

time and export markets with products now largely made in other areas of the Dominion is a case in point. Industries based on the region's raw materials are most valuable because of their additional benefits to the primary industries. Specialty manufacturing in which transportation costs do not add disproportionately to overall costs and the processing of raw materials imported by sea for national and export markets and for the Maritimes may well be another sector with real possibilities.

Assistance towards the establishment and expansion of industry in the Maritimes is now available through a number of channels. Private and public research organizations, in collaboration with Federal Government agencies and with Provincial development departments, are making significant contributions in both the technical and practical fields of activity. The various trade associations, as well as individual enterprises with national business contacts, can also play increasingly effective roles in "selling" the advantages of Maritime location to outside firms and in working with Provincial authorities to the same end.

It would appear that industrial development in the region would be facil-

itated by carefully planned expansion in the primary and basic materials sector. Progress in this direction would perhaps stimulate the output of a wider range of products in certain of the older industries, as, for example, in steel, where diversification would be advantageous. At the same time, increased production of selected materials may open up promising avenues for exploration, leading to substantial growth in secondary manufacturing. In this connection, it is possible that today's growing realization of the industrial implications of a modern defence policy—especially the need for dispersal of plants engaged in essential manufacturing—may also contribute to a broadening of the Maritime economy.

Thus, it may be concluded that there is a variety of opportunities to be examined. With a tide-water position, skilled and available labour, quantities of domestic and readily importable raw materials, a wide market to be extended with Newfoundland's entry into Confederation, and a manufacturing industry which can contribute increasingly to the area and to the nation, the Maritime Provinces form a region of significance to the Dominion in peace and of vital importance in times of emergency.

Quebec: Rich Resources For Industry

By MAURICE LAMONTAGNE

ALTHOUGH Quebec's role has always been of decisive importance in the expansion of the Canadian economy, its future contribution to the economic progress of our nation may well be still greater, if its vast natural resources are exploited on a rational basis. This condition is essential, however. Unless the industrial development of the province is conceived according to a well-integrated plan, it will be largely illusory

and will never attain its long-run objectives.

These are precisely the points which will be emphasized in the present article. Because it is impossible to appraise the future without referring to the present and to the recent past, consideration is to be given both to the present stage of economic development and to its probable evolution. Two aspects of the problem will be discussed in particular: the basic economic factors and the nature of the industrial structure.

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I—Basic Economic Factors

Economic activity may be reduced into fundamental elements which are represented by the specific factors of production, population, capital and natural resources. The industrial development of a country or of a region ultimately depends upon these factors.

In respect to population, the Province of Quebec shows certain characteristics which should be noted. Among the Canadian provinces, Quebec has the highest rate of natural increase. From 1941 to 1944, she contributed 38 per cent of the national increase, although she had only 29 per cent of the total population. In 1881 the number of persons less than 20 years of age in Ontario exceeded by 270,000 that in Quebec. In 1921 it was about the same in the two provinces, while in 1941 Quebec's population in this age group was about 150,000 higher than that of Ontario. If the same trend is maintained during the present decade, Quebec will have 250,000 more young people in 1951 than will Ontario. Even now a greater number of young workers is entering the labour market each year in Quebec than in Ontario.

The trend to urbanization has been very strong in Quebec, especially since the beginning of the twentieth century. In 1941 the proportion of urban to rural population was about 63 to 37, while the national ratio was about 54 to 46. To-day Quebec is the most urbanized province in Canada.

Finally, one other feature concerning population which is worth noting is migration. From 1931 to 1941 net immigration amounted to 6,645, while during the period from 1941 to 1944 the total was as high as 11,000. Migration however is not likely to be important in the immediate future. On the one hand, provincial authorities are not favouring immigration and there is no apparent scarcity of labour; on the other

hand, strong obstacles to immigration exist.

On the whole, then, population will not be a limiting factor in the industrial development of the province. Indeed the reverse situation must be faced: the high rate of natural increase which has been maintained in past decades requires constant and rapid economic expansion if unemployment is to be avoided.

Economic progress, however, is much more conditioned by the availability of natural resources than by population which is, in this respect, a somewhat passive factor. Forest and mine resources, reinforced by an abundant reserve of electric power, will be in the future, as they have been in the past, the dynamic elements in Quebec's development.

Forest resources have played an outstanding role all through the economic history of Quebec. Since 1920, under the impetus of the demand for pulp and paper, forest production has expanded at an unprecedented rate; to-day, this industry is of vital importance to the whole industrial structure of the province.

At present there is good reason to believe that output in this field has attained its maximum and that no new expansion may be expected. According to the most reliable pre-war estimates, forest resources in accessible territories consisted of 66 billion cubic feet. But this general estimate is likely to be misleading. First, it is a very gross approximation; even the experts admit that the best figures are merely guesses, since no serious attempt has yet been made at scientific measurement. Second, annual rates of growth and of consumption are more significant than data concerning total reserves. With an annual rate of growth of 19.3 cubic feet to the acre, the average annual increase has been estimated at 1.5 million cubic feet. Annual consumption during the years 1937 to 1939 approximated 1.1 million

cubic feet, an average which has been greatly exceeded since that time. Here again estimates are far from being perfect, with the result that even the very small margin apparent in pre-war years must be accepted with reservations. On the basis of present practices in logging operations, precise measurements may be obtained, but the extent of damage caused by fires and, above all, by insects is much more difficult to ascertain.

The experts most familiar with the current situation are quite pessimistic about the future. For some time they have been urging an extensive research program, a more effective system of fire protection, and improved methods of conservaton and reforestation. Unfortunately the public authorities have not yet taken steps to implement these recommendations. Under present circumstances, therefore, it is impossible to forecast the future of forest production in Quebec with any degree of accuracy. The least we can say is that, if the present policy is maintained, expansion is not very likely; on the contrary, a decline may be expected.

If forest reserves cannot be appraised even approximately, mineral resources are still less generally known. The best illustration of this fact was presented during the Legislative Assembly's discussion on the bill concerning the Hollinger Company's project in the Ungava, when the Government was obliged to admit that it did not know what it was giving up. Thus, although it is recognized in a general way that the mineral wealth of the province is important, it is obviously impossible to estimate with precision the future expansion of production in this field.

Quebec's mining industry is young. After a rapid growth during World War I, the rate of increase was relatively slow for the next decade and a half. Since the beginning of large-scale mining operations in the Abitibi region in 1935, development has proceeded at an ac-

celerated pace. Production, which amounted to \$28.1 millions in 1933, had risen to \$188.1 millions in 1942. Despite this tremendous increase, however, the danger of exhaustion seems rather remote.

On the contrary, recent reports indicate that Quebec will experience new and important developments in the mining industry. New discoveries are still being made in the Abitibi region. Gold and copper deposits have also been found in the Chibougamau area—a part of the province where activity is expected to expand rapidly as soon as transportation facilities are made available. Lead has been discovered around Richmond Gulf, on the shores of Hudson Bay.

The most important developments, however, are taking place in the Ungava. Test-drilling and surveys of iron ore deposits in that region have been undertaken by various mining interests, especially Hollinger North Shore Exploration Company and Quebec Labrador Development Company. Thus far, information on these projects has been available only in the limited reports issued by the participating companies. The Hollinger group has announced that its target of 300 million tons of proven ore would be reached at the end of this year. The deposits are very high in grade, varying from 55 to 65 per cent in iron content, with 2 to 4 per cent silica and, in some instances, 6 to 10 per cent manganese. Much of the ore is of bessemer quality. Another special advantage is that surface operations are possible; as a result, the average productivity per man-hour is expected to be more than four times greater than that obtained in underground operations.

Iron deposits have been reported in several other areas of the province—particularly along the watershed between Mistassini Lake and the territory conceded to the Hollinger Company—but it is too early to give any indication of possible developments at this time. If the Provincial Government will stimu-

ulate and control prospecting throughout this vast area, it will be kept informed of the extent, the variety and the location of proved deposits. It will then be in a position to determine a general plan of rational exploitation.

In addition to its forest and mineral resources, Quebec has an abundant reserve of cheap power. Present installations provide about six million horsepower, but production can easily be doubled. A vigorous program of expansion is already in progress. An article by W. M. Bonham may well be quoted on that subject. "At Beauharnois, well over a million horsepower remains to be put to use and it was announced recently that preparations for additional generating units aggregating 600,000 horsepower will be commenced shortly. The Shawinigan company are now installing 195,000 horsepower of new turbines at Shawinigan Falls. They will commence in the spring of 1948 construction at the Trench site on the upper St. Maurice of a 400,000 horsepower plant. There remain four more undeveloped sites on the St. Maurice aggregating 620,000 horsepower. Another million horsepower will appear on the outskirts of Montreal when construction of the St. Lawrence Deep Waterway necessitates damming of the Lachine Rapids. Further storage facilities on the Saguenay, St. Maurice and other rivers can provide more firm power at the present sites when the occasion warrants the expense. On the lower St. Lawrence there are numerous substantial powers not yet developed."¹ Finally, abundant reserves can be utilized on the rivers flowing into James Bay, such as the Nottaway, Broadback, Rupert and Eastmain.

In general, we can safely argue that the exploitation of Quebec's vast natural resources — which to-day accounts for about one-third of the net value of production in the province—has formed

the basis for the major proportion of her industrial development. On that account, then, it is possible to predict both stability and rapid progress for the future, provided that markets are available and that resources are well conserved and rationally exploited.

II—The Industrial Structure

With the growth in population and the development of its primary industries, the province has been able to build another section of its industrial structure on the processing and finishing of imported raw materials for both the domestic and the export markets. Thus, industries in this group held an important position in 1939, when they represented 42 per cent of the gross production of consumers' goods, 50 per cent of semi-finished products, 99.5 per cent of transport material and 62 per cent of other equipment. The principle imports utilized by these industries were raw cotton, iron and steel. On the other hand, the province has developed an important export trade, especially in agricultural products, timber, pulp and paper, aluminum and other non-ferrous metals.

Industrialization during the war years were vigorous and rapid; the over-all pattern was greatly changed, while unequal developments previously existing in various lines were accentuated. The share of manufacturing in the net value of production rose from 58 per cent in 1939 to 71 per cent in 1943. Employment in manufacturing increased from 220,321 in 1939 to 437,247 in 1943, with the forty leading industries accounting for 188,368 or 87 per cent of the total increase. Among these, the main contributors were as follows:

Miscellaneous Chemical Products.....	40,564
Aircraft.....	28,566
Shipbuilding.....	23,338
Non-Ferrous Metal Smelting and Refining.....	11,979

1. Canadian Mining Journal, January, 1948.

Iron and Steel Products.....	10,379
Electrical Apparatus.....	10,101
Railway Rolling-Stock.....	8,471

Most of these industries provided typical war-time employment and belong to the group which is most difficult to convert to peace-time production. It is impossible, for instance, to maintain war-time levels in such industries as chemical products, aircraft and ship-building which together employed 5,484 workers in 1939 and 92,468 in 1943. Since the end of the war, employment in that group has been converted to civilian production. With a huge accumulated demand, peace-time industries were able to expand as soon as the various shortages began to disappear.

With the background of the changes in recent years, we may now appraise the prospects for future expansion. First we may analyze the possibilities of development in the sector of the traditional industries of the province. We will briefly consider the main industrial groups.

The largest peace-time manufacturing industry from the point of view of employment is the textile industry. The main feature of this group is its dependence on imported raw materials. It seems that its most important locational factors are nearness to markets, low wages, a large female population and good transport facilities. This industry has a definite weakness: it is not yet able to participate in world trade, it is confined to the domestic market and, even there, it must be protected by high tariffs. The war has meant an important expansion of its production but did not change its long-term position. Thus, when economic conditions become normal, the industry will very likely revert to its pre-war situation, which was characterized by unused capacity and high seasonal variations in production. The structural development of the industry is largely conditioned by population growth, but in the short-run it follows

quite closely the general cyclical pattern.

The manufacture of wood and paper products has long maintained a position near the top in reports on production in Quebec. The two leading industries in this field, comprising the large number of pulp and paper plants and of sawmills throughout the province, have been built in large part to meet the demands of the export market. To-day, these two industries are confronted with common problems, of which the following are outstanding:

1. Disposal of a major share of their output is dependent upon economic conditions in foreign countries;
2. They suffer from unused capacity in normal times;
3. Operations are subject to a wide cyclical variation, resulting in drastic curtailment of production and the closing of many plants in unfavourable years;
4. Raw materials are becoming more and more difficult to obtain.

Although the sawmills are less dependent upon the export trade than is the pulp and paper industry, their present condition is much worse. All the signs of a decadent industry are apparent: high rate of mortality, especially among the largest mills, inefficient organization, small scale operations for most firms, and short periods of production. The industry is faced with competition from British Columbia, where the firms are relatively young and well-organized and have at their disposal rich reserves of high-grade timber.

The great weakness of the pulp and paper mill is its immobility: it cannot migrate as easily as the sawmill when its forest resources are exhausted. Of course, this is not an immediate problem for the greater number of plants, especially those which are located in the St. Maurice and Saguenay regions, but the mill located in the Eastern Townships and

in the Quebec district are faced with this situation now. It does not seem that we should be very optimistic about the future expansion of this industry. After a period of rapid growth and of acute competition, it received a decisive blow during the last depression; thus, a suitable occasion was provided for the formation of an efficient cartel. With a highly co-ordinated and integrated organization, the industry is in a position to control the entry of new enterprises. Furthermore, it will profit from the lesson of the 'thirties and will also be forced to cope with its competitors abroad.

The boot and shoe industry is likewise of major importance in the provincial economy. The main problems which it has to face are remoteness from markets, comparatively high transportation costs, labour problems, and strong foreign competition. Although the industry is still firmly established, there are some signs of migration towards the centre and the west of the country. This is due to a change in the relative importance of locational factors: at present, proximity to markets seems to be what matters, while previously it was the availability of well-qualified and low-paid workers. It would not be surprising to witness here in Canada the same geographical shifts that took place some time ago in the United States.

These brief considerations seem to indicate that entirely new industries will have to be organized if Quebec is to experience rapid industrial expansion on a large scale in the future. From this point of view, the most interesting prospects are in the direction of the mining industry and of the related groups in manufacturing. The iron and steel industry, in particular, offers tremendous possibilities, if we take into account recent technological changes.

This last point is very well presented in the article by Mr. Bonham, to which reference has already been made. We cannot do better here than summarize

his argument. In recent years, two factors have made the electric furnace competitive with the blast furnace for the production of pig iron: improvements in the Tyland-Hole furnace and the rising price of coke. As Mr. Bonham writes: "One of the important inducements to establish the electric-furnace reduction of iron at present is that a furnace of proven merit and of simple and economical design is now available. The Tyland-Hole furnace, developed in Norway during the past decade and now operating in eight different countries under a great variety of conditions, uses the Soderberg continuous electrode, gives a good quality of gas as a by-product and consumes only 2,200 to 2,500 kwh of power per long ton of iron produced. The capital cost is moderate—less per ton of output than the blast furnace." Experience has shown that the relative costs of iron from the two types of furnaces are the same if the cost of one pound of coke is from 1.8 to 2.7 times the cost of one kilowatt-hour of power.

For the conditions prevailing in Quebec, and assuming that power is obtainable at about 3 mills per kwh, then the price of coke would have to vary between \$9.90 and \$13.20 per ton to arrive at the same relative price for pig iron. Since the price of coke is now higher than \$13 per ton, the electric furnace has the advantage over the blast furnace. Considering that the cost of power is not likely to rise and that important improvements can still be made in the new method of ore reduction, Mr. Bonham concludes as follows: "Thus the electric furnace has considerably better than an even chance on the St. Lawrence under to-day's conditions. Any change in these conditions in favour of the blast furnace depends essentially upon two factors: a decided improvement in the output per man-shift of the coal-miners or a drastic cut in wages. Who will say that either of these is likely?"

Even if a large-scale development of the iron and steel industry in Quebec seems desirable and economically possible, we must admit that nothing is being done at present in that direction. Apparently the ore will be shipped directly to the United States without any elaborate processing. Only a strong movement of public opinion might change the situation.

Up to now, the Province of Quebec has developed very rapidly. But this

expansion has already created difficult problems; very often, it has been misdirected and has not contributed enough to the welfare of the population. More than ever before, Quebec needs dynamic and rational planning in order to consolidate the progress that has been made and to expand along new lines of economic endeavour. It is to be hoped that public authorities will appreciate their responsibilities before it is too late.

Ontario: Expansion With Confidence

By HON. ARTHUR WELSH

ANY article dealing with the industrial expansion of Ontario must take into account many favourable contributing factors.

Geographically and geologically speaking the Province is in a good position, and these factors have, from the earliest times, attracted to this section of the country men and women looking for opportunities. It is a truism that nothing succeeds like success, and the successful establishment of the early settlers in our Province has been like a snowball and has gathered momentum through the years.

Many people from all over the world continue to feel that Ontario is likely to offer the biggest opportunities for their future welfare and happiness, and it is with the advent of increased population that the Province will continue to expand in every way.

The fertile and arable lands of Ontario were responsible for the success of the early settlers. Ontario's agriculture is rich and diversified, and has brought wealth and prosperity over the years. In 1947 the cash farm income was about

\$546,000,000, as compared with \$473,000,000 in 1946, and \$453,000,000 in 1945; so it can be seen that this is still a great factor in our Provincial economy.

The emphasis is shifting, however, and during the last 50 years the bulk of the great increase in population has taken place near the cities, and the Province would appear to be changing over from a mainly rural population to a mainly urban one, and from a predominantly agricultural to an important industrial Province.

Improving Transportation

Various things are making this possible—one thing, of course, is the availability of many raw materials, which are actually within our own boundaries, and those which we have not got are easily accessible to us. And in this connection, the excellent transportation facilities play a large part.

The larger centres are served by an unexcelled inland waterway system, and railways, highways and commercial air lines all serve to promote the welfare of the Province. Ontario has no fewer than 12 railroads having more than 10,000 miles of single track, or 25% of the total railway mileage in Canada.