

Section 2.—Scientific and Industrial Research in Canada.

The signal for the practical application of science and invention to industry on a wide scale was given between 1750 and 1800 when the steam engine, supplemented by the inventions of Hargreaves, Compton, and Cartwright, revolutionized the textile industry, then transportation, and finally all industry and gave to Britain the lead that placed her in the vanguard of industrial progress. But for many years the scientific point of view was not understood and scientists were pictured as absent-minded men who had little or no conception of the practical details of everyday life. As late as 1794, Lavoisier, the great chemist, lost his head at the guillotine because, in the words of the President of the Court, "the Republic has no need for chemists".

In Canada, the need for co-ordinated research was not widely recognized until the War of 1914-18. It is true that Canadians had shown initiative and marked ability in many fields of scientific investigation in which individual research was necessary but, taken by and large, industry itself was not alive to the benefits that science could give. From the early years of the War, however, enterprising Canadian manufacturers found opportunities for entering upon new lines of manufacture with practical control of the market at a time when agriculture was booming, prices were abnormally high, and imports of competitive goods were shut off. This was Canada's industrial opportunity. Naturally, factory methods became more specialized and a high degree of administrative and mechanical efficiency was attained, but the times and the conditions were not such as to stimulate interest in research methods. The sheer independence and initiative of the Canadian manufacturer was enough of itself to bring success.

After 1918, the application of research was imperative if Canadian industry was to retain the lead it had won, but the incentive was often lacking: competition was keener and the manufacturer had to cut his costs to the limit in order to survive the successive periods of post-war depression. It was during this time that pressure on the Government for help was greatest. For Government aid to be effective, however, it was necessary to enlist the active support of the industrialist, without undermining his independence and initiative, or chaining him to the routine of government administration.

Up to this time the improvement of old and the discovery of new industrial processes had depended on the initiative of the manufacturer; now they depended on the co-operation of progressive industry with science and the practical application of the results obtained in the laboratories of scientific men. Yet difficulties had to be faced. Under the present economic system, such efforts must not be too centralized. Manufacturers who carry on their own research work are legitimately jealous in their effort to keep the results to themselves. Yet the Government can help even in the most exclusive fields by promoting scientific research along generally useful lines and handing the results over to industry as a whole or, again, by assisting in the solution of individual problems of national importance, as in the case of the separation of radium from Great Slave Lake ores, carried out by the Mines and Resources Department in co-operation with Eldorado Mines in 1933. All considerations point to the necessity for co-operation along such lines wherever possible. If industries engaged in the production of similar articles can be brought to improve their product continually by their own systematic efforts, then the ability of the Government to make joint contributions through the channels of governmental