

of Government and of industry. The secondary or manufacturing industries depend to a very large extent on science, to an even greater degree than do the primary industries. If, therefore, the economy is to expand further, scientific research must be expanded at a faster rate than the economy itself. A continued increase in research in Government institutions is therefore essential. At the present time much research that affects industries of all sizes in Canada is done in federal and provincial laboratories, and this will continue to be true, particularly in large scale or expensive fields such as aerodynamics and atomic energy. Government laboratories and Technical Information Services are also particularly useful to the smaller industries which cannot hope to be technically self-supporting. At the present time the picture as far as Government laboratories are concerned is healthier than that of the universities or of industry. Canada is spending per capita an amount which is roughly the equivalent of that in the United States or Great Britain on Government laboratories, while support for research in universities and spending on research in industry lags considerably behind. In spite of this, however, research effort is expanding rapidly in all countries and a continued growth of government research laboratories is essential. This is particularly the case because of certain limitations to research in industry in Canada.

INDUSTRIAL RESEARCH

"With the growing importance of a secondary manufacturing in our economy, research performed by industry itself has been on the increase. Before the last war, secondary manufacturing contributed about 15 per cent to the net output of the economy and employed about the same percentage of the civilian labour force. Since the war these proportions have risen to 22 per cent of total net output and to nearly 20 per cent of the civilian labour force.

"Before the war Canadian secondary industries spent less than \$5 million a year for scientific research. In 1956 they spent about \$80 million, which represents an increase of 20 per cent over the previous year. More than 80 per cent of current expenditures is for research in company laboratories in Canada, and only 18 per cent for work done outside Canada. These figures may indicate a departure from the former dependence on research conducted by parent companies outside Canada.

"A significant fact about these research expenditures, however, is that about 65 per cent of them are made by a relatively few large companies. This top-heavy pattern differs little from what is found in other industrialized countries. Not only do larger companies conduct more research; they are also more alert to the work of government laboratories, and to the services provided by the provincial

and federal governments. One explanation of this, of course, is that changes in products or techniques which are suggested by research involve capital outlay which the larger firms can better afford. It is an historic fact, however, that many of our large firms of today owe their expansion to the successful use of scientific techniques.

"Compared with the United States or Great Britain, Canadian expenditure on research by industry is relatively low and there is no question that it will have to expand in the future if Canadian industry is to continue to develop. There are, however, many difficulties ahead. These include the control of Canadian companies from abroad, the tendency for research to be done by the parent organization, the relatively small size of most Canadian companies, and above all the relatively small Canadian market as compared with the market in the United States. In spite of these difficulties, however, the last ten years have seen a very considerable expansion in Canadian industrial research and the future outlook is definitely encouraging. It is, however, essential if such an expansion is to occur that the supply of competent scientists and the general scientific atmosphere be satisfactory. This means that research in the universities and in Government laboratories must be maintained on a high level if the expansion within Canadian industry is to take place.

"The whole Canadian scientific picture thus looks encouraging. It will, however, necessitate a major effort to bring about the type of expansion that will be required for the future. This effort involves above all continued and increasing support of Canadian universities which are the sole source of supply of the people necessary for an expanded scientific effort. In addition industrial research rests on the foundation of pure science and of long-term applied science, and it is essential that every encouragement be given both to university and to Government research in these fields."

AWARDS AND COMMITTEE SERVICES

"The Awards and Committee Services Branch administers all Council activities associated with the support of scientific research in Canadian universities.

"A major portion of the work of the Branch is the operation of an extensive scholarship programme designed to assist outstanding students in Canadian universities who are taking postgraduate training. To graduates in science, engineering, mathematics and psychology, Bursaries are offered for the first year, and Studentships for subsequent years of postgraduate training. The former have a value of \$800, the latter a value of \$1,200 for the academic year; summer supplements amounting to \$800 may be added, at the discretion of the students' supervisors, for work during the summer months. A few Special Scholarships