

FIRST CANADIAN FISHING CHART

ENCOURAGING CANADA'S INDUSTRIAL GROWTH

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areas of advanced technology, where the risk exceeds normal business practice, a "rifle" approach in the form of direct assistance is more likely to be effective than the "shotgun" approach provided by tax incentives.

NEED FOR SHARPER TOOL

A sharper tool for the support of Canadian "bright ideas" is provided by research-assistance grants administered by the National Research Council and the Defence Research Board in the civil and military sectors respectively. In both programmes, costs are shared 50-50 with industry, and support is extended over a period of years. In 1964, the NRC Industrial Assistance Programme will invest about \$3 million in some 104 civil-research projects, while the DRB Defence Industrial Research Programme will provide almost \$5 million for approximately 100 defence-research projects.

Probably the most difficult stage in translating an idea into a useful product is the development phase, because of the complexity of the process and its relatively high cost (which may exceed the cost of the original research by a factor of ten). In the defence sector, we have evolved the Defence Development Sharing Programme, which complements the U.S.-Canada Production Sharing Programme initiated by the Department of Defence Production in 1958. This programme is supporting some 45 development projects, to the extent of \$19.5 million in the current fiscal year. The list of projects comprising this programme includes such items as STOL and VTOL aircraft, gas-turbine power-plants, reconnaissance and navigation systems, radar and communications equipment. Indeed, the span of our endeavour extends from the earth's surface (rough terrain vehicles and hydrofoil craft) to outer space (atmospheric sounding rockets and satellite communications).

SHORTAGE OF CIVIL-DEVELOPMENT PROJECTS

The obvious gap in our spectrum of assistance is in the important area of civil (or non-military) development. As indicated earlier, I believe that our most critical shortcoming lies in the application of science to the development of new or better products. In view of the established need for a major expansion of our industrial R-and-D activity, coupled with our successful experience with the Defence Development Programme, we are now actively exploring the possibility of extending direct financial assistance to promising civil-development projects. This would be in line with the practice of many other advanced industrialized nations, and would offset to some extent the relatively modest level of our defence development expenditure, which, in other countries, has served to underwrite technological progress in the civil sector.

In entering the civil-development field, we shall, of course, encounter many new problems and some basic policy questions. For example, what criteria

should be applied to the selection of projects for support? The determination of the market requirement becomes much more complex and economic factors will have to be taken into account. What funds will be required and what proportion of the cost of any given project should be borne by government? Should these development funds operate on a "loan" or a "grant" basis and, in the former case, should it be expected to become self-supporting? What should our patent policy be? Should the Government retain patent rights and seek to recoup its outlay in the form of royalties?

Although the foregoing represents a formidable array of potential problems, I can assure you that they are receiving close attention by my officials and that solutions must be found in the very near future. For, if we are to keep pace with the dynamic technical and economic progress of this modern world, it seems clear that we must seek to double or even triple the level of developmental activity in Canadian industry as rapidly as possible. Obviously, this cannot be accomplished overnight, but I should suggest that a target annual-growth rate of industrial R-and-D of the order of 20 to 25 per cent *per annum*, sustained over a period of five years, will be required to achieve our essential objective of overcoming Canada's "technological lag". As a longer-term goal, we should aim at a progressive growth in all scientific and technical sectors to attain the recommended national research ratio of 2.2 per cent GNP, in order to bring Canada up to parity with other modern industrialized nations.

You may conclude from the foregoing remarks that the Department of Industry is seriously concerned with the relative scarcity of technological resources upon which the future health of our manufacturing industry and indeed our national economy depends. Some philosopher (doubtless an engineer) has said that "innovation is the yeast in the industry brew". In any view, science and technology must permeate our industrial structure, and management should recognize the material and economic benefits that can accrue from their rapid and efficient exploitation.

Our task seems clear - we must create an intellectual climate which will stimulate new ideas, we must develop a business attitude which is receptive to technological progress, and we must broaden and strengthen the creative capability of our industry. This means more scientists in industry, better research facilities, many more engineers to apply results of scientific progress and the re-investment of a large share of company earnings in research and development. We must also achieve a much closer "coupling" between the scientific activities of our government research establishments, our universities and our industry. Above all, we must abandon our "follow-the-leader" or "branch-office" complex and begin to exercise our native talents and initiative; for it is not merely a matter of short-term profit or loss, but may ultimately become a question of our economic survival as a nation....
