

Scientists find 40 new fish species

"Absolutely new to science," is the description given by two Toronto scientists of some 40 species of tropical fish they discovered a few months ago in the isolated Chagos Archipelago in the Central Indian Ocean.

Drs. Alan Emery and Richard Winterbottom of Toronto's Royal Ontario Museum expect to present papers on about 20 of their finds during the next 18 months, in co-operation with other international scientists.

The two Canadians, the only ichthyologists on a British Armed Forces Trust expedition from January to April last year, collected about 50,000 specimens of some 600 species — weighing about one-and-a-half tons — which are now bottled and stored at the Royal Ontario Museum.

A group of scientists explored the 40 islands which, according to Dr. Emery, are "3,000 miles from Sumatra on the east and 3,000 miles from Africa on the west". There, every morning, supported by a British crew, they dived to collect specimens.

Unique photos

"Once we got the fish, their life colours disappeared quickly," said Dr. Emery, "so we had to photograph them quickly. I suggest the series of slides we have [over 3,000], is a unique record in the world, including juveniles, female and male spe-



Dr. Richard Winterbottom carries the ROM expedition flag to a depth of 60 feet on the outer reef at Chagos.

cimens." Their finds range from the half-inch coral goby to the eight-foot white-tip shark.

"A large percentage are new to science ...undescribed species," said Dr. Emery. "We estimate that there are about 40 that are absolutely new."

The job of determining what is new involves searching the records of 20,000 species described since 1758, when the first such record was made. The Toronto scientists have been exchanging samples with experts across the world to determine what has, in fact, been found. Following that, descriptions, measurements, characteristics, etc. must be documented. Finally, said Dr. Emery, "comes the fun process" — finding names for the new fish.

ROM's exhibit

In December, the Royal Ontario Museum opened an exhibition, *A Remote Coral Wilderness*, of the rare and colourful sea-life, which documents the trip and shows photos of the scientists' living quarters and laboratories, as well as the various methods of collecting the fish. Included are superb underwater shots of the Chagos specimens. The method of scientifically describing and naming a new species is demonstrated at the exhibition, which is described by the Museum as "an absorbing view of one of the last underwater frontiers of the world".

Unique helium pilot project

An Alberta company is pioneering a unique process, which could eventually provide Canada with its own domestic supply of helium.

Canada's helium is now supplied entirely by the United States, but should the process being tested prove successful, Canada may soon be able to meet its own needs in this versatile commodity.

Helium is used in satellites, nuclear technology, medical procedures and many other interesting and unusual applications. It is a chemically inert gas found in small quantities in natural gas. It is seven times lighter than air, does not become radioactive and when liquefied is the coldest substance known to man.

Helium properties render it essential to uses such as welding stainless steel, copper, aluminium, titanium and zirconium; controlled atmospheres for growing crystals for semi-conductors and proces-

sing fuel elements for nuclear reactors; in satellite observation and communication systems; chromatography; heat transfer in gas-cooled nuclear reactors; breathing mixtures for medical purposes and deep-sea diving; leak testing and innumerable research and medical applications.

A first

Alberta Helium's Edson plant is the first of its kind in the world. While the United States is using a liquefaction process to remove helium from a natural gas stream, Alberta Helium is testing a membrane process which uses between 70 and 75 percent less energy than the liquefaction process.

The pilot plant is built on the McLeod River station of Alberta Gas Trunk Line Limited, about 200 kilometres west of Edmonton, where two natural gas pipelines are being made available containing different levels of helium and different types of pipeline impurities.

Three membranes are used in the process. The membrane itself is made of cellulose acetate placed on what looks like a coffee-drip filter pad. The company is testing the efficiency life span of the permeation membranes.

By the time the pipeline debris, oil and other impurities have been trapped by the third and final membrane, the extracted helium is about 90 percent pure. Because the final purification process is already well known, it was decided to dispense with this final step and return the helium to the pipeline stream.

Operated by computer

The station is completely automated and monitored by computer by the Alberta Research Council in Edmonton. For safety reasons the plant is started up by employees visiting the site, but after start-up the plant operates completely unattended and processes can be adjusted by computer from the Alberta capital.

The helium-recovery program began in 1969 financed by TransCanada PipeLines, Alberta and Southern Gas Company Limited and the Research Council of Alberta. Alberta Helium was incorporated in 1973 with the Research Council performing the actual research.

Alberta Helium has already received enquiries from the United States and Argentina. Should the experiment continue to prove successful, a commercial helium extraction plant could be a reality by the mid-1980s.