peared in the fourth edition and it became increasingly apparent that the series had become inadequate and outdated.

While Canada's participation in the fifth edition was costly – particularly in time – it is regarded by CHS as immensely worthwhile because of global recognition of the high quality workmanship, the result of which may be further commissioning by other nations to chart their waters.

Copies of the GEBCO series are available from international chart dealers across the world or, write to the Canadian Hydrographic Service, Department of Fisheries and Oceans, Ottawa, Ontario K1A 0E6, Canada.

TRIUMF over cancer

TRIUMF, a giant cyclotron in Vancouver, British Columbia which the National Research Council of Canada supports, is now producing a different kind of radiation for use against cancer.

TRIUMF scientists hope that a beam of tiny sub-nuclear particles called pions will deliver more cancer-killing energy to deep tumour sites than conventional irradiation can.

Cancer cells cause damage by their unchecked replication, which also makes them more vulnerable than normal cells to any radiation harmful to the genetic material DNA. Standard therapeutic isotopes like *cobalt-60* bathe both tumours and surrounding, healthy tissues with fast-moving particles, the idea being that the more reproductively active tumour cells will suffer more.

But these treatments deposit most of their energy in the first few centimetres of penetrated tissue, and are thus less effective against deep tumour sites. Raising doses to kill more cancer cells scorches healthy tissue; lowering doses to save healthy tissue hurts the cancer less. This tradeoff is critical in areas like the pelvis and brain.

The pions produced by the Vancouver particle accelerator, however, have a "depth-charge effect" – they travel through the intervening normal cells between beam source and tumour with little disruption, saving their full force for the tumour itself. This effect relies on the pions' unique properties.

First, they travel at a respectable fraction of the speed of light. Second, their stable lifetime is so short that at these "relativistic" speeds they go only a few metres from their origin to a point where they interact with surrounding matter.

This point is known with great accuracy, so that a carefully positioned patient will have his or her tumour precisely where the pions cause most havoc. Finally, the damage the pions cause at the end of their brief lifetime is much greater than equivalent damage from a *cobalt-60* beam. Dr. Gabriel Lam, the scientist in charge of the pion-irradiation project, compares cobalt particles to "a razor – but the pions are like hand grenades".

Building a better screwdriver

An Ontario firm has built a new screwdriver that is a well-balanced, compact, attractive-looking hand tool.

Manufacturing and Machine Works Limited of Waterloo has designed the multi-bit Dura-Drive with four different bit selections made from high-quality tool steel. The reversed tapered handle fits many different sized hands and also pushes tightly into the hand giving the user a better grip which in turn helps to turn the screwdriver with less effort when driving a screw. If more turning power is required, a second bit can be swung out at right angles to the ends and used as a lever.

The design of the screwdriver, according to the company, has increased the state of the art with respect to multi-bit screwdrivers, in that the Dura-Drive bits cannot get lost. Also when the bits are tucked away in the handle, the screwdriver will stand up on the locking ring end.

Dura-Drive screwdriver.

Support for UN international year

Canada is providing a grant of $300 000 to the United Nations Centre for Human Settlements (UNCHS) for preparations leading up to the 1987 International Year for Shelter for the Homeless (IYSH). The funds represent the first contribution to IYSH from a developed country.

The grant will be used to assist Third World governments to improve the shelter and neighbourhoods of the poorest people of Africa, Asia, Latin America and the Caribbean, both in rural areas and in squatter settlements surrounding urban centres. In particular, the emphasis will be on encouraging and assisting governments to develop and implement shelter demonstration projects. The budget of this preparatory period will total $5 million (US), half of which will come from Third World countries and half from developed countries.

In 1976, Canada hosted the United Nations Conference on Human Settlement (HABITAT). This resulted in the formation of the United Nations Commission for Human Settlements to assist governments, particularly Third World governments, to improve the quality and quantity of housing, with special emphasis on the needs of the rural and urban poor. A member of the commission since its inception, Canada strongly supports its objectives. The Canadian International Development Agency has already contributed to a number of settlement programs designed to improve the physical environment of the poor, both in rural and urban areas throughout the Third World.

Ontario-New York acid rain pact

Ontario and New York state have signed a special agreement to exchange information and conduct joint research on acid rain, an increasingly serious problem in both jurisdictions.

The agreement was signed by Ontario environment minister Keith Norton and New York's commissioner of environmental safety Henry Williams. It calls for standard methods and procedures in sampling, laboratory work and the free exchange of scientific information.

Mr. Norton said he hoped to sign acid rain pacts with other states this summer and to hold aanother meeting later this year. Quebec also has signed agreements with several states.