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B. CANADA

Development of Canada's Economy, 1850–1900

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IN THIS paper a brief review of economic developments in Canada in the second half of the nineteenth century is presented. It covers the period leading up to confederation in 1867 and the first efforts of the young nation to consolidate its economy and to create a firm basis for sound institutions that would support the rapid economic development which Canada was to experience in the twentieth century.

Major Features of the Development

By 1850 the Canadian economy had come to rely more heavily on agriculture than ever before. Agricultural products, notably wheat, had replaced timber as the staple export; and removal of the colonial wheat preference in 1849 had partly motivated the annexation manifesto of that year. This increased importance of agriculture in Canada's economy had not come about spontaneously; on the contrary, it had been carefully nurtured by the public authorities and supported by public funds. V. C. Fowke makes this pointed observation in appraising the role of agriculture in Canada:[1]

> It has served as an instrument of empire in different ways according to the requirements of place and time. Simplest and most obvious has been its use as a defence device, where settlement has been encouraged for the protection of territory and trade routes. Equally widespread has been its use as the provisioner of the great staple trades, whether of fish, fur, sugar, or timber, or of the carrying trade itself. Provisioning, of course, has been partly a defence function, since in the economic conflict of competitive empires, notably the English and the French, survival necessitated a degree of commercial vitality possible only on a strong agricultural base. A significant change occurred, probably within the past hundred years, when Canadian agriculture finally achieved direct commercial importance as the provider of a staple product, wheat.

[1] Vernon C. Fowke, *Canadian Agricultural Policy*, University of Toronto Press, 1946, pp. 3 and 4.

Note: This paper was prepared in cooperation with Mr. T. R. Vout and Mr. O. Hickie, economists with the Canadian Department of Trade and Commerce, whose valuable contributions are herewith gratefully acknowledged.

To a large extent the type of agricultural product produced in Canada was determined by external demand. The emphasis shifted from wheat to cattle in the mid-1860's as demand for wheat in the British market was replaced by demand for cattle in the United States. Shifts from product to product in response to changes in foreign demand occurred in other sectors of the economy as well.

The railways also played a major part in the switch from timber to agricultural products as Canada's staple export. The system of inland waterways, even with major improvements, had not and could not open up the hinterlands of Ontario and Quebec to the extent that the 1,900 miles of railway built in the 1853–60 period did. The waterways had proved adequate for the transport of furs and even of timber during the earlier stages of Canadian development, but an outlay of $100 million on a network of railway lines was required for transporting the products of commercial agriculture.

The adoption of free trade by Britain in the 1840's removed many of the restrictive measures which had limited Canadian production and trade and gave the infant Canadian manufacturing industry much more scope in the home market. The census of 1871 reveals that Canada had made some progress in industrialization since mid-century. The Canadian manufacturing industry was both larger and more diversified than it had been two decades earlier. In 1851 manufacturing activities in Canada had been largely concentrated in a few lines, with flour and gristmilling, sawmilling and shipbuilding accounting for about half the industry's total output. In 1871 these industries were responsible for less than one-third of the total value of manufacturing output. An important textile industry had been developed, and a beginning had been made in iron and steel products, vehicles, and agricultural implements. Canada's tariff structure afforded only slight protection to industry, and to occupations without much foreign competition in the home market; for example, shopcrafts and local services were particularly thriving. The high costs of transportation also afforded protection to domestic industries turning out bulky or heavy goods.

During the great depression which covered much of the period 1873–96, the Canadian economy did not stagnate. It grew, though at a reduced rate, and consolidated some of the gains already made. True, the high hopes held at confederation were not fully achieved, progress was slow and disappointing, and the tight money market that followed the Vienna and New York crashes of 1873 forced the curtailment or postponement of many Canadian capital projects. On the other hand, over the period as a whole, the terms of trade moved sharply in Canada's favor as the prices of the manufactured goods Canada imported fell more rapidly than the prices of the natural products which formed the bulk of its exports.

The 1873–96 period saw a complete reversal of Canada's tariff policy. To make confederation possible, the tariffs of central Canada had been reduced in 1866; and in 1868 the new dominion had removed all duties on grain, flour, meal, and breadstuffs of all kinds and left the reductions of 1866 unchanged. However, increased government spending and the inability to borrow money compelled the Canadian government to raise existing customs duties somewhat in 1874; for example, on manufactured goods from 15 to 17½ per cent. By 1879 hope for a renewal of reciprocity with the United States had dimmed—although the budget of that year again made the offer—and the Canadian Government decided to promote industrialization in Canada by protecting the domestic market through high tariffs. In 1880 and again in 1887 further upward revisions were made to certain customs duties, and by the latter year the national tariff policy was in full operation. W. A. Mackintosh comments on the national policy as follows:[2]

> This decision for industrialization by means of the protective tariff was definitely related to the settlement policy; it was to be a means by which the new market, which it was hoped would open up in the west, would be available to the other regions. The decision was definitely related also to the transportation policy for Canadian industrialization promoted the east-west traffic which was important for transcontinental railways.

Under the protection afforded by the national policy the Canadian manufacturing industry grew moderately. Its output more than doubled in value between 1870 and 1890, despite falling prices. Ontario and Quebec benefited in particular, as larger-scale manufacturing industries were established to cater to the national market. These industries were helped by the decline in transportation costs, which removed much of the cost advantage hitherto enjoyed by smaller industries in their local markets. The Maritime Provinces did not fare as well, although an iron and steel industry—including a plant for manufacturing railway cars—was established, and textile mills, sugar refineries, and glass factories were set up behind the protective screen of the new tariff. These, as a rule, could not compete in the markets of central Canada, and sales were largely restricted to the home market.

Among the notable developments in transportation in Canada, 1873–96, were the completion of the first transcontinental railway along an all-Canadian route and the eclipse of the wooden sailing ship. Confederation provided the necessary credit to permit the extension of central Canada's railway system to an Atlantic terminus in the Maritimes and to western Canada. The Intercolonial Railway, under government ownership, and the Canadian Pacific, a private venture, were the

[2] W. A. Mackintosh, *The Economic Background of Dominion-Provincial Relations. A study prepared for the Royal Commission on Dominion-Provincial Relations, Appendix 3*, Ottawa, 1939, p. 20.

results. In 1872 an agreement was concluded with British Columbia guaranteeing the construction of a railway within ten years, but because of various financial and political difficulties the line was not completed until 1885–86. Other railway construction, including the start of the Canadian Northern Railway which was eventually to become almost a transcontinental line, boosted Canada's railway mileage from about 3,000 miles in 1873 to over 16,000 miles in 1896. The rapid decline of the wooden sailing ship after 1870 hurt the Maritime Provinces, whose economy had depended heavily upon it in the shipping and wooden shipbuilding trades.

By the mid-1890's Canada was well prepared to take full advantage of any upturn engendered by improved economic conditions abroad. The area of the new dominion had been completed in 1873, a set of national policies for the development of the country had been formulated, and a satisfactory national transportation system, both rail and water, had been created. One of the major objectives of confederation had been achieved: to create the framework and the institutions which would provide a sound base for a rapidly growing economy. Growing prosperity in Europe and the United States, with a price rise encouraged by the discovery of gold in the Klondike in 1896, and an expansion of international trade signaled the beginning of what was to be a quarter century of unsurpassed economic growth for Canada.

Agricultural development, the opening of the West for large-scale settlement, and an investment boom of exceptionally long duration as well as widening foreign markets were among the major factors contributing to this period of rapid economic expansion commencing with 1896 and lasting well into the twentieth century.[3] Describing the spurt given to Canadian economic expansion through the development of agriculture towards the end of the nineteenth century, Kenneth Buckley says:[4]

> The prairie frontier finally passed the critical margin separating potential from actual resources when the opportunity it afforded became definitely superior to alternative opportunities open to migrants. This shift in the character of the frontier occurred quite suddenly in the mid-nineties. . . . Two factors were fundamental. The interior of the continent is a single, continuous plain and the movement into western Canada was a natural extension of the American frontier after the occupation of more accessible free land in the United States. This natural movement of population was accelerated by a sharp upturn in the price of wheat in the mid-nineties. At the outset investment was largely the expenditure of personal effort and savings upon opportunities recognized by those close at hand. Most

[3] For a description of the investment boom, see Kenneth Buckley, *Capital Formation in Canada, 1896–1930*, University of Toronto Press, 1955, pp. 6ff.
[4] *ibid.*, p. 5.

of the first arrivals on the frontier were North Americans. Their expenditures embodied knowledge gained from experience in a similar environment. Outside capital was not attracted on a significant scale until the boom was well under way.

Higher world prices for wheat made it again profitable for Canada to expand wheat production, and the prairie provinces were the natural area where wheat-growing could be undertaken on a large scale. Also, higher prices enabled Canadian wheat-growers to overcome the high transportation costs because of the distances of the prairie region from Maritime and St. Lawrence ports where comparatively low rates on ocean freight were obtainable. With market conditions favorable and overseas countries willing to absorb increasing quantities of Canadian wheat, the long-awaited settlement of the West began in earnest.[5]

After 1896 people poured into the West as they had poured into Upper Canada sixty years earlier. The railroad had provided them with easy access to the prairies, but settlement pushed rapidly into the back country and railroad lines followed population as well as preceded it. Settlers continued to leave eastern Canada to make new homes in the West.

Rising prosperity in the late 1890's accelerated expansion of Canada's manufacturing industry, and the industry's output in 1900 was about one-fourth above that of 1890. The growing diversification of Canada's economy is discernible in the added importance in 1900 of such sectors as the manufacturing industries producing iron and steel products, paper and printing, metals and metal products other than steel, and chemicals and allied products. The urbanization of Canada's population, which had been proceeding steadily since the beginning of the second half of the nineteenth century, continued in the last decade despite the influx of settlers to the West which added to the rural population.

The Canada of 1900 was a far cry from those little, scattered, and isolated British North American colonies of 1850 which were to unite a quarter century later. Confederation had made Canada a political entity with one central government, one set of laws, and a common currency. By the end of the century it was well on its way to becoming an integrated economic and social entity as well. Not only had Canada grown greatly in population and output over the fifty-year period, but its economy had begun to develop and to become more diversified as industrialization and urbanization proceeded at a rapid pace. The stress and strain of the great depression had done much to create a feeling of national unity. By the end of the nineteenth century the foundations for a great and prosperous Canada had been well and truly laid.

[5] M. Q. Innis, *An Economic History of Canada*, Toronto, Ryerson Press, 1935, revised edition 1943, p. 240.

Growth of the National Product

GROSS NATIONAL PRODUCT

Total Product

The economic development examined in the preceding section can be measured by estimates of the national product. Canada's gross national product in 1900 stood at $1,057 million, about six times that of 1851. With allowance for price change, the 1900 figure is 4½ times that of a half-century earlier, indicating an annual average rate of increase in total gross national product in constant dollars of 3.17 per cent (Tables 1 and 2). The rate of growth in real gross national product was not

TABLE 1

Gross National Product, in Current and 1935–39 Dollars, and Implicit Price Index, Selected Years, 1851–1900

(dollar figures in millions)

	1851	*1860*	*1870*	*1880*	*1890*	*1900*
Total:						
Current dollars	169	319	459	581	803	1,057
1935–39 dollars	406	582	764	982	1,366	1,877
Implicit price index (1935–39 = 100)	41.6	54.8	60.1	59.2	58.8	56.3
Per capita:						
Current dollars	68	98	125	135	167	197
1935–39 dollars	164	178	208	228	283	350
Per person working:[a]						
Current dollars	244	335	410	433	505	592
1935–39 dollars	585	611	683	731	859	1,052

[a] For 1851–80, based on the number of persons with civilian jobs only; for 1890 and 1900, members of the armed forces are included.

The sources of this and the following tables are discussed in the Appendix; the source of the index is given in text footnote 6, below.

uniform in the three subperiods or in the five decades comprising the 1851–1900 period. The largest increase (88 per cent, implying an annual average rate of increase of 3.38 per cent) took place between 1851 and 1870. Over the next subperiod 1870–90, the over-all increase was about 79 per cent, indicating a yearly rise of 2.95 per cent, and over the 1890's the total increase was about 37 per cent, an annual average growth of 3.23 per cent. The decade increases in gross national product in real terms range between 43 per cent for the first decade (1851–60) and 29 per cent for the third decade (1870–80); for the other three decades they were 31, 39, and 37 per cent for 1860–70, 1880–90, and 1890–1900, respectively.

TABLE 2
Percentage Increase in Gross National Product in 1935–39 Dollars, Selected Periods, 1851–1900

	1851–70	*1870–90*	*1890–1900*	*1851–1900*
Total:				
Over the period	88.2	78.8	37.4	362.3
Annual average[a]	3.38	2.95	3.23	3.17
Per capita:				
Over the period	26.8	36.1	23.7	113.4
Annual average[a]	1.26	1.55	2.15	1.56
Per person working:				
Over the period	16.8	25.8	22.5	79.8
Annual average[a]	0.77	1.11	2.05	1.20

[a] Compound rates.

Product per Capita and per Worker

Gross national product per capita rose from $68 in 1851 to $197 in 1900, an increase of 190 per cent in value and of about 113 per cent in constant dollar terms (Table 2). This gain in real output per head of population indicates an average annual increase of 1.56 per cent, just below the rate of population growth (1.58 per cent) shown for the same period. Gross national output per working person grew from $244 in 1851 to $592 in 1900, a rise of 143 per cent in value and, in real terms, 80 per cent or 1.2 per cent a year.

Despite significant increases in Canada's population and labor force during the second half of the nineteenth century, real output per capita and per worker increased substantially in the three subperiods and in the five decades of the half-century. These gains became progressively larger in each of the subperiods, as shown in Table 2.

VALUE ADDED BY SECTOR

Tables 3 and 4 show the figures for value added by the sectors and sector components, used to build up the estimates of gross national product for the selected years in the 1851–1900 period. The figures reflect the changes in the contribution made by these factors to Canada's gross national product in the second half of the nineteenth century.

Primary Industries

The value added by the four primary industries—agriculture, fishing and trapping, mining, and forest operations—increased from $79 million in 1851 to $386 million, a gain of 389 per cent, but their contribution to gross national product declined from 47 per cent in 1851 to 37 per cent

TABLE 3

Value Added, by Sector, Selected Years, 1851–1900
(millions)

	1851	*1860*	*1870*	*1880*	*1890*	*1900*
			(current dollars)			
Commodity producing industries:						
Primary industries	79	160	206	253	294	386
Secondary industries	38	61	101	132	226	264
Total	117	221	307	385	520	650
Service or tertiary industries	32	63	96	130	214	311
Other sectors:						
Rent	16	30	43	58	69	90
Net interest and dividends received and paid abroad	−1	−3	−4	−16	−30	−32
Indirect taxes less subsidies	5	8	17	24	30	38
Total	20	35	56	66	69	96
Total, all sectors	169	319	459	581	803	1,057
			(1935—1939 dollars)			
Total, all sectors	406	582	764	982	1,366	1,877

in 1900 (Tables 3 and 4). This reduced importance of the primary sector in Canada's output was the result of the failure of the agricultural and forest industries to maintain their relative positions among the sources of value added. As Table 4 shows, the value added by the agricultural industry rose from $54 million to $282 million over the period, and that of forestry from $23 million to $52 million, but the proportion of the totals dropped from 32 to 27 per cent in the case of agriculture and from 14 to 5 per cent in the case of forestry. The decline in the relative importance of the latter was due largely to the shift in preparing forest products for market from the bush to the sawmill, as sawn lumber replaced square timber in world demand. The contribution made to gross national product by sawmilling operations is included in the manufacturing sector's total so that this change increased the contribution of the secondary sector at the expense of the primary one.

The contributions of both the mining and the fishing and trapping industries to national output increased in the 1851–1900 period. The value added by primary mining operations was $35 million in 1900 as against $1 million in 1851; and by fishing and trapping, $17 million as against $1 million. In 1900 mining accounted for 3.3 per cent of the total value added, a substantial increase over the 0.6 per cent shown for 1851, while the fishing and trapping industry increased its share of the total from 0.6 per cent to 1.6 per cent.

TABLE 4

Value Added, by Industry, Selected Years, 1851–1900
(dollar figures in millions)

	1851	*1860*	*1870*	*1880*	*1890*	*1900*
			(current dollars)			
Primary industries:						
Agriculture	54	122	153	186	217	282
Fishing and trapping	1	3	5	11	13	17
Mining	1	2	4	6	11	35
Forest operations	23	33	44	50	53	52
Total	79	160	206	253	294	386
Secondary industries:						
Manufacturing	31	48	87	110	189	223
Construction	7	13	14	22	37	41
Total	38	61	101	132	226	264
Service or tertiary industries	32	63	96	130	214	311
Total, all industries	149	284	403	515	734	961
Adjustment[a]	20	35	56	66	69	96
Gross national product	169	319	459	581	803	1,057
			(per cent)			
Primary industries:						
Agriculture	32.0	38.2	33.3	32.0	27.0	26.7
Fishing and trapping	0.6	1.0	1.1	1.9	1.6	1.6
Mining	0.6	0.6	0.9	1.0	1.4	3.3
Forest operations	13.6	10.4	9.6	8.6	6.6	4.9
Total	46.8	50.2	44.9	43.5	36.6	36.5
Secondary industries:						
Manufacturing	18.3	15.0	19.0	18.9	23.5	20.8
Construction	4.2	4.1	3.0	3.8	4.6	4.2
Total	22.5	19.1	22.0	22.7	28.1	25.0
Service or tertiary industries	18.9	19.7	20.9	22.4	26.7	29.4
Total, all industries	88.2	89.0	87.8	88.6	91.4	90.9
Adjustment[a]	11.8	11.0	12.2	11.4	8.6	9.1
Gross national product	100.0	100.0	100.0	100.0	100.0	100.0

[a] Comprises rent, indirect taxes less subsidies, plus net investment income.

Secondary Industries

The value added by the two secondary industries, manufacturing and construction, rose from $38 million at the beginning of the second half of the nineteenth century to $264 million at its end, and its proportion of the total GNP increased from 22½ to 25 per cent. The gain in the relative importance of this sector was due entirely to the increased contribution made by the manufacturing industry; the share contributed by construction remained unchanged. Value added by manufacturing increased from $31 million in 1851 to $223 million in 1900, a six-fold gain, and its proportion of the total GNP rose from 18 to 21 per cent. It should be noted that the Canadian manufacturing industry of 1900 was considerably different from that of a half-century earlier. In 1851 manufacturing operations were largely restricted to the primary processing of natural products, notably the milling of grain to produce flour, whereas in 1900 the industry was considerably more diversified, with a sizable portion devoted to more highly manufactured goods including fabricated iron and steel products. (Details of the increased diversification of manufacturing operations are given below.)

Value added by the construction industry increased about five-fold over this period, rising from $7 million in 1851 to $41 million in 1900, but its share of total value added remained unchanged at about 4 per cent.

Tertiary Industries

The largest sector gain in value added, as a proportion of the total GNP, was in the tertiary or service industries which increased nine-fold in dollar terms (from $32 million in 1851 to $311 million in 1900) and raised its contribution to the total from 19 to 29 per cent. The growth of this sector seems to have taken place fairly evenly throughout the whole half-century, with an increase in its relative contribution to the total national output shown for each decade. The great expansion which took place in the transportation, trade, finance, and personal and professional service industries was the chief factor in the increases achieved by the tertiary industries in their contribution to Canada's gross national product. Also, what data are available suggest that between 1851 and 1900 the average annual earnings per employee in a number of service industries, the earnings of railway workers for example, increased more than in the commodity-producing industries. This would contribute to increasing further the value added by the tertiary sector.

Other Sectors

The remaining sectors are rent, net interest and dividends received and paid abroad, and indirect taxes less subsidies. Their value added

rose from $20 million in 1851 to $96 million in 1900, but their proportion of the total declined from 12 per cent at the beginning, to 9 per cent at the end of the period.

The rent item, that is, net income from rent not implicitly included elsewhere, comprised the most important item in this group both in 1851 and 1900 and, indeed, at each of the intervening decennial census dates. Its contribution to the value of national output increased from $16 million to $90 million, with a substantial increase shown over each of the decades (Table 3).

Canada incurred a deficit in respect to ingoing and outgoing interest and dividends in each decennial year in the second half of the nineteenth century; consequently, this component is a negative factor in each of the selected years and reduces the total value added by the other components accordingly. While the interest and dividends item increased from an adverse balance of $1 million in 1851 to one of $32 million in 1900, its effect on the 1900 Canadian output of $1,057 million was negligible.

Indirect taxes constitute a part of the market price of goods and services, and we must add them in to arrive at a final figure, but government production subsidies must be removed since they are already included in the appropriate sectors. The indirect taxes pertain only to custom duties and excise taxes, while the subsidies comprise only federal payments or bounties on a very small number of items. The value added by this category shows a moderate increase in each of the six selected years used, rising over the entire period from $5 million in 1851 to $38 million in 1900.

PRICE TRENDS

Information on general price trends can be obtained by looking at the implied price index used to convert gross national product in current dollars into gross national product in constant dollars (Table 1).[6]

The general price index (1935–39 = 100) stood at 41.6 in 1851, rising fairly gradually to 60.1 in 1870 and then declining rather slowly to 59.2 in 1880, 58.8 in 1890, and 56.3 in 1900. The decline amounted therefore to 6 per cent for the period 1870–1900, or an annual average rate of 0.22 per cent (compound). Of course, in some of the intercensal years the price index might have dropped further than is indicated by the data for census years. For example, descriptive data suggest that the index reached its lowest point in 1897, a level even lower than that reached at any previous time in the second half of the nineteenth century.[7]

[6] This price index has been obtained for the period from 1867 onward from my previous study, O. J. Firestone, *Canada's Economic Development, 1867–1953*, London, Bowes and Bowes, 1958, with special estimates prepared for the years 1851 and 1860.

[7] See *Board of Inquiry into Cost of Living in Canada*, Ottawa, King's Printer, 1915, Vol. II, p. 21.

But speaking generally, what data are available suggest that the general decline in price levels in Canada was not as catastrophic as has been suggested in the literature. A much sharper price decrease was experienced, for example, from 1920 to 1921, when the implied price index of gross national expenditure dropped by 12 per cent (from 144.2 to 126.8) in one year. Another significant decline took place between 1929 and 1933 when the implied index of gross national expenditure dropped by 19 per cent (from 115.3 to 93.7) over a four-year period.

The price pattern in the second half of the nineteenth century was one of a fairly steady rise in the 1851–70 period, at 1.96 per cent per annum, followed by a decline over the next three decades of 0.22 per cent per annum. The net effect was a general price level a good deal higher at the end of the nineteenth century than at the middle of the century. The over-all increase for the period as a whole was 35 per cent, an average annual rate of 0.62 per cent. Not even the great depression of the nineteenth century was able to hold back price increases over the period as a whole; it did, however, succeed in slowing down the rate of increase over this fifty-year period.[8]

The Development of Manufacturing

The growth of manufacturing in the period 1851–1900 shown in Table 4 is sufficiently large to warrant closer examination. At the beginning of the second half of the nineteenth century Canada possessed only the rudiments of a manufacturing industry. Eastern Canada had a sizable number of specialized workshops, usually adjoining or in the owner's residence, where manufacturing processes were conducted; but the shops were almost invariably small and the operations were done by hand. The colonies of Canada (Ontario and Quebec), New Brunswick, and Nova Scotia also possessed fairly well-developed flour, grist, and lumber milling industries which usually employed water or wind power, while wooden shipbuilding operations had advanced to a high degree in Quebec and New Brunswick. However, with the possible

[8] On the basis of the general wholesale price index, the decline in prices during the great depression is considerably greater: from 1873 (the high point) to 1896 (the low point), from 90.9 to 55.9 (base of index 1935–39 = 100), a total decline of 38¼ per cent and an annual average rate of decline of 2.09 per cent (compound). It bears emphasis, however, that the changes in the wholesale price index overstate fluctuations in the general price level applicable to economic activity as a whole. For example, from 1870 to 1900 the implied price index of gross national expenditure declined by 6 per cent, while the wholesale price index dropped by 22 per cent. Similar differences are indicated for more recent periods of protracted price declines. Between 1929 and 1933, the implied price index in gross national expenditure declined 19 per cent compared with a 30 per cent decline for the wholesale price index. (For data see *Prices and Price Indexes*, Dominion Bureau of Statistics, March 1952; *National Accounts Income and Expenditure, 1926–1950*, Ottawa, Queen's Printer, 1951; and Firestone, *op. cit.*)

TABLE 5

Population and the Labor Force, Selected Years, 1851–1900

	1851	*1860*	*1870*	*1880*	*1890*	*1900*
	(thousands of persons)					
Population	2,483	3,263	3,673	4,308	4,820	5,356
Civilian labor force:						
Employed	694	952	1,119	1,343	1,590	1,781
Unemployed	29	40	47	86	84	74
Total	723	992	1,166	1,429	1,674	1,855
Armed forces					1	6
Total labor force	723	992	1,166	1,429	1,675	1,861
	(persons per thousands of population)					
Labor force	291.2	304.0	317.5	331.7	347.5	347.5

The data are as of December 31.

TABLE 6

Persons Working, by Industry, Selected Years, 1851–1901
(thousands of persons)

	1851	*1860*	*1871*	*1881*	*1891*	*1901*
Primary industries:						
Agriculture	378	514	566	662	735	717
Fishing and trapping				29	30	27
Mining				7	16	29
Forest operations				8	13	17
Total				706	794	790
Secondary industries:						
Manufacturing	84	112	148	190	260	309
Construction				215	163	188
Total				405	423	497
Service or tertiary industries	102	151	192	267	389	496
Total, all industries	694[a]	952[a]	1,130[a]	1,378	1,606	1,783

[a] Includes persons working in industries for which details are not shown.

The figures cover gainfully occupied persons as reported for the census years. The data are as of January 1852 for 1851 and as of April 1 for the other years.

exception of the last, the country's manufacturing industries of the 1851 era were small-scale, catering to the needs of the immediate vicinity. Most of the work was custom or repair, and steam power was rarely employed. Moreover, in the more remote areas and in many rural sections of the more settled parts of the country, the individual households were largely self-supporting, producing most of their primary articles of food, clothing, and building materials at home.

The industrial revolution in Canada did not come until the 1860's and 1870's, when the factory system was introduced. Even at the close of the nineteenth century, there were still a large number of small-scale establishments of the home workshop type in operation. In 1890 only 14,000 out of Canada's 76,000 manufacturing establishments had five or more employees, and there were only 15,000 such plants in 1900.

While the 1870 census disclosed that Canada had made considerable progress in developing a manufacturing industry, most of the operations were devoted to the production of the simpler type of goods such as prepared foodstuffs, lumber and leather products, clothing, and beer and liquor. With a few exceptions, such as sawn lumber and flour, manufactures were intended for sale in the immediate locality. There was still no sign of production for a provincial or national market, and most of the more highly manufactured items the country needed were imported. In fact, over the entire half century the Canadian manufacturing industry does not appear to have made as much progress as did that of such other countries as the United States, Great Britain, and Germany. Among the reasons for the lag were (1) the lack of tariff to protect the Canadian infant industry in the earlier period from British and American goods, (2) the limited Canadian market itself and the great distance that separated its parts, (3) the Reciprocity Treaty and other developments which encouraged Canadians to concentrate on producing natural resource products for export in return for imports of manufactured items, and (4) the highly unsettled economic conditions that prevailed from 1873 to 1896 and offset to some extent the encouragement offered by a more protected domestic market as a result of the national policy from 1879 onward. But the domestic market grew, and toward the end of the nineteenth century it provided new stimulus to Canadian industry.

Export of manufactured products, while important for certain key industries, was not a major factor of industrial expansion as a whole in Canada. In 1900, for example, more than four-fifths of the output of Canadian manufacturing industry was sold in Canada, with about three-quarters of the country's total needs for manufactures being met by the domestic industry (production was $584 million of which $104 million was exported, while imports were valued at about $134 million).

INCREASED IMPORTANCE OF THE MANUFACTURING INDUSTRY

Growing Output and Employment

In 1900 Canada's manufacturing industry produced goods with a gross value of $584 million, about seven times the 1851 output. In volume terms, that is, after allowing for the slight increase in prices that took place during this period, the gain was somewhat less, the constant dollar figure in 1900 being about $6\frac{1}{4}$ times that of the earlier year, representing an average annual gain of 3.82 per cent per year. Over the period the number of persons employed in the manufacturing industry increased from 84,000 to 309,000, or by 268 per cent, and the proportion of Canada's persons working in manufacturing rose from 12 per cent in 1851 to 17 per cent in 1900 (see Tables 6 and 7).

TABLE 7

Number of Establishments and of Employees, and Gross Value of Production and Value of Fixed Capital, in Current and 1935–39 Dollars, Manufacturing Industries, Selected Years, 1851–1900

(dollar figures in millions)

	1851	*1860*	*1870*	*1880*	*1890*	*1900*
Establishments (thousands)			43	50	76[a]	15[b]
Employees (thousands)	84	112	148	190	260	309
Gross value of production:[c]						
Current dollars	82	126	234	310	470	584
1935–39 dollars	149	174	293	432	700	936
Value of fixed capital:[d]						
Current dollars			40	81	173	254
1935–39 dollars			65	129	289	422

[a] Includes 14,000 establishments having five or more employees.

[b] Covers only establishments with five or more employees.

[c] Manufacturing as defined in decennial censuses through 1900 includes certain construction work, hand trades, custom work, and repair. Central electric stations are also included in 1890 and 1900.

[d] Covers the value of plant, equipment, and land used for industrial purposes.

The increases in manufacturing output and employment vary somewhat in the three subperiods into which the second half of the nineteenth century has been divided in this study. This was the pattern—a more rapid expansion in the first period as the factory system was introduced; a somewhat reduced rate of expansion but still very significant in the second period as some of the results of the national tariff policy made themselves felt; and further lessening of the rate of expansion in the third period, as Canada's manufacturing industry endeavoured to consolidate the gains made in the previous two periods and prepared to

make use of new technological developments, particularly the use of electric power and new methods of processing indigenous raw materials. Thus, between 1851 and 1870 the gross value of manufacturing production rose by 185 per cent in value and by 97 per cent in volume (constant dollar terms), while the number of persons employed grew by 76 per cent. Between 1870 and 1890 manufacturing output doubled in value, indicating a gain of 139 per cent in real terms as prices declined, while employment again increased by 76 per cent. In the final period, 1890–1900, production rose by one-quarter in value terms and by one-third in volume terms, while employment increased by about one-fifth.

Increased Output per Worker

In 1900 the average worker in the manufacturing industry turned out goods valued at $1,890, almost double the $976 worth he produced in 1851. In real terms the gain in output was about three-quarters, representing an average annual increase of 1.10 per cent over the entire period. The actual gain in productivity, that is, in real output per man-hour, was undoubtedly greater, since the number of hours worked per year in the manufacturing industry is believed to have declined fairly substantially over this period (by about one-eighth between 1870 and 1900 when the length of the average workweek in manufacturing was reduced from approximately 64 hours to 56½ hours). Indeed, as Table 8 shows, real output per wage earner per hour slightly more than doubled over the thirty-year period.

The largest gain in real output per employee per year appears to have been achieved in the middle subperiod, the increase between 1870 and 1890 being about 36 per cent, indicating an average gain of 1.55 per cent per year. The comparable figures are 12 per cent (0.58 per cent per year), 1851–70; and 12.5 per cent (1.18 per cent per year), 1890–1900. One of the factors that contributed to this contrast was the stimulation furnished by the tariffs imposed under the national policy between 1879 and 1887, a move which provided a wider domestic market for Canada's manufactured goods. Another was the effect of the factory system which had been introduced into Canada in the first subperiod and which was beginning to show results in terms of increased productivity in the second. A third reason was the change in the industry mix and growing industrial diversification, as greater emphasis was placed on a higher degree of manufacturing in Canada. A fourth factor of importance was the growing mechanization of Canadian industry and increased capital investment.

Growing Capital Requirements

While data on the capital employed in manufacturing operations in Canada are not available before 1870, a sharply upward trend is

TABLE 8

Gross Value of Production and Value of Fixed Capital, in Current and 1935–39 Dollars, per Establishment, per Person Working, per Wage Earner, and per $1,000 Output, Manufacturing Industries, Selected Years, 1851–1900

	1851	*1860*	*1870*	*1880*	*1890*	*1900*
Gross Value of Production						
Per establishment:						
Current dollars			5,000	6,000	6,000	[a]
1935–39 dollars			7,000	8,000	9,000	[a]
Per person working per year:						
Current dollars	976	1,125	1,581	1,632	1,808	1,890
1935–39 dollars	1,774	1,554	1,980	2,274	2,692	3,029
Per wage earner per hour:						
Current dollars			0.48		0.59	0.76
1935–39 dollars			0.60		0.88	1.23
Value of Fixed Capital						
Per establishment:						
Current dollars			1	2	2	[a]
1935–39 dollars			2	3	4	[a]
Per person working:						
Current dollars			270	426	665	822
1935–39 dollars			439	679	1,112	1,365
Per $1,000 output:						
Current dollars			171	261	368	435
1935–39 dollars			222	299	413	451

[a] Not available because the number of establishments given in the 1901 census covers only those with five or more employees.

apparent in the last thirty years of the nineteenth century. The total fixed capital employed in manufacturing jumped from about $40 million in 1870 to $254 million in 1900, a 535 per cent increase. After allowing for the slight decline that took place in the price of capital goods (the substantial reduction in the costs of machinery was largely outweighed by increased construction costs), the gain in real terms was 549 per cent. The increase in the total fixed capital invested in manufacturing took place much more rapidly in the 1870–90 period than in the 1890–1900 decade, increasing at an average annual rate of 7.74 per cent over the first two decades and 3.86 per cent for the final decade, indicating again that Canadian manufacturing industries underwent a period of consolidation toward the end of the nineteenth century.

The increases shown in fixed capital in real terms required per employee and per unit of output over the 1870–1900 period are impressive also (Table 8). The amount of real capital invested per worker in the manufacturing industry more than tripled, rising from $439 in 1870

to $1,365 in 1900. As in the case of the total capital invested, the bulk of the increase in requirements per worker took place in the 1870–90 period, the increase being at an average annual rate of 4.71 per cent, almost double that of the final decade, when the gain was 2.07 per cent annually (Table 9). In relation to real output, about twice as much real

TABLE 9

Percentage Increase in Selected Items Reflecting the Growth of Manufacturing Industries, Selected Periods, 1851–1900

	1851–70	*1870–90*	*1890–1900*	*1851–1900*
Gross value of production in 1935–39 dollars:				
Over the period	96.6	138.9	33.7	528.2
Annual average[a]	3.62	4.45	2.95	3.82
Value of fixed capital in 1935–39 dollars:				
Over the period		344.6	46.0	
Annual average[a]		7.74	3.86	
Number of persons working:				
Over the period	76.2	75.7	18.8	267.9
Annual average[a]	3.03	2.86	1.74	2.70
Gross value of production in 1935–39 dollars per person working:				
Over the period	11.6	36.0	12.5	70.7
Annual average[a]	0.58	1.55	1.18	1.10
Value of fixed capital in 1935–39 dollars per person working:				
Over the period		151.0	22.8	
Annual average[a]		4.71	2.07	
Value of fixed capital in 1935–39 dollars per $1,000 output:				
Over the period		85.2	9.2	
Annual average[a]		3.13	0.88	

[a] Compound rates.

fixed capital was required by the Canadian manufacturing industry in 1900 as in 1870. In 1900 an investment of $451 in 1935–39 dollars was needed to produce goods worth $1,000 in 1935–39 prices, compared with an investment of $222 in 1870—an average annual increase in capital requirements of 2.39 per cent. This increase in capital requirements per unit of output did not take place evenly or uniformly either. The largest increase is indicated for the first two decades, 1870–90, an annual rate of 3.13 per cent, compared with the yearly rate of increase of 0.88 per cent shown for the following decade.

Value Added by Manufacturing

Manufacturing's contribution to Canada's gross national product was $223 million in 1900, about 7 times the 1851 figure, in current dollar terms, and about 6⅓ times, in constant dollars (Table 10). The larger gains appear to have been achieved after 1880, notably

TABLE 10

Value Added by Manufacturing, in Current and 1935–39 Dollars, Selected Years, 1851–1900

	1851	*1860*	*1870*	*1880*	*1890*	*1900*
Total value added (millions):						
Current dollars	31	48	87	110	189	223
1935–39 dollars	56	66	109	153	282	357
Value added per person working:						
Current dollars	369	429	588	579	727	722
1935–39 dollars	667	589	736	805	1,085	1,155
Value added as percentage of gross national product	18.3	15.0	19.0	18.9	23.5	20.8

in the 1880–90 decade when the increase in real terms was about four-fifths. Over the 1851–70 period the value added by the manufacturing industry increased by about one and four-fifths times in current dollar terms and by about 95 per cent in constant dollars. Between 1870 and 1890 the gain was 117 per cent in value and 159 per cent in volume, while in the final decade, 1890–1900, the increases were about 18 per cent and 27 per cent, respectively.

Substantial gains were also achieved in the real value added by manufacturing per employee. In 1900 the value added in constant dollars per person working in the manufacturing industry was about 73 per cent higher than a half century earlier. By subperiods, the increases in real terms were 10 per cent, 47 per cent, and 6½ per cent respectively, for 1851–70, 1870–90 and 1890–1900. However, the gains indicated for the value added in real terms per working person did not keep pace with those achieved in the whole economy (gross national product in real terms per working person) over the whole period (80 per cent, 1851–1900) or in either the first subperiod (17 per cent, 1851–70) or the third subperiod (22½ per cent, 1890–1900). Only in the middle period did the average worker in manufacturing increase his contribution to real gross national product more than the average worker in all industries.

In an industrial revolution manufacturing is usually considered to be the leading sector in productivity increases. That this was not the case in Canada in the second half of the nineteenth century is due to a number

of factors. In the first place, the benefits of the industrial revolution were greatly reduced because it came during a world-wide depression, which affected Canada in many respects. Secondly, industrial development, particularly in the earlier period, continued to be concentrated in many small plants (though the situation was somewhat improved by the end of the nineteenth century). This was caused partly by the limitations of the domestic market, and partly by lack of adequate capital and difficulties in acquiring the necessary managerial skills and technical knowledge.

On the other hand, changes in agricultural methods and the shift of emphasis to agricultural products such as wheat, more suitable for mass production, were responsible for achieving major productivity increases in this sector. Significant productivity increases were also recorded in the service sector (though only slightly above the rate of increase in manufacturing), mainly as a result of the introduction of modern means of transportation and communication and a substantial expansion of services in urban communities, which grew at a considerably faster rate than those in the rural areas.

This pattern is illustrated by the varying rates of increase for the different sectors in terms of the annual average rate of real net value added per working person for the 1851–1900 period as a whole: manufacturing, 1.13 per cent; agriculture, 1.55 per cent; service sector, 1.17 per cent; all sectors, 1.20 per cent.

The fluctuations in value added by the manufacturing industry, as a proportion of gross national product, ranged between a low of 15 per cent in 1860 (when two major manufacturing industries, flour milling and sawmilling, were depressed) and 23½ per cent in 1890 (when the manufacturing industry was prospering under the full protection of the national policy). The variations in manufacturing's contribution are small for the other four decennial years: 18 per cent in 1851, 19 per cent in both 1870 and 1880, and 21 per cent in 1900 (Table 10).

CHANGING STRUCTURE OF THE MANUFACTURING INDUSTRY

Pioneering Stage

A new country in its first stage of development normally concentrates its economic efforts upon obtaining a sufficient surplus of natural resource products which it can export in raw or semiprocessed form in return for manufactured goods. In this pioneering stage of development —when the country is being settled—only the simpler types of manufacturing are carried on to process natural products for export and to serve the more urgent needs of the community for the bare necessities of life: food, clothing, and shelter. The home-building industry usually enjoys a price advantage, since the raw materials and finished products

it uses are bulky and weighty, and transportation costs of imported items of this nature are correspondingly high.

The Canadian manufacturing industry appears to have been at this stage of development at the middle of the nineteenth century. As Table 11 shows, the two most important branches of manufacturing in that year were concerned with processing wheat into flour and logs into lumber, mainly for the export market, and six others out of the ten leading branches were engaged in the small-scale production of the

TABLE 11

Ten Leading Industries, by Value of Output, Selected Years, 1851–1900
(dollar figures in millions)

	Gross Value of Production ($)	(% of total)		*Gross Value of Production* ($)	(% of total)
1851[a]			1890		
Flour and grist mill products	24	31.1	Log products	54	11.5
Log products	10	13.0	Flour and grist mill products	52	11.1
Shipbuilding	7	9.1	Clothing	34	7.2
Boots and shoes	5	6.5	Boots and shoes	19	4.0
Carding, pulling, and woollens	4	5.2	Foundry products	17	3.6
Tanned leather	2	2.6	Bread, biscuits, and confectionery	15	3.2
Carriages and wagons	2	2.6	Lumber products	15	3.2
Alcoholic beverages	1	1.3	Refined sugar	12	2.6
Foundry products	1	1.3	Tanned leather	12	2.6
Furniture	1	1.3	Butter and cheese	11	2.3
Total	57	74.0	Total	241	51.3
Total, all manufacturing industries	77	100.0	Total, all manufacturing industries	470	100.0
1870[a]			1900		
Flour and grist mill products	39	17.6	Log products	59	10.1
Log products	31	14.0	Flour and grist mill products	54	9.3
Boots and shoes	16	7.2	Slaughtering and meat packing	30	5.1
Clothing	12	5.4	Butter and cheese	29	5.0
Tanned leather	9	4.1	Boots and shoes	28	4.8
Foundry products	7	3.1	Clothing	22	3.8
Alcoholic beverages	6	2.7	Bread, biscuits, and confectionery	21	3.6
Woolen goods	6	2.7	Foundry products	16	2.7
Carriages and wagons	5	2.2	Tanned leather	14	2.4
Shipbuilding	4	1.8	Refined sugar	13	2.2
Total	135	60.8	Total	286	49.0
Total, all manufacturing industries	222	100.0	Total, all manufacturing industries	584	100.0

[a] For four provinces only.

simpler types of manufactures for the local market: boots and shoes, cloth, leather, alcoholic beverages, foundry products, and furniture. Only the wooden shipbuilding industry, which had reached a high state of development in Quebec and New Brunswick by this time, and possibly the carriage and wagon production industry can be considered as somewhat more advanced, and these accounted for only about one-tenth of the gross value of the whole manufacturing industry.

The broadening of Canada's manufacturing industry base and its increased diversification is evident from the fact that in 1851 the leading ten branches of manufacturing were responsible for almost three-quarters of the industry's total output in that year. The share of the gross value of manufacturing production accounted for by the leading ten declined successively from 74 per cent in 1851 to 61 per cent in 1870, to 51 per cent in 1890, and to 49 per cent in 1900.

The uneven development of the 1851 manufacturing industry is evident in the preponderant role played by flour milling. In that year the flour and grist mills were responsible for 31 per cent of the value of the output of all of Canada's manufacturing—a proportion not even approached by any other single branch in 1870, 1890, or 1900 (the next highest is 18 per cent in 1870, for flour milling also). The vulnerability of the Canadian manufacturing industry because of its dependence upon one or two branches in these early days is apparent in the data for 1860, when the output of flour milling fell to $21 million (from $24 million in 1851), and its share of the gross value of production declined to 18 per cent from the 31 per cent it had contributed in 1851. However, flour milling was still Canada's most important industry in 1860, and it remained so in both 1870 and 1880. In 1890 and 1900 it was surpassed by the log products industry, which had held second place in 1851, 1860, 1870, and 1880.

Shift to Consumer Goods Industries

Among the changes in the structure of the manufacturing industry that took place in the second half of the nineteenth century was the decline of wooden shipbuilding which reached its peak in Canada about 1865 and declined rapidly thereafter as steel ships came into service. As a result the share accounted for by shipbuilding fell from 9 per cent of the gross value of production in 1851 to $\frac{1}{3}$ of 1 per cent in 1900.

The improvements in the standard of living and the changes in Canadian life in this half-century are reflected in the changed pattern of the manufacturing industry and in the relative importance of its various branches. In 1890, bread and confections, refined sugar, and butter and cheese all made their first appearance among the ten leading manufactures, by value of output. In 1900 the slaughtering and meat packing industry, which had ranked nineteenth in 1890, held third place, and

butter and cheese production had replaced boots and shoes in fourth place. The increased urbanization of the population created larger markets for these factory-made consumer products, and the increased real output (and income) per capita provided the means to meet these increased demands.

GROWING SIZE OF PLANTS AND RUDIMENTS OF MASS PRODUCTION

Another indication of the progress achieved by the manufacturing industry in Canada is development of larger-sized plants which could carry out manufacturing operations more efficiently and could employ through increased use of machinery and equipment and improved plant layouts the rudiments of mass production techniques. By 1900, for example, there were 430 plants which had an output of $200,000, or more, in that year. The aggregate output of these plants, $212 million, was equivalent to about 36 per cent of that of the whole Canadian manufacturing industry.

Of these 430 plants, 323 produced goods valued at between $200,000 and $500,000; their combined output was $94.5 million—an average of $293,000 per establishment. Included also were 68 plants whose annual production was between $500,000 and $1 million each. Their aggregate output of about $46.5 million indicates a plant average of $687,000. Thirty-nine establishments had a product between $1 million and $5 million with a total output of $71 million yielding an average of $1.8 million for each plant. Among the plants with gross value of production of $1 million or over were four sugar refineries with a combined output of $12.5 million, three flour mills with an aggregate value of production of $6.3 million, eight slaughtering and meat packing establishments which together turned out products valued at over $14 million, three plants producing a total of $4.7 million worth of cotton products, and three log product mills with a combined output of some $4.3 million.

Despite the substantial progress made during the second half of the nineteenth century in developing a sizable and diversified manufacturing industry, at the end of the century the Canadian industry was far from the industrial stage reached in other more advanced countries such as Britain, the United States, and Germany. A primary iron and steel industry was lacking, the other metals and the chemical industry were only in the initial stage of development, and advanced manufacturing operations covering final fabrication of both consumer and capital goods were still relatively unimportant. Yet industrial change was accelerating in Canada, modern factories were being erected, and experienced management and a trained labor force were being acquired. These factors combined to provide the framework for the great expansion in manufacturing operations that was to come in the first half of the twentieth century.

APPENDIX

Sources of Basic Data and Methods of Preparing Estimates

The following notes give a brief explanation of the sources and methods of estimation used in obtaining the data for 1851 and 1860 only. All the figures from 1870 on were taken from my earlier study, where the sources of the data and the methods of estimation for the 1870–1900 figures are stated in considerable detail.[9]

The new estimates presented here for the period before 1870 are primarily based on the censuses, the journals of assembly, and the trade and navigation returns of the individual provinces for the years in question. A large part of this material has been summarized in volumes 4 and 5 of the *Census of Canada, 1870–71*, as well as in various volumes of the *Yearbook and Almanac of British North America (or Canada)* between 1851 and 1872.

In many cases, the data available for 1851 and 1860 are quite fragmentary and of questionable quality and coverage. Referring to the 1861 census returns, Arthur Harvey wrote:[10]

> In truth, however, it must be remembered that the census of 1861, at least for Quebec and Ontario, was lamentably faulty. The writer has official experience of the great difficulty of completing accurately any great work of the kind, while the subordinate compilers throughout are untrained, inaccurate, perhaps careless—if not worse—and is, therefore, predisposed to look on it with a lenient eye; but the fact is, the census of 1861 is a monument of incapacity on the part of all concerned in its preparation.

Consequently, where some of the data appeared seriously unreliable or subject to undercoverage or omissions, a certain amount of estimation was necessary. In addition, certain adjustments were required to make the figures comparable with those available after 1870. For the sake of consistency, the methods of estimation and adjustment followed as closely as possible the same pattern as those outlined in *Canada's Economic Development, 1867–1953*.

The data available for 1851 and 1860 cover only four provinces, Ontario, Quebec, New Brunswick, and Nova Scotia, and, to a limited extent, Prince Edward Island. The figures were adjusted on a population basis to include all the territory that was to become Canada after confederation. Hence, unless otherwise specified, the whole of present-day Canada is covered (except Newfoundland, which joined Canada in 1949). Other methods of estimation and sources of the data are described briefly below.

[9] *Canada's Economic Development, 1867–1953*.

[10] *The Yearbook and Almanac of Canada for 1870*, Arthur Harvey, ed., John Lowes & Co., Montreal, 1870, p. 14.

It bears emphasis that the estimates for the early period of Canada's economic history had to be based on data that had been collected for purposes other than those which they have been made to serve. In addition, the estimates had to be fitted to modern concepts of statistical economic analysis as far as possible. In some cases, they reflect quantitative judgments as to what economic changes might have taken place during this period in the light of historical and economic events. However, the judgments made by other investigators may well differ from mine, and thus the estimates presented here represent an invitation to other scholars to further increase the scant knowledge—supported by aggregative economic data and modern methods of analysis—of Canada's economic developments in the earlier period of its economic history.

TABLE 1

Data are based on Tables 4 and 5. Official price indexes for years before 1867 are not available. The Dominion Bureau of Statistics has published historical series of general wholesale price indexes beginning with 1867 (*Price and Price Indexes, 1949–1952*, p. 14). These have 1935–39 as the base period. To arrive at estimates of the general wholesale price indexes for 1851 and 1860 on a similar base period, Taylor's and Michell's index numbers were used.[11] These numbers were linked to the Dominion Bureau of Statistics series at 1867 and converted to a 1935–39 base.

The implicit price indexes shown in this table for 1851 and 1860 were obtained by applying the close relationship which was found to exist between the implicit and general wholesale price indexes. In 1867, the implicit price index was 75.7 per cent of the general wholesale price index level. This percentage was then used to calculate the implicit price indexes for 1851 and 1860 from the wholesale price indexes obtained for those years.

TABLE 2

Percentage changes are based on Table 1.

TABLES 3 AND 4

The notes to these tables cover separately the components of each sector, as given in Table 4.

Agriculture

The censuses of 1851 and 1860 give only the quantities of the various agricultural products produced in those years. Some minor estimations

[11] K. W. Taylor and H. Michell, *Statistical Contributions to Canadian Economic History*, Toronto, Macmillan Company of Canada, 1931, Vol. II, p. 55.

and adjustments of these figures were required to take account of omissions and undercoverage. Data on field crop production, except for minor omissions, are given in these censuses. For animals products, where omission or understatement was apparent, estimates were based on the given livestock data.

The value figures were arrived at by applying the average prices for the census years as published in *Statistical Contributions to Canadian Economic History* (pp. 58–62), the *Census of the Canadas for 1851–52* (Vol. 1, pp. xxvi–xxvii), and the provincial journals of assembly, to the total quantities of the various agricultural products produced.

For net value added by agriculture, which is required to build up the gross national product, duplications had to be eliminated by deducting from the value of output the value of materials consumed in the production process. The methods used were similar to those employed in preparing the estimates from 1870 onwards, that is, an average of 29.3 per cent was deducted to cover the value of seed, feed grain, fodder, milk, and so forth, used up in the production process. Also, estimated blacksmithing and other minor costs were deducted.

Fishing and Trapping

Figures on the value of fisheries products were obtained from the provincial censuses and from the data given in the *Yearbook and Almanac of British North America for 1867* (p. 18). These figures cover the total value of fish marketed, whether in a fresh, dried, cured, canned, or other prepared state. To exclude this value added by processing or manufacturing, which was later transferred to the manufacturing component, the data were adjusted by the same method employed for data after 1870. In other words, the value of the fish landed was taken to be an average of 63.7 per cent of the total value of fisheries.

Figures on trapping are not available for 1851 and 1860. Estimates were based on the relationship between the value of furs produced by the various provinces as given in the censuses of 1881, 1891, and 1901 and the value of furs exported in those years as given in the appropriate trade and navigation returns. This relationship was applied to the value of furs exported in 1851 and 1860 to obtain the value of trapping for those two years.

Mining

Data on mineral production are from the provincial censuses, except for the data for coal production in Nova Scotia which are given in the *Yearbook and Almanac of British North America for 1867* (p. 46). Value figures, which were not given in the censuses, were prepared by applying prices obtained from the journals of assembly to the quantities as recorded in the censuses. Since the value of mineral production was

quite small in these early years, no attempt was made to adjust these figures to conform to the primary mining production concept.

Forest Operations

Production data for this component are not available for 1851 and 1860. The methods of estimation were similar to those employed and outlined for the data from 1870 on. The values of square timber exported in the census years were taken as the values of square timber produced. The values of saw logs were obtained by taking 43 per cent of the output value of sawmills for those years. This proportion was found to be the cost of materials used by the sawmills as reported in the 1861 censuses for Ontario and Quebec.

The amount of firewood produced was estimated on the basis of the average number of cords produced per family as calculated from the 1871 and 1881 censuses. Figures thus derived for 1851 and 1860 were then valued with the appropriate prices of firewood as calculated from exports of this product given in the trade and navigation reports. Production values of other forestry products such as masts, spars, tanning bark, railroad ties, etc., were estimated on the basis of their export values.

Manufacturing

The gross value of manufacturing production figures are based on the census data of the individual provinces. In most cases, the coverage of output data of the various branches of the manufacturing industry are incomplete since not all firms made full returns. These data were adjusted for full coverage on the basis of the average output per worker as calculated from the returns of the reporting firms. Where no figures of employment were given, adjustments for full coverage had to be made on the basis of the average output per firm.

In this way, figures of the total output value for a sample of the eighteen leading branches in 1851 and 1860 were arrived at. The output values for the same sample of industries in 1870, 1880, and 1890 were then obtained from the censuses, and the proportions which these eighteen contributed to the total output of all industries were calculated. By extrapolating the indicated trend of these calculations, it was estimated that the samples comprised some 71 and 78 per cent of the total value of manufacturing output for 1860 and 1851, respectively. These proportions were used to estimate the total output value figures which were then adjusted to include all of Canada.

To obtain the figures for net value added by the manufacturing component, the costs of items such as fuel, materials, supplies, certain services, and so forth, has to be deducted from the gross value of production data. Here again, the same methods as outlined in my earlier

study were followed. Deductions of 56.4 per cent of the gross value were made for the cost of materials, 1 per cent for fuel, and 5 per cent for other duplications.

Construction

The method used was to build up the value of construction on the basis of domestic disappearance of building materials in Canada, plus an allowance for on-site work, overhead, and profits of the building industry, and the net value added by construction done by owners. Briefly, the values of construction materials available for use in Canada were arrived at by calculating the total values of domestic production, imports, and freight charges on these items, less the values of exports and the flow of construction materials to nonconstruction uses. Data on production and on exports and imports of building materials were obtained from the provincial censuses for 1851–52 and 1861 and from trade and navigation returns for the same years. Adjustments were made for undercoverage and noncoverage of building materials consumed and for materials flowing to nonconstruction uses. Allowance was then made for the value of work added to the value of building materials to arrive at a gross value of total construction—that is, new construction as well as repairs and maintenance. Finally, the net value added by new construction was estimated using the experiences of later years for which more detailed records were available. (For a description of methods of estimation, see notes to Table 89 in Part III, Section 11, *Canada's Economic Development, 1867–1953.*)

Other Sectors

This portion, which is shown only as an adjusted total in Table 4, is also shown by item in Table 3. This total comprises rent, net interest and dividends received and paid abroad, and indirect taxes less subsidies.

RENT. Industrial and commercial rents are implicitly included in their appropriate sectors. This item then, covers the residential rent not elsewhere included, less certain deductions. Data were based on estimates of the gross expenditure on residential rent obtained by methods outlined in the study covering 1870 and later years. Figures were adjusted to exclude rent paid by farm tenants, which is implicitly included in the agriculture totals. Twenty per cent was then deducted from the remainder to eliminate such duplications as the cost of materials used in the repair and maintenance of dwellings, fuel, light, and so forth, when they are part of the rental agreement, mortgage interests, and so forth. The remaining portion of this component is made up of expenditures for taxes, depreciation, repairs and maintenance, labor, and net rental income.

NET INTEREST AND DIVIDENDS RECEIVED AND PAID ABROAD. Data are from the appropriate provincial journals of assembly.

INDIRECT TAXES LESS SUBSIDIES. Data pertaining to indirect taxes were obtained from the provincial journals of assembly and consist of customs duties and various excise taxes levied by the provincial governments for the census years.

While some subsidies were paid by the provincial governments in 1851 and 1860, particularly in the form of fishing bounties, their totals were so small for those years that they were not included.

TABLE 5

Population

Figures were taken from the provincial censuses. Estimates of the population for the rest of Canada are based on data given in the *Yearbook and Almanac of Canada for 1870* (p. 14) and the *Seventh Census of Canada, 1931* (pp. 348–350). The census data in 1851 relate to the end of the year; for 1860, they relate to the beginning of April of the following year. The latter figures were converted to a year-end basis by linear interpolation to make them comparable with other years.

The numbers of gainfully employed persons as reported in the provincial censuses appear to be seriously understated in the light of the data in later years. The estimates of the total labor force were arrived at by extending back to 1851 the ratio of persons in the labor force to total population trend which prevailed between 1870 and 1890. Estimates of the number of unemployed were based on impressions of the degree of employment existing in those years, obtained by appraising various indicators of economic activity and descriptive material commenting on the state of the economy at that time.

TABLE 6

Data for the total number of persons working are from Table 5. To obtain the number of persons working by industry, special compilations were made from the number of workers in the various occupations as reported in the censuses. To distribute the numerous unclassified laborers of those years, a similar compilation of workers in the different occupations was made from the census report of 1870. This indicated that some 55 per cent of the unclassified workers were farm laborers, 5 per cent were laborers employed in manufacturing, and the remainder were laborers in the construction industry. The "unclassified" totals for 1851 and 1860 were then distributed accordingly.

TABLE 7

Data for the number of establishments are not available for 1851 and 1860. The number of persons working in manufacturing industries was

obtained as explained in the notes to Table 6 and has been adjusted to cover the whole of Canada.

The gross value of manufacturing production in current dollars was obtained by methods explained in the notes to Table 4. The constant dollar figures were obtained by use of the general wholesale price index, which was constructed by the method outlined in the notes to Table 1.

Data for the value of fixed capital in the manufacturing industries for 1851 and 1860 were found to be so scanty and unreliable that no attempt was made to estimate the value for these two years.

TABLE 8

Based on Tables 6 and 7.

TABLE 9

Based on Tables 6, 7, and 8.

TABLE 10

These figures for the census years 1851 and 1860 are based on Tables 1, 4, and 6. The constant dollar values were obtained by application of the general wholesale price index described in the notes to Table 1.

TABLE 11

Output values of the various industries included here for 1851 are taken from the sample of industries prepared from the census data as explained in the notes to Table 4. The total gross value of manufacturing production data are from Table 7.

COMMENT

KENNETH BUCKLEY, University of Saskatchewan

The study by Firestone and his colleagues, T. R. Vout and O. Hickie, is a welcome addition to knowledge of Canada's economic development from 1850 to 1900. Conceived, as it is, within the familiar framework of national accounting, it provides a fresh approach to the history of the period which will both complement and check impressions based upon other approaches. Indeed, with respect to two of its major findings—the high rate of increase in gross national product per capita and per worker and the increase in the price level from 1850 to 1900—Firestone suggests that the measured changes conflict with expectations derived from historical accounts which possibly overemphasized the depression that accompanied the decline in world prices from 1873 to 1896. Another major finding—that the service sector expanded more rapidly than any other—illustrates the way in which the approach may

illumine a development that could be overlooked in a less systematically quantitative investigation.

I cannot agree that the impressions created by the historians' accounts of Canadian economic development in the second half of the nineteenth century need to be and can be corrected by estimates of product per capita and per worker. The economic historians relied heavily upon population trends as an index of economic growth. And looking at Canada's population growth, they were particularly impressed by the fact that net migration was negative for four consecutive decades from 1861 to 1901. The decline went so far that the annual rate of population growth neared zero in the mid-nineties. The population trend justifies the conclusion that Canada was a relatively declining region from the sixties to the nineties. Now, thanks to Firestone's work, we have a measure of the trend in income per capita over the period, but the fact that it shows a considerable rise does not alter the earlier conclusion. Canada was a small, integrated part of a larger international economy. Since there was freedom of movement of population into and out of Canada, in terms of the logic of the staple method used by Canadian historians, one would expect that the secular rate of change in income per capita would be the same in Canada as in the larger economy of which it was a part. This observation may be relevant to the fact that the primary trends of income per capita in Canada, as measured by Firestone, and in the United States, as measured by Kuznets, have virtually the same slope.

The staple method is essentially a theory of regional economic development and is appropriate for new countries that are highly dependent upon trade and external supplies of labor, capital, and techniques. It begins with the resource structure of the country and looks to the rate of growth of employment and investment opportunities to find significant measures of economic growth. Considering the implications of the staple theory on the one hand and the Kuznets–Firestone approach on the other, they seem to lead to the whole question of determining what are the appropriate units (e.g. regions, countries, or the international economy) for the investigation of economic growth. It is clear that if one must accept the country as the unit, no one approach can be everywhere the best. The staple theory may be better for Canada with its dependence on external trade and factor movements, and that of Kuznets may be better for large and relatively closed economies like the United States. But in the application of either, or of any other approach, there is a point of diminishing returns —a point, that is, when an alternative is more efficacious and we benefit by using it.

The problem of getting long-term average rates of change in national product and prices when the reliable measures are limited to single

years at decennial census dates is pointed out in the paper. Since the interest is in primary trends, the chronology of the business cycle is at issue here. It would also be useful if further work using this pioneering venture as its point of departure would take into account the long Kuznets cycle which shows up in Canadian population series, transportation investment, housing, and in other annual economic series, and which is particularly relevant to the challenge raised by Firestone when he questions our conceptions of the character of Canadian growth in the latter nineteenth century.

DUNCAN MCDOUGALL, Purdue University

This paper by O. J. Firestone is an important addition to his pioneering empirical study of the economic development of Canada. Much rethinking will have to be done as a result of his work and I suspect that it will have to be done largely along the lines he has mapped out. Only by such empirical work will the nature of Canadian economic development come clear. Although some of the estimating techniques used by Firestone can be questioned, I do not plan to discuss the data presented except incidentally.

One problem I had while reading this paper was to determine the definition of economic development used. Obviously this definition includes something more than an increase in population and per capita product. This additional component is revealed by the emphasis in the paper given to the progress over the period toward the development of a national economic structure. This addition, however, makes the definition of economic development largely nonquantifiable and leads to a disproportionate emphasis upon industrial diversification. At the same time no account is given of the economic costs resulting from the implementation of the national tariff policy.

This definition raises most questions in relation to the problem of Canadian proximity to the United States. It can be argued that, in terms of the rate of growth of per capita product, proximity to the United States was a definite advantage to Canadian economic development. The disadvantages stem from the attempt to build a Canadian nation. A purely speculative question that could be posed to analyze the question would be: What would be the population and per capita product of the present area of Canada had there been no boundary? The next step would be to ask, what would have resulted had there been a political but no economic boundary (if such is even conceptually possible)? I suspect that the conclusion would be that the attempt to build an independent Canadian economy involved substantial costs. These costs would then presumably be balanced, under the definition used by Firestone, by the benefits (largely unmeasurable) of an independent economy.

The rates of increase of gross national product are impressive over the 1851–1900 period. But Firestone's preoccupation with the tracing of the process of industrialization may have led him to understate the real problems of imputation involved in developing a consistent series over a period of early industrialization. This problem is related to the question of whether the following should be included in an analysis of development: "The Canada of 1900 was a far cry from those little, scattered, and isolated British North American colonies which were to unite a quarter century later." The question raised is, if they are so different can they be compared? If the answer is that there is some demonstrable continuum justifying comparison, then two points follow. The first is that the essential unity rather than the differences should be emphasized; the second, that the imputation problem becomes paramount in the analysis.

The emphasis given in the paper to the development of manufacturing seems quite out of proportion to evidence presented in the data. The industrial distribution of value added shows quite clearly that it was the service or tertiary industries that increased their share more rapidly than any other industrial group. This suggests that the emphasis should be upon commercial rather than upon industrial development. Industrial development is important to the extent that per worker product in manufacturing is above that in non-manufacturing but in Canada, like many dependent economies, economic development seems to have been largely a result of commercialization.

In the nineteenth century Canadian economic development was particularly dependent upon world economic conditions. In particular migration flows played a substantial part. Notice for example the rising labor force participation rate shown in Table 5. But this important aspect of development is mentioned only incidentally. It is not clear, of course, whether the destabilizing effect of the substantial gross migration flows that were a feature of the period were offset by the favorable characteristics of the foreign-born, e.g. higher labor force participation rates than for the native-born. Furthermore, although Canada lost many native-born to the United States this may well have been a "safety-valve" movement. But again, because the border was relatively open to the flow of people and ideas, Canada may well have benefited from the presence of the United States.

REPLY by Mr. Firestone

Buckley is quite right when he points out that the major findings of the study are threefold: (1) the remarkably rapid growth of the Canadian economy in the second half of the nineteenth century, notwithstanding the fact that this period includes the struggling endeavors to establish a new nation in North America and to cope with the effects

of the great depression of the 1870's to the 1890's; (2) the increase in the over-all price level in Canada over this half a century notwithstanding a significant drop in world prices for about a quarter of a century, with this decline abroad affecting the general price level in Canada less than had been thought to be the case; (3) the dynamic growth of the service industries, which expanded more rapidly than any other major sector in the economy (excluding mining).

My colleagues and I have offered some reasons for these developments in our paper. For example, we have explained the comparatively rapid rate of growth of the economy as a whole in the nineteenth century by pointing to the effects of the industrial revolution, the urbanization of the population, the creation of an extensive transportation and communication network, the changing composition of the Canadian economy, and so forth. We feel that a great deal more research is required to explain the varying rates of growth which we have observed in the Canadian economy in the nineteenth century compared with those of the twentieth century. We also believe that it would be helpful to compare economic developments in the United States not only for the *same* period covered for Canada but also an *earlier* period in U.S. economic history which, in terms of the stage of economic development reached, would be more nearly comparable with the situation faced by Canada in the second half of the nineteenth century.

The price trends which we have shown in our paper raise some interesting questions both in terms of their meaning as well as in terms of the data used and the phasing. Available literature on this subject suggests that during the depressed 1870's to 1890's import prices declined drastically while export prices rose moderately. We can confirm this, but we also find that domestic prices moved a good deal more slowly than world prices. Among the reasons are the fact that in this early period of development Canada was a high-cost producer in most fields, with increased protection reducing import competition. The costs of transportation were also high, and showed great resistance to decline because of the large capital expenditures involved in creating the facilities Canada, with her vast distances, required. Prices in the service sector were generally rising, and this offset to some extent the declines which took place in the prices of most commodities.

As to the data used, we point out in the study that the wholesale price index shows much greater fluctuations than the implied price index of gross national expenditure. The latter reflects total economic activity while the wholesale price index is heavily weighted by basic commodities, a substantial proportion of which are exported and are therefore as a rule subject to greater fluctuations. We also encountered some problems in the phasing of our analysis of price trends, and this point is elaborated farther on.

Buckley raises a very interesting question when he sets out some of the differences in methods of analysis between the staple approach and the approach used in this paper which represents a macro-economic approach supplemented by sector and regional analysis. We would like to see more comparative work done, using the results of analysis yielded by the staple approach and those yielded by the macro-economic approach. Presumably, we would require a more comprehensive analysis of economic growth which would bring together the results of a fairly large number of studies of the growth of individual staple industries and their impact on economic development. Buckley also raises the questions: What is an appropriate unit for economic analysis, and what is the most meaningful yardstick of economic growth? We certainly need more regional analysis and sector analysis to answer these questions. As far as method of measurement is concerned, we are a little puzzled as to how some other factors can be measured. We have in mind certain intangible or non-material values which affect economic motivations and hence the rate of economic growth.

In conclusion, I should like to deal with another point which Buckley has raised: the problem of phasing. As we point out in the study, the basic data that could be obtained reflecting economic change in the second half of the nineteenth century are in many cases too crude to enable us to pinpoint turning points of economic change. For example, price data indicate a decline in the general price level after 1873. Some sectors of the economy turned down in 1872, others in 1873. A number of sectors of the economy, however, continued to expand after 1873, yielding a high point in 1874 in terms of the *volume* of gross national product as shown in our annual series.

Similar difficulties are encountered in 1896 and 1897. Prices seem to have reached their lowest point in terms of an annual average in 1896, but monthly data suggest even lower points in the early part of 1897. Our gross national product data in real terms suggest a low point in 1897, but certain sectors of economic activity seem to have reached their low point somewhat earlier, e.g. exports in 1895. The other difficulty we faced is that detailed information is only available for years at decennial intervals, and it is for this reason that we have used the data for 1851, 1860 and then data at ten-year intervals thereafter. We have made the point that this method of analysis understates somewhat the effect of economic fluctuations, but it does provide a fairly reasonable indication of the rate and direction of growth of the Canadian economy.

This conclusion is supported by the following two tests, using annual rates of change (compound) of gross national product per capita in real terms, which we feel is a sensitive indicator of economic growth.

The annual average rate which we have used in this study for the

1851–70 period amounts to 1.26 per cent. The rate of growth from 1851 to 1874 (which in terms of gross national product was a turning point) amounts to 1.23 per cent, or very close to the earlier rate. Similarly, the differences are small if the comparison is made between the rate of annual increase from 1870 to 1900 and from 1874 to 1900, 1.75 per cent and 1.86 per cent.

There is the other point—that a possible bias may be introduced by using single years in any long-term or intermediate-term comparison. One way of trying to minimize this bias is to select years representing a similar phase of the business cycle.

We find this point borne out by Canadian data. For example, we were able to check the rate of annual increase for the period 1870 to 1890 with five-year averages, from 1867–71 to 1896–1900. The average annual rate of increase for this period is 1.80 per cent, again very close to the ratio shown for single years, 1.75 per cent. The disparity between the two rates, however, would grow if, for example, a comparison were made between the five-year averages for 1870–74, and 1900–1904, because the earlier five-year period includes two years of declining economic activity, 1872 and 1873, while economic activity in Canada in the five years commencing in 1900 rose steadily. These examples, we believe, emphasize the necessity in any analysis of long-term economic growth of considering carefully the circumstances of each period when comparing it with another period.

We would like to conclude by expressing our appreciation to the National Bureau for having given us an opportunity to present part of the story of Canadian economic development and to benefit by comments of American scholars.