

## Lithoprobe provides portrait of lithosphere

The findings of the first phase of Lithoprobe, one of the most ambitious deep-earth studies ever undertaken in Canada, were recently outlined by Minister of State for Mines Robert Layton.

The findings confirm the suspicion that Vancouver Island had originated far from the Canadian landmass and profoundly alter scientific concepts on the origins of the continents. They are considered by scientists as a revolutionary breakthrough in the scientific understanding of the structural evolution of the earth. They are also expected to have important economic implications with the improvement of existing strategies of mineral exploration as scientists increase their understanding of the origin of certain kinds of mineral deposits, and how and where they form. In addition, they are expected to shed new light on the nature and origin of earthquakes and other natural hazards.

In the announcement, Mr. Layton said "Lithoprobe will help refine our model of how the world works".

### Initial study

Lithoprobe, sponsored by the Department of Energy, Mines and Resources and the Natural Sciences and Engineering Research Council of Canada, began last year on Vancouver Island as part of the five-year project to obtain a three-dimensional picture of part of the Canadian continental lithosphere, which consists of the earth's crust and part of its upper mantle. The lithosphere

varies in thickness from 70 to 100 kilometres. It is not a uniform mass but more like a jigsaw puzzle, made up of gigantic plates that press upon each other.

Traditional techniques have provided precise data on the composition of the earth to a depth of two kilometres, but Lithoprobe will obtain a picture of the earth's crust to depths of 20 kilometres or more. Surveys at such depths are quite complex and costly. As a result, the locations selected across Canada are expected to provide the most information on the origins of the Canadian landmass.

Because of the mystery shrouding the origins of Vancouver Island and the movement of two enormous crustal plates located off the coast of British Columbia, scientists selected this area of the west coast for the first phase of Lithoprobe. It was conducted near Bamfield on the west coast of Vancouver Island.

Heavy trucks equipped with hydraulic jacks were used to obtain information from the depths of the earth. Each vehicle had a metal plate that could be pressed on the ground. The plates were vibrated by means of a compressed-air system, transmitting shock waves into the ground. These shock waves passed into the depths of the earth and were then picked up by geophones positioned along a line several kilometres long.

A device in each truck and the geophones were connected to a central computer that controlled the sequence of vibrations. Since the speed at which waves are

propagated depends on the density and elasticity of the rock, the data from these seismic surveys was used to obtain a three-dimensional profile of the subsurface.

### Further projects

Over the next few years, seismic surveys similar to the ones conducted on Vancouver Island will be carried out at the other designated locations including the Kapuskasing Belt, the Abitibi Belt, the Sudbury Basin, the Rocky Mountains, Newfoundland, the Williston Basin in the prairies and possibly other locations.

In these studies, specialists will also use other techniques, such as seismic refraction studies and geomagnetic and electromagnetic surveys. Drilling is planned for the last phase in order to obtain core samples which will provide very precise information.

The Lithoprobe project is part of a wide-ranging study of the lithosphere being carried out on a world scale. Scientists in the United States, Britain, France, the Union of Soviet Socialist Republics and other countries are currently conducting experiments similar to those being done in the Lithoprobe project.

## Software scores in France

PUCE Inc., a small Montreal, Quebec manufacturer of computer software recently received the 1984 Golden Apple prize awarded by Apple France in Paris for the best software of the year.

The program which won the award was Photo, a creative and computerized way to learn the basics of photography.

Puce Inc. is primarily a supplier of educational software. The initials stand for Programmation Utilisée et Conçue pour l'Enseignement (Programs Uniquely Conceived for Education).

The word *puce* in French means flea and also means computer chip, a recent addition to that language.

PUCE was launched two years ago by five former employees of a textbook firm. The company also uses the talents of more than 40 Montreal-area teachers who develop programs as a sideline.

More than a dozen of its own software titles are now offered in Puce's winter 1985 catalogue for Apple, IBM and Commodore equipment.

Company president Jean-François Desautels says the company has been successful internationally and its products are distributed in the United States, France, Belgium, Switzerland, Spain and West Germany.



Heavy vehicle used in Lithoprobe study with metal plate that was pressed on the ground and vibrated to transmit shock waves into the ground.