



Artist's impression of "Provident House," an ambitious experiment aiming to achieve year-round heating on solar energy alone.

conversion, but none as yet to the development of economically viable systems.

An interesting section of the solar programme recognizes that "building codes will need to be reviewed to ensure that restrictions are not placed in the way of constructing solar serviced buildings and that sun rights are protected."

Government funds

Government spending on solar energy research is very small compared with that spent on developing non-renewable resources such as nuclear energy and oil. Until last year, virtually all experimentation was done by universities, individuals and small private groups. Last April, however, the federal Government allocated just over C\$1m. to projects sponsored by CUDP under the Ministry of Urban Affairs. Provincial governments, notably Ontario and Manitoba, are also beginning to promote research.

Alongside "The Ark," another federally-sponsored project which could yield interesting results is a native housing project under the auspices of McGill University. The project involves Indian workers in building four demonstration houses — primarily out of local rock, logs and moss — incorporating wind turbines to generate electricity and a system for storing solar heat in water and rocks, to enable the occupants to warm their homes and grow vegetables. Three of the houses under construction are in an experimental village in La Macaza, 100 miles northwest of Montreal; a fourth will be built on the north shore of Lake Mistassini.

Lesson for Indians

The directors of the project want Indians from all over Quebec to visit the houses during construction and once they are occupied, in the hope that they will learn the techniques used in them and realize that by participating in a do-it-yourself programme they can have more control over their own housing problems.

Government research workers are also making a comparative study of the various solar collectors now available with a view to allocating funds for the commercial development of solar hardware.

The biggest single event concentrating and giving a boost to Canada's progress with solar energy was the conference last June. Initiated by the Winnipeg-based Solar Energy Society of Canada, it brought together for the first time the various researchers, experimenters, sponsors and commercial interests in the field. There were 48 speakers and 350 delegates.

Professor J. D. Hay of the University of British Columbia, addressing the conference, pinpointed the development which has made solar heating feasible in northern climates: by simply tilting solar collectors to an angle perpendicular to the sun's rays (about 70 degrees for most of Canada) the energy received is equivalent to that absorbed by horizontal surfaces in the southern United States.

Research institute

Ray E. Chant, director of the industrial research office at Manitoba University, spoke of a need for increased efficiency in solar collection. Researchers, he said, were working on new covers for collectors which would be stronger, cheaper and optically superior to glass.

A Canadian research institute which has been quietly developing sun and wind-powered devices for use in underdeveloped countries has suddenly become a focus of interest in its own land. The Brace Institute, founded in 1959 with funds from the will of a Canadian engineer, Major James H. Brace, has been working away since then to find ways of using simple energy sources to solve irrigation and distillation problems for small, unsophisticated communities. Iran, Turkey, Niger, Haiti and Peru have benefitted from their expertise. Now they are beginning to consider how they can apply their know-how to meet the needs of industrialized countries.

Experiments set up on a small plot of land at Macdonald College, which is open to the public every Friday afternoon, include a solar house, windmills made of

oil drums sliced in half and mounted on platforms for a push-pull effect, and food cookers that use only solar radiation.

Tom Lawland, director of the Brace Institute's field operations, emphasizes the need to consider the elements when we design our houses — paying the maximum attention to both positive and negative influences from them.

Thermal thinking

His remarks reveal all kinds of details that can be turned to thermal advantage. "If you have winds coming primarily from one direction — whether northeast, north or northwest — you might build more solid walls on that side so heat loss will be less and make use of what nature provides from the southern exposure. In winter you can use reflected solar radiation off the snow on the lawn." Such simple measures could mean savings up to 30 per cent a year on present heating bills.

Commenting on past and present building habits, he says: "We have based our house building design on aesthetic considerations with almost complete disregard for the thermal efficiency of the house.

"I'm not saying we have to tear down all the old buildings, but let's at least start thinking 20, 30 or 40 years ahead . . . Why can't we live rationally — that is, within the environmental constraints — with what our planet provides? Let's do away with waste. In other words, let's environmentally design our buildings for the wide spectrum of operations we have to face in this climate."

Solar houses have another keen advocate in Jack Wadsworth of the Government-sponsored Central Mortgage and Housing Corporation, which encourages home ownership by subsidizing mortgages. When the Mississauga house was being completed in the autumn, he commented that he would like to see 20,000 such houses built in Canada over the year.

The general feeling about it, though optimistic, is more cautious in the short term. Like Ontario's energy minister, Dennis Timbrell, who says: "We're probably looking at 10 or 15 years before solar energy becomes a viable alternative." ♦