

## AGRICULTURE

TO SPEAK OF Canadian agriculture is to generalize about an industry in which there are some 600,000 productive units varying widely in acreage, in scale of production, in specialization, in receipts, and in net income. A few scattered facts about Canadian farms gleaned from the evidence presented to us and from the study prepared at our request on the *Progress and Prospects of Canadian Agriculture* may be sufficient to make clear the variety that underlies the aggregate statistics.\* In Newfoundland, according to the 1951 census, farms on the average were of only slightly more than 23 acres. In Alberta, on the other hand, the average size of farm was 527 acres, and in Saskatchewan 550 acres. Along the south and southeast coast of Nova Scotia, in much of Cape Breton Island, in the central and northeastern sections of New Brunswick, and in the Gaspé, as well as in Newfoundland, many of the farms are hardly above the subsistence level; and this is also true of northern Quebec and northern Ontario. On the other hand, we were told that in Saskatchewan perhaps as many as 20 farmers own private airplanes;<sup>1</sup> and of course highly prosperous farmers are to be found in other provinces as well. A farmer cultivating four or five sections of good wheat land in the Regina Plains clearly has little in common with a farmer in New Brunswick whose cash receipts from farming may amount to no more than \$500 a year and who ekes out a living by working in the bush or on the roads. He may even have little community of outlook with another wheat farmer in the same province tilling a quarter-section of 160 acres. Nor is there necessarily much in common between a dairy farmer with a large farm on the outskirts of Vancouver and a pensioner working a small orchard of perhaps ten acres in the Okanagan Valley, or between a Nova Scotia farmer specializing in egg production with as many as 200,000 poultry in large hen-houses equipped with mechanical feeders and another farmer in the same province who keeps a small brood of chickens about the house, pastures two or three cows on a stony hillside and earns a little cash income by hiring himself out to do odd jobs. Yet all of these are classed as farmers for

---

\* For the 1951 census, a farm was defined as a holding on which agricultural operations were carried out and which was (1) three acres or more in size, or (2) from one to three acres in size and with the agricultural production in 1950 valued at \$250 or more. A similar definition was used for the 1956 census, although for the most part the results of the farm census made in that year did not become available in time to influence our study of Canadian agriculture.

census purposes. When it is stated — as is true — that productivity in agriculture is lower than in any other sector of the Canadian economy, it must be remembered that output per man-hour on many Canadian farms is probably at least as high as in many manufacturing concerns. When attention is drawn — as it should be — to low average incomes in agriculture, it must be remembered that some Canadian farmers make with fair regularity an income that many of their fellow citizens would envy.

The one thing that Canadian farmers increasingly have in common is an interest in farm prices and farm incomes and a tendency to regard their occupation as a business. Farming in Canada has been moving more and more to a cash basis and becoming more and more commercial. One aspect of this trend is that income in kind, as a percentage of gross farm receipts, has declined sharply over the last 20 years as farmers and their wives have found it more convenient and economical to sell a higher proportion of their output and to buy more of the food and fuel they need in the same way as city-dwellers do. Even in the Annapolis Valley, for example, where apple growing is still one of the most important agricultural enterprises, we were told that some farm households buy cases of tinned applesauce instead of keeping barrels of apples in the cellar.<sup>2</sup> At the same time a higher proportion of farm inputs have been coming from other sectors of the economy and must be paid for in cash. The rapid mechanization of Canadian agriculture since the end of the War, which was mentioned in Chapter 5, has involved larger cash outlays for gasoline, oil and grease and repairs, while the application of other technological advances to farming has involved heavier purchases of commercial feeds and seeds and fertilizer. Another way in which farming has come to resemble other businesses more closely is in its capital structure. In every province farming has become more highly capitalized; and the capital is increasingly concentrated in machinery and implements and livestock rather than in land and buildings. Finally, the more commercial character of agriculture is noticeable in the fact that since 1951 the number of unpaid family workers on Canadian farms has declined rapidly while the number of hired workers has changed very little.<sup>3</sup>

This trend toward a more commercial agriculture is proceeding at a different pace in different parts of the country. But it is visible everywhere. The representative of one of the farm organizations in Saskatchewan, after describing for us how young farmers in the area where he lived had come together to study the application of modern accounting practices to agriculture, remarked that farmers of his generation were now inclined to look on themselves as "straight businessmen".<sup>4</sup> In the brief we received from L'Union Catholique des Cultivateurs, the development of farming in the Province of Quebec was described as an evolution away from agriculture as a way of life toward agriculture as an enterprise.<sup>5</sup> In most

parts of the country it is still both, it is still a way of life as well as a business. But both in reality and in the attitude of farmers toward their own occupation, it is becoming increasingly commercial.

### *Agriculture's Special Characteristics*

But if agriculture is an industry, a business, it is an industry that differs in some important particulars from all others. Perhaps the most fundamental difference is that there is a relatively inelastic demand for its output. This can be called a fundamental difference because it arises from something immutable in human nature, from the fact that the lusts of the eye and of the other senses are more insatiable than physical appetite. There may be little limit to the amount of chrome a man may want on his automobile or to the frequency with which he can be persuaded to change it. There is a limit to the amount of food he can eat. He can hardly be stuffed with grain like a Strasbourg goose; and even if his tastes, as he grows wealthier, run to richer and more varied fare, the returns accrue more to the processor and the restaurant keeper than to the primary producer. So, after a certain level has been reached, the demand for foodstuffs rises much less rapidly than rising incomes, while the demand for many manufactured products follows the income curve upwards or moves ahead of it. Put in economic terms, that is to say that the income elasticity of demand for farm products as a group is relatively low. Closely related is the fact that the price elasticity of demand for many farm products is likewise relatively low. A drop of 10 per cent in the price of potatoes will result in little increase in consumption, while a similar drop in the price of television sets may clear out all the surplus stocks that dealers have on hand.

Of equal importance are the inelasticities and immobilities on the supply side of agriculture. The temperament of the agricultural industry, increasingly commercial though it has become, is still necessarily attuned to the slow wheeling of the seasons and the slow fulfilment of biological processes. After a farmer has put in a crop there is little point in closing down the factory. After a sow has farrowed, it would be silly to slaughter the innocents even if there has been a sharp fall in the price of hogs. There is little to be done but wait until the pigs are ready to be sent to market and then take whatever price they will fetch. Nor do farmers ordinarily cut back their intended production because of a clouding of business expectations. Few things in agriculture are more remarkable than the constancy of farm inputs in bad times as well as in good and the constancy of total agricultural output, provided nature is reasonably kind. Similarly, farmers themselves are relatively steadfast and immobile. With conditions of full employment, it is easier for farm workers to leave agriculture; and this process is also facilitated when agricultural incomes have been high, so that farm owners have enough money to enable them to start on a

different life or to retire and their neighbours have enough money to buy them out. But farming, as we have said, remains a way of life as well as a business. All that that implies make it harder for farmers to shift to other occupations, although in good times their sons may feel much more footloose and hired hands then may come and go so quickly as to be of little use.

The relatively inelastic demand for foodstuffs and the relatively inelastic response of agricultural production to changing prices, when coupled with the fact that there are a large number of producing units in agriculture, explain the wide fluctuations in farm prices and farm incomes. Farming is open to the hazards of the weather and of plant and animal diseases so that inevitably there are sharp unplanned variations in the output and supply of particular commodities. In the face of relatively inelastic demand, the result is a wider fluctuation in the price of foodstuffs than in other wholesale prices.<sup>6</sup> Whereas the price of nickel or newsprint may remain unchanged for a year or more, the price of many agricultural commodities fluctuates from day to day. An analysis that has been made for us of the variation in wholesale prices of farm and non-farm products suggests that the spread from year to year in the price of Canadian farm products over the 20 years from 1936 to 1955 has been almost twice as great as the average annual variation in other wholesale prices.<sup>7</sup> Moreover, swings in farm prices are also accentuated by cyclical movements peculiar to agriculture. Farm incomes are comparatively unaffected by fluctuations of the business cycle so long as the downswing does not go so far as to produce a drop in total effective demand for foodstuffs. But agriculture has epicycles of its own that amplify variations in farm prices. When the price of grain is low relative to the price of livestock, many farmers see a prospectively promising market for cattle or hogs and, acting independently and without knowledge of the plans of others, take steps to increase their production. Then the price goes down and many of them cut back their livestock inventories. But these cycles of production run over three to six years or more, the length of the cycle depending on the type of livestock, with the result that prices fall further at the peak of the cycle than they would if agriculture were a business more immediately responsive to price changes.

Again because of the relatively inelastic nature of demand, farm prices have a more dominant influence on aggregate farm income than is true in other industries. Individual farmers, of course, who have a good crop when crops generally are poor and prices are high, will do very well both because of the volume of their sales and the prices they can command. But aggregate agricultural income would seem to be chiefly affected by the level of agricultural prices, in the absence of catastrophic and persistent crop failures or abnormal changes in total demand. The depression of the '30's cut so deeply into incomes that there was a sharp drop in effective demand



for foodstuffs, so that consumption as well as prices was reduced. Conversely, the heavy demand for North American foodstuffs during many of the War years and in the five or six years after it, when agricultural production in other parts of the world had not yet fully recovered, meant that Canadian farmers were profiting both from higher prices and from a heavy volume of sales.

But such a favourable situation is uncommon. There is persuasive evidence that for many decades in the industrialized countries of North America and Western Europe, as well as in less advanced areas, agricultural incomes have lagged behind others. The reasons are not entirely clear. It is somewhat obscure, for example, why even a very rapid introduction of technological improvements in agriculture does not seem to improve the relative position of agricultural producers, although, of course, it helps to create higher real incomes for the whole community, farmers included. On the other hand, there is wide agreement that the inelastic nature of the demand for farm products and the inelasticities and the rigidities on the supply side of agriculture are both important elements of an adequate explanation. If demand were not comparatively static, there would not be so strong a tendency for technological improvements, as they spread through agriculture, to produce an over-supply of farm products. If farmers were less rooted to the land, technological change, together with the greater efficiency and competitive pressure that it brings with it, would lead to an even greater exodus from farming than in fact occurs, and in this way would counter the persistent tendency toward a relative decline in average farm incomes.<sup>8</sup>

### *External Demand*

In trying to explain the characteristics of agriculture that set it apart from other industries, we have spoken as though domestic demand were all that needed to be considered. That is of course an over-simplification. If external demand is expanding and effective, it can be sufficient to offset the tendency toward over-production that seems almost inseparable from agriculture in an industrial economy. The attitudes of many Canadian farmers and many members of the public toward agricultural production and agricultural policy have been deeply coloured by the fact that through long periods in the past agricultural production in this country has been chiefly directed toward satisfying growing external demand. The question we must ask is whether such conditions are likely to be found over the next twenty-five years.

Wheat will continue to bulk so large in our total agricultural exports that it deserves separate treatment in any discussion of prospective external markets. In attempting to assess the amount of wheat that Canada may expect to sell over the next two or three decades, we have first estimated the total volume of wheat that is likely to be traded internationally and

have then made a judgment of what proportion of this volume Canada may expect to supply.

The record of the international trade in wheat since the turn of the century is shown in Table 8.1, together with some indications of the sources from which it has come. It will be seen that with growing population, growing demand and comparatively mild import restrictions, world trade in wheat grew steadily for the first three decades after the turn of the century until markets collapsed in the '30's. The latter years of the War brought a great expansion in wheat exports and this trend continued until 1951 while wheat production in Europe and rice production in the Far East were being restored. Although some downward drift was discernible in following years, the amount of wheat currently entering world trade is still substantially above the amount that was traded in the years immediately before the War.

Any judgment of the probable size of world trade over the next two or three decades must take into account anticipated population growth in many parts of the world; the prevalence of government programmes to promote a higher level of self-sufficiency in foodstuffs, and particularly in cereals; and finally, the fact that, after a certain standard of living has been reached, the demand for wheat is less elastic than that for almost any other food. In Chapter 2 we gave some indication of the population growth that may be expected in various parts of the world and in Chapter 4 we described the scope of agricultural protectionism. But the inelastic demand for wheat in highly developed countries also needs to be stressed. In North America, for example, per capita consumption of wheat has been declining since the turn of the century, and the demand for it now contracts with rising incomes more than for any other foodstuff with the exception of potatoes, dry peas and beans, and salt sides and lard.

This characteristic of the demand for wheat in highly developed countries must be borne in mind in attempting to estimate the probable volume of world trade. In many of the countries of Western Europe, for example, including the United Kingdom, France, Belgium, Switzerland, Spain and Ireland, per capita wheat consumption has been declining. Moreover, in most of these countries population growth is likely to be slow. In a few other countries of Western Europe, including Western Germany and the Scandinavian countries, although per capita consumption of all cereals has been declining, per capita consumption of wheat has been increasing because of a shift away from rye as the principal bread grain.<sup>9</sup> There have also been per capita increases in wheat consumption in Italy, Greece and Yugoslavia, where the standard of living on the average is still considerably lower than elsewhere in Western Europe. As a result, however, of declining per capita consumption in many of the countries of Western Europe and the expectation of only moderate population growth in the area as a whole, it should not be expected that any substantial

Table 8.1

## WHEAT AND WHEAT FLOUR—WORLD EXPORTS BY PRINCIPAL COUNTRIES

(averages: 1900-54; annual 1945-55)

	Four major exporters						Eastern exports <sup>c</sup>	Other	Total exports
	Argentina	Australia	Canada <sup>a</sup>	U.S. <sup>b</sup>	Sub-total				
	%	%	%	%	mil. bu.	%			%
1900-09 <sup>d</sup> .....	14.1	4.4	6.4	26.0	303	50.9	38.7	10.4	596
1910-19 <sup>d</sup> .....	13.4	8.3	19.2	27.5	455	68.4	19.6	12.0	665
1920-29 <sup>d</sup> .....	18.4	10.5	31.8	26.4	732	87.1	4.8	8.1	840
1930-39 <sup>d</sup> .....	18.3	16.1	28.3	10.6	520	73.3	12.5	14.2	710
1945-54.....	8.4	9.9	29.9	40.4	818	88.6	—	11.4 <sup>e</sup>	923
1945.....	8.0	4.2	42.2	45.6	856	100.0	—	—	856
1946.....	7.7	6.0	29.9	50.9	736	94.5	—	5.5 <sup>e</sup>	780
1947.....	10.9	10.3	22.4	52.0	893	95.6	—	4.4 <sup>e</sup>	934
1948.....	6.2	12.3	22.1	50.9	909	91.5	—	8.5 <sup>e</sup>	991
1949.....	10.7	13.8	28.7	36.2	737	89.4	—	10.6 <sup>e</sup>	825
1950.....	11.0	13.5	23.5	39.1	817	87.1	—	12.9 <sup>e</sup>	937
1951.....	2.8	9.3	32.5	44.6	951	89.2	—	10.8 <sup>e</sup>	1,066
1952.....	2.9	10.0	39.7	32.2	838	84.8	—	15.2 <sup>e</sup>	988
1953.....	12.5	8.1	32.7	24.7	686	78.0	—	22.0 <sup>e</sup>	879
1954.....	13.6	9.6	26.1	28.2	752	77.5	—	22.5 <sup>e</sup>	970
1955.....	11.3	10.3	28.4	34.0	854	84.0	—	16.0 <sup>e</sup>	1,016

a Includes exports of "wheat unfit for human consumption" from Canada to U.S. as follows: 1950-51, 12 mil. bu.; 1951-52, 30 mil. bu.; 1952-53, 20 mil. bu.; 1953-54, 4 mil. bu.; 1954-55, 3 mil. bu.; and 1955-56, 9 mil. bu. Also includes wheat exported to the U.S., a part of which was milled in bond and later exported by the U.S.

b Excludes the wheat equivalent of exports of flour milled in bond. Includes principal products other than flour.

c Includes U.S.S.R.

d Calendar years.

e Eastern Europe combined with "other".

SOURCE: *The Wheat Situation*, United States Department of Agriculture (Agricultural Marketing Service), Oct. 31, 1955, Table 15, and Oct. 31, 1956, Table 17.

increase in the volume of world trade will come from this quarter. Moreover, the governments of all these countries have been active in promoting domestic production. In the Soviet Union and the countries of Eastern Europe within its orbit, agricultural production seems to be placed at a continuing disadvantage in comparison with industrial production and the chronic difficulties to which it is subject may necessitate substantial imports of wheat from time to time which will tend to increase the volume of world trade. But these requirements can be arbitrarily curtailed by the totalitarian controls exercised over consumption standards, and foreign purchases can be subordinated to political objectives, so that it would be unwise to count on any significant increase in the volume of world trade from this source.

In South America population is increasing rapidly and per capita consumption of wheat may also be expected to rise in most countries. On the other hand, the opportunities for expanding wheat production are very great and many South American countries have already made remarkable strides toward becoming self-sufficient. Through new irrigation projects and the use of improved seeds and fertilizers, Mexico, for example, in recent years has moved to a position where in most years it can dispense with imports. Since the end of the War Brazil has been the fourth largest importer of wheat in the world, ranking only after the United Kingdom, Western Germany and Japan. It too, however, has increased its wheat production prodigiously so that its output is now almost six times as large as before the War.<sup>10</sup> In general, it seems unlikely that the importing countries of South America will be responsible for much, if any, increase in world trade.

Such increase as is to be expected will probably come almost exclusively from countries in Asia and Africa such as Egypt, India, Pakistan, and Japan where poverty is still deep and widespread and where there is abundant room for an increase in per capita consumption of all cereals and of wheat in particular. How world trade will be affected by their requirements will depend on how fast their populations increase; on how successful they are in promoting economic development and raising standards of living; on how self-sufficient they can become in the production of cereals; on changes in consumption habits, including in some countries a shift from rice to wheat; and on how acute are the exchange problems they have to deal with. In most of these countries substantial population growth is to be expected. It may also be expected that their efforts to encourage economic development will bear fruit. But they are all endeavouring to increase their domestic production of food grains and already some of them have had considerable success. Cereal production in India, for example, during the years of the first Five-Year Plan increased at a faster rate than population and an even larger increase is projected over the period of the second Five-Year Plan.<sup>11</sup> Japan, on the other hand, many of whose people have

developed a taste for wheat rather than rice as a result of the post-war Occupation and continuing United States assistance, has a dense population and relatively little arable land. Although in Hokkaido there is considerable acreage that might be brought under cultivation, it is inconceivable that Japan will ever be able to produce all the food it needs.<sup>12</sup> More generally, it may be doubted whether agricultural production in these countries, taken together, can keep pace with population growth and provide for at least the modest improvement in nutritional standards that is essential. Instead, it would seem that the growth of population in the countries of Africa and of Asia and the Far East is at present exerting some upward pressure on the volume of world trade in wheat and will continue to do so over the next two or three decades, although this pressure will be checked by exchange difficulties and by government policies designed to stimulate domestic production.

As we see it, world trade in wheat over the next few years may drift down from a present artificially high level at which it is being maintained by United States disposals in excess of normal commercial marketings. Over the long run, however, the level will be pushed slowly upward by population growth and by rising effective demand in many of the countries of Asia and Africa, so that over most of the next two or three decades it may hover around a total of 950 million bushels.

Of a total world trade in wheat of that order of magnitude what proportion might Canada expect to supply? The advantages and disadvantages of Canadian producers can be stated very simply. Canada has hard wheat to export; but it has to be paid for in hard currency. The United States at the present time is exporting wheat for soft currency or no currency at all, and at cut-rate prices that would not be possible if the United States Treasury were not subsidizing American wheat producers so handsomely. So long as that policy continues, the Canadian Wheat Board will have difficulty in securing a fair share of the world market for wheat produced in Canada. We must hope, however, that the efforts now being made to dissipate United States stocks and to prevent the accumulation of very large surpluses in the future by taking wheat acreage out of production will be successful. To the extent that it is, our problems will be eased. The Argentine has also traditionally been a large exporter of wheat and is now coming back strongly into the market. It has hard wheat of high quality, which can be purchased for soft currency, and in the years ahead may offer vigorous competition. The next most important competitor in the world market is Australia and it, too, enjoys the advantage of selling wheat for soft currency. This is attractive to many Asian countries, which, moreover, have not the same preference for hard wheat as is shown by millers in the United Kingdom and the countries of Western Europe. These four countries — the United States, Canada, the Argentine and Australia — are the most important exporters and normally supply about 80 per cent

of all the wheat that is traded internationally. In addition, both France and Turkey in recent years have exported large quantities. But they are both high-cost producers and it may be doubted whether either of them can afford permanently to subsidize wheat exports so heavily as they have been doing in the recent past. Since 1920 Canada has accounted on the average for 30 per cent of the world's trade in wheat. We are inclined to think that when the present exceptional surpluses throughout the world have been reduced, and when the United States stops dumping wheat at cut-rate prices throughout the world, we should be able to obtain on the average about that share of the total market. That would mean that, over the short run while there is stiff competition in disposing of surplus stocks, we might not be able to export more than 220 million or 250 million bushels annually, but that over most of the next two or three decades our average annual exports should run between 255 million and 300 million bushels. At that rate, total requirements of Canadian wheat from both external and domestic sources might amount to between 370 million and 415 million bushels in the immediate period of heavy surpluses and to between 435 million and 480 million bushels over the longer run. Others may quarrel with those estimates, which we need hardly say are put forward very tentatively. But we doubt whether there will be much disagreement with the broad conclusion that, while Canada should be able to maintain, it will have difficulty in increasing, its traditional share of a world wheat market that will be expanding only very gradually over the next twenty-five years.

Nor, in our opinion, is much increase in Canadian exports of other agricultural commodities to be expected. Import restrictions in other countries will hold them down, as well as the pressure of Canadian domestic demand, and the rising cost of some Canadian production. In the past many Canadian farmers produced large quantities of a number of commodities, including cheese, bacon and apples, for export to the United Kingdom and other overseas markets. Those markets have now almost vanished and will probably never be recovered. It might perhaps be taken as a symbol both of the way Canadian farmers have bid them farewell and of the deep and intimate influence on Canadian production of changing external demand that many Nova Scotian apple-growers, by a gradual process of grafting, have been replacing varieties preferred in the United Kingdom with varieties to be sold in Canada, and, if possible, in the United States.<sup>14</sup> Other than wheat, our principal overseas exports of agricultural commodities in recent years have been coarse grains, with substantial quantities of barley, in particular, going to the United Kingdom for feed and to Japan for food. Some of these sales have clearly been exceptional and it would be rash to believe that most of this trade will be permanent. The United States has also been taking large quantities of coarse grains, chiefly because Canadian barley is preferred by United States maltsters and Canadian oats are preferred by New England cattle breeders. The probable

volume of this trade is also unpredictable. But in our opinion total exports of coarse grains are likely to fall below the volume exported in 1955 as progress is made in overseas countries with programmes to promote self-sufficiency and as Canadian requirements increase. Overseas markets have also been of some importance for producers of tobacco, seeds, and oil cake and meal; and we would expect such sales to continue, and even increase somewhat. But for most agricultural commodities other than wheat, the United States in our judgment will be the only market of any consequence over the next twenty-five years; and even in that market we would not expect much expansion, as may perhaps be illustrated by our anticipation for livestock and livestock products. There will continue to be some border trade in livestock; some cattle will still be shipped to the United States for finishing; there will be some export of purebred breeding stock; specialty pork products will also move across the border in more than negligible volume. Some believe that this latter trade could be expanded significantly because of the preference of United States consumers for cuts from the leaner hogs that are characteristically raised in Canada. But there has been a marked shift in taste in the United States away from all pork products in favour of beef; hog production in the United States is highly efficient; and leaner type hogs are being developed; so that we doubt whether such exports will increase substantially. On balance, it is our view that total exports of Canadian agricultural commodities to the United States will not be much higher in 1980 than they were in 1955.

If that conclusion is found surprising in the light of the population growth that is expected in the United States, it should be remembered that, as it has recently been put by an authoritative group of farm leaders and agricultural economists in the United States, "the heart of the farm problem" there is "the propensity of farmers to step up output faster than domestic and foreign demands are growing".<sup>15</sup> This is to be traced to the very wide and rapid spread of technological improvements through American farms, which has been fanned by artificially high prices and has led to increasingly larger outputs per acre and per unit of feed. In the view of the same group of experts, the "corrective forces operating today do not appear to be sufficiently strong to bring farm production into balance with demand". We have already expressed the opinion that, in time, price and other changes in United States agriculture may bring supply and demand sufficiently into balance so that agricultural surpluses will cease to be chronic. That may be overly sanguine. But it would stretch even the limits of our optimism to believe that over the next twenty-five years United States farmers will be so powerless, the inducements offered to them so slight, and the remedies applied to over-production so drastic, as to leave much room in the United States market for increased imports of Canadian foodstuffs.

It may be convenient at this point briefly to recapitulate the argument we are trying to advance and to see where it is leading before the thread

of it is lost in the details of our speculations about prospective external and domestic demand. There would seem to be in all highly industrialized countries a tendency for the spread of technological change in agriculture to produce an over-supply of farm products and for agricultural incomes, as a result, to trail behind others. This tendency can be counteracted if external demand is rising rapidly. We can see, however, little reason for expecting this to be the case over the next twenty-five years. The implication, which we shall endeavour to develop later, appears to be that government policy toward agriculture should avoid aggravating the danger of over-production that, in our opinion, may well be present over most of the period that we have to consider.

### *Domestic Demand*

It will be domestic demand that will be providing the stimulus for agricultural expansion in Canada over the next two or three decades, and that will have the greatest influence on the changing pattern of agricultural production. We envisage both growing population and growing per capita disposable income (which may be defined with sufficient accuracy as personal income left after taxes). Population growth will mean that a proportionately larger bulk of farm products will be needed to feed the additional millions who will be living and working in Canada. Growth in disposable personal income will mean that the total demand for some farm products will increase much more rapidly than for others. By marrying estimates of population growth to estimates of per capita consumption as these will be affected by rising disposable personal income, some idea may be obtained of probable requirements for the main groups of agricultural commodities twenty-five years from now.

We have already noted that, as the level of income rises, per capita consumption of bread grains and potatoes as well as of a few other commodities declines. Concurrently, however, there is an increase in the per capita consumption of other foodstuffs. More fruit and vegetables are bought and, in particular, consumers use their higher incomes to buy more of the protective, high-protein foods, such as meat and eggs, which cost more per calorie than bread and potatoes. In a later chapter we discuss anticipated trends in disposable personal income. For present purposes it is enough to know that by 1965 we estimate that personal disposable income will have risen by approximately 18 per cent on the average and that by 1980 it will have risen by approximately 70 per cent. After applying these projections to the statistical record of changes in per capita consumption over the past 20 years and after giving some attention to the parallel changes that have occurred in the United States, we have formulated estimates, which are summarized in Table 8.2, of per capita consumption by 1965 and 1980 for the major groups of foodstuffs.

By presenting estimates for only the main groups of foodstuffs, we have perhaps seemed to sidestep many of the problems that are involved



Table 8. 2

## TRENDS AND ESTIMATES OF PER CAPITA CONSUMPTION

*(averages: 1935-39, 1951-55 with estimates for 1965 and 1980)*

Years	Cereals	Potatoes	Other starches	Fruits	Veg- etables	Oils and fats	Dairya products	Red meats	Poultry meat	Eggs
	Pounds per capita									
1935-39 .....	202	200	106	113	127	16	449	117	21	31
1951-55 .....	166	145	108	169	136	29	448	140	28	35
1965 .....	152	130	108	177	138	32	438	147	29	38
1980 .....	128	110	105	223	145	35	418	169	33	45
	Indexes 1951-55 = 100									
1935-39 .....	121.7	137.9	98.1	66.9	93.4	55.2	100.2	83.6	75.0	88.6
1951-55 .....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1965 .....	91.6	89.7	100.0	104.7	101.5	110.3	97.8	105.0	103.6	108.6
1980 .....	77.1	75.9	97.2	132.0	106.6	120.7	93.3	120.7	117.9	128.6

a Includes butter.

NOTE: Consumption figures are in retail weight except for fruits and vegetables, which are in fresh equivalent, and for meats, which are dressed carcass weight.

SOURCE: Based on W. M. Drummond and W. MacKenzie, *Progress and Prospects of Canadian Agriculture*, 1957, a study for the Commission. Chap. 2, Table 12, p. 32.

and have perhaps robbed the estimates of some of their interest. A few notes of explanation may help to restore it. It will be noticed that per capita consumption of fruits has been increasing rapidly over the last 20 years and that we expect this increase to continue. Citrus fruits account for most of it, so that continuance of this trend will mean a proportionately greater increase in imports than in Canadian production. Within the category of dairy products we have included not only fluid milk, cheese, and dried milk of various kinds, but butter as well, although with almost equal logic it might have been included in the category of fats and oils. We admit to great uncertainty in estimating how the per capita consumption of butter will move in the future. When the sale of margarine was legalized in most provinces in 1948 and 1949, butter consumption fell sharply and has since continued to fall fairly steadily although it is far above the level of per capita consumption in the United States. We have assumed it to be unlikely in the short run that all legal restrictions on the use of margarine will be removed. We have also assumed that there may be some decline in the price of butter relative to the price of substitutes for it. On these assumptions, we think that although per capita consumption of butter will decline still further, the downward movement will be less precipitate than it has been since 1948. There can be little doubt, on the other hand, that oils and fats of vegetable origin will continue to be substituted for those of animal origin as technological changes result in the production of vegetable fats in more palatable forms and at lower costs. Our composite estimate of per capita consumption of dairy products also conceals uncertainty about the possibility that an instantly soluble whole milk powder may be developed. If that were to happen, the consumption of fluid milk would almost certainly drop very sharply and milk distribution would be transformed. As was pointed out to us in the Atlantic Provinces, this would be a boon in many parts of the country where fluid milk is either unavailable or available only at inordinate cost.<sup>16</sup> Finally, we confess to some doubt about how per capita consumption of dairy products and other fats and oils will be affected by medical research into the causes of diseases of the heart and the vascular system. If it were to be shown with more certainty that a diet with a high fat content is at least in some cases a contributory cause of heart trouble, the consumption of fats and oils might be less than we anticipate.

In spite of these uncertainties, however, we think that the broad outlines of these estimates are probably reliable. They suggest that by 1965 individual Canadians will be eating about 10 per cent less potatoes and cereals than in the period from 1951 to 1955 and about 25 per cent less by 1980. By 1965 they will want, and will be able to pay for, about 5 per cent more meat, eggs and poultry per person than they consumed ten years previously; and by 1980 per capita consumption of these commodities will have risen by about 20 per cent above the level of the mid-fifties. Per capita consumption of dairy products as a group is unlikely to rise, while

the consumer will be buying larger amounts of fruits and vegetables, many of which will be imported.

If these estimates of per capita consumption are multiplied by the number of mouths that will have to be fed, the result should give the total domestic food requirements that may be anticipated over the next twenty-five years. On the assumption that net immigration runs on the average at 75,000 a year, it was forecast in Chapter 6 that the total population of Canada will rise by 1965 to 19,520,000 and by 1980 to 26,650,000. Our estimates of the total food requirements for a population of that size are presented in Table 8.3. Whatever the magnitude of error in these estimates may be, the broad implications for Canadian agriculture are clear. The domestic market for meat and meat products and for eggs will be strong throughout the period and will gain in strength as the period wears on. The weakest markets will be those for the direct consumption of cereals and potatoes. Domestic demand for dairy products may be expected to increase at approximately the same rate as population. Those farmers who are in a position to grow oil-bearing crops will find a strong market for them. There will be heavy demand for Canadian-grown fruits and vegetables, and imports of many of these commodities will also rise substantially.

The increase we anticipate in domestic demand for livestock products is so substantial that we have also thought it advisable to show these requirements converted into the form in which they would be met from the farm. Accordingly, in Table 8.4 meat requirements have been converted from dressed carcass weight to the number of animals slaughtered and the demand for dairy products has been assessed in terms of milk production.

No doubt the estimates of demand contained in Table 8.3 and Table 8.4 could be extended and refined. Add to them, though, the forecasts given earlier in this chapter of probable total demand for Canadian wheat and also assume, as we do, that there will have to be a 70 per cent increase in production of feed grains in order to meet the domestic demand that we anticipate for livestock products, and the main dimensions of the schedule of demand that we anticipate will be reasonably apparent. It will be noticed that the increase in the requirements of hogs and beef cattle that we expect by 1965 will be comparatively moderate and that most of the increase by far will take place in the last 15 years of the period. The chief reason for this is that livestock production was exceptionally high during the period from 1951 to 1955, which we have taken as the base years for our forecast of livestock requirements.

### *How Demand will be Met*

So much for the anticipated demand. How will it be met? Will greatly increased imports be needed? Will new agricultural land be opened up or will the land at present in farms be used more intensively? How large a labour force will be required? What will be the role of technology?

Table 8. 3

**TOTAL CONSUMPTION OF THE MAJOR FOOD ITEMS**  
*(1935-39, 1951-55 with estimates for 1965 and 1980)*

Years	Cereals	Potatoes	Other starches	Fruits	Veg- etables	Oils and fats	Dairy <sup>a</sup> products	Red meats	Poultry meat	Eggs
Millions of pounds										
1935-39 .....	2,232	2,213	1,168	1,248	1,400	179	4,953	1,296	236	339
1951-55 .....	2,445	2,145	1,597	2,492	2,006	428	6,621	2,065	411	518
1965 .....	2,967	2,538	2,116	3,447	2,684	625	8,556	2,869	556	742
1980 .....	3,411	2,931	2,796	5,930	3,864	933	11,150	4,504	879	1,199
Indexes 1951-55 = 100										
1935-39 .....	92	103	73	50	70	42	75	63	57	65
1951-55 .....	100	100	100	100	100	100	100	100	100	100
1965 .....	122	119	132	138	134	146	129	140	136	143
1980 .....	140	134	175	237	193	218	168	218	214	231

<sup>a</sup> Includes butter.

NOTE: Data for 1935-39 and 1951-55 are averages of the annual rate of domestic disappearance for human consumption in the years indicated. Weights are expressed at retail, except in the case of fruits and vegetables, which are in fresh equivalent and meats, which are dressed carcass weights.

SOURCE: W. M. Drummond and W. Mackenzie, *Progress and Prospects of Canadian Agriculture*, 1957, a study for the Commission, Chap. 2, Table 13, p. 36.

Table 8.4

# REQUIREMENTS IN TERMS OF LIVESTOCK NUMBERS AND OUTPUT

(1951-55 average and projected requirements 1965 and 1980)

Years	Hogs	Cattle for beef	Veal calves	Milk cows	Hens	Milk	Eggs
	Output Number in Thousands			On Farms June 1st millions		Output whole milk billions lbs.	million of doz.
1951-55....	7,570	2,040	1,180	3.1	26.8	16.3	388
1965....	10,100	2,600	1,500	3.3	29.3	18.5	518
1980....	16,200	4,200	1,575	3.5	37.1	24.6	820
Indexes 1951-55 = 100							
1951-55....	100	100	100	100	100	100	100
1965....	133	127	127	105	109	113	133
1980....	214	206	133	112	138	151	211

SOURCE: W. M. Drummond and W. Mackenzie, *Progress and Prospects of Canadian Agriculture*, 1957, a study for the Commission, Chap. 2, Table 14, p. 37.

Some of these questions in our opinion can be answered with considerable confidence. We are reasonably certain, for example, that, apart from some obvious exceptions, imports of agricultural commodities will not increase substantially. We have already suggested that increasing quantities of citrus fruits and fruit juices will be imported, and there will also be increased imports of other commodities that either cannot be grown in Canada at all or can be grown here only at ludicrous cost. But except for commodities that require tropical or semi-tropical climates for their production, Canada has always been able to supply its own requirements of foodstuffs and to do so at prices that, given the present comparatively moderate degree of protection, have been generally competitive. We see little reason to expect any major change in this situation, although from time to time some adjustments may be necessary in the degree of protection afforded Canadian producers or in the prices they receive, if it is to be maintained.

We are also fairly sure that not much new land will be brought into cultivation to meet rising demand. There is still some virgin land in Western Canada available for settlement, although it is less than many people imagine. But, except in a few areas, it is not of the highest quality and is located in latitudes where the winters are severe and the growing seasons short. Since much of it is under forest cover, the initial costs of clearing and breaking it would be higher than were incurred in breaking the open prairies; since, typically, it is far from established markets, continuing transportation costs would also be high. In Manitoba it is estimated that, in the settled parts of the province, there is approximately

a million acres of agricultural land not yet in farms, and in all probability all of this will be brought into cultivation before 1980. But it is very doubtful whether much of the land that is available in the more northern parts of the province will be settled during the period we have to consider. Almost all of the agricultural land in Saskatchewan is now in use, with the exception of a tract on the lower Saskatchewan River near the Manitoba border which could be brought under cultivation only if large drainage and diking works were undertaken. The cost of these, however, would be so heavy that we doubt whether it would be found economical to bring this land into production during the next two or three decades. Most of the agricultural land in Western Canada that is not yet in farms is to be found in Alberta and is located in the Peace River District and in the gray wooded soil region that lies north of the very fertile black soil region. It seems not unlikely that as much as three million acres of this land will be added to the area in farms by 1980. There is also unoccupied land in British Columbia, and some of it, no doubt, will also be brought under cultivation. We would estimate that by 1980 the area of land in farms in Western Canada might well have increased by some six million acres. This increment will be offset by land being lost to agriculture in Eastern Canada. The area of land in farms has been declining in the Maritime Provinces since 1911 and in Ontario and Quebec since 1941. In part, this is to be explained by the encroachment of urban areas on land previously in farms. Far more important, however, has been the abandonment of farms either because they were too remote, or too small, or had too poor soil to return a decent living or because the lie of the land was such as to prevent the use of modern mechanical methods of cultivation. We expect that the process of farm abandonment will result in far more land going out of agriculture in Eastern Canada than will be added to it by the new settlement still to be expected in a few districts of Quebec and Ontario. The net loss in Eastern Canada between 1951 and 1980 may well be slightly over four million acres. If these estimates of new settlement in the West and farm abandonment in the East prove accurate, the total area of land in farms in Canada would increase from 1951 to 1980 by only about two million acres, or from 174 million to approximately 176 million acres.<sup>17</sup>

Instead, rising demand will be met by intensified use of land already in farms to make it yield a higher output per acre. This will be the principal response of Canadian agriculture to rising demand, we feel sure, partly because modern social attitudes have greatly increased the cost of land development and partly because modern scientific advances have greatly widened the opportunities for intensified land use. Nowadays there are few pioneers who are willing to go into the bush with an axe and a team of oxen to clear a little land this year and a little more next year until they have a holding of respectable size; and there are few governments willing to run the risk of having them become a public charge if the venture fails. As a result, roads, schools and other community services have ordi-

narily to be provided before a new area is opened for agricultural settlement, soil surveys have to be made in order to avoid attempts to farm sub-marginal lands and government assistance ordinarily has to be provided to help in clearing the new farms. All this is expensive. — in most cases so expensive that it would be cheaper to obtain an equivalent additional output through the more intensive use of land in areas already settled.

Intensification of land use can come about in a number of ways. It can take place through the improvement of land already occupied but never cultivated.\* In Eastern Canada the proportion of improved land to total occupied land has been fairly stable for the last 50 years and is unlikely to increase very much. In the areas of later settlement in the West, on the other hand, the proportion of improved land has been rising. This trend seems likely to continue and may well contribute more productive acreage to Canadian farming over the next twenty-five years than the amount to be expected from the development of new land. Another method of intensifying land use is by reducing the amount of land under summer-fallow. Ever since large-scale wheat production was successfully established on the prairies the system of rotation used has involved keeping fields cultivated throughout the growing season without producing a crop.<sup>18</sup> The original purpose was to conserve scarce moisture but the practice has also been recommended as a means of weed-control. How widespread it has become is suggested by the fact that in 1955 the area under summer-fallow amounted to over 20 million acres, so that a traveller flying west from Winnipeg on an early August afternoon would see below him field after field the colour of lamp-black with scarcely a hint of green or gold showing through and so scrupulously cultivated that the soil seemed to have been screened and sifted. We doubt whether there will be anything like so many black patches on the checkerboard by the summer of 1980. Summer-fallowing will always be necessary in many parts of the semi-arid brown and dark brown soil regions of the southern Prairies but in the black and gray wooded soil regions summer-fallowing, it now seems clear, is not necessary to good husbandry.<sup>19</sup> Even if the area under summer-fallow in these regions were to be no more than cut in half, the acreage gained for the production of forage and grain crops would amount to nearly six million acres. Irrigation will also make a contribution of some importance to more intensive land use over the next two or three decades. Completion of the projects already planned, such as those on the Bow and St. Mary rivers in Alberta, will add some 800,000 acres to existing irrigated land in the Prairies and no doubt over the years this land will be farmed more intensively. It must be remembered, though, that much of the land already irrigated in the West is still being used for wheat-growing rather than for specialty crops or for livestock production, which alone could give

---

\* Improved land is defined by the Dominion Bureau of Statistics as land which has been "once subject to ploughing".

an economic return on the capital invested; and that most irrigation projects require relatively large capital expenditures to produce a stated increase in production. Capital would be used more economically in most circumstances, it would seem, to finance the application on settled and developed land of new technological developments to increase agricultural output; and, indeed, we expect this to prove the principal method by which land use will be intensified over the next twenty-five years.

The most spectacular technological change in Canadian agriculture within recent years has been the mechanical revolution that has replaced horsepower with machines. Shortly after the end of the War, Canadian farmers found themselves facing labour shortages as a result of the rising wages being paid in urban areas; and at the same time more efficient mechanical equipment became available. It was apparent that only by mechanizing their operations could they manage with less labour, meet the competition from other industries for the services of the fewer hands they would still require, and earn larger incomes for themselves and their families. It would be less trouble, too, they reflected, to look after a tractor than a stable of horses; and it would be nice to get the harvesting done in one fell swoop. Fortunately, farm incomes had been relatively high during the strenuous War years so that many farmers were in a financial position to meet the heavy outlays that mechanization would involve. Accordingly, as soon as the conversion from war to peace-time production got underway, farm machinery began to stream in great volume on to Canadian farms, particularly in the West. The census taken in 1951 showed that for every hundred farms there were three times as many tractors that year as there had been in 1941, five times as many combines and three times as many trucks; and almost all this increase may be assumed to have taken place after 1946.<sup>20</sup> At the same time, the number of horses on farms fell drastically, dropping by two-thirds in Western Canada and Ontario and by one-quarter in Quebec and the Maritimes. This phase of the continuing process of mechanization has now pretty well run its course in most of the agricultural areas of Canada, although it should not be assumed that further striking mechanical changes are unlikely. It is possible, for example, that at some stage during the next two or three decades machines may become common for ploughing, harrowing, cultivating, seeding and fertilizing all in one operation,<sup>21</sup> in rather the same way as nowadays on most prairie farms the harvesting operations that used to be spread over a period of weeks are all performed at one time by a combine. On the whole, however, it seems likely that the technological changes of most importance over the next twenty-five years will be those designed primarily to increase the productivity of nature rather than the productivity of labour — to increase, that is, output per acre, per unit of feed and per head of livestock rather than output per man-hour.

It may be, for example, that research with controlled radio-activity will be successful in producing more fruitful plants and animals; and



science may have other striking gifts in store for agriculture. But the technological advances we have in mind for the most part will be of a homelier character. They will come about through the wider use of cultural practices that have long been known and that will be applied more generally as soon as farmers are convinced there is sufficient demand to make them profitable. Already they have had sufficient influence on agricultural yields in Canada to give some idea of what further progress is possible. The record of Prairie wheat yields, which we discuss later, is difficult to interpret. But there is no doubt that in Eastern Canada yields of fall wheat and coarse grains have been greatly increased by the use of more fertilizer and better seeds. There has also been a great increase in potato yields, which have risen from an average of 125 bushels per acre in the years immediately before the War to an average of 192 bushels per acre in the period from 1951 to 1955, and even so, fall 30 or 40 bushels short of average yields in the United States. Biological improvements in agriculture have been of particular importance in making possible the great increase in Canada's output of livestock and livestock products over the past 25 years. Output from these farm enterprises has risen, on the whole, more rapidly than total agricultural output, and they have accounted for a rising proportion of farm cash income in each of the agricultural regions of Canada. This has come about through greater specialization, which has permitted more attention to be paid to practices designed to increase livestock output. Milk yields per cow, for example, have risen from just over 4,000 pounds a year before the War to more than 5,000 pounds in 1955; and are still well below average yields in the United States and many European countries. Increases in egg production have been even more remarkable, the annual production per hen having risen from 110 before the War to 171 in 1955. Chicks are now usually bought from special hatcheries rather than hatched on the farm. They are given vitamins like other carefully nurtured infants. Their feed is specially ground and mixed and comes in commercial packages. They are inoculated against a wide range of diseases. It is no wonder that in due course they lay so many eggs or appear on the table as such plump and tender broilers. Specialization in the production of beef and pork has not spread so widely as specialized poultry production. But there are enough farmers who have specialized in these enterprises to show fairly clearly the path which efficient production will take. Hogs will no longer be fed with whatever feed is available and cheap, as has often been the case on the Prairies; or with the skim milk left after the butter fat has been sent to the creameries, as has often been the case in Eastern Canada. The feed and care given them will ensure that most sows have two litters a year and that there is a large number of pigs in every litter. Beef herds will be kept for that purpose exclusively and will not be used for milk production as well. Artificial insemination will be used more widely to maintain high-quality strains. Above all, more attention

will be paid to pasture improvement and to the production of good forage crops. Most of the pasture in Canada consists of unimproved native grasses and its carrying capacity could be multiplied by the use of fertilizers and the planting of more nutritious grasses. It is principally through the application of such well known and unspectacular cultural practices as this that we would expect the output of Canadian agriculture to increase over the next twenty-five years.<sup>22</sup>

To construct a significant measure of total agricultural output is particularly difficult because of fluctuations in crop yields and farm prices. However, it would seem that over the past 25 years the physical volume of agricultural output in Canada grew by some 30 per cent to 40 per cent. This increase was achieved with a smaller labour force and without much development of new agricultural land. We would anticipate that over the next twenty-five years agricultural output may grow by perhaps 65 per cent to 70 per cent and that this growth will be accompanied by only a very slight increase in the acreage of land in farms and a further substantial decline in the farm labour force. Increasing yields will enable Canadian agriculture to produce a much larger quantity of foodstuffs on little more than the acreage currently in use, while the increasing productivity of farm labour will permit output to rise while the labour force is falling.

We have stressed the important role that will be played over the next two or three decades by changes designed primarily to increase the productivity of nature. But many of these, of course, will also operate to increase the productivity of labour. The key facts about output per man-hour in Canadian agriculture are, first, that it is still lower than in any other sector of the economy, and, second, that it has been rising more rapidly than in any other. Unless there is to be a greater relative increase in agricultural prices than we foresee, average farm incomes in the future can keep pace with other incomes only if real output per man-hour in agriculture increases at least as fast as in other industries. We see no reason why that should not be the case so long as policies are avoided that would prevent sub-marginal land from being withdrawn from agriculture and sub-marginal producers from leaving the industry. Certainly the inducements for continuing innovation will be strong. Domestic demand will justify the introduction of many technological changes to raise biological yields, which will incidentally raise output per man-hour as well; and competition for scarce manpower will maintain the pressure on many farmers to apply more labour-saving devices. Field operations will be still further mechanized. And electric power will be increasingly used to run motors that will lighten the task of tending livestock. Nevertheless, we doubt whether livestock production can ever be so highly mechanized as the production of crops. It is for that reason that, although we have estimated that output per man-hour in agriculture will increase at an

average annual rate of 3 per cent until 1970, we think the rate may drop to 2.5 per cent in the following ten years, when livestock production will be becoming dominant throughout Canadian agriculture. It would be consistent with these productivity estimates for the labour force in agriculture to fall from 817,000 in 1955 to 735,000 in 1980.\*

The slower rate of mechanization that we anticipate, particularly in the latter part of the period under consideration, when linked with the rising demand for livestock and livestock products, will tend to retard the decline in the number of farms in Canada. Since 1941 it has been dropping steadily as a result of the consolidation of some farms, particularly in the West, to make them large enough to reap the full economic advantages of mechanization, and the abandonment of others, particularly in the East, many of which were found to be either too small, too steep, or too stony for mechanized production. The trend toward fewer farms will continue. One reason is that the mechanization of field operations in Canadian agriculture is not yet complete. Another is that the mechanical revolution that has already occurred has left in its wake the need for further adjustments in farm organization. But the trend will be counteracted, particularly after 1965, by the need to increase output and intensify land use. For these reasons, we anticipate that the number of farms in Canada, which totalled 623,000 in 1951, may decline to 570,000 by 1965 and to 540,000 by 1980. This degree of reorganization, when considered together with our expectations concerning occupied acreage, would produce farms of an average size of 306 acres in 1965 and 326 acres in 1980, compared with an average size of 279 acres in 1951.\*\* There will be fewer farms and they will be larger in size. But the overwhelming majority of them, we expect, will still be family farms, owned and operated on a family, rather than a corporate, basis. Such farms have proved efficient in the past and in spite of all the changes that we anticipate for Canadian agriculture, we see no reason to think that they will not serve Canadian needs well in the future.

### *Agricultural Policy*

When you take down an almanac from a nail in the kitchen, the information you find in it may be as precise and reliable as the time at which the sun will rise on the third Sunday in March, or as nebulous as a prognostication of the weather at harvest time. Since what we have tried to

---

\* We are aware that this numerical estimate of the labour force in agriculture, which is taken from the study prepared for us on *Output, Labour and Capital in the Canadian Economy*, (p. 309), does not tally exactly with the estimate presented on page 101 of the study prepared for us on *Progress and Prospects of Canadian Agriculture*. This is one case where we have not thought it necessary, or perhaps even entirely desirable, to iron out a minor discrepancy between the various estimates that have been made for us.

\*\* Returns of the 1956 census show that by that year the number of farms had dropped to 575,000 and the average size of farms had risen to 302 acres.

say about future agricultural prospects in this chapter may occasionally be regarded as a kind of almanac for Canadian farming, we are anxious that it should not be misinterpreted or misused. A few readers may perhaps be so misguided as to take our statistical forecasts for gospel. Others may think so little of them as to make what we would regard as the opposite mistake and write them off as little better than old wives' tales. Forget figures, then, for the moment; and let us try to set out in very broad and simple strokes the main characteristics of the future that we foresee for Canadian agriculture over the next twenty-five years. In the first place, we think that in this country as well as in other industrialized countries in the Western world, there will be a latent tendency toward the over-production of agricultural commodities. We cannot see that external demand will be very lively over the next twenty-five years. Domestic demand, on the other hand, will rise fairly steadily and will determine the growth and changing structure of Canadian agriculture. The demand for livestock and livestock products will be greater than for any other farm commodities. There will be little development of new land. Unless unforeseen events arise to contradict the basic assumptions on which our whole inquiry rests, we think that a future for Canadian agriculture of that general kind is much more likely than any other.

Our views on policy issues, in any case, are rooted in that perspective. We would doubt the wisdom of large-scale programmes to extend the geographical limits of agricultural settlement. We would be hard to convince that Canadian agriculture as a whole is likely to benefit from the investment of large amounts of capital in monumental irrigation schemes. We would be skeptical of any immigration programme to bring agricultural workers to Canada which did not show itself fully aware that the agricultural labour force is declining and that the welfare of those left in agriculture depends in large measure on that process not being impeded. We would have questions to ask about the indefinite continuance of government payments to agriculture which would, either directly or indirectly, have the effect of perpetuating uneconomic farming enterprises. Finally, we would warn against any and every measure that might stimulate the tendency toward over-production and, in consequence, depress average incomes of Canadian farmers.

Those admonitions are all negative in character. But we do not mean to suggest that there are not many positive things that governments can, and should, do in this as well as in other sectors of the economy. The operations of the market and of the price mechanism will indicate many of the shifts and adjustments that will be required; and we have no doubt that Canadian farmers by and large can be relied on to respond effectively. This will be particularly true, in our opinion, over the next decade when the required increase in output and the shifts in production will not be very large. Governments, however, will have a role to play in

hastening and facilitating changes that would in any case be brought about by economic forces, and in tempering the winds of change so that individual farmers do not feel too fleeced and forgotten. There will thus be need for government assistance in agriculture over the next twenty-five years; but the assistance will probably take different forms than in the past.

It would be an anachronism to expect governments to continue to act in a way that was appropriate to the primitive, heroic age of Canadian agriculture, when great new areas of farm land were being opened to settlement and when great population movements were taking place. That period came to an end more than a quarter of a century ago, although the fact was long masked from view by drought, depression, and war. But if government measures to bring new agricultural land under cultivation and to settle new farming communities are no longer needed, there are many adjustments to be made in which governments have an important part to play. In some parts of the country, more lasting treaties have still to be negotiated with the physical environment and everywhere the process continues of adjusting agricultural production and organization to changing economic circumstances.

The droughts of the '30's proved that large tracts of land in the Prairies were not permanently suitable for raising crops; and under the terms of the Prairie Farm Rehabilitation Act, measures were taken in co-operation with the provinces to move many farmers from these areas and settle them elsewhere, to sow the prairies once again with grass, to organize community pastures and to help farmers and municipalities construct small-scale irrigation systems. This work has been highly successful and approaches completion. We would suggest, however, that it might be supplemented by action to relocate farmers who in some parts of the Prairies have had consistently poor crops and who have received payments year after year under the Prairie Farm Assistance Act. A limit might well be set, in our opinion, to the number of years over which farmers might receive such payments; and farmers who have had a succession of bad years might instead be given financial assistance to move elsewhere. As is well known, there has been much discussion of the probable cost and value of altering the physical environment of some parts of the Prairies through large-scale irrigation schemes. We have not felt obliged to assess such projects in detail. Insofar as they are designed to augment existing sources of hydro-electric power, we can see that at some point they may be needed. We can also appreciate that the large investment involved would clearly benefit the particular areas in question. Insofar as such projects, however, are intended as a form of assistance to Canadian agriculture, we doubt whether they are likely to prove their worth for many years to come. They would certainly provide a useful insurance against some of the worst effects of drought by supplying pasture and fodder that would enable herds to be maintained. We wonder, however,

whether the coverage of such insurance might not be greatly widened by proceeding with smaller and more scattered irrigation schemes. We can also see that more irrigable land would help to meet the demand for live-stock products and special cash crops that will be much greater twenty-five years from now than it is at present. We would suggest, however, that such large and costly schemes should not be implemented until there is a prospect within a measurable number of years of sufficient demand developing for these agricultural commodities to persuade farmers to take the trouble, and make the additional private investment, that would in many cases be required to produce them. Otherwise there would be little effect on agriculture from the large outlay of public funds, since most of the farmers in the areas concerned would simply go on growing wheat as they are doing at present; or, alternatively, if the water for irrigation were made available at artificially low prices in order to induce farmers to use the land in the ways contemplated by the schemes, the result might well be over-production of the products appropriate to irrigated land.

By and large, though, the task of bringing farming and the physical environment into harmony has been accomplished on the prairies and the problems that still remain are marginal. That is not true of other parts of the country. Driving along the highways in Nova Scotia, for example, we noticed the forest reasserting itself in many places, with seedlings one or two feet high forcing their way through the pasture. In many cases that verdict no doubt should be accepted and the land used for the purposes of forestry rather than for agriculture. Without land-use surveys, however, it is difficult to know where the land should be used in much the same way as it is at present, where farming will continue to be unprofitable until larger farms can be created, and where the best solution for the farmer would be a combination of some land in agriculture and some land in a farm woodlot.

It was for that reason that we drew attention in our *Preliminary Report* to the need for preparing reliable land-use surveys. We were pleased to see that this suggestion won influential support and that a committee of the Senate has since been established to consider this problem. We feel sure that when land-use surveys have been made, it will be found that if average incomes of those engaged in agriculture in many parts of the country are to be raised, holdings will have to be enlarged and some farmers encouraged to take up other occupations. We suggest that wherever the people and government in a province are interested in co-operating in such a plan, the Federal Government should assist in working out a better system of land use, including the provision of credit facilities to finance the consolidation of holdings and the provision of assistance, financial and otherwise, to people who may wish to be relocated and re-established in other industries. Such a programme would be applicable to any area where it seemed desirable and where the provincial government

was prepared to co-operate. But we think it might be of particular advantage to the Maritime Provinces where the problems of subsistence agriculture are particularly acute. In any appraisal of the best land-use in this area, we suggest that attention be directed toward increasing the forest potential as a means of increasing the incomes of farming people in the Maritimes.

Adjustment of farm organization and farm production to changing economic circumstances, including changing technology, will also, in our opinion, call in some instances for rather more generous credit arrangements than are now available. Too easy credit can aggravate farm problems by inducing an expansion in output that would lead to lower prices. Scarcity of credit, on the other hand, can prevent a desirable rise in agricultural productivity by perpetuating antiquated types of farm organization. As the mechanization of Canadian farms continues, some farmers in all parts of the country will need more medium-term capital to enable them to buy machinery and equipment, and more long-term capital to enable them to enlarge their holdings, while the rise in demand for meat will mean that more capital will also be needed for the purchase of livestock. As the result of these cumulative developments, the capital value of farm businesses will be rising on the average; and there will be difficulty in transferring them from one owner to another — in many cases it will be from father to son — unless somewhat more generous credit arrangements are available. So long as farm incomes are relatively low and irregular, it is important that fixed annual payments on mortgages and other forms of indebtedness be no larger than is necessary. Appropriate rates of interest will vary from time to time, but annual payments can be reduced by extending the number of years over which the principal will be repaid. Since the long-range prospects for farm income and for the ability of farmers to service loans would seem to be favourable, we think that farm credit agencies might appropriately extend the period of repayment up to 40 years for long-term loans and up to five or six years for medium-term loans. Extension of credit on somewhat easier terms is one way by which the adjustment of Canadian farming to changing economic conditions can be facilitated. Another way is by altering the emphasis of research programmes. In view of the heavy demand that is anticipated for beef and other livestock products, it would seem sensible for research programmes to stress the improvement of beef cattle, feeding for beef production, production of forage crops, and the carrying capacity of grasslands.

The problems we have been discussing may be called production problems in that they involve changes in both the level of total output and in its commodity composition. But most of them will attract public attention not so much because of interest in production goals or even production shifts as because of concern over average farm incomes. This

concern is parallel to concern over the levels of employment in other sectors of the economy. It has grown as agriculture has become increasingly commercial and moved more and more to a cash basis. Although agricultural output will be a declining proportion of total output over the next two or three decades, and the labour force in agriculture will be declining in both relative and absolute terms, the level of average farm incomes will continue to figure largely in public discussion in Canada for a long time to come for the reason, as we have mentioned earlier, that farm incomes both fluctuate more than others from year to year and also tend to lag behind others in the long run. That is still true, although a considerable improvement on both counts is to be discerned over the period from 1939 to 1955. During those years variability in farm incomes was damped down by strong overseas demand and by steadily rising domestic demand which had the effect of stabilizing farm prices. Over the same period there was also a relative improvement in average farm incomes compared with others. This was because technological change was rapidly increasing output per man-hour in Canadian agriculture and the movement of labour off the farms was being encouraged by prosperity in other sectors of the economy. It must also be acknowledged, however, that important contributions toward improving the relative position of farm incomes in these two respects were also made by government action to support farm prices and to give statutory backing to producer marketing boards. It is these instruments of agricultural policy that we must now consider.

Because of the exceptionally wide fluctuations in farm prices and the dominant influence they exert on farm incomes, we think there is ample justification for farm prices being supported by governments. As experience in the United States has shown, however, agricultural price support schemes can very easily lead to rampant over-production, which can be corrected — if at all — only by direct and drastic controls on production. That is a sequence of agricultural developments that we in Canada should avoid like the plague. In this matter the beginning of wisdom is to realize that the proper purpose of price support programmes is analogous to the purpose of unemployment assistance: their purpose should be to prevent distress on the farms. But if that is the beginning of wisdom, it is not its end; for it will always be a nice calculation to set the support level for a particular commodity high enough to prevent distress and yet low enough to avoid over-production. This is an undertaking of such importance and delicacy that, in our opinion, it should be entrusted to a board of full-time members who would be relieved of other duties so that they could concentrate on anticipating the occurrence of emergency conditions and on determining the effects of particular prices on production and incomes. In addition to recommending the level at which the prices of particular farm commodities might be supported from time to time, such a board might be left free to recommend also how this should be done. In general, two possible methods are available: the Government can either



purchase agricultural commodities when the prices fall below the stated support level, or it can allow farmers to dispose of their products at the prevailing market prices even though these may be below the support level, and then make up the difference with deficiency payments. The latter procedure would avoid the difficulties in which the Government would otherwise be involved in selling, storing, and disposing of surplus commodities. It would also have the advantage of letting the producer see the return that his products would bring him in a free market; and this knowledge might be expected to lead to a more realistic pattern of production. In our opinion, however, it is not possible to say that deficiency payments in all circumstances are to be preferred to direct price supports; and an advisory judgment on this point, as well as on the level of support, might well be sought in each particular case from the board. Finally, we are convinced that neither the Government nor the board in administering the price support programme should be bound by any automatic formulae.

Our view of the causes of low and variable farm incomes leads us to believe that producer marketing boards can, in principle, prove useful instruments contributing to orderly marketing, greater stability of farm incomes, and improvement in the relative position of farm incomes, without exploitation of the consumer. However, we recognize that organized marketing boards possess no magic which will unfailingly convert the hopes and aspirations of producers into reality. Agriculture, as we have already tried to describe it, is a complex industry. The practical problems of effective organization and operation of marketing boards, and the extent of the gains to be expected from the rationalization of marketing processes, differ considerably from product to product. The proponents of marketing boards point out that other groups in the community, including both labour and industry, are organized on a large scale, and that it will be increasingly necessary for farmers to organize in a similar way. While some farmers, and others as well, may object to the compulsory feature of these boards — without which they would soon become ineffective — the future growth of the co-operative movement and of compulsory marketing boards based on the will of the majority seems highly probable. This we concede; but we would counsel a cautious approach, a process of gradual building, proceeding first in those situations which offer the greatest prospect of permanent achievement, each addition designed by skilled and experienced architects intent on particular needs and problems.

There remains the special case of wheat marketing. Wheat is such an essential foodstuff that, in most countries of the world, governments take a close interest in its production and distribution. They bonus domestic production. They subsidize exports. They limit imports by the use of tariffs and quotas. In many parts of the world, moreover, the demand for wheat is highly inelastic; and this complicates the problem of selling. Wheat growing is also particularly open to hazards of the weather, so that yields

may vary phenomenally from year to year. For all these reasons, it is quite proper that the marketing of Canadian wheat should be regarded as a special case requiring special arrangements. During our public hearings, we were impressed by the wide support expressed by Prairie producers for the method under which the wheat and coarse grains grown on the prairies are marketed by the Canadian Wheat Board. We believe that this general method should be continued.

Nevertheless, we doubt whether the procedures followed by the Wheat Board are fully adequate to deal with a situation in which one bumper crop succeeds another year after year, and in which there are substantial surpluses elsewhere in the world. In our *Preliminary Report* we proposed certain procedures to be put into effect in the event of such circumstances persisting. Our proposal involved giving producers advance information on the total quantity of wheat which the Board would anticipate accepting for delivery during the crop year, and guaranteeing minimum receipts to individual farmers based on this estimated quantity. It was assumed that under conditions of persistent surpluses, the judgment of the Board on probable deliveries would be helpful to farmers in planning their production programmes; and that, in times when the ability of the Board to accept deliveries was acknowledged to be limited, some producers would find more attractive alternatives. At the same time it was proposed that wheat producers would be assured of minimum receipts even if the Board found it impossible — or because of differences in grades, inexpedient — to accept deliveries from individual farmers. This feature of the plan implied payment for wheat held on the farm. In all other respects the procedures envisaged have been employed by the Wheat Board at one time or another. The proposal set out in our *Preliminary Report* is a matter of public record and can be referred to, if need be, whenever there is a conjunction of full elevators, large crops, and strong competition from other suppliers of wheat, so that the income of Prairie wheat farmers would be very low unless the procedures presently followed by the Wheat Board were supplemented in some way.

We realize, of course, that it is impossible to say how frequent bumper crops are likely to be, or when world surpluses of wheat are likely to be replaced by world shortages. Our view of the probable relation of world supply and demand over the next two or three decades and of probable Canadian wheat sales is not so pessimistic as to lead us to suggest that there should be a permanent reduction in the acreage sown to wheat on the Canadian prairies. On the other hand, we are aware that it can be argued that, since the turn of the century, there has been a tendency throughout the world toward the over-production of wheat.<sup>23</sup> We are also aware that comparatively recent changes in wheat growing on the Canadian prairies may be producing crops that, on the average, are in excess of the

amount that can be sold. Much depends on how the figures for yields per acre which are shown in Table 8.5 are interpreted.

Table 8. 5

**CANADIAN WHEAT PRODUCTION, ACREAGE AND YIELD**  
(average for five-year periods, 1901-55)

Periods	Production (mil. bu.)	Seeded acreage (thous. acres)	Yields (bu. per acre)
1901-05.....	86.5	4.36	19.8
1906-10.....	126.0	7.09	17.8
1911-15.....	248.4	11.70	21.2
1916-20.....	228.4	16.97	13.5
1921-25.....	366.5	22.08	16.6
1926-30.....	435.3	23.91	18.2
1931-35.....	320.8	25.53	12.6
1936-40.....	364.1	26.52	13.7
1941-45.....	378.2	21.40	17.7
1946-50.....	393.9	25.42	15.5
1951-55.....	534.5	24.54	21.8

SOURCE: For the years 1901-07 data provided by the Dominion Bureau of Statistics from Food Research Institute Wheat Studies, Stanford University; for the years 1908-47, D.B.S. *Handbook of Agricultural Statistics* Reference Paper No. 25, Part 1, p. 1; for the years 1948-54, D.B.S. *Grain Trade of Canada, 1954-1955*, p. 9; for the year 1955, D.B.S. *Quarterly Bulletin of Agricultural Statistics*, January-March, 1956, p. 26.

There has been exceptionally good growing weather for wheat in every year in this decade, with the exception of 1954 and 1957, and that has no doubt been more responsible than anything else for the exceptionally large crops that have been harvested in Canada. It is also possible, however, that technological changes have been operating to increase prairie wheat yields. This was suggested to us by witnesses representing the Manitoba Federation of Agriculture, the United Grain Growers and the Alberta Wheat Pool; and we are not inclined to set their opinions aside lightly.<sup>24</sup> In any case, such views would seem highly plausible. Through rapid seeding and rapid harvesting, better use is now made of weather conditions. In addition, the use of weed killers and pesticides is now widespread. These technological changes may well be working to increase the size of the harvest in favourable years and to prevent extremely low yields, even in times of drought. The question of whether new techniques are increasing prairie wheat yields should perhaps be regarded as "not proven". It may be, for example, that they are merely operating to offset the tendency toward declining yields that otherwise might now be apparent on the prairies because of reduced soil fertility. But, in our opinion, the possibility should be borne in mind that with these new techniques of wheat production, there may be a tendency for more wheat to be harvested on something like the present acreage in the Prairies than can be sold on the average over a term of years.

If that proves to be the case, there will be even more reason for giving careful thought to how supply might best be adjusted to demand should

that become necessary. No doubt others may be able to think of a better plan than ours for making the adjustment. We would suggest, however, that no such plan is likely to prove satisfactory to prairie wheat growers unless it contains some provision for providing them with at least a minimum income in periods of extreme surplus. Nor is it likely to help maximize wheat sales unless, while treating individual producers equitably, it yet manages to give the Board latitude to accept delivery of the more salable grades of wheat and defer delivery of others. These were among the principles incorporated in the proposal we put forward for a supplementary procedure to be used by the Board in an emergency situation of wide and persistent surpluses with bumper crops. Perhaps such a situation will never last long enough to necessitate restrictive measures. Perhaps the Wheat Board will always be rescued in time by crop failure in Canada or elsewhere. But if action to restrict wheat production ever does become necessary, we think the principles mentioned above deserve consideration by whoever may be responsible for finding the least distasteful method for adjusting production to effective demand.

## FISHERIES

THE ROLE OF AGRICULTURE in the Canadian economy is more than twenty times greater than that played by fishing and fish processing, but the 30,000 enterprises which are comprised in the latter industry vary no less widely than their farm counterparts in productive techniques, size, efficiency, and earnings. Moreover, although they account for less than one-half of one per cent of total national output and income, these enterprises utilize no fewer than 150 commercial species of fish, from the abalone and ale-wife to the wolf-fish and yellowtail; and they process and market more than four hundred different products, including staples such as salt cod, luxury foods like lobster, and non-food commodities ranging from seal skins to cod liver oil. In an industry characterized by such variety, averages and aggregates alone must be used with more than the usual amount of reserve, for it is not only in the physical sense that the fisherman using primitive, inexpensive and manually-operated equipment from a one-man dory is not in the same boat as the crewman on a 200-ton dragger equipped with the latest electronic navigating and fish-finding equipment. Similarly, the productivity and prospects of a shareman in the small-boat fisheries of the East Coast with an average income of around \$250 a season are hardly to be compared with those of an Atlantic dragger skipper or a British Columbia salmon fisherman whose annual income from fishing may be more than \$5,000; and the fish processing done by the fisherman's family who eke out a few extra dollars by laboriously spreading and drying their scanty catch in the sun of Newfoundland bears little resemblance to that carried out by the well-paid workers in a modern, highly-mechanized freezing or canning plant.

Nor do statistics of employment by themselves reveal the full measure of the fishing industry's importance as a source of livelihood to numerous Canadians in places where alternative cash incomes are not readily available. It is suggested in the study prepared for us on *The Commercial Fisheries of Canada* that as many as 75,000 people may take part in commercial fishing operations at some time during the year, but to a substantial proportion of these fishing is not an important source of income;<sup>1</sup> on the other hand, the labour force figures, which show an average of some 25,000 people engaged in fishing throughout the year, undoubtedly underestimate the number of citizens who are dependent on this activity for a major part of their annual earnings. The most meaningful figure, in our

view, probably lies in the range of 35,000 to 40,000 persons, to which must be added an annual average of some 15,000 Canadians engaged in the processing side of the industry. On a regional basis, employment in the fisheries varies widely from its national average of just under one per cent of the labour force, from a high of about one-sixth of all employment in Newfoundland to a low of under one tenth of one per cent of the total in Ontario. But even though less than one person in two hundred is employed in fishing and fish-processing in each of the five central provinces, many individual communities and settlements scattered from the St. Lawrence to Great Slave Lake look to the industry as the decisive or only source of their livelihood.

A striking example of the lack of alternative employment opportunities normally available to many of those presently engaged in the more marginal segments of the fishing industry, and the attraction of those opportunities when they do occur, is to be found in a recent government publication,<sup>2</sup> where one of the reasons given for the decrease in the catch of the white whale fishery of Hudson Bay in 1955 was that there had been a late start in full-scale hunting because most of the Eskimo hunters normally dependent on this activity had gone to work for an insurance company on the salvage of a large plane forced down on the ice the previous winter! In contrast, the highly commercial salmon industry of British Columbia is constantly faced with vigorous competition for labour from other industries, and wages and working conditions have had to be kept at levels broadly competitive with those of other occupations, as evidenced by the fact that in 1954 the income of all salmon fishermen from all sources in that province was \$3,056, or \$1 less than that of the average earnings of all paid workers in the Canadian labour force.

Perhaps the clearest view of the future of this diverse industry may be obtained by focussing on the prospects for the main products of each of the regional fisheries — on the Pacific Coast, on the Atlantic, and in the freshwater lakes. But any forecasts we make can be not much more precise than those of the fisherman estimating his day's catch before he sets sail in the morning; our guess, like his, may prove wide of the mark long before sundown. We will, however, try our luck first in the Pacific Ocean and set our nets for the salmon fishery, which represents just over two-thirds of the value of the region's fish landings and a slightly higher proportion of their value when marketed by fishermen and fish processors to wholesale, retail or export outlets. Both the primary and processing sides of the salmon industry produce a uniform, high-value product which lends itself readily to highly mechanized mass-production methods — the capital investment in an average primary enterprise on the West Coast is more than five times as high as in the Atlantic region, while 83 per cent of the output of the British Columbia processing industry comes from plants with sales of over one million

dollars annually. The industry has been able to concentrate in the larger centres to take advantage of the full economies of large-volume operations both because the salmon runs are well defined geographically (some 20 million salmon annually head for the Fraser River system alone) and because refrigerated packing boats have reduced the importance of distance. The whole West Coast industry is in fact in a strong position to face the future, being with few exceptions relatively well-integrated, efficient and productive; with less than one-sixth of total Canadian employment in the fisheries it now produces over one-third of the industry's output. We do not expect this regional fishery to have any great difficulty in meeting its future capital requirements in view of the fact that recent expenditures for larger boats, modern equipment, and new machinery have been running at a rate not very different from the \$6 million to \$7 million annually that we foresee for the future. The Pacific industry will, we believe, also continue to be successful in meeting its labour needs by raising productivity and wages, and its labour force will probably decline slightly further in absolute terms.

The salmon population will not of course expand automatically to meet future requirements. Further study will be needed on the spawning and migratory habits of the species as well as on the control of predators and of stream pollution — a particularly important question in view of the increasing effects on British Columbia rivers of logging activities, industrialization and the spread of urban settlement. We have assumed, for the purposes of the forecasts which follow, that research will be successful in devising techniques which will permit salmon stocks to be maintained and exploited concurrently with any power developments that may take place. The international efforts that have been made to conserve and manage fish stocks must also be continued, for although much has already been accomplished, we will never be in a position to be careless about the supply of this important resource. It is estimated that with improved utilization, knowledge, and techniques, the Pacific salmon stock might support an increase of over 100 per cent in the total salmon catch. The market for salmon in 1980, as for fish as a whole, will be closely related to North American population growth. Three-quarters of the catch is now canned and of this about two-thirds goes to the domestic market, a proportion which it is conservatively estimated will be maintained in the future. United States sales may account for 10 per cent of the pack by 1980 — considerably more if there should happen to be any worthwhile lowering of the present tariff on canned salmon. Export markets overseas, which used to take well over half of the total pack, may continue to be subject to some currency and trade restrictions, although a relative expansion in this market may be foreseen. The increase in sales of fresh and frozen salmon should be considerably greater — exports to the United States, where the tariff on these items is not a significant obstacle to trade and where domestic deficiencies will

probably increase, may rise by more than 75 per cent, while an even faster growth will occur in Canada itself.

The growth of the other Pacific fisheries cannot be forecast with any great degree of precision. The future of the herring fishery, which now accounts for about 10 per cent of the regional total and in which the catch is largely processed into fish meal and oil, will depend in large measure on scientific discoveries about the size and habits of the stock and on the development of markets; an increase of from one-third to one-half is well within the realm of possibility. The prospects for expansion of the halibut fishery, which accounts for another 10 per cent of the total, are also in large measure tied to the supply of the raw fish that will be available; at the present time the highly specialized halibut fishing boats are restricted to a quota which in many cases limits fishing to only a few weeks of the year. While conservation measures have undoubtedly contributed to the recovery of the halibut stock from its low levels of three decades ago, other factors influencing the supply of this fish make it difficult to predict a very substantial increase in the catch by 1980. About three-quarters of the Pacific halibut is marketed in fresh and frozen form in the United States over a comparatively low tariff while the rest is almost entirely consumed in Canada; no problem of markets is foreseen for this fish over the longer run. Sales of other Pacific sea products including groundfish, crab, clams and anchovies, should be capable of rapid expansion, though not in all cases without better merchandising and selling techniques.

Now let us try another ocean and see whether we can get a draft of what the future may have in store for the Atlantic fisheries, which accounted for just over half of the \$90 million to \$95 million at which all Canadian fish landings were valued in 1954 and 1955. However, on the basis of weight the region's share of the national catch of two billion pounds annually is nearly two-thirds — the Atlantic species are typically of lower price than those found on the West Coast or in inland waters. A balanced assessment of the future of the regional industry must take this into account, together with the fact, indicated in some of the figures given earlier, that the average income and productivity of the Atlantic fisherman is well below the national average. But before we look at prospective productivity trends, we first must try to assess the outlook for demand and for the resource supply. Rising incomes and the desire for variety in the diet suggest a favourable future for the higher-priced species like salmon, scallops, oysters, swordfish and tuna, which together account for about one-tenth of the value of regional landings. The market prospects for lobster, which represents just under one-third of the Atlantic regional total and a considerably higher proportion in the Maritime Provinces, are also extremely good; however, if the stock is to continue to be managed on a sustained yield basis it is doubtful if the catch can be



substantially increased. The fortunes of the herring and sardine industries, as on the West Coast, will be largely dependent on improvements in the method of locating and catching herring; if a stable and increased catch is obtained these industries could greatly expand their sales of consumer products.

Practically the entire balance of production from the Atlantic fisheries, half of the total, comes from the groundfish species, of which cod accounts for two-thirds; these resources, with the possible exception of the fairly heavily exploited haddock and halibut stocks, are likely to be more than adequate to support the catch required to meet foreseeable demand. The most important source of demand will continue to be export markets, which now absorb about two-thirds of the output of Atlantic groundfish; this proportion is about the same as that applying to exports of all Canadian fish products in recent years. However, a sharp distinction must be made between the export outlook for fresh and frozen Atlantic groundfish and for the same fish in salted and dried form. Exports of the latter products are, of course, still important — in 1955 some 60 per cent of cod production was salted, mainly for sale abroad — but foreign sales have fallen over the years to less than half their volume of four decades ago. We expect these exports to go on declining from their present level of 125 million pounds to about 100 million pounds in 1980, with relative prices continuing to show an unfavourable trend. In the once important Mediterranean market, exchange restrictions and the encouragement of domestic fishing fleets will cause sales to drop still further, while exports to the United States, mainly for boneless production, are also likely to fall because of rising processing costs in this American industry. On the other hand, Brazilian markets, which have been almost entirely closed to our producers because of currency difficulties could conceivably be an important source of demand. The main market, however, will be the Caribbean area; sales may increase to 90 million pounds from the present 55 million as population grows, even though per capita consumption of salt fish will probably fall as rising incomes and expanding industrialization permit an increase in the consumption of more expensive meat, agricultural, and fish products.

An additional factor limiting the expansion of the Canadian salt fish industry, in the absence of unforeseen technological advance, may be the shortages of manpower and capital resulting from the expansion of more productive branches of Atlantic fishing. Consumption of fresh and frozen groundfish is expected to continue to increase rapidly as improvements in refrigeration and processing methods make them more appetizing and convenient to use. The growth of markets for these products will be closely related to rising incomes and population in North America, and sales overseas will continue to be relatively unimportant. United States consumption of groundfish fillets, the principal form in which fresh and

frozen Atlantic fish is exported, may very nearly double, and even on the somewhat pessimistic assumption that Canada will not maintain its present 75 per cent share of total American imports, sales to this market should rise by four-fifths. This estimate is based on the assumption that United States tariffs on packages and block fillets, presently equivalent to about 13 per cent *ad valorem*, will not be increased as has frequently been proposed by the United States industry. On the other hand, any great expansion in the per capita consumption of fish sticks would probably increase the total American market for our groundfish, despite the fact that these products are to a large extent substitutes in the eyes of consumers for the fillets from which they are made. Although some people are optimistic about the growth of the market for fish sticks if packaging and quality can be improved, Canadian processors will not be able to serve this market directly unless the United States tariff is considerably reduced. Domestic consumption of fresh and frozen Atlantic groundfish should more than double over the next twenty-five years, as should the production of fish meal from Atlantic species for use as a high-protein feed in agriculture. In summary, we expect the catch of Atlantic groundfish may be nearly twice as large in 1980 as it is today, although because of over-capacity in some sections of fish-processing, there will not be a parallel increase in that industry.

These estimates of future production from the Atlantic fishery will not, however, be realized without a very substantial increase in productivity — the net value of production of the average Atlantic fisherman is about one-sixth that of the typical member of the Ontario labour force and just one-third that of the average worker in the Atlantic region itself.<sup>3</sup> The productivity differential in the processing side of the industry, if less unfavourable, is also very substantial. We are, however, hopeful that a significant increase in efficiency and output will take place, not only because there is a substantial backlog of unused technology to be applied but because of recent achievements in the industry. Outlays for bigger and faster fishing boats, power equipment of all kinds, and electronic fish-finding, navigational and communication devices have been rising rapidly at the same time as investment in small boats has been declining to a fraction of its level 20 years ago. Increased capital, better techniques, and more sea-worthy boats have caused the catch and incomes of fishermen to rise very noticeably — more days can be spent at sea, new fishing grounds reached, and uncertainty and hardship considerably reduced; the catch of a fisherman on a modern well-equipped deep-sea dragger, which represents an investment of up to \$15,000 per employee, is very much greater than that of the inshore fisherman with perhaps \$500 worth of equipment who, even if the elements are kind, can rarely expect the season to last more than six weeks.<sup>4</sup> In processing, output per man has also been increased as larger and more mechanized plants have been built to use new filleting, freezing and storage techniques.

The main factors underlying this rising productivity in the Atlantic fishery will undoubtedly work with more force and wider effect in the years ahead: research and education will increase the ability and determination of wider segments of the industry to deal with their difficulties; the relatively favourable market for fresh and frozen fish will continue to encourage the development of more modern processing operations; and the possibility of more acute labour shortages in the industry will further diminish the opposition to bigger boats and more productive equipment which has often impeded progress in the past. As the amount of new capital required to modernize the regional fishery will be considerably more than has been invested in recent years, it remains to be seen whether the industry will be able to raise and apply these sums without an extension of the present framework of federal and provincial government assistance. In any event, inflows of capital will undoubtedly be matched by an outflow of labour of perhaps 20 per cent to 25 per cent over the period, although the combined effect of a higher catch and lower employment will mean much larger incomes for those who remain.

However, the greatest part of the long-run decline in employment in this fishery has in fact already occurred; since 1947 the number of fishermen in Newfoundland alone has fallen by over 40 per cent to about one-third of its level 40 years ago, while in the whole Atlantic region the decline has been well over 20 per cent. Moreover, growing incomes and education, better communications, and improved employment opportunities should combine to ensure that future labour mobility is higher than it has been in the past. Some spots of stagnation will of course remain, and some small secluded communities will survive in which fishermen will have to be prepared to supplement their earnings in other seasons in occupations like farming or logging. In general, however, we believe that modern boats and improved refrigeration both ashore and at sea will lead to more centralization of population in towns capable of supporting an integrated fishing operation based on a large specialized processing plant. This trend will continue not only because of the dwindling importance of fishermen and processors being located in scattered settlements near the fish supply, but because the people living in such isolated localities are increasingly aware of the growing number of alternative employment opportunities and are anxious to move to places where social and cultural activities are greater.

Low productivity, under-employment, and lack of alternative opportunities also characterize segments of the freshwater fisheries, which supply about one-tenth of total Canadian marketings. The factors operating in other sectors of the fishery will undoubtedly bring about further significant increases in efficiency here as well, but a few pockets of poverty and inefficiency will continue to be found, particularly in the North. The main demand for fresh or frozen pickerel, whitefish, lake trout, and other

freshwater species in the next twenty-five years will still come from the United States, although Canadian demand is also expected to grow very quickly. However, because most of our 260,000 square miles of inland waters are subject to the competing claims of industry and recreation, it is unlikely that the fish stocks can support an increase in the catch of much over 50 per cent on a sustained yield basis, even with intensified activity in more remote regions; this, together with rapidly rising demand, suggests a considerable rise in relative prices. Sport fishing activity, which yields a catch equal to one-quarter of the inland total and which is indulged in by one of every ten Canadians, will probably grow *pari passu* with population, but the catch per angler will almost certainly fall.

In summary, we expect the weight of all Canadian fish landings in 1980 to increase by some 60 per cent; because of a shift in demand to the more valuable species and highly-processed products, marketed values should gain even faster. Despite this growth, over-all fish consumption in North America will still account for less than 10 per cent of that of meat, poultry, and eggs, largely because competing farm products on this continent will continue to be relatively favourably priced. Both fishing and processing will use more capital per man, and are likely to require a total gross investment of at least \$300 million over the next quarter century. Concurrently, new methods and machinery will cause employment to fall, individual incomes to rise, and seasonal variations to be reduced. Exports may diminish slightly in importance as Canadian population and per capita consumption grow, although sales to the United States, mainly in the form of fresh and frozen products, are expected to account for a rising proportion of exports and may continue to absorb over half of domestic production. Because our fisheries generally should be able to maintain their competitive advantage, imports are likely to remain complementary to Canadian output for the most part. Underlying all these developments will be the combined influences of education, scientific discovery, and the existence of higher-paying occupations elsewhere, which together will cause the Canadian fishing industry to become much more commercial, specialized and productive. We do not believe it is in the industry's interest to resist this trend.

Rather than try to emulate the restrictive trading behaviour of other countries, we hope that Canada will take every opportunity to remove or reduce barriers to international trade in fish and to expand commercial markets overseas. It may, however, be necessary for Canada to re-examine its doctrine of territorial waters to remove certain anomalies and inconsistencies. This would raise many complex problems of treaty and international law, but at present government regulations which forbid Canadian trawlers of over 65 feet in length from fishing within 12 miles of the mainland on the East Coast, can only be enforced against foreign vessels within the three-mile territorial limit.

Domestic policies should be constructive — designed to ease inevitable changes, rather than to impede them and make them more prolonged and painful. Efforts should therefore continue to be devoted to such activities as biological and technological research, education, and inspection services, for these programmes, when wisely conceived and executed, have done much to raise the efficiency and quality of fishing and fish processing. Similarly, soundly based federal and provincial loan schemes, which have in the past provided productive capital to both sides of the industry, can probably play a useful role, while continued Canadian collaboration in international efforts to conserve or increase fish stocks will be essential.

## FORESTRY

IN AN EARLIER chapter we suggested that Canadian economic history, until quite recent times, could be seen in its essence in terms of a series of relatively few staple commodities for export, coming forward in sequence to supply the central thrust to our economic development. Fishing, the fur trade, then forestry — initially for the shipment of large timbers to Britain — were the headwaters of the stream of Canadian growth. Later the stream was joined by agricultural products, specifically the rushing current of wheat which flowed to world markets; then came the industrial materials, of which lumber and newsprint were among the first. The process continues, with great tributary inflows of aluminum, the non-ferrous metals, oil and iron ore, but now the main stream of development itself has become broad and seems to have an impetus of its own. We see it now as more than just the sum of these individual parts. Forest products appear two or three times in this sequence. In 1868 such products made up about 40 per cent of our commodity exports, while throughout the 1926-55 period, excluding the War years, the proportion varied from a quarter to a third. Currently, three forest products, newsprint, lumber and wood pulp are among our first ten export items, with newsprint heading the list.

The forest industries comprise many different items which are produced and marketed in diverse ways. Within the group are production units which are among the smallest as well as among the largest in the economy, such as the small farm woodlot at one extreme and the giants of the pulp and paper industry at the other. Output ranges from elementary wood procurement to relatively high stages of processing and fabrication. Markets for the individual firms producing wood products vary in size from the small local rural production and sale of rough lumber to world-wide distribution of newsprint.

For Canada, neither the over-all importance nor the diversity of conditions in the forestry industries should be surprising. Lumber in one form or another has been used in the building of structures and the manufacture of furniture and equipment from earliest times; despite the emergence of steel and other materials, lumber continues to be an attractive commodity to use in many activities. Forests are unevenly distributed over the globe, and Canada has been fortunate to have some of the finest stands of timber found anywhere; thus Canada has long been an exporter of lumber to world markets.

The growth of newspapers as a medium of mass communication and advertising and the inventions which made newsprint relatively cheap brought forth a quite phenomenal increase in the world demand for newsprint during the last 50 years, though one for which the rate of growth has gradually diminished. The increase in consumption was particularly rapid in the United States. More recently the adaptation of paper to packaging and the increased use of paper as a building material have accounted for a phenomenal growth in the consumption of other pulp products. Indeed much more of the world consumption of wood pulp is accounted for by coarse and fine papers, and paperboard nowadays than by newsprint. The availability of large accessible softwood forests in Canada; proximity to the United States market and comparatively cheap sea-borne transportation to overseas markets; and the availability of large-scale resources of hydro-electricity; these have given Canada a strong competitive position in pulp products. Newsprint is Canada's biggest export, and it flows to many parts of the world. Restrictions in other countries against the importation of highly manufactured pulp products other than newsprint and wood pulp, have limited Canadian participation in the large and rapidly expanded foreign consumption of coarse and fine papers and paperboard. As establishments engaged in the manufacture of pulp products must be large in size to be efficient and as the finished product can bear higher transportation costs per unit of weight or bulk than lumber, there are fewer firms and larger-scale enterprises in the pulp and paper industry than in other forestry industries.

Canada's forest endowment has indeed been generous. Over 40 per cent of our land area is covered by trees and more than half of this is now capable of producing merchantable timber. Over 10 per cent of the world's output of wood logged for industrial purposes comes from Canada's forests; as a world source of industrial wood we now rank third, the United States accounting for about 30 per cent and the Soviet Union for about 25 per cent of world output.<sup>1</sup> As we consume a smaller proportion of our output than do these other areas, Canada accounts for between 30 per cent and 40 per cent of world exports of wood products.

It would be wrong, of course, to suggest that the mere existence of large forest areas in combination with a limited domestic market serves to account for our important contribution to world forest product requirements. Clearly, many factors play a part. Ample availability of the complementary resources — water and power — was essential. So was the supply of capital and the close proximity to the large and rapidly growing United States market. So also was research by supporting industries and by governments and universities. South America, which possesses large forest resources, has not become a major producer or exporter of industrial wood products because of the absence of some of these other factors.<sup>2</sup>

# PRODUCTION TRENDS IN THE FORESTRY INDUSTRIES, 1925-55

Table 10.1

	Unit	1925	1926	1935	1945	1955	1955 as per cent of 1926	1955 as per cent of 1945
Annual value in millions of dollars								
Pulp and paper .....	G.V.P. <sup>a</sup>	193	215	163	399	1,327	617%	333%
Lumber .....	G.V.P. <sup>a</sup>	134	135	66	231	644	477	280
Veneer and plywood .....	G.V.P. <sup>a</sup>	—	—	—	24	116	—	485
Fuelwood .....	G.V.P. <sup>a</sup>	40	40	32	39	34	80	87
Canada's Gross National Product — all final goods and services .....	millions of current dollars	—	5,294	4,345	11,850	26,769	505	225
Some indicators of volume of output								
Pulp and paper								
Total pulp .....	1,000 tons	2,773	3,230	3,868	5,601	10,151	314	181
Newsprint .....	1,000 tons	1,537	1,889	2,765	3,324	6,196	328	186
Lumber industry — sawn lumber .....	millions bd. ft.	3,889	4,185	2,973	4,514	7,920	189	175
Veneer and plywood								
Veneer 1/10" base .....	1,000 sq. ft.	—	—	—	186	643	—	346
Plywood 1/4" base .....	1,000 sq. ft.	—	—	—	321	1,160	—	—
Fuelwood .....	1,000 cords	9,159	9,279	8,791	7,587	3,623	39	48
Canada's Gross National Product — all final goods and services .....	millions of 1949 constant dollars	—	7,670	7,619	15,413	21,573	281	140

<sup>a</sup> Gross value of production.

SOURCE: Based on data produced by Industry and Merchandising Division, Dominion Bureau of Statistics, see various issues of *General Review of the Manufacturing Industries of Canada*. The Gross National Product figures are revised figures contained in Wm. C. Hood and Anthony Scott, *Output, Labour and Capital in the Canadian Economy, 1957*, a study for the Commission, Chap. 7.



The pattern of development of Canada's forest industries over the past several decades is summarized in Table 10.1. This shows that the output of the forest industries has grown more rapidly than the average of all economic activities in Canada during the past three decades, primarily because of the rapid growth of the pulp and paper industry. Is this growth likely to continue over the next twenty-five years? We believe that there can and will be a considerable increase in the absolute levels of production of the forest products industries, but that the growth may be somewhat slower relatively than it has been in the past. The reasons for this conclusion emerge most easily from a consideration of the various segments of the industry group. The discussion which follows is based on the study prepared for us on *The Outlook for the Canadian Forest Industries*.<sup>3</sup>

### ***The Lumber Industry***

We shall begin with the lumber or sawmilling industry, one of Canada's oldest manufacturing operations but still one of its largest. In output, sawmilling still ranks within the leading ten manufacturing industries; in employment it rivals the pulp and paper industry. It is an industry made up of more than 8,000 mills, many of which are very small, but some of which are extremely large, as shown in Table 10.2. Sawmilling is an activity carried on in every province, but the large integrated operations are concentrated in British Columbia.

**Table 10.2**

### **SAWMILLS CLASSIFIED BY SIZE OF ANNUAL PRODUCTION, 1953**

Size class production in m.f.b.m.	Number of mills	Percentage of number	Percentage of production
Under 200.....	4,197	52.8	4.2
200- 499.....	1,516	19.1	5.9
500- 999.....	934	11.7	9.0
1,000- 4,999.....	1,112	14.0	31.9
5,000-14,999.....	141	1.8	15.5
15,000-19,999.....	19	.2	4.5
20,000-and over.....	36	.4	29.0
Sub-total.....	7,955	100.0	100.0
Specialty mills.....	239		
Total.....	8,194		

NOTE: It is estimated that there were, in 1953, more than 1,000 additional small mills which did not report their production.

a Thousands of feetboard measure per year.

SOURCE: *The Outlook for the Canadian Forest Industries*, 1957, a study prepared by the Commission's forestry study group, Chap. 4, Table 10, p. 31.

Transportation costs are of critical importance in determining the location of lumber mills and the market areas which they serve. The costs of transporting trees as such or as large logs are high, unless a water network can be used to float logs to a mill as in British Columbia; thus milling will only be economical in much of Canada when it is carried on

in close proximity to the trees. The finished product, lumber, is itself bulky and of low unit value and therefore expensive to transport. Thus timber resources which are not outstanding in a physical sense but which are close to markets will be exploited. The markets themselves are spread out geographically; every little hamlet and every farm requires lumber from time to time. Isolated pockets of timber resources and dispersed markets for lumber explain the large number of small local establishments in the industry.

There are important exceptions to this localized structure of the lumber industry. Limited resources of timber of lumber quality and the population and industrial concentrations in Ontario and Quebec make these provinces lumber "deficit" areas which "import" wood from both the West and the East. The Prairies also are importers. There is therefore some long-distance movement of lumber within Canada. On the West Coast the huge logs can be transported cheaply by water and the industry there has evolved toward large mills located on tidewater on the south mainland coast or on Vancouver Island closer to the domestic and export markets they serve. These large mills also make integration feasible: there is a sufficient quantity of mill waste to justify by-product operations or the sale — and sometimes export — of what would otherwise be waste material. And this fuller use or sale of the raw logs itself helps support the large-scale operation. In the East, integration is much less common and where it does occur, the production of lumber is likely to be the subsidiary operation. The required scale of operations is achieved in pulp and paper manufacture and, in effect, the pulp mill sometimes becomes a collection point for the raw materials of a lumbering operation.

In general, we would not expect the structure of this industry to change much in years to come: because of the factors mentioned, the typical mill will probably remain small. There is little prospect that the industry as a whole will be able to achieve production economies associated with an increasing scale of mill operations. Scope for use of automatic techniques appears to be limited and productivity gains are likely to be small.

There has been a long-run increase in the relative price of lumber, compared with other structural materials. This is partly because of the limited increase in productivity in the lumbering industry, compared with other industries; in turn the limited increase in productivity reflects the technical difficulties of applying capital-intensive mass-production techniques and the small scale of many of the mill operations. In order to retain labour, the lumbering industries must nevertheless match increases in wage rates in alternative occupations. Insofar as lumber prices will be influenced by these factors in the future, it appears likely that the relative price of lumber will continue to increase compared with other products.

These prospects regarding costs do not apply to the same extent to lumber operations on the West Coast. There the larger scale of operations provides more scope for mechanization designed to raise productivity; this along with the use of wastes from lumbering in the manufacture of other products, can offset, at least partly, the rising trend of lumbering costs. These mills — and the larger eastern ones as well — should expand production relative to the industry as a whole. However, even for these mills productivity gains are unlikely to match those in such competing industries as iron and steel and aluminum (although the pulp and paper side of the West Coast forest product operations partly offsets this situation). Here we return to the basic characteristics of sawmilling and its raw material. The simplicity of the manufacturing process itself limits the scope for production economies. It was this simplicity which gave lumber an early start as a low-cost industrial raw material but the advance of technology in other fields has tended to reduce this initial advantage and is likely to continue to do so. Secondly, sawlogs, the raw material, are not uniform. There will be variations of species, size and quality; and varied defects such as knots, rot, pitch and stain. Lumber is produced in a wide range of sizes and grades. Sawlogs must be examined, graded and routed; and so must sawn timber on its way to further processing. Automatic handling and control techniques cannot readily be applied to these tasks.

In summary, we conclude that lumber prices will rise relatively in the future, or what is the same thing, that supply will respond to expanding demand at rising costs, thus inhibiting the expansion of the quantity demanded. In these circumstances, by how much will lumber needs increase? The answer will depend on the long-term price elasticities of demand and supply. There are four main uses for the output of sawmills: in construction, principally residential; in the manufacture of such things as furniture and toys; in the crating and packaging fields; and in a special use, railway ties. Taken together, these uses cover a broad range of economic activities, many of which will increase rapidly with general economic expansion. But what role may lumber attain in these various activities in the future? Lumber has lost ground to competing materials over the past quarter century as is shown in Table 10.3. This has been largely due to changes in the prices for lumber and for such other materials respectively, but other factors have also been important. In many uses competing materials seem far superior. And the complexity, precision and scale of modern industrial requirements have rendered lumber unsuitable in some former applications. Non-uniformity, inflammability and poor weathering qualities are obvious disadvantages and they have been heightened by progress in competing materials.

But there are also bright sides to the prospects for this industry. If some of the advantages which lumber enjoyed have narrowed or dis-

Table 10.3

**PERCENTAGE INCREASES FOR LUMBER—  
ECONOMIC ACTIVITY AND COMPETING MATERIALS**  
(annual averages 1926-30 versus 1950-54)

	1926-30	1950-54	Per cent increase
Apparent consumption of lumber in Canada — million f.b.m. ....	2,483	3,555	43.2
G.N.P.—millions of constant 1949 dollars. ....	8,453	19,086	125.8
Value of new construction expenditures — millions of 1949 constant dollars. ....	1,279	2,555	99.8
Domestic consumption of portland cement — thousand barrels. ....	10,430	21,636	107.4
Value of production of structural materials — thousands of constant 1949 dollars. ....	63,244	140,420	122.0
Exports of lumber from Canada—million f.b.m....	1,988	3,557	78.9

SOURCE: Based on data presented by the Forestry Branch, Department of Northern Affairs and Natural Resources and on the revised Gross National Product figures in Wm. C. Hood and Anthony Scott, *Output, Labour and Capital in the Canadian Economy*, 1957, a study for the Commission.

appeared, there are some it retains: natural beauty, easy workability, good “strength for weight” properties, all are inherent. There have been a number of technical developments such as lamination and bonding which adapt lumber to modern needs; treatments have been developed which improve the resistance of wood to weather and fire.

In recent years, about 30 per cent of Canadian lumber output has gone to the United States and something under 10 per cent to the United Kingdom. Many of the same considerations as we have just discussed apply in these important markets but from the studies which were prepared for us, and from other studies,<sup>4</sup> we judge that export volume should hold up well. For the Canadian industry in its international setting, good quality and availability of resources are important assets; relative to foreign lumber sources, its competitive position is strong.

In the continuing contest for position as an industrial material, lumber has its own advantages; the past records indicate a continued growth in lumber consumption with growing population. For example, since the 1920's, the basic trend in annual per capita lumber consumption in Canada has been essentially constant: it was 252 board feet in 1926-30 and 248 board feet in 1950-54. We expect the going to be a little harder in the years ahead. Because of more intense competitive pressure from other materials and the prospect of rising “real” lumber prices, the domestic per capita use of lumber might fall by as much as 10 per cent by 1980. If so, this would mean aggregate Canadian requirements of 5.8 billion board feet, as against an average of 3.7 billion board feet for the 1952-54 period. Similar trends seem in prospect for exports and, in all, we foresee

perhaps a 60 per cent expansion of output by 1980. At that time, production might therefore reach almost 12 billion board feet.

### *Pulp and Paper*

When we turn to pulp and paper, the largest of the forest industries, we find an industry which contrasts in many ways with sawmilling. Though its origins can be traced back almost 150 years, most of its growth has occurred in this century. The mills of the Canadian industry are typically large scale and number only about 130 in all. Commonly, plant and equipment for one such mill represents an investment exceeding \$50 million; a single newsprint machine might cost \$8 million. Like sawmilling, however, pulp and paper is heavily committed in export markets: out of total production valued at nearly \$1.3 billion in 1955,<sup>5</sup> exports totalled almost \$1 billion. The main lines of the industry's product structure can be summarized as follows:

Table 10.4

#### PULP AND PAPER PRODUCTION AND EXPORTS, 1955

	Production	Exports	Per cent exports
	1955—millions of dollars		
Newsprint.....	688	666	96.8
Market pulp <sup>a</sup> .....	297	297	100.0
Other paper grades.....	293	28	9.6
Total.....	1,278	991	77.5

a See following text.

SOURCE: *The Outlook for the Canadian Forest Industries, 1957*, a study prepared by the Commission's forestry study group; and Dominion Bureau of Statistics, *The Pulp and Paper Industry 1955*, Table E, p. H-12

Not all of the market pulp manufactured in Canada is exported — as is shown above — but in order to avoid a double count in the output of the industry, we have excluded the relatively small amount, valued at about \$20 million, which was sold to Canadian mills. The predominance of newsprint and the importance of newsprint exports are the striking features of the table. This is truly a large-scale enterprise: Canadian mills account for almost one-half of world newsprint production of some 13 million tons; they account for almost four-fifths of the newsprint which moves in world trade and they supply roughly three-quarters of United States needs, now running at nearly seven million tons annually.

The production of newsprint might be described as follows: the raw material, pulpwod, enters the mill to be ground, or chipped and cooked, combined with water, conveyed to the paper machine where the water is removed by pressing and drying, then cut to width and rolled ready for shipment. There is, of course, rather more to the process than this, but one is impressed nevertheless by its clean and uncomplicated nature. Faced

by a bank of four paper machines, each about 300 feet long and rolling out a 20-foot width of newsprint at perhaps 20 miles per hour, one gets unmistakably the notion of efficiency and simplicity. It is a simplicity which in some respects is the envy of those producing other grades of pulp products. Currently, the Canadian pulp and paper industry annually produces 6.5 million tons of a single, essentially uniform commodity, standard newsprint paper. In the other segments of the industry there are hundreds of distinctly different grades of paper and paperboard. For these grades, production runs are short, punctuated by washdowns of machines and changes in the pulp mixture as required by the new specifications. The difference between the two segments is largely dictated by the markets they serve; as indicated in Table 10.4, producers of the so-called other paper grades sell 90 per cent of their output in Canada, being confined to the domestic market mainly by the effect of foreign tariffs.

During our hearings we inquired into the competitive position in world markets for Canadian production of fine and coarse papers and paperboard because such products appear to be well adapted to Canada's resources. But Canadian exports of such commodities are restricted by foreign tariffs. Because of this, the Canadian producers of fine and coarse papers and paperboard claimed they need tariff protection in return. This is not a matter of comparative efficiency. The domestic market is too small to yield the economies which come with specialization, while competing American mills supplying the large — and protected — United States market are in a position to specialize. We were informed that Canadian mills could probably hold their own in competition if they enjoyed free and equal access to the North American market and were assured that such an arrangement would be permanent. But free access to the United States market does not seem to be a likely prospect.

The past record of growth and the prospects for production of various classes of pulp and paper products are summarized in Table 10.5.

In the past the Canadian output of other paper grades has expanded more rapidly than newsprint, mainly reflecting the rapid growth in consumption of fine and coarse papers and paperboard in Canada.

What is the basis of the projections set out in Table 10.5? Consider newsprint first. In 1956 about 5.25 million tons, or 80 per cent of our output was shipped to the United States. By 1980 shipments to that country might reach about 7.6 million tons, but this would represent a gain of only about 45 per cent. There are two reasons for this rather modest forecast of growth. First, the use of newsprint in the United States is already at a very high level; the American newspaper industry, which accounts for perhaps 90 per cent of the consumption, is healthy but it is past the first blush of youth. In advertising, it must compete against other giant media — magazines, radio and television; in circulation, it must

Table 10.5

**PULP AND PAPER OUTPUT TRENDS BY MAIN GRADES**  
**ANNUAL AVERAGES 1926-30 AND 1950-54;**  
**PROJECTED 1980**  
*(thousands of tons)*

	1926-30	1950-54	Per cent increase	1980	Per cent increase
Newsprint.....	2,322	5,669	147	12,500	120
Other paper grades.....	420	1,584	277	4,107	159
Market pulp					
Exports.....	868	2,032	134	4,880	140
Non-paper pulp used in Canada	n.a.	48	—	165	244
All grades.....	—	9,333	—	21,652	131
G.N.P. in millions of (1949) constant \$.....	8,453	19,086	127	61,800	223

SOURCE: Prepared from data in *The Outlook for the Canadian Forest Industries*, 1957, a study prepared by the Commission's forestry study group. See Table 59, p. 140; Table 60, p. 142; Table 98, p. 250; and Table 99, p. 252

compete against these same media; and the newspaper's claim for readers' time is limited by alternative claimants as diverse as the automobile, the golf course and the home workshop. In these circumstances, newspapers will do well to hold their present place and the forecasts prepared for us anticipate only a minor increase in per capita consumption of newsprint. Compared to 1956 United States newsprint use per person is expected to increase by slightly less than 12 per cent by 1980, and aggregate use by 52 per cent. The latter is a larger gain than is expected for Canadian exports to the United States. The difference lies in a probable relative increase in United States supply of newsprint from domestic sources, and this is the second critical point in the forecasts. In 1950, American consumers obtained 17 per cent of their newsprint supply from home mills; in 1956, 22 per cent. In tonnage, the increase from domestic sources amounted to over 600,000 tons per annum. We are told that there are several reasons for this. A technological advance is one: it is only quite recently that newsprint of satisfactory quality could be made from southern pine. The first mill in the Southern United States began operations in 1940, but some 700,000 tons of annual capacity have been added there since the War. Still more recently a new mill began operations in the Northeastern United States using a new process to produce newsprint from hardwoods. Assistance in the form of special depreciation provisions figured in most of these increases. Another factor has been the industrial growth in the South, which opened up new plant locations and which, through population growth, has brought a burgeoning regional market for local production.

Having the requisite technology, resources and market, a development of this kind is inevitable and it is felt that it will continue for a time, until the effects of rapid increase in the costs of labour and wood

narrow or eliminate the advantages of the recent past. The opinion of the Canadian industry is that by 1960 the effects of the special tax assistance should be at an end and that this, along with expected trends of costs in the South, should restore the competitive position of Canadian mills. Beyond 1960, the proportion of expanding United States needs that will be supplied from Canada is expected to be stable, at about 75 per cent. Implicit in this projection is the assumption that Canadian mills can compete effectively with new domestic United States production in regions other than the South. There is a possibility of increasing production of newsprint based on hardwoods in the Northeastern United States but the technology which makes this feasible is also available to mills in Canada. The future of our forest industries is sensitive to the external competitive situation;<sup>6</sup> thus, special importance is attached to the need for competitive efficiency in our domestic mills if their market share is in fact to be maintained.

This point applies equally to newsprint exports overseas, though the prospective growth in demand is greater than in the United States and newsprint resources are more limited overseas. Excluding Canada and the United States, world newsprint requirements might rise by almost 9 million tons by 1980, equivalent to almost a 150 per cent gain over 1955 levels. Production in the same geographical area — which we shall designate simply as "Overseas" — might increase by only about 5.4 million tons, suggesting that North American exports to overseas areas must rise by 3.2 million tons to close the gap. In 1955 these exports totalled just under one million tons. Overseas import requirements from Canada alone might reach 3.8 million tons by 1980, against 725,000 tons in 1955. This is a very large gain but the overseas demand potential is also large. Some sense of the magnitudes involved can be gained from per capita figures: in Canada, the per capita use of newsprint is now 60 pounds annually; the average level for the overseas countries as a whole is five pounds. If the suggested trends are realized, the average level abroad would by 1980 be brought to a level of just eight pounds of newsprint per person. This modest level of newsprint consumption together with the expected growth in population imply phenomenal increases in demand for newsprint. It might be added that requirements here in Canada are expected to roughly double with increasing population, and may rise to about 72 pounds in per capita consumption.

The third major segment of the pulp and paper industry is market pulp, a term which itself requires clarification. In 1955 the Canadian industry produced just over 10 million tons of wood pulp, exporting about 2.4 million tons and utilizing the balance for further conversion in domestic paper and paperboard mills. The exports represent direct sales of pulp to converters abroad. Projected sales of such products were prepared for us, and are reproduced here in Table 10.5. The other item under the



market pulp heading — non-paper pulp used in Canada — refers to what is technically known as “dissolving and special Alpha grades” of pulp, used in the manufacture of such things as rayon, plastics and explosives. As has been mentioned, we have not treated separately the relatively small volume of paper pulps marketed in Canada. The trend of sales for these pulps is included in the projections for paper and paperboard.

Many of the observations and comments on newsprint are applicable to pulp exports. Production of both in Canada is typically large scale and efficient; both are heavily dependent on the export trade and move in a free trade environment. For each the principal market is in the United States; the largest other external sales are to the United Kingdom. Market pulp is certainly not less sensitive than newsprint to the myriad forces which push and pull at the pattern of our trade. One recent study of the United States pulp and paper outlook<sup>7</sup> foresaw virtually a doubling of pulp production in that country to almost 40 million tons annually over the next quarter century. If this projection is adopted, the indications are that our exports to the United States will also about double — to 3.7 million tons. Though Canadian mills are the major, and sometimes the sole, source of supply in individual instances, their position in the aggregate is thus not large in relation to total United States needs.

In overseas markets, the two elements — a huge demand potential and relatively limited resources — encourage the prospects for growth in Canadian exports of wood pulp. An expansion in the order of 700,000 tons, or 140 per cent, is contemplated. In its submission to us, however, the Canadian Pulp and Paper Association suggested that a much larger expansion could conceivably occur.<sup>8</sup> The Association pointed out that it would be in line with recent estimates prepared by the Food and Agriculture Organization (F.A.O.) and the Organization for European Economic Co-operation (O.E.E.C.) for European paper consumption to reach 20 million tons by 1980 while prospective pulp supply might total just over 14 million tons. Part of this deficit will be made up in the form of paper imports but an increase of about 600,000 tons in pulp imports from Canada has been included in our projections. But, while not included in its forecasts, the Association suggested that additional market pulp imports in the order of two million tons might be needed if the 20-million-ton level of European consumption is to be reached.

Thus, for both newsprint and market pulp an important contribution to the expansion prospects for Canadian output is expected to come from the growth of overseas requirements. Obviously, however, these requirements must become effective; that is, they must be backed by the ability to buy in this country. We indicated in Chapter 4 that world trade will continue to feel the hampering effects of restrictive commercial policy and monetary restraints, but it may well be that our exports of industrial

materials will be much less limited by such restraints than our exports of highly manufactured goods.

### *Other Forest Industries*

We propose to comment only briefly on the various sub-industries which remain. They are listed along with estimates of current production and projected output in Table 10.6. For these commodities, the prospects run the whole range from absolute declines in output to rates of growth which are among the fastest in the entire forestry group. However, they account for a relatively small part of total wood use: in 1954, collectively they took only 20 per cent; individually, none took more than 10 per cent.

Table 10.6

### CURRENT<sup>a</sup> ANNUAL PRODUCTION AND PROJECTED 1980 OUTPUT OF OTHER FOREST PRODUCTS

	Current <sup>a</sup>	Est. 1980	Per cent change
Shingles — 000 squares.....	2,774(i)	2,774	—
Plywood — m. sq. ft.: 1/4".....	762(ii)	2,420	208
Insulation board — m. sq. ft.: 1/2".....	268(ii)	600	124
Hard board — m. sq. ft.: 1/8".....	147(ii)	490	206
Veneers — m. sq. ft.: 1/10".....	484(ii)	819	70
Pulpwood exports 000 cords.....	2,233(i)	1,750	— 22
Fuelwood 000 cords.....	5,300(iii)	2,500	— 53
Other products <sup>b</sup> m. cu. ft.....	75(iii)	80	7

a "Current" refers to (i) 1950-54 average;  
(ii) 1952-54 average;  
(iii) 1954

b Poles, piling, fence posts and rails, round mining timber, distillation wood and hewn ties.

SOURCE: *The Outlook for the Canadian Forest Industries*, 1957, a study prepared by the Commission's forestry study group, Chap. 4.

The decline in production of fuelwood is, of course, not surprising. Studies of prospective fuel requirements prepared for us anticipate a marked substitution for wood by competing fuels and energy sources: in general the latter offer greater convenience and cleanliness, and will in future be more widely distributed among consumers. By 1950 the production of fuelwood from farm wood lots — the main source — was only half of the rate in 1940.

For pulpwood exports, the long-term future trend will reflect the resolution of two major forces: on the one hand continued demand from abroad for such products but, conversely, growing domestic requirements for pulpwood associated with the expansion of pulp and paper output. Moreover, Ontario, New Brunswick and British Columbia are the principal sources for present exports of pulpwood; the first two of these provinces already have statutory measures that restrict the export of

wood in raw form. The volume of pulpwood exports tends to swing widely from year to year; much of it goes to meet incremental needs and it is therefore subject to the pull of peak demands at home and abroad. The average level of pulpwood exports is expected to be about 25 per cent less by 1980 than in recent years.

The plywoods, composition boards and veneers might be regarded as latter-day offshoots of sawmilling; they are that industry's answer to modern industrial demands for uniformity and convenience in use or installation. The use of such products has grown extremely rapidly in recent years; Canadian consumption of plywood and building boards rose by over 50 per cent between 1949 and 1954. We do not expect this pace to be maintained. The rapid increase in output of these products was partly the lusty growth from infancy of these industries; partly, it reflects the unusual vigour of Canadian construction activity in recent years and, partly, an emergence of "do-it-yourself" activities. The short record of experience makes it difficult to gauge the future demand for these commodities. We would feel, however, while accepting the forecasts made for us, that they might well prove to be conservative. It will be noticed, incidentally, that the estimates for expansion in output of hardwood, plywoods and veneers are relatively moderate. This stems from a rather serious resource supply problem. Travelling through many of the forested areas of Eastern Canada, one sees repeatedly the defoliated limbs and trunks of yellow birches interspersed through the stands. This is the effect of the birch dieback, which has severely afflicted Canadian yellow birch trees during the past two or three decades. While precise knowledge of the extent of the damage is not available, many hold the belief that this will be a serious limiting factor to increased production of birch plywood in the years ahead.

### *The Supply Situation*

Does Canada possess the forests capable of meeting the projected increases in output of wood products? The requirements of wood to meet the various projected productions of forest products have been estimated for us, and are found in Table 10.7.

Based on these estimates, to meet the 1980 requirements of the wood-using industries the annual cut of wood will have to be 58 per cent larger than it was in 1954. These estimates include a sizable allowance for increased use of mill leftovers — waste material — in the production of pulp and paper. We are told that at the projected level of lumber, plywood and veneer output, as much as six million to eight million cords of usable material would result as waste. About half of this, it is assumed, might be economically available to pulp and paper production and as a source of fuelwood.

Data contained in *The Outlook for the Canadian Forest Industries* showed the apparent adequacy of the forest resources to meet these de-

Table 10.7

# ANNUAL WOOD REQUIREMENTS — 1954 AND 1980 (estimated)

	Quantities		Equivalent in millions of cubic feet of merchantable timber	
	1954	1980	1954	1980
Pulp and paper requirements				
000 cords.....	13,677	28,000		
of which: Pulpwood.....	12,982	25,000	1,100	2,120
Mill leftovers.....	695	3,000		
Lumber and other sawn products:				
m.f.b.m.....	7,317	11,400	1,400	2,220
Softwood plywood & veneer m.f.b.m.....	235	700	40	130
Hardwood plywood & veneer m.f.b.m.....	93	150	20	30
Pulpwood exports 000 rough cords.....	1,861	1,750	160	150
Fuelwood:				
Roundwood—000.....	3,918	2,000	310	160
Mill leftovers—000 cords.....	1,300	500		
Miscellaneous products				
Produced in Canada.....			50	55
Exports of misc.....				
Roundwood.....			25	25
Total.....			3,105	4,890

SOURCE: *The Outlook for the Canadian Forest Industries, 1957*, a study prepared by the Commission's forestry study group, Table 62, p. 151.

mands. In terms of national aggregates it was shown, for example, that the 1954 wood cut was equivalent to 61 per cent of the "possible cut" — that is, gross annual growth — of softwoods, and equivalent to only 19 per cent for hardwoods. For all species the total cut of 3.1 billion cubic feet was just under 50 per cent of the possible cut. The total drain on our forests was somewhat more than this. Estimated fire losses have averaged some 183 million cubic feet in recent years; however, this estimate is known to be incomplete since it includes mainly the areas now under protection; actual losses might have been twice as great. From the Forest Biology Division of the Federal Department of Agriculture the Commission was given a figure of 900 million cubic feet of wood as being the estimated annual loss due to disease and insects. Together these losses added about a third to utilization and brought the total drain to about two-thirds of the possible cut.

From these estimates it is evident that, had we been able to use the full possible cut — to achieve the theoretical ideal of "complete utilization" — demands upon our forests twice as great as those experienced could have been met without impairment to the forest capital. Allowing for losses due to fire, disease and insects, the actual cut could have been increased by 50 per cent, compared with anticipated increases in annual

wood requirements by 1980 of 58 per cent. However, looking ahead twenty-five years, other factors affecting the wood supply situation can be taken into account. With more extensive fire protection and intensified control of insects and diseases, forest losses might be halved; improved management practices can be expected to increase yields considerably. In addition, there exists on presently inaccessible forest lands a reserve of timber which could potentially yield an annual crop about one-third as large as the possible cut from presently accessible areas. These relationships are drawn together in Table 10.8 which sets forth one possible pattern of growth and use of wood by 1980. It is apparent from these estimates that in the purely physical sense Canadian forest resources are more than adequate to meet the expansion of wood requirements.

We must emphasize here, however, the nature and magnitude of the resources we have been considering. They are spread over thousands upon thousands of square miles, much of the territory being remote, much of it virgin. Thus, in referring to the possible cut, the term "estimate" is used advisedly. Provincial authorities, mostly by sampling techniques, have made an inventory of only two-thirds of the commercially productive forest area. Considering the areas involved, this is an important achievement but much surveying of forest resources remains to be done. Knowledge of the productivity of our forests is fragmentary. The existing estimates need verification by more intensive surveys and these may fill gaps in our information on species, rates of growth, and losses due to fire and disease. Though our knowledge of available forests is limited, we believe that it is sufficiently accurate to support the conclusion of adequate resources to meet substantially higher output in the future. But as regards species or sizes — yellow birch has been mentioned; Douglas fir and veneer logs could be added — the uncertainty of our detailed knowledge constitutes a qualification.

The reassuring prospects indicated by the use of aggregates is deceptive in other respects. Fire losses can be used in illustration. One might feel rather complacent about the fact that losses due to fire represented less than 5 per cent of the total drain but the full implications are much more serious. As mentioned earlier, the figure covers only reported losses and these are most likely to have occurred in the accessible regions. In more specific terms: the real loss involved in the destruction by fire of, say, a healthy stand of spruce in a good location is far greater than mere statistics indicate. Nor is the timber loss the full extent of the damage: there may be a loss of wildlife and of recreational value; the control of water run-offs may be impaired; and where the burn is serious or repeated, permanent damage may be done to the soil.

We are in full accord with representations made to us stressing the importance of efforts at fire protection. These might take several forms, spearheaded by sound and sustained public education on the subject.

Table 10.8

## ALLOWABLE CUT vs. ESTIMATED DEPLETION, 1980

(in millions of cubic feet)

Group	Allowable Cut				Depletion			Percentage of adjusted allowable cut
	Accessible	Potentially accessible	Total	Adjusted <sup>a</sup>	Roundwood requirements	Losses	Total	
Atlantic								
Softwoods .....	567	143	710	820				
Hardwoods .....	195	2	197	230				
Total .....	762	145	907	1,050	500	47	547	52
Central								
Softwoods .....	1,778	706	2,484	2,700				
Hardwoods .....	1,003	127	1,130	1,320				
Total .....	2,781	833	3,614	4,020	2,250	217	2,467	61
Prairies and North								
Softwoods .....	797	487	1,284	1,390				
Hardwoods .....	696	293	989	1,050				
Total .....	1,493	780	2,273	2,440	500	159	659	27
British Columbia								
Softwoods .....	1,347	422	1,769	1,940				
Hardwoods .....	41	17	58	60				
Total .....	1,388	439	1,827	2,000	1,650	74	1,724	86
All Groups								
Softwoods .....	4,489	1,758	6,247	6,850	4,370			
Hardwoods .....	1,935	439	2,374	2,660	530			
Total, Canada .....	6,424	2,197	8,621	9,510	4,900	497	5,397	57

a The data on adjusted allowable cut include provision for higher yields estimated to be achievable within 25 years. These allowances are based on conservative assumptions as to the improved yield potentials only from the forest areas of highest productivity.

SOURCE: *The Outlook for the Canadian Forest Industries, 1957*, a study prepared by the Commission's forestry study group, Table 73, p. 183.

Effective fire control implies many things: active research in methods and in the development of equipment; the extension of information; and access by increased communication and road facilities. It was suggested to us that a new research organization on forest fires be formed under the auspices of the various organizations interested in the forest resources but independent of governmental agencies. Another suggestion is that military personnel might be trained to act as firefighters in cases of emergency, as is done in some other countries. We wish to stress the desirability of co-operation among all interested agencies and authorities. As provided for in the Canada Forest Act, the Federal Government can render valuable assistance in the field through financial assistance to fire protection programmes. The causes of fires — natural and human — being what they are, we doubt if the numerical incidence of fires can be drastically reduced but we feel that efforts along the lines indicated above could reduce the losses by perhaps one-half of the present levels.

Many of the same comments apply equally to insect and disease infestations. The actual and potential losses are much greater than is conveyed by the single statistic reporting estimated current damage. Vigorous co-operative action on a broad scale is needed; though with much less drama than surrounds a forest fire, a major infestation may gradually pervade whole regions inflicting epidemic losses to the mature stands, perhaps even threatening a particular species of tree with extinction. Regeneration can be interrupted or retarded for decades. The spruce budworm damage in New Brunswick and Eastern Quebec is an example of the scope of such things; happily, it is now also an example of effective co-operative action between private industry and all levels of government to bring the menace under control.

We have been discussing the physical aspect of Canada's resource position in forests, pointing out some of the reservations required in interpreting Canada's forestry prospects. However, in the long run it is the economic aspect of our supply position, which will determine how these prospects will materialize. For example, we have heard it suggested that Canada has a unique wealth of resources in the world wood-fibre economy. Such is not the case. Table 10.1, it will be recalled, showed the predominance of lumber, newsprint and wood pulp among our forest industries. This pattern of development does not fully reflect the structure of world demand for wood products: as a case in point the United States uses some 14 million tons of paperboard annually and about 7 million tons of newsprint. Virtually all of the former is supplied from domestic resources while Canada supplies about 75 per cent of the latter.

The fact is, of course, that our advantages — where they exist at all — are relative, not absolute. Moreover, they are relative in a situation which is constantly changing. Advances in the technology of converting a wide range of fibrous materials into paper products are now well known.

Over the past 25 years, commercial operations have been started, using temperate and tropical hardwoods, bamboo and sugar cane waste, to name only a few such materials.

Other factors affect our advantages. The growth of a market itself may justify domestic production at some point. Industrialization may bring transportation or power facilities where none existed before. Something as simple as the stroke of a pen on a tariff regulation or as complicated as the stirrings of nationalism may close a market to our products. All this is not to suggest a prospect of peril and uncertainty; as they have in the past, our forest industries can take advantage of technical changes. Though we might foresee on the one hand a huge demand potential and, on the other, conclude that our resources are ample, it might not follow that Canada's forest industries would participate fully in the growth to come. We might call the required additional ingredient "competitive efficiency"; it will be the result of vigorous fundamental and applied research at all levels of operation, from basic studies of plant ecology to analysis of consumer preference in the marketplace.

The logical starting point for such research activities is at the source of the raw material and comes under the heading of "forest management". Stated most simply, it is the object of such management to increase yields in the best and most accessible locations, thus to make possible more intensive operations without impairment of — indeed, with improvements to — the preferred stands. The advantages are obvious: reduction of the onerous transportation costs associated with long hauls and reduction of high labour costs associated with high labour turnover and low productivity. Year-round logging from permanent campsites or townsites and increased mechanization are the means toward these ends. Control and reduction of forest losses, already referred to, are also a vital part of the management function. Encouragement should be given to tree farming. The farm woodlot generally has the advantages of good location and in addition has a ready labour supply in the farmers themselves. We are not yet at the stage in Canada where we can say simply, "All our forests should be brought under management". The areas involved are too large and much of the area is too remote; the cost burden too high. In order to obtain ample returns for the costs involved, intensive management should be concentrated on the proximate forest areas; in the more remote areas, the emphasis should be on protection with preservation as the primary objective.

As our country grows and the demands upon its forests increase, the problems of economic inaccessibility of remote stands will lessen. To go to the Peace River District for pulpwood is as yet uneconomic; to go there also for minerals and power may transform the prospects. Technology, too, is working to reduce the effects of distance. The truck and tractor were the pioneers in mechanization. The power saw followed but we are told that it might be on the way to displacement in 15 or 20 years by



the use of equipment designed for "whole-tree logging". This would open up a whole new set of possibilities: entire trees would be brought to collection points where machines would remove the limbs and bark, perhaps also performing the preliminary sorting and cutting operations on the peeled logs. In what it called "an exercise of the imagination" the Canadian Pulp and Paper Association, in its brief, discussed these and other revolutionary developments: the use of mobile atomic-power reactors and compact high-speed chemical pulping equipment could free the mills from dependence on large hydro-electric installations, and permit operations to move closer to the forest sources. Perhaps such innovations are imaginative but the technical rudiments have already been worked out. And in essence, the objectives are simple: to increase productivity and to minimize at each stage of the total process the distances over which bulky waste materials are transported.

We should like to be able to add without qualification that these problems are being attacked from another direction — through full utilization of the waste. Much has in fact been done in this regard. On the West Coast, particularly, there are integrated pulp mills which now subsist solely on sawmill waste; some of the waste is also converted to other commodities for shipment to domestic and export markets. But waste does not exist in just those proportions or places which match product demand. The bulk and low unit value of slash, limbs or tree tops limits the distances over which they can be moved for processing. And, considering a higher stage of manufacture, some 50 per cent of the raw material is lost in the waste liquor effluent from sulphite pulping. This waste has been referred to as "a rich storehouse of chemicals". Technically, so it is; but with present knowledge — and foreign tariffs on imports of chemicals — domestic demand imposes modest limits on the extent to which the storehouse can yet be tapped.

Nevertheless, increased utilization of the raw material and greater by-product diversification are in the shape of things to come. The benefits could be very substantial. To maximize the value realized from a given piece of wood is to reduce the share of the cost of the wood which each product must bear. The scope for mechanization will probably be increased. With diversification often comes greater stability of production, as fluctuations in the demand for various products may be differently timed. The point we would stress, however, is that it is not a matter of waiting until demand catches up with potential by-product supply but, rather, of undertaking research to develop new uses and new products.

We seem now to have come full circle, back to market demand. In setting forth the prospects as we see them for the forest industries we have not come upon evidence of crippling problems, nor did we come upon them in the course of our hearings. But neither are the prospects for the individual industries uniformly buoyant. Growth rates will vary,

some impeded by tariff barriers abroad, some accelerated by the strength of foreign demand; for some there will be encroachment from competing products, but some will make inroads on the markets for other materials. In the aggregate, we do not expect the forest industries fully to match the growth of the economy. The forecasts we have used compare with the general economic prospects roughly as follows: in 1955 the forestry group accounted for over 10 per cent of the output of all commodities and about 5 per cent of total domestic output of commodities and services combined; our forecasts would result in 1980 proportions of 8 per cent and 4 per cent respectively. Similarly in labour requirements, we expect the proportion of total Canadian employment provided by the forest industries to fall from just over 5 per cent to just under 4 per cent. Even so, the growth which has been projected is substantial enough when one considers that such youthful new industries as iron ore and natural gas will experience very rapid growth rates which weigh heavily in the overall prospects. But we must add one final qualification. The performance of the forest industries, as we have already stressed, will be largely determined by their competitive efficiency.

## **MINING AND MINERAL PROCESSING**

MINING AND MINERAL processing constitute a major component of that group of activities which for the purposes of this report we have classified as the resource and primary manufacturing industries, the others being the energy, fishing, and forest industries. Having treated oil and gas production and coal mining under the heading of energy, we have used the category of mining and mineral processing to include all other Canadian mining operations — for metals like iron, copper or lead, for industrial minerals like asbestos, gypsum, or potash, and for structural materials like cement, lime, or stone. Also included in this category are all the non-ferrous metals smelters and refineries which process Canadian or foreign ores into semi-finished and primary metals like aluminum, nickel, and zinc as well as those manufacturing plants which produce primary manufactures such as cement and abrasives.

Although the mining and mineral processing industry ranks somewhat behind the forestry and energy industries in its direct contribution to total domestic output, statistics alone do not show the important part it has played in recent Canadian economic development. Accounting in 1955 for just under 4 per cent of all domestic output and directly employing 110,000 persons — about 2 per cent of the labour force — the sector's output has grown by some three and one-half times in constant dollars since the late 1920's, while exports in real terms have grown fourfold to account for no less than a quarter of all Canadian commodity exports. Moreover, the stimulus this increased production has given to investment outlays both directly and indirectly through its requirements for new power, transport, manufacturing, housing and social capital facilities has been one of the main dynamics of our growth throughout the post-war period. Indeed, despite the increasing diversity and maturity of the Canadian economy, the high level of demand for our valuable mineral and other resources has been one of the principal reasons why the rate of our national expansion has outpaced that of most of the other economies of the free world since 1945.

### ***Past Growth***

The rise of mining and mineral processing to a significant position in the Canadian economy is comparatively recent, although sporadic mining activity based on essentially local markets and using elementary extractive

operations and primitive processing methods had been carried on since the early eighteenth century. In the period from 1875 to 1914 a large number of mineral discoveries were made and a number of processing operations started — a surprising percentage of the former in connection with railway construction and the search for precious metals. This is the period in which were made the discovery of asbestos at Thetford Mines, of the copper-nickel ores at Sudbury, of the Sullivan silver-lead-zinc mine in British Columbia, and of the cobalt, silver, and gold strikes of Ontario; the first smelting of aluminum at Shawinigan Falls began in this period also. However, prospecting methods were still very elementary and processing techniques had not been devised to take full advantage of those discoveries that had been made, with the result that mining and associated activities are estimated to have contributed less than 1 per cent to Canada's Gross National Product before the First World War. It was only after 1918 that mining's growth began in earnest, stimulated on the one hand by technological developments such as the selective flotation process, electrolytic refining, and new metallurgical processes and on the other hand by the sharp rise in the world demand for metals and minerals. Canada, with her readily accessible supplies of minerals was able to take full advantage of the growth in the world demand, which was of course intimately linked to rising expenditures on machinery, equipment, and consumer durables, particularly in North America. As a result, mining and mineral processing played a leading role in the economic expansion that occurred in the 1920's, doubling its share of national output and increasing its share of commodity exports to just under 10 per cent.

In the depression of the 1930's, the mining industry received a sharp setback, much more in the form of drastic reductions in price than in decreases in the volume of output and employment. (This was not true of the cement industry, which underwent a most pronounced decline.) However, with the revaluation of the price of gold in 1934 and the increase in demand for armaments, the industry as a whole fared better than most — real output in mining exceeded its 1929 level by 1934 and had almost doubled when the War broke out in 1939. Surprising as it may seem, mining production in 1944 and 1945 was considerably lower than in 1939, due to a decline in gold production and to general shortages of labour in the mines, although activity in the processing end of the industry expanded markedly, led by huge increases in the output of aluminum and cement.

The most significant development for the Canadian mining and processing industry in the last two decades has in fact been the revolutionary change in the United States mineral position; from being typically a net exporter of mine and mineral products that country is now over all a net importer of these materials. This changeover was hastened by the unusually rapid depletion of United States' reserves that accompanied the enormous mineral consumption of wartime, but the deficit increased more

or less steadily throughout the post-war period as a result of the growth of the American economy. That the rise in North American mineral consumption was a relatively rapid one was due in large measure to the increasing proportion of growing consumer incomes devoted to durables like automobiles, refrigerators and other appliances. It was also due to increasing mechanization and industrialization of all sectors of the Canadian and American economies, which in turn led to an increase in the proportion of national output devoted to investment in machinery and equipment. In addition, increases in construction expenditures of all kinds stimulated the production of cement and other structural materials for the domestic market. Much the same trends were operating in the world's other industrial economies, while the world demand for metals and minerals was further increased by the investment and development programmes of the underdeveloped countries of Africa and Asia. Superimposed upon what may be called these "normal" civilian requirements were the large-scale defence purchases and stockpiling requirements which were a consequence of the outbreak of war in Korea in 1950.

Canada was in a uniquely favourable position to take advantage of this post-war surge in the market for metals and minerals. We had an already well-established and advanced mining industry, proven mineral resources, ample supplies of available or accessible power, and an economy capable of supplying the trained manpower and the often complex goods, transport facilities and engineering and other services basic to successful resource development. Our geographical position, the close corporate or other links of many Canadian mining firms with mining and mineral processing companies elsewhere, a favourable tax structure, and a political climate conducive to investment were other factors tending especially to stimulate our post-war mining development. Moreover, the country had a practically untapped geological potential which promised well for future discoveries; with the aid of new prospecting techniques like the geiger counter and the airborne magnetometer large new ore-bodies like the nickel find at Mystery Lake were located. At the same time, new extractive and refining processes favoured the exploitation of newly discovered or previously-known deposits. All of these factors combined to cause the current value of mining and mineral processing production in Canada to more than treble from 1945 to its 1955 total of \$1,650 million. Simultaneously, the range of the industry's production was widened to include such important minerals as iron ore, uranium, titanium dioxide, potash, sulphur and other minerals; and the geographic basis of the industry was further broadened. In addition to expansion at previously existing locations, aluminum and asbestos are now produced in northern British Columbia, nickel in northern Manitoba, and iron ore in Labrador and New Quebec — to cite only a few examples. This process of development has also added new depth to the economy by opening up previously remote areas through the provision of new transport and power facilities such as those

at Sept Iles in Quebec, Mystery Lake in Manitoba and Kemano in British Columbia; by providing increased or new markets for manufacturers of such products as leaching tanks, chemicals, and mining machinery; and finally, by creating new by-products, such as ammonia fertilizers, chemical compounds, and even beneficiated iron ore.

The amount and relative importance of the principal minerals produced in Canada in 1955 are illustrated in Table 11.1.

Table 11.1

## CANADIAN MINERAL PRODUCTION, 1955

	Volume (thousands of short tons unless otherwise stated)	Value (\$ million)	Per cent of total value
Metallic minerals . . . . .	—	1,235	74.9
Copper . . . . .	325	240	14.5
Aluminum . . . . .	584	227 <sup>a</sup>	13.8
Nickel . . . . .	175	216	13.1
Gold . . . . .	4.5 m. troy oz.	157	9.5
Zinc . . . . .	427	118	7.2
Iron Ore . . . . .	14.6 m. long tons	110	6.7
Lead . . . . .	203	58	3.5
Uranium Oxide . . . . .	—	26	1.6
Silver . . . . .	28 m. troy oz.	25	1.5
Platinum group . . . . .	—	23	1.4
All others . . . . .	—	35	2.1
Industrial minerals . . . . .	—	187	11.3
Asbestos . . . . .	1,055	96	5.8
Salt . . . . .	1,245	10	0.6
Gypsum . . . . .	4,668	8	0.5
Sulphur . . . . .	625	6	0.4
Titanium dioxide . . . . .	117	5	0.3
Abrasives, crude and artificial . . . . .	—	42	2.5
All others . . . . .	—	20	1.2
Structural materials . . . . .	—	228	13.8
Total . . . . .	—	1,650	100.0

a Net value of aluminum production (i.e., deducting value of imported bauxite and alumina) was \$202 million.

SOURCE: Dominion Bureau of Statistics, *Mineral Statistics 1955*.

Output expanded further in 1956 (the relevant indexes of physical production rose by about 4 per cent) but some excess supply and considerable weaknesses in the price of certain metals, particularly copper, lead and zinc, have since become evident. Such short-run fluctuations, either in an upward or a downward direction, have always characterized large segments of the mining and mineral processing industry, in part because of the particularly uneven growth of demand from the investment and durable goods industries. An added factor in more recent times has been the uncertainty and irregular timing of defence and stockpile purchases. Moreover, the industry is typically one of big units with the result that, as in 1955 and early 1956, shortages often appear while new facilities are being designed and built, to be replaced by some short-run excess of supply when large "lumps" of additional capacity are brought into production.

However, we have tried to focus our attention on the basic underlying trend, and to avoid being unduly preoccupied with those more distinct but less permanent movements which obscure the main path which our mining industry is likely to follow in the future.

### *General Forecasts*

The basic influences which have operated to increase Canadian mining and mineral processing production in the past will in all probability continue to be felt with undiminished force in the future. The population and standards of living of all of the main industrial countries of the world are continuing to rise, with expenditures on durable goods tending everywhere to increase even more rapidly. Defence requirements may decline relatively from their present level but competition and technological change will combine to put heavy emphasis on investment in machinery and equipment, while the economic development of the less industrialized countries will add still further to the demand for minerals. One must, of course, make allowance for the increased absolute amount of scrap metal which will be available, and also for increasing economy in metal use and design, which will tend to reduce metal and mineral requirements relative to the output of finished commodities. Nevertheless the study which has been prepared for us on *Mining and Mineral Processing in Canada* concludes that world demand for new metal production is expected to be more than double its 1955 level by 1980, with particularly strong demand likely to be shown for the lighter metals and those additives which are capable of standing higher temperatures and of resisting corrosion. World requirements for industrial minerals are expected to expand by about three and one half times, while consumption of structural materials, which because of their relative abundance, bulk and low value are consumed mainly in local and domestic markets, are expected to rise broadly in line with Canadian construction expenditures, or between two and three times.

It is, of course, extremely difficult to estimate the share of future world markets for metals and minerals which is likely to be obtained by Canadian producers. It seems probable, though, that Canadian metal and mineral production will on the whole gain relatively to total world mineral output over the next quarter century. The main mineral users, particularly the highly industrialized economies of the United States, the United Kingdom, and Germany, are expected to become increasingly deficient in minerals and will consequently need to look more and more to external sources of supply. Canada should be in a good position to increase its share of these and other nations' requirements because of our substantial proven resources and our still largely untouched geological potential. Moreover, most of the factors mentioned earlier are likely to continue to work to our advantage. Among these factors the more important will be the technical proficiency and favourable cost record of our mining in-

dustry; the availability of power; a sound economic and political climate; the willingness and ability of our mining industry to introduce and develop new techniques and processes; and established marketing, research, and production links with producers elsewhere. Later in this chapter we shall be discussing some of these supply considerations in rather more detail.

After weighing the evidence and possibilities, we have concluded that the gross value of the production of the nation's mines, smelters, and refineries in 1980 may be about \$5 billion, almost three and one half times the value produced in 1955. Producers of structural materials are likely to expand the value of their output some two and one half times to over \$500 million, the dollar amount of industrial mineral production may expand almost four times to \$750 million, and the value of metal production may exceed \$4 billion, or well over triple their 1955 production. Expansion of that order would indicate that the industry's rate of future growth, while not so rapid as in the exceptional period from 1950 to 1955, will continue to outpace that of the economy as a whole. Its contribution to Gross Domestic Product will rise to between 4.5 per cent and 5 per cent in 1980, compared to some 4 per cent today. Direct employment in the industry is forecast at over 200,000, an increase of more than 75 per cent in the twenty-five year period, although because increases in productivity are expected to be relatively high, its share of the total employed labour force will probably not exceed the present level of 2 per cent. This expansion of production will necessitate heavy investment expenditures, with annual outlays expected to be of the order of \$1 billion by 1980, roughly four times as much as was spent on exploration, construction, machinery and equipment in 1955.

As Canadian producers are likely to obtain an increasing share of an expanding world market for metals and minerals, it is anticipated that the value of our mineral exports may increase by as much as four times to a 1980 level of some \$4 billion. In tonnage terms, the increase may be even more pronounced because, as indicated later, the price of mineral products relative to all goods and services is likely to decline somewhat and some of the comparatively low-value commodities such as iron ore and potash will probably grow in relative importance. In any event, mineral exports may well account for over one-third of the value of all Canadian commodity exports twenty-five years from now and will be the most important constituent of our export trade at that time. Foreign sales will also absorb a somewhat higher proportion of the industry's output than they do today, so that the share of production going to other countries is expected to rise to more than 70 per cent by 1980. The principal market for our minerals will be the United States and an increasing share of the industry's exports will move to that country over the next quarter century. Mineral imports will also increase, growing to about three and one half times their 1955 level in 1980 and accounting for approximately one-third of Can-



adian domestic requirements of minerals. For the most part, imports will continue to consist of minerals like tin and metal alloys in which this country is deficient or of raw materials like bauxite and alumina which are needed to supply our smelters and refineries.

### *The Outlook for Particular Metals and Minerals*

A somewhat better glimpse of the pattern of the industry's over-all growth may be afforded by a brief survey of the expansion predicted in *Mining and Mineral Processing in Canada* for some of the leading individual metallic and industrial minerals. We cannot, of course, foresee with any certainty the precise volume or value of production of each product, but it is possible to outline the broad magnitudes of their probable growth. Iron ore is likely to show the greatest increase in volume from its 1955 level over the next quarter century with a fivefold to sixfold expansion, while the output of Canadian aluminum plants may rise by about four times. The country's output of nickel and zinc will probably about double and the value of copper and lead production may increase by two-thirds and one-half respectively. Uranium production will expand most rapidly of all in the near term and will become our leading mined product by 1959, but it is difficult to discern the magnitude of commercial demand that is likely to emerge in the years following 1962. Gold will continue to be an important mineral product but production of this metal is likely to decline in both volume and value, unless of course its price should happen to be increased.

Until 1939 Canada was predominantly an importer of iron ore, and the only commercial deposits were those being worked at Wabana in Newfoundland. The Second World War and the very prosperous decade which followed helped to change this situation. Threatened with the exhaustion of their long-term reserves of low cost open-pit ores, first one and then another of the large United States steel companies began to look to Canada. Their search for supplementary supplies proved rewarding and discoveries within several hundred miles of the Great Lakes or the Lower St. Lawrence have brought a considerable part of Northern Ontario, Quebec and Labrador into the orbit of many North American steel mills. Beneficiation, by reducing the shipping weight and improving the smelting characteristics of many of these Canadian ores, has rendered additional Canadian iron-bearing material economic. New processing techniques and an expanding economic market for other metals have also encouraged this trend. As a result, by-product iron is being recovered by firms mining nickel, copper and titanium and is being sold outside the country at premium prices. While most Canadian iron ore is destined for the United States, overseas customers are becoming more numerous and plans are well advanced for the shipment of many millions of tons of iron ore a year to West Germany and the United Kingdom. By 1980, up to 60 million tons

annually may move to steel plants in the United States, while Western Europe and other overseas countries may take another 15 million tons. Steel production in Canada is expected to triple in the twenty-five year period, and although United States' mines may continue to supply a considerable volume of ore to Canadian plants, as much as two-thirds of total domestic ore requirements, some 10 million tons, may come from Canadian sources.

Future trends in Canada's trade in primary aluminum are more difficult to forecast. For many years this country has maintained its position as the world's largest exporter of aluminum ingot on the basis of low-cost hydro-electric power and, to a lesser extent, on the basis of easy access to efficient water transportation. Competing with United States producers, who have received preferential treatment in their domestic market, the technologically advanced and well-equipped Canadian industry has managed to keep pace with the approximate doubling in demand for this metal which has taken place every seven or eight years from the 1920's onward. In *Mining and Mineral Processing in Canada* a fivefold expansion in the 1980 world demand for aluminum metal is predicted, with rapidly growing markets foreseen in the construction industry, and in the fields of transportation, electrical equipment, and consumer durables as well as in packaging and canning. However, within this expanded market, in contrast to that of iron ore, the share of Canadian producers may fall — perhaps to something like 15 per cent in 1980 from about 20 per cent in 1955. Among the reasons suggested for this decline is the fact that thermal power costs in the United States are becoming more competitive with hydro-electric power. Developments in the field of nuclear energy and the exploitation of presently unharnessed power resources in Africa or elsewhere could enable Western Europe and the United Kingdom, which absorbed a substantial portion of Canadian output in 1955, to become less dependent upon North American sources of supply in the 1970's. At the same time, the Canadian market for aluminum is expected to expand eight-fold to more than half a million tons in the next quarter century.

Of a total output of close to two and one half million tons, therefore, one-fifth may be absorbed in the domestic market, a third is likely to move to the United Kingdom, a slightly smaller share to the United States, and the balance to other foreign markets. Such forecasts would, of course, have to be modified if United States' tariffs, recently reduced, should be substantially increased or if other special measures were to be taken to protect the American industry. It should be noted also that these forecasts are based on the assumption that much of the nation's undeveloped water-power potential can, and indeed will, be harnessed during the next twenty-five years. Should it prove impossible to negotiate downstream benefit settlements with the United States on the Columbia and other rivers or should other difficulties fail to be resolved, the amount of low-cost electricity for

this purpose would be reduced. In Eastern Canada, substantial movements of hydro-electricity from Labrador to Quebec have also been envisaged. Should political difficulties arise or inter-industry differences prove to be insurmountable, the number and capacity of the aluminum smelters operating in Canada may turn out to be well below those forecast as being economically feasible in 1980.

Although shortages are now easing somewhat, nickel has been in relatively short supply throughout much of the post-war period, mainly as a result of exceptional defence and United States stockpile requirements being superimposed on growing civilian demand. Because of this situation, steps have been taken to increase production in Canada and elsewhere with the result that the total mine capacity of the free world may increase by as much as 60 per cent between now and the early 1960's. The output of the Sudbury Basin will be expanded and new mines will also be completed in the Mystery-Moak Lake area of Manitoba. Yet developments in Cuba and elsewhere may have even greater long-term significance, because the recovery of nickel on a large scale from these tropical laterites may enable the latter sources to supply more than one-third of the free world's requirements a decade hence compared to less than 20 per cent at present. Much of the new capacity will become available at a time when the United States' stockpile of nickel has been filled and when defence needs may be tending to level off. Every effort will therefore have to be made to market these supplementary supplies through ordinary commercial channels. New uses will have to be developed and former applications revived. However, it is altogether likely that world demands for nickel will fall short of the industry's ability to supply new metal during the early 1960's. This surplus capacity, much of it sponsored by the United States' Government, could have a favourable long-run effect upon demand if it helps nickel to regain some of the outlets for new metal taken over by substitute materials during the period of intense shortages in the past decade. Adequate supplies and predictable costs, meanwhile, will help to create fresh demands so that a continued and comparatively rapid increase in commercial requirements can be forecast. Canadian producers will still be in a very favourable position to meet these growing demands and are expected to supply well over half of the free world's requirements, which are estimated at considerably more than half a million tons per year a quarter of a century from now.

Uranium, like nickel, may pass through a period of excess capacity after the early 1960's when present government contracts expire. Within a comparatively short period, uranium has become one of Canada's principal mineral products. Substantial reserves have been developed and mine capacity in this country has been increasing rapidly. Meanwhile, considerable progress has been made in other countries as well. Sizable resources have been proven up in the United States, and additions to capacity are

also being made in South Africa and Australia. It is estimated that by 1960 free world production of uranium may be some 40,000 tons, of which about 15,000 tons will come from the United States, an approximately equal amount from Canada and the balance from Africa, Australia, and other countries. Military requirements beyond 1962 are virtually impossible to determine, but it seems reasonable to assume that they will fall noticeably. World commercial requirements, mainly for the generation of nuclear power, are also extremely difficult to determine because of the many uncertainties which still surround technology and costs. Many responsible people in the industry feel that, barring some major technological break-through which might make power generated from fusion a commercial possibility, the world demand for uranium after 1962 may catch up to present and planned world capacity as early as 1970; others feel this will not occur until some years later. In any event, Canada's domestic requirements for uranium will be small, even in 1980. Other countries more deficient in energy resources — notably the United Kingdom, Western Germany and Japan — will, however, have a much greater need for nuclear power and export sales prospects will therefore continue to be the principal determinant of activity here. As the United States is increasing its attempts to become more self-sufficient, the fortunes of this particular sector of Canada's mining industry may well lie mainly overseas. To what extent Canadian producers will be able to secure this overseas business in competition with mines in other Commonwealth countries and Europe remains to be seen, although our position is favourable in many respects. Canada's output of uranium will tend to fall in volume and value after 1962 but thereafter an upward trend in volume is anticipated, although how fast and how far it will go is impossible to foretell.

World markets for copper, zinc and lead have not been growing nearly as rapidly as those for the newer metals. In the case of copper, this has largely resulted from wide fluctuations in price, together with a long-term upward movement in real prices. In the case of zinc and lead, new uses have not been developed as rapidly as for many of the newer metals and growth of markets in many existing applications has been relatively slow because of increasing inroads by substitute materials and the comparatively large supplies of available scrap. However, despite probable continued slow growth in demand compared with that for other minerals, Canadian producers of copper, zinc and lead are expected to gain a larger share of world markets. This is largely because shipments to the United States market are likely to increase substantially over the long term. The long-run trend of requirements in that market has been outpacing supplies available from United States domestic mines, and many American concerns have shown increasing interest in Canadian sources of supply. Growth of the Canadian market will also be of importance, for more than a third of copper, lead and zinc production by value has traditionally been consumed

at home — a higher proportion than for any of our other principal metallic minerals.

In contrast to the prospects for increasing production of these metals, output of gold, another of our traditionally important minerals, will probably decline absolutely in volume and value over the next twenty-five years. Although increasing quantities will be available as a by-product of base metal mining, these will be more than offset by the expected decline in production from straight gold mines if the present price and cost conditions prevail. For many years, copper, gold, zinc and lead were the core of the Canadian mining and mineral processing industry — copper, indeed, being our leading mineral product in 1955. By 1980 all four will have declined in relative importance and leadership in the industry will have passed to other metals. Yet all four metals will still be important, particularly copper, which is expected to rank behind only aluminum and iron ore in value.

Various other metals will be produced in increasing volume over the next quarter century. Magnesium, following in the wake of aluminum, may be reduced to metallic form in considerable tonnages by 1980. Titanium, which is already being exported in slag form, also has bright possibilities. As the market for the oxide and for metal sponge will multiply over the next quarter century, production of these more highly manufactured products may also lead to a greater degree of processing in this country. The nation's output of silver, mined principally as a by-product of base metal operations, is likely to expand by between one-half and three-quarters while platinum metal production, allied with that of copper and nickel, could increase by as much as 50 per cent. Metals like cobalt, selenium, tungsten, cadmium, molybdenum, calcium, tellurium, lithium, manganese, columbium and thorium may also make a significant contribution to the total value of Canada's mineral output over the next twenty-five years.

Among industrial minerals produced in Canada asbestos will continue to be the most important. With rapidly expanding markets in the electrical, automotive, machinery, chemical and construction industries, world demand may rise two and one-half times to three times by 1980. In Western European markets Canadian producers may face increasing competition from the Soviet Union and Southern Rhodesia and the Canadian share of world markets, two-thirds in 1955, may decline to a figure closer to 50 per cent. However, the United States market, which now absorbs about two-thirds of Canadian output, will grow rapidly. With enlarging markets throughout the Western Hemisphere and shipments to overseas countries likely to continue, though not relatively so important, production in this country will probably at least double in volume. As demand rises, shipments from the Eastern Townships of Quebec, the largest asbestos producing area in the world, and from newly developed mines at Matheson,

Ontario and Cassiar, British Columbia, may be supplemented by production from other areas now under investigation in Quebec, Northern Ontario, Newfoundland and British Columbia.

Following asbestos in importance among industrial minerals, potash production will provide the most spectacular growth. By 1980 North American requirements, mainly for fertilizers, which have to date been supplied from United States and overseas sources, are expected to be of the order of eight million to ten million tons per year if soil productivity and nutritional standards are to be maintained. As much as 2½ million tons a year may be drawn from the extensive potash beds in Saskatchewan which are now under development. The production of gypsum both for the domestic market and for export will increase substantially. Mines and quarries in Newfoundland, Quebec, Ontario and British Columbia will continue to supply the growing domestic market, while those in Nova Scotia, now producing four-fifths of Canadian gypsum, almost entirely for export to the northeastern United States, may expand production more rapidly and increase their share, at present one-third, of United States raw gypsum requirements. Exports from new developments in Newfoundland may also be of considerable importance in the future. Production of salt for the domestic market will expand; and sulphur, produced as a by-product from metal mining and natural gas purification, is likely to become so abundant that marketing difficulties may be encountered in the intermediate term. Among other industrial minerals we expect the most important will be fluorspar from Newfoundland to meet the increased requirements of the aluminum, steel and chemical industries, barite from Nova Scotia for expanding markets in oil-well drilling, and nepheline syenite from Ontario to supplement supplies of feldspar in the glass and pottery industries. For these, as for many other Canadian mineral products, increasing quantities will move largely to the United States market.

### *Supply Considerations*

The above estimates of future production of some of the leading individual products were given in volume terms. However, it should be noted that our estimates of the over-all value of mineral production took into account probable relative price trends, as outlined in the study of this industry. Over the last 30 years, despite increasing resort to lower-grade or less accessible mineral deposits and despite rather prolonged periods of short supply and marked short-term price fluctuations, the long-run tendency of the prices of most minerals has actually been to remain stable or to decline in relation to those of other goods and services. We would expect that short-term price movements either up or down will continue to occur from time to time. Over the longer term, however, we would expect that the relative prices of minerals as a group will decline from their levels in 1955, continuing the downward drift evident in the last three decades. This will not, of course, be true of every individual product

— some may actually rise in relative price and the price of others such as iron ore and gypsum may remain broadly unchanged in relation to goods and services generally. However, in the case of many metals and processed materials, particularly the latter because of the relatively great increases in productivity foreseen for smelters and refineries, declines in relative prices are by no means unlikely.

These trends in real prices for the world's minerals are expected to prevail because further technological developments in discovery, extraction, processing, and use are expected to more than offset possible depletion of some of the higher-grade or most accessible mineral deposits. Scientific exploration will be increasingly relied upon for discovery of orebodies which underlie the carpet of soil, lakes and overburden covering most of this country. The basis of prospecting will continue to be geological maps and reports dealing with particular areas and indicating promising sites suitable for further investigation. Aircraft and helicopters, improved photographic techniques, and new prospecting equipment have greatly facilitated geological reconnaissance mapping in recent years, but less than one-third of Canada has yet been mapped and an even smaller portion surveyed on a scale adequate for mineral exploration. If a geological map of the country is to be completed within a reasonable time and if the expansion of the mining industry is to be facilitated, the excellent work of the Geological Survey should be speeded up through an expanded programme limited only by the number of suitably qualified people available. In promising areas revealed by geological mapping, exploration companies in the last few years have come to rely more and more on the basic chemistry of geology and on geophysical equipment like the airborne magnetometer to aid in the search for ore deposits. Much remains to be done on the further development and application of such geochemical and geophysical techniques, particularly in the interpreting of anomalies, while further fundamental research on the genesis of ore deposits and the geochemical association and migration of the elements would also be of great value to the prospector of tomorrow. An expanded programme of geological mapping with emphasis on the development and use of new prospecting techniques will permit the rate of discovery to remain high in Canada despite a decline in the proportion of easily found orebodies exposed by surface outcrops.

In mining operations better quality tools for drilling, blasting, and transporting ore and the further mechanization of operations in underground and open-pit mines will bring about increasing productivity and lower costs. Large-scale open-pit operations for the non-selective mining of lower grade ores close to the surface will probably become more common than has been the case even in the recent past. In processing operations, modifications of existing techniques in the primary concentration of minerals, particularly in beneficiating low-grade ores, will lead to increasing efficiency.

Hydro-metallurgy has been of increasing importance in the last five years. The evolution of such processes will permit lower-grade and more highly refractory ores to be treated economically and make possible the development of continuous flow processes permitting more automatic operations. Developments in metallurgy and chemistry will facilitate production of higher purity metals and the recovery of additional by-product values from slag or waste materials.

In the field of marketing, research will evolve new uses and new substitutes for various metals and minerals. Relative price changes will encourage such research, particularly favouring metals which are comparatively low priced or which enjoy relative stability in price. Over the long run, the ferrous and light metals, including iron and steel, aluminum, magnesium and titanium, of which the ores are plentiful, will tend to make further inroads in fields originally reserved to the heavy non-ferrous metals, such as copper, lead and zinc. At the same time non-metallic substitute products, such as plastics, synthetic rubber, glass, treated wood, and processed industrial minerals such as asbestos, may offer increasing competition in some limited fields to various metals. Asbestos itself may face increasing competition from glass or other substitutes in uses where high-temperature shielding is not of major importance. Emphasis on processing and using metals of highest purity, already of importance for metals such as zinc, aluminum and magnesium, will extend to other metals, increasing their markets in special applications; and new industrial alloys, designed for specific service conditions such as high temperatures or high strength-to-weight ratios, will be evolved. In new alloys many metals little used today, such as lithium, silicon, the rare earths and perhaps calcium, are expected to find expanding markets.

Technological advances in all phases of the industry will be of importance if costs, which might otherwise tend to rise, are to be kept within the bounds necessary if producers in this country are to compete in the markets of the world. Canada is not the only country where mining and mineral processing have undergone rapid expansion in recent years, nor is it the only area with promising mineral prospects. The Soviet Union and various countries in South America and in Africa have also greatly expanded their mineral output and have become increasingly important as suppliers to world markets. In 1955, for example, the Canadian share of free world production of some of the leading metals and minerals was approximately as follows: copper, 10 per cent; aluminum, 20 per cent; gold and zinc, about 15 per cent each; iron ore, 5 per cent; and lead, 10 per cent. To ensure that our contribution to world production and trade remains high, the Canadian industry must remain a leader in the technological field; and much research, both of a fundamental and applied nature, will be required. Research in processing, like that which led to the successful exploitation and treatment of the Lynn Lake nickel ores, will be of the greatest value to the industry. With comparatively cheap and abun-



dant energy resources still available in this country, the development of suitable processes not only for more economic operations in existing smelters and refineries but also for production of commodities such as titanium, uranium, and manganese metals could have great benefits both for the industry and for the nation. If such research is neglected here but continues to be undertaken in other countries, potential markets for Canadian minerals could be lost for many years. In view of the probable continuing shortage of technically trained people, close co-operation between the industry and federal and provincial mines departments will be important.

In the light of the vigorous expansion of production which we foresee, it is comforting to know that Canadian reserves of most minerals, as established by the various mining companies, are sufficient to maintain present and anticipated rates of production for many years. Known reserves, at present rates of production, will last as long as 250 years in the case of iron ore; 50 years or more in the case of asbestos, lead and zinc; 45 years in the case of copper; and 35 years in the case of nickel, excluding large reserves in the Mystery-Moak Lake area, Manitoba. These are demonstrated reserves of ore of which tonnage and grade have been computed from surface and underground exploratory work and drilling. As it would be unsound economically to spend large sums on the development of reserves years before they are needed, mining companies normally maintain only sufficient reserves for operating security and efficiency. Consequently their reserves tend to remain nearly constant from year to year; they reflect current or near future production rather than the over-all potential of the mines. Thus production of base metals in the 25 years ending in 1955 exceeded the reserves known to exist in 1930, yet by 1956 base metal reserves in Canada had increased substantially over the reserves of 1930. Perhaps of even more significance than the magnitude of reserves at any one time is the trend, over the years, of the ratio of known reserves to production. As this ratio is being maintained or increased in Canada, mineral resources would appear to be more than adequate to support current and expected output.

Ore reserves form only a part of the mineral resources of the country. Of more importance in a discussion of long-range supply are the potential ores and the ore deposits that are still to be discovered. As our reserves are mined, they must be replenished from these two sources. The potential ores include deposits too low in grade, too inaccessible, or too difficult to treat to be mined profitably under present conditions. In the future, improvements in transportation, increases in price, reductions in costs, technological developments such as new and improved mining methods, new techniques in metallurgical treatment, or unforeseen uses for by-products, may make them economic. But maintenance of our reserves will depend mainly on discovery of new deposits. An appraisal of the number of deposits likely to be found in the future to replace those currently being mined must be based mainly on our knowledge of the distribution of rock

formations in Canada favourable for the occurrence of different types of mineral deposits. Much of Canada has still to be geologically mapped and much of the remainder has been covered in reconnaissance only. Nevertheless, available information gives us confidence that new discoveries will maintain or augment our present reserves over the next twenty-five years. Most of our present mines lie within a few hundred miles of the main east-west railway lines. In contrast the main geological regions tend to run in a northerly direction. As the northern parts of these regions receive greater attention, we may reasonably expect they will, in turn, be found to contain orebodies in number, size, and variety comparable to those in the relatively well explored and currently accessible southern areas. Furthermore, the mineral potentialities of the more accessible southern areas are far from exhausted as has been demonstrated by the number, size, and variety of deposits found in the last decade by conventional and newer prospecting techniques. The rapid development of these new techniques is making the prospector more proficient in the search for orebodies not exposed at the surface, and the future will see increasing concentration on discovery of orebodies concealed beneath lakes, muskeg, soil and vegetation, both in the older mining areas and the relatively unexplored northern regions. The application of these new techniques, which are constantly being improved, has played an important part in the accelerated rate of discovery of ore deposits in Canada in the last five years, and will continue to do so in the future. In our view, there is little need to be alarmed about undue depletion of Canada's mineral resources. Indeed, there is every reason to expect that our reserves will be maintained or increased by the discovery of new deposits, supplemented by technological developments that will make possible the profitable mining and processing of lower-grade material that cannot now be classified as ore.

As exploration and development proceeds into more remote areas and as operations become increasingly mechanized, the scale of mining and processing operations will be even larger than it is today. We would expect recent trends in financing to continue over the next twenty-five years with most of the industry's expansion being financed either through borrowing or out of retained earnings by existing Canadian producers. New capital investments by large United States and other foreign mineral-using companies concerned about their long-term supply position will also continue to be important. Millions of dollars are needed to bring new mines and processing plants into production and, although new producers may from time to time enter the field, it seems altogether likely that production will tend to be increasingly concentrated among large concerns, whether owned by Canadians or non-residents. Smaller mining and exploration companies may continue to play a significant role in the discovery and preliminary stages of new mining operations but the larger companies, particularly those with integrated operations from production to marketing, will be in a more favourable position to raise the necessary amounts of capital.

Production from an increasing number of mines in this country will tend to be integrated with processing and fabricating activities elsewhere and a greater proportion of our mineral output will move either between subsidiary and parent or under long-term contracts with overseas and American producers. Proportionately less therefore may be traded on the open market. These developments may present some problems, particularly in ensuring that contract prices are fair and reasonable to Canadian producers, but they will also tend to bring about greater price and output stability in the Canadian industry, particularly in mining operations.

### *The Possibilities of Further Processing*

With these prospects of a strong and rising demand for our mineral output over the long run, we should do what we can to ensure that integration of Canadian mine production with processing operations elsewhere does not, in itself, retard the expansion of refining and smelting operations in this country. There are many factors which will tend to inhibit the growth of processing operations in Canada, not least the fact that there is a very limited market in Canada for most of our minerals. Also, as we have shown, we have by no means a monopoly position in the supply of minerals and our customers in other countries usually have other sources of supply available to them from which they could draw their requirements if indiscriminate restrictions were placed on the export of ores and concentrates. Tariffs and trade restrictions in other countries, particularly the United States, play a very important part in effectively excluding shipments of many minerals in processed form. In addition, there are economic factors of a more fundamental nature which must not be forgotten and which in numerous instances dictate that minerals be transported in ore and concentrate form to the areas of their ultimate consumption. Iron ore, while its metal content can often be improved at the source, is generally shipped out to centres in which adequate supplies of coking coal and steel scrap are available; it is unlikely, therefore, unless there are changes in technology, that more than a small percentage of our production will be exported in the form of pig iron or steel. Gypsum, because its products deteriorate when handled, must be transported in its relatively raw state. On the other hand there are many products in which economics favour on-site processing; for example, copper is easily reduced and can best be shipped in its metallic form. Lead, zinc, and nickel may be smelted and refined close to the mines if low cost energy is available and outlets for their by-products can be found, while uranium could fall in this latter class also. Of course, other circumstances like plant construction costs, the availability of chemicals at competitive prices, and assured markets must also be favourable before processing in Canada can be said to merit heavy investments in projects of this type.

Generally, energy must be available in adequate quantities and at low unit prices if processing is to be economic. At one time, water-power was

the only Canadian resource meeting these qualifications and large blocks were harnessed for this purpose in Ontario and Quebec and, to a lesser extent, in British Columbia. More recently, it has become possible to build very large steam plants utilizing coal, oil or natural gas because technological improvements have helped to narrow the gap between the kilowatt-hour costs involved in generating electricity by thermal and hydraulic means. Canada's power advantages may well be reduced considerably by the advent of nuclear power in large amounts and at competitive prices. If regional and national differences in the cost of electricity are narrowed or eliminated, Canada may lose one of its principal assets insofar as the initial processing of minerals in this country is concerned. To some extent, natural gas and oil may be expected to take the place of water-power, particularly as chemical processing techniques are becoming increasingly important in the mineral industry. Petroleum fuels and petro-chemical materials make other methods of manufacturing possible and result in a wider range of by-products. Western Canada will benefit from these developments, although oil and natural gas are more transportable forms of energy than is electricity. Exported to the United States, they may frequently be supplied at prices and under conditions more favourable than those offered to prospective processors in Canada. In such circumstances it will be difficult for Canadian mining companies in Western Canada to process minerals prior to export, particularly as the United States tariff is substantially higher on imports of processed materials than on materials in the raw state.

Nevertheless, from time to time it may be possible to process a larger share of production of certain minerals, particularly metals, prior to export. The value added by processing operations is considerable, and when the opportunity does arise it should not be lost. But we should always remember that many of Canada's customers in other countries usually have alternative sources of minerals open to them. If we should be unreasonable in our demands that further processing operations be undertaken in Canada, we might find that our customers would look elsewhere for their supplies. Successful efforts to increase the degree of processing in this country will depend essentially on timing the encouragement of domestic processing to coincide with growth in demand. Wherever new smelters and refineries are needed, every effort should be made to ensure that new processing facilities are established in Canada rather than at existing locations elsewhere if it is economically feasible to do so. In some cases informal discussions with producers may be all that is needed to obtain the desired result. In others, the provincial authorities might reasonably be expected to persuade or to require applicants for concessions to agree to undertake some degree of processing, possibly increasing over a period of years. If such attempts fail there may be merit in requiring exporters of ores, concentrates and other semi-processed commodities to obtain export permits valid for a stated period. Each case should be examined carefully and individually. New mines could be given every encouragement

to get into production but it would be made clear that the circumstances in each case would be re-examined at stated intervals, perhaps every five years or so. In general, exporters should be made aware that over the years they would be expected to do more processing in Canada except when obstacles in the way of doing so proved to be real or the cost disadvantages appreciable. Government sponsored programmes of process research and development might also help considerably to stimulate further processing in this country. Pilot plants built in the area where the particular mineral concerned is to be found might later be expanded into full-scale operating facilities in the same area. American producers have benefited in this way from the important work done by the United States Bureau of Mines. With more emphasis on this sort of work, the mines departments of the federal or provincial governments might similarly be able to solve processing problems unique to this country and at the same time promote a more logical evolution of smelting, refining and primary fabricating activities within, rather than outside, Canada.

### ***Conclusion***

In summary, the anticipated growth and development of our mining and mineral processing industry is expected to raise the industry to a position in the Canadian economy in which it will surpass the forest industries and will fall not very far short of agriculture in its contribution to over-all domestic output. While not undergoing as dramatic a growth as in the preceding quarter century, its expansion will still be an important contributor to the dynamism of the Canadian economy in the years ahead, even though its role in this regard will be much less significant than that likely to be played by the energy industries. Apart from its direct effects on incomes and exports, the mining industry will continue to play an important part in opening up the country's undeveloped territory, in providing new markets for our manufacturing and service industries, and in stimulating investment and output in many related fields such as construction and transportation. We would expect also that with new techniques, new products, and new mines, both the industry's geographic base and its range of production will be further widened. Although the nature of demand and supply conditions confronting the industry makes it likely that short-term fluctuations in prices and production will continue to be felt, the industry may be basically more stable than in the past because of corporate arrangements and the pursuit by governments throughout the world of policies designed to maintain full employment. As the industry grows, stabilizes, and matures, it may well be unnecessary to accord it special treatment through subsidies and tax concessions in excess of those extended to many other Canadian industries. The further substantial growth which is foreseen for the mining and mineral processing industry suggests that in every respect it can be safely regarded as a soundly-based and strong contributor to the Canadian economy.

## SECONDARY MANUFACTURING INDUSTRY

OUR DISCUSSION of the resource industries and of the primary manufacturing based on them emphasized how spectacular a part they have played recently in the development of the Canadian economy, and how much they may be expected to contribute to our future growth and prosperity. It is perhaps not so widely recognized that other sectors of Canadian industry have in recent years experienced just as dynamic a growth. Indeed, the development of our secondary and service industries during and after the War has in some respects wrought more profound changes in the way Canadians work and live than many of the more publicized activities on our frontiers. If it may be a little premature to say that Canada has come of age industrially, we are much more a nation of urban factory and office workers than we ever were before. We see no reason why this trend should be reversed; we think, in fact, that few Canadians would want to reverse it.

Much of this growth in secondary as opposed to primary industry has been concentrated in the sector which we have labelled "secondary manufacturing". As defined by us here, it does not cover the whole range of industrial activity that the Dominion Bureau of Statistics classifies as "manufacturing". Excluded are those "primary" manufacturing operations which involve relatively minor processing of domestic resources, in which the value added by manufacture is relatively low, or those highly capital-intensive and often complex industries which produce industrial materials from our basic natural resources and which sell them mainly in export markets. In contrast "secondary" manufacturing industries are characterized by a rather higher degree of processing and by a much greater dependence on the domestic market. They tend to be located close to the centre of that market, generally produce end products rather than industrial materials, draw on both foreign and domestic suppliers for raw materials and components, and on the average have a smaller capital investment per worker than the basic resource industries. A detailed list of secondary industries, giving output and employment in each, is shown in Table 12.1.

Although any division of the larger manufacturing sector necessarily involves some arbitrary decisions, we have found it helpful because it has enabled special study to be given to the different characteristics and problems of both primary and secondary manufacturing industry. Of

the two groups, secondary manufacturing is much the larger, accounting for about three-quarters of the output and a slightly higher proportion of employment in the manufacturing sector.

Table 12. 1

### OUTPUT AND EMPLOYMENT FOR SECONDARY MANUFACTURING INDUSTRIES IN 1953

	Gross value of Production <sup>a</sup> (\$ millions)	Employees <sup>b</sup> (thousands)
Motor vehicles and parts . . . . .	\$1,143	56.3
Other iron and steel products . . . . .	1,083	98.5
Clothing . . . . .	858	120.1
Electrical apparatus and supplies (incl. electronics) . .	848	76.9
Petroleum refining and coal products . . . . .	823	17.1
Textiles (excl. clothing) . . . . .	701	73.2
Chemical products (secondary) . . . . .	626	36.6
Printing, publishing, etc. . . . .	544	66.5
Miscellaneous food products . . . . .	509	23.1
Primary iron and steel . . . . .	459	35.0
Beverages . . . . .	443	21.9
Aircraft and parts . . . . .	399	38.1
Paper products (secondary) . . . . .	389	26.2
Industrial & household machinery . . . . .	385	40.6
Non-ferrous metals products (secondary) . . . . .	371	26.9
Bakery products . . . . .	354	40.3
Railway rolling stock . . . . .	338	35.5
Non-metallic minerals products (secondary) . . . . .	300	29.2
Rubber products . . . . .	291	22.6
Furniture . . . . .	232	29.8
Leather products . . . . .	222	33.1
Tobacco products . . . . .	214	9.5
Shipbuilding . . . . .	183	22.6
Agricultural implements . . . . .	171	14.2
Other secondary wood products . . . . .	117	12.9
Other transportation equipment . . . . .	26	3.7
Miscellaneous manufacturing . . . . .	261	32.2
Total secondary manufacturing . . . . .	\$12,290	1,042.6
Employment according to labour force data <sup>b</sup>		1,090.0

<sup>a</sup> Gross value of production is based on the final factory selling prices of output and includes a substantial amount of double counting.

<sup>b</sup> The Census of Industry Employment figures on which this table is based do not cover the entire labour force in secondary industry; the labour force aggregate is somewhat more comprehensive and is more suitable for comparisons between sectors of the economy.

SOURCE: D. H. Fullerton and H. A. Hampson, *Canadian Secondary Manufacturing Industry*, 1957, a study for the Commission, Chap. 9, Table J, p. 202, and Chap. 9, Table K, pp. 204-5.

We have found it rather surprising that such an important sector should have attracted so little study by our economic analysts and historians. Some individual manufacturing industries have from time to time

been examined, but the emphasis has tended to be more on corporate structure and history, or on price and marketing arrangements, than on the basic reasons why these industries are more or less efficient than similar industries in other countries. Certainly there has been little attempt to draw general conclusions which would apply with some reasonable degree of consistency to the sector as a whole or to most industries in it. In view of this dearth of analytical information we felt it necessary to initiate studies of a number of individual secondary industries and of secondary manufacturing generally. We did this not only to enable us better to appraise the problems and prospects of Canadian secondary manufacturing industry, but also to encourage a wider interest in this very important but inadequately documented segment of our economic life. The seven studies of secondary industry which were undertaken for the Commission are listed in Appendix C; obviously it was impossible to have studies made of all industries in the group, or even all the large ones; and the selection was made on the basis of some industry characteristic of special interest.

In these seven studies, and in the more comprehensive study *Canadian Secondary Manufacturing Industry*, prepared by members of our staff, a great deal of emphasis was placed on the factors which affect the competitive position of secondary manufacturing industry today and which are likely to bear on its growth in future. The purpose of these studies was to suggest answers for such questions as these: what is the cost position of Canadian secondary industries as compared with those in the United States and elsewhere — and what are the main reasons for any differences? What developments in future are likely to affect the competitive position of Canadian industry? Which industries in the group have grown most rapidly in recent years, and for what reasons, and which industries may be expected to show the most rapid expansion in future? How large a secondary manufacturing industry may be expected by 1980? None of these or related questions is easy to answer, but the attempt provides a picture which, if blurred and indistinct in many places, at least enables some judgments to be formed about secondary manufacturing, its competitive position, and the likely course of its future development.

### *Past Growth*

Any appraisal of the sector's present position and prospects must of course begin with a reference to its past growth. It is obviously impossible in this report to do justice to the story of that development, and readers are referred to the study, *Canadian Secondary Manufacturing Industry* for the more essential details. Put very briefly, secondary industry has gone through three periods of very rapid growth: the first decade of this century, when the opening of the western wheat economy and the rapid expansion of the railways gave impetus to the capital goods industries; the boom in the last half of the '20's; and the War and post-war



expansion of the past 18 years. The crucial factor in the story of its growth has been the expansion of the Canadian market for its products. Like the people in other industrial nations, Canadians have demanded more manufactured goods per capita as their levels of living have increased. Also, growth in the size of the Canadian market for manufactured products has resulted in some improvements in the competitive position of Canadian manufacturing activity and thus in some substitutions of domestically produced for imported manufactured goods. Currently production in secondary manufacturing is some three times its pre-war level, and forms over one-fifth of the total output in the economy. About twice as many Canadians are employed in the sector as before the War; these 1,100,000 employees constitute one-fifth of the labour force. Regionally, secondary industry has remained since the turn of the century largely concentrated in Ontario and Quebec; since 1926, the earliest year for which detailed regional material is available, a surprisingly constant 86 per cent to 87 per cent of total Canadian output and employment in secondary industry has been concentrated in these two provinces. Moreover, most of this industry is found in a narrow strip of land between Quebec City on the east and Windsor on the west; even within this strip there are differing degrees of concentration, with a much higher degree of industrialization in and around the two largest cities, Montreal and Toronto. The fact that there has been so little change in the degree of concentration, despite very great technical changes and shifts in production within the sector, suggests that the economic forces inducing this relative concentration in Southern Ontario or Quebec are strong. Nevertheless, a number of other areas in Canada are experiencing as rapid a build-up of secondary industry as the two central provinces, in some instances due to an abundance of a scarce resource and in others to an unusually rapid population growth. Edmonton and Vancouver are examples of such centres.

The close ties linking the expansion of secondary industry with the growth of the domestic market cannot be emphasized too strongly. Export sales have never accounted for an appreciable proportion of the output of secondary industry, although in a few industries, notably agricultural implements, distilled beverages and automobiles, export sales at times have been important. In 1929 about 7½ per cent of the sector's output was exported. By 1939 this proportion had fallen below 7 per cent, and by 1955 it appears to have been slightly less than 6 per cent.

In view of the record of growth, it may be assumed that Canadian secondary manufacturing industry generally is in a healthy state, and that consequently there cannot be very much wrong with its cost and competitive position. Yet this general picture may in some respects be misleading. All industries have not grown at an equal pace and indeed some have declined. Import competition has always been strong and persistent, and throughout our history has had a substantial share of the domestic

market for the products of secondary industry. Since the import volume and share of the market is one fairly important measure of the ability of our manufacturing industry to compete, subject of course to changes in the effective level of tariff protection, it is useful to examine some of the import data as a preliminary to an examination of competitive factors affecting the position of our industry. Although there are considerable statistical difficulties in the way of establishing precise figures, the Commission's study of secondary industry concludes that in 1953 the import share of the market for products of secondary manufacturing was probably in the neighbourhood of 18 per cent. In 1929 the share was estimated to be 20 per cent to 21 per cent, and in 1956 and 1957 it appears to have risen again to about its 1929 level. It is interesting to note, of course, that the past two years have been characterized by a peculiarly strong investment boom and abnormally large inflows of capital. In periods such as this, demand tends to spill over into imports, particularly from the United States; many of the investment goods needed for the capital programme are not readily available in Canada. Conversely, in depressed periods such as the '30's investment declines very sharply and the import share similarly declines.

Apart from such changes in the import share of the Canadian market which result from fluctuations in Canadian economic activity, this relatively high volume of imports is essentially a reflection of the specialized and open nature of the Canadian economy as modified by the tariff and other protective factors. It has been profitable for Canadians to devote resources to producing and exporting some things, and importing others. If we specialize more than most industrialized countries in the production of primary products it is because of our relative abundance of, and easy access to, natural resources. It is not surprising that secondary manufacturing is not so highly developed in Canada as in the United States, the United Kingdom or Germany. Our natural resources, of course, provide only a partial explanation why our requirements for manufactures are to such a degree met by imports and why the role of secondary industry in the economy is somewhat less important than in these other countries. Of perhaps greater importance is the fact that Canadian manufacturers have to face some very serious disabilities in trying to produce goods at prices competitive with imports. The extent to which these disabilities increase Canadian manufacturing costs is reflected in comparative figures of productivity. It is stated in *Canadian Secondary Manufacturing Industry* that output per man-hour in Canadian secondary industry is perhaps 35 per cent to 40 per cent below that of the United States, although very considerably higher than in the other industrial countries of the world.

### *Size of Market and Specialization*

Of the disadvantages which Canadian manufactures have to face, unquestionably the greatest are those associated with the relatively small

size of the Canadian market. As we have pointed out, the domestic market forms the principal outlet for the products of Canadian secondary industry; the post-war restraints on imports imposed by overseas countries, together with the formidable barriers to entry to the rich United States market, has accentuated this dependence in recent years. As a result, our manufacturers are unable to obtain the full benefits to be realized from mass production and specialization in a large market, such as are obtained by manufacturers in the United States, and it is not surprising that it is the American manufacturer who provides the principal source of competition for Canadian producers.

The development of modern industry as we know it today is in fact based broadly on the principle that as volume of output increases costs tend to decline. The savings of larger volume arise from lower unit costs for overhead, depreciation, tooling and die costs, research and development, and particularly from specialization. As one manufacturer put it at the Commission hearings:

"In modern manufacture there are great advantages to . . . specialization. It makes possible the development of straight-line, integrated manufacture, in plants specifically designed for the product, and with equipment that reflects the optimum in the use of power, automation and semi-automation. It makes possible lower labour costs per unit of product, and permits the manufacturer to concentrate the thinking, efforts and skills of his people on the one product or product line, without wastefully scattering their efforts or abilities over a larger area."<sup>1</sup>

The study of Canadian secondary industry makes some attempt to compare relative market sizes in the United States and Canada. This study finds that the United States market for products of secondary industry is in physical terms some 18 to 19 times as large as the Canadian, compared to a population difference of about 10 to 1 and an income difference of 15 to 1. Obviously the relative demand for many products will vary widely from the aggregate; in spite of superficial similarities the economies of the two countries are appreciably different and these differences are reflected in the demand for, and production of, secondary industry products. Using comparative production data, we find such extremes as the United States industrial machinery industry producing 62 times as much as the Canadian — but the railway rolling stock industry producing only 3½ times as much. In those industries where extreme differences in output exist, the Canadian market is usually not large and demands are usually supplied to a substantial degree by imports. In fact, the study suggests that there is a fair correlation between the relative size of the Canadian market and the proportion of it which is supplied by imports. This supports the conclusion that when the Canadian market is relatively large Canadian costs tend to be more competitive than when the market is relatively small.

It must of course be emphasized that a large market in Canada does not guarantee that a product can be manufactured in this country at a price competitive with imports. The crucial factors are the nature of the production process, the size of the optimum plant in the United States, and the extent of the cost penalty for operating below that optimum level. Thus if a product is simple to manufacture, and the economies of large-scale production not very great, the Canadian cost handicap will not be very large even though there may be very great differences in the size of the markets. Conversely, Canadian disadvantages are normally at a maximum when the product is complex, its design is altered frequently, capital and overhead costs are large, and the volume of output relatively small. An example of this latter is an automobile body stamping, and it is not surprising that most of our requirements of such products are imported.

The difference in markets is only part of the story. Even where the Canadian market is large enough in total to make possible a few plants of close to the optimum American size, in many secondary manufacturing industries there appear to be many more producers relative to the size of the market than exist in the United States. One classic case was brought to our attention by the president of a large electrical manufacturing company who told us that a plant of minimum efficient size to manufacture refrigerators in the United States would have an output of 250,000 to 350,000 units per year. By contrast the total Canadian output of refrigerators in 1955 was 267,000 units — produced by 19 manufacturers!<sup>2</sup> This pattern is common, and in many industries the fragmentation of the small Canadian market among a number of producers has the effect of frustrating the achievement of a better cost position. It is suggested in the study of secondary manufacturing industry that this relatively large number of producers may in part be traced to the fact that many firms in Canadian secondary industry are branches or subsidiaries of a United States parent company. In fact, in many secondary industries we have come close to a wholesale importation of the same firms operating in the United States (although, for the sector as a whole, less than one-third of output is produced by firms controlled in the United States). These firms initially may take an overly optimistic view of their prospects. It appears, however, that sometimes United States corporations exhibit a considerably greater reluctance to close Canadian subsidiaries that are not paying their way than similar branches in the United States, probably because of long-term optimism about the growth of the Canadian economy, although (as suggested to us by several manufacturers) loss of face in the larger arena of American business may also be a factor. Another consideration undoubtedly is that the closing of a United States branch is a much simpler operation and involves no interruption in the flow of the firm's products to the area.

Despite the many similarities in corporate entities in Canada and the United States, however, the organization of production is very different, and these differences probably reveal more of the reasons for our relative lack of concentration of industry than the existence of a widespread relationship of parent to subsidiary. In comparing Canadian plants with similar ones in the United States, one is struck, along with the differences in sheer size, by the fact that the Canadian plant in most cases produces a much greater variety of products in relation to its output. This appears to be equally true for Canadian-owned plants and subsidiaries of United States companies. This diversification of production in Canadian plants is again a reflection of the much smaller market here than in the United States. As witnesses pointed out to us frequently, the advantage of a large market may be derived more from the fact that it permits a higher degree of specialization than from the building of a larger plant. One of our large rubber companies, for example, produces 600 different sizes of tires in one plant compared to a small fraction of that number in most United States plants.<sup>3</sup>

It is thus fair to conclude that in most secondary industries we have an appreciably greater number of producers for the size of our market than the Americans, and production is carried out in much less specialized plants, all of which accentuates the cost disadvantages of the Canadian manufacturer. The extent of the handicap will of course vary widely from industry to industry and indeed from product to product, and it is beyond the compass of this report to try to provide detailed estimates — readers are referred to the various studies. It is appropriate for us, however, to try to suggest some of the reasons why our secondary industry, given its market handicap, might still be able to produce goods more cheaply than it does.

To some extent, the diversification and lack of specialization is an inevitable result of the decision to encourage a broader range of manufacturing in this country than would have occurred in the absence of the tariff. But quite apart from this, there is clearly scope for the development in the future of a more rational system of production and specialization. Of the impediments to this development, one frequently heard is that the Canadian manufacturer must diversify to obtain a large enough volume to keep down overhead costs. Moreover it is argued that the Canadian consumer is conditioned by advertising to expect the same degree of choice as his American counterpart, and in a market such as this it is not likely that competition would lead to the concentration of an industry into the hands of one or two producers. Also many manufacturers suggest that to do business they must carry and produce a wide range of products which require them to diversify more than they feel is desirable. This may in part be due to the fact that the Canadian market may not be large enough to make possible the more specialized distribution facilities existing in the United States,

where a wholesaler may build up his line by buying from many specialized producers. On the other hand, it is suggested by some that it is the lack of specialization in production which has prevented the development in Canada of this American type of wholesaling organization.

It is sometimes suggested that manufacturers in this country are able to establish their selling prices behind the protection of the tariff, thereby limiting competition and permitting the least efficient producers to remain in business. Such an allegation would not seem to be justified according to the findings contained in *Canadian Secondary Manufacturing Industry*, from which the following quotation is taken:

"We find it difficult to believe that tariff-protected price agreements are prevalent enough to have a significant inhibiting effect on competition and specialization generally. Although the decision to encourage secondary industry in Canada has involved some degree of tariff protection and has encouraged a wider diversification of manufacturing production than would otherwise have occurred, this does not mean that all protected industries are free from price competition either within the country or from imports. It is true that in the abnormal period of the 'thirties and 'forties the tariff and exchange restrictions may have hindered the development of a fully competitive market, but the post-war reductions in tariffs, the expansion of the Canadian market, and the increasingly competitive attitudes of management have combined in recent years to intensify the degree of competition in almost all secondary industries."<sup>4</sup>

Several manufacturers suggested that diversification is "safer". The specialized producer may find himself at the mercy of one or two buyers who may threaten to switch to readily available imports; some buyers may not wish to tie themselves to a single Canadian producer even at some concession in price; with rapid technological changes the Canadian specialist has much less scope than an American producer for switching into new products should his specialty become obsolete. Other manufacturers expressed the view that the specialist exposes himself to the charge of being a monopolist, and, if not prosecuted, at least subject to a measure of public disapproval. Since there is a considerable measure of specialization now in such industries as chemicals, this appraisal of the consequence of specialization may be entirely unwarranted; but it is a view that has wide currency.

Although some of these arguments are of questionable validity, there is no denying the fact the Canadian secondary industry is a good deal less specialized and concentrated than consideration of productive efficiency alone would appear to warrant. It is true that during the past two decades the rapid growth of the Canadian market and the increasingly compe-

titive business environment has improved the relative cost position of some Canadian producers as evidenced by a slight decline, until recently, in the import share of the market for products of secondary industry. Moreover many witnesses cited the relative improvements in their costs over the past 20 years as compared with their American parent. In some cases the differentials have narrowed quite remarkably.<sup>5</sup> Nevertheless, the cost disadvantages arising from our smaller volume and the less specialized nature of our production are still very significant and the improvements which have occurred have only in a few industries been marked. Small volume and less specialized production are the main reasons why output per man-hour in Canadian secondary industry is some 35 per cent to 40 per cent below that of the United States.

### *Canadian Wage Levels*

If scale is the main problem for our manufacturers in competing with imports from the United States, the level of Canadian wages to some extent neutralizes the disadvantage. It has been estimated that wages in Canadian secondary industry are some 25 per cent below those in the United States, reflecting a roughly equivalent difference in the per capita productivity of the two economies. The fact that the difference in productivity in secondary manufacturing is greater than the gap in wages, however, means that in this sector unit labour costs tend to be higher in Canada than in the United States.

The converse is true in respect of competition from overseas countries, which are in a somewhat similar relation to Canada as we are to the United States. Although the level of wages in these countries is lower than in Canada — and in some very much lower — so is their average productivity. That overseas competition is not more severe is due to the fact that the great majority of our secondary industries lend themselves to the use of highly mechanized processes and advanced techniques not generally available overseas. Our ready access to American capital, technology and research gives us a significant advantage over most overseas producers in the secondary industry sector. With the exception of those products in which large amounts of relatively unskilled labour are an important part of final selling prices, Canadian unit labour costs in secondary industry are generally below those in overseas countries despite their much lower wages. It is of course in products with a high labour content that the main burden of overseas competition is felt by Canadian secondary industry. The difficulties in these industries, however, can best be understood as a product of the competition for labour between various Canadian industries. In boom times, such as the past decade, industries where physical output per man-hour is increasing rapidly (or where the price of the commodity produced rises faster than the general price level) are enabled to pay higher wages and attract workers from industries less

fortunately situated. These latter industries can retain their labour by paying the going rates, but this increases their costs and compels them to raise prices, exposing them to increased import competition. For these industries, the villain of the piece has not really been the low-wage overseas producer but the rapidly expanding, high-productivity industries in the rest of Canada. Thus we have the paradox of the depressed industry in a prosperous economy.

The wage competition for these depressed industries since the War has not come only from the primary industries such as mining and pulp and paper, from construction, transportation and service industries, but from those secondary industries which have raised their productivity substantially — primary iron and steel, chemicals and electrical equipment. The successful expansion of these and other secondary industries serves to illustrate that the very efficiency of most Canadian manufacturers in the use of complex production processes and modern machinery and their willingness to adopt new techniques and products have combined to develop a high-productivity, high-wage secondary industry. This has caused low-productivity, labour-intensive production to become increasingly expensive in this country, not only as compared to the resource industries, but also to the other and more profitable opportunities available to Canadian labour and capital within the secondary manufacturing sector itself. In fact, this process can be seen at work even within individual secondary industries; for example, the efficient mass production processes used by the largest part of the rubber industry have contributed to the raising of Canadian wages to a level that cannot be paid by the low-productivity labour-using rubber footwear producers without incurring serious import competition.

This competition of industries for labour is just another way of looking at price competition, and is thus a reflection of comparative production costs here and abroad, and of the ability of individual industries to compete with imports. As already noted, the process involves all sectors of the economy, including the rapidly expanding service industries, and has brought about a marked decline in the percentage of the population engaged in marginal agriculture, fishing, and other less productive activities in Canada. It is, in brief, the mechanism by which change and adjustment are brought about in a dynamic economy. The very existence of high-productivity, high-wage labour exerting constant pressure on costs has undoubtedly intensified this competition by impelling manufacturers to improve their management techniques and to replace high-cost labour by increasingly efficient production processes and machinery.

In this sense the rising "cost" of Canadian labour since the end of the War has been a stimulus to industrial productivity; yet it is true that Canadian labour has become increasingly "high-cost" to those secondary and other industries which have not kept pace with the rest of the



economy in raising their productivity. Those secondary manufacturing industries most affected by this process in recent years have been those with a high labour content in the production process; unmechanized labour is unproductive and costly. The number of such labour-intensive industries or branches of industries is however small in the Canadian secondary manufacturing sector, and is continuing to decline as more modern production methods gradually replace labour-using processes in these industries. This is supported by the fact that imports from low-wage overseas countries amounted to only one-sixth of secondary manufactured imports in recent years, equivalent to some 3 per cent of total consumption of secondary manufactured products in Canada; both figures are considerably below their 1929 levels. It should not, however, be thought that the failure of some secondary industries to mechanize their operations is necessarily due to a lack of effort to do so. The president of a large Canadian rubber company, for example, pointed out that extensive research and development work on mechanization of methods had been carried out in the rubber footwear industry for many years, but the manufacture of parts for rubber footwear had proved very difficult to mechanize.<sup>6</sup> It might be noted, however, that if the market for such labour-intensive products is large enough, it may be possible to apply entirely new production processes which reduce the high labour content of more traditional methods of manufacture. In some cases, therefore, the scale of operations in Canada contributes indirectly to the higher costs of production of labour-intensive industries and processes in this country by limiting their ability to become more capital-intensive. In such cases, import competition tends to come more from the United States than from overseas countries.

We have outlined briefly what we believe to be the two greatest handicaps our manufacturers face in meeting foreign competition. In those products which are mass produced the small size and excessive division of our market tend to make Canadian manufacturing costs higher than those of the United States, despite the higher level of United States wages. In manufacturing processes which are difficult to mechanize our manufacturers face competition from the low-wage overseas countries. Nevertheless, we do not mean to suggest that these two hazards are a Scylla and a Charybdis between which our manufacturers can manoeuvre only with great difficulty. On the contrary, and as the record of growth indicates, the Canadian manufacturer has many advantages in meeting foreign competition in the Canadian market. In the first place he is already here, and the buyer is prejudiced in his favour; availability of advice, servicing and parts, lower transportation costs and a rapid delivery all are factors in the competitive equation. More important, perhaps, is the Canadian tariff, which provides most of Canadian secondary industry with some measure of protection from foreign competition. The extent of this protection varies widely from industry to industry and product to

product. For most secondary industry products the level of tariff protection runs between 10 per cent and 25 per cent.

### *Other Cost Factors*

There are other factors, of course, which affect the competitive position of Canadian industry and which may in some instances have as important an effect as the two we have just cited. Costs of manufacturing materials and machinery are higher in Canada, which is essentially a reflection of higher costs of manufacturing in Canada and the tariff on imported goods; it is really a function of the problem of scale and specialization. On raw and unprocessed materials, on the other hand, Canadian producers appear to be at no net disadvantage. Freight rates also appear to be little different than those in the United States, although the cost of supplying a population living in a long narrow strip of land across the continent undoubtedly raises over-all transportation costs to the Canadian producers; this again is in part a function of the smaller size of our market. The United States market is large enough to permit a degree of geographical decentralization of production which is simply not feasible in Canada. This is a particularly difficult problem for the Canadian manufacturer in serving markets on either coast. At the same time, he has some natural freight advantages in the central Canadian market, and it is difficult to determine where the over-all balance of advantage lies.

The Canadian climate, with its adverse effects on construction costs and seasonality of demand and employment, has been suggested as a factor which raises relative costs in Canada. Against this is the fact that competing United States industry is subject to similar if not quite so severe winter weather, and in addition to more severe summer heat. The greater seasonal swing in our construction industry inevitably raises costs. Clothing manufacturers also have somewhat greater problems of seasonality than their United States competitors; the earlier United States season means that by the time the Canadian season is at its height the American manufacturer may be disposing of his left-over stock on an "end of line" clearance basis in Canada as well as in the United States.

Close to one-third of Canadian secondary industry on an output basis is controlled in the United States, and in such important industries as automobiles and parts, rubber products, electrical apparatus, chemicals and oil refinery between 50 per cent and 98 per cent of total output is produced by United States controlled companies. Canadian subsidiaries can draw on the parent for the results of their research, engineering and process development, and for design and complex parts, as well as for capital, management, advice, staff training, and skilled technicians. In many of the functions carried out by the United States parent such as research and development the economies of scale are very large and the work could not be duplicated by the Canadian subsidiary at any reasonable price.

Access to the parent neutralizes some of the greatest cost disadvantages Canadian producers suffer as a result of their small market, particularly with respect to complex parts. On the other hand, it is argued that the ease of access to American resources inhibits the development of research in Canadian industry and hence slows our growth. The whole question of foreign investment in Canada and its implications is discussed in Chapter 18.

It is sometimes suggested that American management is better than Canadian, which confers an additional competitive advantage on United States producers. Any international comparison of management ability is difficult to make, but it does appear the greater opportunity for diversified training and experience in the United States, and the relative scarcity of managers in Canada, tend to tip the scales in the direction of United States industry. Still, if a gap remains, it is much narrower than it was 20 years ago, and it is continuing to close. It is sometimes suggested also that the attitudes of labour in the United States have been somewhat more receptive to technological and other changes in the past than has been the case in Canada and that this has adversely affected the position of Canadian producers. This again is difficult to prove one way or the other. Costs of borrowing money are higher in Canada. Profits in relation to sales or net worth also appear to be slightly lower in Canada than in the United States. In any event, since interest rates and profit margins are a relatively small fraction of manufacturing costs, small differences here are not likely to have a very significant effect on the relative cost position of Canadian industry as a whole, although they may be quite important in particular industries.

Some industries have been affected more than others by post-war reductions in effective levels of tariff protection. But on the whole the sharply different performance of the various industries has not been due to differences in the levels of the tariff protection. Of course, there have been instances where increases in effective protection have helped to stimulate the expansion of some industries; government purchasing policies respecting the aircraft and electronic industries are a case in point. But generally it has been fundamental economic factors, not differences in tariff treatment, which have caused some industries to lag at a time when others have been growing rapidly.

The record of growth reflects the emergence of this country as an increasingly versatile, skilled, and rich industrial nation. This has raised the productivity, and thus the wages, of labour to a level that cannot be paid successfully by the high labour-content industries. However, the great majority of our secondary industries have been able to adapt their operations successfully to the accelerating pace of technological advance and mechanization and have enjoyed a healthy and vigorous growth. The sector as a whole has fully kept pace with the rest of the

economy in the post-war period. Moreover, most industries have slightly increased their share of the domestic market and improved their relative costs over the longer term. This has been achieved in spite of increasingly competitive conditions in Canada. While there are still a sizable number of complex products which cannot be manufactured here because of the small size of our domestic market, both the range of goods manufactured and the degree of processing undertaken in this country have been considerably extended in the past two decades.

### *Future Prospects*

Essentially the continuing growth of our secondary industry will depend on two factors, the future size of the market for its products and its ability to compete successfully for a reasonable share of that market. We have emphasized that Canadian secondary industry sells most of its products on the domestic market, and the projection of the Gross National Product for 1980 is thus in a very real sense the foundation upon which the estimates given in the study of secondary manufacturing industry are built. For purposes of that projection an average of the various Commission Gross National Product forecasts for 1980 was used; the resulting figure is roughly three times the level in 1953 (the last year for which full manufacturing data were available).

Looking first at the prospective nature of the expenditures which Canadians will be making in 1980 — on capital and consumer goods and services — there is no clear indication that the share spent on manufactured products will rise or fall. However, the experience of the past half century, during which manufactures have become steadily more complex and have absorbed an increasing share of consumption and capital expenditures, suggests that any change in the share would be upwards rather than downwards. Certainly there will be great changes in the demand for individual products, but if the economy is to be three times as productive there is no reason to believe that the demand for manufactures will be less than three times as great as it is now.

The second important variable in forecasting the future development of our secondary industry is the share of the available Canadian market which it is likely to obtain. Here the test will continue to be the ability of our industries to improve their costs relative to those of their foreign competitors. Some industries, of course, are shielded from foreign competition by such forms of natural protection as high transportation costs, as well as by the tariff, and these industries might be expected to grow with the demand for the commodities they produce. At the same time the pace of technology is such that few products will escape competition from substitutes of domestic or foreign origin.

For most secondary industries the effects of the smaller market will continue to be the principal competitive handicap. As the Canadian market

expands rapidly, it might normally be expected that the ability to obtain the maximum economies of scale will also increase. Post-war trends, which show a gain in the competitive position of most Canadian industries manufacturing mass-produced items such as consumer durables, support this conclusion. But the view that as our market grows the handicap of scale will necessarily decline should not be accepted too readily. Our manufacturers are really chasing an objective which is not stationary but moving, and it may be that the current surge of technological innovation — “automation” in all its forms — will result in the optimum size of production units growing faster than the growth in our market. Certainly the evidence presented to date is conflicting; in some products such as television sets the efficient size of manufacturing units has increased sharply in recent years. In other products, such as primary steel, the new techniques would appear to have made economic much smaller production units than were heretofore possible. However, we have concluded that on balance the net impact of the prospective growth of the Canadian market and technical change will be to bring about further improvement in the relative cost position of our secondary industry. Such gains as may occur, of course, will depend in part on the structure of industry that develops. If in many industries we continue to have an excessive number of producers dividing up the relatively small Canadian market, our prospective gains from market growth could largely be dissipated.

We feel less optimistic about how our industry will fare in competing with overseas producers of labour-intensive products. The gap between North American and overseas productivity and wages has widened since the War; a reversal of this trend appears unlikely, which means that more and more the thrust of overseas competition is likely to affect commodities with a high labour content, which are not readily adaptable to mechanized technique of production, and which are not sheltered from foreign competition by such forms of natural protection as high transportation costs, business and consumer preference for North American products, differing engineering standards, speed of delivery and availability of parts and servicing. At the same time such products will be increasingly subject to competition from cheaply mass-produced substitute products. In effect, labour-intensive products will constitute a relatively less important part of the total consumption of manufactured goods, and the Canadian manufacturers' share of this declining market may be expected to fall. However, national prosperity should be judged not from the point of view of any one or even several industries, but from that of the economy as a whole.

There is another factor to be considered, one which up to the present has been relatively unimportant — export markets. As we have pointed out, only about 6 per cent of our total secondary output is exported. Given

a continuation of the kind of a trading world we have seen since the War, an expansion of that percentage seems unlikely. The prospect for exports of manufactures to overseas countries does not appear promising, since any easing of their exchange position would probably be reflected in larger purchases of Canadian primary products rather than of secondary manufactures. If there should be some reduction in United States tariffs against manufactured goods, some of our secondary manufacturers may find markets for their products in that country. Our forecasts, however, are based on the view that in the main it will be the domestic market on which our secondary manufacturers will have to base their operations in the foreseeable future.

To sum up, we expect that the principal factors affecting the growth of secondary industry will be the expansion of the domestic market and the improvement in the competitive position of our producers. While we would expect some small decline in the import share of the aggregate Canadian market for all secondary manufactured products consumed in Canada, in those industries where operations cannot readily be mechanized import competition may become more severe. The secondary industry study makes some attempt to translate these tendencies into arithmetical projections, and concludes that in 1980 the output of secondary industry will be some  $3\frac{1}{4}$  times as large as in 1955, and will form about 25 per cent of the total output of the economy, a slightly larger proportion than it does today.

### *Employment and Productivity*

What this rate of growth would mean for employment will depend upon the increase in productivity in the individual industries in the sector, broadly defined as output per man-hour. In the secondary industry study an attempt was made to develop a projected rate of annual productivity improvement for the whole sector, based largely upon the performance of the individual industries in the post-war period. These calculations suggest that we may expect to see an annual rate of increase in productivity in secondary industry of some  $3\frac{1}{4}$  per cent, which is somewhat higher than the average of the two assumptions about productivity for the private non-agricultural economy used in preparation of the Gross National Product forecasts contained in this report. As productivity improves through greater mechanization and better techniques, a smaller working force will be required to produce the same volume of output. Of course, employment will also be affected by the average number of hours worked each week; this figure has been falling steadily, and if it continues to decline, as we expect, this would in part counteract the effect that increased productivity would have on reducing the requirements for labour. For purposes of the projections it was assumed that the decline in hours worked will be the same in secondary industry as predicted for the private

non-agricultural economy, or about 18 per cent over the twenty-five-year period.

We hesitate to comment on the degree of confidence that can be placed in the productivity projections. The field of productivity calculation is pitted with all kinds of conceptual and statistical difficulties, and there has been in fact a great deal of disagreement about the extent of our productivity gains in recent years as well as about the methods used to calculate them. Needless to say the area of possible disagreement about projections into the future is much greater. Nevertheless, the pressures of competition tend to bring about productivity gains by increasing the incentives to mechanize. Those segments of an industry which are able to improve their productivity and competitive position by the use of new equipment and manufacturing techniques will be much better able to expand than the industries which cannot. In effect, any industry which lags very far behind the rate of productivity increase achieved by the economy as a whole, even if it is protected from competitive forces by natural protection or by government policy, will find itself losing ground.

On the basis of the above assumptions about output, productivity, and the length of the work week, the estimated secondary industry employment total in 1980 would be about 1,900,000 compared with around 1,100,000 today, although the share of the total labour force employed in secondary industry would be roughly the same as it is now. Gross value of production would be over \$40 billion compared with \$12.3 billion in 1953. As might be expected, the greatest rate of increase is predicted for those industries which have grown the fastest in recent years, and which tend to be capital-intensive and technologically complex — chemicals, electrical and electronic equipment, rubber products, oil refining are examples. These industries have been characterized by the development of new products, by a rapidly growing demand for their products, by a high rate of annual increase in productivity and in general by an improvement in their share of the domestic market. On the other hand, industries with a slower prospective rate of growth tend to be more labour-intensive and characterized by lower rates of productivity gain, which may be expected to expose them to increased foreign competition. The figures of course refer to industries as we know them today. With boundaries between industries becoming increasingly blurred, it may be very difficult in 1980 to draw clear lines of industry demarcation. For similar reasons the growth prospects for any individual firms cannot be predicted on the basis of the prospects for the industry in which it now finds itself.

We see no reason to expect any important change in the present concentration of secondary manufacturing in Southern Ontario and Quebec, although certain urban areas outside these two provinces, particularly in the four western provinces and to some extent in the Atlantic area as well, will continue to attract new secondary industries to make use of

natural resources or as a result of population growth. However, we believe that, because of the importance of achieving maximum economies of scale, secondary industry will continue on the whole to find it advantageous to locate as close as possible to the centre of the Canadian market. Supply of skilled labour will be an increasingly important factor in the location of industry; and manufacturers may continue to find the large metropolitan areas more attractive from this point of view, despite such offsetting disadvantages as higher wages and traffic congestion. Finally, industry tends to be reluctant to move from established locations unless the incentives to do so are considerable. There will be exceptions, of course, but most of the studies and most of the briefs of individual industries seemed to support this general conclusion.

The mechanization and growing capital-intensity which will accompany the expansion of secondary industry, together with the increasing complexity of the machinery and electronic regulating devices, inevitably will result in a continuing rise in the demand for labour with specialized skills and for trained management personnel. The problems arising out of these needs are dealt with elsewhere in the report. It is, of course, essential to the welfare of the sector that these problems be resolved. Otherwise shortages in the supply of managers, engineers and skilled technicians might prevent it from achieving as rapid a rate of growth as we predict for it.

### *Summary and Conclusions*

The picture we have presented here of the developments we expect in secondary industry over the next twenty-five years is abbreviated and subject to many qualifications. Nevertheless it is reasonable to assume that profound changes will not occur in the nature of the economic forces which have shaped the growth of secondary industry for the past few decades; our optimism about the future of secondary manufacturing industry is perhaps coloured by the way it has grown in importance in the economy in the past quarter century. At the same time we should not like to minimize the fact that the prospective growth will not be shared equally by all industries, and that indeed the future may present some secondary industries with serious problems. Even those industries which we expect to grow more rapidly than the average will continue to face the handicap of producing for a relatively small market. The achievement of the kind of growth in secondary industry that we expect, however, is not something that can be assumed to occur automatically. Secondary manufacturing industries will have to continue to show a vigour and enthusiasm for adopting new products and techniques at least equal to its performance over the last decade.

It would seem logical to us that industry should be encouraged to organize itself as efficiently as possible to serve the relatively small market in this country. We have said that one of the problems facing



the industry is the excessive division of the market, which has aggravated the problem of scale for each of the firms involved. A reduction in the number of firms in many industries, with production concentrated in fewer but more specialized plants, could lead to lower costs of production and hence to lower prices for the consumer. A number of manufacturers have suggested that they would welcome developments along these lines, but they believe that a reduction in the number of Canadian producers of any important product might expose those who remain to prosecution under the Combines Investigation Act. Whether or not such would be the case is difficult for us to judge, but it is a view which is fairly widely held. In the circumstances, we suggest that the Restrictive Trade Practices Commission, in judging whether or not any concentration of production in fewer hands is in the public interest, should give considerable weight to the importance of secondary industry achieving the maximum possible economies of scale. Moreover, if the combines legislation as presently drafted stands in the way of a desirable concentration of production, then consideration should be given to some modifications in the Act.

We are fully in accord with the principle that monopolies and cartels should be effectively policed, but it is a relevant consideration that few secondary industries anywhere in the world are exposed to such severe important competition as that experienced by Canadian industry. This import competition provides some safeguard against exploitation by domestic monopolies or cartels.

Having in mind the increasing need of secondary industries to mechanize their operations, if they are to remain competitive, we suggest these industries be allowed to write off over a very short period their capital investment in machinery, equipment and factory buildings. (While this is suggested to encourage secondary industry to keep its equipment and factory buildings modern and up-to-date, such provision could also be applied to other industries.) We believe this would be a useful and effective incentive for reducing costs and increasing the ability of secondary manufacturing industries to compete successfully with imported products. And as the capital assets of the industries in question can only be depreciated once for tax purposes, there should be no appreciable loss in government revenues over a period of years. The timing of such measures intended to assist the manufacturing industries would, of course, be of importance. Their implementation would need to be reconciled and integrated with other policies designed to stimulate or to restrain economic activity throughout the country. It would also be of considerable help in some manufacturing industries if large buyers, including all levels of governments, the railways and public utilities, made a practice of discussing their prospective requirements and their capital expenditure programmes well in advance of the actual placing of orders. Closer liaison

of this kind would make possible a more efficient spacing of production and would lead to lower production costs. It would also be desirable, in our opinion, in view of the growing size and complexity of Canadian manufacturing operations, to increase the number of officials in the Federal Government service having detailed knowledge of manufacturing industry. In this way, liaison between government and industry would be improved and more information about the position and problems of the manufacturing sector would be available to the Government.

## THE SERVICE INDUSTRIES

FEW PEOPLE HAVE noticed the way the service industries have been growing. Other sectors of the economy continually dazzle us with their array of achievements — vast sources of energy harnessed, fabulous mineral wealth laid bare, broad links of communication forged, innovations which revolutionize production, and ingenious wares to satisfy our needs and pamper our fancies. Sometimes, too, these sectors catch our eye because they raise problems which make them the object of public policy. But the service industries, which do not mine, generate, grow, or manufacture a product, seldom shout their advances and rarely become a problem for legislators. Yet this sector includes a larger share of our working force than any other sector of the economy, and this share has been growing rapidly. Table 13.1 outlines the various occupations falling within the term “service industries” (as defined and presented in the special study of them that has been prepared for us\*) and summarizes their growth in terms of numbers employed from 1881 to 1951. Throughout the last three-quarters of a century, the service industries have increased their manpower at a rate that has averaged 3.5 per cent yearly, so that they now employ more than 35 per cent of the total labour force compared to 15 per cent in 1881. For the services to have grown so much is in keeping with what is happening in advanced countries all over the world, where workers are being drawn toward this sector. It is a growth that is connected with profound changes in our way of life — our tastes, our educational level, our habits of work and play, our urbanization, our technology, our increasing interdependence, our rising standard of living.

### *Recent Growth and Change in the Service Industries*

This growth, for all its obscurity, has been one manifestation of a social transformation which has changed the face of Western society, and as in all such upheavals it is difficult to disentangle causes and effects. Still, there are a few clear trends which account in part for the expansion of the services, though this expansion in turn has often added new impetus to these trends. There has been a greater demand for services as our wealth and knowledge have grown. The increase in

---

\* It should be noted that the occupational coverage of the special study on *The Service Industries* and of this chapter does not coincide with that adopted in a more general study prepared for us on *Output, Labour and Capital in the Canadian Economy* and used elsewhere in this report, notably in Chapter 17.

Table 13.1

## GROWTH OF THE LABOUR FORCE IN THE SERVICE INDUSTRIES

Year	Service industries total		Trade wholesale and retail trades, manufacturers' branches		Finance including banking, lending companies, insurance, real estate		Professional services including the professions, education, health, tourism		Government services federal, provincial and municipal employees, the armed services		Personal services including domestic servants, laundries, dry-cleaners, hotels, barber and beauty shops, restaurants	
	No. of workers	% labour force	No. of workers	% labour force	No. of workers	% labour force	No. of workers	% labour force	No. of workers	% labour force	No. of workers	% labour force
1881....	213,000	15.5	78,000	5.7	1,000	0.1	48,000	3.5	8,000	0.6	78,000	5.7
1911....	693,000	25.4	265,000	9.7	18,000	0.7	121,000	4.4	77,000	2.8	212,000	7.8
1931....	1,182,000	30.2	388,000	9.9	92,000	2.4	266,000	6.8	114,000	2.9	322,000	8.2
1951....	1,895,000	36.6	696,000	13.4	143,000	2.8	452,000	8.7	295,000	5.7	309,000	6.0

SOURCE: *The Service Industries*, 1956, a study prepared for the Commission by the Bank of Montreal, Chap. 2, Table 1, pp. 5-6.

the production of manufactured goods has resulted in a larger demand for the services of the distributive trades, of the financial world, and of some professions. Increased knowledge means that many tasks which were formerly carried out by non-specialists are now sufficiently technical that they are better given to specialists who often fall within the service classification. It also means that more people are needed in education to pass on this greater store of knowledge. On the supply side, there are reasons why workers are attracted to this sector, despite a level of pay which is often lower than they could obtain elsewhere. Some jobs in the service industries are attractive to certain workers because they make small intellectual or small physical demands. On the other hand, many other workers come into this sector just because they can find jobs here which will make greater use of their talents and training. The conjunction of these — and many other — forces of demand and supply explain in some measure why the services have expanded so greatly. We shall now see how the services have changed during their expansion.

One of the most important changes has been in the structure of the service industries. It used to be that almost all the undertakings in this sector — except a few such as wholesaling and finance — were the work of small independent proprietors and partnerships. If a newcomer with a small amount of capital, a very little knowledge of the trade, a spirit of enterprise and a desire to be on his own wanted to establish himself in the service industries, he had a good chance of succeeding. But now signs of bigness are appearing which make the position of the newcomer more difficult. The size of the average business unit in the service industries has increased considerably, and the growth of some firms has been astonishing. Groceries, drug stores, department stores, moving-picture houses, newspapers, hotels and many other activities which were once almost the preserve of the small businessman, are now often part of vast chains of similar businesses. Other types of business which are not usually organized into chains have notwithstanding increased their size. Independent proprietors now own larger firms than they used to; the expansion of the government service is common knowledge; partnerships in the professions are becoming more usual, and the size of partnerships is growing; and looser associations of independent firms are being formed which, though they may sometimes prolong the life of the small firm, are more often the beginnings of larger single firms. In the face of competition from such large units, the small and independent businessman has been hard pressed, and has sometimes had to yield. The newcomer, who must buck the experience, the economies of scale, and the easier access to capital of the larger and established firms, thinks more carefully before going into business in this sector; he knows that he will have to be shrewder than his predecessors.

A new breed of workers is appearing, too. They are skilled in the operation of power laundries, in medical art, in running electronic computers, in market analysis, in arranging safaris into Central Africa, in coining advertising slogans, and in countless other jobs which used to be carried out — if at all — in a much less professional manner. Very often, they have acquired their skills in the course of doing a job that is more specialized than in the past; they have therefore become expert in one part of the activities of their firm instead of looking after a number of jobs and doing none of them so well. But these skills may also have been learned through more formal training. Sometimes they paid for their own training in one of the many types of schools which cater to the need of the service industries for more skilled personnel. Or they may have been trained by an employer at his expense in one of a growing number of "in-plant" training programmes. As this sector becomes more specialized and technical, they are finding that such training is more and more important to their work. Trade unions find that it is now easier to organize workers in the service industries. When the units of business were smaller and the workers mostly unskilled and transient, union organizers had little success. But now, with the coming of larger firms and highly skilled personnel, it has been easier to persuade workers to join unions and to persuade management to negotiate with the unions. Already, more than 12 per cent of workers in the service industries, as we have defined them in this chapter, are trade union members and most of them are covered by collective agreements. In some special service industries more than half of the workers are organized; in the entertainment field almost all workers hold a union card and pay dues. We think that this trend toward unionization will continue, since the forces which underlie it — bigness and increasing skill or professionalism — will become, if anything, more compelling.

But it would be misleading to say that the service industries are now or soon will be dominated by large firms, highly trained personnel, and trade unions. These are only the directions in which this sector is moving. Today in all but a very few service industries the man with little capital and little specialized knowledge still has a chance to succeed, and, although he may be more and more handicapped in certain types of business which will become the preserve of big firms, he will find a large range of ventures open to him in the future. True, only the large firms will be able to take advantage of some of the labour-saving innovations which we expect to occur in this field, and this will increase their competitive advantage over the small businessman. But we do not expect their advantage to be greatly increased in many cases. Many innovations will be adaptable for use in smaller firms; others will be made more flexible so that they can be used for a variety of smaller jobs instead of just one large job; and some will be as useful to the small firm as to the big. Moreover, large and established firms with labour contracts, pension

schemes, and investments in plant and equipment, may sometimes find their movements restricted when they want to innovate, and this fact will favour the smaller firm. Thus although the importance of the small businessman will not be so great in the service industries as it has been, we expect him to continue to do a large share of the business in this sector, and to be more prominent here than in any other part of the economy. Nor will labour go so far as in other sectors in organizing its workers or in requiring mainly highly trained workers. Students, housewives, transients, casuals, and unskilled people will contribute, as they always have, an important part of the manpower in this sector; and they will join a labour union less often than their fellow workers in other sectors. If the present trend is toward bigness and professionalism, this trend has barely begun, and, we think, will never be completed.

Although the service industries have been growing they show one surprising feature: in relation to other sectors of the economy they are contributing about the same proportion of national income today as in 1926, while the number of persons employed in these industries has risen substantially. The study prepared for us on *The Service Industries* shows that in the intervening years their contribution has fluctuated widely, contributing more than half of our national income in 1931, while 20 years later, in 1951, their contribution was a little more than a third.<sup>1</sup> Of course, the absolute amount of income originating in the service industries has been increasing over the years. This was inevitable with more and more people employed in this sector. However, employment and remuneration in the service industries both respond less quickly and less markedly to economic fluctuations, and thus are higher than the general average in bad times. In 1931, a depression year, therefore, it could be expected that employment and remuneration would fall off less in the service industries than in the country at large. There is, it seems, a deep-lying trend that dictates that the service industries will employ more and more of our working force and at the same time not increase their relative contribution to our national income.

For the services have failed to increase their productivity as quickly as other sectors. The Canadian labour force as a whole has become much more productive in the years since the War. But this is a composite increase in productivity, which is made up of very disparate parts. In agriculture and the resource industries the increase has been most pronounced and in secondary industry it has been about average. In the service industries, however, as far as one can tell the rate has been less than average.<sup>2</sup> We do not have to look far to find the reasons for this disparity in changes of productivity. Since the Industrial Revolution, agriculture and industry have benefited from countless innovations designed to perform the traditional tasks with less manpower or to perform new tasks which were previously impossible or uneconomic. The application

of these inventions has been the cause of rapid increase in productivity in these sectors. But the services have not been so blessed. Many of the jobs in the service industries are today almost as tedious as they were in centuries gone by. To write a newspaper article takes about as long today as it ever did. University graduates are not more easily produced now than they were in the old days. The writing and producing of a stage play must involve as much effort and worry today as in the eighteenth century. For it is of the very stuff of many of the service industries that they call, more than other sectors, on talents which only human beings can give; imagination, a sense of humour, taste, creativeness, judgment . . . and just the personal touch. As yet these services are not offered by machines in a satisfactory way; we doubt that they ever can be.<sup>3</sup>

To be sure, there have been many advances — some of them striking. New skills, new methods of organization, and new inventions have all kept productivity rising in the service industries, and in many fields the changes have been revolutionary. The restaurateur devised the cafeteria to save labour in serving his customers. The doctor of today can cure many diseases in a fraction of the time his predecessors took, and can prevent others from occurring at all; with the help of new equipment and knowledge he can perform delicate operations which a few decades ago would not have been attempted. The accountant saves precious hours of skilled labour by organizing the bookkeeping systems of his clients so that checks are, to an important extent, automatically carried out. The wholesaler has found better ways of planning his warehouse and now uses machines for many jobs which were once manual. Almost every service industry has changed greatly since the turn of the century. And if, in certain service industries, it has not been possible to increase productivity significantly, there have often been technological improvements which have enabled us to by-pass these areas. The live entertainment industry has not been able to increase its productivity very much, if at all; but moving pictures, records, radio, and television have allowed a single performance to reach audiences all over the world, and to be repeated as often as wanted. Similarly, when it seemed difficult for barber and beauty shops to increase their productivity, new preparations and gadgets were invented which make it easier to shave beards, cut and wave hair at home. Laundries have lost trade to the home washing machine, especially after the invention in post-war years of a variety of new materials which are more easily laundered. The decrease in the number of music halls, cinemas (as a result of television), barber shops, beauty shops, and laundries in recent years testifies to the failure of these industries to raise their productivity significantly; the functions of these industries are still carried out, but with the help of inventions they have been removed on a considerable scale from the service sector to the home. On the other hand, the rise in cost and deterioration of quality in many repair



services have led consumers to replace old shoes, cars, houses and many other goods with new ones sooner than they once did; and manufacturers are making their products out of materials which require repairing and servicing less often. In this case the function has shifted somewhat from the service sector back to the manufacturer. By and large, however, we have not needed to by-pass the service industries. They have kept their productivity rising enough so that their importance as a sector has increased, and we think they will continue to do so.

But we would not want to paint in too extravagant colours the changes which will occur in the service industries by 1980. New skills, new methods of organization, and new inventions will continue to be devised which will perform the traditional tasks more efficiently and enable us to tackle new problems; the techniques which are already known will be used more widely. No doubt in certain areas the changes will be almost as dramatic as science fiction leads us to believe: electronic machines will, we think, run the more modern warehouses of 1980; process complicated data in banks and insurance companies which now employ large clerical staffs for this work; and perform simultaneously complicated bookkeeping operations relating to cost accounting, inventory control and invoicing. Thus, the machine, so long accused of degrading the worker and divesting his work of its individuality, is now liberating him from much of the monotony of humdrum tasks, and creating new tasks which will often be closer to the limits of his abilities. But we should not hope for too much. Innovations will not affect some sectors of the service industries; in other sectors it may prove practical to adopt them only in the larger firms; and in all sectors it will take time for existing and new techniques to filter from the imaginative and daring at the top down to the broad base made up of average and sometimes unprogressive firms. For these reasons we think that the changes in the next twenty-five years will be more often gradual than dramatic, and that they will not keep pace with changes in other sectors.

### *Glimpses at Some Service Industries*

We have called attention in other chapters to the great diversity encompassed by certain sectors of the economy. Large differences in size of units, in profit margins and wages, in types of products, in methods of work, and in productivity lie behind over-all averages and trends; without being aware of these differences, we cannot fully understand what the statistics mean. This is perhaps more true of the service sector than of any other. Embracing the wholesale and retail trades, finance, insurance, real estate, community and public services, entertainment and recreation, the professions, and a host of other business and personal services — to mention only the broad classifications — the service industries can claim a variety which increases year by year. The result is that almost no general-

ization can be made about this sector without qualification. Our discussion in the previous section of the growth of the working force employed in the service industries is but one example. Although no trend is more evident than the flow of workers into this sector, many service industries have not shared in the expansion. Coopers, blacksmiths, peddlers, scullery maids, coachmen, and many other worthies have almost disappeared from our lives; and clergymen, lawyers, and dentists, who are still very much with us, have for one reason or another failed to increase their numbers as much as population. Even in those activities which have been growing most quickly, many individual firms have dropped out of the race; for the service industries have the highest rate of failure in the economy, and failures are frequent in the expanding areas. If even the most obvious truths about this sector must be qualified, how much more cautious must we be of generalizations which are more obscure!

To remedy in some small measure the oversimplification which comes from considering all the service industries together, we shall, therefore, look very briefly at a few of the more important activities in this sector. We have chosen the wholesale and retail trades, banking and finance, the professions, the government services, and the personal services. Although these parts of the service sector are here to stay, they are all undergoing changes in an effort to do their jobs more efficiently and to meet the new demands being made of them. It is with the nature of these changes that we shall be most concerned.

#### *a) Wholesale and Retail Trade*

The high costs of the wholesale and retail trades have from time to time attracted the curiosity of economists and the indignation of the public. In 1939, a study was published in the United States which claimed that 59 per cent of the amount paid by Americans for finished goods represented costs of distribution — what was charged for selling and transporting raw materials, capital goods and, finally, finished goods themselves.<sup>4</sup> We can think of no reason why, in 1939, distribution costs in Canada should have been a smaller proportion of the total expenditure on finished goods; and since that year the proportion has probably risen in both countries. For, as another study in the United States has shown, efforts to increase productivity in the distributive trades have not been crowned with as much success as in other sectors; in fact productivity has probably increased less than half as quickly as in manufacturing and agriculture.<sup>5</sup> With wages rising in this sector as elsewhere, the result has been on the average a constant — or even slightly widening — spread between the price charged by producers and that charged to consumers. Hence distributors have been accused of either profiteering or backwardness. But in fact profits are seldom excessive in the wholesale and retail trades and, as we shall show, great enterprise has been displayed in keeping costs down and offering more varied services.

Although most Canadians have frequent dealings with the retail trades, few realize that the present abundance and variety of shopping facilities is of recent date. A hundred years ago, the standard retail outlet in Canada was the general store which sold under one roof all the needs of man and beast for a price that was open to spirited discussion and that was paid more often in kind than in cash. Since then retailers have been busy cutting costs or adding new services, so that the trade today has changed unrecognizably from its counterpart in the middle of the nineteenth century. First to come were the department stores, which, though they were in some ways only an expansion of the general store, introduced several innovations which lowered costs: they abolished credit and payments in kind in many cases; they sold only at one price; they dropped groceries from their range of goods; and they more often bought from manufacturers where their predecessors had bought through intermediaries. These economies allowed both the cutting of margins and the expansion of inventories in the remaining lines stocked. Soon afterward, the chain store made spectacular gains by carrying much farther some of the innovations of the department store — bulk-buying direct from manufacturers, greater volume sold at a smaller profit margin, and a further reduction of some of the more costly services provided to customers. The chain stores later began self-service stores which were able to lower margins still further because their sales staffs were greatly reduced. The mail order store also rose during the last century; by offering the service — paradoxically enough — of eliminating the need to visit a store to make a purchase, and by cutting margins through, first, doing away with the heavy costs of showrooms and, second, appealing to a national market instead of a local one and thus increasing volume, it was able to capture an important part of the wholesale and retail trade, especially in rural areas. The flow of population into the cities and the appearance of easier means of access from the country to the cities later reduced the sales of these stores and forced them into operating chain and department stores as well; but even today they remain important retailers in outlying regions and, to a surprising degree, in large cities too. Finally, the post-war era brought a rash of new forms of retailing to rival the old ones: surplus goods stores, shopping centres, warehouse sale and discount houses. These may cut costs by increasing their volume so that they can buy in bulk from manufacturers at reduced prices, thus eliminating the profits of intermediaries and lowering the overhead cost per sale. Or they may cut costs by offering the customer reduced services — no credit, no delivery, no guarantees, no repairs, no showroom, or a limited choice. It is true that as each revolutionary form becomes established it often takes on some of the trappings of its conventional competitors: services which had been eliminated are brought back, and margins begin to rise. But so competitive and enterprising are the leaders in the retail trade that new types of retail outlets will certainly be launched whenever a chance of

cutting costs appears. If margins do not fall over the long run, it is because the remaining costs are rising as quickly as productivity.

Manufacturers have been scarcely less active in finding ways of channelling their goods more efficiently to retailers and consumers. A few have found that their products — mainly sewing machines, vacuum cleaners, encyclopedias and brushes — can be sold with startling success directly to the consumer in his house. Manufacturers of goods used by large industrial and commercial companies have also sometimes been able to sell directly to users. But usually manufacturers have to channel their flow of production through a more devious network of distribution in which the consumer is serviced by a retailer, and the retailers and industrial users are serviced by one or several intermediary jobbers, brokers, commission agents, or wholesalers. In an effort to come closer to their users and simplify this network, manufacturers of many products have found it worth while to establish branch offices which distribute their own products. This results in lower costs of distribution in many cases, and also offers other advantages. Those who manufacture highly technical products find that their own trained salesmen understand the product better than other intermediaries, and can see how it can be adapted to the user's special needs; those producing perishable or fashion goods find that the greater speed of a more direct distribution reduces the risk of loss; and those who turn out a large range of products, many of which would individually bring little revenue to a distributor, find that they have a tighter control of sales if they distribute through their own branches. Thus, although sales through manufacturers' branches have been increasing for almost every kind of product and now account for perhaps a third of all sales by manufacturers, they have increased most spectacularly in chemicals and drugs, lumber and building materials, machinery, and pulp and paper products.

The middleman has, therefore, been losing trade. Traditionally, he was dependent on the small retailers and the small manufacturers who needed intermediaries because of the limited scale of their operations: retailers were too small to buy in bulk directly from manufacturers, and these, in their turn, were too small to afford their own distributive network. But with the increase in the size of many units in both retailing and manufacturing, the middleman has been crowded on both sides. On the one hand, retailers are increasing their volume enough to reach back directly to manufacturers; on the other hand, manufacturers have expanded their own branch offices and are selling more of their output directly to retailers and commercial users. The middleman has thus ceded much ground that was traditionally his, though the greater part of our commerce still passes through his hands. Faced with the likelihood that these trends will continue, he has tried to make his services cheaper and more desirable to his clients. He has, in some cases, reduced the services he gives in order to cut costs:

credit, delivery, and visits from salesmen have often been supplanted by cash, carry, and telephone orders. In other cases, he has added new services which were especially wanted by the retailers; these include help with layout, stock control, training sales clerks, and advertising. He has organized co-operative chains of retailers who pool their orders, and the larger volume of business enables him to get lower prices from manufacturers as well as to cut margins. Finally, wholesalers are learning to organize their warehouses more efficiently and to make a greater use of machinery in them. All these measures should help to check the decline in the role of the middleman. Certainly, in distributing food and groceries, hardware, and drygoods — lines in which either the small producer or the small retailer is still prominent — he should continue to play an important role. But even in these areas he will lose some control, and in other areas his losses will be greater. Moreover, he cannot expect to share proportionately in the increase in consumption which will result from our higher standard of living; for durables, which will represent an increased percentage of consumer expenditure in the future, are quickly eluding the network of intermediaries. Thus the functions which the middleman used to perform are shifting significantly to other groups in the economy. From being the most powerful man in trade a hundred years ago — the man who told manufacturers what to make and retailers what to sell — he will have to step down to play, in the future, a more limited role.<sup>6</sup>

#### *b) Financial Institutions*

Just as the distributive trades channel goods from those who produce to those who consume, so our financial institutions channel money from those who save to those who borrow. But the two intermediary businesses are organized very differently. Where the wholesale and retail sectors, as we saw, are still open to newcomers backed by modest amounts of capital and, despite the rise of some large retailers over the past century, still abound with small businessmen, the banking industry, the largest of our financial institutions, has been carried on in Canada by a few large and established firms operating an extensive network of branches. At present there are ten chartered banks in Canada, of which nine were in business 80 years ago and the tenth is owned by a European bank of long standing. Other banks founded over the last 80 years have merged with the existing banks or have gone out of business; they have found it difficult to compete with the experience, larger capital, economies of scale, and the more diversified risks of the larger firms. This is not to say that banking in Canada is not competitive. Indeed, there is keen competition in services and location between branches of different banks and even between different branches of the same bank; and as the number of branches — after being cut back during the depression and during the Second World War — will probably grow to be 50 per cent larger in 1980 than it is now, this competition will be intensified.

Nor are the chartered banks the only financial institutions which channel savings to borrowers, though they are the largest. We have, in addition, a wide variety of other institutions each serving a somewhat different group of clients. Life insurance companies provide not only protection but also an outlet for personal savings. Indeed, life companies have absorbed a substantial part of Canadian savings in the past, and their growth has been fairly steady where that of some other institutions has been spasmodic; we expect them to continue their regular growth in the future. There are also trust companies, which administer estates and trusts, in addition to managing guaranteed funds into which clients can deposit savings; both of these activities should expand considerably in the years up to 1980. There are almost four thousand credit unions; and these, although they account for a small part of total savings, are growing rapidly. There are savings banks and offices sponsored by the federal and provincial governments, and these have grown with the economy. There are at present ten loan companies which deal largely in mortgages; owing to the competition of other financial institutions in the mortgage field, they have suffered a decline in recent years, but we expect the larger ones to continue to prosper. There are personal loan and instalment finance companies which are now providing an increasing proportion of the growing volume of credit used for the purchase of durables. Finally, there are a host of private and semi-private arrangements which by-pass the established financial institutions and which often escape statistical notice; in the past such loans have been of considerable importance, and they will probably be no less important in the future. Such, then, is the profusion of intermediary institutions through which borrowers are brought in contact with lenders.

### *c) The Professions*

The professions — those occupations which require a long period of formal training — have been growing and changing no less than other service industries. It is true that some professions, such as law and dentistry, have not increased as rapidly as population over the last 25 years at least. But most of the traditional professions have grown more quickly than population, and new professions abound. They have all moved toward more elaborate professional and pre-professional training, and toward greater specialization within the ranks of the profession. We think that these trends will continue. As the needs of the economy — not to mention our own personal needs — become more complex in the wake of scientific discovery and increasing wealth, jobs which were once carried out by amateurs relying on common sense or by unspecialized professional men will be increasingly performed by specialists. The result is that in most professions partnerships are supplanting individual practices, and the size of partnerships is growing; this grouping together of professional people allows a division of labour in which each partner can specialize in some

phase of the work. However, a greater proportion of those men and women entering the ranks of the professions will not go into private practice, but will work as employees of large business and government organizations in which the services of professional men are becoming increasingly necessary.

#### *d) Government Services*

Federal, provincial, and municipal government employees have also increased their numbers greatly; the public service today is more than 13 times larger than it was at the beginning of the century. We think that growth will continue at a rate slightly higher than that of the entire labour force, and have predicted that the public service — exclusive of the armed forces — will be more than double its present size in 1980. Although the size of the armed forces in such a distant year is less easily estimated, it would be unreasonable at present to hope that they could be reduced much below their present level; on the other hand, for the reasons given in Chapter 6 it may be that further increases can be avoided. The standard of public service in Canada at present is undoubtedly high, but there are signs that young men and women who are interested in this kind of work are being lured into other sectors by more attractive jobs. A more vigorous recruitment programme seems necessary to attract men and women at the junior and intermediate levels. Equally important, able men and women should not be held back to the rate of advancement of the mediocre, nor assigned to work that is mostly routine; they should be given the position and the tasks which are in keeping with their abilities. With such policies, the government services should be better able to fill their requirements on the junior and intermediate levels, and to train within their ranks more of the administrators and specialists needed for senior posts.

#### *e) Personal Services*

Unlike other service industries, the personal services have not been growing; there has, in fact, been a decrease in the number of workers in this area over the last 15 years. Only restaurants and taverns, hotels and motels, and drycleaning establishments now claim more workers than they did in 1941. The other main activities — laundering, barbering, hair-dressing and domestic service — have all declined markedly, and the more fugitive personal services such as gardening, window-washing and shoe-shining have probably gone the same way. These trends reflect a mixture of economic forces. As levels of income have risen, the demand for more of these personal services has increased. However, as the improvement in productivity in the output of personal services has lagged behind that in other sectors of the economy, personal services have become relatively more expensive; and this has restrained the consumption of such services. Furthermore, there have been marked technological advances in such home appliances as laundry equipment; this has spurred the use

of such equipment in the home and has consequently limited the demand upon establishments providing laundering and similar services commercially. People now have more time to prepare meals, look after their hair and to dig their gardens. These forces have combined to restrict the growth in output of personal services and to limit the growth in employment in such occupations.

### *The Future*

In the complex world of 1980, the same service functions will have to be carried out as in the most primitive and antique ages of human history. Distribution of produce, borrowing and lending, advice from experts, education, care of the sick, government, defence, cooking, personal care, and all the varied service activities of yesterday and today will be part of the world of tomorrow. But we have shown that there are forces which play upon our society and draw some of these functions into and out of the market, into and out of the service sector, or into one service industry and out of another. There are also forces which change the value people place on these functions, so that they are carried out with greater or less vigour than before. We have been living, since the eve of the Industrial Revolution, under the sway of forces which have brought, on balance, more and more functions into the service industries and increased the value which is placed upon them. True, a few functions have left this sector or have shifted from one service industry to another. But if we are to advance, we must leave some things behind: some of the familiar sights will disappear from view and new vistas open up, but as we move forward, we shall grow accustomed to seeing the landscape change.

In looking into the future, we see no reason why the growth of the service industry should not continue at about the same rate as in the past, and along the same lines. We have predicted that the number of workers in this sector will increase by more than 3 per cent yearly, and this will mean that 4.5 million people, or 45 per cent of the labour force will be employed in this sector by 1980. This is far more than double the present size of the working force in the services. It is almost twice the size of the anticipated labour force in primary and secondary manufacturing together, and six times that of agriculture. Although different areas of the service group will grow at different rates, and some will not grow at all, we think that the working force in each of the broad categories will increase at roughly the same rate. Distribution, finance, and government will grow just slightly more quickly than the service sector as a whole; and the personal services will lag slightly behind, but (owing to a rapid expansion of restaurants and motels) will no longer decline. The other broad sectors will grow at about the average rate. In narrowly defined areas, growth and decline will be more spectacular. For example, the number of employees in health, higher education, engineering, and retailing, will



increase much more rapidly than in other service industries; while those in wholesaling, domestic service, the armed forces and hairdressing will grow much less quickly, and may even drop off in numbers. More detailed estimates of the labour force in some service occupations are contained in two studies prepared for the Commission.<sup>7</sup>

As we have explained, productivity will not rise so rapidly as in other sectors; however, we have concluded that it will not lag so far behind that of other sectors that the contribution of the services to national income will fall below its present level. This estimate was formed after balancing many hopes and doubts about the future. It is not easy to decide what improvements will occur in the service industries, and how far and quickly they will be adopted. No one can say where the wand of innovation will next touch. However, certain places are favoured and these include areas which have been more backward than other parts of the economy and where, as a result, rising costs put pressure on businessmen to innovate or else be by-passed. For this reason we think that the service industries, the laggard sector, will share in the bounties of future increases in productivity. But innovation also favours large business units which can support expensive research projects and can afford the large investment in capital goods which may be required. This is perhaps more true in the service industries than elsewhere: in these industries many innovations have been devised by the larger firms and then sometimes copied by the smaller ones. To overcome the disadvantage of their relative smallness, a few firms have tried pooling resources to finance a single research project or establishment; this idea will probably become more widespread. But we see no reason to hope that the services will be much more favoured than in the past by innovation and have therefore not predicted any great changes in present trends. In any case, little innovation in this sector is likely to come from Canadian firms in the future; we shall still be almost as dependent on foreign ingenuity as in the past. It remains, therefore, to ask how quickly and how far we shall go in adopting the innovations of other countries.

At the beginning of the Industrial Revolution, the adoption of known techniques proceeded at a very slow pace. Then, as people became more used to the idea of change, the interval between the invention of a new machine or technique and its use gradually narrowed. Today, the economy is pervaded by an enthusiasm for new ways of increasing efficiency which will probably become even more intense in the future. Trade journals, business and professional schools, consulting firms, employee training schemes, conferences, and a host of other media of communication all allow businessmen to pool new information and share new experiences. These trends will accelerate the adoption of innovations and increase productivity. But many of the smaller firms in the service industries — and some large ones, too — have not kept abreast of new techniques that would make them strikingly more efficient, and it may be some time

before they are exorcised of their mental block against change or forced out of business. We can only hope that in the future they will show a greater willingness to accept the gifts that come their way.

It is possible, too, that productivity will be held back because the services cannot find enough men and women with the needed skills. We expect that workers will be released from some areas of the service industries and from agriculture, and that a larger proportion of the young people coming onto the labour market will choose to enter the service industries. These men and women should provide the labour force with which this sector can expand. But will they have the technical skill needed in the service industries of the future? Of course, there will still be — there will always be — many jobs in the service industries for unskilled workers and for workers possessing the conventional skills: we do not expect that office boys, receptionists, typists, and clerks will disappear from the office of 1980, though they may be used more efficiently. In addition, some routine but difficult tasks which today require skilled labour will become unskilled jobs through the use of machinery. But the demand will grow for people more highly trained in the conventional skills or possessing entirely new skills. To take only one example, we have mentioned that we expect that automatic processing machines will take over a large part of the routine clerical work in insurance companies and banks. Although many clerical workers will become superfluous in such a changeover, other types of more highly trained workers will be needed: "tapers" and "programmers" who have the training in mathematics needed for putting questions in terms meaningful to machines and for building into the control all the criteria necessary for making decisions; repair and maintenance men who are skilled in electronics; monitors who can pick up inconsistencies and remedy them quickly; and people in management who understand both administrative technique and the workings of these machines. Thus the introduction of automatic processing machines will make demands for a wide variety of personnel with skills which are almost non-existent today. And this is but one example. We expect that in almost all the service industries and at almost all levels more highly trained personnel will be needed: there will be a general "upgrading" of workers and management. Where will this specialized manpower be found?

We shall have to tap all the traditional sources. Despite our heavy losses in skilled and professional workers through emigration to the United States, immigration since the end of the war has brought us far more trained manpower than we have lost.<sup>8</sup> Indeed, the proportion of skilled and professional manpower among immigrants has been substantially higher than among the Canadian population as a whole. However, we think it would be unwise for Canada to rely on immigrants in the future, as much as it has in the recent past. There is some

evidence that the proportion of professional people amongst immigrants is falling, while it is rising amongst emigrants, and we think this trend may well continue. Moreover, it is possible that immigration will not bring us a very large number of men and women trained in certain skills and professions which will be in greatest demand in coming years. To some extent, employers will have to fill this gap, as they always have. They have been training more and more of their administrative and sales personnel either by offering training programmes on the premises or by sending them to special schools; such schemes have proved their worth so clearly that we feel they are certain to become more widespread. In addition, employers have been responsible from the very beginnings of industry for training apprentices alongside skilled workers, and this has been an important source of trained manpower. Though apprentices will continue to be taken on in some areas, we expect that their number will become smaller and that few of the skills needed in the service industries will be learned this way. For increasingly skills are being taught in technical schools and institutes, and both workers and employers are becoming aware of the value of longer formal training. The burden for training skilled workers — as for educating our professional men and women — will therefore fall more heavily on our educational system. We have strongly recommended measures which should greatly expand our existing educational facilities to meet the demand that will be made on them. In Chapter 15 we outline the capital requirements of schools and universities in the years up to 1980; and in the final chapter we urge that salaries be substantially increased in order to attract enough men and women of high calibre into the teaching profession. Such measures will increase the flow of skilled and professional manpower into the service industries, as into other sectors of the economy. But trained and able people will probably be as scarce in the world of 1980 as they are today. We hope that in the intervening years employers will learn to make more efficient use of the training and abilities of their employees and thereby bring us nearer the full measure of productivity which is within our reach.

## TRANSPORTATION

THE TRANSPORTATION industry's main and obvious economic function, that of moving raw materials and finished products easily and efficiently to market, is the same in any country — rich mineral deposits which are completely inaccessible or manufactured products which cannot be delivered to potential buyers are of little value anywhere in the world. However, transportation's role in bringing together manpower, materials, and markets has had and will continue to have a unique importance for Canada because of our vast distances, our small and scattered population, our remote natural resources and our dependence on distant export markets. Indeed, an effective and up-to-date transportation system has always been the life line which has made possible the continued development and progress of our specialized economy, even though both the sources of our wealth and the forms of our transport have changed dramatically over the years. The fur trade of early times could no more have existed without the birch-bark canoe than a later generation of Prairie wheat farmers could have survived without a railway and cheap ocean shipping. Similarly, the recently tapped mineral resources of Labrador, like those of the Ontario cobalt and gold country half a century earlier, had to wait for the provision of adequate transport, while the building of the aluminum project at Kitimat was in some measure made possible by the ability of helicopters to fly men and materials into otherwise inaccessible terrain. And tomorrow, as today, we will be heavily dependent on pipelines to market our oil and gas, on airplanes to discover and exploit new resources, and on trucks, railways and steamships to make possible the further development of our specialized mass production manufacturing industries.

It is not surprising, in view of its central economic importance to Canada, that the subject of transportation has been closely interwoven with the political life of the country throughout its history. Even before 1867, expenditures on canals, roads, and port facilities by public authorities were often aimed as much at the furtherance of national goals like defence and the administration of justice as they were at facilitating the commercial movement of passengers and freight. The fact that a unified Canada would be in a better position to ensure the financing of the transportation facilities needed to develop the northern half of the North Ame-

rican continent played no little part in the decision to create a new dominion. And the support given by the new Federal Government to the building by the Canadian Pacific Railway of an entirely Canadian route to the Pacific, in contradiction to all the laws of economics, undoubtedly did more than any other single act of policy — perhaps more than all other policies put together — to enable the hopeful vision of a separate nation to be turned into a practical and prosperous reality. The influence of national policy considerations on the development of our transport facilities has continued to be felt from that day to this. As it shown in more detail in the study prepared for us on *Transportation in Canada*, assistance to the transport sector by governments in the form of subsidies and capital expenditures amounted to some \$350 million in 1953. This assistance takes forms too numerous to mention here; a few examples are the direct subsidies given to railways, the maintenance and operation of toll-free canals, the losses incurred on the operation of airports and marine services, and government outlays on the building and maintenance of roads and highways in excess of revenues received from users.

In addition, whenever possible Federal Government assistance and regulatory policies have been devised with an eye to easing somewhat the heavy transport charges incurred by regions outside the central portions of Ontario and Quebec as a result of the tariff and other national policies. The provision and maintenance of certain railway and steamship services by the Government of Canada was in fact, for Newfoundland in 1949 as for the three Maritime Provinces and British Columbia more than 75 years earlier, a condition of entry into Confederation. The maintenance of the Crow's Nest Pass rates, the 1951 "bridge" subsidy for rail traffic moving across the region north of Lake Superior, the recently increased subsidy on Maritime freight rates, and provincial and federal capital assistance for railways into northern territories are further illustrations of the characteristic concern of Canadian governments with regional transportation services and rates. The whole question of government policy will be discussed again later in this chapter — our point here is to emphasize that trends in Canadian transportation cannot be properly evaluated in terms of commercial consideration alone.

At the same time it should be stressed that purely commercial factors have come to exert a much more important influence than once they did on the pattern of our transportation system. In part, of course, this has been due to the fact that government assistance to transport in any country must inevitably decline after the initial heavy costs of developing basic facilities have been incurred — prior to 1914 almost the entire federal debt and a substantial part of that of the provinces as well, had accumulated as a result of the construction of railways, canals, roads and other transportation agencies. More important, however, in bringing commercial considerations to the forefront has been the comparatively

recent emergence of vigorous competition in the transportation sector. In contrast to earlier periods, when newer forms of transport tended entirely to displace previously existing methods — e.g., the impact of the railroad on the stage-coach and of the steamship on the schooner — more recent technology has led to the growth of new facilities which complement, as well as compete with, older forms of transportation. Thus the railroads, for example, which up to three or four decades ago had a virtual monopoly in the movement of goods and passengers by land, are now engaged in strenuous competition with trucks, airplanes and pipelines over a wide range of their activities. Rail transport, like each of its rivals, has functions which it can clearly perform better and more economically than any of the others, but at the same time there is a broad and shifting area where the question of which carrier gets the traffic can only be answered by the rigorous test of efficiency in a highly competitive market. The market is the more competitive because many of the newer forms of transport can be easily developed, at least on a local basis, by small entrepreneurs; it does not require formidable investments to start a small trucking, flying or inland shipping firm. This growth of competition in transport, although by no means always a net gain to the community, has on the whole led to a more highly developed, efficient, and cheaper national transportation system, offering shippers not only new services but a choice between those services as well. If we are to assess the future of the transport sector in a realistic way, therefore, we must lay special stress on this newly dominant factor of competition.

We shall devote most of our attention in this chapter to freight traffic because of its greater economic importance. Our comments about passenger traffic are made toward the end of the chapter.

### *Recent Trends in Transportation*

The effect of competition on some of the main forms of transport in the past can clearly be seen from the following table:

Table 14. 1

#### ESTIMATED DISTRIBUTION OF INTERCITY REVENUE FREIGHT TON-MILE (millions)

Year	Rail	Water	Highway	Air	Pipeline	Total
1928 . . .	41,846.8	8,067.8	49.7	—	—	49,964.3
	83.8%	16.1%	0.1%	—	—	100.0%
1945 . . .	63,645.7	18,336.2	3,437.4	3.4	400.0	85,822.7
	74.1%	21.4%	4.0%	neg.	0.5%	100.0%
1953 . . .	65,825.3	21,897.2	14,185.4	23.7	6,816.6	108,748.2
	60.5%	20.1%	13.1%	neg.	6.3%	100.0%

SOURCE: J.-C. Lessard, *Transportation in Canada*, 1957, a study for the Commission, Section III, Chap. 1, p. 76.

The striking features of the table, of course, are the sharp decline in the percentage of total intercity freight carried by the railroads and the very rapid rise of highway and pipeline transportation, particularly since 1945. A closer examination of these past trends may help to throw light on what the future holds for each segment of the industry.

*a) Railways*

It is logical to begin this short analysis with the railways, not only because they are still the most important single element in the field of Canadian transportation, but because it is they that have been most affected by the new competitive environment. Table 14.1 shows that in comparison to the peak traffic year of 1928, 1953 railway revenue freight ton-miles increased by not much more than 50 per cent. Real national output more than doubled in this same period. At the same time, an increasing amount of the high-rated traffic (i.e., on which freight rates per ton-mile are comparatively high) has gone to competitors; the proportion of total transport outlays accruing to the railways has, therefore, fallen more sharply than the volume figures above would suggest.<sup>1</sup> Put in another way, the constant dollar value of all expenditures (including government subsidies) on railways increased by 38.5 per cent in the two and a half decades ending in 1953, while expenditures on all other forms of transport increased nearly four and one-half times.<sup>2</sup>

Although the figures which reveal the dramatic decline in the railway's share of the transportation market are comparatively straightforward, some of the basic reasons for this fall are more subtle and complex. An important cause, of course, has been the shift which has occurred in the pattern of national output — the relative rise in services as opposed to commodity production, the decline in the relative importance of agriculture, and the change from coal to hydro-power and oil and gas as the main sources of our energy. In addition, the relatively rapid rise of those manufacturing industries in which output and components are often more conveniently shipped by truck, considerations of plant location, increasing industrial concentration in and around urban areas, and more efficient use of bulky raw materials have all tended in one way or another to bring about a decline in the proportion of national production moving by rail.

The two major railways, however, also claim that they have undergone losses of traffic to competitors because of the statutory and regulatory restrictions imposed upon them.<sup>3</sup> On the other hand, the Canadian Trucking Association claims that limitations on the railways' ability to compete with them are small or non-existent in practice.<sup>4</sup> It is true that section 334 of the Railway Act, which empowers the Board of Transport Commissioners to seek such detailed information about proposed competitive rates, has been liberally interpreted by the Board, although it is potentially restrictive. Moreover, a 1955 amendment to the Transport Act enables

new agreed charges to come into effect 20 days after filing with the Board, thus eliminating long delays. It is also true that appeals from the Board's decisions on rate matters to the Governor-in-Council have been infrequent, with reversals of those decisions more infrequent still, and that the Board's regulations with respect to safety, comfort and convenience have not been unduly onerous to the railways. If, however, we can agree with the truckers that the foregoing restrictions are only potentially limiting, we cannot agree with them that other obligations imposed on the railways have not limited the latter's ability to compete. We refer specifically to the statutory Crow's Nest Pass and related rates on grain, which constitute 27 per cent to 30 per cent of the railways' volume of traffic and less than 10 per cent of their revenue; to the recent equalization of class rates outside the Maritimes which cost the railways nearly \$5 million a year; to the one and one-third rule on transcontinental rates;\* and to the Board's reluctance to allow the abandonment of unprofitable branch lines and services.

These burdens on the railways force them to try to recover their overhead costs from a comparatively small proportion of their total traffic. They claim that some 80 per cent to 85 per cent of their overhead comes from the class of traffic in question. But it is just this portion of the traffic which is most susceptible to competition and if rates are pushed too high, business is diverted to competing forms of transport leaving the railways in an even worse position than before. Authorized freight rate increases of over 100 per cent since the War have not, therefore, begun to return this amount of additional revenue to the railways. In fact, average rates per ton-mile are only some 60 per cent higher than in 1939 because of competitive and regulatory limitations.<sup>5</sup> The railways have, however, been compelled to try to raise their rates almost year by year since the War in order to meet rising internal costs and the increasing wage demands of their labour (wages account for 60 per cent of railroad operating outlays). Although it is difficult to make precise comparisons with other occupations, railway wages certainly do not appear unduly high in terms of national averages; there may well be exceptions in some wage groups whose work is made easier by technological improvements or whose pay is still based on mileage scales more appropriate to the days when trains were slower. However that may be, our point is to emphasize that the railways have had to adapt themselves, in the words of the President of the Canadian National Railways, "to the challenge of a high-wage society". Pressed on the one hand by rising costs and on the other by statutory and competitive limitations on the rates they can charge, the two major railways, which account for over 90 per cent of total Canadian railroad operations, have seen the proportion of net earnings to revenues fall well below the level of the late 1920's, even though the absolute total

---

\* Freight rates on transcontinental traffic to intermediate points may not exceed  $1\frac{1}{3}$  times the rates charged on freight to more westerly points.



has risen. This, of course, has not been true for each and every one of Canada's 31 railways; a few, by the nature of their location, e.g., in the North, have not been subject to the same degree of competition.

The preceding paragraphs may leave the impression that our railway system faces the future gripped by powerful forces entirely beyond its control. This is not the case at all, even though by the common consent of independent Canadian transportation authorities and senior railway executives themselves, it is admitted that our railways were, and perhaps still are, slow in accepting the necessities of the new competitive atmosphere. In terms of adopting new physical equipment, which can save on labour costs and offer customers improved services, we have fallen far behind the United States. With the exception of one or two railways like the Algoma Central and the Quebec Labrador, dieselization has proceeded slowly; the two major railways are not much over half dieselized compared to 100 per cent dieselization for most Class I railways south of the border. In the development and use of centralized traffic controls, automatic signalling devices, and modern switching and freight handling apparatus, etc., we have also lagged behind the United States. Mainly as a result of the slower pace of dieselization gross ton-miles per freight-train-hour on our railways — perhaps the best single indication of railroad efficiency — while sharply improved since 1952, have fallen still further behind United States Class I railways in the post-war period as a whole.

It is by no means clear, either, that our railways have achieved the maximum possible advantages within the framework of present regulations. For example, it is questionable if the number of agreed charges has grown as fast as it might since 1955, even though the total rose in two years from 54 to 156. One wonders also if the total mileage of rail line abandoned — 114 miles in 1955 — indicates that the railways are pressing as vigorously as they might for the elimination of unprofitable services. Moreover, the recommendation of the Turgeon Commission in 1951 that more joint programmes be undertaken by the two railways to achieve added operating economies does not appear to have had very spectacular results. In the 15 years up to 1949 pool trains, joint freight and switching service, and abandonments with joint use of the remaining line had saved about \$1 million annually. Another field in which progress seems to us to have been slower than it need have been, is in the development of "piggy-back services", the carrying of loaded trucks on railway flat cars. Such services, highly developed in the United States, are mutually advantageous in that they combine the door-to-door flexibility of trucks with the long-haul advantages of the railroads.

As is pointed out in the transportation study, railway pricing policy is also undergoing considerable change to meet the new challenge of competition. When the railroads enjoyed a virtual monopoly position,

they maximized their revenues — in the words of Mr. Donald Gordon, held “to the touchstone of corporate self-interest”<sup>6</sup> — by charging on the value of service principle, i.e., what the traffic would bear. Translated into practical terms, this meant that rates on low-value bulk commodities and on developmental routes were kept at low levels, while the greatest proportion of overheads was recovered from high value traffic and non-competitive traffic that could absorb higher freight rates. As pointed out above, competition has drastically changed this situation; the railways can no longer afford to grant internal subsidies to traffic that does not meet its long-run out-of-pocket costs because their high-rated traffic, out of which the subsidies were paid, are now so vulnerable to competition. In these circumstances, carriage of any traffic that imposes a higher overhead on the remaining traffic than if it were not carried at all is likely to lead to further misallocation of transport resources by tempting the railways to charge higher prices than they otherwise would on traffic subject to competition. This may result in the diversion of the latter traffic to competing forms of transport, despite the fact that the economic cost of carriage is lower on the railroad; the misallocation occurs in reverse if the railways slash prices below out-of-pocket costs and win away from trucks traffic that could most appropriately and economically be carried by road. Of course, any traffic which meets its long-run out-of-pocket costs and makes some contribution to common overheads, no matter how small, should be carried by the carrier concerned; in this way overheads on the remaining traffic are reduced, all shippers are better off, and the most efficient use of transport resources is promoted.

It is easier, however, to state the principle than to carry it out in practice because measurement of the costs of any individual railway shipment is extremely complex. It depends not only on the size and weight of the shipment but the distance it is to travel, the routes over which it is to be sent, its ease of loading and handling, its liability to damage, the insurance risk involved, and the special services like refrigeration, switching, and stop-off privileges which may be involved. In addition, there is a time factor involved — assuming space capacity is available, the railways’ long-run out-of-pocket costs are very different, depending on whether the requirement is for an additional carload, an additional car a day, an extra train, or an extra train a day. Yet, even if all these variables are known, it is still impossible to allocate in any definite way the costs, say, of maintaining railway track among all the individual shipments which pass over it;<sup>7</sup> it is also very difficult in many cases to allot to any particular shipment moving in one direction the joint cost which is incurred in sending empty freight cars back to the point of origin. Nevertheless, improved cost techniques are constantly being developed in the United States and Canada to determine more precisely whether shipments are making some contribution to overheads. The importance of these cost studies is indicated by the fact that about 25 per cent of the Canadian National Railway’s ton-

mileage fails to contribute anything to overheads, another 30 per cent is marginal, and virtually all overheads are recovered from 45 per cent of operations; the Canadian Pacific Railway indicated in 1952 that fully 85 per cent of its overheads was recovered from 30 per cent of its traffic. In part this state of affairs exists because statutory rates and equalization schemes imposed on the railways give them no opportunity to price according to cost.

#### *b) Trucks*

Unlike the railways, which have been confronted with all the problems of a relatively declining industry, trucking in Canada has had to cope with the many difficulties of an almost explosively rapid growth. The number of trucks of all kinds registered in Canada grew from 130,000 in 1928 to 820,000 in 1953, and has since grown to over 900,000. Yet even these figures do not tell the full story of intercity highway freight transport. The increase in the number of intercity trucks has been much more rapid, while the heavier vehicles have grown at a faster rate than this again — in the last ten years alone trucks of over 20,000 lbs. have multiplied seven-fold. It appears that only about 20 per cent of the total number of trucks are engaged in intercity operations but because of their greater size and larger mileage per day, they account for over half of the total ton-mileage of all trucks and for 40 per cent of total spending on trucking. In any event, there has been an expansion from 1928 to 1953 of over 85 times in the dollar amount spent by the public on highway trucking compared to a growth in outlays of about 5 times for urban, and 15 times for farm trucking. Some of the reasons for the phenomenal growth of trucking in Canada have been mentioned earlier. The growth of the light manufacturing industries whose output has a high value/weight ratio, and the increasing urbanization and concentration of industry generally has placed a premium on the speed, convenience and flexibility of trucks. They are easy to pack and their door-to-door service reduces handling and consequent damage, while they offer manufacturers a useful means of keeping inventory at a minimum and an easy way to supply retailers with goods and spare parts at low cost. In short, despite their higher costs per ton-mile — an average, if an average means anything, of between 5 cents and 7 cents compared to the railways, one and one-half cents — trucking can provide in many instances a quality of speed and service that reduces the over-all costs to their customers. Other factors besides quality and price have naturally played an important role in the growth of trucking; better truck bodies, engines, and tires, and improved and extended networks of highways have both helped to bring a very high proportion of Canada's population within easy access of the industry — there are now 40,000 miles of paved highways in Canada compared to some 7,500 miles in 1928. Of course, beyond a certain range trucking loses its advantages as was shown very clearly during the 1950 railway strike; speed is

lost and costs rise because the driver must stop to sleep and eat, while the truck's characteristic advantages of low terminal costs and door-to-door handling become relatively insignificant. The actual economic range of trucks is not fixed but depends on the speed and weight of the individual vehicle, on whether the firm has offices along the route to contact and assist the driver, and on whether return loads are available.

With the exception of Federal Government contributions, expected to total some \$250 million, to the Trans-Canada Highway and smaller amounts paid by that government for roads in national parks and Canada's North, all highway and road building is the responsibility of provincial and municipal governments. Regulation of trucking is also in provincial hands, including since 1954 the control of interprovincial and international traffic. In regulatory matters, as in growth itself, the position has contrasted sharply with the railways. Control of the industry is very loose, some provinces making no attempt to control entry into the business or to regulate rates; the railways, on the other hand, must file, publish, and adhere to, their rates. Indeed, only two provinces seriously attempt to control intra-provincial trucking and only one to regulate extra-provincial traffic.<sup>8</sup> Regulation of the industry is inevitably made difficult by the very local nature of some operations and by the ease with which a small operator can enter the field or a private firm begin to operate its own fleet of vehicles; these factors also operate to make hitherto published statistics on the industry incomplete. In any event, as the transportation study notes, the industry in its growth phase has been plagued by fringe elements and gypsy operators who will cut rates to unjustified levels to obtain a return load. This is a source of continuing concern to the sounder, more responsible companies which have developed a high standard of administration, safety and business practices.

### *c) Water*

As shown in Table 14.1, the water carriers (which excludes non-Canadian carriers) — the oldest form of transport in Canada — have actually increased their total share of the available freight volume since 1928, although their proportion of the dollar value of business has fallen because this traffic is almost entirely low-rated. This expansion has been due to their very low costs, 0.2 cents to 0.5 cents a ton-mile, because of their willingness to provide joint "fishy-back" and other co-ordinated services with trucks, and because they have been favourably located geographically to handle both commodities like grain, iron ore, coal, etc., which make up 92 per cent of their volume. The long, narrow, deep-draught ships on the Great Lakes are cheap to build and operate, and are generally equipped with modern handling equipment; one such ship has loaded over 100,000 bushels of wheat — 3,400 tons — in an hour. The Board

of Transport Commissioners regulates these bulk freighters as to seaworthiness, etc., and there is provision for intervention if rates (currently two-thirds of the low competitive railway rate to Montreal from the Lakehead on grain, for example) are excessive. Package freight rates, which are lower than those of the railways, are subject to much the same control as the latter. Seasonal and directional costs are relatively high but are not noticeable to the shipping public because of the low total costs of this form of transport. In the rapidly expanding Northwest Territories transportation market, however, the directional unbalance is very acute — the North-South ratio is 9:1 and high costs are further increased by the long distances and extremely short season involved. Another contributory factor is the need to use paddle-wheelers and barges rather than cheaper types of shipping because of the shallow and shifting sands of the MacKenzie and its tributaries.

*d) Air*

Air transportation has shown the most rapid growth of any form of transport except pipelines since 1945, although it still carries in both Canada and the United States less than one-half of one per cent of the ton-miles transported on the railways. The main reason for this is that the average cost of a ton-mile of air freight is still of the order of 50 cents, or more than 30 times that of railway freight, despite reductions of some 70 per cent in the last 15 years. As in the case of trucking, the expansion of air freight has been tied to the growth of industries marketing products with a high value/weight ratio and depending on speed, flexibility, and, at times, emergency service. However, among the disadvantages of shipping by air are the high costs of handling and stowing, and the need to transfer shipments to and from airports which are often a considerable distance from the shipping or consignment point. The most spectacular growth in air transport has taken place in the North, for aircraft equipped with skis or pontoons can cheaply and quickly reach places formerly inaccessible. This has enabled both the discovery and utilization of our more remote resources to be speeded up — for example, the Quebec-Labrador iron ore development was greatly aided by the 150 million lbs. of air freight which were flown into it, while prospecting in Ungava has been based almost entirely on air transport. The story of aircraft's role in the building of the Distant Early Warning network in the far North is too well known to repeat here, but it gives further concrete proof of the important part which air transport has come to play in our national development. Air routes in Canada are reserved to one or a limited number of carriers by the Air Transport Board, while airlines are free to vary rates for commercial purposes. Directional costs are high on almost all routes — our trans-border freight, but not of course passenger traffic, is over 90 per cent northbound — so that air carriers typically use promotional rate methods to stimulate return freight traffic.

*e) Pipelines*

The striking growth of Canadian pipeline mileage and revenue has, of course, been directly related to the discovery of oil and gas in Western Canada. While not competitive with tanker charges where an uninterrupted water haul is possible, pipeline rates of between 0.3 cents and 0.5 cents per ton-mile compare favourably with other forms of transport. Pipelines are particularly suited to the transportation of Canadian oil and gas because of the long land-haul involved, their freedom from seasonal interruptions, and the high degree of mechanization which is possible. Exclusive pipeline franchises are granted and, as in the case of airlines, rates can be varied for commercial reasons.

*Trends in National and Regional Transport Costs*

The decline that has been occurring in the relative importance of the railroads and the development of more flexible means of transport like trucks, airplanes and pipelines have been accompanied by a reduction in the proportion of total Canadian resources devoted to transportation costs each year. Also contributing to this decline in the burden of what has been called "national transportation overheads", have been the rapid expansion of the country generally, shifts in the composition of national production and export markets, and the increasing concentration and urbanization of population. The transportation study indicates that these forces have caused the ratio of direct transportation costs to Canadian Gross National Product to fall from 10.0 per cent in 1928 to 7.9 per cent in 1953. Comparable figures are not available from the United States for the earlier year, but since 1945 the Canadian ratio appears to have fallen considerably faster than the American, which stood at 5.1 per cent in 1953. A full discussion of the meaning and limitations of these data is not possible here,<sup>9</sup> but it should be noted that the transportation figures are gross and contain numerous duplications, whereas the Gross National Product series is a net concept. The result is to overstate the importance of transportation expenditures in both countries relative to Gross National Product and also to exaggerate the spread between the two countries in the proportion of total *net* outlays devoted to transport. Also private water and trucking transport, which is much more important in the United States, is not included in the above figures. It is probable, therefore, that Canadians spend not much more than 1 per cent more of their incomes on transport than their American counterparts — excluding the cost of private automobiles, which can hardly be regarded as a form of national overhead.

We have already indicated how improved industrial location, economies in materials and handling, and the relative growth of production characterized by low transport costs have contributed to the fall in relative transport costs. Increasing concentration of population has had the same effect, despite the fact that our national market is not large

enough to permit the same regional decentralization of manufacturing as occurs in the United States. The growth of the newer and more divisible forms of transport has obviously played an important role also; roads, pipelines, and air transport can be created in quite small units without incurring the relatively great diseconomies of small scale characteristic of railroads. Thus, with one-tenth the population of the United States, we have approximately 10 per cent as many surfaced miles of road (probably less, if one could adjust for the quality factor which permits a two-lane asphalt road to be adequate for certain routes in Canada, while the comparable United States road is a four-lane expressway, etc.), and about one-sixteenth the number of airports and one-seventeenth the number of scheduled airline route miles (although this should be modified by the fact that unscheduled routes and the use of lakes as landing grounds are relatively more important in Canada).

In sharp contrast, we have fully one-fifth as much main-line railway track as the United States, or about twice as much mileage per capita. Not all of this, of course, has been due to the inevitable necessities of our economic geography. Much of the burden of maintaining this trackage has stemmed from over-optimism and regional pressures which led to the building of three transcontinental railways in Canada. A disregard for economy in the building of such railways as the Intercolonial and the National Transcontinental, has also played its part in raising financial charges to the taxpayer. In any event, the traffic density on our railways is about 55 per cent that of United States Class I roads, and this is the major reason why net revenues per mile of line are lower than in the United States. Other physical factors relevant to the comparison are the higher operating costs associated with the more severe climate in Canada, and on the other hand the advantage to Canadian railroads of operating as integrated transcontinental systems and thereby avoiding the many problems involved in traffic interchanges.

The major part of the greater amount of resources devoted to transport in Canada than in the United States is due to spending on railway operations, in part because railways are still relatively more important in Canada, accounting for 60 per cent of all intercity ton-miles compared to 53 per cent south of the border. The percentage of national resources devoted to other transport services does not appear in total greatly, if at all, higher in Canada when private automobile transportation is included, although this is not true in every instance. In fact, the burden of transportation costs imposed by our climate and geography is smaller than is commonly thought.

As we shall be mentioning regional transportation services and facilities in Chapter 19, we shall confine ourselves here to a brief summary of the differential impact of recent trends on different parts of Canada. Simply stated, the growth and concentration of competition in central

Canada has forced the railways to withdraw a substantial part of the internal subsidy that they formerly granted to marginal services throughout the country; these services must now be priced much closer to their true economic cost. Although the proportion of trucks registered in Ontario and Quebec is smaller than the percentage of population, a very high percentage of *highway transport* trucks are concentrated in these two provinces; one submission stated that only 1 per cent of Canadian highway freight is carried in the four Atlantic Provinces.<sup>10</sup> In any event, the number of competitive rates and agreed charges granted to the Maritimes in particular has been less than in other areas and their freight rates, consequently, have risen relatively. For example, we were told that westbound rates on less than carload traffic from the Maritimes had increased 110 per cent to 130 per cent between 1937 and 1955 compared to an increase, perhaps not entirely representative, of only 42 per cent to 56 per cent from Toronto to Montreal. Rates on a typical steel product from Sydney to Toronto had increased 97 per cent from 1948 to 1955 compared to increases of only 8 per cent and of 59 per cent from Hamilton and Sault Ste. Marie respectively; similar cases that we learned of included salt, stoves, and lumber.

The impact on the West has been less severe. British Columbia, particularly the coastal region, benefits from an extensive network of competitive rates designed mainly to meet competition by water through the Panama Canal, but also to compete where practical with American imports carried by the United States railways; and along with other provinces, it has gained from the numerous agreed charges which have been negotiated. The introduction, in 1951, of the "bridge" subsidy on certain classes of traffic passing north of Lake Superior has been of assistance to the entire West. The statutory grain rates which apply to 40 per cent to 50 per cent of the rail traffic in the western region have been particularly significant in the Prairie Provinces; and the adoption of the one and one-third rule also tended to put a ceiling on some rates in these provinces.

It is, of course, impossible for us to measure in statistical terms this differential increase in freight rates in the Atlantic Region, particularly as many Canadian companies absorb part or all of the freight costs to the outlying regions of Canada. If this freight rate increase had been only a straight horizontal one, i.e., in proportion to prices and other freight rates generally, the average competitive position of the region's producers, if not of each individual firm, would not have been impaired — a freight differential of \$2 on a product costing \$100 is no more onerous than \$1 on a \$50 product if the purchasing power of the dollar has fallen by half; for example, despite numerous increases, the freight component of newsprint from Three Rivers at New York was 13 per cent in September, 1957, compared to 14 per cent in January, 1939. However, the competitive freight position of the Atlantic Provinces clearly has been



adversely affected by the necessity to pay a fuller share of its freight costs than formerly on westbound traffic. If purely economic factors alone were being considered, there could perhaps be little objection to this trend, but it was a clearly established intent of Confederation that the Maritimes should have comparatively cheap access to the markets of central Canada and should not be forced to pay an unduly high price because, for national defence reasons, the Intercolonial took a circuitous route rather than a direct one. However, we would not like to leave the impression here that transportation factors alone have caused the difficulties of the Atlantic Region; markets, resources, labour and enterprise considerations have been much more important. Freight costs, as a percentage of final selling price, vary widely. For example, and as a rough approximation, freight charges may amount to about two-thirds on straw, 50 per cent on lumber and coal, 25 per cent to 33 per cent on pulpwood and steel bars, 15 per cent on canned goods, 5 per cent on automobiles, 2 per cent on cotton cloth, and 1 per cent on leather footwear, all assuming an average haul of about 1,000 miles. Flat generalizations about transport costs cannot, therefore, be made about individual products, but it is worth noting that a recent survey of industrialists in Manitoba put transport costs far down the list as a factor determining industrial location. While the growth of competition in Canadian transport has undoubtedly affected Atlantic freight differentials adversely, particularly on westbound traffic, we must conclude that a correction of this condition alone would not solve that region's economic problems.

### ***The Future and Government Policy***

Will the transport trends of the future be greatly different from the past? We answer with considerable diffidence when we read of the transportation expert of half a century ago who stated it was "nothing less than feeble mindedness to expect anything to come of the horseless carriage movement"! Nevertheless, we feel that future developments will be broadly the same as recent experience. In the economy as a whole there will be a continuation of the relative growth of light manufacturing, mining, and services; agriculture and exports will further decline relatively, while concentration and urbanization of our population will increase. These factors by themselves are sufficient to guarantee that the pressures of competition in transport will continue to be maintained at no less than their present levels in future. Moreover, the rapid pace at which technological progress is likely to be made points in the same direction; the speed, carrying capacity and efficiency of all forms of transport have by no means reached their limits, particularly in the newer forms. There are few products which can now be said to be suited only to one form of transport and, therefore, completely immune from competition; probable future improvements in aircraft, truck, or railway service, are likely to intensify and broaden competition still further.

Looking at these factors as they affect the railways, one must conclude that the pattern of traffic is likely to cause a further relative decline in their importance. However, improved locomotives, lighter materials, improved multi-purpose freight cars, better rail, as well as mechanization and automation of freight handling, switching, signalling, and office systems, will offer the railways considerable scope for enhancing their competitive efficiency and raising labour productivity. Most important, there is a greater recognition on the part of railway managements of the necessity of adopting themselves to competition and rationalizing their operations, both internally and in conjunction with other railways and other forms of transport. We, therefore, expect the volume of railway traffic to increase somewhat faster in the next twenty-five years than in the preceding quarter century, perhaps by 75 per cent to 80 per cent.

The volume of truck traffic is likely to grow by about three times with intercity trucking — particularly privately owned trucking — expanding slightly faster still. Favouring this development, of course, are the expected composition of national transport traffic itself, improved highways and roads, and the development of more powerful, lighter, and larger-sized vehicles. As the number of registered trucks is likely to exceed two million by 1980, we would expect that the industry will make increased use of common terminals and freight clearing houses, as well as improved communications and office-processing techniques, to reduce costs and eliminate needless duplications. Pipeline volume, of course, is likely to expand even faster because of the anticipated growth of our oil and natural gas industry. We think this expansion will be of the order of seven times present throughput, with relative manpower needs being further cut by the use of larger pipe, more electronic equipment, and radioactive isotopes.

The amount of freight traffic carried by air will probably increase by about four times, not least because the all-up weight of large planes is likely to increase to 500 tons from its present level of 85 tons and because the speed of longer-range jetliners may reach 1,600 miles an hour by 1980. The costs of air transport will consequently continue to fall, although rates are unlikely ever to match those of rail and road carriers. Turbo-propeller aircraft are expected to continue to provide service on short and intermediate hauls, but the flexibility of helicopters could lead to their extensive use if their carrying capacity could be increased. Atomic-powered aircraft are a remote possibility because of problems of weight, shielding, and their danger in the event of a crash, but if the helicopter principle is ever successfully adapted to fixed wing jet aircraft for purposes of take-off and landing, the future growth of air transport would be enormously greater than we have predicted here.

The St. Lawrence Seaway and the expected growth in iron ore traffic are expected to be the two major influences on the expansion of inland

shipping. We believe they will cause the volume of water traffic to increase by more than three times from 1953 to 1980. Despite the fact that ships will become lighter, more mechanized, and faster, their main source of revenue will continue to be bulk commodities, with iron ore providing about half the tonnage. Other types of freight for the most part will continue to be hauled by rail or truck because of speed and service factors.

The following table, taken from the transportation study, summarizes these projections:

Table 14.2

**DIRECT TRANSPORTATION COSTS OF INDIVIDUAL CARRIERS  
AS A PERCENTAGE OF TOTAL FOR-HIRE DIRECT COSTS**

Year	Total direct cost (\$000,000)	Railways %	Motor vehicles %	Airlines %	Water carriers %	Pipelines %	Total %
1953.....	\$1,614	57.9	22.4	5.2	13.1	1.4	100
1960.....	2,079	50.8	24.2	6.7	15.6	2.7	100
1965.....	2,485	47.5	25.8	7.6	15.9	3.2	100
1970.....	2,908	44.9	27.0	7.9	16.5	3.7	100
1975.....	3,398	43.0	27.9	8.2	16.8	4.1	100
1980.....	3,885	41.7	28.1	8.2	17.5	4.5	100

SOURCE: J-C. Lessard, *Transportation in Canada, 1957*, a study for the Commission, Section II, Chap. 2, p. 67.

As the table deals only with intercity costs, the heavy expenditures on urban transportation — almost exclusively the preserve of trucks — are omitted. Nevertheless, it points up sharply the continued fall anticipated in the relative position of the railways and the expected expansion of other forms of transport. It is also anticipated that there will be a fall of perhaps 20 per cent in the percentage of Canadian income devoted to intercity transportation directly by users. We also believe that government expenditures on intercity transport will continue to be reduced in importance so that the national overhead of transport is expected to decline in total.

Future developments are expected to be concentrated on existing routes, but improved roads should bring about the greatest percentage increase of trucking in the Atlantic Region. Increases in the volume of freight traffic will probably cause the most pronounced relative growth in air services to take place in this region also, although northern services will show a very substantial expansion. The benefits of the Seaway development, on the other hand, will accrue in large measure to Western Canada and the central provinces. Most ocean ships will probably continue to end their journey at Montreal, but because large lakera will be able to come down-river, grain rates are expected to be 5 cents to 7 cents cheaper than at present. Other rates will be reduced also, partly as a result of the increased competition experienced by trucks and railways.

The anticipated increase in westbound ore shipments from Quebec and Labrador is likely to change the directional flow of traffic, making east-bound rates cheaper than those on traffic moving west. This could conceivably affect some Maritime producers adversely, both by making their shipping costs higher and by lowering the delivered cost of competitive goods from Central Canada. The Seaway will also eliminate the need for trans-shipment points between Montreal and the Lakes, although many of these communities will undoubtedly attract new industry to take advantage of the Seaway. In general, intense competition will continue to prevent the railways or other transport agencies from extending internal subsidies to the Atlantic Region on the former scale.

What is the significance of these trends for government policy? We have no panaceas to put forward, but, at this stage of our national development, we think a reasonable primary aim to be to allow the benefits of competition to accrue to shippers and the general public. Unnecessary subsidies are not just out of one pocket into another; they divert transport from economically low-cost agencies to high-cost media with consequent adverse effects on industrial location, on resource utilization, and on the real incomes of Canadians generally. In a competitive atmosphere, prices of each of the forms of transport should be allowed to reflect, as nearly as possible, the costs of the service provided.

It is with these considerations in mind that we suggest that the Board of Transport Commissioners should vigorously follow up the suggestion of the Turgeon Commission to permit more abandonment of unprofitable branch lines and other unremunerative services. With the growth of bus and trucking services, this could be done in many cases with little or no loss to the public in terms either of convenience or of cost, particularly as the roads are now increasingly being kept open and serviceable throughout the winter. In those few localities where no other transportation is available, it would seem reasonable to permit the railways themselves to operate bus and trucking facilities, subject to those same safeguards of the public interest which are applied to similar services in the province concerned. Some provinces virtually prohibit the introduction of more economic substitute services by the railroads; this, however, should not deter the railways from applying for, and the Board from granting, line abandonment in these circumstances — the provincial authorities always have the alternative open to them of licensing some other service. An obvious corollary of the above is our recommendation that the railways should not be forced to build new lines or introduce new services which are economically unjustifiable.

We also believe that a more unified approach should be taken by the Federal Government in dealing with the transportation agencies under its control. Rather than having each transportation enterprise competing—and unequally at that — for the taxpayer's dollar in order to be able to conceal

the high real cost of certain of their services, we believe it sounder, cheaper, and more efficient for them to provide only those services which will stand on their own feet. Moreover, if for national policy reasons, the Government feels it necessary to provide transportation at reduced rates to certain regions or producer interests, this should be done by openly reimbursing the transportation enterprises involved rather than by imposing uneconomic rates which have to be recouped as best they can elsewhere at the cost of substantial misallocation of the country's transport and other resources. The railways in particular should be allowed to earn a reasonable rate of return where their services are economically justifiable, if they are to finance their needed capital expenditures. Indeed, we take it as axiomatic that the public should pay directly for the public interest; they should not transfer their responsibilities to the shoulders of railway labour or the users of Canadian transport. We, therefore, have concluded, although with no little reluctance that the burden imposed on the railways by the statutory rate on grain traffic could be lifted with the least distortion in the short run by a new charge on the public treasury. Over the longer term we would hope that greater flexibility could be introduced into these rates by the cost reductions which will be effected by the Seaway, by improvement in the world wheat situation and by the growth of livestock production in the Prairie Provinces.

In line with the broad aims of policy which we believe should be followed is our recommendation that other forms of transport should pay a fuller share of the true costs of their operations — subject, of course, to any regional subsidy that may be extended by governments. According to calculations in the transportation study, inland water transport pays only 78 per cent of its full costs, the balance being made up by the provision of harbour, canal, and marine, navigational and other services by the Government at a loss. We would hope that steps will be taken to increase revenues from these sources gradually over the years and that the Seaway, which will be in direct competition with the railways, will pay its full costs including interest and amortization. Air transport is in a similar situation, receiving a subsidy amounting to broadly the same percentage of its total costs through the provision of airports and weather, navigational and other services at well below their real prices. To keep subsidies in check — they would otherwise grow rapidly because of the need for longer runways, better equipped airports, and improved navigation facilities — it may be necessary to raise the landing fees of aircraft at Canadian airports. Although we were told that the landing fees for a North Star aircraft are nearly four times as high in Canada as in the United States, they amount currently to only about 50 cents per passenger carried.

As we indicated in our *Preliminary Report*, these conclusions apply with no less force to Canadian trucking. It is calculated both in *Transportation in Canada* and by the Canadian Tax Foundation that the users of

highways are paying no more than 59 per cent to 64 per cent of highway costs — considerably less if the calculations are made, as they should technically be made, on the basis of amortizing replacement costs, not just historical costs.<sup>11</sup> It is generally agreed by transportation authorities that at least 75 per cent to 80 per cent of road and highway costs should be paid for by users, with many authorities holding that it should be 100 per cent, i.e., that those benefiting from vehicular services should pay for the benefit through the taxing and licensing fees of the vehicles that use the roads and highways for door-to-door deliveries, passenger traffic, or community services. It is, of course, impossible to allocate these costs among individual users like trucks, buses and cars according to a rigid scientific formula, even though some general conclusions may be drawn. The same problem occurs in the allocation of the cost of different roads or highways, although it is reasonable to assume that road costs as a whole should be equally divided among all users, particularly as a less travelled route can be built relatively much more cheaply than a heavily-used main express highway between two large industrial centres. In any event, the risk of distorting transport facilities is small in that user taxes now amount to less than 8½ per cent of the average annual total costs of operating a private passenger automobile. For trucks, the percentage varies from under 5 per cent to 15 per cent, depending on the size and use of the truck.

It appears that the larger trucks in particular are responsible for a major part of the large short-fall (\$179 million in 1953) of user revenues in relation to provincial and municipal expenditures. This is true whether their share is calculated on an incremental cost basis — i.e., on the extra damage done to roads by the pounding of heavy trucks and the heavier construction of highways and bridges they require — or on a ton-mile basis. The transportation study indicates that cars and light trucks pay from just over three times to seven and one-half times as much taxes per gross ton-mile as do the heavier vehicles, depending on the province concerned and the size and class of truck. We feel that special studies should be made to determine more exactly the proportion of taxes and fees which should be paid by the different classes of vehicles, with a view to removing these anomalies as well as those which exist in relation to the railways and other forms of transport. It should be pointed out that even a doubling of taxation on the heavier classes of trucks — if this were found to be justified — would only raise the total operating costs of those trucks by 5 per cent. It is unlikely, therefore, that any tax increases found to be necessary will bring about sweeping changes in the pattern of traffic, even though it will eliminate many distortions and inequities. Trucking's growth to no little degree depends on an adequate road and highway system, not only in terms of capacity but in terms of speed, safety, and service; if the roads are to be adequate, all users should pay a larger share of the bill than they have in the past.

We do not think the sort of unity of transport policy we have been talking about can be achieved by some super transport body with rigid regulatory power, even if there were no constitutional objections to such a scheme. We do, however, believe it can be more nearly attained if the authorities concerned seek to ensure that each form of transport as nearly as possible pays its own way and is regulated in such a way as to prevent waste, duplication, and uneconomic rate-making. At the same time we are sure that governments will continue to be subject to pressures to provide free or uneconomic transport services. Numerous transportation matters on which representations were made to us were either not within our terms of reference or incapable of proper study by this Commission. For instance, as the matter is being thoroughly examined by another Royal Commission, we did not feel it proper for us to comment on policy questions connected with coastal shipping, despite the numerous representations we received from the Atlantic Region against barring cheaper foreign ships from this service. For the same reason we did not wish to comment on policy with respect to ocean shipping, despite the similar representations made to us and the opposing views expressed by the Canadian shipbuilding industry that it was in their, and the national, interest to build up a Canadian merchant marine. We also received contradictory submissions from Trans-Canada Air Lines and Canadian Pacific Air Lines, the one claiming that the volume of air traffic in Canada was too small to permit two mainline air-carriers to operate efficiently, the other denying that this was the case. We feel that all the facts and implications of alternative policies should receive careful and continuing study.

We received representations that a railway should be built on the North Shore of the St. Lawrence and that the St. Lawrence River should be kept open for winter navigation from Quebec City through the Gulf.<sup>12</sup> This area requires better water transportation services and, in particular, a year-round boat service from Rimouski to such points on the North Shore as Baie Comeau and Sept Iles. The provision of a year-round water transportation service would help to reduce the present isolation and the consequent high cost of seasonal fluctuations in economic activity on the North Shore. We believe the development of this important area would be speeded if present transportation inadequacies were improved in this way. We are also of the opinion that the solution of the technical problems involved in providing winter ocean navigation to Quebec and the assessment of the financial costs of so doing should be pressed forward. In our view, a railway on the North Shore of the St. Lawrence may well be needed in the years to come.

It was also asserted to us that the Welland Canal may need to be improved before 1980 if it is not to prove a stumbling block to traffic using the Seaway. This would involve "twinning" the five locks out of eight which are still single at a cost of \$125 million to \$150 million. Because

it is impossible to foresee with great precision the amount of Seaway traffic which will pass through the Canal, the directional balance of that traffic, and the average size and cargo carrying capacity of the ships involved, we were not able to determine how soon this bottleneck might become apparent.

### ***Passenger Traffic***

Trends in passenger traffic have been not wholly unlike those in freight transport, although they have been much more sharply defined. From a virtual monopoly of all intercity passenger miles at the turn of the century, the railways' share of this traffic declined to just under 40 per cent in 1928 and to just over 10 per cent in 1953. Concomitantly, the share of private automobiles has grown from nil to 60 per cent and nearly 80 per cent respectively in the same period, while in the last quarter century the share of buses has grown from 2.2 per cent to 7.1 per cent of the total and of air transport from nil to 2.9 per cent. The rapid growth of automobile traffic, of course, has had the most profound and far-reaching impact on our social and economic life. Together with all the other speedy forms of modern transport, it has also had a profound effect on our national unity, enabling Canadians to see other parts of the country easily and quickly and to meet and understand their fellow citizens in a way that was undreamed of a comparatively few years ago. One has only to contrast the seven-hour air journey from Toronto to Vancouver (soon to be four hours) with the year and a half it took Cheadle to move the same distance through Canada in 1862 by rail, steamer, canoe, horseback, and finally, on foot — swimming rivers, climbing mountains and hacking through the forests of British Columbia.<sup>13</sup> Of course, modern transport facilities have increased the pull to the south and overseas as well, and will continue to do so in future. If this sometimes seems to inhibit Canadians from seeing as much of their own country as they should, it also has made a welcome contribution to our knowledge and has enabled us to see ourselves in better perspective.

The growth in the importance of the private automobile as a means of intercity transport is bound to be much slower in the future — if only because it has attained such a large share of the total now. Automobile registrations, however, will probably more than treble their 1953 total to 8¾ million in 1980, with annual expenditures on the operation of cars rising relative to Gross National Product up to about 1965 and falling slightly thereafter to a 1980 level a shade higher than at present. As it is unlikely that the size of intercity buses can be increased, even though their speed might be stepped up with better highways, it is probable that they will not hold their present share of the passenger market. Air travel, particularly on long-hauls and international routes, will doubtless continue to increase with the speed and carrying capacity of aircraft,



even though passenger rates, presently averaging 6 cents a mile, are unlikely to fall as low as those of the buses and railways, currently 2½ cents and 3 cents a mile respectively. Rail transport will probably continue to decline slowly, although on mainline routes and for shorter and overnight journeys it will compete satisfactorily with the airlines because of time-consuming journeys to and from airports. Extensive development of helicopter service could, of course, alter this picture considerably, although introduction of speedier trains and the more extensive use of rail diesel cars should enable the railways to maintain their competitive position fairly well.

The further growth of automobile, truck, and bus registrations, together with increased urbanization, will naturally intensify still more our already acute problems of urban traffic congestion. It is estimated that more than half of all vehicle miles are travelled in urban areas and that an even higher percentage of vehicles are concentrated in these centres, although only 11 per cent of all road expenditures are made in our cities. The result has been collective frustration on a grand scale — speeds have been reduced in many cases to five miles an hour in the rush-hours, the benefits of the shorter work week have been eroded by the extra time taken to get to work, and the costs of delay have mounted to an extraordinary level (in Montreal the extra fuel costs alone of traffic congestion have been estimated at no less than \$30 million annually). The gross inefficiency of urban transport has, in fact, prejudiced the progress and well-being of our larger cities.

As we indicate in the next chapter, the answer to this problem is intimately linked to the whole question of municipal planning and finance. An intelligent start cannot be made, however, until there is more recognition of the fact that automobiles take up between three and four times as much street space per passenger as public transport and cost three to six times as much. Moreover, it takes between four and six three-lane expressways to transport as many passengers in rush hours as a subway or a rapid transit system, and at about five times the cost per person transported; in addition, the expressways create an additional downtown parking and congestion problem. It may reasonably be asked why in these circumstances urban transport has declined so rapidly in importance. The answer in our view is twofold; the inadequate response of public transit authorities to changed conditions and, more important, the fact that the congestion caused by private automobiles slows down the public transit vehicle's speed, making it more convenient and quicker for more people to take their cars, particularly as they are conscious only of immediate operating costs in calculating their expenses. This loss of traffic causes still more congestion and further losses of transit patronage; thus the cycle moves on and on.

In our opinion, the answer to this problem lies in three basic directions. First, the motorist should pay a greater share of congestion's real costs, in terms of streets, parking facilities, and all the other costs of delay. This is important if the municipalities are to remain financially strong. Secondly there will have to be more highway by-passes built and more restrictions on vehicle movements downtown; an outright ban on parking, or even of access in some instances, more one-way streets, fewer left turns, etc. Thirdly, in the larger cities where these arrangements are not sufficient to restore an orderly flow of traffic, large expenditures will have to be made on rapid transit systems, either below, on, or above the ground. In view of the figures given above, it seems reasonable to us that if the provinces are willing to make contributions for expressways, perhaps they should also be ready to provide assistance for rapid transit systems in metropolitan areas. If our cities are to prosper, the motor car must cease to be treated, in the words of Lewis Mumford, "as the sacred cow of our society".

## HOUSING AND SOCIAL CAPITAL

CANADA'S STOCK of fixed capital assets may be divided conveniently into industrial capital, social capital and housing. Between the first and the last two of these groups lie real and important differences. A school and a factory building are both, clearly, structures — nowadays, from the outside, they may even look alike. But there the resemblance ends. They are put up for different reasons; they are paid for in different ways; they have different roles to fulfill.

It follows that in attempting to visualize Canada's future requirements of housing and social capital, we must adopt a special viewpoint. First, however, we must indicate what we choose to mean by social capital. We here include schools, universities, churches, hospitals, airports, roads and streets, sewer and water systems, and a mixed assortment of other buildings, installations and equipment used by public institutions and departments of government. For all these things, it seems to us, the Canadian public has come to assume a particular sort of collective responsibility. They do not, for the most part, come into being as a means of making money, but rather to meet acknowledged needs. Their provision is usually undertaken, not by private enterprise, but by governments, religious bodies, and public service organizations of various kinds.

We cannot pretend that our list is a wholly consistent one. Several borderline cases spring to mind. There would be, for example, a good case for including the physical assets of urban transit utilities, were this statistically convenient. There is, too, some anomaly in leaving railways out when roads and airports are in. Sir John A. MacDonald, had he been cursed with the need for such terminology, would probably have regarded railways as neither industrial nor social capital, but as a complex and highly explosive mixture of both. Housing, bound up as it is with family life and so basic a need as shelter, resembles social capital in many respects. Most housing construction in Canada is, to be sure, a commercial venture. But over the last two and a half decades, the public has come to demand of governments that they exert an increasing measure of influence in this field. The rate of housing completions and the availability of housing finance, in particular, have become major preoccupations of government policy.

*Housing and Social Capital Needs*

In looking at this particular segment of Canada's future, then, we cannot limit ourselves to the kind of considerations that are associated with commercial enterprises. The question that has to be asked is not, on the whole, how much housing and social capital will be profitable in view of effective demand, but rather, how much will Canadians be prepared to pay for, largely through taxes, to meet their needs? Some clue to the answer is provided by our forecast of national income. As national wealth increases, the likelihood is that progressively larger dollar amounts will be devoted to housing and social capital. Another most important indication is to be found in the population forecast of Chapter 6. More people, more houses; more children, more schools. But there are still other factors to be considered. New roads will be needed, not just because the population is growing, but also because that population is making an increasing per-capita use of motor vehicles. New high schools must be erected, not just because the number of teen-agers is rising, but also because those teen-agers are tending to stay for more schooling. Broad technological and social changes of this sort will exert a great influence in the future as they have done in the past.

One of the most significant forces bearing on future housing and social capital requirements will be urbanization — the burgeoning of cities and towns; the increasing ratio of urban to rural population. This will affect not just the location of need, but its amount and intensity. Rural people, of course, need housing, schools and roads. But their requirements do not as a rule extend to civic squares, day nurseries, sidewalks, curbs, sewage disposal plants, and elevated expressways. Important as it will be to meet the changing requirements of the rural community, by far the larger part of the bill for new housing and social capital will be incurred in areas which, if they are not urban today, are destined to become so.

We may, by laying so much stress on this, appear to labour the obvious. Urbanization, after all, has been going on through most of the history of Canada. It has shown up in nearly every census since Confederation. It has been one of the most outstanding and talked-about developments of the post-war boom.

In a wider sense, however — in the sense which embraces not merely the fact but its full implications — urbanization is not so obvious. Canadians have flocked to the cities, but their institutions, their habits of mind, and especially, perhaps, their mythology, have lagged behind. The jut-jawed outdoorsman, still vivid against a prairie sky, a rocky coastline or a stand of black spruce, still works long hours as a national symbol. To a degree, this is very well: such people exist, and their race will, we profoundly trust, endure, providing a flesh-and-blood link with the pioneer

past. But the unromantic fact is that most Canadians today are not like this at all. They live and work in cities and towns; their environment, for most of the year at least, is an urban and largely man-made one. It is of no small importance that they should see themselves and their surroundings for what they are. The spectacle may not in all respects be pleasant to contemplate, but contemplated it must be as the vital first step in moving toward more efficient and more rewarding patterns of urban life.

Our expectations regarding the future urban-rural distribution of Canada's population are summarized in the accompanying table. In brief, we anticipate that the urban population will more than double. By 1980, Canadians living in cities, towns and villages of 1,000 population or more, and in other settlements forming part of large urban areas, will account for almost 80 per cent of the total population, compared with just over 60 per cent in 1951. Close to 50 per cent will be living in enlarged versions of the present 15 census metropolitan areas, and more than half the population will be living in metropolitan and urban areas of over 100,000 population.

Meanwhile, the rural population may increase somewhat in absolute terms, but decline relatively to the total. The rural *farm* population will decline both relatively and absolutely, dropping from roughly 2,800,000 in 1951 to approximately 2,350,000 in 1980. Only about 9 per cent of Canadians in 1980 will be living on farms in rural areas, compared with 20 per cent in 1951.

Table 15.1

### FORECAST OF URBAN-RURAL DISTRIBUTION OF POPULATION

(assumed net immigration — 75,000 per annum)

	1951 (actual)		1980 (forecast)	
	Thousands of persons	Per cent	Thousands of persons	Per cent
15 metropolitan areas <sup>a</sup> . . . . .	5,190	37	12,000	45
Other urban . . . . .	3,433	25	9,010	34
Total . . . . .	8,623	62	21,010	79
Rural non-farms . . . . .	2,534	18	3,294	12
Rural farms . . . . .	2,827	20	2,346	9
Total rural . . . . .	5,361	38	5,640	21
Total population of Canada (excluding Yukon and N.W.T.) . . . . .	13,984	100	26,650	100

<sup>a</sup> St. John's, Nfld.; Halifax; Saint John, N.B.; Quebec; Montreal; Ottawa; Toronto; Hamilton; London; Windsor; Winnipeg; Calgary; Edmonton; Vancouver; Victoria.

SOURCE: Yves Dubé, J. E. Howes and D. L. McQueen, *Housing and Social Capital*, 1957, a study for the Commission, Chap. 2, Table 8, p. 32.

This forecast, which is developed in the separate study prepared for us, *Housing and Social Capital*, rests on two main assumptions:\* first, that the developments which we foresee in the agricultural industry will be associated with a considerable further net decline in the rural farm population; and second, that the larger metropolitan and urban areas, regarded as a group, will draw to themselves as great a share of net increase in the national population as they have drawn in the recent past. Smaller urban places will grow — indeed, they may grow more rapidly in percentage terms than the metropolises. There will be some new Kitimats, too. But well over half the net increase in Canada's population will accrue to urban areas which already have more than 40,000 people in them.

These assumptions and the conclusions to which they give rise may well be unacceptable to many of our readers. Some may think simply that we are wrong — that we are misreading the trends. Others may think that we perceive the trends well enough, but that when Canadians see where those trends are leading — to a Montreal of perhaps three million people and a Toronto of comparable size — they will recoil in horror, mend their ways, and initiate a process of decentralization.

We have a great deal of sympathy with those who would attempt to limit the size of cities and divert growth away from the larger metropolises into smaller places. Advocates of this course have powerful arguments on their side. When they claim that in the long run, and all things considered, their way would be best and cheapest, we suspect that they may be right. If the full social costs are taken into account, locating a major proportion of a country's industry and population in a few large centres may indeed be uneconomic, as well perhaps as a dangerous thing to do from a defence point of view.

At the same time, we must be realistic. Twenty-five years seems all too short a space in which to accomplish such a giant step forward in human rationality. For some centuries, cities in general have gone on getting bigger, adapting their modes of growth to technological and other change, and defying every sort of anathema, prediction of doom, and plea for common sense. William Cobbett, writing in the early part of the nineteenth century, referred to London, then little if any more populous than Montreal and its suburbs in 1956, as "the Great Wen". What epithet would he coin today? The complex attractions of the metropolis, with its multifarious demands for goods and services, its pool of skilled labour, and its variety of diversions and conditions of life, must never be underestimated.

Developments in road transport and energy supply have, certainly, gone far to loosen the pattern of industrial, commercial and residential

---

\* Apart, that is, from those major assumptions regarding war, depression and government policy which are common to all our forecasts.

location. They have made decentralization more feasible for many lines of activity and they have brought welcome new industry to many small towns. But one of their major results has been to produce a new kind of big city — the Los Angeles kind. Sprawling, patchy, less a city perhaps than an urban region, this post-Henry-Ford phenomenon is yet a broadly recognizable entity, with many of the old urban problems and some new ones besides.

We conclude therefore that while opportunities to spur on real decentralization should not be missed, Canadians should expect their larger as well as their smaller urban agglomerations to double or more than double in size. This could be a very bad thing; but it need not be nearly as bad as it sounds, provided adequate resources of energy and intelligence are thrown into the task of recognizing, studying and influencing the forces of urban growth.

### *Aspects of Urbanization*

We may, in appearance, have wandered away from our subject. But not in reality. To a large degree, the provision of housing and social capital requirements over the next quarter century will consist of the extension and revamping of the urban environment — that environment in which most Canadians will spend the greater part of their lives.

What sort of places are Canada's larger centres of population today? We cannot, quite obviously, attempt to answer this question fully here. History, geography, and patterns of economic development have made each of Canada's bigger cities and urban areas importantly different, one from another. There is probably no single generalization or prescription for betterment that can be applied without qualification to them all. And yet there are features and problems common to many. Perhaps the easiest way of stating what some of these are is to describe, in a crude and oversimplified way, an imaginary but not altogether untypical Canadian metropolis — a place of some size, let us suppose, which has experienced an average share of post-war prosperity and growth.

To begin at the centre, there is the downtown business district, containing most of the larger stores, offices, banks, cinemas and public buildings. Signs of growth are evident: many of the buildings are new and larger than the ones they replaced. This district has expanded, both outward and upward. The daytime population density has increased, and the density of traffic has increased even more, reflecting a greater per capita ownership of motor vehicles. Many of the streets are now one-way, curb parking has been severely restricted or banned altogether, and some off-street parking facilities have been provided. All these developments have helped, but they have not been enough to arrest an underlying tend-

ency for the traffic situation to become gradually worse. One effect of this worsening has been to speed up the relative movement of commerce and industry to the suburbs. As a group, the downtown stores are doing a larger volume of business, but it is not as large a share as it used to be of the total business. A number of leading businessmen, together with the mayor, the city planner and others, are becoming seriously concerned over the future of the entire district.

Ringling the centre is a belt which contains some of the oldest and least desirable housing that the area has to offer. Looking back toward the centre, one sees in places a striking contrast of slum and skyscraper. Not all of the structures in the district are housing, and not all of them are in bad condition; indeed, the observer's principal impression is likely to be one of confusion and patchiness. Essentially incompatible land uses — an auto body shop, say, and a multi-family dwelling — huddle unhappily together. The old industrial and warehousing quarter and the coal and railway complex are all too close at hand. The proximity of these and of the downtown "core" makes for heavy flows of the noisiest and most earth-shaking sort of vehicular traffic. Like its structures, the district's people are a varied group: not all, by any means, resemble the conventional picture of slum-dwellers. Some, for example, are recent immigrants who could afford to live better, but who are economizing in order to build up a stake. As a whole, however, the district accounts for much more than an average share of the city's expenditure on social services and policing, as well as on fire protection.

As one moves further outwards, the houses, though still mostly quite old, become larger and less crammed together. Part of this ring is where the Victorian and Edwardian "carriage-trade" used to originate, and even today a measure of spaciousness and dignity remains. Some of the houses continue to be occupied by single families; others, however, have been converted into apartments and offices. Still others have been torn down — not always without protest — to make way for new apartment blocks. Young families have tended to move away to the suburbs, with the result that there are not so many children about as there used to be. Some of the schools actually have capacity to spare.

The next ring (no real Canadian city, of course, is ever this geometrically precise) consists of the erstwhile suburbs of the first four decades of the twentieth century. For the most part, these are now thoroughly built up and "citified", with a good range of municipal services and amenities: paved streets, curbs, sidewalks, street-lights, sewers, water-mains, transit service, elementary and secondary schools (including two technical institutes), police and fire stations, parks and a couple of branch libraries. The pattern of streets is mostly a monotonous grid, none too well adapted to the steadily increasing traffic load it has to bear. Some



of the wider streets combine the functions of urban arteries, highway connections, and secondary commercial districts. In the morning and evening rush hours, they fail to perform any of these duties satisfactorily.

From here on, the picture becomes much more varied. The density of population and of structures tends to thin out, but the thinning does not occur smoothly or evenly. Wherever there is a good highway, the built-up area ribbons out along it, generating local traffic and greatly reducing the road's capacity as a medium and long-distance artery. There is no regular or well-defined periphery. In some places, sub-division has leapfrogged clear into the open country. The structures are of many types and qualities. There are some semi-rural "Jerryvilles", havens from city taxes and building by-laws, where people have built or are building their own houses, in stages, on minimum budgets. There are streets of one-and-a-half-storey boxes, dating from the early post-war period; there are \$30,000 ranch bungalows and split levels on half-acre lots; and there are many other categories of housing, including some apartment blocks. There is industry: long, low, often attractively landscaped plants, freed from the limitations of downtown congestion and land costs, and adapted to modern, mechanized methods of handling and production. There are shopping centres, and there are the usual gauntlets of gas stations, motels and hot-dog stands. All this, sprawled over a vast acreage which was once mainly devoted to market gardening and dairy and chicken farming, and which still is agricultural in spots.

As a whole, the fringe of "Metropolis" amounts to a major manifestation of post-war prosperity and growth. All the more striking, therefore, is the fact that much of it — the outermost part, especially — is decidedly poor in municipal amenities and services. In the 1920's, housing construction tended to follow the extension of at least the basic services: now the reverse seems almost more true. Much of the road and street mileage is rough and unpaved, without curbs or sidewalks. Ditches, as deep in places as a small child is high, are too often the only storm sewers. For many householders, water and sanitation is a matter of individual wells and septic tanks, both of varying reliability.\* One large, outlying development boasts a community well, water-mains, sewers, and a "package" disposal plant. These worked admirably for a time: now, however, as the development grows, the basic water supply is giving cause for concern, while the disposal plant has become overloaded and is contributing to the pollution of a once pleasant stream. Throughout the fringe, schools, though new, are moderately to badly overcrowded.

---

\* A Central Mortgage and Housing Corporation study has shown that in 1956, some 29 per cent of the population of the 15 census metropolitan areas was largely unprovided with sewer service. Some 41 per cent of the population of 21 other major urban areas lived in largely unsewered municipalities. See Central Mortgage and Housing Corporation *Sewerage Service for Urban Housing in Canada*, Ottawa, 1957.

Police and fire protection exists, but is thinly spread. Transit service is reluctantly and sparsely provided, at a financial loss. Curiously enough, in view of the sprawling, land-prodigal nature of the area, there are large residential tracts in which little or no space has been left over for parks.

One might think that these shortages were simply a result of the haste with which development had gone forward and that most of them would be corrected before very long. Unfortunately, one cannot be altogether sure of this. Even less can one be sure that when the shortages are made good, the total result will prove to have been an attractive and reasonably economic extension of Metropolis. Already it is becoming obvious that much of the fringe — there are honourable exceptions — has developed quite haphazardly, in such a way as to make the provision of proper municipal services far more difficult and expensive than it really need be. Moreover, for all that the fringe's location and character have been made possible by the automobile, not enough account has been taken of the needs and habits of that vehicle. Many of the street layouts and distributions of land use generate unnecessary vehicle movement or make insufficient separation between through and local traffic. This will become clearer as development continues and traffic increases.

A key fact about Metropolis is that, notwithstanding a large-scale annexation some years ago, more and more of the growth has been occurring outside the boundaries of the city proper. To illustrate some of the significance of this, we may point to "Edgetown", one of the less favourably situated fringe municipalities. In 1945, Edgetown was predominantly rural (and indeed still is nominally organized as a rural municipality). When the first new housing developments appeared, they were welcomed: the municipality's tax revenues were enhanced, and farmers' regrets at losing their land were mitigated by the prices they received for it (although some now fervently wish they had held out longer). As time went on, however, the council became painfully aware that for a municipality, urban housing is far from clear gain. The new residents began to demand good schools and a growing list of expensive services and amenities. When they first moved to what was then almost the country, they probably did not expect to need so much in the way of city-type facilities. But they changed their minds.

Now, with much of the best land already taken up, the municipal fathers are of the opinion that, housing shortage or no, they should have held back residential development and corralled more industry. A good, fat proportion of industrial assessment, yielding more in taxes than it received back directly in services, would have provided extra revenue with which to service the residential areas. "Industriurbia", another fringe municipality next door, acquired just such a proportion and is doing well out of it, an ironic feature of the situation being that not a few of Edge-

town's residents settled where they did in order to be close to their jobs in Industriburbia (Metropolis city has a similar complaint).

However, it is too late now: Edgetown finds itself with comparatively high residential taxes, low residual borrowing powers (these are determined by the provincial government, largely on the basis of assessment), and a big backlog of capital works. Developers approaching the council with subdivision proposals get a cooler reception than they did formerly: their plans are only approved on condition that they undertake to provide paved roads, curbs, and sewer and water laterals. In effect, the financing of local improvements has been shifted from municipal debentures to National Housing Act mortgages. The citizens continue to pay, but as homeowners rather than taxpayers.

Some Edgetown residents have begun to inquire into the possibility of annexation to the city. The city authorities are not, on balance, enthusiastic. They would like, certainly, to exert more control over development in the fringe. For some time, they have been unhappy about the way things are going out there. They have been aware of definite adverse repercussions on the city; moreover, they have a suspicion that sooner or later, in one way or another, they will find themselves responsible for servicing much of the present fringe — for, as they put it, “straightening out the mess”. But to take on Edgetown, or a large part of it, would be to take on a formidable backlog of capital expenditure, and the city has a backlog of its own. The previous annexation has not yet been fully digested; there is still some vacant land within the city limits; two large new residential developments will need servicing. Work has just begun on a major expressway. A slum clearance and urban renewal project in the near-downtown district is being discussed. The city is being pressed to start treating its sewage instead of discharging it raw into the “Metropolis River”. The city, therefore, is chary of annexing more territory just at present — particularly territory which, demonstrably, would cost more to service than it yielded in taxes at prevailing city assessments and rates. If the proposed annexation took in a larger area — if, for example, it included Industriburbia, together with “Manybucks Village”, which has no industry (heaven forbid!) but which manages to support an excellent school and what its residents consider to be an adequate level of other services — then, perhaps, it would be more worth while — some day. Both Industriburbia and Manybucks would probably fight annexation. The city's case would have to be carefully prepared.

This, then, is Metropolis — fundamentally, an expanding social and economic entity, with numerous ties of interdependence between its principal parts — governmentally, something else again. As a mechanism, or an organism, it has serious defects. With the inestimable benefit of hindsight, one can see many ways in which its post-war expansion could have been better managed.

We are guilty of overdrawing, as well as of oversimplifying. Many large urban centres in Canada have managed to handle their growth problems a great deal better than our imaginary Metropolis. Some cities were fortunate enough to begin the post-war period with overextended boundaries inherited from previous booms, and with large tracts of land acquired through tax defaults. Advantage was taken of this circumstance to exert a close and farsighted control over new development. Nevertheless, many of the problems and situations which we have described will be familiar to numbers of Canadians. Examples of them, or of problems and situations very like them, exist today and can be readily identified. We would ask our readers to consider whether, on the assumption that our forecast of urban growth is broadly correct, the manner in which many Canadian centres have expanded and still are expanding should not be a subject of serious public concern.

Urban growth is a complex thing; it changes character over time and has a way of resisting or eluding most panaceas. We will not undertake to say either what form Canada's larger cities are likely to take by 1980, or what form they should take. Possibly a roughly concentric arrangement of Metropolis plus green belt plus well-planned and semi-self-sufficient satellites should be the ideal. Possibly something else will prove to be more in accord with the social and technological facts of life twenty-five years hence.

It does seem to us, however, that if the expansion of large urban areas is ever to be brought under an adequate degree of rational control, it will have to be done by governments or joint authorities exercising jurisdiction over all or most of their respective areas. Annexation, amalgamation, metropolitan federation as in Toronto — there are various alternatives. The essential is that the big problems, the area problems, be dealt with on an area basis. When numerous individual municipalities attempt to handle such problems without reference to any joint or overriding authority, it is virtually in the nature of things that they should get at cross-purposes with one another. It is also quite likely that when, as a means of resolving the impasse, some large-scale annexation or other form of union is proposed, one or more of the affected municipalities will balk, judging that it has more to lose than to gain. This, however, may only be true from a narrow, short-run point of view. The great majority of the area's citizens, including many residing in the recalcitrant municipality, may be in favour of going ahead. If such is the case, and if the entire matter has received adequate study and publicity, there would seem to be justification for the provincial government concerned to act in the interests of the majority.

It may be that the pattern of urban growth in some parts of Canada will become so extensive as greatly to exceed the scope of even the largest practicable municipalities or municipal federations. Already, there appears

to be some need for regional planning bodies with wider geographical purviews than most which have hitherto existed and with responsibilities relating to agriculture and other non-urban interests. As time goes on, these bodies may have to be given additional powers and functions. How this is to be done while maintaining the essentials of local democracy may be one of the knottier problems of the future.

For some persons, planning is a magic word; for others, it is an obnoxious one. Our own view is that trained, professional town planners are valuable people indeed (they are also, incidentally, very scarce people just at present), provided they are put to work in the right context. They have special skills and techniques; they are apt to possess as well a highly desirable comprehensiveness of outlook. But too much should not be expected of them. They cannot simply be hired and relied upon to produce glittering solutions from their mysterious boxes of tricks. To paraphrase Clemenceau, planning is too important a thing to be left entirely to planners — and with this, most planners would heartily agree. The most successful examples of planning have involved a method of approach, a way of doing things, which has permeated just about every aspect of the municipality's operations, including — this is especially important — the financial aspect. Good municipalities and school corporations have always done a considerable amount of planning, with or without professional assistance. To them, much of what modern proponents of planning now advocate will seem merely an enlarged and more formalized version of what they have been doing all along. At the risk of being caught in the crossfire of contending schools of thought, let us attempt to summarize what the "new look" broadly is. When an area has been subjected to a thorough and continuing survey;\* when, on the basis of that survey, a zoning, land-use and capital improvements plan has been drawn up, flexible yet resistant to capricious or doubtfully motivated alterations; when to this have been added a zoning by-law, another by-law controlling subdivision, and a long-term capital budget; and when the whole thing has been examined, discussed and accepted by department heads, council and the public — then there is planning, in the full, mid-twentieth-century sense of the term.<sup>1</sup>

Hitherto, the long-term capital budget has been the most commonly missing link in the chain. Now, however, it is making a more frequent appearance in Canada. It is, of course, a forecast, and like all forecasts may be falsified by events. In any given year, the municipality may be able to raise more or less money than it had anticipated. Changing circumstances may necessitate major revisions. But the great advantage of a capital budget is, firstly, that taking one year with another, it keeps physical planning and programming within hailing distance of the financially possible;

---

\* A planning survey — not merely a civil engineering one.

and secondly, that if it is properly conceived, it is based on a carefully worked-out system of priorities, so that if items have to be cut, they can be those items whose postponement least disrupts the co-ordinated advance.

Mention of long-term budgeting makes this an appropriate point at which to ask whether the one-year term for elected municipal officials — still very prevalent in Canada, though not so prevalent as it once was — is really long enough in a city or urban area of any size. It has, to be sure, an earthy, Jacksonian flavour about it, and may still be a good way of keeping small rural councils close to their constituents. But to ask men and women to be responsible for expenditure running into the heavy millions, to make or approve plans extending for many years into the future, and yet to be prepared to face the electors every 12 months, seems rather a tall order. The temptation to defer difficult decisions to the next council, and then again to the next, must be very great — all credit to those who resist it. Perhaps democracy and the requirements of statemanship might now compromise at a two or even a three-year term.

Another feature of urban municipal government which could usefully be re-examined is the degree of separation which still commonly exists between the business of planning and building roads and streets and the business of providing public transportation. "Transit utilities should be organized as business enterprises, and they should pay their way" — this dictum comes down to us from the days when the electric tram was Everyman's transportation and the fastest thing on city streets. Obviously, conditions have changed. The private automobile has not only cut into passenger volume; it has also crowded the streets in such numbers as to make transit service slower and less dependable, and it has stimulated the growth of low-density, automobile-oriented suburbs where buses run at a loss. Meanwhile, the five-day week has reduced Saturday revenues, and television has kept many former evening riders at home. Notwithstanding all these developments, urban municipalities still tend to insist that their transit utilities be self-supporting, even to the extent of paying municipal taxes on their properties. Almost anything, it would sometimes seem, is preferable to a transit subsidy. In practice, the "almost anything" has usually taken the form of higher fares (which may not be unreasonable, having regard to what has happened to prices and wages in general) and of the reduction or elimination of less patronized runs. A rigorous and sustained application of the self-support principle might just possibly leave some Canadian cities with virtually no transit at all.

We have no pat solution to offer for the urban traffic problem. Conditions vary greatly from city to city, and different remedies will no doubt be appropriate in different places. Two generalizations do, however, seem valid. The first is that the value of a transit utility is not all to be found in its balance sheet. The utility may be losing money in a strictly financial

sense, but it may be saving the city a much larger sum in street and traffic expenditure. Few would deny that it takes more streets, more traffic lights, more policemen and more parking space to move 1,000 people in private cars than it does to move the same number in transit vehicles. This leads to a second generalization, which is that the business of moving people and goods about large urban areas, whether by public or private vehicles, should by now be regarded as a single problem. As in any field of government expenditure, the overriding objective should surely be to give the taxpayer value for money — to spend public funds where they will do the most good, which in this case presumably means where they will do most to relieve congestion, meet the demand for movement as it grows, and promote desirable patterns of urban living.

Viewed in this light, mass transit service may be deserving of much stronger financial support than it has received in the recent past. Over the next twenty-five years, there are likely to be times and places where the provision of truly rapid and attractive transit service — subways, monorails, or express buses running on exclusive strips or streets — offers a more fruitful field of expenditure than any immediate alternative. It would be the greatest of pities if municipal authorities were to be discouraged from considering such possibilities by theories of transit finance dating from the street-car age, or by unrealistic systems of provincial grants. We are hopeful that provincial governments may come to the conclusion that if they are to make grants for transportation purposes at all, they can save themselves a lot of money by not restricting their grants to roads but, instead, making them available for whatever promises to be the most suitable and the most efficient facility in each particular case.

The question of railway commuter service might be looked at from a similar standpoint. With good reason, railways have come to regard commuter service as a notorious money-loser: expensive rolling stock and terminal facilities must be kept in being for two brief rush hours. But here again, the balance sheet does not necessarily tell the full story. Certain railway lines in some of the larger metropolitan areas are potentially well located for commuter service.\* In a few cases, the provision of public funds to make a frequent and attractively priced service modestly remunerative to the railways might do more at less cost to relieve traffic problems than any alternative expenditure.

All this is not to deny the need for efficient systems of urban roads and streets. Whatever can be done to improve and extend transit and commuter service, the volume of motor traffic in urban areas must be expected to grow enormously; and its accommodation will demand the expenditure

---

\* Montreal, of course, has had large-scale commuter service for many years. There is also one well-patronized run in the Toronto area.

of many hundreds of millions of dollars. It is all the more important, therefore, to base all outlays for transportation on the broadest possible study and to make sure that the money is going to the right places.

The problem of urban traffic is not a little related to the problem of urban renewal and redevelopment. The terms "urban renewal" and "urban redevelopment" have come into increasing use of late. Sometimes, they appear to be employed almost interchangeably. We are informed, however, that there is a distinction between them. "Urban redevelopment" means any replacement of structures occupying urban land. It can be applied to a major slum clearance and rehousing project such as Regent Park in Toronto, to the replacement of a small office building by a new and larger one, or to the tearing down of an elderly mansion to make way for a parking lot. To some degree, urban redevelopment is always going on, in every city. "Urban renewal" has a broader meaning. It embraces, not just redevelopment, but the repair, rehabilitation and improvement of structures. It means the whole process by which the older parts of urban areas adapt themselves, or should adapt themselves, to changing circumstances. It is the process of keeping up to date. Like redevelopment, it is not a new discovery by the planning profession, but has been going on for centuries. The trouble is that what may be called "spontaneous renewal" rarely occurs soon enough or comprehensively enough. Whole districts or large parts of districts slip downhill into a condition of blight. Other districts, while not yet blighted in any obvious sense, remain set in a form which grows less and less suited to the modern, automotive way of life. Here, perhaps, is the basic problem of the downtown business district, which renews itself piecemeal and sporadically, but which does not undergo the fundamental modernization that it really needs.

Canadian urban municipalities have been showing increasing interest in large-scale redevelopment projects. Procedures vary: usually what happens is that a tract of land in a blighted area is "assembled" by purchase or expropriation, cleared (although some of the better structures may be allowed to remain), then turned over to public or private agencies for housing or other purposes. Just what purposes are appropriate will depend on the location of the land, and on the way in which the urban area which surrounds it is developing. Ideally, the redevelopment project should be preceded by thorough study both of the district in question and of the larger entity of which it forms part. An important question, of course, is where and how the former residents of the cleared district are to be rehoused.

We anticipate that the larger issue of urban renewal will require considerably greater attention than it has received so far. Renewal, as we have indicated, involves not only redevelopment and the elimination of



existing blight, but the anticipation and prevention of future blight. Over the next twenty-five years, large sections of Canadian cities, notably those built up during the Wheat Boom of 1896-1913, will be reaching the potential danger point, if they have not done so already. By 1980, it is estimated, something approaching one million dwelling units of the present housing stock will be 75 or more years old.<sup>2</sup> To assume that increasing national wealth and the normal processes of urban evolution will largely take care of the problem would in our view be most unwise. Prosperity and a high average standard of living are not a sufficient cure for slums and blight: the past ten years have shown that. The remedy must be more deliberate and specific.

The ultimate salvation of downtown districts may lie in renewal on a fairly massive scale. Many informed observers are coming to think that so long as the basic alignment of these districts remains what it is — a system of right-angled canyons in which pedestrians are pushed about by big, bossy motor vehicles, and in which few people, afoot or otherwise, can go to their destinations easily and pleasantly — the underlying malaise will continue, with expressways, parking garages and transit improvements proving in the end to be mere palliatives. It has been proposed that “downtown” be converted gradually into one or a series of pedestrian islands, attainable but not penetrable by motor vehicles, an exception being made for pick-up and delivery vehicles, which would use underground tunnels. On arriving at the edge of an island, the motorist would park his car in one of a ring of parking lots and garages, then proceed the rest of the way on foot, possibly with the aid of moving sidewalks.

This proposal is past the pipe-dream stage: it is actually going to be tried in Fort Worth, Texas, and some of its aspects are embodied in the plans for the Place Ville Marie in Montreal. Proponents of the idea have in mind a good deal more than a drastic means of dealing with traffic congestion. They visualize a city centre that would have more to offer the human spirit than the spectacle of huge, monotonously regimented blocks of physical capital and rivers of nervous horsepower. New and more interesting groupings of buildings would gradually make their appearance. There would be parks and plazas, a place for sculpture, greenery, and outdoor recreational facilities. Like a few of the more elaborate suburban shopping centres today, “downtown” would have extra pulling power because it was good to look at and pleasant to wander in. It would be a logical location for new theatres and concert halls — for civic centres.

We do not wish to advocate any particular course of action with respect to downtown areas. We do suggest, however, that in some of the larger Canadian cities the problem has reached, or soon will reach, a stage where only large, imaginative solutions are likely to have much hope of success. Cautious, *ad hoc* measures may relieve traffic congestion temporarily, but do little to revitalize the patient.

*Changes in the Rural Community*

Paralleling the urbanization of recent years has been a decided alteration in the character of rural communities in many parts of Canada — an alteration which has had an important bearing on housing and social capital requirements. Here again, generalizations are dangerous; one can say, however, that such things as the movement of people away from rural areas to cities and towns, the mechanization and enlargement of farms, and improvements in transport and communications have had a significant impact on rural life in all the major economic regions of Canada. Rural people have become less cut off, less different in outlook from city people. As farming has taken on more of the attributes of business enterprise, so the persons engaged in it have tended to acquire business ways — urban ways — of thinking and acting.

The implications for housing and social capital are most readily apparent in the Prairie Provinces, where the processes of farm enlargement and mechanization, coupled with rural depopulation, have gone farthest.<sup>8</sup> Many people have moved out of agriculture altogether; many others have found it possible to take up residence in towns and cities while still continuing to farm. Those who still live on the land are no longer content with the isolation and the rudimentary services and amenities of an earlier day. They want better roads, schools, and medical and hospital services. They are prepared to travel considerable distances to buy, sell, and have their machinery repaired. They are more apt to drive through small villages and hamlets and continue on to larger centres. Like the farms, the "natural" regional trade and service areas have become fewer and bigger.

All this has had an important effect on the amount and quality of social capital provided in rural areas, and on the way in which it is provided. Many responsibilities which once belonged to local units of government have passed in whole or in part to provincial governments. There has also been a pronounced growth of larger, special-purpose units of local administration such as health regions, hospital districts, and consolidated school districts. It has been found better to handle these functions in relation to larger geographical areas. Where the old local school district could aspire only to a one-room, one-teacher school, the new consolidated district, knit together by school bus service, can provide a properly staffed and equipped institution capable of giving rural children the education they need to engage in successful modern agriculture or to take up good jobs in cities and towns.

In many instances, the one unit of administration which has not been enlarged is the municipality proper. Informed observers believe that there is often a case for enlargement here too, particularly in areas which have undergone substantial depopulation. Bigger municipalities, with dimensions keyed to the automobile rather than the horse and buggy, could achieve

certain economies of scale. They would be better placed to hire trained personnel, and to make the fullest and most economical use of modern mechanical equipment. Where large, special-purpose units have been superimposed on groups of small municipalities, difficult financial and administrative problems are likely to arise. The taxpayer may be hard put to determine just what he is paying for and whether he is being treated equitably. If municipalities and special units were amalgamated into single large units, or at least given co-terminous boundaries, a welcome degree of simplification would result.

As we have stated, we anticipate further significant changes in the agricultural industry, and in the pattern of rural life. It will be important from a social capital standpoint to examine the structure of local government in the light of these changes, and to undertake reorganization where it seems appropriate.

### ***Forecast of Housing and Social Capital Expenditures***

The foregoing sections will have provided some background against which to assess our forecast of expenditure on housing and social capital. This forecast, which is presented in Table 15.2, we regard as a conservative one. It has been built up item by item, mostly on the basis of somewhat higher than average 1955 standards of adequacy. It makes full allowance for population growth, but only partial allowance for backlog and replacement needs, regarding which information is scattered and incomplete. The possibility, perhaps the probability, should be kept in mind that Canadians generally may come to demand a quality, range and expensiveness of housing and social capital much exceeding even the best standards of 1955, in which case the forecasts given in Table 15.2 may prove to be considerably too low.

In brief, we expect that about \$100 billion (at 1955 prices) will be spent on new housing and social capital over the twenty-five years ending in 1980. Housing will account for about \$45 billion to \$50 billion, roads and streets for about \$20 billion, waterworks and sewerage systems and schools and universities may each require about \$5 billion and hospitals nearly \$3 billion. These amounts, it should be emphasized, relate to requirements of new physical capital only. In all the fields covered, many more billions will have to be spent on such things as staff wages and salaries, maintenance, and interest charges.

Examined in conjunction with our projections of over-all output and expenditure, the forecast suggests that housing and social capital investment may form a gradually declining proportion of Gross National Expenditure. By 1980, annual investment in housing and social capital may be accounting for between 6 per cent and 7 per cent of Gross National Expen-

Table 15.2

# FORECAST OF GROSS NEW INVESTMENT IN HOUSING AND SOCIAL CAPITAL

(in billions of 1955 dollars)

A — by items		1956-80
Housing.....		43.7
Social capital:		
Hospitals.....		2.7
Schools and universities.....		4.2
Roads and streets.....		19.5
Waterworks.....		2.4
Sewerage systems.....		2.7
Airports.....		1.3
Churches and other religious buildings.....		1.5
Other buildings.....		8.4
Other construction.....		2.5
Other machinery and equipment.....		2.3
Sub-total: social capital.....		47.5
Grand total: housing and social capital.....		91.2
B — by ten and five-year periods		
	Actual	Forecast
	1946-55	1956-65    1966-70    1971-75    1976-80
Housing.....	10.2	14.0    8.4    10.0    11.3
Social capital.....	9.6	16.2    9.0    10.3    12.0
Total.....	19.8	30.2    17.4    20.3    23.3

SOURCE: Yves Dubé, J. E. Howes and D. L. McQueen, *Housing and Social Capital*, 1957, a study for the Commission, Chap. 10, Tables 59 and 60, pp. 150 and 152.

diture — about the same as the average for the 30 years ended in 1955 which included the depression and the War periods, but considerably less than the average for the five years 1951 to 1955.

It would seem, then, that if we are broadly correct in our expectations regarding general economic growth, providing housing and social capital of a good 1955 standard may become progressively easier. But the standard may well rise. Indeed, we would regard it as entirely appropriate that as Canadians become wealthier, they should expect better schools, roads and houses — that they should come to evince more interest in paying for such things as concert halls and civic centres. We would not be surprised if housing and social capital expenditure as a proportion of Gross National Expenditure turned out to be higher than our forecast appears to indicate.

If our basic assumptions are sound, expenditure on most kinds of social capital will probably show a fairly continuous rise over the next twenty-five years. With respect to housing, however, there may be something of a lull in the early part of the period. The reason for thinking this is that for the next few years, the persons most likely to be marrying and forming families will be the children of the depression and early War years — periods of low birth rates. The forecast of family formation in Table 15.3 shows a distinct dip from the high formation rates of recent

years (though the reader's attention should be drawn to the immigration assumption involved). Not, perhaps, until the mid-1960's will new families be formed as fast as they were being formed in the early 1950's.

This need not mean a proportionate dip in housing construction. The replacement demand for housing may increase: there may be a rise in the rate at which old housing is destroyed or abandoned. Technological improvements in the house-building industry, coupled with increasing incomes, may put new housing within the means of a larger proportion of the population.

Table 15.3

**FORECAST OF NET FAMILY FORMATION IN CANADA**  
(based on assumption of 75,000 annual net immigration)

		Thousands of families
1951-55	(Actual).....	443
1956-60	.....	348
1961-65	.....	414
1966-70	(Forecast).....	500
1971-75	.....	605
1976-80	.....	683

SOURCES: 1946-55, Central Mortgage and Housing Corporation, *Housing in Canada*, and *Housing Statistics* (quarterly).

1956-80, Yves Dubé, J. E. Howes and D. L. McQueen, *Housing and Social Capital*, 1957, a study for the Commission, Chap. 3, Table 10, p. 54.

It may be, however, that housing construction will for a time show some tendency to level off or even decline. If this does in fact happen, the next five or ten years may present an excellent opportunity to make some headway with slum clearance and urban renewal — to launch a determined attack on urban blight before the high birth rates of the early post-war years are reflected in a sharp new upsurge in family formations. Perhaps too it will be a good period in which to eliminate the large backlog of urban land servicing — to catch up with accumulated needs for paved roads, sidewalks, and sewer and water facilities.

Another field in which capital construction may not show a continuous rise throughout the forecast period is that of education. Our expectations regarding school and university enrolment (based, of course, on our population forecast) are summarized in Table 15.4, where the effects of the post-war increase in birth rate can be traced diagonally from the upper left to the middle right. The "big bulge" is already passing through the elementary schools, as many parents and school trustees can testify. It will hit the secondary schools with greatest force in the early 1960's, and the universities four or five years later. "Bulge" is perhaps a misnomer here, since there will be no letdown after it has passed: enrolment will simply increase rather less rapidly. Construction of new buildings will continue, but at a somewhat less hectic pace. We anticipate that over the forecast period enrolment in secondary schools and universities will

increase faster — in the case of universities, much faster — than the teenage population as a whole. Present-day enrolment in secondary schools is equivalent to just over 50 per cent of the population of 14 to 17 years of age, inclusive: by 1980, the proportion may be 70 per cent. Between 7 per cent and 8 per cent of persons 18 to 21 years of age are now in university; perhaps by 1980, some 15 per cent of the same age-group may be there.

Table 15.4

**FORECAST OF SCHOOL AND UNIVERSITY ENROLMENT**  
(based on assumption of 75,000 annual net immigration)

	Elementary	Secondary	University <sup>a</sup>
	(thousands of students)		
Estimated enrolment in 1954-55 .....	2,534	504	67
Forecast enrolment in 1979-80 .....	4,352	1,289	267
Net Increases in enrolment:			
1954-55 to 1959-60 .....	584	163	27
1959-60 to 1964-65 .....	403	213	39
1964-65 to 1969-70 .....	208	180	50
1969-70 to 1974-75 .....	235	112	46
1974-75 to 1979-80 .....	388	117	38
1954-55 to 1979-80 .....	1,818	785	200

<sup>a</sup> Includes enrolment in the last four years of classical colleges in the Province of Quebec.

SOURCE: Yves Dubé, J. E. Howes and D. L. McQueen, *Housing and Social Capital*, 1957, a study for the Commission, Chap. 5, Table 22, p. 73; Table 23, p. 74; and Table 26, p. 84.

### Conclusion

This report is concerned essentially with economic questions but we would be remiss if before concluding this chapter we did not state our clear appreciation of the human problems involved in the present process of urban expansion. Such problems sometimes assume a rather different form in large cities than they do elsewhere. The needs of families and the solitariness of individuals give rise to social problems that can in part at least be met by the provision of recreational and cultural facilities. Undoubtedly as hours of work are shortened and Canadians have more time for leisure the need for such facilities will increase rapidly. Fortunately perhaps the tastes, desires and habits of people are not all the same and their needs for recreational and cultural facilities differ correspondingly. Examples of the kind of requirements we have in mind would include supervised playgrounds for our young people, community centres, hockey rinks, football and baseball grounds, auditoriums, art galleries, symphony orchestras; yes, and race-tracks, and stadiums for spectator sports.

No doubt sympathetic attention will be given to the social problems we have mentioned and to the measures and facilities required to relieve them. But in the last analysis, solutions will depend in an important degree upon the provision of adequate finances and, until the problems of muni-

cial finance have been dealt with satisfactorily, limited progress only is likely to be made. It was not our responsibility, as we understood it, to undertake an exhaustive study of municipal finance, or, indeed, of government finance in general. However, we have some tentative suggestions to make in connection with municipal finances — although not about the division of tax revenues between the three levels of government — which we have set forth in Appendix I in the hope they may provoke discussion and some further study of this highly important question.

So far as the long-run prospects for providing an adequate supply of housing and social capital are concerned, we find ourselves fairly optimistic. The proposition that Canada as a nation is now, or will be in the future, too poor to afford proper schools for its children or adequate sewage disposal for its urban centres we reject out of hand. Nor do we believe that a people who contrive to own several million motor vehicles are financially unable to construct an efficient system of roads and streets for those vehicles.

The real problem to be faced by Canadians in this field is not going to be one of fundamental inability to pay. It will be, rather, one of deciding what proportion of a growing national income should be devoted to the building of those things which only the community can provide, and of developing the best possible fiscal and administrative arrangements to make that decision effective. We have put forward in Appendix I a few suggestions as to what some of these arrangements might be. As we have said, our main hope in doing so is to stimulate keen and widespread study of the entire financial and administrative side of housing and social capital. If we have laid an apparently disproportionate amount of emphasis on the problems and functions of local government, it is because we feel that here, most of all, new thinking will have to be done. In the increasingly urbanized society which is evolving, Canadians will be well advised to take a fresh and constructive interest in the affairs of City Hall.