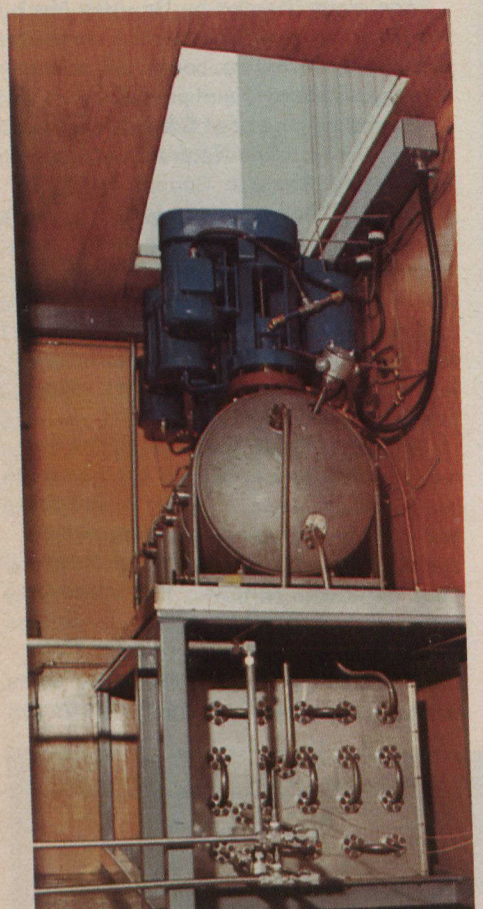
Preserving the environment

A new process for toxic organic waste disposal with energy-producing potential has been developed by the Ontario Research Foundation (ORF) and is now being marketed under licence by WetCom Engineering Limited of Scarborough.



Toxic organic waste-disposal unit.

In the Wetox process, the liquid waste is pumped through a heat exchanger and then into a reactor where it is mixed with compressed air. The oxygen in the air reacts with the organic matter to produce mainly carbon dioxide and water. The heat produced helps keep the liquid material in the reactor at the required high temperature.

The entire process is co-ordinated by a microprocessor. The processor monitors and controls the process at all times, and can signal when there is a problem.

After carbon filtering, the remaining material is neutral enough to pass through a normal sewage treatment plant. To any company which generates liquid organic waste as a result of its production process, the financial and environmental advantages are obvious.

A mobile plant for the Wetox process was developed by ORF after study of a prototype built by an American firm for the Skylab project. The Ontario government helped with funding, both for initial research and for the pilot project.

First commercial application of the process is at Uniroyal Chemicals in Elmira which, with financial help from the federal government, is just finishing building a $1.3-million Wetox plant to get rid of residues from production of chemicals.

"One of the big benefits of Wetox is that we will be able to destroy, on-site, strong wastes previously shipped off-site," said project manager Louis Klink. He estimates that there will be a $200 000 annual saving in transportation costs.

WetCom is currently handling requests for demonstrations of the process from the United States, the Netherlands and England.

Scanner could replace X-rays

A $1-million machine that uses magnetism to scan a patient's body without emitting harmful radiation may revolutionize diagnostic medicine, some medical researchers say.

The machine, known as nuclear magnetic resonance (NMR), can take repeated scans over a short period to monitor the effects of medicine on the body's organs, study ways to reduce the severity of strokes, find aneurysms in the brain, or chart the damage caused by multiple sclerosis.

The NMR scanning technique allows doctors to check tumor response to treatment on a continuing basis without exposing the patient to the radiation emitted by X-rays. Instead, NMR uses radio frequencies and a magnetic field, neither of which appear to harm body tissues.

The method also takes images of areas of the body that do not show up well with X-rays such as the back part of the brain – which is covered by bone – and the spinal cord. Furthermore, it shows not only structure, but function of soft tissues, revealing abnormalities that do not affect the size or shape of an organ. Even an image of the bone marrow can be made with the magnetic effect.

One of the first machines in existence is installed at the University of British Columbia in Vancouver; others will be installed in Alberta, Quebec and Ontario.

Voice-controlled wheelchair

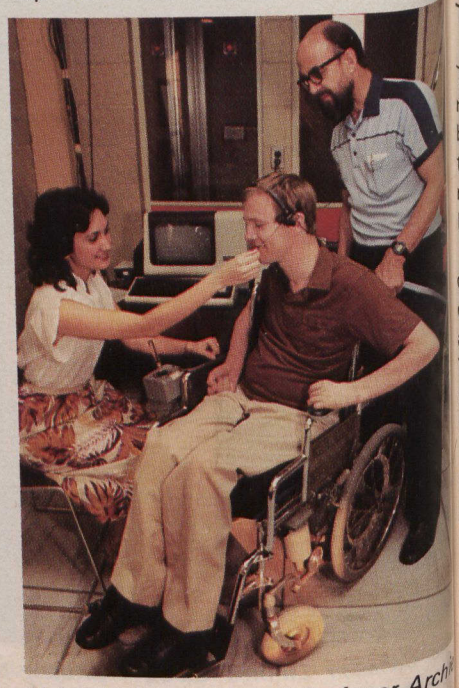
A new wheelchair operated by the sound of the voice could offer new mobility and independence to quadraplegics who cannot manage the stick controls on standard electric wheelchairs.

A standard electric model coupled with a computer, the wheelchair is controlled solely by voice commands and requires no body movement whatsoever.

The voice-operated wheelchair was developed by Haleh Vafaie, a fourth-year student in the systems and computer engineering department at Carleton University, Ottawa.

The computer can be programmed to recognize any sound in any language. Because it recognizes a sound's frequency, it must be re-programmed for each person's voice.

The voice recognition unit inside the computer is an electronic board about the size of a sheet of letter paper. It has a 100-word vocabulary and is available only in the US. A video terminal was donated by Digital Equipment of Canada Limited in Kanata, near Ottawa, and was booked into the university's computer. The cost so far has been about $2 000, including about $1 200 (US) for the voice recognition unit. The wheelchair cost about $4 000 new. The next step, combining the computer and voice recognition unit onto one prototype electronic board on the back of the wheelchair, is expected to cost $5 000.



Haleh Vafaie (left) *and Professor Archie Bowen* (right) *with Bob Brown in voice-controlled wheelchair.*