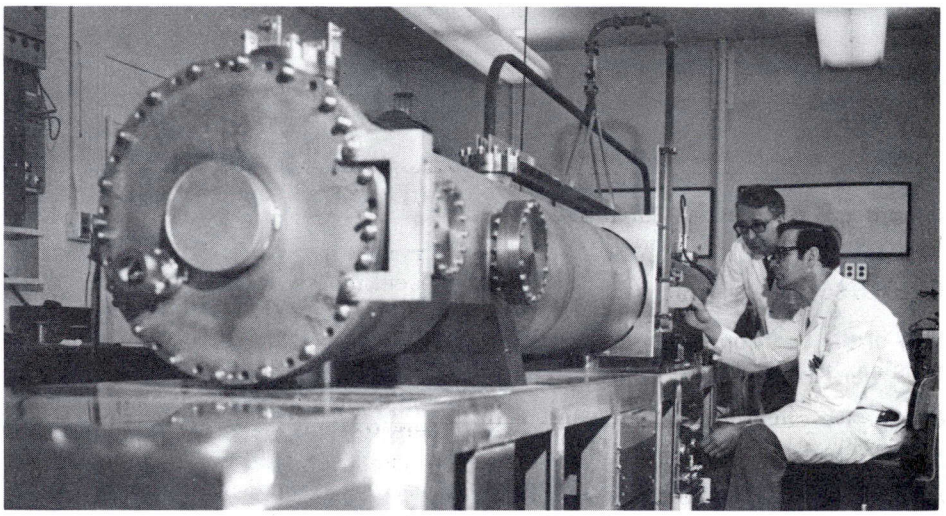
Immediate plans include a large (200 kw) wind machine to be erected on Quebec's Magdalen Islands in the Gulf of St. Lawrence, where the power generated will augment electricity produced by conventional diesel-electric generators.

Atomic clock

Transition of Cs V (Canada's newest time and frequency standard) to continuous operation has been carried out successfully and scientists have obtained a good measure of its performance. The four-metre-long instrument is believed to be the world's most accurate and stable clock, off by no more than three seconds in one million years. Scientists in the Time and Frequency Section of NRC's Division of Physics have also made advances in the dissemination of precise time by telephone for digital clock systems. One system will enable a user anywhere in Canada to link a commercial secondary clock with the NRC laboratory by telephone line. The distant clock's time will then be corrected automatically to within one millisecond *via* an electronic time code.

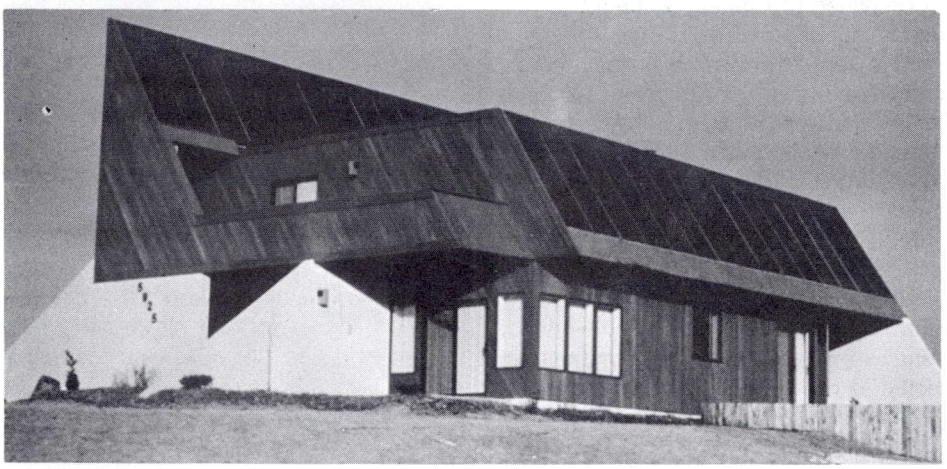


Atomic clock at the National Research Council in Ottawa.

Solar energy for heating

A major NRC responsibility within the framework of the interdepartmental panel on energy research and development is the co-ordination of all programs on renewable energy resources, one of the most promising of which is solar energy.

The Division of Building Research, as part of its investigation into the use of solar energy for heating buildings, has developed apparatus to measure the performance of the solar-collector panels installed on a demonstration house situated in Mississauga, Ontario. It has been calculated that enough energy can be collected from sunlight in Canada to make a significant contribution to the heating of homes and commercial buildings.



Demonstration house heated by solar energy at Mississauga, Ontario.

Ultrasonics in eye surgery

An alternative method has been developed to determine accurately the axial length of the eye in cases when diseased lenses have become opaque and optical techniques cannot be used.

Implantation of lenses in defective human eyes is now an established technique for the restoration of sight and, in order to ensure proper vision, it is important that an artificial lens of the correct power be used; it is for this reason that the axial length of the eye must be accurately determined before the operation. The new technique, which works like an echo chamber, uses ultrasonic vibrations which bounce from the back of the eye to give accurate information of the distance between front and back.

Computer speech

A system being developed at the Division of Electrical Engineering will serve as a valuable aid to people with visual or speech handicaps. This addition to the Division's complement of man-machine interactive systems converts typewritten or stored sentence structures into artificial speech.

Under computer control, a synthesizer combines phonemes of English into recognizable speech, the handicapped person merely feeding the sentences into the machine *via* a typewriter keyboard. In addition to storage and execution of commands for speech, the computer must deal with the task of interpreting the erratic rules of the English pronunciation system. An example of the effectiveness with which the instrument carries out its task is demonstrated by its ability to pronounce correctly such sentences as: "The boy sitting on the bough ought not to cough."

Re-refined oil

The Fuels and Lubricants Laboratory is investigating methods of re-refining used lubricating oils, procedures which will become of progressively greater significance as the world's petroleum resources decrease.

Used motor oil is acid-treated to remove additives and contaminants and the resulting "re-refined" base oil receives additive treatment (in the same way as virgin base oil) appropriate to its intended application.