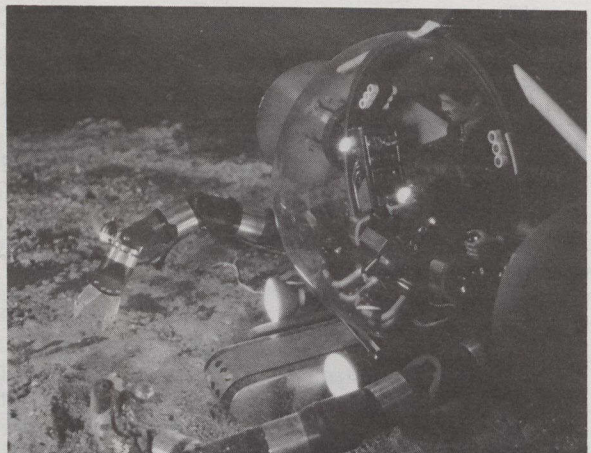
One-man sub to search for oil on ocean bottom

Deep in the sea off the Nova Scotia coast, the strange creatures that inhabit the murky bottom are about to get their first view of a human, reports *The Globe and Mail.*

This spring, a Canadian-built one-man submarine that looks like a fishbowl with robotic arms will begin manned trials in the Atlantic depths. Propelled along the bottom by battery-powered motors, the *Deep Rover* will permit divers to explore nearly a kilometre beneath the sea without connection to the surface. It will give its driver the closest feeling yet to swimming free in the deep.



Deep Rover, *a Canadian-built one-man submarine allows divers to explore beneath the sea.*

The most advanced of deep-ocean research vessels, *Deep Rover* solves several problems facing divers who want to work or stay for long periods under more than about 300 metres of water. That is about the practical limit for diving suits, which require bulk to withstand pressures many times greater than surface air pressure.

Pressurized submarines and diving spheres are useful for long dives but they are ponderous and do not give the diver much chance to closely view or interact with the things he or she encounters.

Micro-submarines such as *Deep Rover* offer the advantages of both diving suits and submarines. Manoeuvrable and usable at depths of 1 000 metres or more, they can dive quickly and return to the surface without problems of decompression, because the atmosphere inside the bubble is maintained at surface pressure.

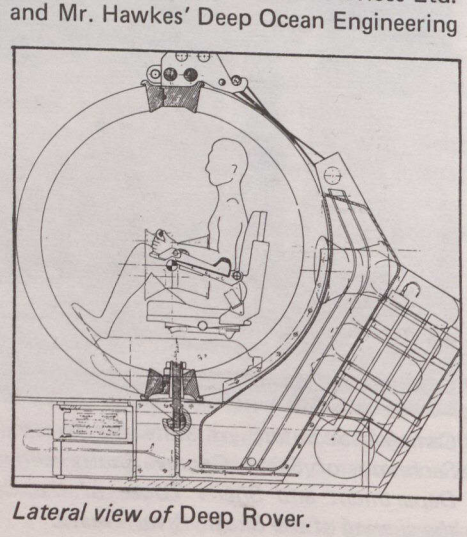
Deep Rover has already spent more than 4 000 hours underwater, testing the ability of its molded plastic bubble to stay watertight and withstand high pressure. Graham Hawkes, who developed the *Deep Rover* concept, will probably be the first person to crawl inside the 1.3-metre-diameter bubble for a test ride. Seated in a padded chair, he will be able to look in all directions and observe the sea floor with the help of powerful lights mounted on the body of the craft.

"The vision behind *Deep Rover* is that ultimately, it will be possible to have comfortable, affordable access to the ocean in a manner as commonplace and accepted as driving an automobile or flying an airplane," Mr. Hawkes said. *Deep Rover* is self-contained and can operate free of links to the surface. The driver has hand controls that order the crab-like manipulator arms in front of the craft to make remarkably accurate movements.

Delicate building tasks

The Hawkes manipulator system was originally designed for an oil-rig vehicle called the *Rig Rover.* The arms can move in five different ways and the hands can move in four ways, making it possible to do very delicate building tasks and to pick up scientific specimens. In laboratory tests, the mechanical claws picked up eggs and served glasses of champagne without breakage. The controls are so simple to use and so precise they can make the mechanical arms draw intricate pictures and even sign cheques.

Deep Rover was built in Halifax in a joint venture by Can-Dive Services Ltd. and Mr. Hawkes' Deep Ocean Engineering Inc. When testing is completed, Can-Dive will operate *Deep Rover* for Petro-Canada to explore for oil as deep as 800 metres below the surface. Because Petro-Canada wants television pictures, *Deep Rover* will operate tethered to a platform floating near the surface. An umbilical cable will carry television signals from cameras mounted on the microsub.



Lateral view of Deep Rover.

Alberta-New Mexico sign joint research venture

The University of Alberta and Summa Medical Corp. of Albuquerque, New Mexico, have agreed to establish a joint research venture to seek new diagnostic tests for cancer.

Summa's research is aimed at using monoclonal antibodies — and other molecules that seek out and stick to cancer cells and cancer-related proteins shed by malignant cells — to develop blood and urine tests for detection of cancer. Such tests could be used for early detection of the disease, and for determining whether surgery or chemotherapy had cured the patient of the disease.

Summa Medical Corp. has set up a wholly-owned subsidiary, Summa Biomedical Canada Ltd., that will have its head office at the university. A 450-square-metre research and development laboratory housing eight Summa researchers will be built in the university's dentistry-pharmacy building within the next year.

Researchers at many centres have had considerable success in attaching radioisotopes to monoclonal antibodies. The antibodies then bond with cancer cells, allowing them to be detected with diagnostic tools, such as gamma counters or nuclear magnetic resonance imaging devices.

Summa's parent company in the United States is seeking to develop diagnostic methods in which the antibodies would be injected into a patient's body, but the Canadian research will concentrate on in-vitro (test tube) techniques.

The company will gain access to the equipment, scientific expertise, research results and library at the university. In return, Summa will pay an overhead charge for its laboratory and office space, and will pay the university a fixed percentage of gross profits from the sale of any diagnostic kits manufactured. Except for limited clinical trials, no product manufacturing will take place at the university.