

retail prices and house rent of 13.8 per cent. Similarly comparing prices in 1906-10 with those in 1911-12, the wholesale index-number increased 7 per cent., as against 10.2 per cent. in the case of retail prices and rent. Turning, however, to the index-numbers for retail prices of groceries and food alone (last column), it is seen that retail prices had *not* increased in 1911-12 as much as the wholesale prices, either for groceries and food alone, or for all groups combined. It appears, therefore, that, *although cost of living in Melbourne has increased at a greater rate than wholesale prices, retail prices of food and groceries alone have not increased so much as wholesale prices, the greater increase in the cost of living being entirely due to advance in house rent.*

In graph C the index-numbers computed from import and export values for the whole Commonwealth are shewn in relation to index-numbers published by the Labour Department of the Board of Trade, England. The items included in these two sets of figures are almost uniform, prices in both cases being computed from the import and export values. It may be seen that the general trend of the graphs is, for the most part, identical, with the exception of the years 1902 and 1908, when prices were high in Australia owing to the droughts, and of the year 1904, when low prices prevailed in Australia.

The last graph (D) has already been referred to. It relates to groceries and food only, and shews clearly the connection between wholesale and retail prices in Melbourne, and import and export values for the whole Commonwealth. The large increases in 1902 and 1908 and the low prices prevailing in 1904 are seen in all the graphs. The average value of the index-numbers during the years 1901-5 were 1050, 1031, and 930 for wholesale, retail, and import and export prices, respectively, the corresponding levels for the next five years being 1042, 1021, and 964, respectively.

VI.—COMPARISONS BETWEEN INDEX-NUMBERS FOR AUSTRALIA AND OTHER COUNTRIES.

1. General.—In several of the more important countries of the world, index-numbers have been computed on some system for a number of years. It is, therefore, possible to make some comparisons between the course of prices in Australia and other countries, but such comparisons are subject, however, to certain qualifications, inasmuch as there is no uniformity either in the list of commodities included or in the methods adopted for the collection of the data. Moreover, as already pointed out, the methods and technique adopted in the computation of the index-numbers in other countries are ordinarily far from satisfactory, and the results obtained are of limited accuracy, and are not reversible. This lack of reversibility becomes of special importance when it is desired to compare the various index-numbers by taking a common period as the base period throughout, as in the present case. For the index-numbers in different countries being originally computed with various periods or years as base, their reduction to a common period or year as base does not give the same results as would have been obtained had they been originally computed with the common period as base.

In spite of the foregoing objections, the index-numbers computed for the various countries may, for the most part, be taken as *roughly* indicating the general trend of prices and the general relative price levels at different periods. At any point they may really be subject to appreciable correction compared with results deduced from properly weighted data.*

In most countries the index-numbers are computed either from wholesale prices or from import and export values. In making any comparison between Australia and other countries, it will be preferable, therefore, to use the index-numbers based on Melbourne wholesale prices. These index-numbers have the further advantage that they are available for a considerable number of years.

2. Index-Numbers for Various Countries.—In the table on p. 77, price index-numbers are shewn for the following countries, viz:—the United Kingdom, Belgium, Germany, Italy, France, Canada, the United States, New Zealand, and Australia. These index-numbers have in each case been computed with the year 1911 as base (= 1000). In making any comparisons between the results it must, of course, be understood that the figures do not in any way shew the relative prices in different countries, but that they merely exhibit the fluctuations in price-level, taking the prices in 1911 as base (= 1000) in each country separately.

The question of relative cost of living in different countries is dealt with in Section VII. hereof.

The figures shewn in the last column may be termed the world's index-number, and have been computed by weighting the index-number for each country specified by a number representing its relative population. The weights used are as follow:—

Weights (representing Relative Populations) used in Computation of World's Index-Number.

Country	United Kingdom	Belgium	Germany	Italy.	France.	Canada.	U.S.A.	N.Z.	Aus.
Weight ..	45	7½	65	35	40	7	92	1	4½

These weights shew the predominating effect which countries with larger populations, such as the United States of America, Germany, and the United Kingdom, have on the world's index-number, compared with countries like Australia and New Zealand.

* It was not practicable to attempt a computation on fresh lines of the whole of the data.

Index-Numbers of Wholesale Prices in Australia and Other Countries, 1840 to 1912, with Prices in 1911 as Base (= 1000).

Particulars	United Kingdom.				Belgium.	Germany.	Italy.	France.	Canada.	U.S.A.	New Zealand.	Australia.	Average weight'd according to Population.
	Index No.	Economist.	Board of Trade.	Sauerbeck.	Average.	Waxweiler.	Schmitz and Hooker.	Imports and Exports.	Various.	Dept. of Labor.	Aldrich Bureau of Labor.	McIlwraith.	
No. of Items.	22	45	39	..	10	29 to 40	†	Various.	230	90 to 257	33 to 45	80	..
1840			1,287	1,287						1,105			1,165
1841			1,250	1,250						1,095			1,146
1842			1,137	1,137						1,020			1,058
1843			1,037	1,037						960			985
1844			1,050	1,050						964			992
1845			1,087	1,087						972			1,010
1846			1,112	1,112						1,0p6			1,041
1847			1,187	1,187					1,006	1,007			1,052
1848			975	975					949	959			961
1849			925	925					1,041	934			956
1850			962	962					1,102	968			996
1851	911		937	924		730			1,083	1,002			928
1852	815		975	895		741			1,140	971			823
1853	946		1,187	1,066		829			1,255	1,032			1,021
1854	1,069		1,275	1,172		884			1,267	1,068			1,071
1855	1,034		1,262	1,148		905			1,267	1,070			1,073
1856	1,078		1,262	1,170		898			1,388	1,071			1,095
1857	1,157		1,312	1,234		948			1,369	1,064			1,115
1858	1,043		1,137	1,090		827			1,236	963			991
1859	1,008		1,175	1,083		847			1,299	948			1,004
1860	1,080		1,237	1,158		882			1,293	946			1,026
1861	1,100		1,225	1,165		870			1,261	952	1,719	1,541	1,033
1862	1,173		1,262	1,217		894			1,274	1,114	1,738		1,102
1863	1,377		1,287	1,332		910			1,294	1,406	1,804		1,243
1864	1,509		1,312	1,410		933			1,311	1,802	1,822		1,416
1865	1,329		1,262	1,295		870			1,255	2,051	1,766		1,463
1866	1,292		1,275	1,283		890			1,178	1,807	1,869		1,368
1867	1,166		1,250	1,208		898			1,125	1,629	1,745		1,273
1868	1,077		1,237	1,157		894			1,087	1,518	1,719		1,212
1869	1,075		1,225	1,150		894			1,079	1,452	1,533		1,186
1870	1,075		1,200	1,137		870			1,086	1,346	1,438		1,137
1871	1,041	1,244	1,250	1,178		918			1,116	1,287	1,402	1,233	1,142
1872	1,172	1,334	1,362	1,239		1,020			1,150	1,313	1,438	1,339	1,206
1873	1,167	1,397	1,387	1,317		1,058			1,123	1,301	1,533	1,464	1,215
1874	1,129	1,354	1,275	1,253		972			1,060	1,258	1,505	1,390	1,153
1875	1,089	1,294	1,200	1,194		910			1,022	1,207	1,384	1,340	1,100
1876	1,044	1,262	1,187	1,164		886			1,028	1,118	1,308	1,354	1,056
1877	1,063	1,295	1,175	1,178		890			1,008	1,049	1,346	1,314	1,030
1878	998	1,213	1,087	1,099		816			947	957	1,260	1,219	950
1879	901	1,158	1,037	1,032		741			957	914	1,187	1,213	903
1880	1,007	1,186	1,100	1,098		827			979	1,011	1,215	1,112	1,016
1881	932	1,165	1,062	1,053		808			957	1,000	1,177	1,124	955
1882	972	1,174	1,050	1,065		784			935	1,026	1,140	1,292	964
1883	909	1,160	1,025	1,031		769			927	1,003	1,103	1,186	936
1884	875	1,049	950	958		733			905	940	1,075	1,130	887
1885	824	985	900	903		678			890	880	1,037	1,112	838
1886	806	929	862	866		643			831	869	1,009	1,092	807
1887	832	911	850	864		663			801	876	963	1,059	809
1888	828	940	875	881		706			823	891	963	1,077	837
1889	866	951	900	906		741			846	891	1,037	1,174	853
1890	896	951	900	916	795	792	803	868	866	873	1,000	1,058	865
1891	879	983	900	921	811	796	843	865	852	864	1,009	945	855
1892	839	931	850	873	806	749	833	818	808	820	972	818	825
1893	841	915	850	869	751	728	828	847	805	817	935	860	810
1894	808	862	787	819	778	677	779	776	763	743	916	749	750
1895	768	833	775	792	770	661	760	732	776	724	869	760	732
1896	786	807	762	785	762	649	769	713	727	699	897	922	716
1897	764	824	775	788	787	671	749	724	724	694	906	925	721
1898	758	853	800	804	799	710	778	760	755	722	906	896	749
1899	786	844	850	827	805	744	841	830	786	786	916	809	797
1900	868	915	937	907	857	793	937	859	850	855	944	894	864
1901	823	886	875	861	868	765	863	832	840	839	916	974	831
1902	785	883	862	843	886	740	832	818	856	873	935	1,051	830
1903	819	886	862	856	890	785	843	832	808	878	935	1,049	847
1904	861	899	875	878	902	793	867	826	875	874	888	890	850
1905	856	893	900	883	901	817	861	832	895	896	916	910	864
1906	937	919	962	939	957	879	913	915	942	947	944	948	823
1907	1,014	987	1,000	994	962	952	953	966	991	1,001	1,000	1,021	878
1908	897	940	912	916	998	859	916	878	949	950	972	1,115	815
1909	883	951	925	920	981	887	926	890	952	978	944	993	831
1910	947	994	975	972	967	919	966	938	983	1,017	963	1,003	870
1911	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1912	1,055	†	1,053	1,054*	†	†	†	†	1,058*	1,055*	†	1,174†	†

* Preliminary. † First nine months only. ‡ Not Available.

(i.) *United Kingdom*.—The figures shewn for the United Kingdom in the fourth column are the arithmetic means, where available, for the respective years, of the three index-numbers referred to.

(a) "*The Economist*" *Index-Numbers* are based on wholesale prices of 22 articles, as at the 1st January and the 1st July in each year. This method is open to the objection that it does not give a true average price for the whole year. Moreover, no system of weighting is used except that cotton appears three times, viz., as Surat cotton, cotton yarn, and cotton cloth. These index-numbers are published periodically in "*The Economist*."

(b) *Board of Trade Index Numbers* are stated to represent the wholesale index-numbers for 45 commodities, though in the majority of cases the data consist of import and export values, and not of wholesale price quotations. The price ratios are weighted according to the relative values consumed. The index-numbers are published in the "*Abstracts of Labour Statistics of the United Kingdom*."

(c) *Sauerbeck's Index-Numbers* are based on the average annual wholesale prices of 39 commodities. A crude and unsatisfactory method of weighting is adopted by taking, in some cases, two or three price quotations for certain commodities. For example, two grades of wheat and three of sugar are included, thus weighting wheat less than sugar, whereas the Board of Trade weight for wheat (47) is much larger than that for sugar (20). Again, Sauerbeck gives equal weights to coal, copper and iron by taking two quotations for each, whereas the Board of Trade weights for these commodities are 34, 5 and 16 respectively. As already mentioned, such divergencies in weights greatly prejudice the value of the deduced index-numbers.

(ii.) *Belgium*.—These index-numbers were published in a paper read before the International Statistical Institute in 1911 by E. Waxweiler. Beyond the fact that only 10 commodities are included, information as to methods adopted, etc., is not available.

(iii.) *Germany*.—The index-numbers from 1860 to 1889 are known as Schmitz's index-numbers, and are based on the wholesale prices at Berlin, Breslau, and Bremen of 29 articles. The crude system of weighting adopted by Sauerbeck of including two or three grades of certain articles has also been followed in these figures.

The index-numbers from 1890 to 1911 were computed by R. H. Hooker, M.A.,* in continuation of Schmitz's numbers, but they refer to 40 commodities, the same crude system of weighting being adopted.

(iv.) *Italy*.—These index-numbers represent the arithmetic mean of two index-numbers computed for imports and exports, respectively. No information is available as to the methods or technique followed. The index-numbers are published in the *Journal of the Royal Statistical Society*.*

* See "*The Course of Prices at Home and Abroad*," by R. H. Hooker, M.A. *Journal of the Royal Statistical Society*, London, December, 1911.

(v.) *France*.—The index-numbers from 1847 to 1879 represent the arithmetic mean of two import and export index-numbers computed by De Foville. From 1880 to 1889 they are based on official figures furnished by the Ministère du Travail et de la Prévoyance Sociale, and from 1890 to 1911 they are taken from "*La Réforme Economique*," a periodical review published in Paris.

(a) *De Foville*.—The index-numbers from 1847 to 1879 are based on values for all imports and exports.*

(b) *Salaires et Coût de l'Existence*.—From 1880 to 1889 the index-numbers are based on either import or wholesale prices of 10 commodities, and are published in official documents.† No system of weighting is adopted for the computation of the results.

(c) *Réforme Economique*.—The particulars given from 1890 to 1910 are the index-numbers published by *La Réforme Economique*.‡ No information is available as to the number of commodities included or as to methods followed in deducing the results.

(vi.) *Canada*.—The index-numbers are published in the official publications of the Dominion Department of Labour.¶ They are based on the wholesale prices of 230 articles, but no proper system of weighting has been adopted. Several grades of certain important commodities have been taken, thus following Sauerbeck's method.

(vii.) *United States of America*.—The index-numbers given from 1840 to 1889 are those furnished in 1892 by the Finance Committee of the United States Senate. They are known as Aldrich's index-numbers. From 1890 to 1911 the numbers are those published by the United States Bureau of Labour.

(a) *Aldrich*.—These index-numbers are based on wholesale prices; from 1840 to 1859, 90 commodities were included, and from 1860 to 1889 the list was extended to comprise 223 commodities. Though several grades or qualities are taken of some articles, no proper system of weighting is adopted. This is, of course, a very unsatisfactory feature.

(b) *Bureau of Labour*.—The index-numbers for 1890 to 1911 are those published by the Federal Bureau of Labour in continuation of Aldrich's numbers. They relate to the wholesale prices of 257 articles, and are weighted in the same crude manner as Aldrich's, Sauerbeck's, and other index-numbers.

(viii.) *New Zealand*.—The index-numbers are taken from the Report of the Commission on the Cost of Living in New Zealand, 1912,

* See "The Principles of Money," by J. L. Laughlin. New York, 1903, p. 208.

† See "Salaires et Coût de l'Existence." Paris, 1911, pp. 44 and 45.

‡ See "The Course of Prices at Home and Abroad" by R. H. Hooker, M.A., *ut supra*.

¶ See "Wholesale Prices in Canada, 1890-1899" by R. H. Coats, B.A., Ottawa, 1910, and see also "The Labour Gazette," published monthly.

and are based on the wholesale prices of a number of commodities, ranging from 33 in 1861, to 45 in 1887 and onwards. The results are not weighted at all.

(ix.) *Australia*.—The index-numbers are based on the Melbourne wholesale prices of 80 commodities. Full particulars as to methods and technique have already been given in this Report.

3. **General Comparisons.**—The direction and relative extent of the movements in each country may be more readily seen by a consideration of the average prices during various periods compared with the average prices in 1911 and 1912.

The following table shews the index-numbers for the average prices in 1911-12, compared successively with the average price during each of the four preceding quinquennia as base:—

Price-Indexes in Australia and other Countries, Changes in General Price Levels, between 1911-12, and Four Preceding Quinquennial Periods.

Particulars.	COUNTRY.									Weighted Average all C'tries
	United Kingdom.	Belgium.	Germany.	Italy.	France	Canada.	U.S.A.	N.Z.	Aust. (Melb.)	
Average for 1891-5 as base	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1911-12 ..	1,201	*1,277	*1,385	*1,230	*1,239	1,285	1,293	*1,064	1,288	*1,259
Average for 1896-1900 as base	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1911-12 ..	1,249	*1,247	*1,403	*1,230	*1,277	1,340	1,368	*1,094	1,223	*1,300
Average for 1901-5 as base	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1911-12 ..	1,189	*1,125	*1,282	*1,172	*1,208	1,187	1,178	*1,089	1,115	*1,185
Average for 1906-10 as base	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1911-12 ..	1,083	*1,028	*1,112	*1,070	*1,091	1,069	1,049	*1,036	1,070	*1,060

* 1911 only, 1912 prices not available.

The above figures shew the general increase in prices which has taken place in all countries since the nineties. It may be seen that the price-index for 1911-12 is in every case (except in New Zealand) greater in comparison with both the first two quinquennial periods than either of the last two periods, and also that the index-numbers for 1911-12 are greater when the years 1901-5 are taken as base, than the years 1906-10. This, of course, shews that prices have risen since the nineties.

Comparing prices in 1911-12 with the average for the five years 1891-5, it may be seen from the above table that the increase in Australia (28.8 per cent.) is greater than the increase for all countries

considered as a totality, *i.e.*, the increase based upon the weighted average (25.9 per cent.). The increase in Australia is practically the same as in Canada (28.5 per cent.); it is less than the increase in either Germany or the United States, but greater than that in any other of the countries specified.

Compared with the next five years, the increase in Australia (22.3 per cent.) is less than the weighted average for all countries (30.0 per cent.), and is also less than the increase in any other country except New Zealand, where it is only 9.4 per cent.

In regard to the average for the years 1901 to 1905, the increase in Australia (11.5 per cent.) is again less than the average (18.5 per cent.), and less than the increase in any other of the countries specified, except New Zealand (8.9 per cent.). Compared with the next five years, prices in Australia have increased 7.0 per cent., which is greater than the weighted average for all countries specified (6.0 per cent.), but is less than the increase in the United Kingdom, Germany, and France.

It appears, therefore, that compared with the first and last of the five-yearly periods, prices in Australia have increased in 1911-12 to a greater extent than in other countries, but that compared with the ten years 1896 to 1905 they have not increased so much as the average.

Reference to the graphs on page 78 shews that there is considerable similarity between the general trend of price movements in the several countries. It will be seen that on the graphs reference has been made chronologically to certain important events and occurrences, which are generally recognised as having had important influences on price movements in one or more of the countries. The effect of these events and occurrences on prices is referred to in some detail in the last section of this Report relating to the world's index-number and the factors controlling its movements.

Generally speaking, prices were low in about the year 1850 (see graphs for the United Kingdom, Germany, France, and the United States). They then increased rapidly for about five years, and were maintained at a comparatively high level until about 1865. In Germany, however, although prices rose from 1851 to 1857, their level, as compared with 1911, was not as high as in the other countries specified, while in America the rise did not set in until several years later (1861). In about the year 1865 a marked decline began, and lasted for about five years. From 1870 to 1873, there was a rapid recovery, except in the United States, where the progressive decline was arrested, but not converted into an increase. From 1873 until about 1887 there was a general fall, followed by a slight increase in most countries until 1890. Prices then again fell until about 1896, when they reached their minimum during the period under review. Since that year there has been a universal increase until the present time. It may be seen that on the whole the graph for Australia exhibits more violent fluctuations than those for other countries. This fact is due almost entirely to the effect of droughts, a matter which has already been referred to (see Sections II., III., and IV., hereinbefore).