

Frank Hooper built what was probably Canada's first operational solar collector, left, near Port Credit, Ontario, during the winter of 1950-51. In 1975 he designed Provident House, right, with architect John Hix. Near King City, Ontario, it is large and luxurious (with over 3,500 square feet of floor space) and heated entirely by the sun.

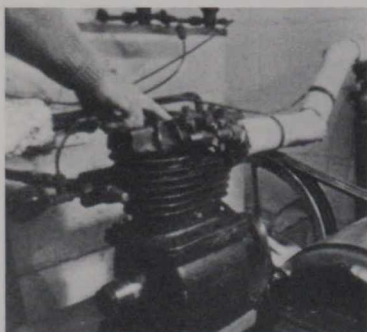
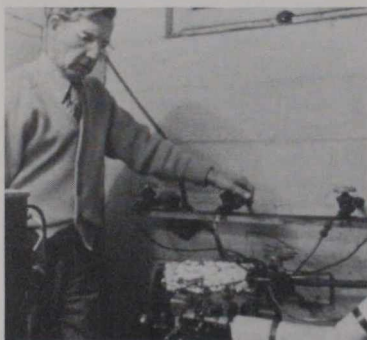
south for maximum exposure to the sun, and it has thirty-six vertical collector panels along the roof line, seven slanted panels below, a wood-burning stove and a 185-square-metre greenhouse.

The roof panels are the most sophisticated conversion devices: water flows through pipes, absorbing heat then transferring it to insulated storage tanks in the basement. When needed, it is pumped through coils in air ducts, heating air that is blown through floor registers. The panels below the roof heat water for domestic use; the wood-burning stove keeps the room warm on cold and sunless days. Because planned windmills ran into technical problems, electricity for lights and appliances comes from the local power company.

The major successes of the Ark are its passive heat system and its combination greenhouse/fish

hatchery. Passive heat collected in the greenhouse is stored in rocks and fish ponds. On sunless days it heats air that can be blown through the building. The greenhouse's coldest temperature last year was 7°C (44.6°F). It provided fresh tomatoes for Christmas and was producing lettuce and broccoli in mid-January. Energy costs are 40 to 50 per cent of those for a conventional greenhouse, and yields are the same. The heat stored in the ponds speeds up the growth of the fish. The Ark currently has 5,000 to 6,000 rainbow trout, and it is hatching 7,500 brook trout eggs.

The Ark was designed to research all kinds of questions involving survival. Waste from the Ark, both sewage and garbage, falls directly into a fibreglass composting chamber in the basement. It is decomposed by nature's own micro-organisms, slowly, safely and completely.



In 1951, when Bill Loosley, top left, built his house in Burlington, Ontario, he installed a heat pump, a "refrigerator in reverse." It circulates Freon gas through underground copper pipes, below. The ground around the pipes is 40-45°F all year. The gas is heated by the ground and returned to the house, where it is compressed into liquid, bottom left, raising its temperature. Air blown past it heats the house. The Freon is then decompressed and sent back underground as gas. In 1974 it cost Mr. Loosley \$75 to heat his house.

