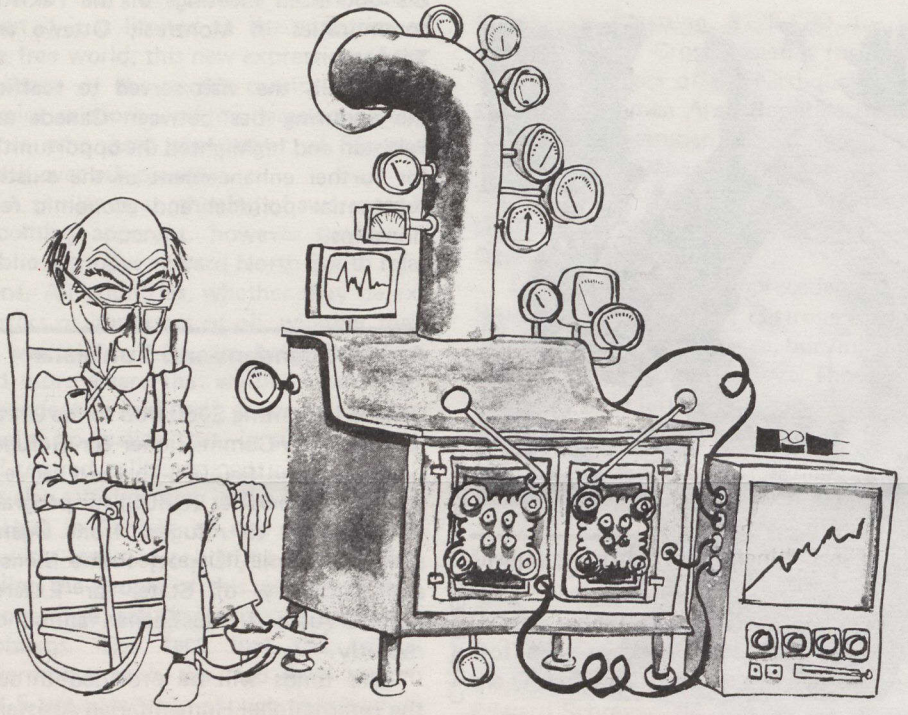
Back to basics: wood stoves make a comeback



Canadians purchased more than 200 000 — twice as many *per capita* as the million sold in the United States in 1979. And the demand continues. North America has gone back to the hearth — the wood stove is "in".

Wood, used for thousands of years throughout the world, provided 70 per cent of Canada's energy requirements during the last century. Since wood is cheap, readily available, and renewable, people are again turning to it as an alternative fuel to combat increased fuel prices and conserve energy.

In the past, wood stoves have been designed by trial and error with little attention being given to the intricacies of the process of combustion and heat transfer. Currently, even the best wood stove operates at only a maximum 66 per cent efficiency, meaning that 34 per cent of the energy is lost. Poor ones, on the other hand, produce toxic fumes and carbon monoxide; air currents can cause small explosions in the combustion chamber; and the buildup of creosote deposits in the chimney increases the risk of fire.

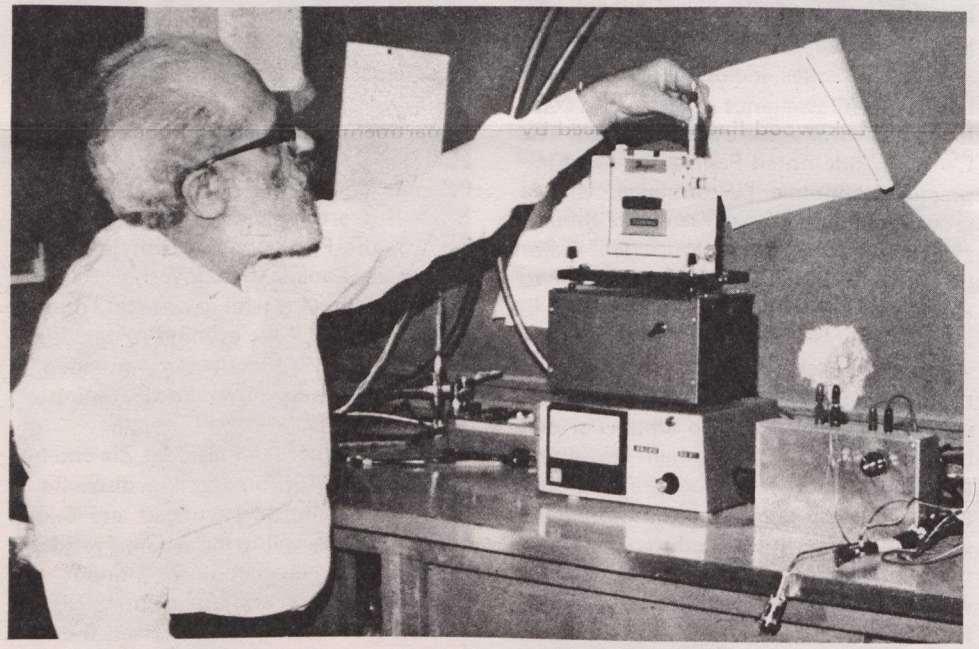
New developments

In the small town of Bobcaygeon, some 320 kilometres northeast of Toronto, Ontario, a small company, incorporated only five years ago, has tackled some of these inherent problems. Lakewood Manufacturing Limited produced its first wood stove in February 1977, and ten months later, its one-thousandth. By mid-1979, 5 000 stoves had been completed. Today, Lakewood has become one of this country's larger manufacturers of wood-burning stoves. Through its licencee organization, the Lakewood line of stoves is now produced by 14 licencees in the United States and Canada.

"All our stoves were designed using known technology and combustion and heat transfer strategies," says Clyde L. Logue, vice-president. "They were certainly not the ultimate in efficiency, but they worked. However, in searching the literature, there was little technical information available and no work had been done on combustion efficiency or on heat transfer. What tests had been done were limited and definitely non-repeatable from a scientific point of view. We were essentially flying blind, using only our intuition and expertise to guide us. So, we decided the time had come to obtain hard technical information to allow us to test our stoves so we could design both stoves and furnaces for maximum efficiency."

Contact was established with Ryerson Polytechnical Institute's Department of Mathematics, Physics and Computer Science in Toronto and with Professor Erwin Fernbach, a specialist in nuclear reactors. Lakewood then approached the National Research Council for assistance under its IRAP-M program, which is specially geared to assist smaller firms with little or no established research facilities of their own.

"When I was asked to take charge of the project," says Professor Fernbach, "it all seemed so very much like attempting to re-invent the wheel. After all, wood energy had been extensively used and there seemed to be little new ground to break. It came as a surprise to find a great number of problems are still waiting to be solved — from the very mechanisms governing the combustion and pyrolysis of wood to the development of devices to transform the chemical energy of wood into other energy forms."



Professor Erwin Fernbach with some of the measuring instruments designed and developed in his laboratory to study the wood-burning process.