

The Growth of Canadian Industry, 1939-1948

By JOHN I. McVITTIE

THE most dynamic element in the Canadian business picture to-day is the unprecedented program of investment which is making itself evident in almost every sector of industry. Following the war-time development of specialized production facilities, capital expenditures on the re-equipment and extension of the nation's industrial plant are a tangible expression of confidence in the future of the domestic and export markets for a wide range of products. While the program reflects in part the conversion of war-created plant to peace-time purposes, it represents to a far greater degree the modernization and expansion of manufacturing properties whose development had been postponed through the long depression of the 'thirties and held in check by the pressure of war-time priorities.

War-time Industrial Expansion

The production of munitions, military equipment and ancillary supplies required the creation of a number of specialized industries, the expansion of selected plants and the conversion of others in accordance with the tremendous demands of modern warfare. Guns, small arms, explosives and ammunition were produced largely in new plants owned by the Crown and, in most instances, managed by private manufacturers. Facilities for the construction of aircraft and of ships were built around the very small peace-time nuclei which were available at the outbreak of war; in many respects, the war-time plants in these two fields might almost be considered as new in-

dustries. Canada's outstanding record in the provision of war transportation equipment developed from the considerable expansion of the automotive and railway rolling-stock industries to produce mechanical transport and armoured fighting vehicles. Radio and electrical manufacturing plants were enlarged substantially to undertake the war job of supplying instruments and communications equipment.

In the battle for superior production, in terms of both quality and quantity of war supplies, there was a second front which required careful planning to ensure integration with other aspects of the overall program. The construction of new war plants and the expansion and conversion of existing plants necessitated provision of large quantities of machine tools and other types of production machinery. A wide range of equipment was needed to supply motive power for factories and for war transport: electric motors were used in plants and in certain of their products, while engines, boilers and related fittings were essential in industry and in shipbuilding. The demand for components and parts, especially for aircraft, marine vessels and other mobile equipment, reached into the nooks and crannies of the whole industrial structure and created a general stimulus to enterprises of every size.

The war-time record of Canadian industry is familiar, at least in outline, as a result of the publicity given to the country's achievements during the six years of conflict. What of the import of that record, of those achievements, for the future? In the present connection, formulation of an answer focusses attention on three aspects of the situation which are deserving of special comment.

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Firstly, it should be noted that although war-time demands for a lengthy list of products were met in large part by existing plants, adapted or expanded for the purpose, new facilities were developed for the manufacture of equipment which previously had not been produced extensively, if at all, in Canada prior to the war. Diesel engines and various types of machine and cutting tools, for example, were important additions to the country's production register, while the range of output for electric motors and other power and precision equipment was broadened considerably.

Secondly, the exigencies of war forced the utilization of advanced techniques and new materials which were made available by intensive scientific and technological research. Striking progress was made in the application of new methods, of modern industrial "know-how," as evidenced in planning and organization on the part of management and in the development of new skills on the part of labour. A related effect derived from experience with new processes and materials: Canadian industry is to-day perhaps more conscious than ever before of the fundamental importance of scientific research—both pure and applied—as the basis of industrial advancement.

The third factor of special significance for the future is to be found in the nation's additional facilities for the production of industrial materials and electric power. Most spectacular of the installations in this category have been two associated projects in the Saguenay district of Quebec. The Arvida aluminum plant increased Canada's output from some 83,000 tons in 1939 to 496,000 in the peak year of 1943, a figure somewhat in excess of the total of world production in the years immediately preceding the war. The Shipshaw hydro development in itself accounted for 60% of the war-time increase of two million horsepower in Canada's electric energy capacity. In other parts of the country, new plants for producing aluminum,

brass and copper forms have been of interest to the construction industry and to manufacturing concerns alert to the prospect of additional sources of supply for both old and new materials. Of basic importance in the provision of machinery and equipment is the availability of iron and steel, and in this respect there were notable war-time advances. Canada's steel ingot capacity was increased about one million tons per annum, while there was a marked expansion in rolling-mill facilities and in steel alloy capacity; new shapes, forms and sizes in semi-processed or finished steels have also been added to the list of products from foundry, casting and forging plants. In the field of chemicals, there were considerable increases in the capacity to produce fertilizers and industrial chemicals, while the Polymer synthetic rubber plant, with an output larger than the country's pre-war consumption of natural rubber, is the only plant in the world equipped for the complete conversion of petroleum gases and liquids into various types of crude synthetic ready for delivery to manufacturers.

In terms of finance, the organization of Canada's war-time production facilities was recorded in staggering totals. It is estimated that from September, 1939, to August, 1945, new business investment in plant and equipment exceeded \$4.5 billions, of which about \$3.5 billions were expended directly or indirectly on war projects. The Canadian Government provided more than \$200 millions for the construction of 170 new plants and plant extensions and over \$500 millions for machinery and other equipment. Private expenditure on war plant has been calculated at more than \$500 millions for capital purposes, with a similar total estimated for current expenditures on tooling costs and related outlays, as indicated by reports on war-time allowances for depreciation and depletion and other special tax arrangements. There was also a large volume of invest-

ment financed without the benefit of emergency tax relief or directed into production less closely associated with war needs; in many non-war industries, capital expenditures were individually small and frequently were more than offset by depreciation of prewar assets which could not be replaced or rebuilt. Despite the unprecedented expansion of plant and equipment during the war years, it should be noted that the major part of the investment was channeled into those industries of primary importance to the war program, while productive facilities in other sectors of the economy were impaired in many instances by shortages and other restrictions on the supply of capital goods.

Conversion of War Plants

The transition to peace-time production was facilitated to some degree by the availability of plant and equipment created during the emergency period. It was inevitable, of course, that part of the war-time facilities should prove of limited value, if any, especially in those instances where machinery and other equipment of a highly specialized nature had been required. On the other hand, it is probable that the demand for construction materials and labour was eased somewhat by the release of buildings and other structures from war production.

By 1 June, 1948, peace-time allocation of most war plants and extensions financed directly by the Canadian Government had been arranged. Of the total of 170 establishments, 22 complete units and parts of 16 others, comprising about 37% of the total floor area, have been retained by the Crown. Included in the present list of occupants are Canadian Arsenals Limited—which is using more than 5 million square feet of space to provide for limited output of defence materials and as stand-by war capacity—Polymer Corporation Limited, Central Mortgage and Housing Corporation and several Government Departments. 114

war-built plants and a number of extensions to pre-war factories, representing 51% of the floor space and about 53% of the estimated public expenditure on buildings, have been acquired by lease or purchase by private concerns. Three years after the end of the war in Europe, only about 1% of the floor area was awaiting disposal; the balance of 11% had been dismantled or demolished, because of chemical contamination or for use in current construction. On the basis of the war-time use of the various plants, only in three categories has less than two-thirds of the floor space been transferred to private industry: 60% of the area formerly given over to production of industrial equipment and 80% of that used for ammunition filling has been retained by the Government, while in the case of chemical and explosives plants some 25% of the space is being used for Governmental purposes and another 45% has been dismantled.

As a means of assistance to small firms which ordinarily would rent accommodation, the Government, acting through War Assets Corporation, has established three multiple tenancy projects—in Toronto, Verdun and Montreal—on a temporary basis. Under this plan, 84 firms with a prospective payroll of 6,400 persons are now engaged in the manufacture of a wide range of products.

Many of the commodities produced by concerns occupying leased or purchased properties originally built by the Government are now being made in Canada for the first time; the extensive list includes factory-built bathroom units, new types of furnaces, and a variety of plastic goods. Other products were manufactured or processed in this country before the war, but a number of new firms have entered the picture and the commodities themselves incorporate new features and advanced developments derived in part from war-time research and production experience. Transportation equipment — automobiles, truck

buses, trailers, aircraft, railway rolling-stock — electrical and communications goods for household and industrial consumers, processed and packaged food-stuffs, building materials, textiles and base metal products are included in the general list.

In the conversion of war plants to peace-time purposes, shortages and other problems in the supply of machinery and equipment have created difficulties for both old and new firms. In some cases, it was possible to continue production with the facilities built during the war, although the system of distribution and the channels of marketing required careful review and often reorganization; included in this group are the plants producing basic materials such as aluminum, brass and copper as well as the two nitrate plants at Calgary and Trail which have been so important to post-war fertilizer output. In other instances, conversion has not only forced the development of new or expanded markets, but also the installation of new equipment, the organization of new establishments and the training of new personnel.

A number of the problems just cited apply equally to the companies which have undertaken peace-time production in war plants which were privately financed. In most cases the emergency investment was directed towards expansion of existing plants and related facilities which were usually integrated closely with the original establishments. Here the major problem, perhaps, has been analysis of the domestic and foreign markets to determine the nature and the quantity of products which could be manufactured or processed in the additional plant; for some, the answer has been found in the introduction of new lines of goods, while in others the current demand for durable goods and for basic and building materials has been considered as justifying the formulation of long-range production and marketing plans directly on the basis of past experience.

The Post-war Capital Investment Program

Capital investment in the post-war period has been guided initially by the need for the conversion of war-time production facilities. A favourable environment for those industries most stimulated during the war has been provided by the sudden surge of demand for durable goods in the past three years. As suggested previously, the general direction of conversion plans by private industry has been shaped not only by the availability of facilities created in the emergency period but also by the experience gained by management and by labour in the production of a long list of commodities and materials for which there are actual or potential markets at home and abroad.

Because of special economic conditions in the decade or more preceding the end of hostilities in 1945, there had accumulated a tremendous backlog of capital and maintenance requirements to be tackled as soon as labour, materials, and financial resources became available not only for reconversion but also for modernization and expansion of pre-war facilities. Estimates on capital investment outlays for construction of plant and for the purchase of machinery and equipment, as prepared by the Department of Reconstruction and Supply, indicate the volume of actual and forecast expenditures in this post-war period. For manufacturing and utilities both public and private, it is estimated that the total will be \$2.6 billions for the four years, 1945 to 1948 inclusive; in manufacturing alone, these compilations reveal an increase from \$171 millions to \$540 millions in the same period.

This program of investment has gained momentum rapidly. As conversion of war plant neared completion and as urgent replacements were made, attention was turned to long-range plans and their implementation. In manufacturing, the shift in emphasis is appar-

ent in the increasing capital expenditures on new facilities for the manufacture of textiles, vegetable products, and pulp and paper. The heavy outlays planned by the leading utilities—electric power, railways and telephones—indicate accumulated needs: the expected investment related needs: the expected investment of some \$525 millions by this group in 1948 is close to the total for all manufacturing enterprises together. In agriculture and commercial fishing and trapping, estimates of \$264.5 millions for machinery and equipment reflect the improved position in farming particularly and the continued trend towards mechanization.

Special mention should be made of leading developments in manufacturing. In the pulp and paper industry, for example, a large proportion of the post-war investment is centred on chemical pulp mills, several of which are now coming into operation. Pulp for rayons and cellulose plastics is to be produced at a large plant being erected in British Columbia—a further indication of the increasing association of this important industry with the chemical and textile groups. A considerable part of the planned output for the various new mills is intended for export, although there has also been growth in the production of finished papers and paper products in Canada. Large expenditures by newsprint concerns relate chiefly to modernization and overall improvement of existing facilities for the dual purpose of eventually reducing high costs and increasing output.

In the metals and metal-using industries, additions to production capacity have been undertaken by a number of firms, especially those manufacturing farm machinery and equipment for the telephone and electric power industries. The processing of aluminum—especially into wire, cables and castings—and of other light metals is now reaching a new high both in volume and in the number of firms. Of outstanding interest for

the industry as a whole is the new mill for cold-rolled steel which is expected to begin production soon of a basic material now almost entirely imported.

In chemicals, a widespread program of expansion has been under way since the end of the war. New units for the production of basic chemicals—caustic soda, chlorine, soda-ash and sulphuric acid—together with the Polymer plant at Sarnia will supply materials for the increasing number of processing and manufacturing plants in this group. Additional capacity and new products are also reported by firms making paints, varnishes, synthetic resins, and coatings for textiles and for wire and cable.

In the textile industry itself, investment is in large part centred on modernization to reduce costs and labour requirements. New facilities are being built chiefly for the production of synthetic materials and fabrics: additions to capacity for filament yarns, nylon fibre and rayon fabrics, together with new units for manufacturing staple fibre yarns and nylon flake which previously were imported into Canada.

Other branches of manufacturing are also being affected by the investment program. Additional plant for rubber products—especially foam rubber and synthetic rubber films and fabrics—and for petroleum refining will ensure further supply sources for the Canadian market. The food products industry is being expanded through the construction of a number of new units for canned foods, meat and fish packing, dairy products and flour milling. The heavy demand for construction materials is encouraging additions to plants making cement, bricks, asbestos products and other building supplies.

The Increase in Manufacturing Capacity

It will be evident that the impact of these developments on the long-range structure of Canadian industry cannot

be readily assessed at the present time. The anticipated decline in economic activity following on the drastic curtailment of war expenditure has been offset by industrial expansion for peace-time purposes. Although serious problems relating to procurement of supplies and labour have hampered the general program in many respects, post-war investment has been stimulated by fiscal measures of the federal government, by concessions from certain provincial and municipal governments, and by the availability of private reserves and credit resources. The backlog of postponed maintenance and replacement has been tackled along with new construction and installation of new equipment and machinery, thus providing temporarily the foundation for a high-employment economy.

Estimates on capital investment, however reliable, cannot be taken as a measure of additions to industrial capacity. The overlap of new construction and modernization programs, the necessity of scrapping war-time facilities in many instances, and, above all, the sharply rising price level—these and other less obvious factors make it difficult, if not impossible, to compare the country's pre-war and post-war manufacturing potential. Comparisons of the current levels in industrial production and in employment with those of 1939—indicating an increase of 75% to 80%—do not provide the desired figures on expansion in capacity, for there were many idle men and machines before the war. It is apparent, however, that there has been a substantial increase in the manufacturing capacity of Canada; perhaps a reasonable guess might place that increase between one-third and one-half over pre-war levels, by the end of 1948.

The Future of Canadian Manufacturing

Of greater significance than the measure of the increase is the trend of develop-

ment within the industrial structure itself. Canadian manufacturers are now equipped for a greater diversity of output than ever before; the larger volume of improved pre-war lines has been supplemented by a long list of new products. Thus the dependence of the domestic market on imports for a wide range of commodities and materials is being reduced at the same time as the competitive position of Canadian goods abroad is being strengthened.

As the preceding sections have indicated, a substantial part of the new developments in manufacturing is founded on the nation's established basic industries, which in their turn have also been modernized and expanded to meet post-war requirements. Intelligent exploitation of our natural resources—iron, base metals, asbestos, salt, limestone, petroleum, the forests, and hydro-electric power—will continue to supply a large proportion of the materials needed for the fabrication of construction supplies, engineering equipment, machinery, paper and paper products, and a variety of synthetics. At the same time, the industries concerned with the processing and packaging of foodstuffs and related by-products are being aided indirectly by advances in agriculture and in commercial fishing; the introduction of new techniques, the replacement of outworn equipment and the acquisition of mechanized facilities on the part of these two primary industries is of importance to the whole economy.

Under the stimulus of both military and post-war demands, the various industries using iron and steel have shown remarkable progress, not only in the volume of their output but also in the diversification of products. At the present time, the upward revision of requirements for defence purposes, coupled with exchange difficulties and other restrictions on imports of supplies in this category, together are directing attention to the domestic volume of output in primary steels and industrial components; indeed

it is not altogether improbable that further developments may be anticipated in this field.¹

In the private sector of the economy, the release of the accumulated demand for durable goods has tended to obscure the long-range picture. Looking to the future, it would appear that, once replacement and maintenance programs have been reduced to a more normal size and capital investment in plant construction begins to taper off, Canada will have a substantial surplus capacity for the production of durable goods. Although many products in this category would be strongly competitive in the export market, ability to compete is not in itself the decisive factor in a world where international trade has not been re-established on a multi-lateral basis. Eventual recovery in Western Europe implies a marked increase in that region's production of durable goods for domestic and foreign markets. In the United States, as in Canada, increasing attention will be given to exports as the

backlog of domestic demand is reduced, thus adding to the difficulty of marketing Canadian goods abroad.

The post-war program of capital investment in modernization and expansion of existing production facilities has tended to correct the temporary imbalance which had resulted from the intensive development of selected industries during the war. To-day the efficiency of Canadian manufacturing and its potential output are at higher levels than ever before. In terms of markets, the position is relatively strong for the present and probably for the immediate future. But overshadowing the problem of future consumption capacity in the home territory is the riddle of prospects for foreign markets. The achievement of multilateral trade and of more stable international conditions is essential for sustained prosperity in Canada.

1. At p. 234 of this issue, the significance of the iron and steel industry and its problems is discussed by M. Hollinger in "Steel—The Key to Industrial Expansion."—Editor'.

The European Recovery Program

By RODNEY GREY

THE first reaction of Canadians to the inauguration of the foreign assistance programme of the United States was the hope that our export and currency problems would be solved. It has now become abundantly clear that optimism was quite unjustified. From the very beginning, of course, government leaders like the Minister of Trade and Commerce, Mr. C. D. Howe, warned that ERP was no solution for Canada's U. S. dollar shortage, and that Canadian exporters would have to make even greater efforts to sell their goods in foreign markets as the post-war sellers' market declined.

In addition to ERP, of course, there are other important factors affecting our trade pattern. The major development since ERP was launched is the American rearmament program. Purchases of materials and supplies in Canada may provide a solid floor under our drive for increased exports to the United States. A good deal of such purchasing would tie in with the production of war goods which would be lend-leased to European nations. In the strictly military sphere, this armament scheme is the counterpart of ERP's objectives in the civilian sector of the European economy. Until further policy decisions have been announced, however, its implications for Canadian industry cannot be assessed.

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