

and do not reflect the effect of cost and price increases. It is difficult to determine how much of the apparent increase is attributable to these factors and, since there is as yet no measure of research output, it is not possible to determine how much increased costs are balanced by increased output.

Scientific expenditures represented 5% of the total 1973-74 federal budgetary estimates, a proportion that has remained almost constant since 1970. Scientific expenditures were reported by 27 departments covering 43 budgetary programs; 10 of these departments each spent more than \$30 million on scientific activities in 1973-74 (Table 9.2).

**Research and development (R&D)** accounted for 72% of the total current expenditures in 1973-74 (Table 9.1). This represents a decrease; during the years from 1964-65 through 1972-73 R&D represented an average 75% of the current expenditures. On the other hand, expenditures for scientific information increased; in 1973-74 they represented \$75 million, or 8% of current expenditures, while in 1970-71 they accounted for 5%.

The Department of Industry, Trade and Commerce and the National Research Council each spent more than \$100 million for R&D in 1973-74. The funds provided by Industry, Trade and Commerce support extramural R&D, principally in Canadian industry, and are provided through established grants programs such as the Industrial Research and Development Incentives Act and the Program for the Advancement of Industrial Technology. The National Research Council spent 41% for in-house work, 10% for Canadian industry and 47% for Canadian universities and non-profit institutions. The 1973-74 R&D expenditures of the Department of the Environment are principally for in-house work, \$86 million of the \$96 million total, but contract expenditures are increasing. The Medical Research Council, entirely, and the Department of National Health and Welfare, primarily, fund extramural R&D activities, while the departments of Agriculture, and Energy, Mines and Resources are mainly performers of in-house R&D. Over 70% of the expenditures of Atomic Energy of Canada Limited and the Department of National Defence are for in-house R&D work but both also provide significant support to the extramural sector.

**Related scientific activities** expenditures of the federal government are devoted almost entirely to intramural operations — the \$288 million budget for 1973-74 included \$249 million in-house expenditures and \$1 million for administration of extramural programs. Table 9.3 gives a breakdown of expenditures by the main performers. The Department of the Environment is the major funder of these activities, allocating almost \$124 million to intramural activities.

Scientific data collection — the gathering, processing, collating and analyzing of data on natural phenomena — is the principal related scientific activity supported by the federal government with expenditures of \$102 million in 1973-74. Examples of this activity include the collection and analysis of meteorological data by the Atmospheric Environment Service, geological surveys conducted by the Geological Survey of Canada and the collection of data on land use capability under the Canada Land Inventory.

Scientific information activities include the operation of libraries and the dissemination of scientific information and knowledge. This is rapidly becoming one of the most important related scientific activities of the federal government. Expenditures for this activity have more than doubled since 1970-71 to \$75 million for 1973-74. The Department of the Environment is the major spender in this area with \$35 million for 1973-74. The National Research Council also provides extensive scientific information services through the National Science Library, the Information Exchange Centre, the Technical Information Service and the publication of scientific research journals as well as support of symposia and conferences. Consumer and Corporate Affairs spent \$7 million for patent information services in 1973-74.

Testing and standardization is an important scientific activity of the Canadian Armed Forces with expenditures of \$38 million, all intramural, in 1973-74. The National Research Council is the second largest spender with \$5 million. The total for this activity in 1973-74 reached \$54 million. Projects include the testing of equipment (e.g. Post Office testing of mail handling machinery) and the development of national standards for materials, products and processes (e.g. the National Building Code).

Feasibility studies are a relatively small (about \$21 million in 1973-74) but important activity. Approximately one fourth of such expenditures are for studies carried out in federal establishments; the remainder are contracted to industry. The Canadian International Develop-