

NRC through its industrial research assistance program (IRAP) and the program of industry/laboratory projects (PILP) contributes \$81 million to industry. The latter program is designed to assist companies in technology transfer from both government and university laboratories.

Payments for R&D in the natural sciences and engineering had a concentration of 33% in Ontario (excluding Ottawa) and 28% in Quebec (excluding Hull).

## 12.6 Federal support to universities

Total payments to universities were estimated at \$588 million in 1984-85 with 86% in the natural sciences and engineering and 14% in the social sciences and humanities. Most of these payments (67%) were for R&D grants made by the three university granting councils: the Natural Sciences and Engineering Research Council (NSERC), the Medical Research Council and the Social Sciences and Humanities Research Council (SSHRC).

NSERC was the largest of these councils with a 1984-85 budget of \$292 million. Since 1979-80 NSERC experienced an average annual growth rate of 18%. Its program had five major components: manpower training, equipment, targeted research, discipline research and general programs. In 1984 NSERC created a national microelectronics network with about 30 centres in Canadian universities and an implementation centre at Queen's University in Kingston, Ont. as the focal point for the other centres.

The Medical Research Council budget was \$157 million for 1984-85 and the SSHRC budget was \$57 million. The department of national health and welfare provided funds for an \$18 million program for health research in universities. The department of the secretary of state was slated to spend \$25 million to fund a series of centres of specialization in Canadian universities.

The bulk of the funding was going to universities in Ontario (36%) and Quebec (23%).

## 12.7 Provincial research organizations

Eight provincial governments have established research councils or foundations with primary responsibilities to assist firms with technical problems. In 1983 total expenditures were estimated at \$113 million with about 1,800 people employed. Although relatively small in comparison with other organizations, their impact on industries in their respective provinces is substantial. In aggregate these organizations receive about 44% of their funds as a grant from their own provincial governments. About 20% of their expenditures is derived from contract research on behalf of industry.

**The Nova Scotia Research Foundation Corp.** is a Crown provincial agency with control vested in a

board of directors. Its 1983 expenditures were about \$5.4 million. The foundation performs research in fermentation and microbial technology; in chemical engineering including research on arsenic removal, methane removal, food, coal and corrosives; in ocean technology; and in marine and ground geophysics.

**The New Brunswick Research and Productivity Council**, created in 1962, had a 1983 budget of \$5.0 million. The council's research includes: pest control and pesticide residue, fuel oil and coal, ore processes, mineral smelting, bed combustion of fossil fuels, nuclear reactors, oil rigs, and effects of chemical additives in the food industry.

**The Centre de Recherche Industrielle du Québec**, created in 1969, had a 1983 budget of \$18.5 million. The centre operates research laboratories in both Québec City and Montréal. It works closely with small- and medium-sized businesses covering various aspects of applied sciences in the creation of new processes and products. It stresses advanced manufacturing techniques and is studying the applications of computer aided design and manufacturing (CAD/CAM) and robotics.

**The Ontario Research Foundation**, established in 1928 as an independent Crown corporation, had a 1983 budget of \$20.3 million. It performs research in energy conservation and solar systems, on long range transport of pollutants, waste treatment, building materials including fire and flammability studies, pulp and paper, microelectronics, mineral processing, hydrometallurgy and waste utilization. It operates a centre for alternate fuel utilization and a centre for powder metallurgy.

**The Manitoba Research Council** had a budget of \$5.3 million for 1983. The council operates a technical information service for industry, an industrial technology centre and the Canadian Food Products Development Centre. It performs research in the areas of plastics extrusion, fibreglass, atomic absorption spectroscopy, solid waste, wood stove testing, meat processing, and bacteria in milk products.

**The Saskatchewan Research Council** had a 1983 budget of \$9.5 million. The council performs research in biomass production and refining, farm energy use, sediments, ceramics, geochemistry, computer systems, computer-aided design and computer-aided manufacturing, and applied climatology. It operates a Canadian centre to design and develop innovative instruments.

**The Alberta Research Council**, created in 1921, had a 1983 budget of \$41.2 million making it the largest of the eight organizations with nearly double the expenditures of the next largest. The council performs research on the geology of Alberta oil-bearing sands, bitumen recovery, steam separation of hydrocarbons from sand, coal conversion,