

BIRTHS, MARRIAGES AND DEATHS

could effect a doubling of real personal incomes within less than 20 years. The realization of this possibility would, of course, require corresponding increases in the rate of investment in new plant and training of manpower. Nevertheless, there is no doubt in my mind that, for our process industries at least, there is a latent potential for worthwhile improvement in productivity by the application of automatic process control which we cannot afford to overlook.

PROCESS CONTROL CENTRES

The case for automatic process control centres around the quest for improved plant efficiency and the achievement of higher product quality. With the increasing complexity of manufacturing processes, the demands for greater uniformity of product and the need for higher rates of output, the efficient control of modern industrial plants is rapidly passing beyond the capability of the unaided human operator no matter how skilled he may be. The multiplicity of parameters which must be taken into account and the speed with which decisions have to be taken and control adjustments made, virtually dictate the use of computers for this purpose.

In controlling industrial processes, I understand that techniques very different from those involved in data processing are required, since the computer must interface with a complex dynamic system and operate in a real time environment. Moreover, in addition to replacing the mechanical functions of the human operator, the computer must learn the "feel" of the process (corresponding to the human judgement factor), so that each practical application has to be developed from scratch. This necessitates the employment of technical personnel with multi-disciplinary skills and, in the case of sophisticated processes, may take two years or more from planning to implementation. Automatic process control is, therefore, not something that can be brought off-the-shelf and installed on a moment's notice. Rather, it is a technique which must be learned for each industry and the optimum solution must be tailored to the specific needs of each individual situation....

INTERNATIONAL ASPECT

Exports of primary products account for something like 16 per cent of our gross national product, and it is vital to our economy that the prices of such products remain competitive on the international market. Therefore, we must strive for the maximum efficiency in the extraction and processing of our primary products to offset any handicaps arising from the exploitation by foreign producers of higher-grade resources, lower labour costs or technological advances. Certainly, even very small improvements in the efficiency of process industries with large "throughputs" resulting from the introduction of automatic process control could pay large dividends in earning capacity.

On a related theme, I am sure there will be general agreement that we should seek every opportunity to upgrade the value of our exports of primary prod-

ucts by further processing in Canada. This, of course, is not always economically feasible, particularly where we must compete against well-established or larger-scale producers. I should like to suggest however, that by fully exploiting the resources of new technology generally and automatic process control in particular, we can make significant progress toward this desirable goal.

Although the foregoing has emphasized applications for primary industry, I am equally certain that similar opportunities exist in the secondary sector, such as chemicals, petroleum products, synthetic materials, and food products, to name a few.... I am not suggesting that automatic process control is a panacea for all our industrial ills, or that every firm can benefit. However, as a technique for increasing industrial efficiency, I consider that it merits serious study by all segments of our processing industry.

ENHANCING PRODUCTIVITY

Finally, I should perhaps say something of the role which the Government is playing in this regard. When the Department of Industry was formed in 1963, it was given some fairly explicit terms of reference, but I think our primary mission is best summed up in the phrase "to enhance industrial productivity". The three principal factors affecting productivity are, of course, the state of technology, the scale of operation and the skill of management and labour. All of our endeavours for enhancing productivity are designed to contribute to improvement in one or other of these categories and I should like to mention briefly some of the relevant programmes which have been initiated for this purpose.

On the technological front, our major effort has been to stimulate technical innovation by providing financial incentives and assistance for research and development activity in Canadian industry. In addition to the general tax incentive, there are four programmes of direct financial assistance.... I should expect that there are many aspects of the application of automatic process control which might qualify for support under one or other of these programmes.

On the production side, we are proposing to provide for the remission of customs duties on production machinery not available from Canadian sources as a means of encouraging our industry to equip itself with the most modern plant. Other programmes aimed at modernizing different sectors of our secondary manufacturing industry are also under current consideration.

On the upgrading of industrial skills, one of the most important factors is the rapid and effective dissemination of technical information, and better means for achieving this objective are being actively investigated by the Department. Another facet of this subject is, of course, the sponsorship of seminars.... as a means of promoting the introduction of new technology. In this regard, the direct communication between users, suppliers and the universities will afford opportunities for mutual co-operation, which, I am sure, will lead to worthwhile results in grappling with the wide range of technical problems confronting our manufacturing industries....