Pushing back the frontiers of medical technology

Since the discovery of insulin 65 years ago by Frederick Banting and Charles Best, Canadians have been at the forefront of developments in medicine. Nowadays, some of the most sophisticated medical diagnostic and treatment hardware in the world is designed and manufactured in Canada.

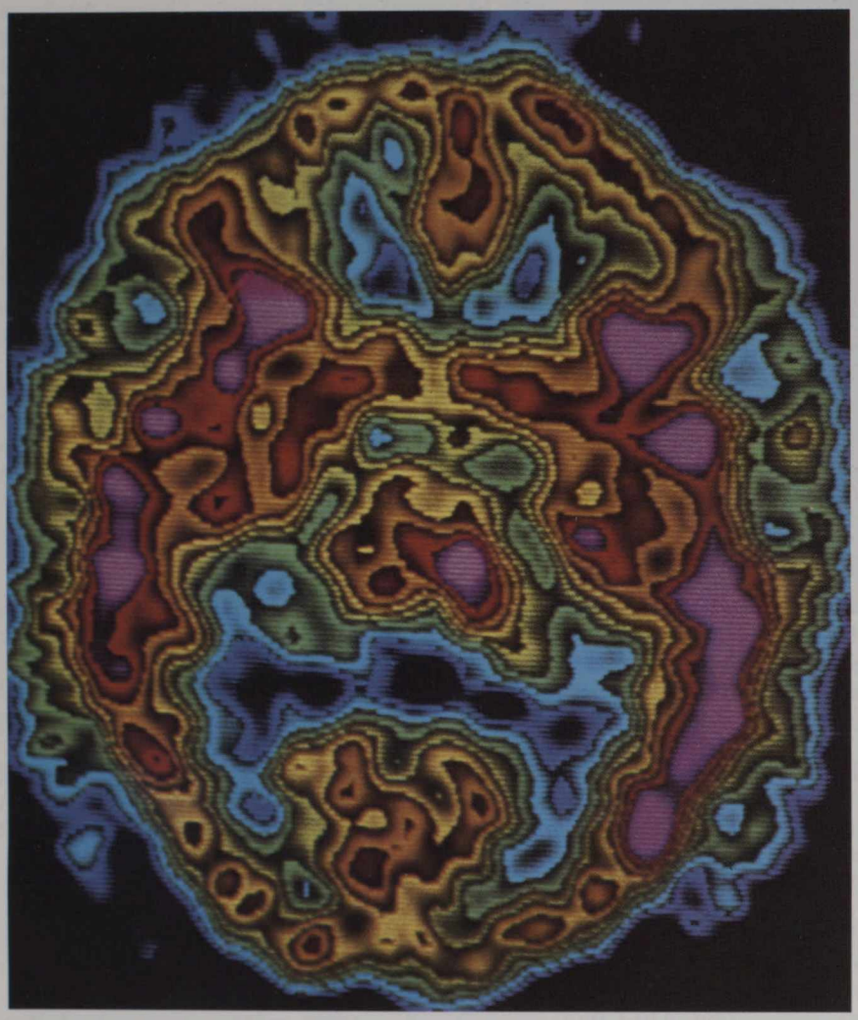


Image of blood flow in the brain, taken by a nuclear medicine camera.

The implementation of a national health care programme in 1961 acted as a fillip to Canadian medical research and development. New fully equipped hospitals and clinics were constructed, which made use of the latest in medical technology; major emphasis was placed on medical research; and Canada's medical products manufacturing industry embarked on a rapid programme of expansion.

As a consequence, there are now more than 400 Canadian firms across the country engaged in the manufacture and supply of over 1200 medical products from adhesive bandages to sophisticated scanners. Many of these products enjoy an international reputation and are exported all over the world.

Leading role in cancer treatment

One area in which Canada has set the pace is cancer therapy. Canada opened the world's first commercial cobalt-60 therapy unit in Ontario in 1951, and today Atomic Energy of Canada Ltd — a Crown corporation — is a major producer or radioisotopes, cancer therapy units and irradiation facilities. Over 1700 of AECL's units are in operation around the world, catering for more than half a million patients in 80 countries.

In a bid to make radiation therapy safer, AECL's medical division has designed a treatment simulator whereby a therapy team can practise a treatment protocol before exposing patients to gamma rays. All data on the size and location of a tumour are fed into the machine which calculates the correct radiation dosage.

AECL's industrial and isotopes products division now makes over half the world's radioactive isotopes. These include technetium-90 for examining functioning organs, xenon-133 for lung scans, and gallium-79 for spotting hidden abscesses or soft-tissue tumours.

Furthermore, in collaboration with the Montreal Neurological Institute, AECL has developed *Therascan 3218* which enables doctors to look inside the brain to study body chemistry and organ function. This device should lead to major advances in the study and diagnosis of strokes and epilepsy.

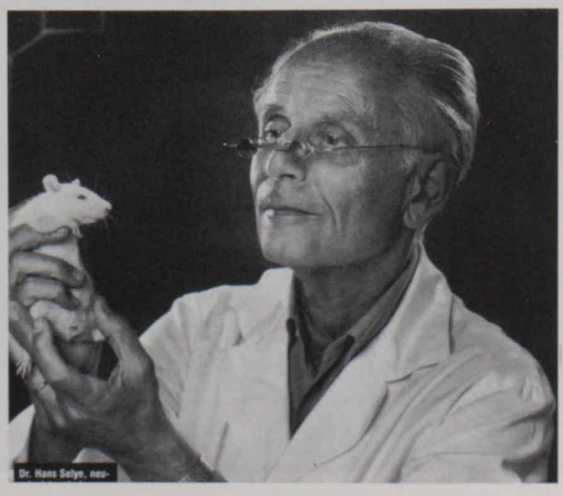
Another activity of AECL is the manufacture of irradiators which are used for the sterilisation of medical supplies as well as for research. A third of the world's surgical supplies are currently being sterilised with gamma rays, and more than 70 large-scale Canadian machines are in use throughout the world.

The largest AECL unit is in Japan with a processing capacity of 200 000 cubic metres of supplies a year.

Biosig's instrumentation keeps stress at bay

One of the inescapable effects of modern life is stress, on which the late Dr Hans Selye was an internationally recognised authority. Stress overload is regarded as a major cause of illness, and much research has been done into the field of stress testing.

Biosig Instruments Inc of Montreal, for instance, manufactures a biofeedback device for measuring scalp and forehead muscle tension. This produces a tone proportional to the amount of tension monitored from the muscles. From this information, an individual develops an awareness of when these muscles are under tension — and how best to relax them to relieve the tension.



Dr. Hans Selye, neu-

Photo: Karsh, Ottawa

Dr Hans Selye: recognised neurologist and pioneer in stress research.