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ARCHITECTURE AND TOWN PLANNING IN THE NORTH

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When considering the problems of building in the north to talk of an architecture of climate would be to tell only half of the story. It is people in the climate, the cities and the landscape, in families or crowds that count. Ordinary people, not architects, people who sometimes are born in the north and know it and love it or hate it, other people who are moving from more populous areas to small isolated communities in the wilderness, and must be given the amenities they previously enjoyed.

I try to base my work on that seasonal rhythm of the north which I find so enthralling, and form communities which encompass all its richness of contrasting experiences. I shape my buildings with a completely protected winter part surrounded by sheltering outdoor places for spring and for fall. Beyond these is free summer life in the natural landscape with which the north is so richly endowed.

It can be difficult enough to express these thoughts in words—how much more difficult to say them in concrete and wood, in asphalt and grass, to say them with precision and warmth but without unnecessary pathos and exaggeration.

For it is surely buildings, and streets, gardens and trees, not economy, technique and aesthetics that people dream about when they seek a home, or a place in which to work or play; these are only as the bricks with which to build a great and complicated dwelling, a place to find warmth and protection, to find both togetherness and privacy and feeling that "this is where I belong, this is my dwelling and here I will like to be".

I hope that we architects could give such a dwelling a form, make a space with a potential for contentment. But in the final count it is the inhabitants who will give the same dwelling its meaning and will change our architectural space to place.

My question is, "Do the cities and buildings of the north well serve the needs of their inhabitants"? My answer is "No".

Man in his ingenuity has invented many ways of protecting his puny body—of maintaining its surface within the narrow range of temperatures and humidity which allows for survival. As his inventiveness and artistry increased he has moreover created conditions of convenience, comfort and pleasure.

Where could this protection be of greater need than in the north? But cities—our most concrete artifaxes, which represent nothing other than their own existence—are none the less liable to the laws of symbolics and fashion, and a

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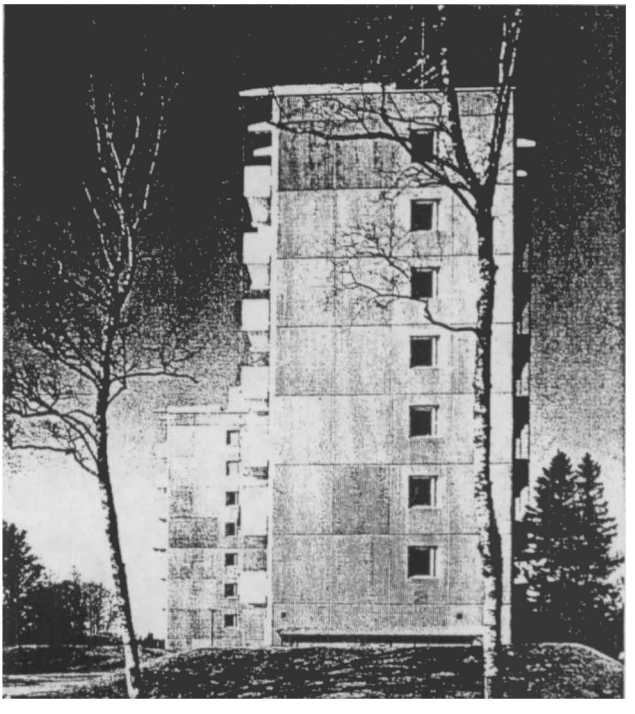
house not only has to be a house, to shelter, protect and function, but it must also symbolize a house, a city must represent a city.

When I came to Scandinavia and the north at the end of the 1930s I found, after living there some time, that this symbolic aspect of architecture in some ways seemed to be regarded as of greater import and urgency than that primary purpose—to clothe, to comfort and to protect. What little I have seen in Canada and Alaska convinces me that the situation there is no different. Neither in Canada, Alaska, Scandinavia nor Siberia will I find communities intelligently and inventively built to give pleasing and effective comfort and protection in the specific conditions of the north. I can find Arctic outposts or alpinist huts technically giving survival conditions in situations of extreme stress, or cities with overheated buildings and draughty streets, but nowhere can I find a sector of our modern culture which has a special local flavour of the north due to a combination of understanding, inventiveness and, not least, artistry in satisfying special human needs in this special part of the world.

Since I was caught by the fascination of the north and began to sense the challenge as well as the needs and possibilities of the situation there, I found it difficult to reconcile the northerners' love of their forests, rocks and islands with their longing for southern ways, and to explain why their modern buildings so often had the arcades, pergolas and *bris-soleil* which belong to a far more southern climate, but have become symbols to be used in the architectural rat-race.

With time, I realized that one of the characteristics of the northerner is that he is conscious of living at the outer edge of the happenings which are central in the interests of the time, far from the metropolitan centres where the fashions and culture of the age are created. He longs to belong to these happenings, or if he himself has no greater interest, his wife, his children and his artists are all drawn to these great magnets. One of his methods for maintaining the emotional threads of contact is by imitation of the styles and thoughts of the innovators in the great capitals of the world, and he does this even if the styles serve no more useful purpose in this special situation than do city hats or silk stockings at the polar circle. In the outlying parts of the region, where practical and self-reliant people—hunters, fishermen, traders or engineers—live in small isolated communities without contact with or great interest for artists and other culture-bearers, this tendency is particularly apparent, and such communities are very ill-equipped for creating a specific and indigenous branch of modern culture fitted to the land in which they live. The culture of Lapps or Eskimos, which are excellently adapted for the life of a northern huntsman, degenerate and finally collapse as these native people also feel the drag and fascination of the new ways of the southern cities. Nor does the southerner who moves into the region find these nomad cultures of help other than in his hunting journeys or his sports—the northern community culture of the industrial age must be newly invented, and social scientists, artists and architects must help.

This is a task which grows in importance as minerals and other natural resources are developed and the role of the north changes. Instead of huntsmen and traders, northern communities must attract engineers and technicians and



Apartment houses in Kiruna.

Photo: R. Erskine

(*Facing p* 166)

their wives, people with special knowledge and capacities. It can not only rely on the adventurers and "Arctic enthusiasts" who are prepared to enjoy a wilderness life.

What then are the characteristics of this sub-Arctic realm, lying between the empty Arctic wastes and the bountiful fields and teeming populations of the temporate zone? How does it form our lives, how should it, with our sensitive help, mould the buildings and cities we use?

Above all it is a world where it is only with the advent of our technical civilization that man became free from a long and constant warring with the difficulties of an inhospitable climate, and with wrestling meagre returns from its meagre soil. It is a world without a rich history of city culture and techniques precisely adapted to its special demands.

It is a world of great contrasts, of the yearly rush from the cold, dark sterility of winter through a short and explosive spring to a few green months of life under the night-time sun. And so the swing back through rapidly shortening days of mist, rain and frost to winter, snow and ice.

These are happenings of great import to the people who experience them and it can be seen how spirits lift as the days lengthen and melting snow runs in the gutters, how people put up their defences as autumn frost and darkness grips the land. In summer they plunge into the chilly lakes and wander the streets in the midnight sun, in winter they draw up their fur collars and hurry from house to house, and spirits droop unless lights are lit both indoors and out.

Here houses and towns should open like flowers to the sun of spring and summer but, also like flowers, turn their backs on the shadows and the cold northern winds, offering sun-warmth and wind-protection to their terraces, gardens and streets. They should be most unlike the collonaded buildings, the arcaded towns and mat-shadowed streets of the south Europeans and Arabs, but most similar in the basic function—of helping people to maintain their skin at about a comfortable 30 °C. When studying the beautiful towns of the south, whether old or new, it is not the forms in themselves which should interest us, but the inventiveness and artistry with which people solved the needs which were peculiar to their situation and time, the comfort and beauty which they created. Only by such methods can arise a personal and indigenous Alaskan, Canadian, Scandinavian or North Russian tradition.

The implements of city building for creating these conditions in the north are many, but several changes must be made in the present thin tradition of community building.

The greatest change is that of introducing a considerably greater degree of concentration than has so far been usual. The loosely scattered villages of the north seem to be built by wilderness dwellers who were in harmony with abundant space and wished it to flow through their towns and around their houses. At best, northern towns have become very like all others; similar in appearance, function and structure, but less pleasant and convenient due to their isolated situation and exposure to a harsh and extreme climate.

Concentration gives exceptional advantages in the north if once it is emotionally acceptable, but I have experienced the difficulty of this type of innova-

tion when working in the town of Kiruna, in northern Sweden. It was possible, for example, to point out the exceptional costs of road building, maintenance and snow clearance, of laying drains and water mains at a depth of 3 m often in rock, to protect against frost, as well as the discomfort of moving in an open windy community in the winter blizzards. When I prepared a scheme for the complete central renewal of Kiruna, I suggested continuous runs of buildings where people could move outdoors in wind protected sunny streets, or indoors in enclosed and heated walkways—the warm, northern equivalent of the cool arcades of Perugia and Venice. In the floors and ceilings of these walkways, instead of under the streets, easily accessible for repairs and for laying of additional services, were ducts for the sewers, pipes and cables. There were many characteristics of the project which were particularly suited to Kiruna dwellers' needs, but, though the proposal for central redevelopment of ten city blocks of this township of 20 000 people was accepted, the strength of a mere fifty year tradition on the one hand, and the unfamiliarity of the vision I gave on the other, were such that the town has been built on its original street pattern and with a largely traditional structure. One central city block is, however, so built that it reminds one of the original concept, and has for me been of great interest to design and execute.

In the project for a new mining village of Svappavaara there have been far too many deeply regrettable compromises but sufficient of the original idea has remained to give experience and to win approval from the inhabitants. It is proposed to build a second stage according to the same principles.

It is curious, but perhaps inevitable, that farther south, where the need for these ideas is far less urgent, I have usually found them more readily acceptable. Possibly the new building types for northern Canada must first be built in Montreal or Vancouver?

However this may be, having experienced the successes of these schemes, and seen the unsuitability of the compromises, I am even more convinced of the need to find new forms for northern communities and consider that, with certain adjustments and additions, my general thesis of their structure is still valid.

For microclimatic reasons a township should be built on a south slope where the radiation from the low Arctic sun is more intensive than on the flat country, and where protection from the cold northerly winds is greater. Further advantage can be gained by turning to the south-east to catch the early morning radiation which tempers the cold night air. The validity of such a placing is well supported by observing vegetation on the sterile northern screes and the luxurious southern pastures of Norway, the vineyards on the south slopes of Lausanne or the potato fields on southern slopes in north Finland. The exposed tops of hills, or shadowed northern slopes, should clearly be avoided, and I wonder whether new towns should be built on the crown of a windy, Scottish hill with dwellings on the northern slope facing the Highlands—I remember that farmers built long rows of trees across the Lowlands to break the winds, and placed their farms in coppices or in the valleys. But in more extreme climates the low parts of valleys should also be avoided, for in the still of intensively cold weather the heavy cold air flows from the hills and collects in the hollows and valleys.

The structure of the town itself can be of vital importance in improving the climate within its boundaries, and with modern techniques almost any degree of protection can be achieved. One of the most exciting ideas which comes to mind when first presented with these problems is that of the township which is a single enormous building complex, or a township covered by domes or suspended membranes. In the most extreme conditions of the Arctic or Antarctic, these could be the most suitable ways of providing climatic defence. The physical convenience of such a township would be very great, and it would tend to be economical to run and to heat. The greatest difficulties would probably be of social and psychological nature since such a town could easily be institutional and introvert, and though openable parts of the structure could give certain contact with the outer world, this would tend to be indirect and tenuous. Negative experience has been reported from northern encampments where people have been able to live without contact with the outer world that surrounded them, and it has been suggested that less sophisticated organization has been more successful.

To me it seems, however, that in the most extreme situations such techniques should be deployed, but with an even greater degree of sophistication and fantasy which would take into account the problems I have mentioned.

In such a town, or indeed, in the central part of a sub-Arctic town where partial use of these planning techniques could be suitable, a multitude of varying functions would cluster together for common protection and warmth, and an assessment of the needs for external contact and daylight would need to be established. The dwellings, schools, workshops, meeting places and shops find their place within the general structure in relation to the urgency of their demand for contact with the outer world or with internal parks.

Due to the fascination that such structures have for engineers and architects, it is necessary to warn against the science-fiction aspects of the concept and the over-exaggeration of their importance. High-Arctic establishments will probably neither be numerous, large, nor places of long-term dwelling. In the sub-Arctic there are long, light nights and the cool summer warmth which are so precious that they are the dream of the northerner moved south. There is the brilliant sun on snow and the crisp clean air of spring which Kiruna dwellers look upon as the loveliest time of the whole year, more precious than their three greeen summer months; there is the blaze of autumn colours and the first thin blue ice on lakes. It would seem that other more subtle instruments than total coverage, a wider range of experiences must be sought in the low-Arctic. Here should be offered a system of sheltered, outdoor walkways, open to the sky, the sun and to falling snow, and interlocking with this a system of enclosed, heated and daylit streets for bad weather. A third system, covered where possible to reduce snow clearance costs, would be the car routes which can lie on the northern sides or in the cellars of buildings.

Continuous strips of buildings can encompass and protect zones for gardens and for smaller buildings, they will reflect warmth and sunlight to their southern side and protect from the coldest winds. Accumulation of snow on the lee sides of such buildings, in regions with heavy snow drift can, however, be a very real problem and study of aerodynamic forms is necessary. Adjustable shutters, a

type of *brise-vent*, and buildings with aerodynamic form giving "stalling" characteristics are two of the methods to be considered. These can protect against storms without hindering quieter breezes, normally give still air for comfort but air movement to clear snow, or mosquitoes when necessary.

Since they only have a limited sphere of influence, such strip buildings would need to be repeated at intervals or additional windbreaks created by tree belts, a structure which would sub-divide and give character to a town. Such tree belts, combined with snow traps of bushes, are known to road engineers and to prairie farmers, but I sought them in vain in the township of Winnipeg.

Each individual building should also be given such form and equipment that it would protect both itself and its own outdoor-room, should present its inhabitants with sheltering sun catchers, and a wind-protected entrance for an arriving guest or a householder unlocking his door.

Should these characteristics be applied to the design of a whole township, to its buildings, its streets and its parks, the result would not only be an instrument for comfort and convenience, but also a structure with elements of aesthetic harmony in all its parts, the kind of harmony to be seen in the desert village, or in fishing villages pressed in amongst the rocks.

The snow is another factor of considerable import. Not only does it hinder traffic when it falls, but the costs of clearance are considerable, especially if it has to be driven away from the streets. Where it is not driven away the space demanded for the street and sidewalk, as well as for ploughed-up snow is considerable. The wider the carriage-way the more space is required, and the town expands and loosens in order to accommodate this snow storage, more land is used, distances increase, and the protective effect of buildings reduces. When cars take longer to stop due to snow and ice it is unallowable that snow-piles at street corners hinder sight, or that sidewalks are cleared later and less well than carriage-ways, so that children run in the street; yet the problems of snow clearance are such that this is very common.

Separation of pedestrian and mechanical traffic is therefore even more important in the north than elsewhere, and the temptation to ignore it just because of snow difficulties must be firmly resisted. Narrow outdoor pedestrian ways can be cleared by tractors by small equipment or by underground heat, and can offer safety, wind protection and intimacy, a contrast to the wide curves and easy gradients of car roads which must facilitate the use of rapid and large-scale clearing equipment.

Whilst in the south distances of thirty to fifty to metres from dwellings to cars can well be accepted, people will not readily enjoy walks in a blizzard or in loose snow, and car pick-up possibilities near to dwellings become essential in the north.

Also movement on the snows hould be planned for, Snowmobiles and Snow-scooters, for ski-running or tobogganing on non-sanded paths, for ice-hockey rinks, ski-jumps and slopes, and snow play places for small children to climb and build in, and all these should be lit for evening use.

The beauty of snow and of rime frost in trees or on the ground, the sweeps and spirals of wind-blown snow, the reflection of lights from the white ground and

roofs, the springtime run of icy water in gutters—all these and more are part of the aesthetic of the outdoor north, and should be part of city planning.

The low temperatures of winter do not in still weather present problems of great complexity since it is fairly easy for people to protect themselves against the dry cold of the high latitudes, but the impact of the cold on the design of buildings will be the more noticeable, tending to make them simple and compact in form, without unnecessary articulation of walls and over-dimensioned windows. Verandas, balconies and other wind-protecting sun-traps would be separated from the heated building so that thermal bridges which give movements, stresses and heat losses are reduced. They would be formed with a view to their function—to keep out wind and to reflect inwards the sunlight and warmth.

The dark winters would demand a highly illuminated city, with lighting which gives beauty in form and in colour and which uses reflection from the snow. Night shutters cut out the dark and the cold, but occasional large glass areas in the ground floors of buildings gives contact with the warmth inside, and a flood of welcoming interior light over the street.

Windows also are needed for the spring and winter, to feed solar heat into the buildings, but shutters on bedroom windows, or no bedrooms to the north, so that people are not kept awake by the light and the heat of the midnight sun.

Buildings should if possible be given such form that south elevations are large to catch the light and warmth from the south, while north elevations are low, to avoid creating long shadows on the ground behind. Buildings so created will turn to the south, and their shutters will open and close with the changes of seasons and of temperature and light that fall upon them, responding sensitively to the variations of climate like the sun-excluding shutters of Italy.

The very limited choice of vegetation for planting can give an enforced stringency to parks and open spaces and lead to the use of other means to introduce variation into the landscaping.

In Svappavaara only fir, birch, and rowan trees, two types of bushes and a few flowers could be planted with confidence, it was necessary to dispose these few plants in a large number of formal and informal ways, in blocks, in spread planting or in rows. To add further variation the ground was modelled in sculptural forms and granite blocks from the iron mine placed in groups or as "individuals". Both the summer effect and the fall and drift of snow in the winter were part of garden planning in the town, and I have proposed that the fir forest be cut in sweeps and blocks, both for the landscape effect and to provide family ski slopes, steep slalom *pistes* and bobsleigh runs.