

## In Industry

Canadian scientists and engineers have been especially active in those fields where science and technology have proved important to the development of Canada's natural and human resources.

Many recent Canadian technological achievements have been made possible by increased research and development activity in industry. The proportion of Canadian R&D funded by industry has grown steadily in recent years.

### TELECOMMUNICATIONS AND REMOTE SENSING

Canada's unique geography has provided the impetus for a telecommunications industry of international calibre. Building on Canada's need for swift, long-distance communications, firms such as Northern Telecom, Mobile Data International and Telesat have become world leaders in aspects of telecommunications technology.

Canada's Northern Telecom, for example, was the first to introduce an all-digital telephone switch. Another Canadian firm, Mobile Data International, provides mobile data terminals to fleet operators around the world, such as Federal Express. Canada was the first country to operate a geo-stationary domestic satellite system. Telesat operates Canada's Anik telecommunications satellites.

MacDonald Dettwiler (MDA) is one of the world's leading suppliers of turnkey remote sensing ground stations. MDA scientists have pioneered in the development of commercial systems for mapping Earth from space.

### HEALTH CARE

Health care is a field in which Canadian firms have long excelled. Connaught Biosciences, for example, is one of the world's leading developers and suppliers of human vaccines. One Connaught product, ProHiBitD, is the first in the world to offer protection against bacterial meningitis.

A Montreal firm, IAF BioChem International Inc., was awarded the prestigious gold award for invention in the 1989 Canada Awards for Business Excellence. IAF received the tribute for the invention of an AIDS diagnostic kit, which uses a mixture of synthetic peptides as the antigenic material.

Many leading American pharmaceutical firms operate research laboratories in Canada, in order to draw upon the pool of highly trained manpower.

Pharmaceutical R&D among Canada's largest companies increased 30 percent to \$164.5 million from 1987 to 1988. In 1989 expenditures were expected to reach \$211 million, more than double 1987 levels.

### ENERGY

Atomic Energy of Canada Ltd. (AECL) has pioneered in the peaceful use of nuclear energy. Its CANDU nuclear reactor, which uses an original heavy water principle, has the best safety record and is the most cost-efficient in the world.

Hydro-Québec is a world leader in the transmission of electricity over long distances. A new alloy developed in its laboratories — Hydroloy — was selected by *R&D Magazine* as one of the top 100 innovations in 1989. Hydroloy reduces erosion in hydroelectric turbines.

For decades, U.S. industries and citizens have relied on secure supplies of electricity generated in Canada. New plans call for Canadian producers to apply state-of-the-art technology to install additional, environmentally sound generating capacity in the 1990s, in order to bolster the North American power grid.

### MANUFACTURING

As the scale of world manufacturing and trade grows in the 1990s, many Canadian firms will be looking to form new technology and marketing alliances with companies in the U.S.

A growing number of U.S. multinational companies are awarding their Canadian subsidiaries mandates to develop, manufacture and sell products worldwide, on behalf of the parent company. U.S. firms such as Pratt and Whitney have chosen to build on the scientific and technological expertise of their Canadian divisions to exploit world markets.

### TRANSPORTATION

Canada's transportation industry is a leading supplier of sophisticated equipment to U.S. operators. A good example is UTDC Inc., which recently supplied the Florida Department of Transport with eighteen bi-level commuter rail coaches for service linking downtown West Palm Beach and Miami.

*Aircraft component testing at a National Research Council laboratory.*

## AWARD WINNERS

Today, many Canadian firms rank among the world's best at developing and applying science and technology. Each year, leading Canadian inventions and innovations are showcased by the Canada Awards for Business Excellence. Companies recently singled out for tribute include:

**Virtual Prototypes Inc.** Development of a breakthrough technology for rapid prototyping of control and display systems.

**Alcan International Limited.** Development of an aluminum-air fuel cell system.

**Hymac Ltd.** Development of a 24-megawatt (32,000-horsepower), two-stage pulp refiner with independently controlled refining zones.

**Diffracto Ltd.** Development of "D Sight," a machine-vision-based system for the measurement of surface quality.

**International Road Dynamics Inc.** Development of a Weigh-In-Motion system for road vehicles.

**Sub Aquatics Development Corp.** Development of a passenger submarine.

**Canfor Corporation.** Development of Ecobrite, a non-toxic, anti-stain chemical for the treatment of lumber.

**University of Guelph.** Discovery of PRESPONSE, a vaccine against pneumonic pasteurellosis in cattle.

National Research Council

