scornful intellectual damnation. Too often, however, the result has been a paucity in design, a poverty in philosophy, for you may admit that as one looks, for example, at the design of most modern interiors, one is forced to believe that the creators of these glittering impersonalities had eaten all their meals in dog wagons, consummated all their loving in bordellos, and done all their reading in bus stations.

Some time ago, I had in my hands an old Chinese dish of translucent and green jade. It stated ever so clearly that simplicity and perfection are synonymous; perfection especially in material, proportion and execution. It stated that the mere omission of enrichment does not mean simplicity. The real difference between barrenness, which so often carries the title, and real simplicity, is that the latter will bear infinite and delightful study.

The idea that the machine concept of shelter had any international validity finally broke down into many regional appreciations that what might do in one part of the world would not necessarily do in another. The great dampening effect of a few universal and general architectural ideas is now coming to an end and at last there will be released once more the flood of interrupted invention. For again it is recognized that human needs are composed of regional and ethnic differences which are not only deep in their being but also are worthy of cultivation. However in these regional diversions from the main theme there still persists a confusion of life and the machine.

I said that the belief in mechanistic evangelism had come into speculative question. We may glance, for a moment, into a consideration of the recent and widespread movement expressing the needs for a revised general education. Here the concern is for a reorientation, in men's thinking, toward the humanities as a basic foundation leading to a larger enrichment of cultural life. Here, again is an attempt to give the world the *other half of that culture* which has been, because of its seeming impracticality, so much in the discard. Dr. Conant in his introduction to the Report of the Harvard Committee's study into "General Education in a Free Society" stated the problem as follows: "Neither the acquisition of information nor the development of special skills and talents can give the broad basis of understanding which is so essential if our civilization is to be preserved. No one wishes to disparage the importance of being 'well-informed'. But even a good grounding in mathematics and the physical and biological sciences, combined with an ability to read and write several foreign languages does not provide a sufficient educational background for citizens of a free nation. For such a programme lacks contact with both man's emotional experience as an individual and his practical experience as a gregarious animal. It includes little of what was once known as 'the wisdom of the ages', and might nowadays be described as 'our cultural pattern'. It includes no history, no art, no literature, no philosophy." (Page VIII—"General Education in a Free Society"—Harvard University Press, 1945).

A friend of mine has defined a cultured man as one who is thoroughly conscious of his time and is selfless in aiding its creation.

Lately I have been working with one group after another of men interested in science, studying with them their needs in technical building but also in trying to answer what amounts to a clarion call for further amenities. I have not found one of them who is scornful of beauty in either building or group plan arrangement. One well-known engineer said to me: "We engineers have learned not to be averse to smelling the architect's flowers". A scientist recently added: "I hope we can influence some of my workers to be men and not just scientists".

We have seen since the beginning of the century a forced enlargement of our social consciousness in relation to the ill-housed. This means at best but a further reaction against the very mechanistic age and beliefs which have helped create the urban slum. While it is quite true that every past city civilization has had its blight and slum areas, never before have people, knowing better, frankly and openly helped to design future ones. I refer to the many housing developments in the U.S. Some time ago I wrote: "We made a visit to a great housing project, a modern Utopia, where the ugliness of the individual units, the lack of distinction in all the detail of the buildings, and in the landscaping, was perhaps one of the reasons for the absence of care given by the inmates to the institutional-like surroundings. What gift to life has this barren existence in these barren surroundings?"

Again it is interesting to observe that the architectural revolution which proclaimed such a strong denial against the enrichment of its surfaces and spaces was part of a general feeling that world-wide and stringent economies were necessary in order that the distribution of even one nation's wealth might be developed for its own citizens. At a time in the U.S. when it was very evident that we had the possibility of a further and enlarged production and that we were actually under-consuming what we had *at that time* produced largely because we were unable to discover monetary ways for distribution of that production to people in actual need: at this time we created further deficits by arbitrarily burning and plowing in grain and killing off four out of the five little pigs. During the depression a group of cotton manufacturers told me that were it possible to furnish a clean shirt a day to every man in the U.S. and a clean sheet a week to every bed there would be no need to worry about the cotton industry producer and processor alike.

We live in a world of fabulous resources and many and varied skills; yet we still maintain scarcity economics in capitalistic and communist worlds alike. But we have mass-produced in great abundance the ugliest cities in the world's history. Nor has the international revolution in Architecture done other than add more geometry, more interminable lines, more cubic masses, all largely disassociated from man and nature.

Heretofore we have accepted the benefits of a push-button civilization with little consideration as to whether they have added to the spiritual betterment of our lives as well. Nevertheless, to many of us it has been increasingly obvious that our cities, while cleaner and more healthy, were meaner in aspect and lacking in the pleasantness which other cultures had achieved. We can call to mind, in contrast, English cathedral cities, New England towns, Italian hill towns. In a like manner, our living quarters, while also cleaner and more healthy, were places determined by minima considerations, for it is true that as each further comfort was added a little less space was provided to ease the jars of family life. The jammed up qualities of the airplane, the ship's forecastle, the trailer, were offered as desirable conditions in which to create the bases for a North American civilization. There would seem, finally, much justification for the recent popular song: "Don't Fence Me In".

While I could develop this critical argument much further, it surely has gone far enough to indicate that society and architecture, their designers and builders, have, in my opinion, gone along a road far removed from the economical, physical, and emotional needs of the modern man.

It is at this point in the argument that, generally, the cure-all of an enlarged and further use of the machine is brought out and rattled to frighten away the troubles which continue to exist. We must use more concrete, more steel, more glass; to these must be added more synthetics, more gadgets, more plastics, all put together through more research; more prefabrication, restricted through more standards, in more mass production methods, to reach a supposedly cheap enough machine-like shelter. Nor is this all, for these are to be arranged along super-highways strung with roundabouts and four-leaf clovers like a pearl necklace. With more and more speed, more and more the machine pushes the possibility of quiet and relaxation further and further into the ash-can. Granting the practical efficacy of all of these, the world-wide chaos in the urban development shows that they have not been sufficient and that just more of them is not necessarily the answer.

There is an old Hindu saying, and its wisdom is still pointed —"Actions follow ideas like a cart follows an ox." May we look at the future—not to paint a Utopia which means "no place" but to indicate a community which may mean to each of us "my place".

We need a revolution stating the principles of a new architecture and a new city expressing the possible economy of plenty. Here in North America, as I have said, we have natural resources in great abundance; a population unusually self-reliant and with a knowledge and an adeptness in human skills, both hand and machine, not surpassed anywhere in the world. We are fortunate indeed for we have also the increasing wealth to be got from scientific research; we have tapped the universe and will be, without doubt, generously rewarded for our efforts.

It would seem also that we might be permitted sufficient isolationism to the extent of accomplishing that in which, so far, we have failed, namely: to provide out of these resources and these skills for the welfare of all our people. We will need an understanding that natural wealth and its skilled distribution will not be enough to accomplish this welfare, for at the same time we must learn to consciously enrich our civilization. We must appreciate the need for what has been called "conspicuous waste" as applied, however, to the peaceful and healthy delight of a people seeking a full life rather than as late when it has been achieved by waging war. We must realize that the efforts necessary to the creation of an enriched community and individual life is not parasitic, is not "unproductive labour" in the world's work, but is absolutely necessary if we are to achieve full and wide use of our total skills. We must understand as being not only wrong but dangerous, because of its confused expression, this philosophy stated by Lewis Mumford in "The Culture of Cities": "Mass production itself demands, aesthetically, an emphasis upon the general, and standardized, upon forms freed from irregularity, superfluity, and imaginative caprice; in order to make collective production and distribution possible on a scale that will embrace a whole society, economy must be a regulating principle in all design; for it is only by saving on the means and instrumentalities of life that a community can command the necessary abundance at the higher levels of art, science, education and expression." This Mumford-conceived world would seem to offer a society where *the many are to be repressed in the minima of ill-understood economics.* I have said this before, but I think it worth repeating: "One of the most amazing times in the history of the world was the twenty years leading up to the second world war, when there developed a type of architecture wholly inspired by these principles as stated by Mumford with the concomitant, if not result, that millions of unemployed were to be found the world over. This building principle, this engineering concept of economics continues to be a hurdle over which a society expecting to produce an expanding economy of plenty must stumble. It must be obvious that any concept based on an increased capacity to consume cannot be attained by an insistence upon minima solutions."

My wife and I once spent ten days on a visit to T.V.A. looking at the great dams and lakes, the design of communities, the spread of power use, and in the latter search we rode widely looking for evidences of influence—we came upon an electric line going up a rutty road, the line strung on little better than bean poles. In a draw in the hills we shortly came upon a typical mountaineer shack, one made famous in "Esquire"—out in front of the unpainted structure was a "Tobacco Road" Ford, the dagger rows of corn were still planted to cause erosion. There was a sow and a litter of piglets among the piles that held up the wide flooring. It looked like the place of a man who if he saw 100 hard dollars a year would think himself wealthy. On the porch was a man in overalls—a woman in a cotton wrapper, and two children similarly dressed. In front of them and being slowly unwrapped was a brand new G.E. washing machine. Its shiny white newness was in sharp contrast to the rundown character surrounding it. I said to my wife, "What damn fools, no money, yet they are spending what must mean nearly a year's income on a gadget which, it is evident from the amount of clothes they possess, they do not need." My wife replied, "You have dragged me up hill and down dale some twenty-five hundred miles to see a social experiment and you don't recognize it when you see it. This is the real beginning of pride in that family."

Far better, in my opinion, would be a growing understanding that only by increasing our demands for those things which mean luxury (to nations of lesser means and which we North Americans can afford on a society wide scale) can we obtain fully the necessities of life without begging for them. Both an architecture and a city built upon an expanding economy will not develop in barrenness, but only in a revolution demanding the enrichment of all aspects of effort—all design—wherever it touches our lives. Yes! I mean, for example, that buildings might even have ornament.

I firmly believe that man is related to and lives in a world of pattern and colour. The denial of this relationship is a denial of a biological necessity. I believe his eyes and his mind have, throughout his whole historical development, been adjusted to the rich natural patterns about him. The complications of the flower from the bud to the blossom; the lay of the feather on a bird, and many other *not simple* designs have been not only comprehensible to him but have caused him delight.

I would have this revolution develop a consciousness of the human reasons underlying the great decentralizing forces working on our city life. We need a firm understanding that the city is man, and only secondarily property; man striving to live in a community of interests. And while it is true that several of the recent city plans in the English-speaking world have this fundamental conception underlying them it is not yet general in North American thinking.

We do not need the ready and clever solution to the problem of human living in architecture. Each time we approach a problem we should endeavour to thoroughly understand and give each solution a meaning to human relationships as they exist close at hand. Above all we should cease thinking that being pioneers in imitation is desirable, or that a photograph of a foreign building in a magazine is more important than a knowledge of our own cultural surroundings.

If we understand the quality of decentralization we will achieve a human scale in urban life, and the skyscraper, so uneconomical, so grandiose, will give way to more reasonable structures. For this decentralization of the city has as its fundamental reason an escape from its congestion, an escape into

a better and more open type of urban life where the sun will shine on green land and trees, where children may play without interference, where people at work can see the landscape architects' flowers and nature's trees.

European planners are unnecessarily impressed with the idea of the great American metropolis and its traffic problems, so much so that they think the solution of present day physical difficulties with super-highways and four-leaf clovers to be more important than solving urban life itself. And they express their belief in these words: "We should not ruralize cities since this would mean lowering their cultural position."

While this is admittedly in strong contrast to the actual decentralization of urban life we see all about us, further consideration might be given, for the moment, to the idea that ruralized cities will be lowered in their cultural position.

Here it is of interest to note that while our civilization has become increasingly urban, increasingly sophisticated, it has not developed, in America, along historic city lines. The spread out character of the city, the increasing number of mechanical and electrical means of urbanizing the country has changed the trend toward great agglomerations in restricted areas, to great populations spread out over large regions. *We are seeing the development of a new city form.* The past, moreover, does not bear out the assertion that rural cities had lowered cultured positions; for example, "On the basis of all the information available, it has been estimated that the total population of Athens and Attica (a rural City State) at about the year 431 B.C. was between three hundred and four hundred thousand persons. What great and eternal achievements were won by a population so small and inhabiting a district so insignificant in area."

We might recall the hot ambitions stirring the relatively small number of Florentines when successively Dante, Leonardo and Michaelangelo built a culture, the ripples of which still expand in our modern world. And Shakespeare's London, when across the boards strode the assured quotation for nearly every moment of our English language culture. And, lest we Americans forget, the "Flowering of New England" took place about a Boston whose local pride was hard put to find two hundred and fifty thousand souls. Recently, we are reminded of the men who worked for the Federation of the Thirteen Colonies—a nation finally made under the inspiration of men like Jefferson, Madison, Franklin, Hamilton, Jay, authors of lasting fame, all great men from rural cities.

Shall we contrast with this evidence the neurosis of modern international culture where the childishness of a Klee, the erodic mysticism of a Dali, the brutal starkness of a Picasso, the tortured little sculptured scale of Lipchitze, and more, the repetitious sing-song of Gertrude Stein, are all claimed as desirable influences. It has seemed to me that art when it has little to say is apt to stutter. Quoting from Gertrude Stein: "Ordinary pigeons and trees. This is a setting which is as soon, which is as soon ordinary setting, which is as soon, which is as soon and noon." We might suggest that lally columns are a stammering form of architectural expression, for at least certain architects never get by that hurdle into freedom. Our revolution must state that neurotic abstractions are, as the dictionary defines them, subsconscious withdrawals from reality, and to create a background for a life of plenty we must face and master reality.

The recent Anglo-American search for the size of a reasonable community is of peculiar importance because it was not so long ago that the community actually had a position so related to the individual that he knew personally who represented him in government, in the placement of taxes upon his effort and security; this at a time when he was not referred to as either the underprivileged or as the submerged third.

I believe this revolution should bring into being a sense and quality of neighbourhood order, an order thoroughly related to the need for regaining family scale, one in which the mass housing concept of endless repeats of today's "projects" are broken down in size and given as much variety as possible, one in which the engineer's concept of cost value will be judged always against the enduring qualities of family needs and relationships. The average housing project is an outstanding example of what happens when costs are considered over delight in urban living. When the community develops the quality of order, then the buildings will follow also in having meaning. The community order is not a meaningless series of patterns, but is related to the basic emotional needs of the family. It is not anything which can be expressed in purple phrases.

It is not popular to quote dictators, but Dr. Salazar, of Portugal, has expressed this idea so succinctly: "In the family, man is born, the generations are reared, that little world of affections is formed without which man does not easily exist. Destruction of the family entails destruction of the house, the hearth, the bonds of relationship. A man is left facing the state as an isolated stranger without roots, shorn of half his nature he exchanges a name for a number and the life of society is altered." (Further): "The intimacy of family life requires comfort and isolation. In a word, it demands a house, a private house of one's own." (Again): "A small independent house means tranquility, a legitimate sense of property, a family; a hive means promiscuity, a revolution, hatred, the merging of the individual into the multitude." In a world in which man is constantly being told that he must be internationally minded he is in danger of losing those simple matters of enjoyment which an intense and local interest can and does give. We must remember insularity can be made both the basis of criticism or achievement. This small house is not a machine. It must be a home.

An ordered community, in its very character, will permit the citizen to regain his unity with nature itself, helping him realize he is part of nature's open way of life. His appreciation of its variety, its infinity, its greatness, comes with immediate proximity to the soil and its benefits. The city which forces its citizens to struggle through interminable deserts of masonry to reach the few parks, wherein either relaxation or exercise can be taken, is one without order. But also in North America where land is not limited in extent he should be able to call contact with his own ground, his own patch of sunlight, his own refreshing tree shadow. We are too apt to say that home ownership is not desirable because the possibilities of work are not sufficiently stable, and therefore our population must be nomadic in character, rather than in seeking to reinforce the desirability of the home by making work stable and secure.

The city in making the home secure and working conditions stable will find no difficulty in securing a permanent citizen-interest which at present is so lacking or so fugitive. One can hardly blame the citizen,—in the modern disintegration of urban life with its chaos, its ugliness, its lack of security,—because he displays so little willingness to aid in making an order which the day after tomorrow he may leave for a similar blot on God's landscape. This lack of interest by the citizen may have its base in the growing tendency of state and nation to dip directly into the incomes which, in the past, generally were left to the city.

Granting a stable citizenry, and no one will (even in these days of internationalism) deny its desirability, the city will have reason for really enriching its public life; and again that pride which in the past raised the Parthenon, which built the great Greek theatres, the Roman gymnasia, the mighty cathedrals, the lofty guild halls, the spacious plazas will have new opportunities.

We are developing an open ruralized city with many opportunities for play and delight in immediate public spaces, even though the outdoor use is but for a brief season. I have been reading, recently, the books dealing with the government of German cities before the first world war, and again realized

that good citizenship, good management, the will to create, is all that is necessary to make cities fit to live in. What fools the Germans were, for what lovely cities were Cologne, Dusseldorf, Frankfort, Hamburg, with their beautiful new housing settlements, their many parks. The German city manager and the German architect were brilliantly creating one pleasant community form after another, *making the city a sound common business whose ideal was the happiness of the German people:* Good cities, generous food, good music. The many housing developments after the war from 1919 on were hard, brittle, doctrinaire in principle—the great hives that Dr. Salazar spoke about. No longer gemutlich, they presaged the Nazi world of insensitiveness which followed. The early German efforts were produced in a world of expanding human needs and accomplishment, the latter under the principles of strict economy the fruits of which were used in a frightful burst of wasteful energy devoted to war and brutality. It is not to be doubted that had the German people continued to find the funds for urban betterment rather than for war the accomplishment within the cities would have been indeed great and the debt readily borne.

If we are sincere in helping the world to higher living standards this will mean that we will use the rich marbles of Italy, the rare hardwoods of the tropics, the fine natural threads (as well as the synthetic ones) woven into beauty. It will mean the building of structures where artists have given their skills, buildings of which poets may write, buildings which strive again to achieve personality through materials other than concrete, for the concrete building being built largely with common and unskilled labour has the lack of personality of that labour reflected in the ugly abstractness of the result.

It will mean seeking just the opposite of Mumford's world, namely, one in which individual caprice is acknowledged as desirable. The other morning I had breakfast with Frank Lloyd Wright, and later we went to see the model for the new museum. Wright is about 80 years old, but this design of his is one of the most *youthful* buildings I have ever seen. It soars above the pedestrian world. I said later that Wright now designed every building as if it were to take its place in a happy world —one of light, of grace, of gayety, of human beings not bowed down in fear, of human beings who lived in a world where what is possible seems actually so. All his life he has denied the minimum and has reached for the stars, as a free man in a free society. He has asked a drab society to compromise with him on the basis of his ideals.

I think the architectural profession has been as a whole lacking in spiritual leadership. The architect has tried to be too many things to too many people; he has wished to appear as an engineer, as a business man, even as a realtor; something each time which seemed desirable because it indicated a group either making more money or for the moment having a larger standing in the community. I have long believed that the chaos which exists, not only in building design but also in our cities, is largely due to the lack of this leadership on his part. Certainly the cities of the past, with their many distinguished buildings and open spaces, owe most to the architectural profession, not only in the design but, again, in the influence upon the craftsman, mason, carpenter, metal worker. The architect then took a leading position in creating order and beauty in urban living.

As a profession we are trained in the ways of imagination. Shall we say that the architect's reason for being can be summed up in these ideas: The development of order, the creation of beauty, the enrichment of life as it pertains to the physical qualities of shelter and its surroundings. You will notice I have refrained from using words that have a practical ring, and this is on purpose, because I have never doubted the growing practical competence of the architectural profession, and my belief has been strengthened during the war because I have found architects carrying on, with imagination and efficiency, a wide variety of work, but because, more important, the opportunity of creating this world of order and beauty is everywhere demanding our attention.

We architects have a job to do, an obligation, because no other profession has either the training or the imagination; (I might add not even the same desire of will) to make the city a pleasant place to behold. Recently, having seen a more terrible than usual realty development, one completely ugly, I suggested to the President of our chapter that we endeavour to get the lending institutions to employ outstanding architects as arbiters of taste with the idea of insisting on good design or no loan. This is worth while for consideration by other architectural groups. I do not believe that the case is hopeless because there are developers who have made a great success in obtaining the qualities of unity and beauty. The Urban Land Institute in its Technical Bulletins is showing an increasing concern in developing community amenities. I quote from one of these bulletins.

"In some of our shopping centres, as well as in our residential neighbourhoods, we have installed objects of art, and believe it has given identity and appeal to our merchants. These include such features as small pools, benches, sundials, wellheads, statues, fountains, and vases. . . . In certain areas such expenditures might not be warranted but it does increase pride of occupancy." And, again,—"The benefits of trees are that they provide shade, amenity and beauty, and the drawbacks are difficulty of uniformed growth, untidiness, and the danger of obstructing window display. However, in a recent survey of one shopping district, nineteen out of twenty merchants were in favour of keeping the street trees."*

One of the leaders of a great laboratory said in requesting consideration of further enrichment in a new project: "We have estimated that these amenities would cost, over and above the bare necessities, a mere one-half of one per cent. of our annual operation costs. We think that with the type of employee we desire this will make for better thinking and better work."

Order and beauty are the bases of planning. They will be the result of our appreciation of the ever present need for design, an appreciation that conscious design is an absolute necessity in a gregarious society; that non-planning and its resulting chaos are too costly, not only in their qualities of economic security, but also, and more important, in their emotional sense.

Much of our housing is bad architecture because it has fallen upon the emotional ways of undigested social thinking and especially because of the miscomprehension that a rapid attainment of mere quantity will solve our difficulties. The miserable Willow Runs and other war towns should forever deny this. Here the need for design is most obvious, design which achieves some idea that architecture of a home is not an abstract product of a factory but must have emotional aspects which lead to happiness. For while the home can be made in a hovel or a tenement it will blossom better in a house which is an expression of life as we ideally may live it here; with all the comfort we can foresee and of materials that are in nature harmonious to the locality in which the house is built. We will have many new materials which we will want to use but they should not be permitted to influence our lives toward further ugliness. They should be tested for their amiability.

We architects who, as well as others, are being asked to sacrifice in order to make a 'brave new world', should at least sweep clean our own doorsteps. It is in this humble job of making our own doorstep orderly that we architects have sufficient work to do in the post-war world. It is in our local field that we must be statesmen, for it is in these immediate surroundings and with human energy that we must obliterate the mean and create the noble.

*The Urban Land Institute, Technical Bulletin No. 4.

NATURAL AND ARTIFICIAL LIGHTING OF INDUSTRIAL PLANTS

By E. L. DODINGTON

The lighting of a modern industrial plant, designed to house the processing of materials in an efficient and economical manner, should be one of the first considerations of the designer after the architectural programme has been determined. Very often the first problem to be solved will be whether the plant will operate with maximum efficiency if designed by conventional methods, utilizing windows for daylight and ventilation, or whether the recently developed "controlled conditions" plant without windows but with adequate and constant artificial lighting, mechanical ventilation, and air conditioning would prove to be superior in overall considerations. The factors which would determine such a decision are too numerous and varied from one industry to another to deal with here, and much has been written elsewhere on the subject, (Cf. 1-8). This article will review some of the major considerations in the design of industrial lighting systems, both natural and artificial, pointing out advantages and disadvantages as they may affect the design of the building, and the lighting system.

Design for Daylighting

The simplest and most common type of window for factory daylighting is an almost continuous strip of glass on each floor, in all outside walls. Such a window is very effective for lighting work-benches ranged along the walls immediately under the windows, where brightness levels of the work are comparable to the brightness of the window itself. However, the ineffectiveness of side windows in illuminating rooms in which the width is large compared to the ceiling height is shown by *figure 1*.

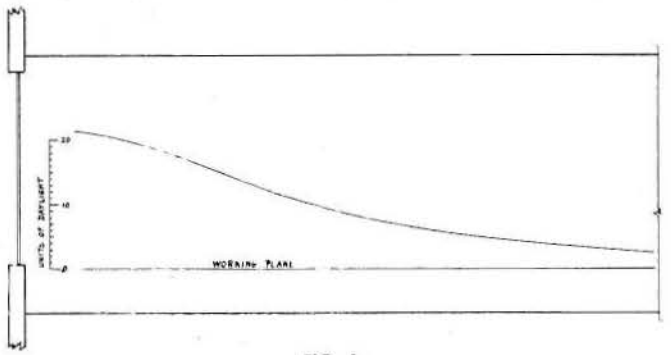

FIG. 1.

The condition is in reality worse than is indicated in figure 1, for the workers in areas remote from the windows not only have to work under low illumination with resultant low brightness levels, but usually have to contend with glare caused by the extreme brightness of the window in contrast with the generally low brightness in the area in which he is working.

While the man working near the window has all the advantages of high illumination and low glare as long as the sun is not shining directly through the window, there are sure to be times, unless he is working near a north wall, when direct sunlight will become intolerable, due to both glare and heat. To correct this condition diffusing shades should be installed and their operation assigned to some individual. Many plant superintendents, to avoid this trouble, have the windows coated permanently with calcimine, a practice which sometimes results in higher window brightness and more severe glare for those remote from the window, and at the same time reduces illumination near the window.

In general, illumination from side windows should only be considered for areas in which the maximum distance from the window is twice the height of the window from sill to head. Tall narrow buildings come well within this category. (Cf. 9.)

For wide areas with low ceilings the most satisfactory method of daylighting is the saw-tooth roof with vertical or sloped windows which should never face any direction other than north. For adequate light quantity and good distribution over the floor areas, as indicated in *figure 2*, the window height vertically from sill to head should be at least one-third of the horizontal window spacing.

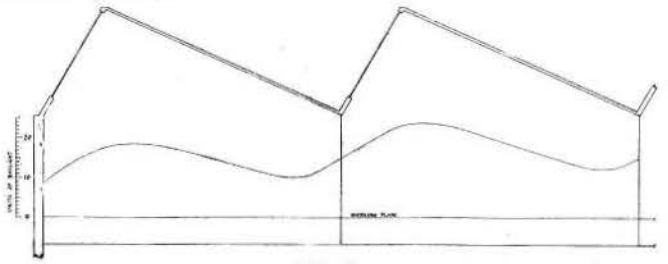

FIG. 2.

The chief disadvantages of this system are: (a) limited arrangements of machinery and working facilities, because no worker should have to face the skylight with its inevitable glare, (b) design and installation of good artificial lighting are complicated by the sloped roof and the large window areas which should be free of light obstructions, (c) this type of lighting is restricted to top storey application only.

In wide bay areas of medium height the monitor roof is widely used, and if adequately designed can give fairly satisfactory results. To avoid as much direct sunlight as possible, such areas should be planned on a north-south axis, receiving light from the east and west sky. In general the width of the monitor should be about one-half the width of the bay, and the window height from sill to head should be about one-half the width of the monitor. A typical light distribution curve for such conditions is shown in *figure 3*.

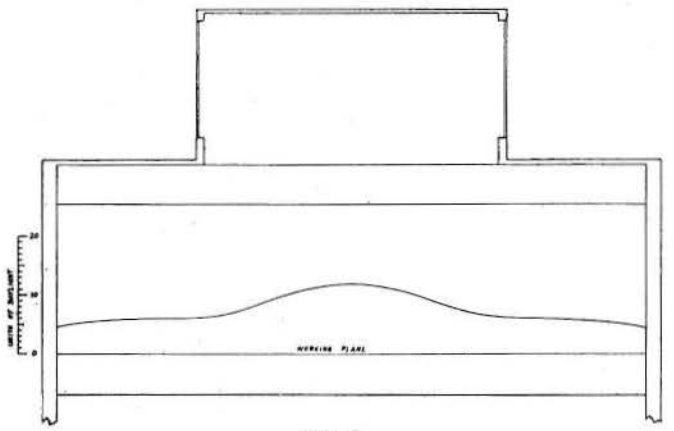

FIG. 3.

The monitor roof has the intrinsic defect of high glare conditions, because regardless of the direction in which a worker faces he has, except in a very few locations, always a window in his field of view, usually seen against dark surroundings. Also if an adequate artificial lighting system is to be installed, the large area fixtures of modern fluorescent lighting may noticeably obstruct the penetration of daylight to the working plane.

In all these discussions of daylighting it would be futile to attempt to evaluate illumination levels in terms of foot-candles,

due to the wide variations in sky brightness during working hours from zero before sunrise and after sunset to the extreme brightness of clouds at noon on a lightly overcast day. A light overcast in the sky, contrary to usual assumptions, produces a sky brightness greater than that on a clear day. All that one can do is to provide for an even distribution of as large a portion as possible of the daylight available at any time. The units of daylight indicated in *figures 1, 2, 3,* are percentages of the illumination that would be obtained outdoors with an unobstructed horizon.

Design for Artificial Lighting

Even when an industrial plant is designed to take advantage of natural lighting, it must be equipped to provide artificial lighting for working periods when daylighting fails to give satisfactory levels of illumination. This means that where shift work or any night operation is contemplated, the artificial lighting system should be designed to provide as high a level of illumination as is required for the type of work to be performed, entirely neglecting any component of daylight. In wide multi-storied buildings, where daylighting is possible only from side windows, the artificial illumination of wide floor areas should be considered as the only source of light.

The design of an artificial lighting system involves six major steps:

1. Determination of the illumination level required for the specific function it must serve. This will in many cases require several different levels at different locations in the building. Illumination levels should be in accordance with general modern practice as recommended by the Illuminating Engineering Society in a report entitled "American Recommended Practice of Industrial Lighting", 1942 (Cf. 10).
2. Selection of a source, with possible alternatives, which will give the desired colour quality for any specific purpose. For example, some industrial processes require light having the spectral quality of daylight; in other processes the colour of the light does not matter except for psychological effects on the working personnel, a factor which is being given more consideration now than in the past by progressive management.
3. Selection, or special design of optical auxiliary equipment, that is reflectors, refractors and diffusers required to control the distribution of light from the source, so that it is utilized on the working plane with maximum efficiency and with a minimum of glare. A number of alternative systems may be suitable for any one purpose. This step involves the layout, in detail, of each lighting system under consideration, to show the equipment and locations necessary to provide the required level and quality of illumination. This will also indicate the power requirements for operation of the system.
4. At this point, consideration should be given to the power distribution systems required for the various alternative systems in mind for a project. Simplicity of the wiring system, its appearance against the structure, windows, and ceilings of the building may affect the choice of the lighting system, and may help to narrow the range of alternatives derived from the first three steps.
5. With each alternative system provision should be devised for maintenance of the lamps and reflectors.
6. The final step necessary to select the best system is an economic analysis of the remaining alternatives. This analysis should include all factors pertaining to the continued efficient operation of the system, as well as the initial cost. The total annual cost of the lighting system can only be determined by the sum of the following usual list of factors:
   (a) Annual charges to amortizing the capital expenditure for all initial equipment, wiring, and installation, including maintenance equipment.
   (b) Annual power costs based on probable operating hours.
   (c) Annual lamp replacement cost.
   (d) Annual cost of maintenance. This item should include probable equipment repairs and replacements, cleaning materials, and wages paid to the maintenance crew.

Light Sources

The light sources at present available for industrial illumination are greatly varied in spectral quality, intensity, brightness, output, efficiency, life, and initial cost. The considerations involved in selection of the most suitable source are outlined above, but the characteristics of the various types must be known before a selection can be made. The following will describe briefly the most important characteristics of the available sources.

Incandescent:

This type of source has been by far the most used artificial light in the past, and at present is still widely used where high intensity is required, as in high bays, or where low initial cost of the system is a major factor. Its spectral or colour quality is that of sunlight minus most of the blue and green light. Hence where colour comparisons are to be made considerable trouble may be experienced due to colour distortion in favour of the yellow and red end of the spectrum. The only approach to daylight colour possible with incandescent lamps is obtained by use of the blue tinted "daylight" bulb, at a considerable sacrifice in lighting efficiency, as the daylight characteristic is obtained only by absorbing, in the glass, light in the red end of the spectrum where it is most plentiful.

While the efficiency of the incandescent source (that is light output in lumens per watt of power input) has been doubled and even trebled during the past few decades, it is inherently an inefficient light source due to its large and unavoidable radiation of infra-red energy which serves only to produce heat. This heat output may often be a deciding factor against the incandescent source where such heat is undesirable and would necessitate mechanical ventilation.

The brightness (candle-power per unit area) of the incandescent lamp is extremely high due to its small surface area per unit of light output. The result is a condition of glare whenever such a source is placed near a person's line of vision, or when a mirror reflection of the source is seen as a bright spot on any polished surface. Such glare spots will often make reading of dials and gauges on machinery impossible from a normal operating position, without supplementary lighting controlled by the operator. Reflecting equipment for industrial lighting almost invariably leaves the bare source exposed to view except at angles near the horizontal; hence direct glare from general incandescent lighting can usually be overcome only by high or very low mounting, and reflected glare only by careful positioning of important visual areas with respect to the light sources, or vice versa.

Offsetting some of the disadvantages of incandescent lighting, especially in areas where vision is not very critical, is its relatively low initial cost. While its power consumption is higher than that of other sources, it usually requires many hours of operation of those sources before the initial difference in cost is redeemed by savings in power costs. Maintenance costs may often be in favour of the simple and predictable performance of incandescent sources and auxiliary equipment.

Mercury Vapour

This source has been applied in the past, when incandescent lighting was the only alternative, to general high illumination, low bay lighting of work benches and machines, with varying degrees of success. For this purpose it has been almost entirely replaced by the fluorescent lamp. The chief objection to this source is its colour characteristic. The light emitted is almost entirely blue and green, and the psychological effect is most depressing, particularly to female personnel. The human skin, under this light, appears mottled greenish-blue and black. All objects appear in these colours only, and hence where colour is involved this light is useless.

The mercury source, however, has found considerable success in high intensity, high bay lighting. To modify its colour characteristic it is often combined with incandescent sources, producing a colour effect somewhat similar to daylight, and utilizing the relatively high efficiency of the mercury source (30 to 36 lumens per watt as compared with 16 to 22 lumens per watt for incandescent lamps). Fixtures are now manufactured to combine these sources in the correct proportions for good colour characteristics.

The glare characteristics of the mercury source in its high bay application are approximately the same as those of the incandescent source. With high mounting and correctly designed reflectors, direct glare is not serious, but reflected glare must be carefully considered in view of the type of work to be performed. If the work requires critical vision against large polished surfaces (as in aircraft production) reflected glare may prohibit the use of such bright sources.

An interesting application of this combination of mercury vapour and incandescent sources to aircraft production, avoiding the condition of reflected glare, has been installed at Budd Field, where the arched ceiling of the plant and clean operating conditions indicated the use of indirect lighting to obtain 35 foot-candles of illumination, a revolutionary development in industrial lighting.

With regard to initial cost, mercury vapour lighting is bound to be expensive in comparison with incandescent lighting due to the auxiliary electrical equipment required for starting and operation. This may, however, be offset by savings in power costs due to higher efficiency, and by reduction in lamp replacement, due to longer lamp life and fewer lamps, the mercury source now being available in units of 3,000 watts power rating, producing 120,000 lumens per unit, the equivalent of 5.8—1,000 watt, or 3.7—1,500 watt incandescent lamps, or 64—40 watt, 4 foot fluorescent tubes.

An unfortunate disadvantage of all electric discharge sources such as the mercury lamp, is the flickering light obtained when alternating current is supplied at low frequencies as in the 25 cycle per second areas of south-western Ontario and in a few locations in northern Ontario and Quebec. This flicker is annoying to those who work under the light, and may prove very troublesome due to stroboscopic effect on moving objects. Rotating wheels, for example, may appear to be standing still or rotating at a much slower speed than they actually are, or may even appear to be rotating in the opposite direction; similar effects are obtained with objects of symmetrical pattern moving in straight lines. This characteristic must always be borne in mind in designing lighting for industries supplied with low frequency current, and should not be neglected even where 60 cycle current is supplied. (Cf. 13).

Fluorescent

The modern outgrowth of the mercury vapour source is the well known fluorescent lamp. This lamp is a mercury vapour tube coated on the inside with fluorescent powders which absorb the ordinarily wasted ultra-violet radiation from the mercury arc and re-emit a large portion of it at wavelengths within the visual spectrum. The colour of the light emitted is controlled by the fluorescent powders used, but only two colours are in common use as general illuminants, known as "daylight" and "white".

In colour characteristics, the "daylight" fluorescent lamp approaches the spectral quality of daylight (north sky) more closely than any other common source. It is excellent where colour comparisons are involved in industrial operations, and where the lighting is used only during the day as a supplement to daylight, but where it is the sole or major source, unless the illumination level is high, a cold, gloomy effect is obtained, similar to that produced by natural daylight on a heavily overcast day. The "white" lamp is better suited to general illumination, due to its emission of more light in the warmer colours of the spectrum, reds and yellows. Its general effect is very white, "cool" light without the yellow effect of incandescent light, and yet without the very gloomy effect of the daylight lamp.

In luminous efficiency the fluorescent lamp ranks high, most types producing 36 to 43 lumens per watt of power input, including losses in auxiliary electrical equipment.

In its glare characteristics, the fluorescent lamp is the best of all the common industrial sources. The brightness of the lamps and the usual reflectors is low in comparison with incandescent equipment, and hence the lighting units can be mounted lower, closer to the line of vision without causing undue ocular discomfort or disability. The lamp brightness, however, is still above the limit for comfort, especially when viewed against dark surroundings, and every possible precaution should be taken to avoid placing such a lamp where it will be exposed to view within an angle of about 30 degrees from a worker's normal line of vision.

Due to the large area of fluorescent reflecting equipment the problem of avoiding reflected glare from shiny surfaces such as machine dials and gauges becomes more difficult than with the smaller incandescent and mercury sources. With the long fluorescent sources covering a large portion of the ceiling area, the locating of these lamps with respect to visually important areas on a machine becomes very critical.

In high bays, general fluorescent lighting can be applied in a manner best suited to the building structure. Usually this results in straight lines of fixtures, either as continuous troughers, or spaced out as determined by the illumination level required. Where spots of high illumination are required on small areas, supplementary lighting is provided by individual low mounted units.

Satisfactory general lighting in low bays is much more difficult to attain than in high bays, due to both direct and reflected glare. Where no critical vision is involved, the lighting units can be mounted symmetrically in straight lines, spaced as required for the illumination desired. Where the area is used for machine tool work or similar operations requiring critical vision at certain points, if an ordinary general lighting system is used the machines should be placed on the floor to suit the lighting, otherwise supplementary sources may be required to illuminate points not reached by the general system, and to overcome the effect of reflected glare from stationary units. One method of generally illuminating such areas, which has been found to be quite satisfactory, is a grid system in which fluorescent units are mounted in straight lines in two directions mutually perpendicular. With this system light strikes machinery from all directions, so that the effect of a single source misplaced for any one point is overcome by light from numerous other sources in different locations. This system, of course, is only applicable to high level illumination.

The most economical method of lighting a machine tool area, as regards economy of both floor space and lighting equipment, is to treat each machine separately, placing the fluorescent lighting units as required for best conditions at each machine (Cf. 12) without regard to symmetry or alignment over the whole area. If the machines are closely spaced, the general illumination level will be high, and if there are any large areas between machines they can be provided with supplementary general lighting. The wiring for this type of layout should be an adequate symmetrical pattern of duplex plug receptacle outlets on the ceiling. This allows the maximum flexibility of lighting layout in the initial installation, and also maximum flexibility for changes in lighting or machinery location.

The initial cost of fluorescent lighting is, and probably always will be much higher than that of incandescent lighting, due to the large, low output fixtures and the auxiliary electrical equipment (starters and ballasts) required for their operation. The low power consumption per unit of light produced, how-

ever, makes large savings in power costs possible. Where operation of artificial lighting is continuous, or where power bills are based primarily on the peak demand of the lighting system, the annual cost of a fluorescent system may often be less than that of the equivalent incandescent system. In some locations where mechanical ventilation or air conditioning is required to carry off excess heat from machines, bodies, lighting, etc., as in the windowless "controlled conditions" plants, the low heat output of fluorescent sources per unit of light output allows a very considerable saving in capacity of the cooling system required, as compared to that required using incandescent lighting.

With fluorescent lighting operated by low frequency alternating current, we encounter again the problem of lamp flicker with its annoyance and stroboscopic effects. (Cf. 13). A large part of these effects can be overcome on the working plane by auxiliary equipment in the ballasts, or by three-phase power supply, connected so as to make the lamps flicker at different times during the current cycle. The combination of this and correctly designed reflectors smooths out most of the flicker on the working plane, but there is no way to avoid the flicking appearance of the individual lamps. As a result of this residual flicker, some plants are installing frequency changers to obtain 60 cycle per second current. In many cases, the cost of this is more than offset by the lower cost of 60 cycle fluorescent fixtures, and somewhat lower power loss in the ballasts. The least objectionable flicker on low frequency is obtained by use of three long, small diameter, high voltage cold cathode fluorescent lamps, connected for three-phase operation in a single reflector. The installation of these high voltage sources, however, requires many additional considerations of safety, maintenance, efficiency, and cost.

Maintenance of fluorescent lighting is usually more expensive than incandescent, due to several factors. While the lamps have a life rating double that of incandescent lamps, the output of a single 40 watt fluorescent tube is only slightly more than that of a 100 watt incandescent lamp. Hence the number of lamps in service for equivalent illumination level is usually much higher in the fluorescent system. This, with the relatively high fluorescent lamp cost makes replacement costs high. Besides lamp replacements, we have the cost of replacing the fallable starters and ballasts. When a fluorescent lamp or its starter fails it must be replaced at once, as they rarely just go out, but usually flicker on and off continuously for an indefinite time, causing extreme annoyance and distraction. The still unpredictable life of lamps and auxiliary equipment must be borne in mind for large installations where a regular maintenance crew operating on a definite replacement schedule is desirable.

One further precaution in the use of fluorescent lamps applies where low temperatures are likely to be encountered, as in some mill buildings and foundries, where heat is almost completely shut off at night, even in cold weather. If the air temperature is below about 40 degrees F., the lamps become very difficult to start, and they flicker on and off for a long time before they warm themselves or are warmed sufficiently to maintain the electric discharge through the mercury vapour.

Interior Finishes

In designing the lighting of a plant the interior finishes used are of prime importance. Lighting, appearance, safety, cleanliness, and morale of the workers have been found to improve greatly with light coloured and contrasting painting of the building and different parts of the machinery (Cf. 14, 15). White cement floors have been used successfully in aircraft production to reflect light to the underside of wings and fuselages (Cf. 16).

Conclusion

The above discussions should indicate clearly that the overall design of lighting for an industrial building is not just a simple matter of providing windows where convenient or architecturally correct, and then providing a sufficient number of any type of lamp, in symmetrical layout, to give the required average illumination level. This is the easy way out for the factory designer, and can always be accomplished, but it may not be the best and most economical method.

Where twenty-four hour operation is contemplated as a possibility in order to utilize capital investment in equipment to the maximum, or where very precise machine work is being done, the advantages of the windowless plant should be given every consideration. In this type of plant, "in line" production is made possible for a large number of industrial operations, saving large floor areas and costs of transporting materials from one department to another. In some plants, constancy of working conditions from one shift to another has reduced labour troubles previously due to preference for one shift. Most unpleasant working conditions such as extreme heat, smoke, or dust must be relieved mechanically with resultant better working conditions. The claustrophobic effect of such buildings may be a serious detriment where the open floor area is small, but in large areas without partitions, and with effective lighting and air conditioning, few employees will complain.

In the past, daylighting for factories was a necessity. Now it is only one alternative and should be treated as such, recognizing all its disadvantages and costs, as well as its advantages and savings. In designing our new factories, let us not ignore precedent, but not allow it to be the determining factor at the expense of progress and development. In enthusiasm over new developments, however, let us not assume that because a new development is successfully applied in a few cases, it is the best available for all applications. This has happened in the past with fluorescent lighting, resulting in many disappointments due to its misapplication. The only justifiable approach to any such engineering problem is one of open mind, basing conclusions and selections of lighting systems on all available facts as they affect, or are affected by conditions in the individual case.

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MAIN ENTRANCE

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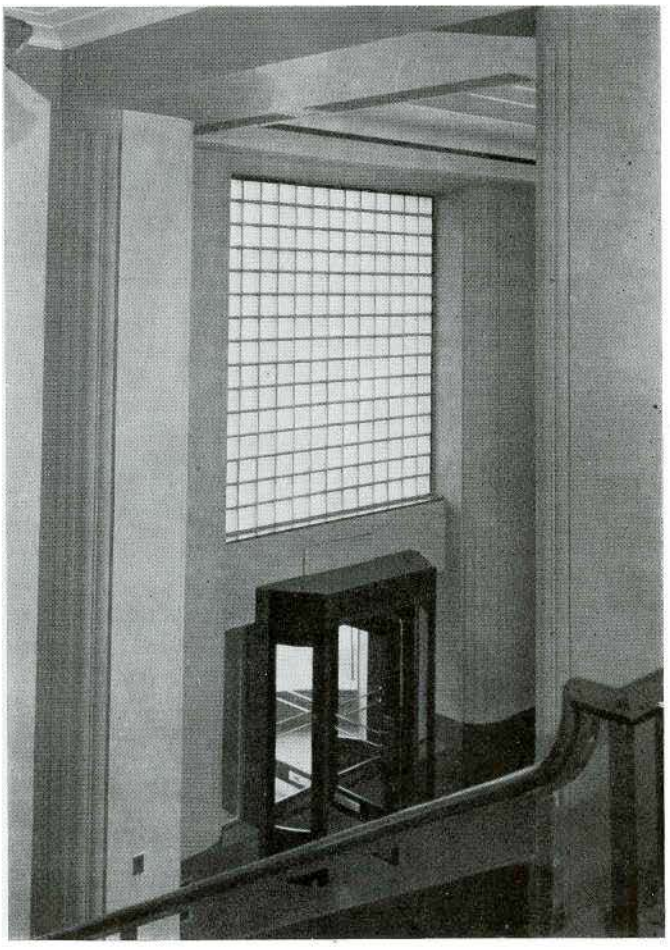
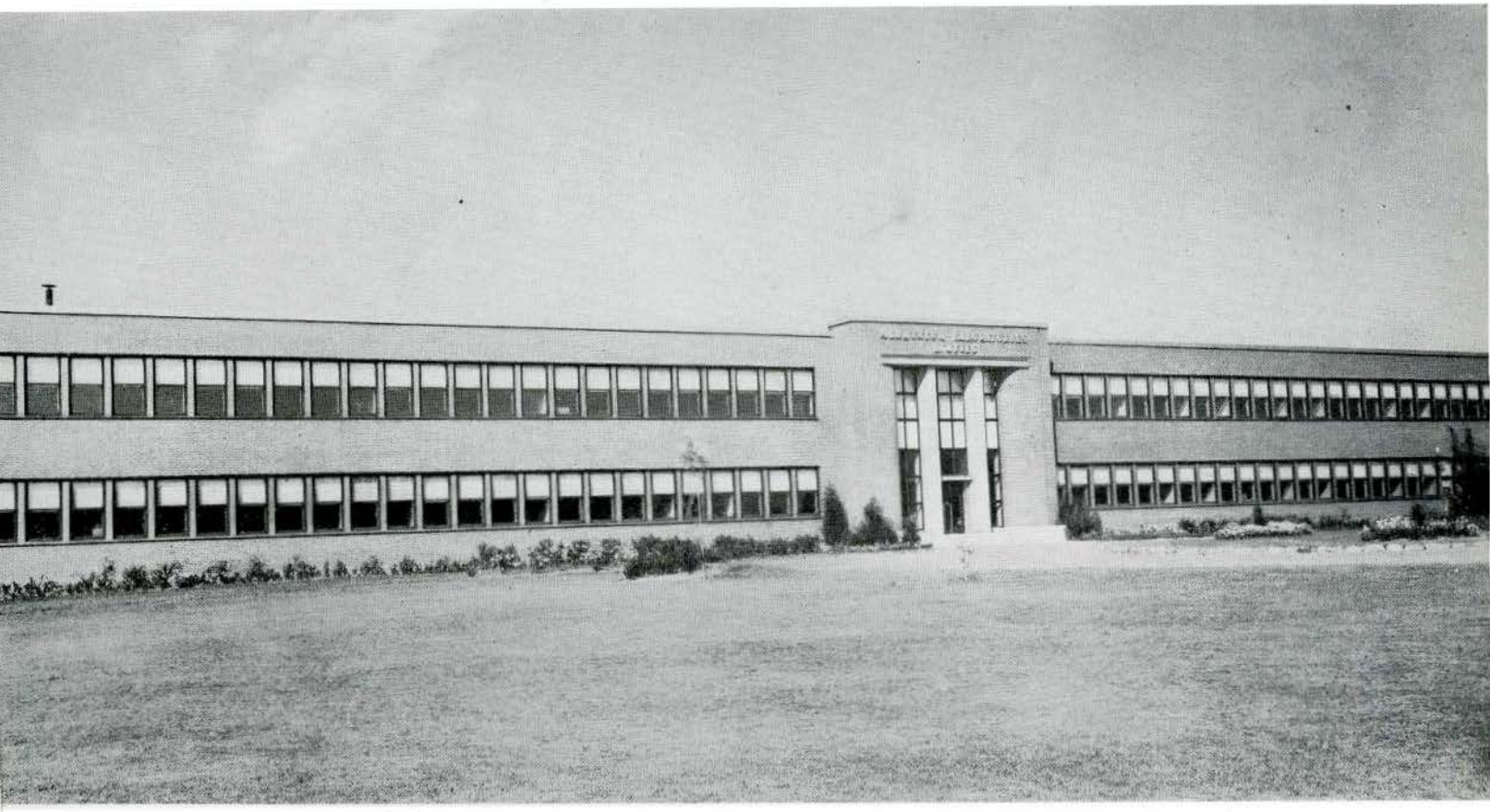
ARVIDA, QUEBEC

FETHERSTONHAUGH AND DURNFORD, ARCHITECTS

MAIN ENTRANCE HALL, TERRAZZO MAP ON FLOOR, ALUMINUM STAIR RAIL



LOOKING DOWN MAIN STAIRWAY TO ENTRANCE



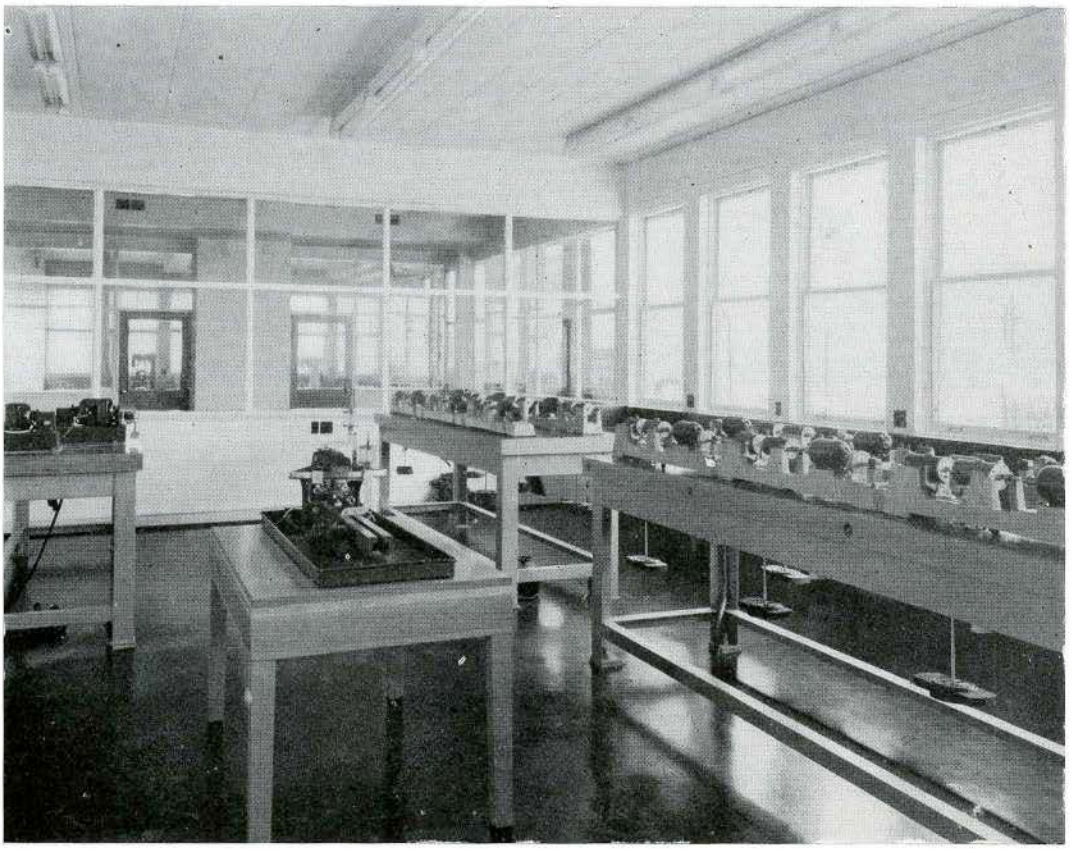
ALUMINUM LABORATORIES LIMITED RESEARCH BUILDING, KINGSTON, ONTARIO

J. C. MEADOWCROFT, ARCHITECT

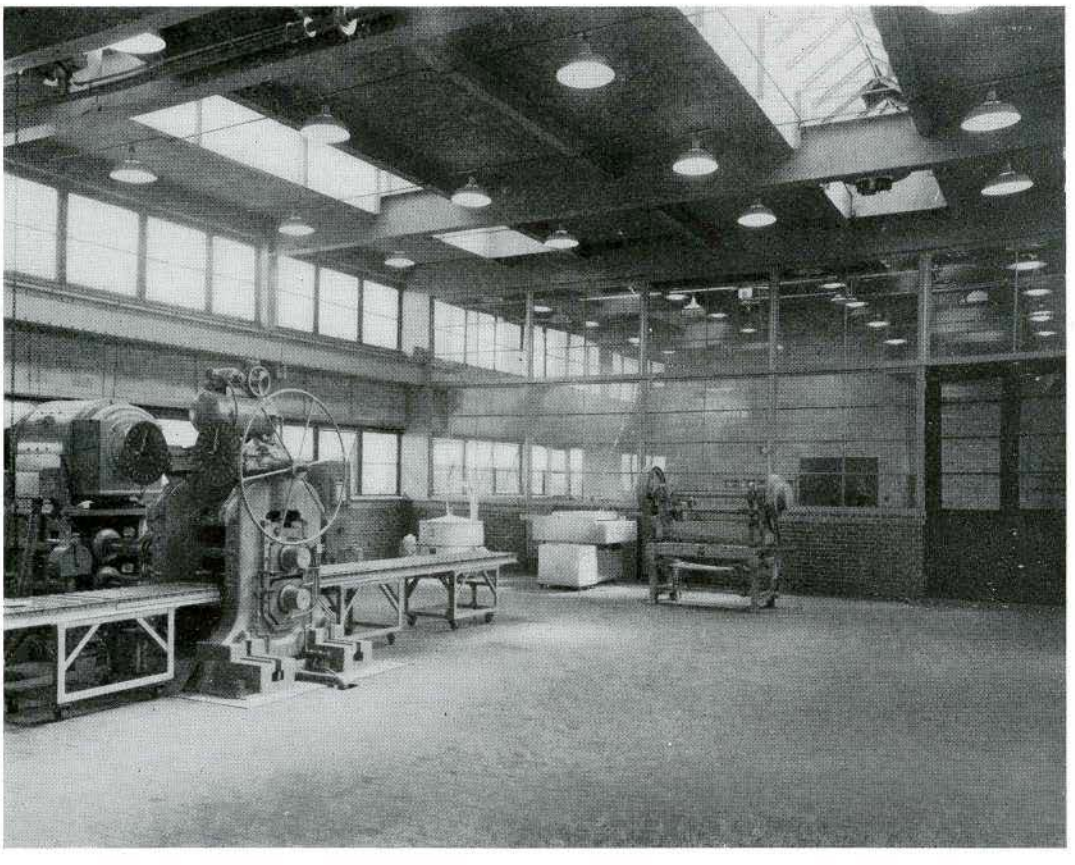
The Kingston Research Laboratory was designed and constructed for Aluminum Laboratories Limited primarily for fundamental and applied research to supplement work of a second Laboratory for research on fabricating and general technical investigation conducted by the Company at Bambury, England.

LIBRARY

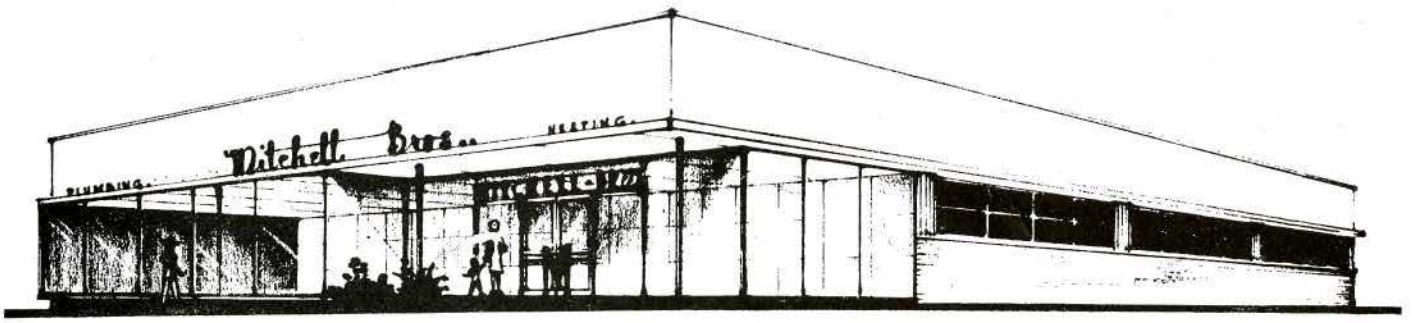
FOYER



FATIGUE MACHINES

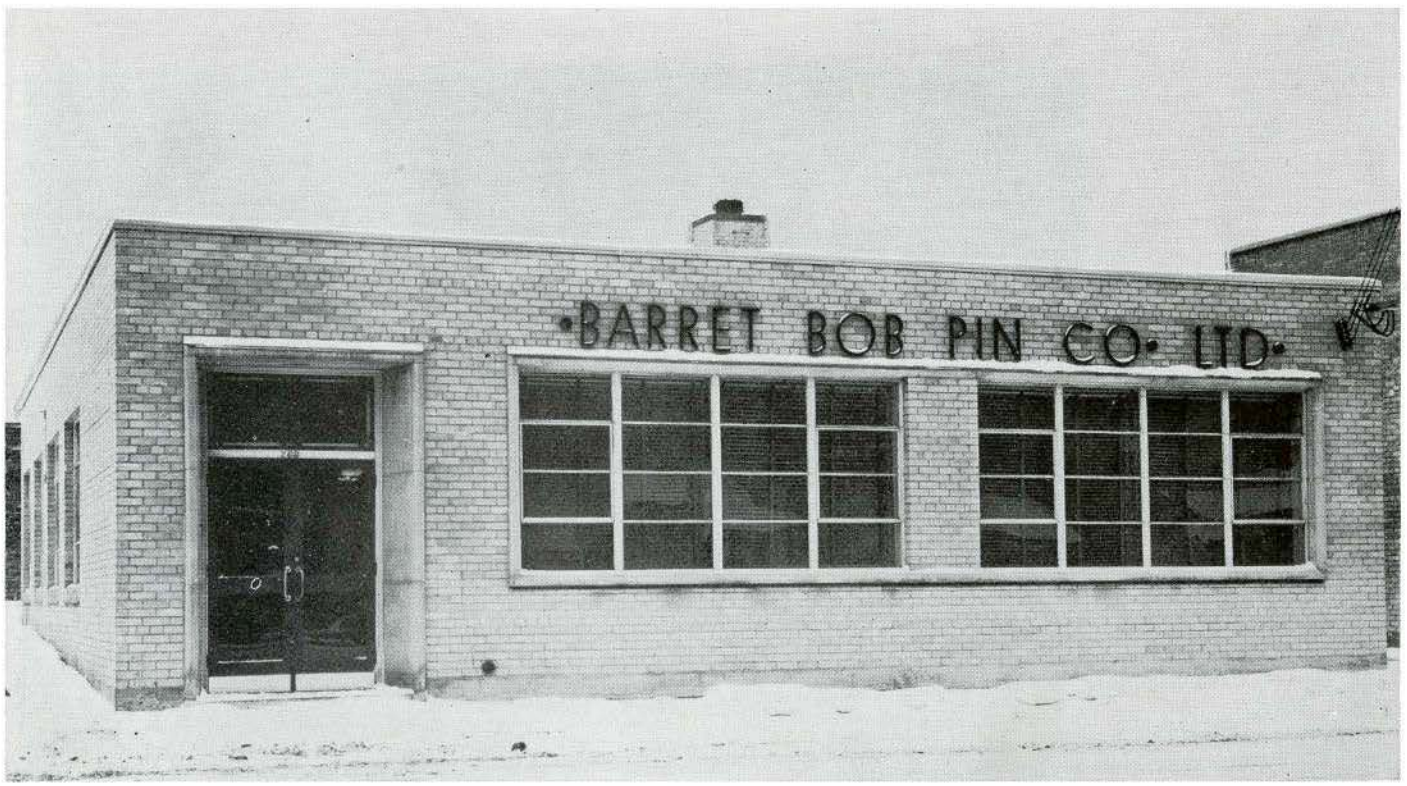


ROLLING MILL AND SHEAR



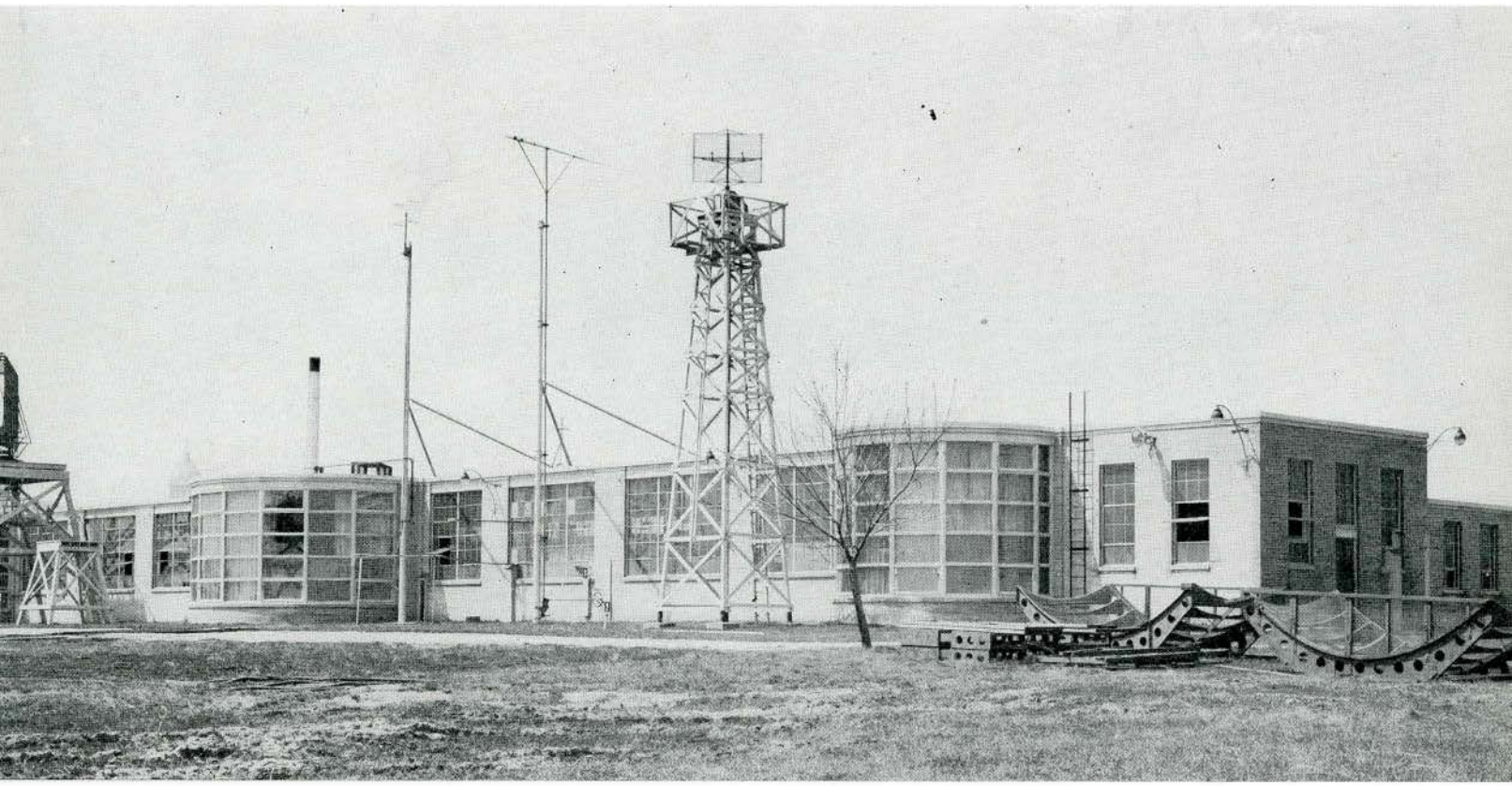
PERSPECTIVE DRAWING OF SHOWROOM AND PLANT FOR MITCHELL BROS., VANCOUVER, B. C.

C. B. K. VAN NORMAN, ARCHITECT



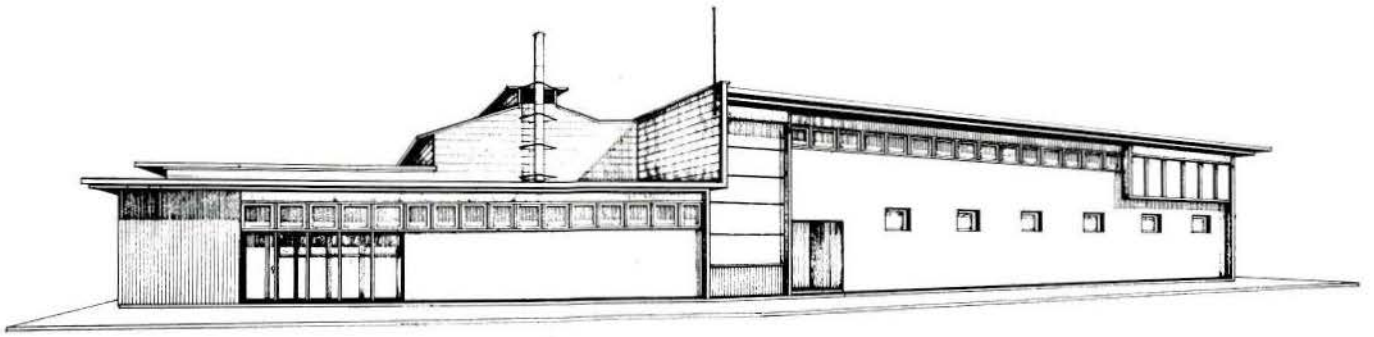
BARRET BOB PIN COMPANY LIMITED, TORONTO, ONTARIO

PAGE AND STEELE, ARCHITECTS



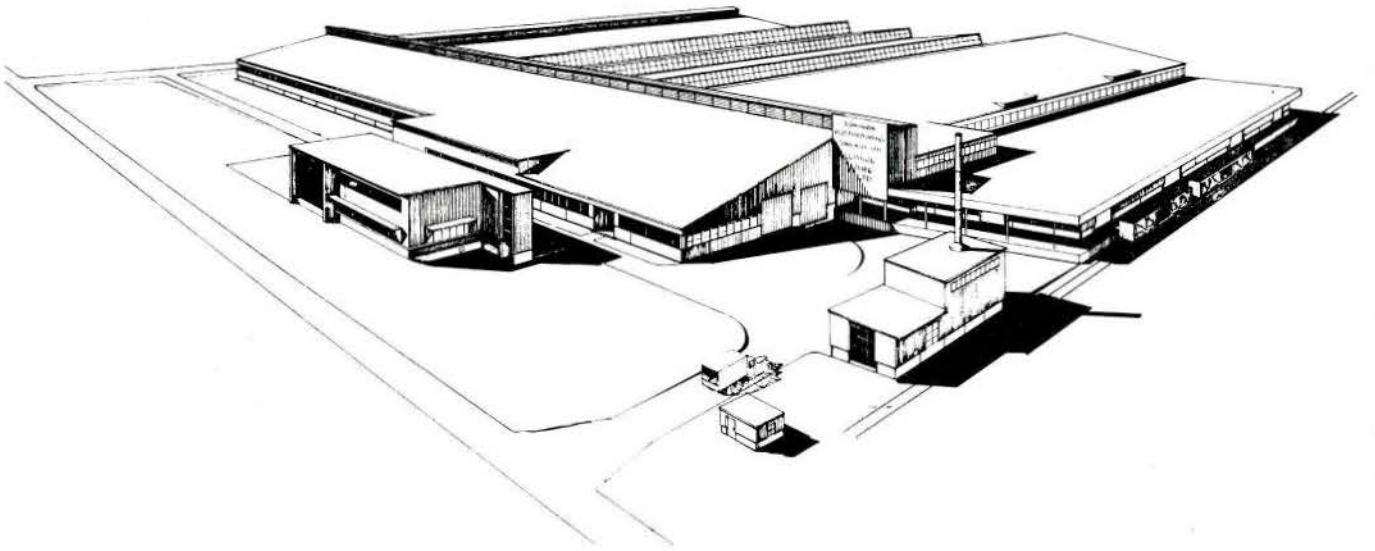
RESEARCH LABORATORY, RESEARCH ENTERPRISES LIMITED, TORONTO, ONTARIO

ALLWARD AND GOUINLOCK, ARCHITECTS



ALLIANCE WARE LIMITED, VANCOUVER, B. C.

SHARP & THOMPSON, BERWICK, PRATT, ARCHITECTS



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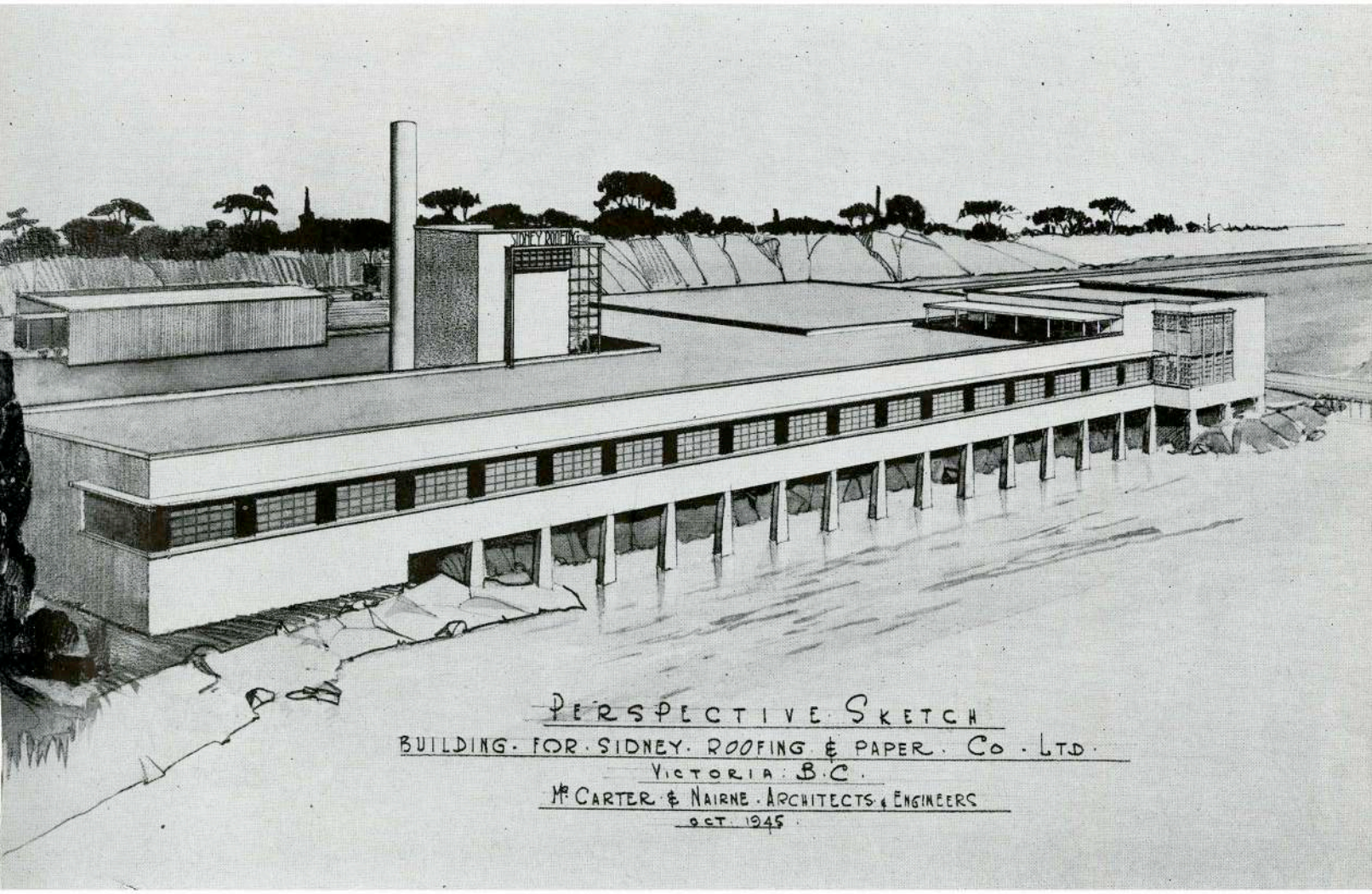
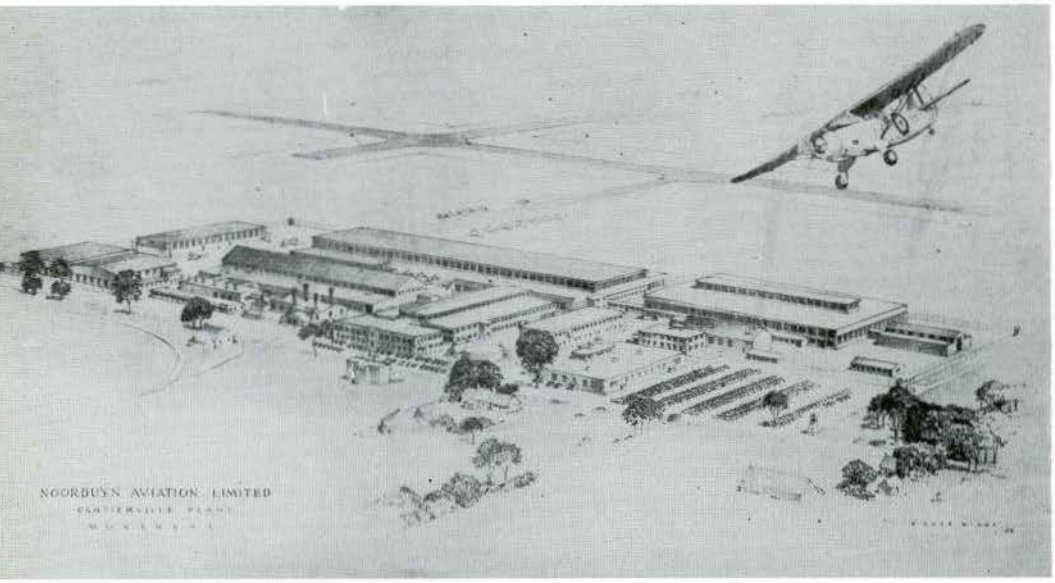
SHARP & THOMPSON, BERWICK, PRATT, ARCHITECTS

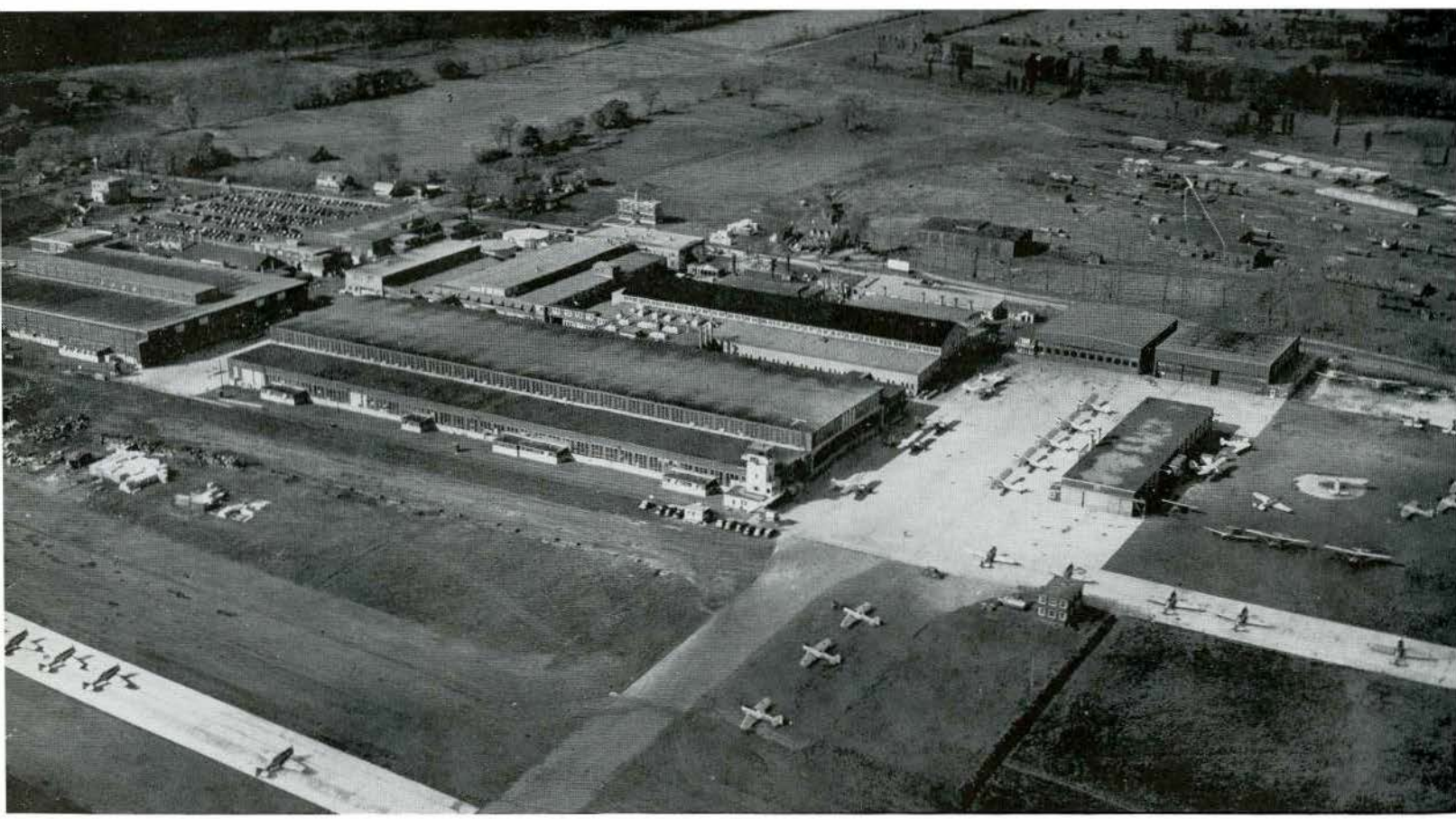


PERSPECTIVE SKETCH
BUILDING FOR SIDNEY ROOFING & PAPER CO LTD
VICTORIA B.C.
Mr CARTER & NAIRNE ARCHITECTS & ENGINEERS
OCT 1945



PERSPECTIVE DRAWING OF NOORDUYN AVIATION LIMITED, CARTIERVILLE, QUEBEC

H. ROSS WIGGS, ARCHITECT



AERIAL VIEW OF NOORDUYN AVIATION LIMITED, CARTIERVILLE, QUEBEC

H. ROSS WIGGS, ARCHITECT, AND L. A. AND P. C. AMOS, ARCHITECTS

G. LORNE WIGGS AND COMPANY, CONSULTING ENGINEERS

PANEL HEATING

By **KAREL R. RYBKA**

Introduction

The prominence of panel heating — mostly mis-termed "radiant" heating — in the recent American engineering literature gives it the appearance of a new and unheard-of development and could lead to the impression that it is the cure-all for heating ills. Its more than forty-year struggle first for survival and later for a decent existence seems forgotten, and little seems to be known of its many designs and patterns which have developed over the years; through ignorance, some of its earlier developments are being hailed as the newest and latest, and sometimes even future aspects of the science of heating. There belongs the oft-heard statement that in the near future panel heating may also serve for summer cooling, although it was so applied a decade ago in Switzerland and Czechoslovakia; or the expression of hope that some bright lad may soon develop the use of panel heating coils as an integral part of the reinforcement of concrete structures, though they have so been used in 1933 in a large Dutch institution, and shortly afterwards the Czechoslovak Department of Public Works published regulations for the use of heating tubes as concrete reinforcement.

Unless the Architect or Engineer knows well the history of this controversial subject, he is at a loss to extract from the maze of contradictory information those grains of truth that will permit him to correctly apply its many available patterns. Although panel heating is here to stay, it will not replace many of the recent developments in heating and ventilation and particularly in air conditioning, but it will contribute to better living and working comfort where applied after careful consideration of its special merits and limitations.

Physiological Concepts

The indoors environments for human occupancy are intended to ensure the measure of heat losses from the human body required for comfort and health; this heat loss must be distributed reasonably evenly over the entire body. Overheating one and chilling another part of the body will be detrimental to health, even if the total heat transfer from the body corresponds to the required metabolic rate. The human body has, however, considerable regulative powers which will usually correct for small discrepancies in heat transfer from its diverse parts.

The heat lost indoors by the average human body at rest, by evaporation, convection, conductance and radiation is approximately 400 BTU/h. For diverse degress of activity the rate of heat loss is higher and considerable data are available on this subject. Heating designs are readily corrected for these variations by a slight reduction in temperature of the working space.

The loss by evaporation at comfortable indoors conditions averages 80 BTU/h which leaves about 320 BTU/h for loss by convection, conductance and by radiation. It is immaterial what proportion of this heat is transferred by radiation, as long as the total rate of transfer is maintained.

Many panel heating experts still obscure their calculations by complicated formulae involving the fourth power of the absolute temperatures, though within the applicable temperature range from 50°F. to 120°F. heat transfer by radiation is closely proportionate to the difference in temperature of the bodies; for the so-called black body 1.05 BTU per sq. ft. per hour per degree F. will give good results and will reduce for usual clothing or walls and floor coverings to slightly less than 1.0 BTU per sq. ft. per hour per degree F. Similarly, the heat transfer from the human body by convection in reasonable still air and usual room temperatures will resolve itself—regardless of the complicated convection formulae and their fractional powers of temperatures and mean diameters —to a constant value of nearly 0.70 BTU per sq. ft. per hour per degree F.

The mean surface temperature of the clothed human body has been variously estimated from 75°F. in England, to between 83°F. and 86°F. on this continent; (the lower English value is due to the heavier clothing usually worn there). The surface of the average person exposed to radiation is estimated at 15.5 sq. ft. and that exposed to convection 19.5 sq. ft.

Fundamental Design Data

From the foregoing it is easily computed that, with still air and a mean wall temperature of 83°F., which stops heat transfer from the human body by radiation, an air temperature of about 59°F. would ensure the required total heat loss of 320 BTU/h per person by convection only, whereas with 83°F. air temperature, which stops transfer by convection, about 61°F. mean wall temperature would achieve the same result by radiation only. Similarly to these extreme sets of values it is easy to establish corresponding air and wall temperatures for any intermediate condition. (This mean wall temperature must include an allowance for the radiation from the heating unit.)

These considerations prove that the old-fashioned living and working space, with its limited outside walls, would ensure satisfactory comfort conditions with an air temperature close to 71°F., as the mean wall temperature (also resoundingly called mean radiant temperature or M.R.T.) would be inevitably close to 71°F. And conversely, in panel heated spaces with reasonably substantial walls and well insulated windows, a mean wall temperature of 73° to 75°F. will ensue, requiring for comfort an air temperature of 67° to 69°F.

And this immediately leads to the final conclusion that the simple heat loss computations employed for "radiator" heating are fully applicable to panel heating, as the indoors temperatures used in either form of heating are nearly identical. It remains only to select a heating surface capable of supplying to the space the total amount of heat required to offset the calculated heat losses.

Care must be taken to eliminate excessive temperatures, particularly if panels are installed in floors. Some floor panels installed in Europe at the turn of this century have hampered there for a considerable time the acceptance of panel heating. They employed floor temperatures which exceeded 85°F. and invariably led to sore feet and expensive alterations. For wall and low ceiling panels in rooms of average height, 120°F. should be considered the maximum permissible temperature for comfort, though in high rooms considerably higher temperatures may be allowed. ("Radiators" in similar positions use temperatures over 200°F., but their influence is restricted by limited radiating area.)

Design and Types of Heating Panels

The best known type of heating panel consists of pipe coils or pipe grids placed either in the floors, walls or ceilings, and through which warm water is circulated.

Another panel design is a copy of the original methods used by the Romans some two thousand years ago and consists of ducts or chimneys in walls and floors through which heated air is being circulated. They are mostly built of hollow clay tiles placed end to end. Sometimes the ducts terminate with air inlets into the room, to give supplementary air heating.

In some installations steam or high temperature hot water is carried through pipes which in turn are located in ducts in the floors or walls, etc. A very early pattern of this heating form was used about 1900 in the New York Lying-in Hospital and consisted of steam pipe coils behind smooth steel plate enclosures and placed along outside walls and under windows. Such heating panels are kept at low temperature by the air space between pipe and inside surface of enclosing duct. Control of heat supply is obtained by changing the rate of flow, or the temperature of the heating medium similarly to "radiator" heating. Diverse improvements were later introduced, many of which were intended only to circumvent patents granted for panel heating, such as fins attached to high temperature pipes and placed parallel to and partly in contact with the inside face of the duct surface, and designed to allow wider spacing of pipes or to reduce the extent of ductwork and piping.

The desire for creating accessible and inexpensive panels led in their day to smooth faced steel plate or cast iron radiators either with or without convection space on the back, which often were substituting for wainscotting. This pattern was particularly favoured in commercial and industrial plants. Further developments of this pattern led to strip heaters and to metal baseboards through which hot water or steam is circulated; similar equipment has long been used occasionally to heat pews in churches, and also as strip heating in diverse plants.

Interesting, though wasteful and only applicable in very special cases, is the use of window areas as heating panels; the window is usually the largest single source of heat loss in a room and its elimination would often suffice to establish comfortable conditions. One method used as a supplementary heating panel, employed electric or steam strip heaters placed inside of lower part of a double window. Another type used carefully dehydrated and filtered hot air circulated between the two sheets of glass and it has been found satisfactory even in large glass areas without supplementary heaters.

Of some interest in industry are electric panel systems, with heating elements in conduits or ducts laid in floors or ceilings; the clearance around the elements permits use of fairly high temperature. Other types use wide strips of wire mesh imbedded in floors or ceilings and heated by low tension currents supplied from a special transformer. Electric panels have a future where no heat need be supplied during the working hours, as they would operate outside of the work day on very cheap power rates.

Fuel Costs of Panel Heating

The proponents of panel heating are claiming considerable reduction in fuel consumption against other heating forms, and often quote 30 per cent. and more in savings. At first it was assumed—and many supposedly well informed people believe even now—that this is due to the lower air temperature. The explanation is rather weak, as this heating is based on higher surface temperatures of walls and floors and it is not the air temperature but the surface temperature of a wall which is determining the extent of its heat losses. It is self-evident that heating panels if installed in outside walls, in floors on ground, or in roofs will increase, rather than reduce, heat losses of buildings unless their back surfaces are heavily insulated.

Claims that panel heated buildings benefit more than radiator heated buildings from solar radiation entering the building on bright days also have not been substantiated.

In some instances proof of savings by a comparison of fuel costs has been claimed under supposedly identical conditions, except for the type of heating. The only reasonably comprehensive report of this kind pertains to a school in Copenhagen and though about ten years old, is still avidly being quoted by most exponents of panel heating; however, upon close examination, it is found that during the tests the radiator heated portions of the system were manually controlled, whereas the flow temperature of the panel heating was thermostatically regulated. And it is a known fact that even a simple automatic heating control inevitably either effects considerable fuel savings or better comfort conditions than a manually controlled system. Other such comparisons were based on buildings of an entirely different construction where the expected differences were calculated and it was then proven that in actual practice the spread was much wider. In the last twenty years no irrefutable proof of actual fuel savings has been published.

Until exact and unimpeachable results prove the contention of the large savings, the only savings that could be expected in practice are those which usually accompany any form of modernization, and invariably can be ascribed to better control of heating or to better building construction; in addition, the negligible increase in boiler efficiency—if the boiler supplies directly the desired water temperature—and the slight reduction in heat losses of the supply and return pipes due to lower surface temperature, smaller pipe size and protected location of pipes (with "radiator" heating the piping is in outside walls, with panel systems usually in partitions) may ensure some added economy.

All these benefits are partially offset by the experience that the fuel consumption of panel heating systems during reduced temperature periods, viz., over week-ends and holidays, is higher than that of equal "radiator" heated buildings.

(Some laboratory comparisons have shown equal or higher fuel costs of panel heating but these results are being dismissed by the adherents of panel heating on the basis of insufficient sizes of the installations.)

Advantages of Panel Heating

Apart from any controversial claims of operating savings, a well designed and properly installed panel heating system has many distinct advantages. It is fully concealed and eliminates obstructions and loss of usable space and permits placing heat supply where it is needed.

One of the most important features is a more even distribution of air temperature both horizontally and vertically throughout the heated space, than is usually obtained with "radiators" or any other form of heating. In spaces with floors on ground or in rooms directly under a low roof, the floor, respectively the ceiling is usually warmer with panel heating than with any other heating form; this also applies to outside walls except that "radiators" if placed under windows, blanket to a higher degree the cold window surfaces. These characteristics of the panel heating render it more conducive to health, both by uniform heat transfer from the human body and by reduced air currents and drafts. The reduced air temperatures in panel

heated spaces permit correspondingly higher relative humidities without condensation on windows and other cold surfaces. Furthermore, the low temperatures of panels eliminate entirely the scorching of dust, which is the most objectionable feature of high temperature hot water and steam heated radiators, as it charges the air with small quantities of irritant vapours and fumes.

The large heating surfaces of panel systems render them also well suited to summer cooling, but will be fully satisfactory for it only where the panels are located in ceilings or fairly high in walls. Floor panels increase the discomfort from direct contact of the human body with the cooling surface and have the tendency to stratify the cooled air in the lower levels of the room. The local climate must also be considered as high relative humidities of the air will inevitably lead to condensation and added maintenance. Another disadvantage encountered with floor panels used for cooling would be the need to protect them carefully against solar radiation.

Influence of Building Design on Comfort

The recent clamour and demands of workers for better heating in industrial plants is usually written off by the Architect, by management and sometimes even by the hygienist as a result of unionization on one side and gradual "softening" of the workers on the other. The Architects do not realize their large share of responsibility in these trends.

An unbiased comparison of industrial buildings prior to and after the turn of the century discloses that—regardless of our severe climate—they proceeded to substitute the single-storey-on-ground-glass-house of Albert Kahn and his contemporaries for once even for heavy industry quite common multi-storey building, which in itself was more substantial and had a limited, easily heated floor area. The many acres of flimsily encased single storey plant buildings expose the worker inevitably for several months of each year to the cool radiation of and contact with unheated floors and to the chilling radiation of skylights, windows, badly insulated walls and thin roofs. In earlier days a few radiators were dispersed over these tremendous surfaces and were insufficient to overcome their cooling effect in cold weather but overheated the space in mild weather.

To make matters worse, the efficiency expert and time study man stepped in, and whereas the moulder or press operator in the occasional early single storey plant was forced to do some walking and carrying from stock-pile to his working position and from there again to another stock pile, and occasionally also proceeded leisurely to a tool grinder, etc., the operator in a new plant is mostly tied to his working post, materials are supplied to and taken from him mechanically, and all his motions are systematically being reduced.

To this should be added that, in the old plant the work usually was done at a normal working level, whereas present assemby lines often necessitate placing some of the operators on high platforms and others on the floor or even in pits and there is little doubt that this renders the providing of all-round satisfactory temperature conditions more difficult than ever.

These problems become still more serious in plants where considerable vapours and steam are discharged by or are necessary for the manufacturing processes. There belong food processing, paper, textiles, dyeing, tanning, printing and many similar plants. Whereas in multi-storey buildings the basements and often the top stories served as storage areas and on the other floors the high humidity became annoying only on windows, the single storey plant has become notorious for wet, slippery and dangerous floors and for wet, slimy ceilings and roofs, which cause much spoilage by the dripping of condensation into the finished products, in addition to constant maintenance and inevitable annoyance. This is accentuated by the need of providing large openings in the roofs for ventilation as the cross-window ventilation which was usually sufficient in the small floor of multi-storey buildings, becomes inadequate in the large floor areas of single storey buildings.

These comparisons indicate some ways towards improving the shortcomings of the modern single storey building. The main requirement is to create floor and ceiling conditions which simulate, if not improve on those of the intermediate stories of multi-storey buildings. This points towards a more extensive use of panel heating in industry wherever other considerations do not rule it out.

Disadvantages of Panel Heating

The chief objection to panel heating in industrial buildings is at present its high cost, when compared with the customary heating forms such as unit heaters, central fan heating systems and others. In some instances the possible omission of ventilation systems for exhausting vapours, or of supply ventilating systems, necessary to overcome formation of fog in the building, may change the comparison to favour the panel heating. In most cases, however, it will be necessary to evaluate such intangibles as improvement in health of employees and incidental improvement in absenteeism, reduction in maintenance costs and repairs, reduced spoilage of goods, etc.

Consideration must also be given that in plants subject to vapour and steam troubles, often little if any heating is required during the working day as the heat losses of the process are sufficient to maintain proper temperatures. Therefore, any claims of improvements must be very carefully investigated and substantiated, in order to avoid subsequent disappointments and dissatisfaction.

Another word of caution should not be omitted. In plants where noxious or obnoxious fumes, dust and gases are generated in the course of the processes, panel heating may also lose much of its advantages by the rapid changes of air required for purification of the indoors atmosphere.

Future Trends

In view of the considerable age of panel heating—it antedates many of the developments in heating and air conditioning which have far outdistanced it—no surprising developments may be expected from it in the near future. The designer has a sufficiently wide variety of patterns to choose from and will hardly worry about any others. The most promising development to be yet tried is the combination of reverse refrigeration supply of heat with panel heating and incidental summer cooling. The low water temperatures for heating which are a criterion of a good heating panel, do permit so high a factor of utilization of the reversed refrigeration cycle, that under favourable conditions, electric heating could be rendered cheaper than heating with more common fuels. The advantages of such an installation would be indisputable.

☆ ☆ ☆

THE PROVINCIAL PAGE

AEDIFICAVIT

GEORGE G. TEETER

Mr. George Teeter was born "fifty plus" years ago at Grimsby, Ontario, which he hastens to add is not to be confused with "either beer or prize-fights". He is of Empire Loyalist stock and received his higher education at the Toronto Technical School of Practical Science.

He was articled with Gouinlock and Baker, Architects, of Toronto and later with George W. Gouinlock. He spent two years with Thomson and Angus, Architects, of North Bay.

In 1910 he came west and has been in continuous practice in Winnipeg since that time with the exception of the ten years spent with the Provincial Department of Public Works. He has been connected with the design and construction of the Christie Brown Bakery, Bryce's Bakery, Trinity Baptist Church, King Memorial United Church, the City Tubercular Hospital, the Deer Lodge Hospital Heating and Power Plant, and the Grand Stand at Polo Park.

Mr. Teeter refers to himself as a rather reluctant and backsliding Baptist. He claims no particular hobbies—"a poor golfer and worse at bridge"—but fails to mention the fact that he is a master of the art of the after-dinner speech.

Mr. Teeter has often been a member of the Council of the Manitoba Association of Architects, was President during the past year, and has always been keenly interested in the affairs of the Association.

ALBERTA

Although, by some writers and by common popular belief, architecture has been represented as having gradually developed from the humble construction of human dwellings and structures for utility, proceeding by slow steps to buildings of larger scale, the general history of the art shows precisely the reverse. The oldest works of any claim to the title of architecture are neither human dwellings nor utilitarian structures, nor do they have the appearance of having been derived from such origins. In ancient days architecture was an art specially created for monumental magnificence. The great pyramids of Egypt may not rank high as architectural design. They are clearly efforts to attain magnificence. These were the forerunners of those stupendous temples which are the earliest examples of orderly complex buildings on a large scale. The ancient Greeks housed their people meanly and their gods magnificently. Their temples are sheer efforts of a conscious aspiration after the beauty of harmonious design. They were built to inspire the mind through what thoroughly satisfied the eye. The Romans erected vast structures which were utilitarian in the sense that they served for the recreation of the multitude of the public, the physical pleasures of the wealthy and the needs of their government. The service of the needs of private family life by architecture probably began in the barons' castles of the middle ages and spread downwards to the manor house, the yeoman's house, the burgher's house and so, at last, present day architects have come to concern themselves with low cost housing and to endeavour to associate this with improved standards of living for individual families of the poorest.

We now consider the great need of our time to be for more and better housing for all those whom we must call citizens. These two things,—the more and the better,—are not easily achieved in these distressful days when labour and material for the work are so hard to get together. How can we even attain the same quality and produce a low cost house when the house that cost $3,000 before the war now costs $5,000 and takes twice the time to build. The temptation to lower the standard is in these circumstances almost overwhelming and is not being entirely resisted. We hate to admit this and hope that it is only temporarily.

When an Architect is appealed to in this matter, how can he reduce cost without lowering standards. By good and careful planning he can give better value for the money expended than can the amateur. That is pure gain. But this much he has always done. What can he do to improve on his former efficiency? He may squeeze down the rooms to smaller dimensions. But that is lowering the standard. He can utilize basements for bedrooms and substitute meagre utility rooms for the purposes formerly served by the basement. That too is to lower the standard. He can ingeniously adapt old lumber from discarded wartime buildings and save a little cost, but the price still remains high.

In Alberta a good deal of this sort of thing has been done and there has been some outcry that we are building potential slums and thus preparing future trouble for ourselves. We cannot actually build a slum if we try so long as we are using sound materials, for slums imply age and decay. Slums also imply congestion and inadequacy of sanitation. Quantity of accommodation, if we could get it, would be some security against congestion and sanitary fixtures, if we could get them, would go towards insurance of health. What some of our cities have done,—probably most of them,—is to build basementless houses with materials salvaged from disused wartime buildings. When these are arranged in "bays", that is, on three sides of a space open towards the street, they have avoided some of the chances of a potential slum. They may be internally congested owing to too many persons crowding into them. But the ready access to open ground is some relief even to that condition and is far preferable for children as compared to accommodation in apartment buildings. In addition, this manner of arranging buildings gives some opportunity for group design. The consequent imposed neighbourliness may also be some social gain.

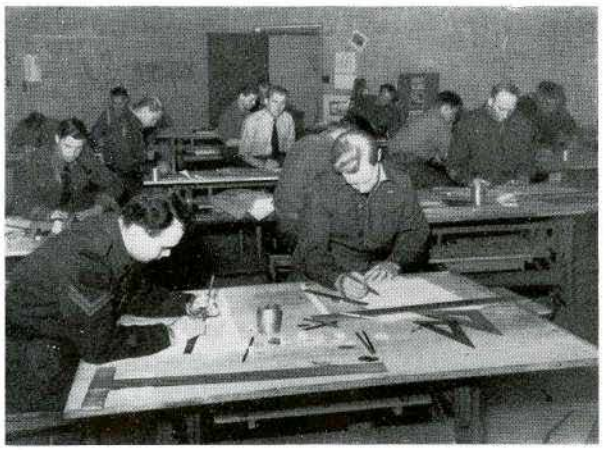
Cecil S. Burgess.

ONTARIO

First Canadian Army, Home Planning Centre

A tear glistened in the eye of Willem M. Dudok, who, seated in the back of a jeep gazed at the tower of his beloved town hall in Hilversum, Holland. It was encased in a shapeless mass of German steel scaffolding erected as a base for camouflage material. Elsewhere on the building a few men were lazily dismantling the remains of anti-aircraft gun mounts.

Approaching the main entrance he was greeted by a collection of Army signs, vehicles and activity very much foreign to



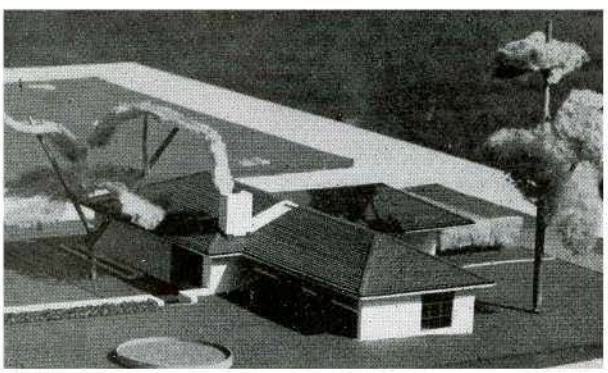
DRAUGHTING ROOM

the setting. It was really too much for him and he turned to me saying, "I never thought this could happen to me". However, after a genial inspection of the draughting room, offices, exhibition corridor and workshop, he not only enthused but promised to come and lecture to the School.

Here at Hilversum in July, 1945, after two months of strenuous effort, a centre had been established where men of the Canadian Army could study the problems of house design, construction and decorating while waiting for repatriation.

The School was staffed by two graduate architects, a landscape architect and a construction engineer plus the services of an expert modelling team and administration personnel. A three-week course provided thirty students with the opportunity for a fairly intimate study of home planning with lectures in the mornings and practical work during the afternoons. One of the features of this course was a generous supply of ¼" scale models, of essential fixtures for bathrooms, kitchens, living rooms and bedrooms. Each student was allowed a set of his own to bring into three dimensional view a plan of his own design. The normal routine was interrupted by visiting lecturers and senior officers of the general staff. Each week was highlighted by a visit of the entire class to neighbouring centres including Rotterdam, Utrecht, Amsterdam and The Hague, where the day was spent viewing good examples of Dutch architecture.

The students were fed and housed in requisitioned buildings where a real effort was made to create a home-life atmosphere. For many of these boys the step from front-line activity to comparative peace and tranquillity was a new and exciting one and without exception they applied themselves with vigour and enthusiasm to the pleasant task of learning why houses cost money.



MODEL OF HOUSE DESIGNED FOR INSTRUCTIONAL PURPOSES

The full-time services of Captain J. A. Secord, St. Catharines, Captain J. C. H. Porter, Vancouver and the entire staff of the camouflage branch of the Canadian Army were invaluable both during the organization period and the courses that followed the opening day. Space does not permit mentioning all those who contributed to the success of this venture. It was planned to remain in operation so long as Canadian troops were in Holland but unfortunately was disbanded at the end of the third course. There is, however, consolation in the knowledge that at least ninety prospective Canadian home owners were able to convert destructive energy to constructive thinking.

Wilson A. Salter.

CONTRIBUTORS TO THIS ISSUE

E. L. Dodington is a Professional Electrical Engineer, whose chief study and interest has been the lighting of buildings. Graduating from the University of Toronto in 1938, he joined the Faculty, and is now lecturer in Applied Physics. In the practical field, he has had experience in electrical consulting practice, installation of lighting and electrical equipment, and contracting. He is at present serving as lighting consultant on the Committee on Planning, Construction and Equipment of Schools in Ontario.

Karel R. Rybka, Mechanical and Electrical Engineer, graduated at Prague in 1923. In 1937 was awarded the Degree of Doctor of Science during a brief visit in Prague. Came to Canada in 1928 and has since been engaged in Consulting Engineering. Was prominently connected with the construction of some of the major buildings in Toronto, such as the Royal York Hotel, Eaton's College Street Store, Maple Leaf Gardens, Toronto Stock Exchange, some of the University buildings, and many others. During the war was consulting engineer on several of the major war-time projects. Is a member of the Engineering Institute of Canada, the Association of Professional Engineers of Ontario, the Corporation of Professional Engineers of Quebec.

Ralph Walker, Student in Architecture, Massachusetts Institute of Technology, Class of 1911; Thirty-third Holder of the Rotch Travelling Scholarship in Architecture, 1916; served during World War as 2nd Lieutenant in 40th Engineers, Camouflage Section; Member of the firm of Voorhees, Walker, Foley & Smith (and its predecessor, Voorhees, Gmelin & Walker), New York, N.Y., since 1926. Contributed numerous articles on architecture and art which have been published in architectural periodicals and books. Consulting Editor of "Pencil Points", 1936-1938.

☆

POSITION OPEN

Wanted—Architect to undertake responsibility along general lines, such as class of work which comes under the jurisdiction of a Provincial Department of Public Works. Desirable age, not exceeding forty. Applicants to submit in writing academic qualifications and practical experience, together with references and salary expected, to the Civil Service Commission, Province of Nova Scotia, Post Office Box 943, Halifax.

A TRAVELLING EXHIBIT ON COMMUNITY PLANNING

Ottawa, February 1, 1946.

Dear Sir,

As previously mentioned in *The Journal,* the Architectural Research Group of Ottawa has been at work on an exhibition on community planning. The exhibit is called *Your City and You,* and was first shown in the National Gallery of Canada recently.

The show does not pretend to offer a specific solution for Ottawa or any other city; neither does it pretend to be saying anything original or revolutionary to professionals about planning. It *is* intended to stimulate interest in, and discussion of, the processes by which planning can be made significant to Canadians in general, and therefore made effective. In other words, the panels (there are twenty-one of them, each five by four feet) are addressed to the man in the street.

So that the display can be seen by as many as possible of the "men in streets", the National Gallery has added it to their list of travelling exhibitions, which may be booked by any reputable organization for showing in any hall in Canada. The cost to the sponsoring local organizations is very small—the more of them there are, the smaller it is. Several of the civic art galleries may already have made arrangements to mount this show by the time this letter is published.

We think the interest shown in the exhibit in Ottawa may be some indication of its value in illustrating public discussions on planning. *Your City and You* received several foot-columns of press comments; the Prime Minister spoke briefly about it to those attending the Dominion-Provincial Conference last month. He referred to the relation between good planning and good housing. The school authorities have made arrangements for class visits to the Gallery, and so on.

Quite frankly, Mr. Editor, the authorities of the government housing corporation, the National Film Board, and the National Gallery (all of whom have helped in the production and distribution of the show) are looking for increased public discussion of planning. They look to the architectural profession to play a leading part in that discussion.

Various members of ARGO have written personally to friends across Canada about the show. We ask you to print this letter, which all those we have missed may regard as an invitation to borrow the display for their own communities. Inquiries about dates, rates and joint sponsorship with other local groups should be addressed to the Director, National Gallery of Canada, Elgin Street, Ottawa, Ontario. By helping with publicity, installation and supplementary talks and films, the local Chapters of architects can use this instrument as it was designed —to stir up public interest in planning. We think you will agree that it is unnecessary to enlarge on the benefits of that interest to architects.

Yours very truly,
Alan H. Armstrong, Chairman,
Architectural Research Group of Ottawa.

BOOK REVIEW

BRITISH ARCHITECTS AND CRAFTSMEN
By Sacheverell Sitwell

Published by B. T. Batsford Ltd., 15 North Audley St., London, W.1, England, Price 21 Shillings

This is a book for those who know and admire English Architecture. No one else could keep his feet on the ground in the torrent of facts and anecdotes that rush the reader headlong through 185 pages. It is a Baedeker of English Architecture from King's College to the Red House written with knowledge and enthusiasm.

Sometimes it is heavy going (like the post-script on page 8) and one is rather frequently irritated by Mr. Sitwell's attitude toward buildings and furniture. This is perhaps best described by Carlyle's opinion of Chelsea Hospital—that it was the work of a gentleman. Mr. Sitwell likes his building; and their contents to be the work of gentlemen with a taste for the magnificent. Hence his liking for Kent—and, so help us, his furniture. Nevertheless, one is grateful for a considerable body of useful information and an excellent index. In no other work could we have discovered that T. Tompion was buried in the Abbey, or that Sir C. Wren was a beekeeper.

For the second time in a British publication, we have seen the garden front of Castle Howard described as the Entrance Front. It is not necessary to know the house (we saw it in 1941 on a six-day leave in Britain) because the *Vitruvius Britannicus* perspective is shown by Mr. Sitwell on page 86, and leaves no room for doubt. This is perhaps of little importance, and we are grateful to the author for the chapter on Vanbrugh which is the best in the book.

Messrs. Batsford have done their usual good job of craftsmanship and have presented the book in a charming wrapper —a print of 1730 by Thomas Archer.

We would offer this suggestion to the publishers. The Schools of Architecture throughout the Empire and the United States are very much in need of a book dealing with small and smallish houses of the Renaissance period in England. It is hard to define further in income or social groups over such a period, but students (especially at this distance, or even Liverpool) wonder where the people lived who did not own a Wollaton, a Kedleston or a Blenheim. Twenty-five years ago we asked ourselves that question, and a new generation with a much keener social sense demands an answer. It is obviously not to be found in Bannister Fletcher, Tipping—or Sitwell.

E. R. Arthur.

DESIGN
By Elwyn E. Seelye

Published by John Wiley and Sons, 440, 4th Ave., New York 16, N.Y. Price $7.50.

"Design," published by John Wiley and Sons, is a data book for Civil Engineers. The author, Mr. Elwyn E. Seelye, has made available his personal data that he has developed in the 35 years of his practice and has supplemented it by information drawn from the latest publications of outstanding authorities. It has the possibility of becoming as useful a book as Architectural Graphic Standards, which has become an almost indispensable instrument in an architectural drafting room.

This volume is the first of a series of three. A book on specifications and cost and a field manual will be issued later.

The prime purpose of this book is to provide ready reference data in a condensed but effective form on the main phases of civil engineering — structures, soils, roads, airports, bridges, dams, docks, drainage, sewage and water supply.

"Design" does not obviate the importance of other standard engineering texts but it is a supplement to them by presenting the data in a direct and concise form. Brevity, an important factor in a book of this nature, has been achieved by the use of graphs, tables and diagrams. In some cases, the engineer may find it concise to a degree that the information, so presented, is not as thorough or as labour-saving as other familiar tables.

The Architect will receive this book with varying degrees of indifference. The sections on structures and soils will be of great interest but much of the data deals with phases of engineering that are of little concern in his practice.

J. B. Langley.

PROFESSIONAL COLUMN

Eric W. Hounsom is now practising in his own name at 302 Belsize Drive, Toronto.

The following partnerships have been formed:

F. Bruce Brown and Brisley, 12 Bloor Street East, Toronto, to continue the practice of J. Francis Brown and Son.

Fetherstonhaugh, Durnford, Bolton & Chadwick, University Tower, Montreal.

Fleury and Arthur, 85 Bedford Road, Toronto.

Shore and Moffat, 79 Queen Street East, Toronto.

OBITUARY

PROFESSOR JAMES BURN HELME

The many friends and associates of Burn Helme were shocked to hear of his sudden death towards the end of 1945. Although he had been in poor health about a year ago, he had apparently completely recovered and seemed to be on the verge of additional important contributions in the fields of Education and the Fine Arts.

Born in Smith's Falls in 1897, he received his Architectural education at the University of Toronto, graduating in 1922 and proceeding to France on an Ontario Government Scholarship where he specialized in Town Planning at the Ecole de Hautes Etudes at the Sorbonne, Paris, and also travelled extensively on the continent. Upon his return he took a Master's degree in Architecture at Toronto pursuing still further the study of town planning.

The appointment as Assistant Professor of Architecture at the Pennsylvania State College immediately followed. He made his permanent home at this beautiful centre of learning eventually becoming head of the division of Fine Arts. His influence on the College became more and more remarkable with the passing of the years. But one instance of this is the great mural in the "Old Main" building—a large fresco by an eminent American artist. He had a large part in supplying the initiative, enterprise and vision that made this important work possible.

Although he was chosen to assist in the regional plan of New York City in 1927 and wrote many articles connected with town planning, his interests gradually swung to a critical study of painting. He spent considerable time at Harvard University in the thorough pursuit of this subject and received a Master's degree in Arts. Indeed he had almost completed his work towards a Doctorate when conditions at State College, Pennsylvania, forced his return to become acting head of the Department of Architecture for a year. Poor health prevented him from ever completing the work begun at Harvard.

However, he kept broadening his knowledge and experiences; travelling many times to Europe—extensively throughout the United States and to Mexico. He has left a few charming water colours made on these trips although his time was spent mostly in critical examination of places he visited. These water colours were of such quality as to have been hung in the Royal Canadian Academy Exhibitions and the Pennsylvania Academy of Fine Arts. One or two were published as Frontispieces in the early editions of our *Journal*.

Although his interests centred in the United States, yet his associations with his native country was continuous. He was always a member of the R.A.I.C. Seldom did he miss his annual visit to this country to see relatives and close friends. To those of us who knew him well, these visits were a source of real inspiration for Burn Helme was one who was able to co-ordinate and draw from his wide experiences broad conclusions and theories on art and life which were truly substantial.

His place as a teacher, critic and writer in Fine Arts and Architecture and as a great and generous personality will indeed be difficult to fill.

Wendell P. Lawson.

JOHN M. LYLE

John Lyle who gave so much of his life to Art and Architecture is no more and Canada is made poorer by his death. No man did more to help educate the young Architects of Toronto and those trained under him give proof of his untiring devotion and ability, nothing made him happier than helping others to become expert in their profession. He was a strong advocate for improvement in the appearance of Toronto and in developing a higher standard of Architecture. His life was very full and his works will be an everlasting monument to his name.

"Artistic gatherings at the Art Gallery, where he served as president from 1941 to 1944, were made more attractive by his gracious humanity. His sudden death brings to us a loss which is obvious; but what will not pass is the memory of his type. Such a man influences ideas of the artistic man. He was never culture conscious; he was just cultured and practical and amiable. The honours he had won are things on which it is easy to put a finger in special mention. But what he was, himself, was as valuable as what he did."

Mr. Lyle was consulting Architect for the Toronto Civic Improvement Commission, under Sir William Ralph Meredith in 1911. He had won recognition for the distinctly Canadian themes he adopted in decoration employing Canadian flora, fauna and marine life for industrial design.

Born in Belfast, Ireland, he was the son of the late Rev. Samuel Lyle, one-time Presbyterian minister at Hamilton, Ontario. He received his early education in the Hamilton Art School of which his father was founder. Later he attended Yale Art School and Ecole des Beaux Arts, Paris, France. For 14 years Mr. Lyle practised as an Architect in New York, returning to Toronto in 1907. He was the designer of the Bank of Nova Scotia, Halifax, N.S., Runnymede Library, Toronto, Great Memorial Arch, Royal Military College, Kingston, and many bank buildings.

Mr. Lyle was awarded the gold medal of honour by the Ontario Association of Architects in 1926 and the same year was made a member of the Royal Canadian Academy. During the first Great War Mr. Lyle's connection as an Architect with a number of building projects in France and Belgium won for him the silver medal given for civilian relief work in France and awarded by the Secours Nationale in 1915. He was also decorated by the French Government in 1919 with the French Medal, Reconnaissance Francaise. He was a Fellow of the Royal Institute of British Architects; a Fellow of the Royal College of Architects and the Royal Architectural Institute of Canada.

Our deep sympathy is extended to his wife and family in their great sorrow. To them I would like to repeat a few lines from a poem by Edgar Guest:

"Men are of two kinds, and he
Was the kind I'd like to be
Some preach their virtues, and a few
Express their lives by what they do
That sort was he. He wasn't cheap
Or shallow, but his course ran deep,
And it was pure. You know the kind.
Not many in a life you find
Whose deeds outrun their words so far
That more than what they seem they are."

"If ever man on earth was free
And independent, it was he.
No broken pledge lost him respect,
He met all men with head erect,
And when he died I think there went
A soul to yonder firmament
So white, so splendid and so fine
It came almost to God's design."

Edgar A. Guest.

D. E. Kertland.

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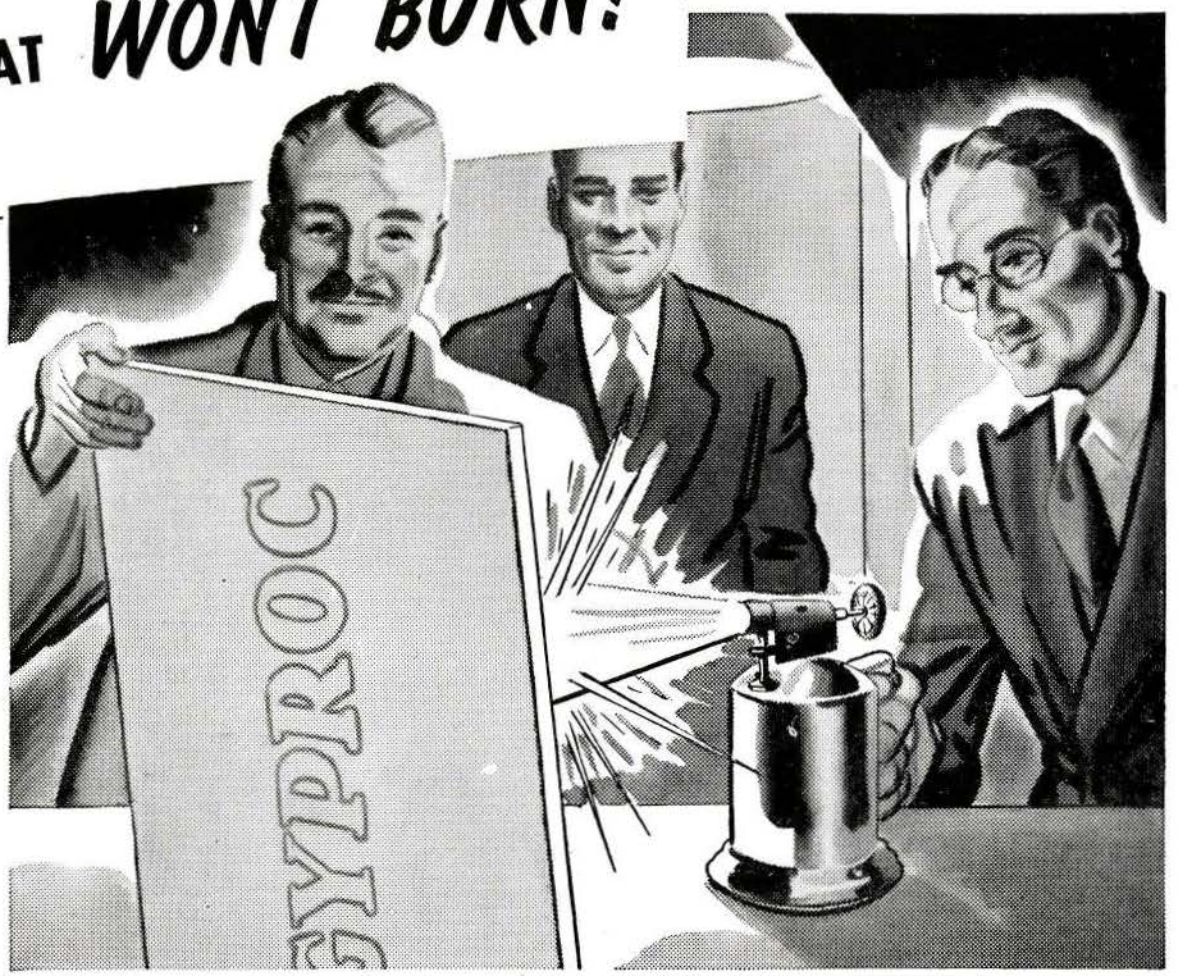

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