

## France participates in Expo 86

French Minister of Transportation Charles Fiterman has announced that France will participate in the 1986 World Exposition to be held in Vancouver, British Columbia, from May 2 to October 13.

The commitment was made during recent meetings in France between Canadian Prime Minister Pierre Elliott Trudeau and French Prime Minister Pierre Mauroy.

British Columbia's minister responsible for Expo 86, Claude Richmond, commented: "Expo's theme of transportation and related communication is particularly well suited to the French. France has an impressive list of firsts, particularly in the field of air travel."

Senator Jack Austin, federal minister responsible for Expo 86, was delighted by the news. "It is most appropriate that France, whose famed voyageurs helped open up Western Canada, should be the first continental European country to join the roster of national participants at Expo 86, which now has reached 14."

Since the Montgolfier balloon rose from French soil in 1793 chalking up the first aerial voyage in history, France has claimed the first parachute descent, aerial photo, manned powered dirigible, helicopter flight, seaplane flight and air mail service.

France's Aerospatiale, co-developer of the *Concorde*, has become the largest aerospace company in the European Common Market, with involvement in Europe's *Ariane* space launcher. Carrying on an old tradition, France is also researching modern airships.

In land transport, France has been called the cradle of modern road technology. Public buses were introduced in France in the 1600s, and today France's 260-kilometre-an-hour *Train à Grande Vitesse (TGV)* is hailed as Europe's first high speed passenger rail line.

But Canada's historic tie to France is strongest in the area of marine transport. The sea link forged 450 years ago by Jacques Cartier, Samuel de Champlain and the founders of New France is itself a remarkable story of transportation and communications.

Thirteen other flags now fly at Expo 86 headquarters beside the French tri-colour — those of Britain, Saudi Arabia, Kuwait, Kenya, Senegal, Dominica, St. Vincent, Montserrat, United States, Peru, Indonesia, Australia and the host nation, Canada. Ontario, Quebec and British Columbia have also pledged pavilions.

## New keys to cancer detection

Researchers at the Atomic Energy of Canada Limited (AECL) Chalk River Nuclear Laboratories, Ontario, have made important new breakthroughs in detecting cancer origins.

Since Isaac Berenblum's classical model of tumour production was developed in the early 1940s, earlier researchers have been aware of two stages of tumour development, an initiative phase and a promotion phase. In Berenblum's experiments, mouse skin was first exposed to a coal tar derivative (tumour initiator), followed by repeated doses of a skin irritant (tumour promoter).

In the past decade, cancer researchers have concentrated on the identification of tumour initiators — those chemicals, now numbered in the thousands, which are capable of causing mutations in living cells and are presumed to be carcinogenic (cancer causing) for man.

### Soot and saccharin

One of the earliest-recognized carcinogens was soot, known some 100 years ago to cause scrotal cancer in chimney sweeps. Tumour promoters — chemicals which enhance rather than initiate the development of cancers — have gained less attention. Saccharin is an example of a chemical which is believed to act as a tumour promoter.

In the 1980s, Dr. Chaim Birnboim and co-workers John Jevcak and Alf Knight of the radiation biology branch of AECL are beginning to unravel the mystery of what actually happens in the promotion phase of tumour production. Their theory is that the tumour promoter

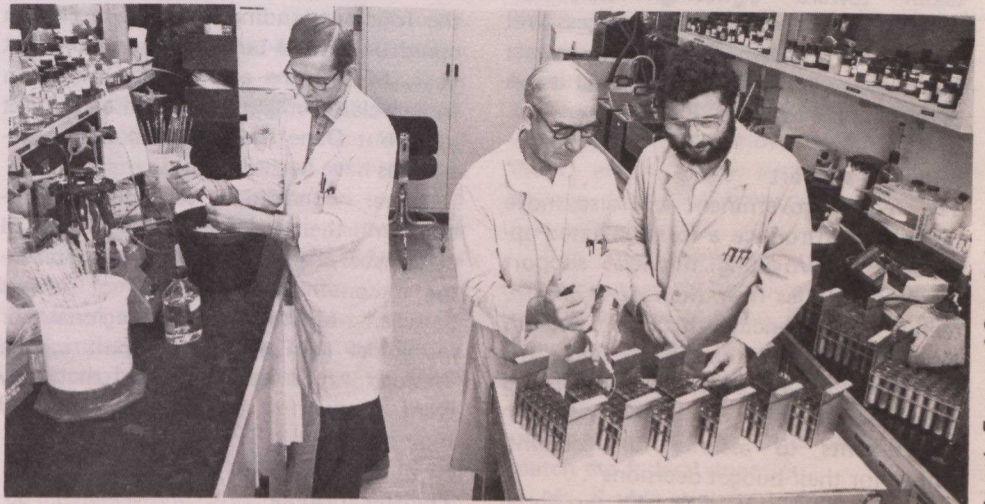
exerts an effect on skin cells *via* an indirect route: the chemical promoter has an initial irritant effect which leads to localized inflammation causing special white blood cells called phagocytes to arrive on the scene. Phagocytes' normal function is to protect an infected area by "swallowing" the bacteria at the site and they actually bombard the bacteria with reactive chemicals such as hydrogen peroxide.

In mouse skin experiments, repeated doses of the tumour promoter fool the phagocytes, triggering the cells to produce hydrogen peroxide and other reactive forms of oxygen which cause damage of DNA (deoxyribonucleic acid) in normal cells in the area. It is this damage to DNA in skin cells which they believe may be responsible for tumour promotion.

### Model tested

Birnboim and Jevcak tested their model with the rapid and sensitive FADU (fluoro-metric analysis of DNA unwinding) test which they recently developed to detect DNA damage in living human cells. When they exposed human white blood cells, which are similar to mouse phagocytes, to even extremely low amounts of the known cancer promoter, phorbol ester, they found DNA damage roughly equivalent to that expected from an enormous radiation dose of 1000 rads. Such DNA damage was predicted by their model.

The Chalk River work identifying processes likely involved in the promotion of tumours is a significant step towards a better understanding of factors that can cause cancer.



AECL researchers, (left to right): John Jevcak, Alf Knight and Chaim Birnboim, use their fluorometric technique for analysis of DNA damage in samples of white cells which have been exposed to tumour-promoting chemicals.