

FIFTY YEARS
OF CANADIAN PROGRESS
AS ILLUSTRATED BY
OFFICIAL STATISTICS,
1867 TO 1917.

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Fifty Years

Canadian
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FIFTY YEARS OF CANADIAN PROGRESS AS ILLUSTRATED BY
OFFICIAL STATISTICS, 1867 TO 1917.

By ERNEST H. GODFREY, *Dominion Bureau of Statistics, Ottawa.*

[Read before the Royal Statistical Society, Tuesday, November 18, 1919,
the President, The Right Hon. HERBERT SAMUEL, in the Chair.]

In this Paper I propose to submit a statistical description of the progress of Canada during fifty years of existence as a federal union. No comprehensive review of Canadian progress has been laid before the Royal Statistical Society within recent years. In 1888 Mr. J. G. Colmer, C.M.G., then Secretary to the High Commissioner's Office, reviewed certain aspects of Canadian progress in a Paper entitled "Some Canadian Railway and Commercial Statistics,"¹ and in 1884 Mr. Cornelius Walford presented "A Statistical Review of Canada, including its Confederated Provinces"²; but the latter Paper was read before the completion of the Canadian Pacific Railway in 1886, and both Papers were read before the organization of the provinces of Saskatchewan and Alberta in 1905 and twelve and sixteen years, respectively, before the opening of the present century, when began in Canada a progress which proved to be phenomenally rapid and comprehensive.

My subject will cover in greater or less detail, according to the data available, the main departments of Canadian national activity, including especially the acquisition of territory and growth of population, the utilization of natural resources in respect of agriculture, live stock, dairying, forestry, fisheries, minerals and manufactures, the trade movements as represented by exports and

¹ *Journal of the Royal Statistical Society*, vol. li, part i, p. 74.

² *Journal of the Royal Statistical Society*, vol. xlvii, part ii, p. 312.

imports, the development of facilities of transportation and communications, finance, and the records of public education, temperance and criminality.

Historical and geographical.

Before proceeding, however, to discuss in detail the statistics of the fifty years 1867 to 1917, it is advisable very briefly to recall the chief events that led to Confederation in 1867; so that those who may not have followed very closely the development of our Overseas Dominions may better appreciate the circumstances under which the progress to be described has been achieved.

In 1763 Canada, with all its dependencies, passed from French to British rule by the Treaty of Paris, signed on February 10 of that year. From this date to 1774 the country was under military rule. In 1774 the Quebec Act of the Imperial Parliament (14 Geo. III, c. 83) gave French-Canadians the free exercise of the Roman Catholic religion, the enjoyment of their civil rights, and the protection of their own civil laws and customs. The Act annexed large territories to the province of Quebec, and provided for the appointment by the Crown of a Legislative Council and for the administration of the criminal law as in England. In 1791 the country then called Canada was divided by Act of the Imperial Parliament (31 Geo. III, c. 31) into Upper Canada (now Ontario) and Lower Canada (now Quebec), and the Act established a constitution for each, with a Legislature consisting of a Legislative Council and a Legislative Assembly. On December 24, 1814, the Treaty of Ghent ended the two years' war with the United States, and in 1837 a rebellion in Upper and Lower Canada led to the mission of Lord Durham, whose report of January, 1839, recommending "responsible government," paved the way for the complete autonomy which was eventually acquired. In 1841 the two provinces were reunited under the name of the province of Canada by an Imperial Act (3-4 Vict., c. 35), which established responsible government. The Legislature under this Act consisted of a Legislative Council of forty members, appointed for life by the Crown, and a Legislative Assembly of eighty-four members elected by the people. In 1853 the members of the Legislative Assembly were increased in number to 130; and in 1856 the Legislative Council became an elective chamber. In 1860 the Prince of Wales (afterwards King Edward VII) laid the corner stone of the Parliamentary Buildings at Ottawa, and in 1865 the seat of Government of the province of Canada was transferred to Ottawa from Quebec. On June 8, 1866, the Provincial Parliament, on the occasion of its first session in the new buildings, passed resolutions in favour of

Confederation. This was finally accomplished by the British North America Act, 1867 (30-31 Vict., c. 3), which united as the Dominion of Canada the four provinces of Nova Scotia, New Brunswick, Quebec and Ontario, and provided for admission into the Union of other parts of Canada. The Act took effect on July 1, 1867, and the anniversary of this date, known as "Dominion Day," is observed in Canada as a statutory public holiday. In 1870 the new Dominion purchased the territorial rights in Prince Rupert's Land of the Hudson's Bay Company and acquired the rights of government control over the whole of the Northwest Territories.

Areas and political boundaries.

On May 12, 1870, the new province of Manitoba was formed out of Rupert's Land and the Northwest Territories by Act of the Dominion Parliament (33 Vict., c. 3), confirmed by Act of the Imperial Parliament in 1871 (34-35 Vict., c. 28). By Imperial Orders in Council British Columbia and Prince Edward Island, then the largest and smallest of the provinces, situated respectively at the western and eastern limits of the country, were admitted into the Dominion, British Columbia on July 20, 1871, and Prince Edward Island on July 1, 1873. On September 1, 1905, were formed out of the Northwest Territories, by Acts of the Dominion Parliament (4-5 Edw. VII, cc. 3 and 42), the two new provinces of Saskatchewan and Alberta, thus completing a chain of nine autonomous provinces from the Atlantic to the Pacific.

Since Confederation, adjustments of the provincial boundaries have been made by Imperial or Dominion authority, including the settlement of the boundary between Ontario and Manitoba on August 11, 1884, and an extension of the boundaries of Quebec on July 6, 1896. By the Boundary Extension Acts, 1912, of the Dominion Parliament (2 Geo. V, cc. 32, 40 and 45), the provinces of Ontario, Manitoba and Quebec were enlarged by the addition of areas that were previously part of the Northwest Territories. The effect of these Acts was to extend the northern boundary of Manitoba to the 60th parallel of north latitude and the northern boundary of Ontario to the southern shores of Hudson Bay, while to the province of Quebec were added the whole of the territory of Ungava and that part of Labrador which is within the Dominion of Canada. Manitoba thus received 178,100, Ontario 146,400 and Quebec 354,961 square miles of additional territory.

In the accompanying series of six maps are shown the political development of the Dominion of Canada from 1841 to 1917. Map 1 shows the province of Canada consisting of Upper Canada (Ontario)



1.—PROVINCE OF CANADA, 1841-66.



2.—CANADA AT CONFEDERATION IN 1867.
(Ontario, Quebec, Nova Scotia and New Brunswick.)



3.—CANADA IN 1870, SHOWING THE NEW PROVINCE OF MANITOBA AND THE NORTHWEST TERRITORIES AS THEN ORGANIZED.



4.—CANADA IN 1873, SHOWING THE ADDITION OF BRITISH COLUMBIA (1871) AND OF PRINCE EDWARD ISLAND (1873).



5.—CANADA IN 1905, SHOWING THE NEW PROVINCES OF SASKATCHEWAN AND ALBERTA AND THE YUKON TERRITORY.



6.—CANADA IN 1917, SHOWING THE EXTENSION OF BOUNDARIES OF QUEBEC, ONTARIO AND MANITOBA AS EFFECTED IN 1912.

and Lower Canada (Quebec), as existing from 1841 to 1866; Map 2 Canada as at Confederation, consisting only of the four original provinces, Nova Scotia, New Brunswick, Quebec and Ontario; Map 3 the same provinces with the addition of Manitoba and the provisional organization of the Northwest Territories as in 1870; Map 4 the addition of British Columbia in 1871 and of Prince Edward Island in 1873; Map 5 Canada in 1905 with the two new provinces of Saskatchewan and Alberta and the Yukon Territory; and Map 6, Canada as it is to-day, with the boundaries of Quebec, Ontario and Manitoba, enlarged by the Boundary Extension Acts of 1912.

The computed area of the Dominion of Canada, consisting of the nine provinces and of the Northwest and Yukon Territories, is now 3,729,665 square miles, of which 3,603,910 square miles are land and 125,755 square miles are inland waters. It is not easy, even perhaps for statisticians, to grasp the significance of these dimensions; but my purpose being rather to illustrate progress, I would here simply state that the size of the Dominion at Confederation, consisting of the four original provinces as then delimited, did not exceed about 377,000 square miles: so that as a consequence of the political adjustments above described, the Dominion is now nearly ten times larger than it was in 1867.

In Table I is shown by provinces the land and water area of the Dominion as constituted in 1867, as it stood at the beginning of each decade from 1871 to 1911, and as it stood on Dominion Day in 1917.

TABLE I.—*Territorial distribution of Canada, 1867–1917.*

Province.	1867.	1871.	1881.	1891.
	sq. miles.	sq. miles.	sq. miles.	sq. miles.
Prince Edward Island	—	—	2,133	2,000
Nova Scotia	18,660	21,731	20,907	20,550
New Brunswick	27,105	27,322	27,174	28,100
Quebec	210,020	193,355	188,688	227,500
Ontario	121,260	107,780	101,733	219,650
Manitoba	—	14,000	123,200	64,066
Saskatchewan	—	—	—	—
Alberta	—	—	—	—
British Columbia	—	—	341,305	382,300
Yukon Territory	—	—	—	—
Northwest Territories	—	2,465,712	2,665,252	2,371,481
Total	377,045	2,829,900	3,470,392	3,315,647

TABLE I.—*Contd.*

Province	1901.	1911.	1917.
	sq. miles.	sq. miles.	sq. miles.
Prince Edward Island	2,184	2,184	2,184
Nova Scotia	21,428	21,428	21,428
New Brunswick	27,985	27,985	27,985
Quebec	351,873	351,873	706,834
Ontario	260,862	260,862	407,262
Manitoba	73,732	73,732	251,832
Saskatchewan	—	251,700	251,700
Alberta	—	255,285	255,285
British Columbia	372,630	355,855	355,855
Yukon Territory	196,976	207,076	207,076
Northwest Territories	2,437,904	1,921,685	1,242,224
Total	3,745,574	3,729,665	3,729,665

The areas in this table are, for 1871 to 1917, official computations, as given in the Census Reports, and for 1867 they are as recorded in the *Year Book and Almanac of Canada for 1868*. The differences apparent are due partly to differing computations and partly to the territorial changes, the principal of which have been mentioned.

Population and immigration.

It is fitting that these two subjects should be considered together, because Canada as one of the new countries of the world is dependent for increase of its population more upon a constant stream of immigrant settlers than it is upon the natural increase of its native-born.

Table II shows by provinces and territories the population of Canada, as returned by each decennial census from 1871—the first taken since Confederation—to the last decennial census of 1911.

TABLE II.—*Population of Canada by Provinces and Territories in the Census years 1871 to 1911.*

Provinces.	1871.	1881.	1891.	1901.	1911.
Prince Edward Island	94,021	108,891	109,078	103,259	93,728
Nova Scotia	387,800	440,572	450,396	459,574	492,338
New Brunswick	285,594	321,233	321,263	331,120	351,889
Quebec	1,191,516	1,359,027	1,488,535	1,648,898	2,003,232
Ontario	1,620,851	1,926,922	2,114,321	2,182,947	2,523,274
Manitoba	25,228	62,260	152,506	255,211	455,614
Saskatchewan	—	—	—	91,279	492,432
Alberta	—	—	—	73,022	374,963
British Columbia	36,247	49,459	98,173	178,657	392,480
Yukon Territory	—	—	—	27,219	8,512
Northwest Territories	48,000	56,446	98,967	20,129	18,481
Total	3,689,257	4,324,810	4,833,239	5,371,315	7,206,643

TABLE III.—Increase of population of Canada, by Provinces from decade to decade, 1871 to 1911: A. in absolute numbers; B. in percentages.

Provinces.	Population 1871.	A. Increase in absolute numbers.				Population 1911.	Increase 1871 to 1911.
		1871 to 1881.	1881 to 1891.	1891 to 1901.	1901 to 1911.		
Prince Edward Island	94,021	14,870	187	— 5,819	— 9,531	93,728	— 293
Nova Scotia	387,800	52,772	9,824	9,178	32,764	492,338	104,538
New Brunswick	285,594	35,639	30	9,857	20,769	351,889	66,295
Quebec	1,191,516	167,511	129,508	160,363	354,334	2,003,232	811,716
Ontario	1,620,851	306,071	187,399	68,626	340,327	2,523,274	902,423
Manitoba	25,228	37,032	90,246	102,705	200,403	455,614	430,386
Saskatchewan	—	—	—	91,279	401,153	492,432	492,432
Alberta	—	—	—	73,022	301,641	374,663	374,663
British Columbia	36,247	13,212	48,714	80,484	213,823	392,480	356,233
Yukon	—	—	—	27,219	— 18,707	8,512	8,512
Northwest Territories	48,000	8,446	42,521	— 78,838	— 1,648	18,481	— 29,519
Total	3,689,257	635,553	508,429	538,076	1,835,328	7,206,643	3,517,386

Provinces.	Population 1871.	B. Increase in percentages.				Population 1911.	Increase 1871 to 1911.
		1871 to 1881.	1881 to 1891.	1891 to 1901.	1901 to 1911.		
Prince Edward Island	94,021	15.82	0.17	— 5.33	— 9.23	93,728	— 0.31
Nova Scotia	387,800	13.61	2.23	2.04	7.13	492,338	26.96
New Brunswick	285,594	12.48	0.01	3.07	6.27	351,889	23.21
Quebec	1,191,516	14.06	9.53	— 0.77	21.45	2,003,232	68.12
Ontario	1,620,851	18.88	9.73	3.25	15.59	2,523,274	55.67
Manitoba	25,228	146.79	144.95	67.34	78.52	455,614	1,705.99
Saskatchewan	—	—	—	—	439.48	492,432	—
Alberta	—	—	—	—	413.08	374,663	—
British Columbia	36,247	36.45	98.49	81.98	119.68	392,480	982.79
Yukon	—	—	—	—	68.73	8,512	—
Northwest Territories	48,000	17.60	75.33	79.66	14.57	18,481	— 61.50
Total	3,689,257	17.23	11.76	11.13	34.13	7,206,643	95.34

NOTE.—The minus sign (—) indicates a decrease.

The population of Canada in 1911 was 7,206,643, as compared with 3,689,257 in 1871, including the provinces of Prince Edward Island and British Columbia, which did not join the Union until after the first Dominion census of 1871.

Table III shows the increase in the population from decade to decade in (A) absolute numbers, and (B) in percentages.

It will be noticed that the greatest increase took place between 1901 and 1911, the ratio being over 34 per cent., as against a percentage of under 12 for each of the two previous decades and over 17 per cent. as between 1871 and 1881. For the whole period of forty years the rate of increase was 95·34 per cent. The high rate of increase has been chiefly due to the settlement of the three Prairie Provinces, and, especially since the beginning of the century, of the two new provinces of Saskatchewan and Alberta. From 1901 a quinquennial census of population was taken for the three Prairie Provinces, and the results are shown in Tables IV and V.

TABLE IV.—*Population of Prairie Provinces at quinquennial periods, 1901-16.*

Provinces.	1901.	1906.	1911.	1916.
Manitoba	255,211	365,688	461,630	553,860
Saskatchewan	91,279	257,763	492,432	647,835
Alberta	73,022	185,412	374,663	496,525
Total	419,512	808,863	1,328,725	1,698,220

TABLE V.—*Increase of population of the Prairie Provinces at quinquennial periods, 1901-16.*

Provinces.	Population 1901.	A. Increase in absolute numbers.			Population 1916.	Increase, 1901 to 1916.
		1901 to 1906.	1906 to 1911.	1911 to 1916.		
Manitoba	255,211	110,477	95,942	92,230	553,860	298,649
Saskatchewan	91,279	166,484	234,669	155,403	647,835	556,556
Alberta	73,022	112,390	189,251	121,862	496,525	423,503
Total	419,512	389,351	519,862	369,495	1,698,220	1,278,708

Provinces.	Population 1901.	B. Increase in percentages.			Population 1916.	Increase, 1901 to 1916.
		1901 to 1906.	1906 to 1911.	1911 to 1916.		
Manitoba	255,211	43·28	37·59	20·0	553,860	217·02
Saskatchewan	91,279	182·39	257·08	31·6	647,835	709·73
Alberta	73,022	153·91	259·16	32·5	496,525	679·96
Total	419,512	92·81	123·92	27·8	1,698,220	404·80

From the beginning of the present century to 1916, the date of the last quinquennial census, the population of the three provinces has increased from 419,512 to 1,698,220, a ratio of over 404 per cent.

Reference may here be made to one of the most significant revelations of the Census of 1911, viz., the extraordinary increase of the urban population as compared with that of the rural. In 1901 the rural population of Canada was 3,349,516, and in 1911 this number had grown to 3,924,394, the increase being only 574,878, or 17·16 per cent. On the other hand, the urban population, which in 1901 was 2,021,799, had grown to 3,280,444, an increase of 1,258,645, or 62·25 per cent. In 1891 the distribution of the population of Canada as between urban and rural was 32·1 per cent. urban and 67·9 per cent. rural; in 1901 the proportions were 37·7 per cent. urban and 62·3 per cent. rural, whilst in 1911 the proportions had become 45·6 per cent. urban and 54·4 per cent. rural. To this question of the increase in the urban population at the expense of the rural—only another form of the question known in Europe as the “rural exodus”—considerable attention has been paid. Dr. Adam Shortt, writing in 1913, pointed out that “in the past fifteen years a number of comparatively small towns have grown into cities, while some of the older cities, such as Montreal, Toronto, Ottawa, Hamilton, Winnipeg, and Vancouver, have enormously expanded. During the past decade a very large number of native Canadians, as well as immigrants, have been concentrated in the rapidly-growing towns and cities, employed chiefly either directly or indirectly in the simple construction of the cities, or in supplying those engaged in this construction.”¹ And my friend and colleague, Dr. Peter H. Bryce, Chief Medical Officer of the Immigration and Colonization Department, writing in 1914, asks, “Can we expect to see, as we have seen, the urban population go on increasing decade after decade and the rural decline, till in England 80 per cent., in Germany 70 per cent., and on this continent 60 per cent. of the total population are living on the labours of the other part?”² Upon this economic demoralization, caused primarily by the abundant influx of capital and immigrant labour, the war imposed a wholesome check, and the Census of the Prairie Provinces in 1916 indicated that both the urban and rural populations had increased in more nearly equal ratios (urban 29 per cent., rural 27 per cent.), as compared with the previous Census of 1911 (urban 92 per cent. and rural 52 per cent.).

¹ *Census and Statistics Monthly*, July, 1913, vol. 6, No. 60, p. 159.

² “Over-population of Cities in Relation to National Character,” *Census and Statistics Monthly*, November, 1914, vol. 7, No. 75, p. 295.

Continuous annual statistics of immigration into Canada began only in 1897. Before that date the figures of immigration as published cannot be trusted to furnish accurate information respecting the number of new settlers in Canada. Large numbers of immigrant arrivals in Canada were really destined for the United States, and the proportion that actually settled in Canada is a matter of estimate rather than of actual statistics, the figures of settlement in Canada being derived from the reports of the Dominion Land Agents. In Table VI are given for the years 1867 to 1896 the total number of immigrants estimated as annually settling in Canada, as extracted from the Reports of the Immigration Branch.

TABLE VI.—*Number of immigrants settling in Canada for each of the thirty years, 1867 to 1896.*

Year.	Number.	Year.	Number.	Year.	Number.
1867	14,666	1877	27,082	1887	84,526
1868	12,765	1878	29,807	1888	88,766
1869	18,630	1879	40,492	1889	91,600
1870	24,706	1880	38,505	1890	75,067
1871	27,773	1881	47,991	1891	82,165
1872	36,578	1882	112,458	1892	30,996
1873	50,050	1883	133,624	1893	29,633
1874	39,373	1884	103,824	1894	20,829
1875	27,382	1885	79,169	1895	18,790
1876	25,633	1886	69,152	1896	16,835

During the first five years after Confederation, the average number of annual arrivals in Canada was about 68,500, but of these about 50,000 passed annually into the United States, leaving only about 18,500 as the number of immigrants annually settling in Canada.

From 1897 onwards the statistics of immigration have been collected under improved conditions, and are of more trustworthy character than those for the previous thirty years after Confederation. It is also possible to separate the totals into nationalities, and in Table VII they are divided into the three categories of immigrants from the United Kingdom, the United States, and "other countries," *i.e.*, countries other than the United Kingdom and the United States.

During the first period, 1867 to 1896, immigration reached its maximum from the years 1882 to 1891, the number of immigrants exceeding 100,000 per annum only, however, during the three years 1882 to 1884. The increased immigration during this period was due to the opening in 1886 of the new Canadian Pacific Railway

TABLE VII.—*Immigration into Canada from the United Kingdom, the United States, and "Other Countries," 1897-1917.*

Year.	From United Kingdom.	From United States.	From Other Countries.	Total.	Percentage of Total.		
					United Kingdom.	United States.	Other Countries.
1897....	11,383	2,412	7,921	21,716	52	11	37
1898....	11,173	9,119	11,608	31,900	35	29	36
1899....	10,660	11,945	21,938	44,543	24	27	49
1900....	5,141	8,543	10,211	23,895	21	36	43
1901....	11,810	17,987	19,352	49,149	24	36	40
1902....	17,259	26,388	23,732	67,379	26	39	35
1903....	41,792	49,473	37,099	128,364	33	38	29
1904....	50,374	45,171	34,786	130,331	38	35	27
1905....	65,359	43,543	37,364	146,266	45	30	25
1906....	86,796	57,796	44,472	189,064	46	30	24
1907....	55,791	34,659	34,217	124,667	45	28	27
1908....	120,182	58,312	83,975	262,469	46	22	32
1909....	52,901	59,832	34,175	146,908	36	41	23
1910....	59,790	103,798	45,206	208,794	29	50	21
1911....	123,013	121,451	66,620	311,084	40	39	21
1912....	138,121	133,710	82,406	354,237	39	38	23
1913....	150,542	139,009	112,881	402,432	37	35	28
1914....	142,622	107,530	134,726	384,878	37	28	35
1915....	43,276	59,779	41,734	144,789	30	41	29
1916....	8,664	36,937	2,936	48,537	18	76	6
1917....	8,282	61,389	5,703	75,374	11	81	8

and the consequent settlement of the great Northwest. Immense activity in railway construction, coupled with a new policy of effective advertising of the agricultural capabilities of western Canada, marked the opening years of the twentieth century, with the result that from 1903 to 1913, broken only by occasional setbacks due to the enforcement of more rigid regulations to exclude the unfit, there was an annually increasing stream of immigrants. The number, exceeding 100,000 in 1903, reached the maximum of 402,432 in 1913, declined to 384,878 in 1914, and was then interrupted by the war. A feature of this period has been the great influx of settlers from the United States, representing in large measure the return to Canada of those who had crossed the border in the previous period, but including also large numbers of American farmers who being already practically acquainted with the conditions of the west, and bringing with them valuable effects, were speedily able to "make good" on the new lands.

Agriculture.

For the measurement of agricultural progress in Canada the statistical data available comprise (1) the returns of the decennial

census for all Canada, (2) the quinquennial census of the Prairie Provinces from 1906, (3) the annual estimates since 1908 of the Dominion Government, based upon the census and applicable to the whole of Canada, and (4) the annual estimates of the Provincial Governments for certain of the provinces for varying periods. The acreage statistics of all field crops were not collected by the decennial census until 1900, but for wheat the acreage has expanded from 1,646,781 acres in 1870 to 2,366,554 acres in 1880, 2,701,246 acres in 1890, 4,224,542 acres in 1900 and 8,864,514 acres in 1910. Similarly, the area under hay has increased from 3,650,419 acres in 1870 to 4,458,349 acres in 1880, 5,931,548 acres in 1890, 6,543,423 acres in 1900 and 8,289,407 acres in 1910. Potatoes, which occupied 403,102 acres in 1870, only increased to 464,504 acres in 1910, this being a crop which as a rule is grown only for home consumption, except for a limited quantity exported from the Maritime Provinces to Cuba and the West Indies.

Table VIII is a comparison between the acreage under field crops in 1900 and 1910.

TABLE VIII.—*Areas of the principal field crops of Canada, 1900 and 1910.*

Field Crops.	1900.	1910.	Increase + or Decrease -.
	000 acres.	000 acres.	000 acres.
Fall wheat	1,121	978	- 143
Spring wheat	3,104	7,887	+ 4,783
All wheat	4,225	8,865	+ 4,640
Barley....	872	1,283	+ 411
Oats	5,368	8,656	+ 3,288
Rye	177	115	- 62
Corn	361	294	- 67
Buckwheat	262	358	+ 96
Peas	670	355	- 315
Beans	47	46	- 1
Mixed grains	273	427	+ 154
Flaxseed	23	582	+ 559
Potatoes	449	465	+ 16
Field roots	205	195	- 10
Corn for fodder	—	294	+ 294
Hay	6,543	8,289	+ 1,746

In this period the expansion under wheat, oats, barley and flax was greater than in any previous decade since Confederation, and was due to the great tide of immigration and settlement on the Prairie Provinces which set in with the opening of the twentieth century. The table shows that the area under wheat more than doubled, that barley increased by more than 400,000 acres, that

oats increased by more than 3,000,000 acres, and flax increased from about 23,000 acres to over 582,000 acres. Records of yields are available for all field crops in the census years, and these are shown in Table IX.¹

TABLE IX.—*Yields of the principal field crops of Canada in the Census years 1870 to 1910.*

Crops.	1870.	1880.	1890.	1900.	1910.
	000 qrs.	000 qrs.	000 qrs.	000 qrs.	000 qrs.
Fall wheat	796	2,531	1,836	2,751	2,551
Spring wheat	1,294	1,513	3,442	4,196	13,959
All wheat	2,090	4,044	5,278	6,947	16,510
Barley	1,437	2,106	2,153	2,778	3,606
Oats....	5,311	8,812	10,429	18,937	30,674
Rye	133	262	168	290	193
Maize	475	1,128	1,339	3,234	1,802
Buckwheat....	466	613	624	568	888
Peas....	1,238	1,719	1,853	1,544	599
Beans	28	—	100	108	103
Mixed grains	—	—	—	908	1,636
Flaxseed	—	—	17	215	531
	000 tons.	000 tons.	000 tons.	000 tons.	000 tons.
Potatoes....	1,268	1,480	1,433	1,483	1,485
Field roots	747	1,292	1,331	2,038	1,300
Maize for fodder	—	—	—	—	2,415
Hay and forage	2,963	4,514	6,869	8,129	9,291

In comparing these records of yield it should be remembered that seasonal differences affect the result. It happened that both 1900 and 1910 were rather poor seasons; so that the difference between these two years is more truly a matter of growth than might have been the case had one of the seasons been good and the other bad.

As already intimated, continuous annual agricultural estimates for the whole of Canada are only available since 1908, and these are shown in Table X for areas and for total yields.

For wheat the acreage given as 6,610,000 in 1908 was 14,756,000 in 1917. Oats, 7,941,000 acres in 1908, were 13,313,000 acres in 1917, whilst flax, only 139,000 acres in 1908, occupied 920,000 acres in 1917. The total yield of wheat, which was 14,055,000 quarters in 1908, was 28,966,000 quarters in 1917; oats, 31,297,000 quarters

¹ Throughout this Paper English currency, weights and measures are employed, including long tons of 2,240 lb., and long cwt. of 112 lb. Dollars have been converted into £ sterling at the par rate of exchange, viz., \$4.86½ = 1l.

in 1908, yielded 49,196,000 quarters in 1917, and flaxseed, the production of which was 187,000 quarters in 1908, gave 859,000 quarters in 1917. In order to facilitate the comparison of any particular year with the average, I have added to Table X the annual average acreage and yield for the two quinquennia 1908-12 and 1913-17, and for the decennium 1908 to 1917.

TABLE X.—*Areas and yields of field crops of Canada, as estimated by the Census and Statistics Office, 1908-1917.*

(000's omitted.)

Field crops.	1908.	1909.	1910.	1911.	1912.	Average 1908-12.
	acres.	acres.	acres.	acres.	acres.	acres.
Fall wheat	770	662	975	1,161	971	907
Spring wheat	5,840	7,088	7,888	9,940	10,026	8,156
All wheat	6,610	7,750	8,863	11,101	10,997	9,063
Oats	7,941	9,303	8,652	9,631	9,966	9,098
Barley	1,746	1,865	1,287	1,522	1,581	1,600
Rye	100	91	114	131	127	112
Peas	413	393	355	295	260	343
Beans	60	56	46	53	53	53
Buckwheat	291	282	362	372	399	341
Flaxseed	139	139	582	879	2,022	552
Mixed grains	582	582	431	525	497	523
Corn for husking	366	353	294	322	298	326
Potatoes	504	514	466	479	484	489
Turnips and other roots	271	248	177	208	198	220
Hay and clover	8,211	8,210	8,282	8,617	8,276	8,319
Alfalfa	—	—	57	97	101	51
Corn for fodder	260	270	294	294	299	283
Sugar beets	11	10	17	21	19	15
	qrs.	qrs.	qrs.	qrs.	qrs.	qrs.
Fall wheat	2,350	2,012	2,548	3,227	2,548	2,537
Spring wheat	11,705	18,831	13,958	25,639	25,472	19,121
All wheat	14,055	20,843	16,506	28,866	28,020	21,658
Oats	31,297	44,183	30,438	45,647	48,954	15,104
Barley	5,845	6,925	3,606	5,552	6,175	5,620
Rye	214	214	192	312	304	247
Peas	883	1,018	601	583	489	715
Beans	156	166	103	128	115	134
Buckwheat	894	976	900	1,055	1,315	1,028
Flaxseed	187	277	531	1,260	3,266	1,104
Mixed grains	2,381	2,424	1,647	1,964	2,150	2,113
Corn for husking	2,859	2,407	1,790	2,398	2,119	2,315
	tons.	tons.	tons.	tons.	tons.	tons.
Potatoes	1,977	2,654	1,490	1,908	2,274	2,060
Turnips and other roots	2,712	2,883	1,382	2,102	2,143	2,245
Hay and clover	10,223	10,604	10,093	12,482	10,819	10,846
Alfalfa	—	—	105	204	255	112
Corn for fodder	2,614	2,482	2,413	2,385	2,712	2,521
Sugar beets	97	77	168	156	179	136

TABLE X.—Areas and yields of field crops of Canada—Contd.

(000's omitted.)

Field crops.	1913.	1914.	1915.	1916.	1917.	Average 1913-17	Average 1908-17
	acres.	acres.	acres.	acres.	acres.	acres.	acres.
Fall wheat	970	973	1,031	818	725	903	906
Spring wheat	10,045	9,321	14,079	14,552	14,031	12,405	10,281
All wheat	11,015	10,294	15,110	15,370	14,756	13,308	11,187
Oats....	10,434	10,062	11,556	10,997	13,313	11,272	10,186
Barley	1,613	1,496	1,718	1,803	2,322	1,804	1,700
Rye	119	111	122	148	212	142	128
Peas....	219	206	196	152	194	193	268
Beans	47	44	43	33	92	51	53
Buckwheat....	381	354	344	342	396	363	352
Flaxseed	1,553	1,084	463	657	920	935	844
Mixed grains	474	463	467	413	497	463	493
Corn for husking	278	256	253	173	303	252	290
Potatoes	474	476	486	473	657	513	501
Turnips and other roots	186	175	157	142	218	175	198
Hay and clover	8,169	7,997	7,777	7,821	8,225	7,998	8,160
Alfalfa	94	90	99	99	110	98	75
Corn for fodder	304	317	333	293	367	322	303
Sugar beets	17	12	18	15	14	15	15
	qrs.	qrs.	qrs.	qrs.	qrs.	qrs.	qrs.
Fall wheat	2,824	2,605	3,665	2,199	1,963	2,651	2,594
Spring wheat	26,141	17,555	45,528	30,649	27,003	29,375	24,248
All wheat	28,965	20,160	49,193	32,848	28,966	32,026	26,842
Oats....	50,584	39,135	58,119	51,276	49,196	69,662	44,883
Barley	6,040	4,525	6,752	5,346	6,461	5,825	5,723
Rye	288	252	311	360	530	348	298
Peas....	494	420	433	277	422	409	562
Beans	100	100	90	52	174	103	118
Buckwheat....	1,047	1,078	983	747	1,027	976	1,002
Flaxseed	2,192	897	764	1,033	859	1,149	1,127
Mixed grains	1,974	2,048	2,190	1,323	2,058	1,919	2,016
Corn for husking	2,097	1,741	1,796	785	1,147	1,513	1,914
	tons.	tons.	tons.	tons.	tons.	tons.	tons.
Potatoes	2,104	2,295	1,617	1,695	2,140	1,970	2,015
Turnips and other roots	1,789	1,848	1,612	989	1,700	1,587	1,916
Hay and clover	9,696	9,160	9,475	12,970	12,219	10,703	10,775
Alfalfa	212	195	233	256	234	226	1,695
Corn for fodder	2,336	2,903	3,021	1,704	2,402	2,472	2,497
Sugar beets	172	97	126	63	105	104	121

One remarkable feature of the fifty-year period under review has been the shifting in the incidence of grain growing, a point discussed and graphically illustrated by Major Craigie, C.B., in his presidential address to the Agricultural Subsection of the British Association for the Advancement of Science at the Winnipeg Meeting of 1909. Formerly, the bulk of the wheat grown in Canada

was produced by Ontario, but with the opening up and settlement of the Prairie Provinces the production of wheat in Ontario relatively to the rest of Canada has declined, whilst the Prairie Provinces have come to produce nearly all the wheat of the Dominion. This has been due to the great increase of immigration, its direction to the soils of virginal fertility in the west and the migration to the west of farmers from Ontario and other parts of eastern Canada. The changes thus effected in the distribution of the principal grain crops (wheat, barley and oats) have been measured for the four ten-year periods covered by the censuses of 1870-80, 1880-90, 1890-1900 and 1900-10, and Table XI shows the percentage proportions of the total for each crop in each census year.

TABLE XI.—*Percentage distribution by Provinces of wheat, barley and oats in the Census years 1870-1910 and in 1917.*

Year and crop.	Maritime Provinces.	Quebec.	Ontario.	Manitoba.	Saskatchewan.	Alberta.	Other Provinces.	Total.
	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.	p.c.
Wheat—								
1870	2.5*	12.4	85.1	—	—	—	—	100
1880	4.9	6.2	84.7	3.2	—	—	1.0	100
1890	—	3.9	50.5	38.1	4.0	—	3.5	100
1900	—	3.5	51.5	33.0	7.8	—	4.2	100
1910	—	—	15.0	25.8	50.7	6.9	1.6	100
1917	0.5	1.8	5.2	16.4	56.0	20.0	0.1	100
Barley—								
1870	3.2	14.5	82.3	—	—	—	—	100
1880	—	10.4	84.8	—	—	—	4.8	100
1890	—	9.2	77.9	8.4	—	—	4.5	100
1900	—	11.4	72.4	12.0	—	—	4.2	100
1910	—	8.1	48.8	22.6	10.6	8.6	1.2	100
1917	0.5	6.9	15.1	29.6	28.0	19.7	0.2	100
Oats—								
1870	12.4	35.6	52.0	—	—	—	—	100
1880	12.4	28.3	57.0	—	—	—	2.3	100
1890	9.0	21.4	56.5	10.0	—	—	3.1	100
1900	7.7	22.1	58.2	7.0	—	—	5.0	100
1910	5.6	13.8	36.6	12.4	24.0	6.9	0.7†	100
1917	3.8	11.2	20.2	11.3	34.0	19.0	0.5†	100

* Nova Scotia and New Brunswick. † British Columbia.

In the case of wheat it will be noticed that whilst, in 1870, 85 per cent. of the total crop was produced by Ontario, this proportion fell to about 50 per cent. for the two census years 1890 and 1900, to 15 per cent. in 1910 and to only 5 per cent. in 1917. In Saskatchewan the proportion was raised from 4 per cent. in 1890 to about 50 per cent. in 1910 and to 56 per cent. in 1917. A similar movement

though not to so marked an extent is observable in the case of barley and oats. But the main fact is that whereas at Confederation and in 1880 the production of wheat, barley, and oats was almost entirely confined to eastern Canada, the position now is that more than half the total wheat crop is produced in Saskatchewan, and all but 8 per cent. of this crop is produced in the three Prairie Provinces. For barley 77 and for oats 64 per cent. of the total crop is produced in the Prairie Provinces.

Another question upon which the agricultural statistics may be expected to throw some light is the increase in relative productivity. Vigorous efforts to improve Canadian agricultural practice have been made for many years by both the Dominion and provincial Departments of Agriculture. The work of the Dominion Experimental Farms, established in 1886, of the provincial Colleges of Agriculture, all of them established since Confederation, and of agencies such as the Canadian Seed Growers' Association, have done much to raise the general level of agricultural production. To obtain any satisfactory evidence on this point from the average yields per acre continuous annual records over long periods are essential, because of seasonal variation. For this reason the census records taken at ten-year intervals do not help us, and the annual estimates of the Dominion Government begun in 1908 have not yet been long enough in existence to afford useful comparisons. But the annual records published by certain of the provincial Departments of Agriculture may usefully be consulted. They include New Brunswick from 1897, Ontario from 1882, Manitoba from 1883, Saskatchewan from 1898 and Alberta from 1899. Limiting our inquiry to wheat, oats, and barley, we are able to make the comparisons shown in Table XII.

In New Brunswick there is a slight increase between the two decennial periods of half a bushel for wheat and two-fifths of a bushel for oats. In Manitoba and Saskatchewan the wheat yield shows a decline due perhaps to decrease of fertility through continuous growth of grain. In the case of oats, the average in Manitoba is less for the second period by 2.2 bushels, but the third period shows an increase of 4.8 bushels over the second period and of 2.6 bushels over the first period. For barley in Manitoba the rate has increased by 2.3 bushels as between the first and third periods. For the five years 1913-17, in Manitoba, the wheat yield is three-tenths of a bushel more, but oats show a decrease of $3\frac{1}{2}$ and barley a decrease of 5.2 bushels as compared with the period 1903-12. In Saskatchewan oats increased by 2.9 bushels and barley by 3.3 bushels. In Alberta all three crops increased, wheat by 1.8 bushel,

TABLE XII.—*Average yields per acre of wheat, oats, and barley, in New Brunswick, Ontario, Manitoba, Saskatchewan and Alberta.*

Period.	Fall Wheat.	Spring Wheat.	Oats.	Barley.
	bushels per acre.	bushels per acre.	bushels per acre.	bushels per acre.
New Brunswick—				
1898-1907....	—	18·6	29·2	—
1908-17	—	19·1	29·6	—
Ontario—				
1882-91	20·0	15·8	35·1	26·0
1892-1901....	20·1	15·2	34·6	26·3
1902-11	23·5	17·9	36·6	30·5
1912-18	23·1	20·1	38·0	31·5
Manitoba—				
1883-92*	—	19·8	36·9	27·4
1893-1902....	—	19·0	34·7	28·8
1903-12	—	17·5	39·5	29·7
1913-17	—	17·8	36·0	24·5
Saskatchewan—				
1898-1907....	—	18·7	34·0	22·3
1908-17	—	17·6	36·9	25·6
Alberta—				
1898-1907....	—	20·6	37·0	26·1
1908-17	—	22·4	38·5	26·6

* For nine years; no record for 1888.

oats by $1\frac{1}{2}$ bushel and barley by half a bushel. In Ontario there has been a distinct improvement in the average rate of production of the chief cereals. Although the difference between the first and second decennial periods is but small, the third period compared with the first shows that the average annual yield per acre of fall wheat increased by $3\frac{1}{2}$ bushels, spring wheat by 2 bushels, barley by $4\frac{1}{2}$ bushels and oats by $1\frac{1}{2}$ bushel. Expressed in terms of value, and calculated upon the area and prices of 1917, these extra yields represent for wheat 942,381*l.*, for barley 387,199*l.*, and for oats 596,303*l.*, or a total value of 1,925,883*l.*, due to the increased yield per acre in Ontario alone. While allowance may be made for causes other than improved skill in cultivation, such as, for instance, a decreased total area involving withdrawal from a particular crop of inferior land, it is reasonable to infer that improved methods of cultivation, including the use of better seed, have been the main factor in bringing about the progress indicated.

Although the census statistics, being only taken at decennial intervals, do not admit of satisfactory comparisons of the yield per acre, there is no doubt that the average yields at the present time are higher than they were at Confederation. In 1870 the yield of wheat in Ontario did not exceed 10·5 bushels per acre,

whilst for the ten years 1902-11 the yields were, according to the Ontario Bureau of Industries, 23 bushels for fall wheat and 17·9 bushels for spring wheat, and the decennial average for 1908-17, according to the Census Office estimates, was 23 bushels for fall wheat and 18½ bushels for spring wheat. Other crops also show a like progress. That Canada has been able to maintain a satisfactory progress in this direction is apparent from a comparison with the average yields of other countries, especially those countries where, like Canada, the areas devoted to grain are large and the cultivation is of extensive rather than intensive character. In Table XIII are shown the average yields per acre of wheat, barley and oats in the principal grain-growing countries of the world, compared with the decennial averages for the period 1908-17 for Canada, as recently calculated by the Census and Statistics Office.

TABLE XIII.—Average yield per acre of wheat, barley and oats in selected grain-producing countries of the world.

Country.	Wheat.	Barley.	Oats.
	bushels per acre.	bushels per acre.	bushels per acre.
United Kingdom	31·82	35·13	48·55
Canada	19·25	27·00	35·25
Australia	11·00	18·96	21·25
New Zealand	29·29	34·94	45·13
India	11·45	—	—
United States.....	14·72	24·91	28·08
Argentina	9·52	15·06	22·04
Austria*	20·37	28·25	34·38
Belgium*	37·32	51·49	64·29
Bulgaria*	13·68	19·52	19·42
France*	19·93	25·46	33·85
Germany*	30·78	36·80	49·86
Hungary*	17·40	23·42	28·60
Italy	14·72	16·17	25·72
Rumania	16·21	17·84	23·09
Russia in Europe*	10·56	34·57	20·99
Russia in Asia (9 Gov.)*	9·67	14·31	18·37
Russia in Asia (other Gov.)*	9·67	12·27	22·04
Spain	13·38	20·82	21·25

Note.—The above averages are calculated over the decennial period 1907 to 1916, except for certain countries, marked with an asterisk (*), for which the decennial data are incomplete. For Canada the period is 1908 to 1917.

A further measure of the progress made by Canada in agricultural production is obtainable by comparing the acreage and yield of crops per 1,000 of the population. This is done in Table XIV for field crops in the aggregate and for wheat, oats, and hay and clover separately, for each of the census years 1870 to 1910 and for 1915 and 1917.

TABLE XIV.—*Acreage and yield of Canadian crops per 1,000 of the population, 1870-1917.*

Year.	Field crops.		Wheat.		Oats.		Hay and clover.	
	acres.	acres.	qrs.	acres.	qrs.	acres.	tons.	
1870	—	472	600	—	1,524	1,047	978	
1880	—	561	959	—	2,091	1,058	1,071	
1890	3,268	564	1,101	826	2,176	—	1,433	
1900	3,713	794	1,305	1,008	3,561	1,229	1,317	
1910	4,794	1,230	2,291	1,200	4,224	1,149	1,400	
1915	4,937	1,906	5,933	1,457	7,331	993	1,195	
1917	5,095	1,764	3,450	1,592	6,025	983	1,461	

Taking the total under field crops the area has grown from 3,268 per 1,000 of the population in 1890 to 5,095 in 1917. For wheat the area has grown from 472 acres per 1,000 in 1870 to 1,906 acres in 1915 and 1,764 acres in 1917. Wheat production, which was 600 quarters per 1,000 in 1870 attained to 5,933 quarters per 1,000 in the prolific year 1915 and to 3,450 quarters in 1917. Oats grew from 1,524 quarters per 1,000 in 1870 to 7,331 in 1915 and 6,025 in 1917. Hay and clover alone show a decrease as regards acreage and only a slight increase as regards yield. For area the rate of 1,047 acres in 1870 has decreased to 983 acres in 1917 and the yield, which was 978 tons in 1870 and 1,433 tons in 1890, was not more than 1,461 tons in the good hay year of 1917.

We may fittingly conclude this portion of our review by a comparison of the total areas and total values of field crops, so far as data are available for the purpose. Table XV gives this comparison for the years 1910-17.

TABLE XV.—*Total areas and values of field crops, 1910-17.*

Year.	Areas.	Values.	Year.	Areas.	Values.
	acres.	£		acres.	£
1910	30,556,168	79,009,664	1914	33,436,675	131,215,097
1911	35,261,338	122,851,476	1915	39,140,460	169,606,657
1912	35,575,550	114,532,731	1916	38,930,333	182,166,440
1913	35,374,930	113,583,156	1917	42,602,288	235,199,270

The total area under field crops has grown from 30,556,168 acres in 1910 to 42,602,288 acres in 1917, an increase of 12,046,120 acres, or 39 per cent. To a large extent this increase has been due to a wonderful display of farming energy since the outbreak of the war, and the results have been achieved by a population whose growth has been arrested through the decline of immigration, and whose

force has been diminished by the large proportion of the flower of Canadian manhood fighting overseas. In the same period the total value of the field crops of Canada has grown from 79,009,664*l.* to 235,199,270*l.* in 1917, that is to say, the value in 1917 is nearly three times that of 1910. This result is chiefly due to the soaring of prices since the outbreak of the War, and only to a limited extent by the increase in cultivation and production.

Farm live stock.

As in the case of field crops, two sets of authorities—those of the Dominion Government and those of certain of the provincial Governments—have occupied the statistical field for collection and publication of the numbers of farm live stock. Only since 1908 have continuous annual estimates of the numbers of farm live stock for the whole of the Dominion been available, and these have been collected and published by the Dominion Government. Prior to 1908 the only statistics of live stock for all Canada are those of the decennial census from 1871 to 1911. For the three Prairie Provinces census statistics are also available for the years 1906 and 1916. For census purposes, horses are divisible into animals over and under three years of age, and cattle into milch cows and other horned stock. Table XVI gives the numbers for each of the five decennial censuses since 1871, and in Table XVII are worked out the percentage increases between each decade and for the forty years between 1871 and 1911.

TABLE XVI.—*Numbers of farm live stock in Census years 1871-1911.*

Description.	1871.	1881.	1891.	1901.	1911.
Horses over 3 years old	643,171	857,855	1,068,584	1,304,910	1,991,841
Horses under 3 years old	193,572	201,503	401,988	272,583	607,117
Total horses	836,743	1,059,358	1,470,572	1,577,493	2,598,958
Milch cows	1,251,209	1,595,800	1,857,112	2,408,677	2,595,255
Other cattle	1,373,081	1,919,189	2,263,474	3,167,774	3,930,828
Total cattle	2,624,290	3,514,989	4,120,586	5,576,451	6,526,083
Sheep	3,155,509	3,048,678	2,563,781	2,510,239	2,174,300
Swine	1,366,083	1,207,619	1,733,850	2,353,828	3,634,778

Taking the latter period first it will be seen that the number of horses in Canada has increased from 836,743 in 1871 to 2,598,958 in

TABLE XVII.—Increase in number of farm live stock, 1871-1911.

Description.	1871-81.		1881-91.		1891-1901.		1901-11.		1871-1911.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Horses	222,615	27	411,214	38	106,921	7	1,021,465	65	1,762,215	211
Milch cows	344,591	28	261,312	16	551,565	30	186,578	8	1,344,046	107
Other cattle	546,108	40	344,285	18	904,300	40	763,054	24	2,557,747	186
Total cattle	890,699	34	605,597	17	1,455,865	35	949,632	17	3,901,793	149
Sheep	-106,831	-4	-484,897	-19	-53,542	-2	335,939	-13	-981,209	-45
Pigs	-158,464	-14	526,231	43	619,978	36	1,280,950	54	2,268,695	166

Note.—The minus sign (-) indicates a decrease.

1911; cattle have increased from 2,624,290 to 6,526,083, and swine from 1,366,083 to 3,634,778. On the other hand, sheep have decreased from 3,155,509 to 2,174,300. One of the most striking features in this table is the extraordinary increase in the number of horses as between 1901 and 1911. This was undoubtedly due to the opening up of the Prairie Provinces in that decade, and the large influx of immigrant settlers, many of whom came from the United States bringing their horses and cattle with them. This is shown by Table XVIII, which gives the number of horses in Canada by provinces, with the absolute and percentage increase for each province. Table XIX shows the numbers of farm live stock per 1,000 of the population, and this table, in which the figures are those of the census, affords perhaps the best measure of the progress of Canada in the growth of its live stock.

TABLE XVIII.—Number of horses, all ages, by provinces, 1901 and 1911.

Provinces.	Horses, all ages.		Increase (+) or decrease (-).	
	1901.	1911.	Total.	Per cent.
Canada	1,577,493	2,598,958	+1,021,465	+64.75
Prince Edward Island	33,731	35,935	+2,204	+6.53
Nova Scotia	62,508	61,420	-1,088	-1.74
New Brunswick	61,789	65,409	+3,620	+5.86
Quebec	320,673	371,571	+50,898	+15.87
Ontario	721,138	812,214	+91,076	+12.63
Manitoba	163,867	280,374	+116,507	+71.10
Saskatchewan	83,801	507,468	+423,667	+505.56
Alberta	92,661	407,153	+314,492	+339.40
British Columbia	37,325	57,414	+20,089	+53.82

TABLE XIX.—Numbers of farm live stock per 1,000 of the population, 1871-1911.

Year.	Population.	Horses.	Milch cows.	Other cattle.	Total cattle.	Sheep.	Pigs.
1871	3,689,257	221	339	372	711	855	354
1881	4,324,810	245	369	443	813	729	279
1891	4,833,239	304	384	468	852	534	358
1901	5,371,315	293	448	590	1,038	467	428
1911	7,206,643	360	360	545	905	302	504

For horses and cattle, it will be noted that the numbers per 1,000 of the population have steadily increased from 1871 to 1901,

whilst in the case of sheep they have as steadily declined. In the number of swine there is greater fluctuation, and this agrees with the known conditions of the swine-feeding industry, which depends largely upon the supplies of low-priced feeding grains. During the forty years the number of swine per 1,000 of the population increased from 354 to 504.

During the ten years 1901 to 1911 a falling off is shown in the number of cattle per 1,000 of the population. This is explainable by the movement of the population during the first decade of the present century, when the urban population increased in a ratio far in excess of the rural. The tables show a marked decrease in the numbers of sheep, which is an unsatisfactory feature of the Canadian live stock statistics during the last fifty years. Various causes have been assigned to account for this decrease, amongst them the low prices of meat and of wool. Probably, however, the chief cause has been the migration of farmers from eastern to western Canada for the purpose of grain-growing on the prairies, which has had the effect of throwing out of cultivation all but the best farms in the east, and has made land derelict that would otherwise have been suited for sheep raising.

Continuous annual estimates of the numbers of farm animals in Canada from 1907 to 1917 are given in Table XX.

TABLE XX.—*Annual estimate of the number of farm animals, 1907 to 1917.*

Year.	Horses.	Milch cows.	Other cattle.	Total cattle.	Sheep.	Swine.
1907....	1,923,090	2,737,462	4,394,354	7,131,816	2,783,219	3,445,282
1908....	2,118,165	2,917,746	4,629,836	7,547,582	2,831,404	3,369,858
1909....	2,132,489	2,849,306	4,384,779	7,234,085	2,705,390	2,912,509
1910....	2,213,199	2,853,951	4,260,963	7,114,914	2,598,470	2,753,964
1911....	2,598,958	2,595,255	3,930,828	6,526,083	2,174,300	3,634,778
1912....	2,692,357	2,604,488	3,827,373	6,431,861	2,082,381	3,477,310
1913....	2,866,008	2,740,434	3,915,687	6,656,121	2,128,531	3,448,326
1914....	2,947,738	2,673,286	3,363,531	6,036,817	2,058,045	3,434,261
1915....	2,996,099	2,666,846	3,399,155	6,066,001	2,038,662	3,111,900
1916....	3,258,342	2,833,433	3,760,718	6,594,151	2,022,941	4,474,840
1917....	3,412,749	3,202,283	4,718,657	7,920,940	2,369,358	3,619,382

In these estimates the province of British Columbia was not included until the census year 1911. For 1917 the totals include estimates for the four provinces of Quebec, Saskatchewan, Alberta, and British Columbia, obtained by improved methods in co-operation with the provincial Governments, but the improvement of method affects the comparability with previous years. On the whole,

allowing for the defect of British Columbia (the census figures of which for 1911 were: horses 57,414, cattle 138,324, sheep 39,272, and swine 33,604), the figures reveal a satisfactory general increase in the period reviewed (1907-17) except in the case of sheep which exhibit a gradual decrease, arrested, however, by an increase in 1917. Census statistics of the numbers of farm poultry in Canada begin with the year 1881 when the total number was 14,105,102; in 1901 they had increased to 17,922,658, and in 1911 to 31,793,261.

The values of farm live stock were not collected until 1901, but Table XXI shows the values of each description for the two years 1901 and 1911, according to the census and for each of the years 1913 to 1917, as estimated by the Census and Statistics Office.

TABLE XXI.—*Values of farm live stock in Canada, 1901 and 1911 and 1913-17.*

Year.	Horses.	Milch cows.	Other horned cattle.	Total cattle.	Sheep.	Swine.	Total.
	000L.	000L.	000L.	000L.	000L.	000L.	000L.
1901....	24,304	14,228	11,136	25,364	2,157	3,379	55,204
1911....	77,951	22,316	17,813	40,129	2,225	5,675	125,980
1913....	86,318	23,696	17,777	41,473	2,192	5,480	135,463
1914....	76,331	31,558	29,486	61,044	2,990	8,716	149,081
1915....	76,722	33,682	31,328	65,010	3,333	8,970	154,035
1916....	86,021	40,859	42,016	82,875	4,299	12,474	185,669
1917....	88,176	56,328	55,612	111,940	7,309	19,083	226,508

The table shows that the total value of farm live stock in Canada, including horses, cattle, sheep and swine, has increased from 55,204,000*l.* in 1901 to 226,508,000*l.* in 1917, the first time that the billion mark in dollars (Canadian notation) for live stock values has been passed. Thus, the value of Canadian farm animals has increased more than fourfold since the beginning of the century. This, of course, is due not so much to increase of numbers as to the rise in the prices of food animals since 1914 due to the War. The numbers of farm animals in Canada, as will be seen by comparing Tables XVI and XX, have increased since 1901 by 1,835,256 horses, 2,344,489 cattle, and 1,265,554 swine, whilst sheep have decreased by 140,881. Since 1913 the average values per head, for all animals, except horses, which are less, are between two and three times more than they were in 1913, as is apparent from Table XXII.

Although before 1901 there are no census records of farm values, we may roughly measure the difference between the total values of farm live stock in 1870 and in 1917 by applying average values per

TABLE XXII.—*Average values per head of horses, cattle, sheep and swine, 1913-1917.*

Year.	Horses.	Milch cows.	Other cattle.	Sheep.	Swine.
	£ s.	£ s.	£ s.	£ s.	£ s.
1913....	30 2	8 13	4 11	1 1	1 10
1914....	25 18	11 16	8 15	1 9	2 11
1915....	25 12	12 13	9 4	1 13	2 18
1916....	26 8	14 8	11 3	2 3	3 12
1917....	25 18	17 11	11 15	3 2	5 6

head to the census records of number in 1870. These average values for 1870 I have calculated from the Customs returns of that year, which give the total numbers and total values of horses, cattle, sheep and swine exported. They work out to 17*l.* 1*s.* for horses, 4*l.* 15*s.* for cattle, 10*s.* for sheep and 14*s.* for swine; and the total value of the farm live stock of Canada in 1870 may therefore be placed at not more than 29,178,000*l.*, as compared with the value of 1917 exceeding 200,000,000*l.*

Dairying.

The establishment in Canada of the dairying industry upon a factory basis has been one of the most significant agricultural developments since Confederation. The production of grain on the Prairie Provinces, which began to assume importance with the opening of the Canadian Pacific Railway in 1886, and the effect of the McKinley Tariff of 1890, rendered grain-growing in eastern Canada unprofitable; and the farming situation was only saved by the increased production of dairy products, for which a market was gradually built up with the United Kingdom. The first cheese factory on the western side of the Atlantic was started about the year 1851 in Herkimer County, New York State.¹ Five cheese factories started in Ontario between the years 1855 and 1860, and between 1861 and 1870 eighty-three dairy factories were started in Canada, of which one factory made butter only, fifty-seven factories made cheese only, and twenty-five factories made both butter and cheese.²

The introduction into Canada from Denmark in 1882 of the centrifugal cream separator marked an important epoch in Canadian dairying, and the industry has continued to expand from that date. As shown in Table XXIII, statistics of home-made butter have been

¹ *The Dairying Industry in Canada*, p. 23. By J. A. Ruddick, Dairy and Cold Storage Commissioner, Ottawa, 1911.

² *Report on the Census of 1901*, vol. ii (Natural Products), p. xlviii, Ottawa, 1901.

collected by the decennial census since 1870, also of home-made cheese, except in 1900.

TABLE XXIII.—*Production of home-made butter and cheese in the Census years, 1870, 1880, 1890, 1900 and 1910.*

Description.	1870.	1880.	1890.	1900.	1910.
Butter	cwt. 662,416	cwt. 915,582	cwt. 996,225	cwt. 940,563	cwt. 1,233,023
Cheese	44,507	28,437	55,957	—	12,172

Values were not collected until 1910, when the value of home-made butter was 6,221,941*l.* and of home-made cheese 31,445*l.*

Statistics of the factory production of butter and cheese have formed part of the census of manufactures; but they have been limited to the number of employees and to the value of capital, salaries, wages, raw materials, and products; they have not distinguished separately between butter and cheese. The total value of the products of butter, cheese, and condensed milk factories was 7,650,608*l.* in 1910, as compared with 6,109,297*l.* in 1901 and 2,215,146*l.* in 1891, the year of first record. The first attempt to collect comprehensive statistics of the dairying industry was made in connection with the decennial census of 1901. This was followed in 1907 by a postal census of dairying and in 1911 by the decennial census of that year. In 1917 the Dominion Bureau of Statistics, in co-operation with the Provincial Governments, began an annual inquiry into the production of creameries and cheese factories, the results of the first year's inquiry embracing the years 1915 and 1916. In 1918 the dairying statistics of 1917 were collected as part of a general census of industry. Table XXIV, combining all the records available, shows the production and value of creamery butter and factory cheese for each of the years 1900, 1907, 1910, 1915, 1916 and 1917.

The figures in Table XXIV relate solely to the production of creamery butter and factory cheese; they do not include butter made on the farm and known as "dairy butter," which constitutes the larger proportion of the total production. Nor do they include the small proportion of home-made cheese. By adding together the quantities and values of the creamery and home-made butter we get a total butter production in Canada for 1910 of 1,810,685 cwt. of the value of 9,436,840*l.*, as compared with 1,262,588 cwt. in 1900. Of cheese the total production in 1910 was 1,797,030 cwt. of the value of 4,467,155*l.* No continuous annual statistics of the dairying

industry being available before 1915, we must rely for further evidence of the progress of the industry upon the export returns of butter and cheese. These have been taken out as in Table XXV, and have been expressed in quinquennial averages with a view to saving space and eliminating seasonal differences.

TABLE XXIV.—*Production and value of creamery butter and factory cheese, 1900, 1907, 1910 and 1915-17.*

Year.	Source.	Estab- lish- ments.	Creamery butter.		Factory cheese.	
			No. cwt.	£	cwt.	£
1900	Decennial Census	3,576	322,024	1,487,871	1,971,726	4,566,046
1907	Postal Census	3,515	410,102	2,249,807	1,828,369	4,848,829
1910	Decennial Census	3,625	577,632	3,214,899	1,784,858	4,435,709
1915	Census and Statistics Office	3,513	749,934	5,010,626	1,641,856	5,567,912
1916	Census and Statistics Office	3,446	737,160	5,541,031	1,722,934	7,297,112
1917	Dominion Bureau of Statistics	3,418	780,396	7,032,982	1,740,317	8,459,703

It will be seen that both for butter and cheese the bulk of the trade is with the United Kingdom. Between 1883 and 1897 there was a considerable falling off in the exports of butter; but between 1898 and 1907 they reached their highest point, declining, however, to averages of only 49,000 cwt. in the five years ended 1912 and 29,000 cwt. for the five years ended 1917. Of cheese the exports rose continuously until the five years ended 1907, when they reached the maximum, viz., 1,915,597 cwt. From this date they declined to 1,572,902 cwt. and 1,405,331 cwt., the annual averages for the five years ended, respectively, 1908-12 and 1913-17. The demands created by the war, and the consequent high prices, caused a decided increase in the exports of both butter and cheese, these amounting for butter to 30,724 cwt. in 1916 and 71,342 cwt. in 1917, and for cheese to 1,508,586 cwt. in 1916 and 1,613,691 cwt. in 1917.

It has sometimes been too hastily assumed that the falling off in the exports of butter and cheese, as shown in Table XXV, represents a decline in the Canadian dairying industry; but dairying experts are well aware that this is not the case, but that owing to the increase of immigration and especially the settlement of immigrants in urban centres, the milk-flow has been merely diverted into different channels. Cheese for export has been replaced by the manufacture of butter sold for home consumption, and there has been a larger demand for milk consumed whole.

The total dairying output of Canada in other than census years

TABLE XXV.—Exports of Canadian butter and cheese to the United Kingdom, to the United States, and to other countries in quinquennial averages, 1888–1917.

BUTTER.								
Period.	United Kingdom.	United States.	Other countries.	Total.	United Kingdom.	United States.	Other countries.	Total.
	cwt.	cwt.	cwt.	cwt.	£	£	£	£
1868–72	86,759	37,937	10,089	134,785	335,890	169,109	41,918	546,918
1873–77	84,760	17,848	11,053	113,660	409,520	91,232	48,903	549,657
1878–82	121,143	8,268	11,044	140,456	502,397	36,372	39,040	577,809
1883–87	47,803	2,714	9,589	60,106	219,863	12,534	37,191	269,588
1888–92	22,625	420	8,473	31,518	93,903	1,644	32,671	128,218
1893–97	51,597	277	8,054	59,928	221,712	1,027	33,082	255,821
1898–1902	172,045	616	7,402	180,063	780,411	2,466	31,848	814,725
1903–07	223,786	1,053	11,883	236,722	1,114,931	5,137	59,177	1,179,245
1908–12	37,411	4,446	7,598	49,455	199,520	18,493	45,822	263,835
1913–17	17,491	4,696	6,759	28,946	123,288	22,809	46,233	192,330
CHEESE.								
1869–72	61,839	429	277	62,545	169,520	1,233	822	171,571
1873–77	249,821	11,473	902	262,196	670,890	32,878	2,671	706,438
1878–82	390,911	9,839	848	401,598	908,424	21,986	2,055	932,465
1883–87	637,250	2,786	1,339	641,375	1,462,602	6,781	3,082	1,472,465
1888–92	873,420	2,920	1,232	877,592	1,977,945	7,192	2,877	1,988,014
1893–97	1,361,062	634	2,295	1,363,991	2,942,054	2,055	5,548	2,949,657
1898–1902	1,726,116	1,402	3,527	1,731,045	3,874,520	3,493	9,041	3,887,054
1903–07	1,908,491	643	6,563	1,915,696	4,730,341	2,055	19,726	4,752,122
1908–12	1,564,116	1,607	7,179	1,572,902	4,348,972	5,342	22,809	4,377,122
1913–17	1,390,911	3,670	10,758	1,405,331	4,965,615	12,945	42,945	5,021,505

Note.—In 1868 the exports of cheese were included with those of butter.

TABLE XXVI.—*Estimated production of milk and distribution of milk products, 1900, 1907, 1910, 1915-17.*
(000's omitted in the case of lb. of milk.)

Items.	1900.	1907.	1910.	1915.	1916.	1917.
Milch cows No.	2,408,677*	2,737,462	2,853,951	2,666,846	2,833,433	3,202,283
Human population No.	5,322,000	6,302,000	6,917,000	7,928,000	8,140,000	8,361,000
Milk yield lbs.	9,165,016	10,330,193	10,859,306	10,147,349	10,781,213	12,184,687
Imports lbs.	33,936	25,051	26,989	142,678	56,644	17,253
Total lbs.	9,198,952	10,355,244	10,886,295	10,290,027	10,837,857	12,201,940
Exports lbs.	—	788	200,271	134,087	89,370	11,033
Production of butter, cheese, etc. lbs.	4,934,468	5,473,240	5,148,874	8,104,064	8,100,936	8,593,356
Total lbs.	4,934,468	5,474,028	5,349,145	8,238,151	8,190,306	8,604,389
Balance for home consumption lbs.	4,264,484	4,881,216	5,537,150	2,051,876	2,647,551	3,597,551
Milk consumption <i>per capita per diem</i> pt.	1.75	1.75	1.75	0.56	0.71	0.94

* Number of milch cows in 1901.

can only be a matter of approximate calculation based on the estimated number of milch cows, the factory production of butter and cheese and the exports and imports of dairy products. Using all the data available an attempt is made by Table XXVI to estimate the total production of milk and its distribution in the form of dairy products for each of the six years for which statistics of creamery butter and factory cheese are available, viz., 1900, 1907, 1910, 1915, 1916 and 1917.

The more certain factors in these calculations are the statistics of creamery butter and factory cheese and exports and imports. Less certain factors are the estimates of the number of milch cows and of the human population. In 1911 the census showed that the average production of milk per cow was 3,805 lb., or, at the rate of 10 lb. per gallon, 380½ gallons. This average has been applied to each of the years in the table, and may be erroneous though probably not so to a large extent. The same census also showed that in 1910 the total production of dairy or home-made butter was about 68 per cent. of the total butter production, and that home-made cheese represented 0.7 per cent. of the total cheese production. For the purposes of the table, it has therefore been assumed that the proportions of 32 and 1 per cent. represent respectively dairy butter and home-made cheese. No account is taken of fluctuations due to seasonal and other causes; but such differences would not be sufficiently great to disturb seriously the results obtained. The quantities in the table are expressed in terms of milk by weight, butter, cheese, cream and condensed milk having been converted into lb. of milk by the application in each case of recognized average formulæ. The most striking result indicated is the difference between the consumption of whole milk for the first three years of the table, 1900, 1907 and 1910, and the last three years 1915, 1916 and 1917. For the first three years the *per capita* consumption is at the rate of about 80 gallons per annum, or 1¼ pint daily, whilst for the last three years the rate has dropped to 25¾, 32½ and 43 gallons per annum, or between ½ and 1 pint daily. The higher prices for butter and cheese caused by the war undoubtedly stimulated the manufacture of butter and cheese; and as there was no great corresponding increase in the number of milch cows the result was apparently a reduction in the consumption of whole milk. The uses for whole milk include the manufacture of ice cream, a certain but unknown quantity for calf rearing and any other purposes to which milk may be put apart from those specifically indicated.¹

¹ It may be of interest to compare the estimates of the whole milk consumption of Canada with those of the United States and of the United Kingdom.

Forest products.

The Forestry Branch of the Department of the Interior estimates that the total area of land covered by timber in Canada is between 500,000,000 and 600,000,000 acres, of which about 225,000,000 acres are covered by commercial timber distributed by provinces in millions of acres as follows: Nova Scotia, 5; New Brunswick, 9; Quebec, 100; Ontario, 70; the Prairie Provinces, 11; and British Columbia, 30. Since 1887 the Dominion Parliament has created large forest reserves for the permanent supply of timber, for the maintenance of the water supply, and for the protection of wild animals and birds. The Provincial Governments having forestry jurisdiction have adopted a similar policy, and under successive enactments and Orders in Council the total forestry reserves of Canada have increased from 7,413,760 acres in 1901 to 152,833,955 acres in 1918. Of this area 107,997,513 acres are in Quebec, 14,430,720 acres are in Ontario, 2,474,240 acres are parks and reserves for water purposes in British Columbia, and 27,931,482 acres are on lands under Dominion jurisdiction in the three Prairie Provinces and in British Columbia. In addition all unalienated lands in British Columbia are reserved, and their area is estimated to exceed 20,000,000 acres. The statistics available for exhibiting the progress of forest production include the annual export returns from 1868, the returns of the decennial census and the annual statistics and estimates which have been collected and published since 1908 by the Forestry Branch of the Department of the Interior. Table XXVII shows by decennial averages since 1868 the values of

In the United States the average consumption was placed at 25 imperial gallons per annum, or 0.56 pint per diem in 1900—a figure equivalent to that of Canada as now given for 1915—and Sir Henry Rew, in his paper, "Observations on the Production and Consumption of Meat and Dairy Products," read before this Society in 1904 (*Journal*, vol. lxvii, part iii, September 30, 1904, pp. 413-429), placed the *per capita* consumption in the United Kingdom at 15 gallons per annum, or 0.33 pint per diem. For 1915 the average *per capita* consumption of whole milk in large cities of the United States is estimated at 0.60 pint per diem. The average milk consumption on farms in the United States is estimated at 576 pints *per capita* per annum, which represents a daily individual consumption of a pint and a-half. Investigations by Mr. Eugene Merritt (*Bull., U.S. Dept. of Agriculture*, No. 177, 1915) show a daily consumption in the large cities of between six and seven-tenths of a pint *per capita*. Mr. Ernest Kelley, of the Dairy Division of the United States Bureau of Animal Industry, in a letter dated August 30, 1917, stated that he has estimated from available figures that about 36,274,480,140 lb. of milk are used annually in the United States as market milk or cream, and that this would give a yearly *per capita* consumption for the whole country of about 363 lb., equal to 336 pints *per capita* per annum, or about nine-tenths of a pint per diem.

TABLE XXVII.—*Exports of unmanufactured Canadian forest produce in decennial averages, 1868-1917.*

Decennial average.	Value.	Decennial average.	Value.
	£		£
1868-77	4,791,435	1898-1907	6,602,773
1878-87	4,402,998	1908-17....	9,319,588
1888-97	5,187,045		

Canadian exports of unmanufactured forest products. In 1868 the total value was 3,851,423*l.*, and in 1917 it was 11,487,878*l.* The value of manufactured wood products exported was 14,691*l.* in 1868 and 1,026,924*l.* in 1908. In addition to the increase in quantities exported, it must be remembered that prices have risen very materially, especially during recent years.

The census returns relating to forest products are limited to returns made from farms, timber limits and other tracts; they do not include the large saw mills which own timber limits from which logs are floated to the mills. Moreover, the census returns are comparable only for the years 1871, 1881, 1891 and 1901. For 1911 they were limited entirely to the forest products of farms. Table XXVIII shows the census returns for each of the four census years 1871 to 1901.

It will be observed from Table XXVIII that during the latter half of the period covered there was a great falling off in the production of square, waney, and flat timber. Three causes are assigned for this reduction. In the first place, there was a check to the indiscriminate cutting of timber over large areas which were thus denuded of trees to the detriment of other interests; secondly, other large areas were destroyed by forest fires over which there were no effective means of control; and thirdly, the efforts of lumbermen were to a large extent diverted from the production of timber to that of pulpwood and the manufacture of wood pulp.

The statistics issued by the Forestry Branch of the Department of the Interior include (1) the quantities and values of lumber, shingles, and lath (Table XXIX); (2) the quantities and values of railway sleepers and poles purchased by railway and electric companies (Table XXX); (3) the consumption and value of pulpwood (Table XXXI); and (4) the quantity of wood pulp manufactured by processes (Table XXXII).

TABLE XXVIII.—*Census returns of forest products, 1871-1901.*

Description.	1871.	1881.	1891.	1901.
	cubic feet.	cubic feet.	cubic feet.	cubic feet.
Square, waney and flat timber—				
Birch and maple	1,939,357	4,414,795	3,642,273	1,549,997
Elm	1,832,654	3,191,968	2,864,422	1,354,765
Oak	3,302,043	5,670,894	1,895,080	110,210
Pine	26,191,193	43,544,802	10,597,639	2,381,310
All other	32,404,624	54,811,403	25,712,454	6,330,632
Total	65,669,871	111,633,862	44,711,868	11,726,914
	sq. feet.	sq. feet.	sq. feet.	sq. feet.
Logs for lumber—				
Pine	1,241,640,800	2,232,440,700	1,509,052,800	1,533,681,000
All other	931,455,700	2,602,558,400	3,353,848,500	2,123,282,000
Total	2,173,096,500	4,834,999,100	4,862,901,300	3,656,963,000
	cords.	cords.	cords.	cords.
Miscellaneous products—				
Bark for tanning	162,521	400,418	329,797	100,712
Firewood	8,713,083	10,993,234	10,547,161	8,846,026
Pulpwood	—	—	261,110	668,034
No.	No.	No.	No.	
Fence posts	—	—	28,302,255	16,678,885
Masts and spars	121,685	192,241	323,040	31,388
Railway sleepers	—	—	10,664,907	8,151,790
Poles for electric wires	—	—	391,861	255,711

TABLE XXIX.—*Quantities and values of lumber, shingles and lath, 1908-17.*

Year.	Lumber.		Shingles.		Lath.	
	F.M.B.M.	£	M.	£	M.	£
1908	3,348,176	11,165,347	1,499,396	637,396	671,562	305,574
1909	3,814,942	12,908,108	1,988,753	760,516	822,124	406,651
1910	4,901,649	15,925,308	1,976,640	730,933	851,953	399,358
1911	4,918,202	15,581,699	1,838,474	721,660	965,235	454,567
1912	4,389,723	14,275,842	1,578,343	652,462	899,016	424,237
1913	3,816,642	13,519,813	1,485,279	629,721	739,678	366,428
1914	3,946,254	12,403,429	1,843,554	757,961	625,010	325,784
1915	3,842,676	12,723,245	3,089,470	1,178,394	793,226	419,346
1916	3,490,550	11,992,876	2,897,562	1,225,259	665,588	358,344
1917	4,142,871	17,167,254	3,020,956	1,732,440	616,949	375,620

TABLE XXX.—Quantities and values of railway sleepers and poles purchased by railway and electric companies, 1908–17.

Year.	Railway sleepers.			Poles.		
	Quantity.	Value.	Average value per sleeper.	Quantity.	Value.	Average value per pole.
	No.	£	s. d.	No.	£	s. d.
1908....	13,978,416	1,085,277	1 6½	185,807	58,467	6 3½
1909....	14,178,241	1,070,648	1 6½	358,255	102,132	5 8½
1910....	9,213,962	726,498	1 6½	782,841	214,494	5 5½
1911....	14,389,224	1,138,514	1 7½	585,703	217,043	7 4½
1912....	21,308,571	1,926,137	1 9½	608,556	228,806	7 6½
1913....	19,881,714	1,796,064	1 9½	534,592	244,177	9 1½
1914....	19,403,646	1,780,461	1 10½	283,184	135,671	9 7
1915....	7,592,530	684,047	1 9½	179,248	92,639	10 4½
1916....	7,839,515	679,586	1 8½	182,317	87,771	9 7½
1917....	7,661,715	801,819	2 1½	193,359	105,158	10 10½

TABLE XXXI.—Consumption and value of pulpwood, 1908–17.

Year.	Total consumption.	Total value.	Year.	Total consumption.	Total value.
	Cords.	£		Cords.	£
1908....	482,777	602,394	1913....	1,109,034	1,488,362
1909....	622,129	711,797	1914....	1,224,376	1,662,301
1910....	598,487	736,675	1915....	1,405,836	1,936,893
1911....	672,288	891,374	1916....	1,764,912	2,692,696
1912....	866,042	1,071,694	1917....	2,104,334	3,866,605

TABLE XXXII.—Quantity of wood pulp manufactured by processes, 1908–17.

Year.	Mechanical.	Sulphite.	Sulphate.	Soda.	All processes.
	Tons.	Tons.	Tons.	Tons.	Tons.
1908....	248,723	73,509	—	1,945	324,178
1909....	290,723	102,611	—	4,351	397,686
1910....	330,531	85,702	—	7,520	423,753
1911....	323,499	98,563	—	21,537	443,600
1912....	445,736	127,658	29,883	6,213	609,493
1913....	535,907	163,883	60,967	2,296	763,056
1914....	575,823	194,241	62,797	1,690	834,554
1915....	664,086	210,244	82,504	2,812	959,647
1916....	738,622	324,973	90,158	3,462	1,157,218
1917....	824,760	334,726	144,100	3,693	1,307,418

The pulpwood tables show a steady expansion, the quantity used for this purpose having grown from 482,777 cords, value 602,394*l.*, in 1908, to 2,104,334 cords, value 3,866,605*l.*, in 1917. The estimated value of all forest products in Canada for 1917 is in round figures 39,000,000*l.*, as compared with 35,000,000*l.* in 1911.

Fisheries.

As was indicated by Mr. Colmer in his Paper already referred to, the fisheries of Canada are amongst the most extensive in the world belonging to a single country. Abundant supplies of all the principal commercial food fishes, including salmon, lobsters, herring, mackerel, haddock, cod, hake, and pollock, are caught in Canadian territorial waters. The coast line of the Atlantic provinces from the Bay of Fundy to the straits of Belle Isle, without taking into account the lesser bays and indentations, measures over 5,000 miles, and on the Pacific coast, the province of British Columbia, owing to its immense number of islands, bays, and fiords, has a sea-washed shore of 7,000 miles. In addition to these immense salt-water fishing areas, there are in the numerous inland lakes not less than 220,000 square miles of fresh water abundantly stocked with many species of excellent food fishes. The Canadian waters of the Great Lakes, viz., Lakes Superior, Huron, Erie and Ontario, form only one-fifth of the total area of the larger fresh water lakes of Canada.

The two main statistical sources of information relating to the progress of Canadian fisheries are those of the decennial census and those given in the Reports of the Department of Marine and Fisheries and since July 1, 1914, the Fisheries Branch of the Naval Service. The latter in respect of values of total production are annually continuous since 1870. The census statistics give for 1870 and 1880 the number of vessels, boats, men, nets, &c., and the quantities of fish taken by provinces. For the census of 1890, however, no fishery statistics were collected, except those of the Census of manufactures, which are limited to canning establishments. For 1900 and 1911 the census fishery statistics include quantities and values. The differences between the methods of collection and expression for the census years are so considerable that any satisfactory comparisons for the purpose of illustrating progress since Confederation is practically impossible. Perhaps the simplest and most effective method of comparison is to use the annual values as published in the Reports of the Fisheries Branch of the Naval Service from 1870, and reproduced in Table XXXIII. Progress of the fishing industry during the present century may be more readily compared by the census figures, and Table XXXIV,

constructed from data in the Report on the Census of 1911, shows for the two years 1900 and 1910 the values of the fisheries by provinces and distributed as between sea fisheries and lake fisheries and as between fresh fish and canned and cured fish.

TABLE XXXIII.—Total value of the fisheries of Canada, 1870-1917.

Years.	Value.	Years.	Value.	Years.	Value.	Years.	Value.
1870	£ 1,351,518	1882	£ 3,457,000	1894	£ 4,277,445	1906	£ 5,399,893
1871	1,556,136	1883	3,484,559	1895	4,150,548	1907-08	5,239,591
1872	1,966,461	1884	3,650,630	1896	4,193,305	1908-09	5,229,674
1873	2,209,930	1885	3,641,706	1897	4,681,549	1909-10	6,088,184
1874	2,400,387	1886	3,838,209	1898	4,041,188	1910-11	6,157,279
1875	2,126,790	1887	3,777,965	1899	4,498,295	1911-12	7,123,534
1876	2,284,314	1888	3,579,145	1900	4,429,651	1912-13	6,860,847
1877	2,466,972	1889	3,627,791	1901	5,288,455	1913-14	6,823,457
1878	2,715,549	1890	3,640,048	1902	4,512,211	1914-15	6,424,338
1879	2,779,982	1891	3,899,563	1903	4,746,960	1915-16	7,368,487
1880	2,979,446	1892	3,892,020	1904	4,832,144	1916-17	8,056,732
1881	3,250,100	1893	4,250,683	1905	6,067,443		

Note.—From 1870 to 1906 the figures are for the calendar year. From 1907 onwards they are for the fiscal year ended March 31. For 1907-08 the period covered is the fifteen months ended March 31, 1908.

TABLE XXXIV.—Value of sea and lake fisheries of Canada 1900 and 1910.

Province.		Sea Fisheries.	Lake Fisheries.	Total Value.
		£	£	£
Prince Edward Island	1900	209,074	—	209,074
	1910	224,967	12,078	237,045
Nova Scotia	1900	1,492,329	—	1,492,329
	1910	2,079,293	3	2,079,296
New Brunswick	1900	604,656	4,120	608,776
	1910	842,010	7,461	849,471
Quebec	1900	449,971	35,511	485,482
	1910	327,501	20,432	347,933
Ontario	1900	—	230,550	230,550
	1910	—	416,326	416,326
Manitoba	1900	—	70,476	70,476
	1910	—	267,694	267,694
Saskatchewan	1900*	—	—	—
	1910	—	35,529	35,529
Alberta	1900*	—	—	—
	1910	—	16,944	16,944
British Columbia	1900	920,294	13,893	934,187
	1910	1,881,949	907	1,882,856
The Territories	1900	—	31,134	31,134
	1910	—	24,323	24,323
Total	1900	3,676,324	385,684	4,062,008
	1910	5,355,720	801,697	6,157,417

* Included in The Territories of 1900.

TABLE XXXIV.—*Value of sea and lake fisheries of Canada—Contd.*

Province.		Fresh Fish.	Canned and Cured Fish.	Total Value.
		£	£	£
Prince Edward Island	.... 1900	43,700	165,375	209,075
	.... 1910	65,544	171,519	237,063
Nova Scotia	.... 1900	403,661	1,088,658	1,492,319
	.... 1910	589,734	1,489,572	2,079,306
New Brunswick	.... 1900	279,526	329,260	608,786
	.... 1910	423,312	426,159	849,471
Quebec	.... 1900	172,865	312,607	485,472
	.... 1910	75,340	272,419	347,759
Ontario	.... 1900	221,646	8,904	230,550
	.... 1910	414,123	2,183	416,306
Manitoba	.... 1900	64,546	5,931	70,477
	.... 1910	267,694	—	267,694
Saskatchewan	.... 1900	—	—	—
	.... 1910	35,529	—	35,529
Alberta	.... 1900*	—	—	—
	.... 1910	16,945	—	16,945
British Columbia	.... 1900	143,312	790,885	934,197
	.... 1910	475,013	1,407,823	1,882,836
The Territories	.... 1900	31,134	—	31,134
Yukon*	.... 1910	24,323	—	24,323
Total	.... 1900	1,360,390	2,701,620	4,062,010
	.... 1910	2,387,557	3,769,675	6,157,232

* Included in The Territories in 1900.

TABLE XXXV.—*Values of fish by principal kinds, 1900 and 1919.*

Kind of Fish.	1900.	1910.	1900 Per cent. of Total Value.	1910 Per cent. of Total Value.
	£	£		
Salmon	770,460	1,480,658	19.0	24.0
Cod	751,591	1,216,674	18.5	19.8
Lobsters	684,285	777,544	16.8	12.6
Herring	307,678	468,235	7.6	7.6
Halibut	70,356	257,239	1.7	4.2
Haddock	115,752	250,420	2.8	4.1
Whitefish	100,869	202,108	2.5	3.3
Trout	109,975	169,579	2.7	2.8
Smelts	—	163,783	—	2.6
Mixed fish	—	155,418	—	2.5
Mackerel	182,176	—	4.5	—
Sardines	83,316	—	2.1	—
Total (ten kinds)	3,176,458	5,141,658	78.2	83.5
All other fish	885,516	1,015,574	21.8	16.5
Grand total	4,062,010	6,157,232	100.0	100.0

Table XXXV shows the values of the principal kinds of fish for the census years 1900 and 1910. The chief kinds, it will be noted, are salmon, cod, and lobsters, these constituting in 1910 respectively 24, 19.8, and 12.6 per cent. of the total value.

For 1917 new arrangements came into force for the collection of fisheries statistics as part of the general Census of Industry for that year, the Dominion Bureau of Statistics and the various Government branches having jurisdiction over fisheries throughout Canada entering into statistical co-operation. The results have been published as Part III of the Census of Industry. The statistics in this report are for the calendar year 1917, whilst previous annual reports have dealt with the fiscal year ended March 31. For this reason comparisons made between 1917 and previous years are not exact. According to this report the total value of the Canadian fisheries of 1917 was 10,748,964*l.*, as compared with 8,056,732*l.* in 1916-17 and 7,368,487*l.* in 1915-16.

Table XXXVI shows the value of the fisheries by provinces for the fiscal years 1914 to 1917 and for the calendar year 1917. The provinces are ranged in order of value for 1917.

Expressed in decennial averages the values of the Canadian fisheries from 1870 to 1916 were as follows: 1870-1879, 2,186,004*l.*, 1880-1889, 3,528,756*l.*; 1890-1899, 4,150,364*l.*; 1900-1909-10, 5,182,320*l.*; 1910-11-1915-16, 6,793,007*l.* For 1870 the value was 1,351,548*l.*, for the fiscal year 1916-17 it was 8,056,732*l.*, and for the calendar year 1917 it was 10,748,964*l.*

In addition to the statistics of the primary operations of fishing, the Census of Industry took account of the fish-canning and preserving establishments, the total number of which in 1917 was 982. Altogether, the capital invested in the fishing industry in 1917 was 9,687,041*l.*, including 5,457,912*l.* primary operations, 4,184,938*l.* fish-canning and preserving establishments, and 44,290*l.* the value of 9,492 small fish and smoke houses. The total number of employees in 1911 was 94,486, including those employed in primary operations 77,140, in fish-canning and preserving establishments 12,494, contract labourers 4,638 and outside piece workers 214.

Minerals.

Although in 1917 the total value of the mineral wealth of Canada exceeded 39,000,000*l.*, the statement is true that compared with the riches yet lying dormant the mineral resources of the Dominion have scarcely been touched. The greater part of the country has not even been prospected, and even in the older districts very little development work has been done. All the principal metals are found in

TABLE XXXVI.—*Value of fisheries by provinces, 1913-14, 1916-17 and 1917.*

Province.	Fiscal Year.				Calendar Year 1917.	Increase in 1917 compared with 1916-17.
	1913-14.	1914-15.	1915-16.	1916-17.		
British Columbia	£ 2,854,396	£ 2,366,213	£ 2,987,225	£ 3,007,673	£ 4,421,528	£ 1,413,855
Nova Scotia	1,704,981	1,588,395	1,883,599	2,074,083	2,972,941	898,858
New Brunswick	885,341	1,015,085	973,366	1,162,358	1,262,298	99,940
Quebec	380,205	395,441	426,730	614,737	701,584	86,847
Ontario	549,583	566,146	686,534	546,388	588,980	42,592
Prince Edward Island	263,105	259,246	191,852	276,191	367,080	99,889
Manitoba	124,576	174,540	152,654	285,617	317,094	31,477
Saskatchewan	30,534	27,126	34,088	47,660	65,801	18,141
Alberta	16,709	17,819	19,343	29,653	37,808	8,155
Yukon.....	14,027	14,327	13,096	12,372	13,850	1,478
Total	6,823,457	6,424,338	7,368,487	8,056,732	10,748,964	2,692,232

Canada in great abundance. Gold, silver, copper, lead, nickel, iron are amongst the principal metallic products, whilst amongst the non-metallic products are coal, gypsum, asbestos, salt, cement, stone, lime, petroleum, and natural gas.

There are three sources of official statistics of Canadian mineral production, viz., those of the decennial census, those of the Mineral Resources and Statistics Branch of the Dominion Department of Mines and the Annual Reports of the Provincial Departments of Mines in the mining provinces of Nova Scotia, New Brunswick, Quebec, Ontario, Alberta, and British Columbia. The decennial census statistics are not comparable for all the census years since Confederation. In 1871 and 1881 quantities but not values were recorded of the principal raw mineral products of Canada; but in 1891, although a census of the mining industry was taken, the returns were not published, and it does not appear that they were even compiled. In 1911 the mineral census was of a more complex character than any previous one; but it is not possible to institute effective comparisons with the earlier census years. In Table XXXVII the quantities of eighteen of the principal ores, metals, and minerals, according to the census returns, are compared for the years 1871, 1881, and 1901.

TABLE XXXVII.—*Mineral production of Canada, 1871, 1881 and 1901.*

Minerals.	1871.	1881.	1901.
Gold ozs.	22,941	70,015	862,000
Silver "	69,197	87,024	786,000
Copper ore tons	11,884	7,301	231,750
Iron ore "	115,505	199,158	268,878
Pyrites "	2,500	18,545	13
Manganese "	567	2,187	5,369
Other ores "	12,566	5,289	256,023
Coal "	599,112	1,167,700	4,751,541
Peat "	13,189	—	134
Plumbago "	241	25	3,571
Gypsum "	102,170	163,461	195,428
Phosphate of lime "	1,768	13,167	442
Mica lbs.	4,010	16,076	9,510,000
Petroleum gal.	12,969,435	15,490,622	25,028,457
Salt bbl.	—	472,074	405,888
Marble.... .. cub. ft.	8,870	40,126	12,601,278
Building stone "	5,206,796	8,141,227	
Roofing slate sq. ft.	6,013	10,536		5,000

The table shows large increases in 1901 in all minerals except pyrites, peat, phosphate of lime, salt and roofing slate. The production of gold in 1901 was 862,000 ozs., as compared with 70,015

ozs. in 1881 and 22,941 ozs. in 1871; in like manner silver was 786,000 ozs. as compared with 87,024 ozs. and 69,197 ozs., copper ore 231,750 tons, as compared with 7,301 tons and 11,884 tons, and iron ore 268,878 tons as compared with 199,158 tons and 115,505 tons. Coal too increased to 4,751,541 tons, as against 1,167,700 tons in 1881 and 599,112 tons in 1871. The production of petroleum in 1901 was 25,028,457 gallons, as compared with 15,490,622 gallons in 1881 and 12,969,435 gallons in 1871. Building stone and marble were 12,601,278 cubic feet in 1900, as against 8,181,353 cubic feet in 1881 and 5,215,666 cubic feet in 1871. The total value of mineral products in 1910 was 25,069,200*l.* as compared with 9,854,138*l.* in 1900, the distribution of these values being as shown in Table XXXVIII.

TABLE XXXVIII.—*Value of mineral production, 1900 and 1910.*

Products.	1900.	1910.
	£	£
Metallic ores and products	5,169,998	10,064,032
Abrasive products	25,805	88,762
Fuel and light materials	2,896,430	7,708,276
Pigments	3,867	16,482
Structural material of stone and clay	1,332,332	5,744,611
Miscellaneous	425,706	1,447,037
Totals *	9,854,138	25,069,200

Continuous annual statistics of the value of mineral production in Canada, as published by the federal Department of Mines, are available since 1886, as in Table XXXIX.

During the 32 years, 1886–1917, the value of mineral production has increased from 2,100,457*l.* to 39,714,377*l.*, and the *per capita* value from 9*s.* 2*d.* to 4*l.* 15*s.*

Comparing the principal mineral products as between the earliest and latest records we find that in 1867 the production of gold was 145,775 fine ozs. of the value of 619,198*l.*; it reached its highest value in 1900 with 1,350,057 ozs., of the value of 5,734,451*l.* and in 1917 the production was 738,831 ozs., value 3,138,385*l.* Of silver the census of 1871 recorded a production of 69,197 ozs. obtained solely in Ontario. The earliest year of continuous record for this metal is 1887, 355,083 ozs., value 71,356*l.*; the highest value was in 1912, 31,955,560 ozs., value 3,994,653*l.*; in 1917 the production was 22,221,274 ozs., value 3,717,212*l.* Copper, the production of which in 1886 was 3,505,000 lbs., value 79,224*l.*, had increased to 117,150,028 lbs., value 6,548,243*l.*, in 1916 and to 109,227,332 lbs., value

TABLE XXXIX.—*Value of mineral production in Canada, 1886-1917.*

Calendar year	Total value.	Value per capita	Calendar year	Total value.	Value per capita.
	£	s. d.		£	s. d.
1886	2,100,457	9 2	1902	12,993,040	46 8½
1887	2,120,821	9 2	1903	12,686,804	44 6½
1888	2,572,475	10 11½	1904	12,345,972	42 2½
1889	2,879,306	12 2½	1905	14,194,021	47 2½
1890	3,444,624	14 4½	1906	16,291,983	52 7½
1891	3,899,004	16 1½	1907	17,849,010	56 6
1892	3,415,869	13 11½	1908	17,580,422	54 1
1893	4,116,797	16 7½	1909	18,869,369	56 3½
1894	4,095,342	16 4½	1910	21,949,054	63 5½
1895	4,213,444	16 7½	1911	21,209,788	59 3½
1896	4,617,897	18 0	1912	27,749,643	75 7
1897	5,852,885	22 6½	1913	29,923,954	79 5½
1898	7,893,163	30 1	1914	26,478,707	68 6½
1899	10,116,474	38 1	1915	28,172,110	71 0½
1900	13,237,163	49 5½	1916	36,416,265	89 5½
1901	13,519,815	49 11½	1917	39,714,377	95 0½

6,100,370*l.*, in 1917. Nickel, from 830,477 lbs., value 102,388*l.*, in 1869, has increased to 84,330,280 lbs., value 6,931,254*l.*, in 1917. Finally, coal, the production of which in 1874 was 949,780 tons, value 362,347*l.*, was in 1917 12,513,918 tons, value 9,789,688*l.*, with average values per ton of 7*s.* 7*d.* for the former and 15*s.* 1*d.* for the latter year.

Manufactures.

An industrial or manufacturing inquiry has been a feature of each decennial census since Confederation. In 1871, the first census held after Confederation, the Dominion consisted of only the four provinces, Nova Scotia, New Brunswick, Quebec and Ontario. Table XL, giving the capital invested, the number of hands employed, the value of the annual wages, the value of raw materials and the total value of the products, will serve to show the extent of the manufacturing industry in those early days of the Dominion.

TABLE XL.—*Statistics of Canadian manufactures, 1870.*

Province.	Capital invested.	No. of employees.	Amount of yearly wages.	Value of raw materials.	Total value of products.
	£	No.	£	£	£
Nova Scotia	1,241,500	15,595	652,657	1,193,056	2,535,026
New Brunswick	1,227,971	18,352	795,114	1,938,052	3,568,902
Quebec	5,768,091	66,714	2,545,823	9,155,440	15,864,074
Ontario	7,782,229	87,281	4,400,587	13,379,751	23,569,884
Total	16,019,791	187,942	8,394,181	25,666,299	45,537,886

For succeeding censuses the provinces of Prince Edward Island, Manitoba, British Columbia and the Northwest Territories formed part of the Dominion, and Table XLI gives similar particulars for the two census years 1880 and 1890 for the whole of Canada.

TABLE XLI.—*Canadian manufactures, 1880 and 1890.*

Description.		1880.	1890.	Increase.	
Establishments	No.	49,722	75,964	26,242	p.c. 52.8
Capital	£	33,894,352	72,579,023	38,684,671	114.1
Employees	No.	254,894	369,595	114,701	45.0
Salaries and wages	£	12,205,726	20,633,286	8,227,560	69.0
Cost of materials	£	36,973,744	51,523,869	14,550,125	39.4
Value of products	£	63,642,518	96,544,062	32,901,544	51.7

For 1880 and 1890 the figures relate to all manufacturing and mechanical works, irrespective of the number of employees; but for 1900 the returns were limited to factory works employing five hands and over. The returns in 1890 in respect of the number of establishments and employees, the amount of salaries and wages and the value of products were re-compiled with the elimination of returns from works employing less than five hands in order that the two census years 1890 and 1900 might be placed upon a strictly comparable basis. The results are shown in Table XLII.

TABLE XLII.—*Canadian manufactures of establishments employing five hands and over, 1890 and 1900.*

Description.		1890.	1900.	Increase.	
Establishments	No.	14,065	14,650	585	p.c. 4
Employees	No.	272,033	344,035	72,002	26
Salaries and wages	£	16,281,119	23,271,408	6,990,289	43
Value of products	£	75,759,581	98,846,559	23,086,978	30

In 1906 the Census and Statistics Office carried out the first postal census of the manufacturing industries of Canada for the year 1905, and in 1916 a second postal census for 1915 was similarly undertaken. With the usual decennial census returns of 1900 and 1910 there are therefore quinquennial statistics of Canadian manufactures since the beginning of the century, a period of fifteen years, during which took place an enormous expansion of the industrial activities of the Dominion. Table XLIII gives the results of the

four quinquennial censuses for the years 1900, 1905, 1910 and 1915 for establishments employing five hands and over.

TABLE XLIII.—*Canadian manufactures, 1900, 1905, 1910 and 1915.*

Description.	1900.	1905.	1910.	1915.
Establishments No.	14,650	12,547	19,218	15,593
Capital £	91,834,132	171,352,591	256,332,731	402,483,575
Employees No.	339,173	383,920	515,203	—
Salaries and wages £	23,274,408	33,320,631	49,521,265	58,213,678
Raw and partly manufactured materials.... £	46,545,808	—	123,596,712	162,730,061
Value of products £	98,846,559	145,160,219	239,603,975	283,879,495

Note.—For 1915 the number of employees in establishments employing five hands and over is not available. The total number of employees for all establishments in 1915 was 514,883 (52,683 on salaries and 462,200 on wages), as shown in Tables XLV and XLVI.

The increases in absolute figures and in percentages between each of the above quinquennial periods and between 1900 and 1915 are shown in Table XLIV.

TABLE XLIV.—*Increases or decreases in absolute and relative figures, 1900-15.*

Description.	From 1900-05.		From 1905-10.	
		p.c.		p.c.
Establishments No.	-2,103	-14.4	6,671	53.2
Capital £	79,518,459	86.6	84,980,140	49.6
Employees No.	44,747	13.2	131,283	34.2
Salaries and wages £	10,046,223	43.2	16,200,634	48.6
Raw and partly manufactured materials .... £	....	....	....	....
Value of products £	46,313,660	46.9	94,443,756	65.1

Description.	From 1910-15.		From 1900-15.	
		p.c.		p.c.
Establishments No.	-3,625	-18.9	943	6.4
Capital £	146,150,844	57.0	310,649,443	338.3
Employees No.	....	....	....	....
Salaries and wages £	8,692,413	17.6	34,939,270	150.2
Raw and partly manufactured materials £	39,133,349	31.7	116,184,253	249.6
Value of products £	44,275,520	18.5	185,032,936	187.2

Note.—The minus sign (-) indicates a decrease.

Reviewing the whole period of fifty years we find that in 1870 the capital invested in Canadian manufactures was about 16,000,000*l.* and that in 1915 the amount was 402,483,575*l.*, or nearly two billion dollars. Similarly, the value of the products, which was less than 46,000,000*l.* in 1870, has grown to 283,879,495*l.* in 1915. When we consider that the total population which was under 4,000,000 in 1871 was still less than 8,000,000 in 1915, we cannot fail to appreciate how extraordinary has been the rate of progress in manufacturing industry during the fifty years. This is apparent when we compare the capital invested and the value of the products per 1,000 of the population. In 1871 the capital invested in industrial enterprises per 1,000 of the population was 4,342*l.*, and the value of the products was 12,344*l.* In 1915 these figures had increased respectively to 50,767*l.* and 35,810*l.*

In 1917 the Census and Statistics Office published the Report on the Postal Census of Manufactures, which was taken in 1916 for the calendar year 1915. According to this report, the number of industrial establishments in operation in 1915, irrespective of the number of employees, was 21,306, representing an invested capital of 409,737,144*l.*, employing 52,683 persons on salaries and 462,200 persons on wages, and producing goods to the value of 289,127,695*l.* from raw materials valued at 164,819,985*l.*

Table XLV compares the industrial activities of the two years 1905 and 1915, the statistics in this table covering all establishments irrespective of the number of employees.

TABLE XLV.—*Canadian manufactures, including all establishments irrespective of the number of employees, 1905 and 1915.*

Items.	1905.	1915.	Increase.	
			Total.	Per cent.
Establishments No.	15,796	21,306	5,510	34.88
Capital £	173,956,783	409,737,144	235,780,361	135.54
Employees on salary No.	36,496	52,683	16,187	44.35
Salaries £	6,313,367	12,392,021	6,078,654	96.29
Employees on wages No.	356,034	462,200	106,166	29.82
Wages £	27,609,484	47,147,524	19,538,040	70.76
Value of products £	147,600,114	289,127,695	141,527,581	95.88

It will be observed that the capital had increased during the ten years from 173,956,783*l.* in 1905 to 409,737,144*l.* in 1915, the increase of 235,780,361*l.* representing a percentage ratio of 135.54. In the

same period the value of products rose from 147,600,114*l.* in 1905 to 289,127,695*l.* in 1915, an increase of 141,527,581*l.*, or 95·88 per cent.

Finally, preliminary totals have been published of the census of manufactures for the year 1917, which forms part of the Census of Industry. The returns cover all establishments to the number of 34,380, and show a remarkable development in this branch of Canadian industry when compared with the Census of 1915 as in Table XLVI.

TABLE XLVI.—*Canadian manufactures, 1915 and 1917.*

Items.	1915.	1917.	Increase.	
			Total.	Per cent.
Establishments No.	21,306	34,380	13,074	63·12
Capital £	409,737,144	569,695,269	159,958,125	39·04
Employees on salaries No.	52,683	73,598	20,915	39·70
Salaries £	12,392,012	19,722,533	7,330,521	59·16
Employees on wages No.	462,200	619,473	157,273	34·03
Wages £	47,147,524	93,952,522	46,804,998	99·28
Cost of materials £	164,819,985	329,356,622	164,536,637	99·82
Value of products £	289,127,695	619,644,542	330,516,847	114·31

In connection with Table XLVI it is necessary to observe that the statistics of 1917 have been collected with greater completeness than in 1915; so that the increase shown in the number of establishments is largely due to the inclusion in 1917 of many of the smaller concerns that escaped compilation in 1915. Also it should be remembered that the returns of 1917 are swollen by the manufacture of munitions and equipments of war, as well as by the large increase in the prices of all commodities and manufactured articles.

External trade.

The trade returns of Canada may be examined profitably for evidences of national progress in a variety of directions; but the broad fact emerges that so far as total values are concerned the trade, though of course fluctuating annually, has continued to make rapid progress, especially since the opening of the present century and still more notably during the last four years of war. In Table XLVII I have taken out for purposes of comparison the values of the total external trade of Canada for the fiscal year corresponding with the year of the decennial census and for the years 1915, 1916 and 1917. The figures show the total value of imports entered for

home consumption and the total value of the exports of merchandise, including both Canadian and foreign produce. The value of coin and bullion is not included.

TABLE XLVII.—*Canadian trade—1868–1917* (1868, 1871–81–91, 1901–11–15–16–17).

Year.	Imports.	Exports.	Total Trade.
	£	£	£
1868	13,785,946	10,829,118	24,615,064
1871	17,304,222	13,866,221	31,170,443
1881	18,593,388	19,997,118	38,590,506
1891	22,918,930	20,028,053	42,946,983
1901	36,514,832	39,968,622	76,483,454
1911	92,822,314	59,591,069	152,413,383
1915	93,583,835	94,816,930	188,400,765
1916	104,346,965	160,130,111	264,477,076
1917	173,704,307	242,313,589	416,017,896

For the first fiscal year after Confederation, viz., the year ended June 30, 1868, the value of the total external trade of Canada was under 25,000,000*l.* In 1873 and again in 1874, it exceeded 43,000,000*l.*; but an excess of 41,000,000*l.* was not again reached until 1882 and 1883. For the next six years the total trade did not reach 41,000,000*l.* in value; but in 1890 it exceeded 42,300,000*l.*, and during the succeeding decade it continued gradually to increase until in 1899 the value was over 62,000,000*l.* This expansion continued in an increasing ratio until 1913 and 1914, when for both of these years the value exceeded 205,000,000*l.* In the year ended March 31, 1915, after the outbreak of the war, the value dropped to 188,400,765*l.*; but in 1916, owing to the increase of prices and the new industries created by the war, the value rose to 264,477,076*l.*, whilst in the following year 1917, the value as compared with 1916 nearly doubled and exceeded \$2,000,000,000, viz., 416,017,896*l.* Taking the extreme years of the fifty-year period, viz., 1868 and 1917, we find that the total value increased from 24,615,064*l.* in 1868 to 416,017,896*l.* in 1917.

Values, however, especially during the last four years of war, are not a conclusively satisfactory index of progress; and a selection is therefore tabulated of the principal exports for the first year of each decade since Confederation to show quantities as well as values.

TABLE XLVIII.—*Principal exports of Canada, by quantities and values, fiscal years 1868 to 1918.**

Items.	Year.	Quantities.	Values.
			£
Asbestos tons	1891	6,270	105,595
	1901	23,853	177,657
	1911	62,347	426,663
	1918	125,983	1,169,816
Coal tons	1868	236,906	131,654
	1871	284,185	136,121
	1881	375,048	230,782
	1891	744,361	599,293
	1901	1,686,195	1,090,482
	1911	2,067,107	1,235,763
	1918	1,698,243	1,784,391
Copper lbs.	1868	11,150,000	81,004
	1871	6,246,000	24,682
	1881	39,604,000	30,906
	1891	10,994,498	103,808
	1901	26,345,776	546,443
	1911	55,005,342	1,145,524
	1918	77,534,900	2,200,829
Gypsum tons	1881	116,928	24,533
	1891	155,023	38,007
	1901	153,580	38,053
	1911	320,777	87,923
Lead lbs.	1918	179,436	45,301
	1868	112,000	594
	1871	8,000	43
	1901	60,602,338	517,199
Mica lbs.	1911	3,198,047	20,742
	1918	16,188,300	206,768
	1891	—	4,585
	1901	979,258	30,737
Nickel lbs.	1911	815,301	63,465
	1918	1,198,607	93,817
	1891	5,352,043	49,417
	1901	9,537,558	196,923
Fish— Codfish, including haddock, &c., dry salted cwt.	1911	34,767,523	789,530
	1918	83,049,900	1,855,403
	1868	540,633	401,717
	1871	454,825	487,103
Herrings, fresh or frozen lbs.	1881	842,235	650,263
	1891	653,372	640,989
	1901	654,412	567,437
	1911	690,534	878,307
	1918	689,311	1,456,630
	1881	4,960,561	7,008
	1891	16,677,620	21,271
1901	10,521,420	21,181	
1911	10,539,295	29,359	
1918	43,160,000	255,807	

* From 1868 to 1906 the fiscal year ended on June 30; from 1907 to 1918 it ended on March 31.

TABLE XLVIII.—*Principal exports of Canada—Contd.*

Items.	Year.	Quantities.	Values.
Fish— <i>Contd.</i>			£
Herrings, pickled brls.	1881	85,624	62,160
	1891	101,668	68,664
	1901	70,295	52,795
	1911	189,783	100,574
	1918	122,914	253,321
	1868	—	6,284
Herrings, smoked lbs.	1871	—	7,936
	1881	8,464,526	26,140
	1891	5,331,757	22,513
	1901	2,116,576	10,474
	1911	1,696,724	9,348
	1918	3,844,100	41,623
Lobsters, canned lbs.	1881	13,295,502	276,956
	1891	12,000,736	359,793
	1901	11,178,647	469,291
	1911	9,609,874	562,175
	1918	8,663,949	683,233
Salmon, fresh lbs.	1868	—	11,969
	1871	—	13,566
	1881	1,232,169	25,765
	1891	1,236,566	26,884
	1901	1,569,678	29,102
	1911	2,406,818	44,070
Salmon, canned lbs.	1918	8,045,700	160,506
	1868	269,492	9,404
	1871	599,758	22,552
	1881	2,844,183	61,234
	1891	15,935,710	358,646
	1901	35,343,424	593,739
Firewood cords	1911	25,635,892	753,808
	1918	43,777,154	1,742,200
	1868	226,378	101,844
	1871	211,305	97,242
	1881	145,594	64,145
	1891	147,780	64,698
Logs, all kinds M. ft.	1901	44,251	18,679
	1911	19,446	9,527
	1918	18,028	14,743
	1868	—	35,035
	1871	17,128	17,356
	1881	37,832	40,287
Lumber— Basswood, butternut and hickory M. ft.	1891	105,464	150,044
	1901	137,781	216,894
	1911	124,516	245,198
	1918	—	169,437
	1868	607	2,358
	1871	2,155	9,373
Lumber— Basswood, butternut and hickory M. ft.	1881	1,895	7,517
	1891	1,449	5,870
	1901	14,701	82,413
	1911	4,010	19,201
	1918	540	3,462

TABLE XLVIII.—Principal exports of Canada—Contd.

Items.	Year.	Quantities.	Values.
Lumber—Contd.			£
Deals, pine std. hnd.	1868	146,396	819,794
	1871	141,411	999,214
	1881	260,305	1,782,887
	1891	81,780	544,205
	1901	70,572	583,095
	1911	24,232	321,466
	1918	6,585	125,517
Deals, spruce and other	1891	186,442	987,860
std. hnd.	1901	338,593	1,679,641
	1911	158,535	1,425,814
	1918	51,228	649,122
Deal ends std. hnd.	1868	—	27,078
	1871	6,685	32,644
	1881	10,793	66,761
	1891	11,191	57,959
	1901	26,108	140,011
	1911	8,291	70,726
	1918	1,229	12,261
Joists and scantling M. ft.	1868	—	21,080
	1871	—	46,999
	1881	19,118	27,271
	1891	19,896	32,917
	1901	41,853	79,554
	1911	88,902	247,157
	1918	69,699	302,570
Laths, palings and pickets	1868	—	29,584
M.	1871	156,700	32,500
	1881	177,392	37,139
	1891	279,578	80,582
	1901	325,618	124,051
	1911	739,402	505,043
	1918	—	376,153
Planks and boards M. ft.	1868	671,025	1,364,545
	1871	829,550	1,716,960
	1881	652,621	1,459,219
	1891	775,793	1,772,633
	1901	735,695	1,927,501
	1911	1,127,723	4,419,714
	1918	1,190,706	5,816,089
Shingles M.	1868	127,371	52,838
	1871	118,815	48,988
	1881	93,313	38,719
	1891	208,918	90,189
	1901	623,089	235,386
	1911	735,557	346,389
	1918	1,914,154	1,087,460
Pulpwood, blocks of cords	1891	—	38,830
	1901	—	287,049
	1911	936,791	1,251,927
	1918	1,002,127	1,713,550
Sleepers, railway No.	1868	630,810	25,240
	1871	1,156,270	44,716
	1881	3,651,955	66,690

TABLE XLVIII.—*Principal exports of Canada—Contd.*

Items.	Year.	Quantities.	Values.
Lumber—Contd.			
Sleepers, railway No.	1891	1,605,716	£ 63,840
	1901	834,817	31,278
	1911	1,051,272	73,410
	1918	—	36,057
Total timber, square tons	1868	650,928	854,907
	1871	568,806	1,156,548
	1881	523,633	1,213,466
	1891	221,709	633,748
	1901	125,119	396,544
	1911	41,668	214,411
	1918	—	86,364
Animals, living—			
Cattle No.	1868	44,442	226,025
	1871	79,613	468,206
	1881	62,277	711,950
	1891	117,761	1,802,548
	1901	169,279	1,862,571
	1911	124,923	1,754,275
	1918	191,356	2,904,751
Horses No.	1868	7,175	121,243
	1871	15,293	295,369
	1881	21,993	430,271
	1891	11,658	291,214
	1901	7,609	187,044
	1911	2,781	123,551
	1918	16,468	632,341
Sheep No.	1868	102,433	48,005
	1871	313,619	170,415
	1881	354,155	282,035
	1891	299,347	235,565
	1901	394,681	334,058
	1911	46,597	58,938
	1918	134,705	380,581
Swine No.	1868	10,902	8,806
	1871	11,187	9,678
	1881	2,819	2,433
	1891	334	401
	1901	944	1,706
	1911	3,335	10,151
	1918	15,647	78,851
Provisions—			
Butter cwt.	1868	159,412	498,815
	1871	137,751	629,832
	1881	157,685	734,185
	1891	33,634	123,735
	1901	145,653	677,171
	1911	28,040	152,934
	1918	43,944	411,055
Cheese cwt.	1871	73,832	228,083
	1881	439,481	1,132,273
	1891	948,233	1,953,853
	1901	1,747,343	4,252,597
	1911	1,624,069	4,261,341
	1918	1,514,667	7,520,961

TABLE XLVIII.—*Principal exports of Canada—Contd.*

Items.	Year.	Quantities.	Values.	
Provisions— <i>Contd.</i>			£	
Eggs doz.	1868	1,893,872	42,323	
	1871	3,312,145	87,129	
	1881	9,090,135	226,821	
	1891	8,022,935	227,354	
	1901	11,363,064	347,607	
	1911	92,164	5,070	
	1918	4,896,793	466,705	
	Lard cwt.	1871	11,548	30,542
		1881	1,874	4,085
		1891	426	652
1901		7,557	12,041	
1911		1,598	4,606	
1918		17,437	108,570	
Bacon cwt.		1868	84,327	160,988
	1871	92,261	209,357	
	1881	87,387	147,450	
	1891	63,836	121,408	
	1901	919,827	2,361,953	
	1911	500,312	1,647,813	
Beef cwt.	1918	1,784,334	11,916,802	
	1868	21,638	41,857	
	1871	36,496	49,595	
	1881	12,267	17,206	
	1891	2,764	3,298	
	1901	86,701	167,124	
	1911	8,700	18,880	
	1918	773,003	2,674,498	
Meats—				
Canned or preserved lbs.	1881	1,040,251	21,223	
	1891	2,767,080	55,722	
	1901	3,726,997	86,293	
	1911	418,745	11,538	
	1918	13,422,624	759,315	
	Hams cwt.	1881	5,085	8,372
1891		3,605	7,730	
1901		22,579	58,473	
1911		33,981	104,174	
1918		70,307	428,903	
Mutton cwt.		1881	1,550	1,811
	1891	2,607	4,930	
	1901	686	1,174	
	1911	159	438	
	1918	7,638	39,497	
	Pork cwt.	1868	27,940	49,204
1871		49,531	103,051	
1881		14,081	23,363	
1891		604	840	
1901		6,624	10,556	
1911		3,727	9,470	
1918		70,613	421,681	
Wool lbs.		1868	1,605,635	91,274
	1871	2,892,329	172,427	
	1881	1,404,123	84,180	
	1891	1,108,286	50,444	

TABLE XLVIII.—*Principal exports of Canada—Contd.*

Items.	Year.	Quantities.	Values.
Meats— <i>Contd.</i>			£
Wool lbs.	1901	1,043,673	38,328
	1911	1,196,924	52,969
	1918	10,576,627	1,410,792
Fruits—			
Apples, dried lbs.	1891	800,650	10,074
	1901	4,325,854	39,284
	1911	2,844,267	37,951
	1918	61,698	1,274
Apples, green or ripe brls.	1891	450,836	285,558
	1901	678,651	304,721
	1911	523,658	361,043
	1918	103,626	83,841
Grain—			
Barley qr.	1868	506,984	654,782
	1871	604,125	703,869
	1881	1,100,072	1,286,339
	1891	611,541	602,049
	1901	298,296	230,775
	1911	193,157	170,791
	1918	855,849	1,685,440
Beans qr.	1868	4,167	11,537
	1871	4,445	9,244
	1881	13,615	24,188
	1891	40,466	101,870
	1901	38,802	85,923
	1911	3,391	9,828
	1918	1,763	21,692
Buckwheat qr.	1901	53,642	46,794
	1911	57,967	49,093
	1918	20,265	44,482
Oats qr.	1868	217,305	155,039
	1871	67,798	47,514
	1881	365,816	244,905
	1891	32,571	26,694
	1901	1,019,383	511,721
	1911	678,958	440,732
	1918	6,859,735	7,735,427
Peas qr.	1868	267,352	380,274
	1871	144,994	205,830
	1881	530,699	714,648
	1891	344,286	417,658
	1901	483,116	549,588
	1911	59,394	142,085
	1918	17,139	130,144
Rye qr.	1881	108,787	161,062
	1891	42,495	46,534
	1901	85,882	87,302
	1911	9,189	9,538
	1918	109,778	342,971
Wheat qr.	1868	285,588	749,595
	1871	218,622	407,243
	1881	315,459	532,967
	1891	263,527	325,281
	1901	1,217,470	1,412,012

TABLE XLVIII.—*Principal exports of Canada—Contd.*

Items.	Year.	Quantities.	Values.
Grain— <i>Contd.</i>			£
Wheat qr.	1911	5,725,264	9,353,555
	1918	18,799,004	75,274,645
Oatmeal brls.	1881	53,825	48,114
	1891	11,748	9,286
	1901	151,851	96,024
	1911	126,240	106,444
	1918	281,333	456,281
Wheat flour brls.	1871	306,339	330,801
	1881	439,728	446,519
	1891	296,784	285,344
	1901	1,118,700	825,046
	1911	3,049,046	2,846,874
Hay.... tons	1918	9,931,148	19,704,454
	1868	7,017	14,511
	1871	20,971	59,636
	1881	150,339	372,557
	1891	58,110	114,961
	1901	225,872	431,062
	1911	291,189	559,600
	1918	393,184	1,042,574
Whisky gals.	1868	6,990	994
	1871	13,386	3,072
	1881	2,513	534
	1891	19,944	9,374
	1901	143,399	80,638
	1911	314,076	203,167
	1918	588,236	348,298
	Wood pulp	1891	—	57,660
1901		—	398,046
1911		—	1,174,444
1918		—	5,264,766

For imports it is not possible to give the quantities as well as the values; but Table XLIX, besides indicating the progress attained at each of these national stock-taking periods, is interesting as showing the nature of the imports Canada receives in exchange for commodities produced and exported. They consist largely, it will be noted, of the products of tropical countries and of articles not manufactured in Canada. Two other points are illustrated by the trade returns: (1) the so-called "balance of trade," or the reciprocal relationship between the volume of exports and imports, and (2) the value *per capita* of exports, imports, and total trade. Both points are illustrated by Table L.

TABLE XLIX.—*Selection of principal imports for home consumption, 1874-1918.*

Items.	1874.	1881.	1891.
	£	£	£
Animals, living	131,674	112,038	145,859
Breadstuffs	3,241,827	571,501	585,346
Carriages, bicycles, &c.	26,962	31,117	65,060
Clocks and parts thereof	26,480	17,185	22,168
Coal, coke, &c.	679,182	841,895	1,952,243
Chocolate paste, &c.	928	1,941	7,989
Coffee, all kinds, including chicory....	92,449	65,433	143,761
Cotton and manufactures of	2,463,841	2,421,214	1,641,215
Drugs, dyes, chemicals and medi- cines	315,734	370,787	563,959
Earthenware and china	125,703	90,210	130,464
Electric apparatus	—	2,466	96,378
Flax, hemp, jute and manufactures of	400,561	375,215	555,367
Fruits and nuts	212,307	242,412	531,668
Furs and skins and manufactures of Glass and manufactures of	144,173	178,257	210,097
Grasses and fibres and manufactures of	243,945	183,051	256,365
Guttapercha, indiarubber and manu- factures of	29,507	19,723	18,075
Hats, caps and bonnets and ma- terials for same	98,445	167,974	330,277
Hides and skins other than fur	202,200	256,021	279,300
Jewellery	299,656	454,645	415,646
Leather	195,629	73,359	72,150
Total metals and manufactures of	326,147	227,738	194,462
Oilcloth	4,570,917	3,052,037	3,643,866
Oils	34,298	36,229	46,443
Paper and manufactures of	164,561	210,503	365,616
Provisions	160,120	203,504	234,732
Salt	393,898	314,468	288,156
Seeds	95,193	101,637	78,197
Settlers' effects	45,199	29,046	88,036
Silk and manufactures of	254,941	180,374	365,477
Spices	451,758	497,269	459,818
Spirits and wines	34,830	28,654	43,801
Sugar, molasses, &c.	488,708	250,935	297,142
Tea	1,259,101	1,248,113	1,308,149
Tobacco and manufactures of	709,908	736,824	612,629
Tobacco, pipes, pipe mounts, &c.	354,271	242,616	405,774
Vegetables	8,331	24,085	24,483
Watches	13,027	20,673	47,217
Wood and manufactures of....	—	48,709	104,164
Wool and manufactures of	495,734	342,075	636,731
	2,913,743	2,124,842	2,344,617

TABLE XLIX.—Principal imports for home consumption—Contd.

Items.	1901.	1911.	1918.
	£	£	£
Animals, living	189,049	460,934	568,031
Breadstuffs	1,658,331	2,113,129	3,481,231
Carriages, bicycles, &c.	228,237	1,491,341	4,625,077
Clocks and parts thereof	42,913	103,078	122,579
Coal, coke, &c.	2,842,946	6,629,315	16,770,102
Chocolate paste, &c.	33,538	78,665	618,170
Coffee, all kinds, including chicory....	101,574	289,427	436,034
Cotton and manufactures of	2,527,787	6,755,253	12,107,223
Drugs, dyes, chemicals and medi- cines	1,026,703	2,504,384	5,449,960
Earthenware and china	229,063	492,815	526,618
Electric apparatus	189,010	1,054,043	2,269,756
Flax, hemp, jute and manufactures of	702,425	1,117,601	2,365,633
Fruits and nuts	795,962	2,456,608	4,718,793
Furs and skins and manufactures of	490,696	1,027,617	815,244
Glass and manufactures of	323,767	710,967	1,076,490
Grasses and fibres and manu- factures of	27,558	370,400	1,701,625
Guttapercha, indiarubber and manu- factures of	533,580	1,428,212	2,643,260
Hats, caps and bonnets and ma- terials for same	396,028	824,692	941,323
Hides and skins other than fur	846,666	1,665,478	1,807,035
Jewellery	111,005	305,494	179,140
Leather	355,098	1,095,547	1,832,200
Total metals and manufactures of....	7,607,064	21,724,709	42,401,389
Oilcloth	86,472	344,318	506,473
Oils	463,675	1,616,977	7,261,259
Paper and manufactures of....	379,640	1,137,804	1,544,443
Provisions	482,012	952,303	5,659,581
Salt	76,344	87,269	410,768
Seeds	271,680	351,190	387,873
Settlers' effects	768,642	2,891,632	1,308,367
Silk and manufactures of	695,835	1,424,044	3,070,421
Spices	47,033	62,411	103,926
Spirits and wines	394,842	932,459	822,996
Sugar, molasses, &c.	1,914,345	3,592,456	8,113,450
Tea	652,766	1,161,942	2,817,827
Tobacco and manufactures of	443,574	989,639	1,618,324
Tobacco, pipes, pipe mounts, &c.	60,021	136,024	170,918
Vegetables	90,642	357,172	949,654
Watches	128,208	252,744	339,530
Wood and manufactures of....	1,014,457	3,542,125	3,003,406
Wool and manufactures of	2,333,822	5,421,116	7,209,849

TABLE L.—Ratio of exports to imports and value per capita of exports, imports, and total trade, 1868–1918.

Year.	Excess of imports over total exports.	Excess of total exports over imports.	Per cent. ratio of total exports to imports entered for consumption.	Estimated population (000 omitted).	Value per capita of—		
					Exports.	Imports.	Total trade.
	£	£	p. c.		s. d.	s. d.	s. d.
1868	2,956,427	—	78-56	3,372	64 3	81 10	146 1
1869	1,417,443	—	89-08	3,413	67 9	76 1	143 10
1870	273,465	—	98-01	3,454	78 0	77 8	155 8
1871	3,438,000	—	80-13	3,518	87 1	98 5	185 6
1872	5,409,472	—	74-92	3,611	89 6	119 5	208 11
1873	7,854,453	—	69-03	3,668	96 4	139 6	235 10
1874	7,361,457	—	70-92	3,825	93 11	132 4	226 3
1875	8,334,337	—	65-45	3,887	81 3	124 2	205 5
1876	2,627,205	—	86-18	3,949	82 11	96 4	179 3
1877	3,900,673	—	79-83	4,013	76 11	96 5	173 4
1878	2,309,929	—	87-56	4,079	79 9	91 1	170 10
1879	1,626,564	—	89-94	4,146	70 1	78 1	148 2
1880	—	3,336,913	123-23	4,215	84 0	68 2	152 2
1881	—	1,403,720	107-55	4,337	92 3	85 9	178 0
1882	1,927,196	—	91-56	4,384	95 5	104 2	199 7
1883	5,015,096	—	79-97	4,433	90 4	113 0	203 4
1884	3,442,039	—	84-19	4,485	81 9	97 1	178 10
1885	2,577,615	—	87-42	4,539	78 11	90 4	169 3
1886	2,218,634	—	88-75	4,589	77 3	86 0	163 3
1887	3,204,656	—	85-16	4,638	79 4	93 2	172 6
1888	2,154,590	—	89-58	4,688	79 0	88 3	167 3
1889	4,497,286	—	79-94	4,740	75 8	94 7	170 3
1890	3,570,036	—	84-44	4,793	80 11	95 9	176 8
1891	2,889,777	—	87-39	4,844	82 8	94 7	177 3
1892	617,703	—	97-39	4,889	94 3	96 9	191 0
1893	152,089	—	99-36	4,936	95 3	95 11	191 2

TABLE I.—Ratio of exports to imports and value per capita of exports, imports, and total trade, 1868–1918—Contd.

Year.	Excess of imports over total exports	Excess of total exports over imports.	Per cent. ratio of total exports to imports entered for consumption.	Estimated population ('000 omitted).	Value per capita of—			Total trade.
					Exports.	Imports.	Total trade.	
1894	£	£	P. C.	4,984	s. d.	s. d.	s. d.	
1895	—	1,359,176	106.06	4,984	89 11	89 11	185 4	
1896	—	1,774,867	108.58	5,034	82 2	82 2	171 5	
1897	—	2,250,694	110.40	5,086	85 2	85 2	179 2	
1898	—	5,720,221	126.11	5,142	107 6	85 2	192 8	
1899	—	6,826,415	126.30	5,199	126 1	99 10	225 11	
1900	—	1,137,200	103.71	5,259	121 1	116 9	237 10	
1901	—	2,204,933	106.22	5,403	141 6	133 2	274 8	
1902	—	3,453,890	109.46	5,532	147 11	135 2	283 1	
1903	—	2,771,356	106.87	5,532	152 1	146 0	298 1	
1904	—	85,488	100.19	5,673	160 3	162 10	323 1	
1905	6,685,037	—	86.64	5,825	148 11	176 0	324 11	
1906	10,303,676	—	80.07	5,992	138 2	172 7	310 9	
1907	7,525,360	—	87.07	6,171	164 3	188 8	352 11	
1908	11,846,119	—	76.92	6,302	122 3	162 10	285 1	
1909	18,187,088	—	74.85	6,491	166 9	222 9	389 6	
1910	5,813,870	—	90.18	6,695	159 7	176 11	336 6	
1911	14,599,406	—	81.79	6,917	167 6	219 9	387 3	
1912	33,234,245	—	64.20	7,158	166 6	259 4	425 10	
1913	43,917,556	—	59.01	7,343	172 3	291 10	461 1	
1914	60,211,720	—	56.27	7,530	205 9	365 9	571 6	
1915	33,407,235	—	73.64	7,725	242 4	329 0	571 4	
1916	—	1,232,115	101.32	7,928	239 2	256 5	449 3	
1917	—	55,783,146	153.46	8,140	393 6	256 5	645 11	
1918	—	65,000,283	139.49	8,361	560 8	411 5	972 1	
	—	128,146,806	164.72	8,593	758 7	411 0	1,169 7	

With the exception of the two years 1880 and 1881, the "balance of trade" was unfavourable to Canada from 1868 to 1893. From 1894 to 1903 the value of exports exceeded that of the imports, though with the exception of the two years 1897 and 1898 not to any marked extent. From 1904 to the outbreak of the war—a period marked by large introductions of British capital—the imports exceeded the exports, and in 1913 the ratio was as low as 56·27 per cent. In 1915 the balance was turned in favour of Canada by the large exportation of munitions and other war material, and from being against Canada to the extent of over 56 per cent. as in 1913, the balance became favourable to the extent of 53 per cent. in 1916.

The *per capita* value of the total trade of Canada, which was only 7*l.* 6*s.* 1*d.* in 1868, has steadily risen until in 1917 it reached the highest point, with 58*l.* 9*s.* 7*d.* per head.

Throughout the whole of the fifty years the bulk of the trade of Canada has been with the United Kingdom and with the United States. During most of the period the larger share of Canadian exports has been sent to the United Kingdom, whilst the imports have come most largely from the United States.

The grain trade of Canada is highly organized, and elaborate arrangements for the inspection and grading of the principal descriptions of grain are in force under the provisions of the Canada Grain Act, 1912. The opening up of the Prairie Provinces for the growth on a large scale of grain, especially wheat, led to the introduction of grain elevators shortly after the year 1880. During the present century the number of grain elevators in Canada has increased with great rapidity. In 1901 the number of elevators in Canada was 523, with a capacity of 18,329,352 bushels; in 1917 the number was 3,360, with a capacity of 193,844,000 bushels. There are now in Canada six different kinds of grain elevators, the capacity of which has steadily increased with the growth of the export trade in grain. First come the country elevators and warehouses, which in 1917 numbered 3,296 with an aggregate storage capacity of 103,508,000 bushels, as compared with 518 and 12,759,352 bushels in 1901. At Fort William and Port Arthur are thirteen large terminal elevators with a capacity of 41,750,000 bushels as compared with five elevators, 5,570,000 bushels, in 1901. The others include twenty-two public elevators, nineteen hospital elevators, four interior terminal elevators and a public or transfer elevator at Vancouver.

Transportation and communications.

To open up the country and to provide for the constantly increasing traffic in passengers and freight, the railway mileage of the

Dominion has annually expanded with constant and sometimes feverish rapidity. It is claimed, indeed, that the railway mileage of the Dominion is larger in proportion to its population than that of any country in the world.

The first railway in Canada for passengers was known as the Champlain and St. Lawrence. It was opened on July 23, 1836. The length of the line was 16 miles, and the gauge was 5 ft. 6 in. The line was the only one in Canada until 1847, when the railway mileage was increased to 54. In 1851 the mileage had grown to 159 and in 1861 to 2,146. At Confederation, in 1867, the mileage was 2,288.¹ The total railway mileage of Canada at the beginning of each decade from 1871 to 1911 and in 1917 was as follows:— 1871, 2,695; 1881, 7,331; 1891, 13,838; 1901, 18,140; 1911, 25,400; 1917, 38,604. The railway mileage of Canada at Confederation and in 1917 was by provinces as in Table LI.

TABLE LI.—*Railway mileage by Provinces, 1867 and 1917.*

Province.	1867.	1917.	Province.	1867.	1917.
Prince Edward Island	—	278	Alberta	—	4,444
Nova Scotia	145	1,422	British Columbia	—	3,885
New Brunswick	228	1,959	Yukon Territory	—	102
Quebec	500	4,734	In United States	—	413
Ontario	1,415	11,049			
Manitoba	—	4,194	Total	2,288	38,604
Saskatchewan	—	6,124			

The first transcontinental line through Canada, viz., the Canadian Pacific Railway, was opened in 1886, thus completing an enterprise which had been pursued with great courage and persistence in the face of many obstacles. The Canadian Pacific Railway Company is now probably the largest commercial corporation in the world, and with its numerous branches has been a great factor in the development of the Prairie Provinces. The second transcontinental railway of Canada, built partly by the Dominion Government and partly by the Grand Trunk Pacific Railway Company, and the Canadian Northern line, constitute two other transcontinental systems which were completed during the year 1914. They provide access to large areas of excellent agricultural lands, which now only await the settler and the plough for the production of unlimited quantities of grain.

From 147,213,716*l.* in 1876, when steam railway statistics began

¹ Annual Report for 1908 of the Comptroller of Railway Statistics, Appendix A, History of Railway Mileage in Canada, pp. 212 and 213.

to be collected, the capital liability of steam railways has grown to 407,901,368*l.* in 1917; the passengers carried, who numbered 5,190,416 in 1875, were 53,749,680 in 1917, and the freight carried annually has increased from 5,063,226 tons in 1875 to 108,854,814 tons in 1917. Gross earnings, which in 1875 were 4,000,796*l.*, were in 1917 63,857,153*l.* These figures are eloquent enough of the efforts which have been made to meet the constantly increasing demand for traffic facilities.

The electric railways of Canada, which consist principally of urban street tramways, are of comparatively recent development, and the official annual statistics with regard to them begin with 1901. In this year the mileage of electric railways in Canada was 674, and in 1917 this had increased to 1,744. The number of passengers carried in a year increased from 120,934,656 in 1901 to 629,441,997 in 1917. The freight carried increased from 257,080 tons in 1901 to 2,083,507 tons in 1917, and the gross earnings from 1,185,263*l.* in 1901 to 6,213,116*l.* in 1917. The total capital liability of electric railways which was 17,960,931*l.* in 1908 had grown to 33,130,417*l.* in 1917.

A form of transportation which has developed with great rapidity during the last few years is that of motor vehicles, the registrations of which in Canada numbered 197,799 in 1917 as against 69,598 in 1914. The six Government canals have a mileage of 1,594, the traffic for 1917 amounting to 19,856,092 tons as compared with 793,025 tons in 1887. The telegraph system has also developed correspondingly. At Confederation in 1867 there were 7,227 miles of line and 9,040 lines of wire, and during the year 600,770 messages were sent. In 1917 the Government lines had a total length of 11,843 miles and the Chartered Companies 49,397, whilst the number of land telegraph messages was 11,817,517. Messages across the Atlantic by wireless telegraphy were instituted in October, 1907. In 1917 181,740 wireless messages were sent and 3,140,843 words were handled. Telephones were first commercially established at Hamilton in 1877. There were, in 1917, 1,695 telephone companies in Canada with a capitalization of 16,258,080*l.* The number of telephones was 604,136, or one telephone to every 13.4 persons. In 1917 the number of postage stamps issued was 957,051,564 of the value of 4,761,903*l.*, as compared with 306,382,154, of the value of 1,158,245*l.* in 1904.

Finance.

In 1868 the public revenue of Canada, *i.e.*, receipts on the Consolidated Fund Account, amounted to 2,812,588*l.* In 1871 they were 3,972,959*l.*, in 1881 6,089,443*l.*, in 1891 7,927,254*l.*, in 1901

10,790,689*l.* In 1910 for the first time they exceeded \$100,000,000, being 20,854,922*l.*, and in 1911 they were 24,202,448*l.* During the war they have necessarily expanded in consequence of increasing taxation, and for the fiscal year 1917-18 they reached the record total of 53,584,716*l.* *Per capita* the revenue has grown from 1*l.* 2*s.* 7*d.* in 1871 to 5*l.* 14*s.* 5*d.* in 1917. In 1868 the revenue of the provincial Governments of Canada (Prince Edward Island, Nova Scotia, New Brunswick, Quebec and Ontario) was not more than 1,042,209*l.* For the whole of the nine provinces in 1917 the revenue of the provincial Governments was 11,910,201*l.* *Per capita* the provincial revenue was in 1868 6*s.* 8*d.*, in 1917 it was 1*l.* 8*s.* 7*d.* The net public debt of Canada, incurred largely for reproductive purposes, except during the last four years of the war, has increased from 15,560,680*l.* at Confederation to 69,040,431*l.* in 1914, the fiscal year before the outbreak of the war. The debt on March 31, 1918, amounted to 244,907,684*l.*, having been swollen to this amount as a consequence of the war; but the fact that this debt is being shouldered by the people of Canada without undue difficulty is in itself proof of the great progress made by the Dominion in the realization of its resources and the accumulation of wealth.

In 1868 the chartered banks of Canada numbered twenty-seven, with 123 branches. Their paid-up capital amounted to 6,268,562*l.*, and the deposits to 6,915,205*l.* In 1917 the paid-up capital of the twenty-one chartered banks of Canada having 3,135 branches amounted to 22,939,265*l.* and the total on deposit to 337,644,356*l.* The amount at the credit of depositors in the Dominion Government and Post Office Savings Banks on June 30, 1868, was 346,810*l.* This has grown to 11,551,251*l.* by March 31, 1917.

Insurance business of all kinds has had an enormous development during the past fifty years. In 1869 the amount of fire insurance at risk in Canada was 38,704,070*l.* In 1917 the amount was 819,081,681*l.* In 1875 the net life insurance in force was 17,467,657*l.* In 1917 the amount was 325,693,677*l.*

Social Statistics.

In Canada, under the British North America Act, 1867, the control of education is vested in the Government of each province, and consequently there is no marked uniformity of system throughout the Dominion. There is at present no effective co-ordination of education statistics, and it is impossible to construct satisfactory comparative tables. Since 1914, however, statistics of education as from the beginning of the present century have been compiled from the Annual Reports of the Provincial Education Departments for the Canada Year Book, and in Table LII progress in the number of teachers and pupils, and in the average attendance of the latter

is exhibited for the public elementary schools of the whole of Canada for the years 1901 to 1917. In this table, from 1901 to 1905, inclusive, the totals include the seven provinces of Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, and British Columbia. The two provinces of Saskatchewan and Alberta were formed in 1905, and from 1906 all the nine provinces are included, excepting Manitoba in 1912, when no education report was issued by that province. In 1907 and 1908 the sex of the teachers in Saskatchewan was not distinguished, and in Manitoba the sex of the pupils is not distinguished for any year. In the table, therefore, these defects are indicated by printing the totals in italics. It will be noted from the table that the number of teachers has increased from 22,436 in 1901 to 42,563 in 1917, that the total enrolment of pupils has grown from 914,258 to 1,385,722, and that the average percentage rate of attendance has increased from 59.8 to 67. At the beginning of the century the total expenditure for purposes of public education in Canada was 2,414,817*l.*; in 1917 it was 11,573,899*l.*, an increase of 9,159,082*l.*, or 379 per cent. Illiteracy amongst the population, as revealed by statistics of the Census of 1911 for persons of five years old and over, shows a decline of nearly 4 per cent. since 1901.

It has to be confessed that the criminal statistics of Canada, which have been collected annually since 1880, show a marked increase of crime during the last forty years. As shown by Table LIII, in 1880 the total number of convictions per 100,000 of the population was not more than 669; they had increased to 1,363 per 100,000 in 1917. But this apparent increase of criminality is coincident with a marked growth of the population largely by immigration. Experience proves that crime is more prevalent the bigger the population, and that it prevails to a greater extent in urban than in rural communities. The growth of the urban population of Canada has been phenomenal during the past two or three decades. Drunkenness, to which other crimes are so frequently attributed, increased largely since 1880, the statistics showing 333 convictions per 100,000 in 1917, as against 200 per 100,000 in 1880. On the other hand, recent prohibition legislation against alcohol is already taking effect, and the latest statistics show that the convictions for drunkenness have fallen from 60,975 in 1913 to 27,882 in 1917, a decrease of 33,093, or 54.27 per cent., during the five years.

A contrast : 1867 and 1917.

By way of bringing into stronger statistical relief the great progress of the last fifty years in Canada, the principal figures already quoted for the earliest and latest available years of the jubilee period are set out as in Table LIV.

TABLE LII.—Number of schools, teachers and pupils in Canada, 1901–1917.

Year.	Elementary schools.	Teachers.		Pupils enrolled.			Average attendance of pupils.		
		Male.	Female.	Total.	Boys.	Girls.	Total.	No.	Per cent.
1901	17,611	4,617	17,819	22,436	439,733	422,637	914,258	546,999	59.83
1902	17,782	4,370	18,362	22,732	437,438	423,972	914,566	552,093	60.37
1903	18,048	4,229	19,083	23,312	435,211	421,804	914,424	560,668	61.31
1904	18,179	4,022	19,326	23,548	429,688	420,552	908,814	552,502	60.79
1905	18,501	3,788	20,226	24,014	436,220	426,175	925,682	570,738	61.66
1906	20,150	4,542	22,061	26,603	469,029	457,709	990,861	614,267	61.99
1907	20,684	4,553	22,134	27,457	474,102	463,234	1,004,480	617,263	61.45
1908	21,361	4,058	22,557	28,766	486,599	474,169	1,031,799	640,358	62.06
1909	22,134	5,098	24,789	29,887	502,609	486,481	1,062,134	663,771	62.40
1910	22,855	5,270	26,058	31,328	515,611	502,309	1,094,167	683,471	63.38
1911	23,676	5,515	27,628	33,143	530,314	514,436	1,125,798	706,672	62.77
1912	21,877	4,831	26,221	31,052	546,692	533,023	1,079,625	701,441	64.97
1913	24,871	5,645	30,267	35,912	589,115	545,514	1,218,308	789,741	64.82
1914	26,069	6,290	31,509	37,889	601,141	585,953	1,281,048	852,333	66.53
1915	26,796	6,581	32,846	39,427	621,050	605,108	1,327,121	907,619	68.39
1916	27,383	5,957	35,130	41,087	625,317	617,439	1,346,752	893,912	66.38
1917	28,007	5,490	37,073	42,563	639,567	639,567	1,385,722	1,029,742	67.09

TABLE LIII.—Total number and number per 100,000 inhabitants of convictions in Canada, classified according to the nature of offences, 1880-81-91-1901-11-17.

Year.	Offences against the person.		Offences against property with violence.		Other offences against property.		Other felonies and misdemeanours.		Violations of Municipal Acts.		Drunkenness.		Totals.	
	No.	per 100,000.	No.	per 100,000.	No.	per 100,000.	No.	per 100,000.	No.	per 100,000.	No.	per 100,000.	No.	per 100,000.
1880	5,694	135	176	4	3,018	71	202	5	10,681	254	8,438	200	28,209	669
1881	4,353	100	144	3	2,593	60	288	7	12,272	283	9,575	221	29,225	676
1891	4,788	97	283	6	3,369	70	160	3	15,991	331	13,026	269	37,617	776
1901	4,698	87	451	8	4,441	82	384	7	19,447	360	12,727	236	42,148	780
1911	8,352	116	977	14	9,024	125	1,194	17	52,334	726	41,379	574	113,260	1,572
1917 ...	7,229	86	1,321	16	9,886	181	3,014	36	49,332	590	27,882	333	114,011	1,363

TABLE LIV.—Principal statistics for earliest and latest years available, 1867–1917.

1920.1

Illustrated by Official Statistics, 1867 to 1917.

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Items.	Year.	Unit.	Total.	Year.	Unit.	Total.
Area	1867	Sq. miles	377,045	1917	Sq. miles	3,729,665
Population	1871	No.	3,689,257	1917	No.	8,361,000
Immigration	1867	No.	14,666	1913	No.	402,432
Wheat	1870	Acres	1,646,781	1917	No.	75,374
Hay	1870	Qrs.	2,090,484	1917	Acres	14,755,850
Potatoes	1870	Acres	3,650,419	1917	Qrs.	29,217,856
Field crops	1870	Tons	1,267,772	1917	Acres	8,225,034
Horses	1910	Acres	30,556,168	1917	Tons	2,139,963
	1910	£	79,009,683	1917	Acres	42,602,288
	1871	No.	836,743	1917	£	235,199,270
Milch cows	1901	£	24,304,000	1917	No.	3,412,749
	1871	No.	1,251,209	1917	£	88,176,000
	1901	£	14,227,000	1917	No.	3,202,283
Other cattle	1871	No.	1,373,081	1917	£	56,328,000
	1901	£	11,136,000	1917	No.	4,718,657
Total cattle	1871	No.	2,624,290	1917	£	55,612,000
	1901	£	25,363,000	1917	No.	7,920,940
Sheep	1871	No.	3,155,509	1917	£	111,940,000
	1901	£	2,156,000	1917	No.	2,369,358
Swine	1871	No.	1,366,083	1917	£	7,309,000
	1901	£	3,379,000	1917	No.	3,619,382
Total live-stock	1901	£	55,204,000	1917	£	19,083,000
Home-made butter	1870	Lbs.	74,190,584	1910	£	226,508,000
Home-made cheese	1870	Lbs.	4,984,843	1910	Lbs.	138,098,534
				1910	Lbs.	13,263,261

TABLE LIV.—Principal statistics for earliest and latest years available—Contd.

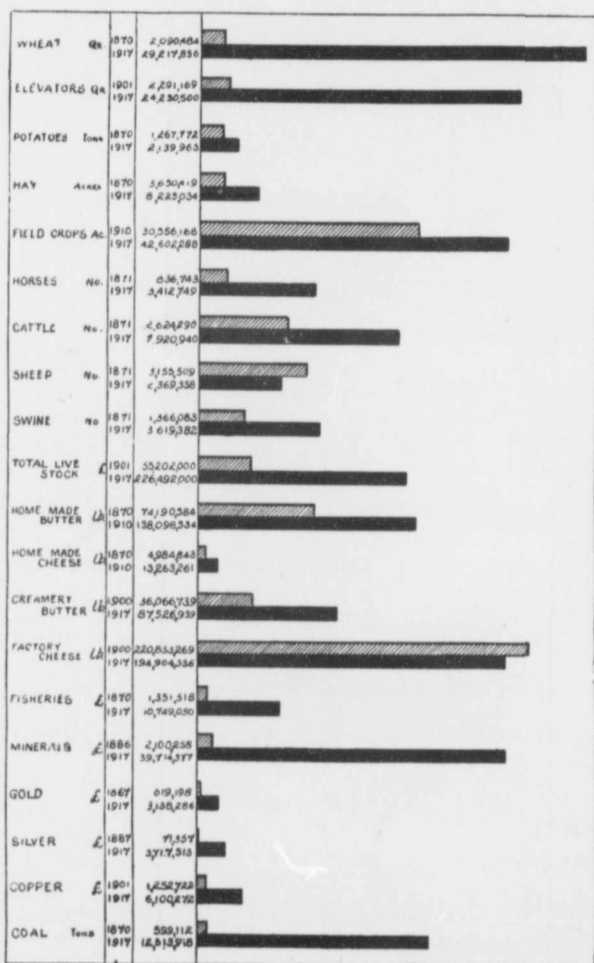
Items.	Year.	Unit.	Total.	Year.	Unit.	Total.
Creamery butter	1900	Lbs.	36,066,739	1917	Lbs.	87,526,939
	1900	£	1,487,871	1917	£	7,032,982
Factory cheese	1900	Lbs.	220,833,269	1917	Lbs.	194,904,336
	1900	£	4,566,047	1917	£	8,459,703
Fisheries	1870	£	1,351,518	1917	£	10,748,964
	1886	£	2,100,258	1917	£	39,714,377
Minerals	1871	Ozs.	22,941	1917	Ozs.	738,831
	1867	£	619,198	1917	£	3,138,286
Gold	1871	Ozs.	69,197	1917	Ozs.	22,221,274
	1887	£	71,357	1917	£	3,717,513
Silver	1901	Lbs.	37,827,019	1917	Lbs.	109,227,332
	1901	£	1,252,722	1917	£	6,100,272
Copper	1871	Tons	599,112	1917	Tons	12,513,918
	1870	£	45,537,886	1917	£	289,127,695
Manufactured products	1868	£	13,785,649	1917	£	173,703,351
Imports	1868	£	10,829,121	1917	£	242,303,650
Exports	1868	£	24,614,770	1917	£	416,007,001
Total trade	1901	Bushels	18,329,352	1917	Bushels	193,844,000
Elevators	1901	Bushels	18,329,352	1917	Bushels	193,844,000
Steam railways—						
Mileage	1867	Miles	2,288	1917	Miles	38,604
Capital	1876	£	147,213,716	1917	£	407,901,368
Passengers	1875	No.	5,190,416	1917	No.	53,749,680
Freight	1875	Tons	5,063,226	1917	Tons	108,854,814
Gross earnings	1875	£	4,000,796	1917	£	63,857,153
Electric railways—						
Mileage	1901	Miles	674	1917	Miles	1,744
Capital	1908	£	17,960,931	1917	£	33,130,417
Passengers	1901	No.	120,934,656	1917	No.	629,441,997
Freight	1901	Tons	257,080	1917	Tons	2,083,507
Gross earnings	1901	£	1,185,263	1917	£	6,213,116

TABLE LIV.—Principal statistics for earliest and latest years available—Contd.

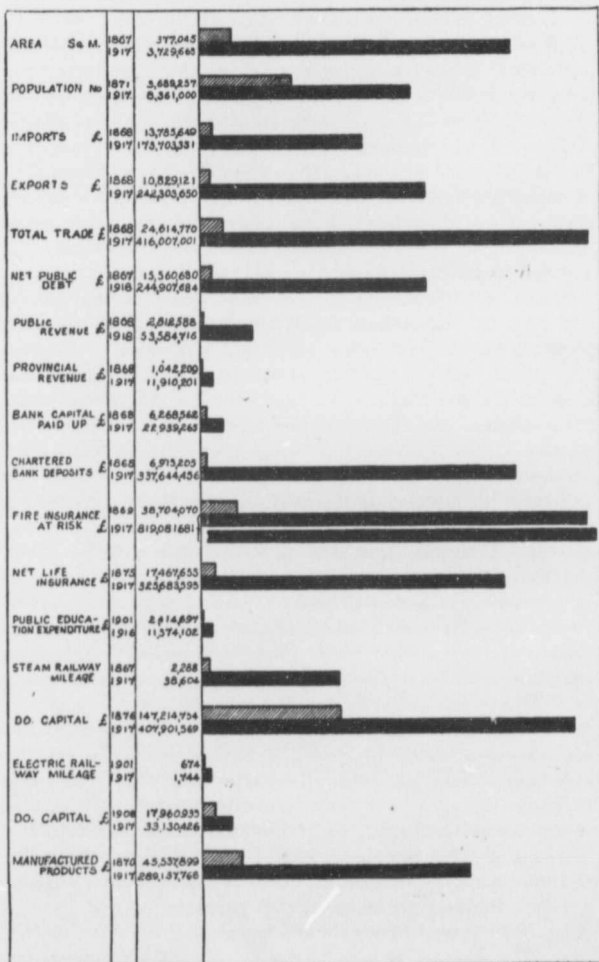
Items.	Year.	Unit.	Total.	Year.	Unit.	Total.
Motor vehicles	1914	No.	69,598	1917	No.	197,799
Canal traffic	1887	Tons	793,025	1917	Tons	19,856,194
Public revenue....	1868	£	2,812,588	1918	£	53,584,716
Revenue <i>per capita</i>	1871	£	1l. 2s. 7d.	1918	£	5l. 14s. 5d.
Provincial revenue	1868	£	1,042,209	1917	£	11,910,201
Provincial revenue <i>per capita</i>	1868	—	6s. 8d.	1917	£	1l. 8s. 7d.
Net public debt....	1867	£	15,560,680	1918	£	244,907,684
Chartered banks	1868	No.	27	1917	No.	21
Branches of chartered banks	1868	No.	123	1917	No.	3,135
Bank capital paid up	1868	£	6,268,562	1917	£	22,939,265
Chartered bank deposits	1868	£	6,915,205	1917	£	337,644,356
Deposits in General and Post Office						
Savings Banks	1868	£	346,810	1917	£	11,551,251
Fire insurance at risk	1869	£	38,704,070	1917	£	819,081,681
Net life insurance	1875	£	17,467,657	1917	£	325,693,677
Public education expenditure	1901	£	2,414,697	1916	£	11,574,102

Note.—The diagram printed on pages 72 and 73 represents graphically the progress of Canada as illustrated by the official statistics given throughout the Paper, but especially those in Table LIV. The black and hatched lines are drawn to the same proportionate scale for the same denominations, viz.: qrs., tons, acres, Nos., £, and lb., except that in the part of the diagram printed on page 73, where the amounts are much larger, the scale is smaller than it is in that part of the diagram which is printed on page 72. The diagram has been drawn for this Paper by my colleague, Mr. R. E. Watts, of the Dominion Bureau of Statistics.—E.H.G.

FIFTY YEARS OF CANADIAN PROGRESS, 1867-1917.



FIFTY YEARS OF CANADIAN PROGRESS, 1867-1917.



Improvement of statistical methods.

A branch of progress in Canada deserving mention as of special interest to this Society is the improvement lately effected in the methods of collecting official statistics. The earlier history and development of statistics in Canada I have described in a Memoir contributed to the Commemorative Volume of the American Statistical Association,¹ but, since that Paper was written, further very definite progress in Canadian statistical reform has been effected. The movement starts from 1912 when Sir George Foster, the present Minister of Trade and Commerce, appointed a Departmental Commission whose report laid down the lines of future statistical development. The practical measures since taken include the constitution of the Dominion Bureau of Statistics under the Statistics Act, 1918, not only as the authority for the taking of the periodical censuses, but also as a central statistical laboratory and general directing and co-ordinating medium for all classes of official statistics, the appointment of a Dominion Statistician with extended functions and powers and the adoption, after intensive study, of improved methods for the collection of annual vital, agricultural, and industrial statistics. An important principle underlying the reforms thus effected is that of statistical co-operation between the various Departments of the Dominion Government and between the Dominion Government, as represented by the Dominion Bureau of Statistics, and the Governments of the nine provinces. For vital statistics, a working agreement, as embodied in a Model Bill for provincial legislative enactment, has been virtually agreed to as the outcome of a Conference of Vital Statisticians held on June 19-20, 1918; and a Census of Industry embracing agriculture, dairying, fisheries, forestry, mines, power plants, and general manufactures, has been taken with great completeness for the year 1917, and is to be followed by similar inquiries annually.

With regard to statistics of agriculture, which before the present century were limited to the returns of the decennial census, considerable improvement has recently been effected. It is not necessary to labour the point that decennial or even quinquennial censuses of agricultural production are of little immediate practical value. The more complete these inquiries are the later do the results appear, and the rapidity of changes, especially in a new country, renders the data valueless almost as soon as published; whilst for comparative purposes census data at long intervals are of small practical value because of seasonal inequality. These considerations

¹ *The History of Statistics: Their Development and Progress in Many Countries*, pp. 179 to 198. Macmillan Company of New York, 1918.

were recognized when in 1908 the Dominion Government began the issue of continuous annual agricultural estimates of field crops and live stock. The system then adopted was that which had been followed for about fifty years by the United States Department of Agriculture, and consisted in the estimation during intercensal years by crop correspondents of plus or minus percentage differences in areas of field crops and numbers of farm live stock, as compared with the previous year. The imperfection of this system—by which errors become cumulative—has long been recognized by English agricultural statisticians, whilst in the United States, too, efforts to introduce improvement by change or modification of system have not been wanting. A ten years' application of the system to Canada has abundantly demonstrated, especially in the case of crops small relatively, but important in the aggregate, the untrustworthiness of data so collected, and it is matter for congratulation that the Dominion Government authorities have broken away from the system before it became too deeply a part of national practice to make rupture easy or even feasible.

The new system, partially applied for the first time in 1917 in co-operation with the Provincial Governments, consists in the annual collection from individual farmers of the areas sown to field crops and of the numbers of farm live stock, the totals for each province being estimated upon the basis of the actual returns received. At present, after a trial of two years in four provinces and of one year in five provinces, the percentage of actual returns varies from twenty to over fifty; but there is reason to believe that by persistence of effort these proportions will gradually increase. The returns are collected through the agency of the rural school teachers and children, who show praiseworthy intelligence and zeal. The employment of the rural schools in this way has much to recommend it. The children are being trained to appreciate the importance of annual statistics of agriculture, and will when they become farmers themselves more readily complete and return the annual schedules as required. The work is also a present annual school exercise of considerable educational value. From the national point of view, it is to be noted that the improved method involves a fresh start every year, so that errors may be corrected instead of multiplied, whilst the co-operation between the Dominion Government and the provincial Governments not only brings to the former the benefit of greater knowledge of local conditions, but also ensures the publication of identical results by both Government authorities, thus eliminating a mutual conflict of Government authority which in the past has been most embarrass-

ing to the students of Canadian official agricultural statistics. Finally, it will not escape the notice of English agricultural statisticians that the method now being applied is similar in principle to that followed in Great Britain and advocated by the International Statistical Institute.

Future outlook.

On July 1, 1917, the fiftieth anniversary of Confederation, the Dominion of Canada was bearing its share as a constituent of the British Empire in the greatest war of all time. Now that this war has happily ended in the complete triumph of the Allied cause and in the vindication of the principles of freedom and justice for which it was waged—thus enabling the world to resume in peace the development of natural resources—we may, in conclusion, consider what direction future progress may take in Canada and to what extent the Dominion may be relied upon for the production of food, of raw materials and of manufactured products. Will the progress of the next fifty years equal that of the last fifty years as—all too imperfectly—described in this Paper? I am too conscious of the failure of past prophecies by more competent authority than I can claim to hazard any definite prognostications.¹ It may, however, be permissible to indicate certain factors that are likely to influence development and justify the belief that progress during the remainder of the present century will be at least as rapid and as solid as it has been during the last twenty years. The return to Canada of the soldiers from the war will add strong forces to the industrial ranks. Schemes for their settlement upon the land under advantageous conditions have been adopted by both the Dominion and the provincial legislatures. To a large extent Canadian development must in the future as in the past be dependent upon a constant influx of suitable immigrants and of capital. There is every indication that in the immediate future the plans for immigration will not cease as heretofore with the attraction and reception of immigrants, but will provide improved facilities for their settlement upon the land.

A new Department of Immigration and Colonization has lately (1918) been established by the Dominion Government, and it is probable that settlement in well-organized communities, in which

¹ In 1898 Sir William Crookes estimated that the area under wheat in Canada would not exceed 6,000,000 acres within twelve years. In 1910 the Dominion Census gave the area as 9,294,800. In 1902 Mr. Hugh McKellar, then Deputy Minister of Agriculture for Manitoba, anticipated a western wheat production of 350,000,000 bushels by 1912. The official return for the three Prairie Provinces in that year—a good season—was 204,280,000 bushels, and the highest yield on record was 300,187,000 bushels in 1915. The quinquennial average (1913-17) was 232,935,000 bushels.

women will take their natural part, will in future relieve the isolation of prairie farming. The more general introduction of mixed farming in western Canada will not only provide for a much-needed increase in the meat and milk supplies, but will also maintain soil fertility and provide remunerative occupation for the winter as well as for the summer months. Recent Acts of the Provincial Legislatures to facilitate the granting of long-term credit will promote the construction of homesteads and farm buildings and the diversion of capital from urban to rural enterprise. The opening of the Panama Canal and the construction of the Hudson Bay Railway should provide important new outlets for Canadian products. The effect of the latter enterprise is at present uncertain and the duration of an ice-free passage in each year is short; but in any case the opening up of the lands adjoining the new railway should have important results in the development of natural resources. He would be bold who should attempt to foretell the future effect of the new science and art of aviation upon the national progress; but it is already evident that exploration and prospecting in lands inaccessible by rail will benefit immensely from this means of locomotion.

The extent to which wheat-growing will continue to be profitable depends upon prices; but there appears reason to believe that these will remain relatively high. The more intelligent organization of migratory agricultural labour, the increased manufacture of agricultural tractors and the making of good roads are other directions in which great progress is likely to be made. One feature of the situation can be referred to without fear of question, and that is the practically unlimited extent of the field which is open in Canada for development in every direction, whether as regards agriculture, forestry, fisheries, minerals, or manufactures. The great desideratum is that future effort, instead of, as in the past, being more or less of haphazard character, should be directed according to comprehensive and co-ordinated plans, intelligently conceived, and having relation not alone to the needs of the Dominion itself, but also to the economic resources and requirements of the Empire as a whole.

DISCUSSION ON MR. GODFREY'S PAPER.

SIR ALFRED BATEMAN, in proposing a vote of thanks to the author, said it was an honour for him to propose a vote of thanks to the writer of the Paper, for his very complete monograph on the great Dominion of Canada, and also to Sir Henry Rew for reading it. In the year 1878 he had had the pleasure of reading before the British Association what he thought was the first Paper on the

statistics of Canada, but that Paper consisted of six rather small pages instead of the thirty-five large ones of the present one. The reason was that at that time there were hardly any statistics in Canada. There were some Census Returns taken every ten years but they were most inaccurate. Even the counting of heads was so bad that the next Census had more than once to apologise for there being no increased population. As time went on, improvement resulted, and he could now speak as to what happened the year of the war, when, as acting Chairman of the Dominion Royal Commission in the Maritime Provinces of Canada, they were taking stock of the resources and trade of the Dominions. They had then completed their survey of the Maritime Provinces, but they had to come home, owing to the war. In the middle of the war they had to return to complete their work so as to bring Canada into line with the other great nations of the British Empire. They had a very instructive and delightful time going from East to West and West to East. The description and statistical survey which they made was unfortunately to be found only in a Blue Book, so that nobody read it; but in the Fifth Interim Report of the Dominion Royal Commission, he thought they would find what would almost repay their curiosity. There was also a description of coming through Canada which he thought had never been rivalled. It had been written by someone who was a skilled master in the works of imagination, and, in fact, it was an open secret that part of the Report was written by his friend and colleague, Sir Rider Haggard. His description of the scenery of Canada was one of the best things ever written, and was utterly unlike the usual style of a Blue Book. Speaking merely on the statistics of Canada, they were struck with the immense profusion of statistics. There were too many of them, and the worst of it was that they did not agree in many cases. The figures of the provinces differed sometimes from those of the Dominion authorities. But, as the Reader of the Paper said, all that was being altered; and he hoped, in future, they would have really very complete statistics of the Canadian Dominion. The Dominion Commission had found especially that the statistics of unemployment and of immigration were deficient, and, with regard to live-stock, the returns did not properly take into account the movement of breeding stock between Canada and America. One particular feature the Commission found was, that Canada seemed to be a little too much Americanised. In England they had every liking for their great American neighbour and friend, but, at the same time, they did not want Canada to become entirely American; and one of the things the Royal Commission recommended was, that Canada should not for the future get her European news mainly through New York. He was glad to say that that recommendation had already been acted upon. As regards statistics, the Commission found that the yearly period, and many other details, did not agree with those of the other parts of the British Empire. They thought there

were difficulties which could be removed by personal conference; and they recommended that the British Government should take the first opportunity of inviting the statisticians of the different Dominions to meet in London and, by conference, agree on certain basic principles which might be adopted with advantage. He was glad to say that the Government had taken that up, and he believed that next January the statisticians, no doubt including Mr. Godfrey, would be here and would be in conference, and that they might have for the whole of the British Empire a much more complete statistical record based on the same principles and the same methods. He was sure when those statisticians came over, the Royal Statistical Society would wish to welcome them; and he thought, with their distinguished President, they would be able to have some opportunity of showing them that hospitality which they wished to show to members of their great Empire.

SIR BERNARD MALLET, in seconding the resolution, said he had no personal knowledge of Canada, and no special acquaintance with her statistics except that gleaned from the very exhaustive Paper which they had heard. It was an amazing story; and he was sure it would be very useful to have the record in their *Journal* for reference by students. Instead of going on with commonplaces, he thought he had better make way for gentlemen who could speak with more knowledge of the subject, but it gave him great pleasure to second the vote of thanks.

DR. PARKIN said it was only by the purest accident of having met Sir Bernard Mallet, and being told their meeting was going to take place, that he was present. He could not say how intensely he had been interested in the Paper. For the last fifty or sixty years he had been familiar with almost every part of Canada, and every part of the Paper had interested him. There were a few points in it on which he would like to make remarks. There was one referred to by Sir Henry Rew in quoting from it with regard to the relation of the urban and rural population. He thought it was worth while pointing out that, in his opinion, the relations of those were going to be different in Canada from what they were in any other country he knew, except in parts of the United States. In Canada they could afford to have a much larger urban population than in any country he knew of except parts of the United States. The contrast between Canada and England was that Canadian agricultural areas were on a great scale. They lent themselves to the application of machinery for the production of food, and the extent to which machinery was taking the place of hand labour in carrying on the agricultural work of Canada was phenomenal. It had already developed one of the greatest agricultural instrument industries in the world, namely, that of Massey Harris at Toronto, the products of which they would see all over the world. As an indication of the importance of such undertakings, when Roumania was hard up for material to carry on its agriculture, that single firm

was found to be ready to supply them to a larger extent than any other with agricultural instruments. He therefore thought they must not suppose that the relative degree of the rural population as compared with the urban population had the same implication which it would have in Australia, or even in England, because it meant, as he had said before, a capacity for doing infinitely larger agricultural work with a smaller number of people. He would have liked to see reference statistically to the increase of capital values. No reference was made to it in the quotations given, and he would like to give a single illustration. When the Canadian Government bought from the Hudson Bay Company their rights to the whole of the North-West, they paid 300,000*l.* for the whole of the vast territory that was handed over. Some years ago he was in Winnipeg when a single block in the city was sold for the same price as the Canadian Government had paid for the whole of the North-West of Canada. If that were applied to the whole of the West, it would give most extraordinary figures in relation to that question. Another point was the question of the future development of wheat production in the West. In the sixties and the seventies the great change in the Middle West of America took place. It had always been said that the development of the valley of the Mississippi depended on dollar wheat. In early days when he first went across Canada, the future of the North-West was very undecided, and they were only getting about 70 cents for wheat. At the time he was travelling to study these questions on behalf of the *London Times*, and everybody there claimed that the cost of production was somewhere about 30 or 35 cents per bushel, but if they could get dollar wheat they thought the West would be secured. When he was out there last year and crossed the Continent, wheat was selling for \$2.40. His friend, Sir Daniel McMillan at Winnipeg, had told him that he knew of farmers who had cleared the whole value of their farms by a single year's crop. They could easily understand that if they had a production of 20 or 30 bushels an acre, which was not uncommon on the prairie soil at \$2.40, that the land brought a pretty good price in value. So far as he could see, the value of wheat was going to be continued for at least four or five or six years; and so long as they had anything that averaged two-dollar wheat, they could be perfectly sure the wheat areas in the North-West were going to be developed with great rapidity, either by the influx of emigrants or the wider application of agricultural machinery, which would be perfectly justified in order to meet the needs of that increased demand. With regard to the space at disposal, he was staying with the Governor of Saskatchewan at Regina a few years ago. They used to think that Edmonton on the Saskatchewan River was almost the most northern point for agricultural settlement, and what they might call the jumping-off place for the North. The Governor had told him that they had just had missioners down from 300 miles north of that on the Peace River, who had told him that for twelve years they had never failed

to raise the best crop of wheat, and, in their opinion, the soil was better than that of the valley of Saskatchewan. This was a country practically unopened, and it gave them an idea of the enormous possibility there was in that direction. Another point was the question of what was going to be the future of Canada. He thought there was nothing that should interest British people more than that; because, if any country was going to change the balance of the British Empire, it would be Canada, and he did not think it was improbable for the reasons he would state. The great development of America had occurred between the early sixties and the present time, in which the country had grown from about 30,000,000 or 35,000,000 to about 110,000,000 roughly. America waited until there were 25,000,000 of people on this side of the Mississippi and 1,500,000 on the other side of the Rockies, before they attempted to cross the Continent with the first line of railway. Canada had only about 4,000,000 of people on this side of the Rockies and about 250,000 on the other side when they built their first trans-continental railway. They now had three trans-continental lines, which gave a facility for opening up a vast area of country with a speed which nothing in America had ever equalled. The only qualification of that was the climate. He had always considered Canada's climate the greatest asset it had. It was like the governor of a steam engine. The tendency would be to go too fast; but the climate of Canada steadied growth. It excluded the African race and checked the Mediterranean races largely who were flooding across the whole of the central part of America. It also carried out a kind of process of selection. It needed a strong race to go through the Canadian life. He thought they had, perhaps, made some mistake in bringing too many people from the steppes of Russia and other parts of Europe, and what they now wanted was the hardier people of this country. As they knew, the Scots from their hardy soil had taken a great place in the development of Canada, and deservedly so, because they had been brought up in a country which encouraged the hardy qualities a country like Canada required. But he was absolutely positive that if the conditions of industry remained in this country as they were, and unless some great change came over those conditions, or if indeed England became prosperous again, as he believed was within her reach, there would be an immense outflow from this country to Canada more than to any other country. He therefore thought that people in these Islands should keep their eye on Canada, since, as he said before, it was the one part of the whole Empire that was likely to change the national balance. A great many people were afraid of the isolation of life in the Western Provinces. Nothing struck him more than the change which had taken place in the last five or six years in that respect throughout the West. When he had gone there ten years ago, he often pitied the people out in those lonely places with their homes sometimes miles apart. When he had gone there last year, nothing amazed him more than to see the change. Almost every farm had a tele-

phone. The lonely woman could have a chat with her neighbour miles off if she wanted to. But that was not all. If one went to Winnipeg or Saskatoon, or Edmonton, they found the young people from within 20 or 30 miles were running in for the week-end or for a day's shopping, as almost everyone of them had his motor. They went to the best hotel and to the cinemas and theatres, and had their dance in the hotel in the evening, and spent the Sunday at the churches in the towns, going back on the Monday morning to their work without the old sense of isolation. Science was changing the whole outlook of life in the West.

The PRESIDENT said he wished to add a few observations, his excuse being that in the year before the War he had had the opportunity of travelling through Canada as the guest of the Government from coast to coast, and was able to see a good many of the things, and to take account of the facts which Mr. Godfrey had translated for them into figures. The subject-matter of the Paper was full of romance. When they saw the things which were translated in the Paper into arithmetic, the impression of course was greatly intensified. Those vast plains in the West, where one could see the great tractors and the enormous ploughs breaking up the prairie eight or ten furrows at a time, and afterwards in the East, where they saw at Montreal the ships being loaded with wheat and the golden grain coming down in shoots from the elevator in one continuous stream, hour after hour, into the ships that were going over to Europe for the feeding of their peoples: all these things made Canada an exceedingly fascinating country to visit. He wondered whether, if Malthus could have foreseen Canada, it would have had any effect upon the theory which he propounded, a theory which had had a considerable effect upon the conduct of mankind. After all, there were now in Canada only 8,000,000 of people. She was only in her infancy. Her agriculture and her industries had hardly done more than begin, and who would set a limit to the greatness of her future? He agreed with Dr. Parkin that it was exceedingly probable there would be a very large immigration into Canada in future years, which might quite eclipse anything of which they had had experience before the war. The conditions of life were likely to be so hard in many parts of Europe, and, on the other hand, the high price of foodstuffs would give such an incentive to the transfer of population to food-producing areas, that there might be an immigration from the older world to the newer world on a scale hitherto undreamt of. Dr. Parkin had pointed out with great force what was undoubtedly one of the most important of the factors that had to be considered, that was the characteristics of the population which would go to Canada. In Mr. Godfrey's Paper, one of the figures that had struck him as exceedingly significant was the increase in the number of emigrants before the war from "other countries." He gave them the figures of the United Kingdom, the United States and "other countries." They rose with great

rapidity until, in 1913, there were 112,000 emigrants from other countries, as he described them, and in 1914, 135,000. He believed it was true to say that these were mostly from Eastern Europe, from countries the population of which was not deterred by considerations of cold. If they visited the schools in some of the newer towns of Western Canada, evidences of that kind of immigration were very obvious. They would see there children of perhaps ten or twelve different nationalities in one school—Serbians, Roumanians, Bulgarians, children from the Ukraine, Poland, and all the countries of Eastern Europe, sitting in their schoolrooms learning English, with Union Jacks in every corner of the room, singing Canadian and British patriotic songs with every variety of accent. What the effect upon Canada would be of a greatly intensified immigration from that part of Europe must remain to be seen; but it was very possible that it might present to Canada in future years one of her most formidable problems. Another thing that struck the visitor to Western Canada was the importance attached by the leaders of opinion to education. Hardly had a new city like Regina, Edmonton, or Calgary felt its feet, but it established excellent secondary schools and usually a university. The universities did not devote themselves solely, as one would perhaps be inclined to expect, to the more immediately remunerative forms of knowledge, the more technical subjects, such as engineering, medicine, or law, but an exceedingly large proportion of the students took an arts degree, which showed that, even in these newer civilisations, the people were wise enough to attach importance to learning for its own sake. He would have wished to see statistics in the Paper of the number of secondary schools. Mr. Godfrey had given them the number of primary schools, but the number of secondary or continuation school and university students was really the best test of the extent to which education was carried in a country. They had heard of the large urban growth in Canada. Just as the motor-car and the telephone had robbed the rural districts of their previous isolation and much of their discomfort, so the new methods of town planning seemed likely to save urban districts from many of the evils which in other countries attended them. In the West the towns were properly planned. They were surrounded with their belt of parks, their streets were broad avenues, there were plenty of open spaces, and the people had wisely determined that the eyesores of the industrial and working-class districts of Europe should not be repeated there, but that they would start afresh on better lines and save their coming generations from the evils that had afflicted the older countries. He had added those few remarks in extending to the author of the Paper, as well as its reader, the thanks of the Society. It was right that the Royal Statistical Society should devote special attention to questions relating to the other parts of the Empire in which they all took so much pride and interest; and the Society would have learnt with much satisfaction that a conference of Dominion Statisticians was to be held

next January. He would like to inform them that probably the January paper to be read to the Society would be contributed by the Statistician of the Commonwealth of Australia, Mr. G. H. Knibbs. As had been mentioned by Sir Alfred Bateman, they hoped to have an opportunity of meeting many of their fellow statisticians from different portions of the Empire, and to enter with them into closer personal relations. He trusted that on that occasion they would have the opportunity of conveying personally to Mr. Godfrey some of the thanks which they now desired to tender to him.

The vote of thanks was put to the meeting and carried unanimously.

SIR HENRY REW, in reply, said, as representing Mr. Godfrey, he ought, perhaps, for the moment, to express on his behalf his thanks for the vote of thanks, and, in accordance with the usual practice, any remarks made in the discussion would be communicated to Mr. Godfrey, and if he had any observations to add in the light of the discussion, he would have the opportunity of doing so in the *Journal*.

Note by Mr. Godfrey.

HAVING read with much interest the discussion following the reading of my Paper by Sir Henry Rew, there appear to be only three points that call for remarks in reply.

I should like to emphasize what Sir Alfred Bateman stated with regard to statistical co-operation between the Dominion and Provincial Governments. The state of things resulting in divergent figures has, it is believed, entirely passed away, and there is now for practically all the more important classes of statistics a close and harmonious co-operation. For the last two years, especially, the annual agricultural statistics of Canada have been collected jointly by the Dominion and Provincial Governments, and the resulting estimates of crop areas and yields, and of the numbers of farm livestock, have been published in identical figures by both sets of authorities. The first annual report of the Dominion statistician, just published, describes in detail the origin, purpose and organization of the new Dominion Bureau of Statistics and its work in co-ordinating the official statistics of Canada.

As mentioned by Dr. Parkin, the question of increase in the capital values of land, &c., was not included in the Paper, there being no direct official statistics on the subject sufficiently complete in character. Estimates have, however, been made of the total wealth of the Dominion, and such might well form the subject of a separate Paper. In an article on "The Wealth of Canada and 'other Nations,'" appearing in the *Journal of the Canadian Bankers' Association* for October, 1919, Mr. R. H. Coats, F.S.S., estimates the present total wealth of the Dominion at about 3,012,000,000.

With regard to the question raised by the President as to secondary and higher education, the statistics of secondary grades are not

published separately by all the provinces ; so that statistics of secondary education for the whole of Canada are not at present available. Statistics relating to the universities and colleges of Canada have been published for recent years, but the War largely dislocated arrangements. Students are now flocking to the Canadian universities and colleges in unprecedented numbers. The question of the co-ordination of education statistics is at present receiving the attention of the Dominion Bureau of Statistics in conjunction with the Provincial Education Departments, a special division of the Bureau having been established for the purpose.

I desire cordially to thank the speakers for their kind references to myself, and to express the hope of being able to meet the statisticians of the Mother Country and of the Overseas Dominions at the forthcoming conference in London.

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