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AN INTRODUCTION
TO THE STUDY OF PRICES



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AN INTRODUCTION

TO

THE STUDY OF PRICES

WITH SPECIAL REFERENCE TO THE HISTORY
OF THE NINETEENTH CENTURY

BY

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PREFACE

THIS book contains the substance of the Newmarch Memorial Lectures delivered at University College, London, during the present session. But as it is intended for the general reader, who is interested in results rather than in technical detail, the form has been somewhat modified by transferring tables of prices, wages, etc., together with discussions of statistical method, to Appendices at the end of the volume.

No attempt has been made to deal completely with the questions raised, and many difficulties will doubtless be left unsolved; but it is hoped that the following pages, as the title implies, will serve to introduce the reader to current economic ideas as to the causes which determine the purchasing power of money; while the historical chapters may prove to be a sufficient commentary on the chart at the end of the book to familiarise the reader with the actual course of prices in the nineteenth century. The requirements of students are to some extent met by the notes on further reading at the end of each chapter.

I wish to acknowledge the kindness of Mr. A. Sauerbeck in allowing me to make free use of the index number which he has calculated for so many years with such care. His work has placed not statisticians only, but the public generally under a permanent obligation. I have received

valuable suggestions and criticisms of detail from Mr. F. W. Hirst, Mr. J. M. Keynes, and Mr. W. G. Constable, the last of whom has also very kindly read through the whole of the proof-sheets. My indebtedness to the teaching and inspiration of Dr. Alfred Marshall will be evident to all who are acquainted with recent economic thought in England. Finally, acknowledgments are due to my wife and workmate, whose constant aid and unfailing encouragement are largely responsible for the production of this book.

CAMBRIDGE, *January 1912.*

PREFACE TO 1920 EDITION

WHEN I received notice from the publishers, two or three months ago, that the 1914 edition of this book would soon be out of print, I was in some doubt as to how to deal with a new edition. In my judgment the time was not yet ripe for writing the history of prices during the War, partly because the war cycle of prices is not yet complete and partly because, although an unprecedented amount of material is already available, the most interesting information on such points as the methods of price control and the course of negotiation with other countries still lies hidden in official records, and much research will be needed before the whole story can be told.

On the other hand, it would be absurd to publish in 1920 a new edition of a work on prices which made no reference to events since 1914. The various movements hitherto described in this book have been compared to the ordinary movements of the waves and tides. The movement of the last five years is by comparison a tidal wave.

It was, therefore, decided for the present to adopt a middle course, and a new chapter has accordingly been added which very briefly summarises the chief facts about wholesale and retail prices, currency and wages, without attempting to give a considered judgment on their significance or to fortify the occasional expressions of

opinion with the argument and accumulated evidence which the importance of the subject deserves. This method may perhaps make the problems dealt with appear simpler than they really are ; but this cursory treatment will, I hope, whet the reader's appetite for a fuller examination of the mass of material referred to—a few references to which are enumerated at the end of the chapter.

The only other changes made have been the bringing up to date of most of the figures in the original Appendices, the addition of an appendix containing the *Economist* wholesale price index numbers from 1914 onwards, and the redrawing of the main chart at the end of the book to cover the period to 1920. This additional material has almost all been collected for me by my brother Mr. G. C. Layton, to whom I am also indebted for seeing this edition through the press. Acknowledgments are also due, for particular figures and references, to Mr. A. Loveday and Mr. M. S. Birkett.

W. T. L.

September 14, 1920.

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APPENDIX A

ON INDEX NUMBERS OF PRICES

A PRICE index number is a device for ascertaining the average change in the prices of a number of commodities. Prices are quoted in all sorts of denominations: bread per quarter, wheat per hundredweight, coal per ton, milk per gallon, and cattle per head. Such quotations are incomparable with one another, and the method of index numbers is needed to reduce them to a common basis. If we have several series of price quotations for different commodities, an index number may be formed by taking the price of each article at a given time as the basis—these bases commonly for convenience being represented by the figure 100, though any other numeral, of course, could be used—and calculating the remaining price quotations for each commodity as a proportion of the basis price. In Table I. prices of British wheat, for example, are shown from the beginning of the century not only in shillings per quarter, but also as percentages of the price in 1900. If a similar operation is performed for other commodities, we should obtain several series of percentage figures which could be compared with one another. Thus, if 1900 is taken as the basis year, and it is found that in 1910 wheat has risen 16 per cent, and is, therefore, represented by the figure 116; beef has risen 7 per cent, represented by the figure 107; tea has fallen 14 per cent and is represented by the figure 86; figures reckoned on the same principle for potatoes, barley, mutton, bacon, sugar, coffee, and rice being 92, 93, 107, 125, 111, 97, and 98 respectively, we could take an average of these figures and say that the index number (unweighted) of this food group is 103.2, showing a rise on the

whole of 3·2 per cent. By using this method we may obtain an index number which will include as many commodities as we can find quotations for.

In practice, wholesale price index numbers do not take into account a very large number of commodities, for it is found that an index number which includes, say, the forty leading staple products, will yield a result not very different from that shown by including some 400 or 500 articles. The forty or so chief produce markets do, in fact, seem to include within their range all the chief changes that influence the value of commodities—transport improvements, new methods of production, optimism or pessimism in the business world, a wider diffusion of wealth or changes in the nature of the world's demand.

It may be urged that a system of averaging which gives equal weight to all the commodities under consideration would not present a correct view of general wholesale prices, and that a theoretically perfect index number would permit more important commodities to exercise a greater influence on the index number than the less important ones. For example, if the price of wheat rises 10 per cent and the price of pepper falls 10 per cent, it would not be correct to attach equal weight to these changes and say that prices had remained unchanged; for very little money is spent on pepper, and the purchasing power of money would clearly be much more affected by the rise of wheat than by the fall in pepper. Commodities should, therefore, be weighted in proportion to the amount of money spent upon them. It is, however, found from comparisons that have been made of weighted and unweighted index numbers that in practice the latter give substantially accurate results over long periods of time, provided a sufficiently large number of articles are taken into account. Moreover, a rough system of weighting may be introduced by taking separate quotations for such things as wheat and flour, beef and mutton, pig-iron and steel rails; but only one for jute or tea. This rough weighting is done in Sauerbeck's index number. For the purpose of our general review of prices, the index numbers of Jevons and Sauerbeck have been used. These two calculations are not strictly comparable, for Jevons takes a smaller number of commodities than Sauerbeck, and takes the geometric instead of the arithmetic mean of the figures for the individual articles. But there is no other index number going back to the beginning of the century,

*

TABLE II

INDEX NUMBERS OF PRICES SINCE 1800

(The figures are those represented in the main diagram.)

Year.	Index Number.	Year.	Index Number.	Year.	Index Number.
1800	235	1840	145	1880	117
1801	233	1841	142	1881	113
1802	183	1842	125	1882	112
1803	208	1843	118	1883	109
1804	198	1844	115	1884	101
1805	220	1845	123	1885	96
1806	217	1846	123	1886	92
1807	215	1847	130	1887	91
1808	242	1848	113	1888	93
1809	262	1849	107	1889	96
1810	237	1850	107	1890	96
1811	227	1851	110	1891	96
1812	202	1852	108	1892	91
1813	192	1853	123	1893	91
1814	190	1854	133	1894	84
1815	182	1855	133	1895	83
1816	152	1856	137	1896	81
1817	195	1857	142	1897	83
1818	220	1858	127	1898	85
1819	187	1859	128	1899	91
1820	172	1860	132	1900	100
1821	157	1861	131	1901	93
1822	147	1862	135	1902	92
1823	143	1863	137	1903	92
1824	147	1864	140	1904	93
1825	172	1865	135	1905	96
1826	150	1866	136	1906	103
1827	150	1867	133	1907	107
1828	136	1868	132	1908	97
1829	132	1869	131	1909	99
1830	135	1870	128	1910	104
1831	137	1871	133	1911	107
1832	130	1872	145	1912	113
1833	125	1873	148	1913	113
1834	130	1874	136	1914	113
1835	133	1875	128	1915	144
1836	143	1876	127	1916	181
1837	140	1877	125	1917	232
1838	140	1878	116	1918	257
1839	153	1879	110	1919	...

PRICE INDEX NUMBERS.

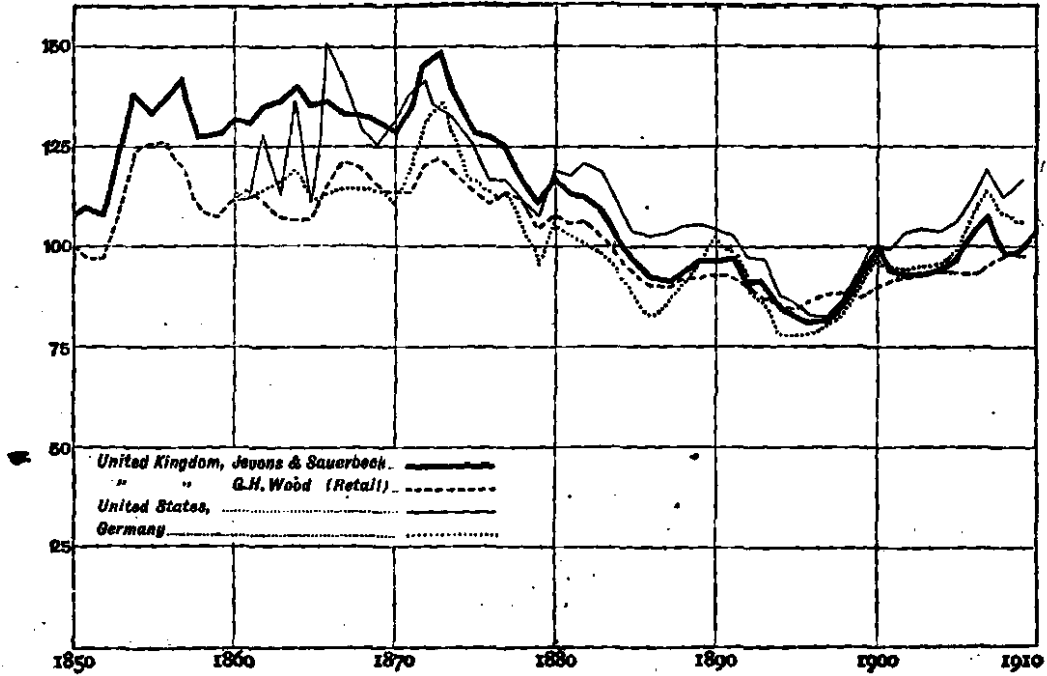


TABLE III.

	Food Prices (Sauer- beck). Average of 1867-77= 100.	Raw Materials (Sauer- beck). Average of 1867-77= 100.	London Economist. Prices of 1st Jan. of each year. Average of 1845-50= 100.	Board of Trade. Prices of 1900=100.	United States (Aldrich Bureau of Labour). Recalculat- ed to basis 1800 =100	Germany (Herr Schmitz). Recalculat- ed to basis 1900 =100.
1860	98	100	123	..	111	112½
1861	97	99	125	..	111½	111
1862	94	101	131	..	127	114
1863	89	115	159	..	118½	116
1864	88	119	172	..	136	119
1865	91	108	164	..	111	111
1866	95	107	162	..	151	118½
1867	101	100	187	..	142	114½
1868	100	99	117	..	139	114
1869	94	100	122	..	125½	114
1870	98	99	122	..	130	111
1871	98	101	128	138	136½	117
1872	102	115	129	145-8	141	120
1873	107	114	134	152-7	135½	125
1874	104	100	131	148-7	132½	124
1875	100	93	126	141-4	126	116
1876	99	91	123	138-0	116	113
1877	101	89	123	141-6	116	113½
1878	96	81	116	132-6	111	104
1879	90	78	101	126-6	107	94½
1880	94	84	117	129-6	118½	105½
1881	91	80	103	127-3	117½	103
1882	89	80	111	128-4	120½	100
1883	89	77	106	126-8	118	98
1884	79	73	101	114-7	110	93½
1885	74	70	95	107-7	103	86½
1886	72	67	92	101-6	102	82
1887	70	67	94	99-6	103	84½
1888	72	69	102	102-7	104½	90
1889	75	70	99	104-0	104½	94½
1890	73	71	102	104-0	103	101
1891	77	68	101	107-4	102	98½
1892	73	65	97	101-8	96½	89
1893	72	65	96	100-0	96	86
1894	66	60	95	94-2	87	77½
1895	64	60	87	91-0	85	77
1896	62	60	91	88-2	82	77½
1897	65	59	89	90-1	81½	79½
1898	68	61	86	93-2	85	84½
1899	65	70	87	92-3	92½	92
1900	69	80	97½	100-0	100	100
1901	67	72	97	96-9	99	94
1902	67	71	89	96-5	103	93
1903	66	72	91	99-9	103½	94
1904	68	72	100	98-3	103	94
1905	69	75	97	97-6	105	97
1906	69	83	106	100-5	111	106
1907	72	86	114	105-7	118	113
1908	73	74	105	102-3	111½	106½
1909	73	75	100	104-1	115	105
1910	74	81	109	108-3	99b	..
1911	75	88	114a	109-4	95b	..
1912	81	88	117a	114-9	101b	..
1913	77	91	125a	116-5	100	..
1914	81	88	119a	117-2	100b	..
1915	107	108	127a	143-9	101b	..
1916	130	140	166a	186-5	124b	..
1917	168	179	223a	243-0	176b	..
1918	176	204	265½a	267-4	186b	..
1919	182-7	231-2	277a	296-3	214b	..
1920	..	..	334½a	..	..	..

(a) 1901=100.

(b) 1913=100.

and during the years covered by both Jevons and Sauerbeck the two index numbers show exactly similar changes in direction, the extent of the movements being about the same in most cases. The former covers the period from 1785 to 1865, but has been reproduced in the chart only from the period 1800 to 1860. From that date onwards Sauerbeck's index number, based at first upon 44 and later on 45 commodities, has been used, as the details on which it is calculated are easily accessible. Sauerbeck's index number for the year 1900 has been taken as the basis for our present purpose, preceding figures being recalculated to percentages of the 1900 figure. This gives 132 for 1860. Jevons's figure for 1860 (viz. 79) was then taken as equal to 132, and his series of figures recalculated so as to make them join Sauerbeck's at that date. We thus get an index number for the whole of the century, which is given in Table II., and represented on the main chart at the end of the book.

Table III. shows an analysis of Sauerbeck's index number under the two heads of food and raw material. It also shows the two other English index numbers, viz. those of the *London Economist* and the Board of Trade. A fifth column gives the Aldrich Report index number for the United States, brought up to date by the Bureau of Labour, while the sixth column shows an index number for Germany prepared by Herr Schmitz

An examination of the two first columns shows that prices of raw materials fluctuate much more violently than food prices. This is not surprising, for the former are influenced by all the many variations of trade, by the state of credit, and by the psychology of the wholesale markets. The demand for food, on the other hand, is a much more definite and pre-determined amount, and though supply used in the old days to vary very much in England from year to year according to the harvest, the supply of cereals and meat is now drawn from such a variety of climates, and produced by so many different methods of production, that the total fluctuates comparatively little from year to year. The same is true to a less extent of other articles of food.

The *Economist* and Board of Trade index numbers show slight differences from year to year, for whereas the former represents market prices on a given date and includes a comparatively small number of commodities, among which cotton plays rather too large a part, the Board of Trade index number

represents for the most part average import or export values (as shown by the declared value of goods entering or leaving British ports), and includes a larger number of commodities. The comparison of these various index numbers shows (1) a general agreement as to the movement of wholesale prices over a period of years with unimportant differences in detail, according to the method of the calculation, and (2) that raw materials are more affected by changing conditions than food prices, and are therefore mainly responsible for the temporary ups-and-downs of the index number.

The American index number is based upon a much larger number of commodities than any of the preceding figures. The fluctuations are, however, as large as those shown for England, while the extent and direction of the movement of prices shows some important differences; in particular, the extent of the upward movement of prices since 1896 appearing to have been much greater than in this country. The same is true of Germany, but in this case the rise of prices in 1900 brought the index number so much above the level of the surrounding years that the curve as a whole lies below the other index number curves. The sharpness of the rise from 1896 is nevertheless very obvious from the diagram, in which these various indices are reproduced.

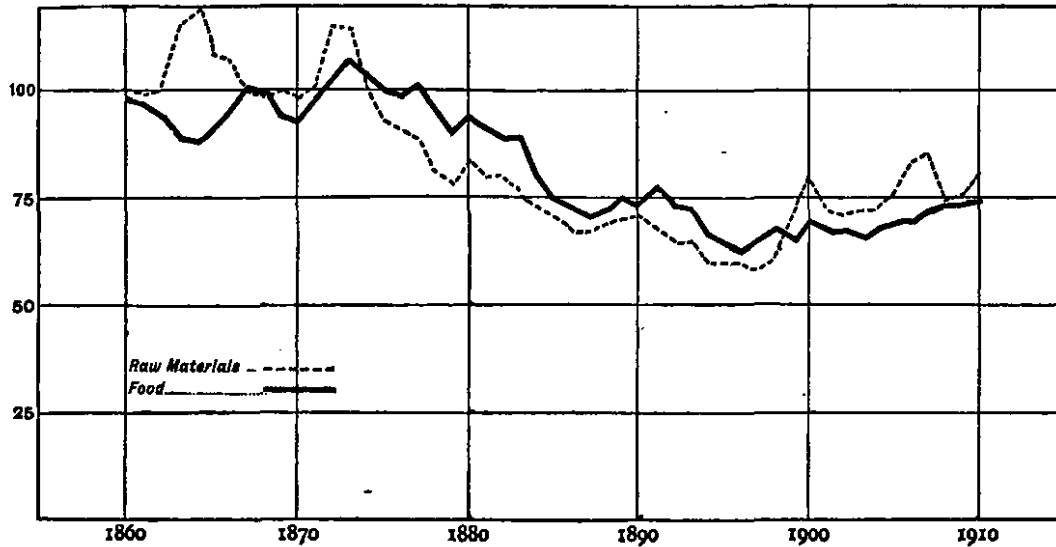
A retail price index number from 1850 onwards is given in Table I. of Appendix F, which has been compiled by Mr. G. H. Wood partly from statistics in the Board of Trade's Report on Wholesale and Retail Prices, and partly from data privately collected by Mr. Wood himself from Co-operative Society records. The basis for the figure is, however, comparatively slight, many of the figures being contract rather than genuine retail prices; hence too much reliance should not be placed on the details of the calculation, which is rather in the nature of an intelligent guess than an authoritative statement of the course of retail prices. As, however, it offers some idea of the relation between wholesale and retail prices it has been reproduced on a chart, together with the index number, for wholesale prices given in Table II. A comparison of these two lines shows that in many parts of the period the indices move together, but that there is a tendency for the wholesale curve to move more violently and to rise and fall to greater extremes. The high level of the wholesale curve in the 'sixties and early

'seventies is due to the high price of materials, and particularly of cotton, coal, and iron. The more violent movement of the wholesale curve is, in fact, mostly caused by the raw material quotations, as will be seen in a second chart on which Mr. Sauerbeck's sectional index numbers for food and material have been separately traced. The figures on which this diagram is based are given in the first two columns of Table III.

BIBLIOGRAPHICAL NOTE

The literature of this subject is voluminous, but a few special references may be given. On the method of index numbers see the chapters on index numbers in Bowley's *Elements of Statistics*, and the same author's *Elementary Manual of Statistics*. The former work treats the subject in a more mathematical manner than the latter. The British Association's Report for 1888 contains a report of a Committee which investigated the subject and offered suggestions as to the compilation of a price index number. The Appendix to the Board of Trade Report on *Wholesale and Retail Prices* (1908) contains a useful summary and explanation of existing index numbers, while a special report to the Canadian Labour Department, by R. H. Coats, on *Wholesale Prices in Canada* (1910), contains a similar and rather more general review of existing index numbers. See also the article on "Index Numbers" in the *Dictionary of Political Economy*, by Prof. Edgeworth, which concludes with a useful bibliography of this question. For a history and summary of the *Economist* index number see the *Economist* for August 19 and 26, and November 18, 1911. For Sauerbeck's index number see the annual report in the *Statistical Society's Journal*, but especially the articles in 1886 and 1893.

SAUERBECK'S INDEX NUMBER FROM 1860, DISTINGUISHING FOOD AND MATERIALS.



APPENDIX B

ON THE WORLD'S GOLD PRODUCTION

It is impossible to give in a short space anything like an adequate explanation of the technique of gold production, but, in order to show the present and future prospects of the world's gold supply, it is necessary to make a brief reference to some important features of the question.

Gold is found in a variety of forms, but we may make a broad distinction between two chief classes. On the one side are *alluvial* deposits caused by the action of water breaking up the original gold-bearing rocks, the gold being either left in an almost pure form mixed with sand in the beds of rivers, or transformed into comparatively soft sandstone rock, as the result of pressure on this mixture of sand and gold. Among such alluvial deposits, known as "placers," comparatively large sized nuggets of almost pure gold have occasionally been discovered, and the gold is always in a comparatively pure form. In the case of alluvial rock the method commonly employed is to disintegrate it by means of a very powerful stream of water. It is then treated in the same way as other alluvial deposits, i.e. after being broken up very finely it is washed in tanks of flowing water, which carries away the earthy matter and leaves the heavier gold at the bottom.

On the other hand, veins of gold-bearing rock are found either in the form of conglomerate, as in South Africa, or in the form of quartz-reefs, in which the gold may be quite invisible to the naked eye. Such rock needs to be treated with powerful machinery, the actual processes of mining being much the same as in the case of other minerals.

In early times attention was only paid to alluvial deposits, but as such forms are readily discovered, they are now only found on the outskirts of civilisation. The gold discoveries of the 'fifties, for example, occurred on the opening up of new countries, but such events can hardly be expected to recur now that almost every part of the world is readily accessible. The discovery of alluvial gold in Alaska in 1898 is the most recent event of this kind. But such deposits are naturally exhausted very rapidly, and in 1880 some alarm was expressed at the diminution of the world's output, the falling-off having been

hastened by the prohibition of the hydraulic method in California in 1884 on account of the devastation which it caused in agricultural districts. The countryside was being ruined by the large outflows of sand and mud washed down from the gold workings, and after a sharp tussle between the agricultural and gold-mining interests, the former carried the prohibition through the state legislature.

As early as 1886 Professor Lexis wrote that gold washings must be expected to contribute less and less to the yearly production, even though from time to time new deposits might be found. In his opinion, the most permanent supply of gold was to be expected from quartz mining, and he pointed out that already it was possible to use ores of low grade which formerly were not considered worth treating. On the other hand, it was pointed out by his critics that quartz mines were not at that time making a profit, and many were sceptical as to the possibility of ever obtaining a very large supply from such methods. But subsequent events have proved the truth of Professor Lexis' view. The enormous recent output of gold is to be attributed, on the one hand, to the discovery of new areas of gold-bearing rock, and, on the other, to enormously improved and cheaper methods of extracting the gold. This change is shown by the following short table of proportions of gold produced from various kinds of rock :—

	1848-75	1876	1880	1905
Alluvia	87·28 per 100	65·24	44·20	15
Lodes	12·72 „	34·76	47·80	57·50
Sedimentary deposits (Transvaal conglomerates) . . . .	...	...	8·00	27·50

The chief improvement in method has been the introduction of the prusso-cyanide process, by which minute quantities of gold are dissolved by potassium-cyanide, the gold being subsequently precipitated by chemical action or electrolysis. It is not too much to say that the present dominant position of the South African mines is the result of this discovery, though the process has also been successfully applied all over the world. Its importance lies in the fact that ores containing very minute quantities of gold may be treated at a profit.

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Seeing that such forms of gold extraction are the chief source of our present supply, the question of the world's gold is seen to turn on the abundance of such low-grade ore. This question is one for geologists. But according to De Launay, we may expect to find low-grade, gold-bearing ores in increasing quantities. In his opinion, gold is distributed throughout the earth's crust on the following principle: pure gold is exceedingly rare, but gold in very minute quantities is to be found almost everywhere. Between these two extremes rocks with a low proportion of gold are plentiful, and rocks with a high proportion are scarce. This view is based on his theory of the place which gold holds in the world's geological evolution. As, therefore, it becomes profitable to work lower-grade ores the supply will be found to be more and more abundant. The future, therefore, depends on the progress of mining and the possibility of working and extracting gold from enormous masses of rock in which minute quantities of gold are combined. The recent history of the South African mines shows how quickly the working costs have been reduced by modern methods, the following figures for a very important group of mines on the Rand indicating that in quite recent years profits per ton have hardly fallen at all in spite of the fact that the quality of the ore has deteriorated.

STATISTICS OF ORE MILLED

	Revenue per Ton of Ore.			Cost per Ton.			Profit per Ton.	
	£	s.	d.	£	s.	d.	s.	d.
1904	1	18	8	1	9	0	9	8
1905	1	15	10	1	7	0	8	9
1906	1	14	6	1	6	3	8	6
1907	1	13	11	1	5	2	8	9
1908	1	11	4	0	17	10	13	6
1909	1	8	11	0	17	1	11	6
1910	1	8	6	0	17	7	10	6
1911	1	7	11	0	18	0	9	7
1912	1	9	0	0	18	8	10	0
1913	1	7	9	0	17	11	9	6
1914	1	6	6	0	17	1	9	0
1915	1	6	3	0	17	5	8	5
1916	1	6	8	0	18	1	8	2
1917	1	7	1	0	19	2	7	6
1918	1	7	11	1	1	7	6	0

The decline in the first column is, of course, the result of working poorer ore, but the last column shows that the fall in quality has been met by economies in working. Such figures quite account for the enormous upward movement of the gold curve.

As regards statistics of production, the following table shows the world's output since the discovery of America, the figures down to 1850 being the estimates of Soetbeer, and the totals for subsequent years being the estimates of the Master of the United States Mint:—

WORLD'S PRODUCTION OF GOLD

	Total Production.	Annual Average.
	Million £.	Million £.
1493-1800 (307 years)	373	1·2
1801-1850 (50 years)	257	5·14
1851-1875 (25 years)	625	25·0
1876-1895 (20 years)	490	24·5
1896-1905 (10 years)	581	58·1
1906-1910 (5 years)	424	84·8
1911-1915 (5 years)	473	94·6
1916-1919 (4 years)	334	83·5
	3557	8·3

The world has thus produced since 1493 gold to the value of £2,750,000,000. Some of this has been lost by wear and tear, and a great deal by use in the arts. This loss is estimated by Del Mar to have amounted in 1878 to £1,340,000,000, while £600,000,000 has been shipped to Asia. It would therefore be a generous estimate to assume that the total world's stock of gold may be valued, roughly, at about £2,250,000,000. The present rate of production will on this basis double the world's gold in some twenty-five years.

It is sometimes thought that South Africa is entirely responsible for the enormous increase in output in the last two decades; but the following table proves that the cyanide process—the discovery of which is primarily responsible for the colossal increase from South Africa—has also had a very considerable influence in other countries. The year 1884 is chosen for comparison, as it is the year of the smallest production since

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the Californian discoveries, while in the period 1856-60 the gold-workings in America and Australia were in full swing :—

	1856-60. Annual Average.	1884.	1909.	1918.
	Million £.	Million £.	Million £.	Million £.
U.S.A.	10·8	6·5	19·9	14·0
Australia	11·5	5·9	14·2	6·5
Russia	3·7	4·6	6·5	2·5
Other countries .	2·1	3·4	16·1	16·3
Africa .. . . .	...	...	34·2	39·4
Total	28·1	20·4	90·9	73·7

This table may be supplemented by the figures for 1917 published by the Master of the United States Mint, which show at a glance the relative importance of the various gold-producing countries :—

	1917. £		1917. £
United States	16,750,140	Servia . . . . .	...
Canada	3,040,000	South America	2,926,920
Mexico	1,800,000	Central America . . .	624,400
Africa	42,921,840	Japan	912,440
Australasia	7,189,100	China	720,020
Russia	3,600,000	Indo-China	10,000
Austria-Hungary . .	2,000,000	Korea	888,800
Germany . . . . .	...	Siam . . . . .	...
Sweden	2,000	India	2,151,320
Italy	400	British East Indies } Dutch East Indies }	568,600
Spain . . . . .	...	
Turkey . . . . .	...	
France	140,000	Total (including other countries)	84,718,040
Great Britain	1,000		

A final table shows the world's production year by year since 1850, together with Soetbeer's ten-year averages from the beginning of the century. These are the figures which are represented by the red line on the chart :—

WORLD'S PRODUCTION OF GOLD

	Tons.		Tons.
1801-10 (Annual Average) .	17	1881-40 (Annual Average) .	20
1811-20 " " .	11	1841-50 " " .	54
1821-30 " " .	14	1851	134

WORLD'S PRODUCTION OF GOLD—Continued.

	Tons.		Tons.
1852	219	1886	160
1853	231	1887	157
1854	200	1888	164
1855	209	1889	175
1856	218	1890	177
1857	209	1891	182
1858	206	1892	197
1859	204	1893	224
1860	192	1894	270
1861	185	1895	290
1862	182	1896	300
1863	182	1897	350
1864	182	1898	425
1865	195	1899	454
1866	200	1900	377
1867	194	1901	390
1868	192	1902	425
1869	190	1903	481
1870	182	1904	500
1871	188	1905	577
1872	175	1906	618
1873	172	1907	631
1874	161	1908	666
1875	160	1909	702
1876	165	1910	712
1877	179	1911	684
1878	186	1912	691
1879	167	1913	662
1880	164	1914	657
1881	160	1915	696
1882	153	1916	660
1883	148	1917	627
1884	155	1918	568
1885	155	1919 (est.)	541

The whole of the gold produced each year does not, of course, go into currency, for large quantities are used by industries of various kinds—the proportion which finds its way into the arts as compared with the amount used as currency being dependent on the extent of the demand for gold as material at the current value of gold. It is difficult to ascertain how much of the world's supply is used in industry, for gold is continually being transferred from one employment to another. But a recent estimate by the Master of the United States Mint shows that in 1907 the new material used for industrial purposes

throughout the world amounted to about one-third of the world's production in that year. But this estimate has very little basis, and it is largely a matter of conjecture how far the enormous increase in the world's gold supply has had the effect of stimulating gold-using industries.

BIBLIOGRAPHICAL NOTE

The technical aspects of this question are dealt with by Monsieur De Launay's *The World's Gold*, and in the article on gold in the eleventh edition of *Encyclopædia Britannica*. A *History on the Precious Metals*, by Del Mar, contains an account of gold-mining from the earliest times, and deals at some length with the social and other problems raised in connection with the gold-mining industry. It also deals at some length with the demand for gold in the arts. An exhaustive collection and criticism of the facts dealing with the production of gold and silver from the earliest times is to be found in Soetbeer's "Materials for the Illustration and Criticism of the Economic Relations of the Precious Metals and the Currency Question." This famous compilation was translated into English and printed as an Appendix to the Final Report of the Gold and Silver Commission.

APPENDIX C

THE VICIOUS CIRCLE OF PRICES

WHAT has been said in Chapter IV. as to the theoretical aspect of price changes, together with the subsequent review of prices in the nineteenth century, should suggest the answer to the various questions which commonly arise when an upward movement of prices is under discussion—the most important of which is, perhaps, to decide what factor is responsible for the original upward impetus. It has already been explained (pp. 33-36) how an increase of the gold supply may act as a stimulus to prices, but it is a matter of common experience that other influences may often be originating causes. A bad harvest, a change in fashion, the development of a new “want” may all cause a rise in prices which spreads throughout the whole field of commerce, provided the other conditions are favourable for an advance and that the circulating medium is capable of the necessary expansion. But the discussion often becomes particularly confused when the chain of events starts with wages.

It is often asserted that a rise in wages is only a move round a vicious circle, the argument being put thus: starting with a rise of wages achieved, let us say, as the result of a strike, the increased wages-bill will add to the cost of production, and so raise prices; if the rise becomes general, the cost of living will increase and diminish the purchasing power of wages; this will produce a renewal of the discontent among the working-classes and result, perhaps, in a further demand, culminating in a strike for still higher wages. This view is apparently supported by the result of the recent advance in wages in the transport trades, for many of the shipping companies have announced their

intention of raising freight rates, while in the case of the railway companies it is proposed that legislation should be passed which will admit of their more readily raising freight rates above the level fixed by the Act of 1894.

But before discussing this argument, the same vicious circle may be traced starting from any other point on its circumference—as, for example, when a monopoly raises price—a case more likely to become important in the United States of America than in this country. Under the protection of a tariff a number of the trusts are formed which raise the price of their products above the level in the open market; the rise of prices raises the cost of living, produces unrest among the working-classes, and eventually a rise of wages; the increase in the wages-bill cuts into anticipated profits of the trusts, which on the score of increased costs of production attempt to raise prices still further, and probably demand a higher tariff. If this is secured the whole process begins again, and, just as when the rise started in wages, seems to involve an indefinite upward movement of prices.

The discussion of monetary theory in Chapter IV. will, however, have shown that such a continuous upward movement could not occur without a steady expansion of the circulating medium, and the demand would probably be—if the experience of the United States may be taken as a guide—for both gold and credit money. If gold were not readily forthcoming, the country concerned would make a heavy call on the world's gold resources, banking reserves in all countries would run low, and prices in the open market tend to fall. In the country with the tariff the price level might conceivably be established at, say, 20 per cent above the level in the world market if the tariff were a 20 per cent one; but in the country without the tariff the level could not long remain above that in the open market. Thus the conception that strikes, tariffs, or trusts can produce an indefinite movement of prices is seen to be limited by the elasticity of the circulating medium, and though the train of events may happen as suggested for a time, the strain to the credit and banking system will produce a reaction which will eventually establish a lower level of prices.

But will everybody be no better off than before as a result of such changes? A moment's thought will show that

the argument assumes that the present distribution of real wealth between employers and employed, or between monopolists and the general public, is fixed by economic laws which do not permit any change in the relative incomes of various classes. If this were so, it is indeed true that no one would be ultimately better off for a rise of wages or profits; for the change of the income of one class would spread itself all round the circle, while the general level would remain high or be reduced to its former position, according to whether the period happened to be one in which the world's gold supply was increasing or not.

But in practice this assumption is very rarely true, and it is certainly never true except over a very long period of time. A section of the community which secures a bigger income is usually able to do so at the expense of some other class. Let us return to the case of the transport workers and the ship-owners. If, as is probable, the rising prices and booming trade of the last few years have added very considerably to the profits of shipowners, the latter will find it difficult to pass on the rise of wages, which is really in the nature of a return to the distribution which prevailed before the boom began. Even if freights are raised for the moment, when depression sets in freights will have to fall; but if profits are not driven down below the level at which it is worth while to keep capital in the business, the masters will not have a case for lowering wages that would convince an arbitrator. The men might be induced to accept lower wages before this point was reached, on account of their comparatively weak bargaining position. But if they kept a strong organisation they could maintain the present wage without harm to the industry, the net result being that they would have increased their income at the expense of the masters' profits.¹ In industries where a large quantity of capital is fixed, such as in railway transport, there is often a very large margin of profits which might go to labour before the demand for labour was seriously checked. In such cases a great deal depends on the bargaining strength of the respective parties to the wage contract.

¹ If as often happens, a rise of wages increases the efficiency of the workers, there may be no other effect on any other class in the community except that which is caused by the fact that the increased production may tend in the long run to lower the level of prices.

But it is possible that the shipping companies could maintain the rise of freight rates indefinitely, on some lines at all events, and some of those who paid the higher rates—merchants, etc.—might not be able to pass on the higher prices to their customers, on account of competition or the restricted purchasing power of the consumers; while even if the rise affected the ultimate consumer some would not be in a position to secure an increased income, but would suffer a fall in the real value of that income. In such a case the rise of freights would not react on the employees in the shipping trade to any considerable extent, but would be shared by the community in general, falling especially heavily on those who had no means of increasing their receipts (classes C, F, and I of Chapter II). The industry would, in fact, be securing for itself a larger share of the national income at the expense of various other income-receivers. If all the claimants to a share in the national dividend were equally able to make their claim effective,¹ no one would be able in this way to increase his share measured in commodities and services; but any rise of wages or profits would react in the way suggested above on the general level of prices. But as distribution is at present determined, the actual effect of a rise in wages depends on the "squeezability" of the employers' profits on the one hand, and on the squeezability of the general public on the other. Recent advances in wages have probably been secured for the most part at the expense of those who have hitherto profited by the rise of prices, and must be regarded as a consequence rather than a cause of rising prices. The points raised, however, in this discussion are more appropriate to treatises on theoretical economics than to this introductory study. The reader is accordingly referred to Marshall's *Principles of Economics*, book v. chap. vi., for a detailed discussion of this question, and a statement of the theoretical conditions under which any single group can increase its proportionate share of the national dividend.

¹ Which requires, in technical language, that the demand for all kinds of goods and services should be equally elastic, while the supply of labour and capital for various employments should also be equally elastic.

APPENDIX D

ON MONETARY STATISTICS

AN enormous quantity of statistical material on this point has been collected by the National Monetary Commission of the United States. No reliable estimates of gold in circulation are available except for the United States, for France, and for the United Kingdom during the last twenty years; but the figures given in that connection show that the gold in the hands of the American people has increased far more rapidly than can possibly have been the case in any European country. So far as bank deposits are concerned, they afford an inexact but important measure of the rate at which banking facilities have spread among the people; we cannot, however, discover how many transactions such figures represent, unless we could discover the number of times that the bank deposits are used for the purpose of business transactions during the year. This information is only available in a few special cases. The figures of joint-stock bank deposits in Great Britain do not give a very exact indication of the actual growth of bank deposits, for they are swollen by the absorption of private banks into the great joint-stock corporations. Such additions to the totals do not, therefore, represent real additions to the banking of the country as a whole. In addition to statistics of gold in circulation and of bank deposits, the gold reserves in the banks of England, Germany, and France, and in the United States Treasury, are also shown. In the case of the Bank of England the average annual minimum rate of discount has also been added. Finally, a table has been added showing the balance of imports and exports of gold coin and bullion during the periods for which statistics are available in the United Kingdom, United States of America, France, and Germany.

Table I. is taken from the report of the Deputy Master and

Comptroller of the Royal Mint. Table IX. is from Palgrave's *Bank Rate and Money Market*. The remaining tables in this Appendix are all from the volumes of statistics published by the National Monetary Commission of the United States.

TABLE I
ESTIMATES OF GOLD CIRCULATION IN THE UNITED KINGDOM

	Total Supply of Gold.	Per Caput.
1844	£46,000,000 (Mr. Newmarch's estimate) . . .	£1 13 5
1856	£75,000,000 (Mr. Newmarch's estimate) . . .	2 13 0
1868	Under £80,000,000 (Mr. Jevons's estimate) . . .	2 12 3
1883	£110,000,000, a wide limit (Mr. Inglis Palgrave's estimate) . . .	3 1 9
1888*	£102,500,000 (Royal Mint's estimate) . . .	2 14 9
1892	£90,000,000 (the Chancellor of the Exchequer's estimate, 1892) . . .	2 7 3
1895*	£92,500,000, Royal Mint's estimate (£62,500,000 in active circulation, £30,000,000 in banks) . . .	2 7 1
1908	£100,000,000 (Royal Mint's estimate) . . .	2 7 2
1910	£113,000,000 (" " ") . . .	2 8 0
1913	...	...
1920	Nil.	Nil.

* These figures were obtained from the Thirty-fourth Annual Report of the Deputy Master and Comptroller of the Mint (1908), in which the following remarks were made: "The estimate by this department of the gold coin in active circulation in 1895 was arrived at by five distinct methods. It may be observed that the methods used in 1856, 1868, and 1888 would give maximum amounts, and the results of the recoinage of light gold coin show that the estimate of 1888 was too high, and that the estimate of 1895 was a closer approximation to the truth."

TABLE IA
GROWTH OF PAPER CURRENCY DURING THE WAR IN THE UNITED KINGDOM

	Currency Notes.	B. of E. Notes.	Scottish Notes.	Irish Notes.	Total.	Per Caput.
	Million £.	Million £.	Million £.	Million £.	Million £.	
1913	...	29·6	7·7	8·0	45·3	£1 5 11
1914	38·5	36·1	9·5	10·9	95·0	2 8 2
1915	103·1	35·3	12·6	15·0	166·0	3 15 5
1916	150·1	39·7	15·5	19·1	224·4	5 1 10
1917	212·8	45·9	19·0	22·3	300·0	6 16 4
1918	323·2	70·3	25·1	30·9	449·5	10 4 1
1919	356·2	91·4	28·0	29·1	504·7	11 9 1

TABLE II
MONEY SUPPLY OF FRANCE

Gold Supply.					Total Money Supply in Circulation.
Years.	In Circulation.	At the Bank of France.	Total.	Per capita.	Gold, Silver, and Bank-notes.
	Million £.	Million £.	Million £.	£.	Million £.
1878	152	44	200	5.42	828
1885	152	44	200	5.28	844
1891	108	48	160	4.21	280
1897	88	76	168	4.36	272
1908	92	96	192	4.98	804

TABLE III
GOLD STOCK OF THE U.S.A. SINCE 1879, INCLUDING BULLION IN TREASURY

Year.	Total.	Year.	Total.
1879	£49,148,367	1900	£206,876,888
1880	70,368,241	1901	224,927,812
1881	95,696,907	1902	238,518,917
1882	101,351,543	1903	249,736,305
1883	108,546,412	1904	265,531,279
1884	109,100,159	1905	271,531,197
1885	117,739,407	1906	295,141,353
1886	118,154,892	1907	293,277,820 ^a
1887	130,104,067	1908	323,626,695
1888	141,163,771	1909	328,408,399
1889	136,012,701	1910	327,208,695
1890	139,112,605	1911	350,639,344
1891	109,316,570	1912	363,637,683
1892	132,855,067	1913	374,152,367
1893	119,539,538	1914	378,131,358
1894	125,458,640	1915	382,145,581
1895	127,251,204	1916	457,833,441
1896	119,919,592	1917	528,633,603
1897	139,247,803	1918	573,502,103
1898	172,302,956	1919	618,408,000
1899	192,699,876	1920	537,502,600

^a As the result of special investigation by the Director of the Mint, a reduction of £27,000,000 was made in the estimate of gold coin in circulation on 1st July 1907 as compared with the basis of previous years.

TABLE IV
VARIOUS CLASSES OF MONEY IN U.S.A. IN CIRCULATION
SINCE 1879

Year.	Gold Coin, Bullion, and Certificates.	Silver Coin and Certificates.	United States Notes and Treasury Notes.	National Bank Notes. ^c	Federal Reserve Notes.
	Amount.	Amount.	Amount.	Amount.	Amount.
	Million £.	Million £.	Million £.	Million £.	Million £.
1879	25.1	13.9	80.2	64.2	..
1880	46.7	14.8	65.5	67.4	..
1881	64.2	23.0	65.0	69.9	..
1882	72.6	26.6	65.0	70.5	..
1883	80.9	30.9	64.6	69.5	..
1884	82.3	30.5	63.7	66.1	..
1885	93.6	36.6	66.3	61.0	..
1886	86.8	37.4	64.7	61.5	..
1887	73.5	49.2	65.3	55.3	..
1888	102.4	61.3	61.6	49.0	..
1889	98.7	72.6	63.3	41.4	..
1890	101.0	61.5	66.9	38.3	..
1891	105.4	84.3	76.7	32.4	..
1892	100.9	89.3	87.5 ^b	33.4	..
1893	100.2	89.3	94.3	34.9	..
1894	112.4	87.6	92.0	40.0	..
1895	105.6	86.3	87.0	41.4	..
1896	99.4	82.6	70.3	43.0	..
1897	110.9	93.3	73.0	45.1	..
1898	138.9	102.5	81.6	44.6	..
1899	142.4	106.5	84.3	45.5	..
1900	162.3	110.1	73.6	60.0	..
1901	175.3	115.1	75.5	69.0	..
1902	187.7	120.2	72.3	60.1	..
1903	198.9	123.9	70.6	80.0	..
1904	222.3	125.6	69.3	86.6	..
1905	247.3	125.9	68.3	96.0	..
1906	237.3	132.1	68.6	109.6	..
1907	232.3	134.7	69.6	117.8	..
1908	279.2	133.1	68.3	125.3	..
1909 ^a	252.6	136.4	68.3	133.1	..
1910	273.7	137.3	66.9	136.7	..
1911	303.9	132.7	67.3	137.5	..
1912	310.8	136.9	67.5	141.0	..
1913	322.5	139.1	67.4	143.3	..
1914	327.5	141.3	67.6	143.0	..
1915	332.6	141.2	66.5	157.1	16.1
1916	410.2	145.5	68.3	143.9	34.6
1917	456.6	148.6	67.2	139.5	103.9
1918	380.5	134.7	63.0	140.6	342.6
1919	357.5	107.5	69.3	144.9	713.0

^a Revised figures include 1909.

^b Includes currency certificates Act, 8th June 1873, from 1892.

^c Figures in this column are exclusive of National Bank Notes in Treasury, lawful money for the redemption of which having been deposited with the Treasurer, U.S. See Table 25, p. 73, *Report of Treasurer U.S., 1903.*

TABLE V
DEPOSITS IN JOINT-STOCK BANKS IN THE UNITED KINGDOM
(000's omitted)

Date.	England and Wales.	Scotland.	Ireland.
October 1877	£133,258	£8,797	£17,204
" 1878	235,392	77,999 ^a	18,737
" 1879	235,996	68,583 ^b	17,517
" 1880	242,290	75,585	17,167
" 1881	263,921	77,869	17,259
" 1882	279,165	79,444	23,135
" 1883	290,116	81,176	27,459
" 1884	313,854	83,249	26,124
" 1885	331,679	83,434	23,587
" 1886	329,328	81,523	33,301
" 1887	339,125	81,020	34,161
" 1888	352,070	82,404	35,183
" 1889	380,579	85,004	37,186
" 1890	390,752	89,076	39,071
" 1891	422,728	91,925	39,338
" 1892	435,345	92,520	40,316
" 1893	432,670	92,413	40,539
" 1894	445,153	92,091	41,670
" 1895	485,277	93,489	43,613
" 1896	564,538	94,338	45,566
" 1897	565,006	95,882	45,580
" 1898	596,794	96,617	46,083
" 1899	624,715	99,189	46,943
" 1900	620,169	103,674	47,726
" 1901	634,346	107,347	48,428
" 1902	641,294	107,136	48,845
" 1903	645,115	106,437	50,439
" 1904	642,286	103,815	52,271
" 1905	672,329	101,538	53,498
" 1906	683,788	101,062	53,959
" 1907	713,263	105,232	55,984
" 1908	712,282	108,718	58,306
" 1909	685,040 ^c	106,736	60,463
" 1910	720,687 ^c	106,652	62,508
" 1911	748,641 ^c	112,209	65,465
" 1912	773,974 ^c	118,795	66,901
" 1913	809,352 ^c	125,887	70,657
" 1914	895,561 ^c	132,504	74,501
" 1915	992,555 ^c	140,569	77,722
" 1916	1,154,877 ^c	166,620	83,746
" 1917	1,365,297 ^c	196,538	99,310
" 1918	1,583,412 ^c	222,055	131,610
" 1919	1,874,184 ^c	259,610	166,231

^a Including City of Glasgow, £3,000,000; and Caledonian Bank, £1,000,000.

^b Including Caledonian Bank.

^c Excluding Bank of England.

TABLE VI

DEPOSITS OF PRIVATE BANKS IN THE UNITED KINGDOM
(000's omitted)

Oct. 1892	£70,899	Oct. 1906	£27,417
" 1893	66,440	" 1907	27,426
" 1894	63,908	" 1908	26,842
" 1895	69,170	" 1909	25,680
" 1896	47,298	" 1910	26,808
" 1897	48,798	" 1911	27,099
" 1898	39,984	" 1912	26,753
" 1899	41,410	" 1913	27,089
" 1900	42,102	" 1914	32,874
" 1901	39,544	" 1915	32,890
" 1902	34,556	" 1916	39,183
" 1903	31,025	" 1917	44,697
" 1904	28,342	" 1918	51,271
" 1905	26,610	" 1919	56,246

TABLE VII

DEPOSITS OF GERMAN JOINT-STOCK BANKS

Year.	Deposits and Current Accounts.	Year.	Deposits and Current Accounts.
1876	£23,978,740	1892	£77,540,278
1877	19,749,331	1893	77,915,308
1878	21,201,059	1894	99,968,148
1879	26,347,933	1895	112,159,366
1880	26,434,928	1896	112,529,378
1881	33,918,066	1897	127,364,008
1882	31,314,748	1898	149,740,279
1883	38,990,593	1899	167,426,672
1884	46,035,947	1900	176,089,149
1885	51,711,238	1901	180,046,695
1886	54,198,749	1902	196,814,891
1887	52,893,462	1903	214,096,974
1888	57,101,231	1904	247,577,865
1889	77,915,442	1905	287,257,797
1890	75,449,654	1906	333,559,836
1891	77,419,531	1907	368,367,853

TABLE VIII

DEPOSITS IN VARIOUS BANKS IN UNITED STATES SINCE 1879

Year.	National Banks.	State Banks.	Trust Companies.	Private Banks.
1879	217·7	36·0	15·2	27·9 ^b
1880	216·7	45·4	18·0	36·5 ^b
1881	271·7	56·0	22·3	48·3 ^b
1882	271·6	60·0	29·0	59·1 ^b
1883	267·1	71·1	33·1	57·7 ^b
1884	243·9	70·5	37·9	...
1885	282·6	74·8	37·7	...
1886	287·8	74·1	42·8	...
1887	329·5	95·8	49·1	20·9
1888	341·7	88·9	51·9	20·6
1889	383·2	110·0	60·5	17·5
1890	395·1	118·0	67·8	21·0
1891	393·8	119·0	71·7	19·4
1892	464·6	139·4	83·0	18·9
1893	387·0	151·1	97·7	14·0
1894	445·1	142·4	95·6	13·5
1895	435·1	155·1	110·7	16·8
1896	427·6	150·7	193·5	12·3
1897	476·7	157·6	115·3	10·2
1898	559·2	199·4	133·1	12·7
1899	700·1	254·5	167·5	17·6
1900	723·9	274·3	206·3	19·5
1901	849·7	345·2	257·7	24·2
1902	893·1	366·6	307·4	27·0
1903	914·0	390·8	340·3	26·9
1904	966·8	447·2	355·1	19·4
1905	1,081·2	507·2	432·9	25·9
1906	1,140·2	586·3	532·4	22·3
1907	1,237·8	655·9	445·5	30·7
1908	1,265·5	628·9	405·9	25·6
1909 ^a	1,368·6	525·1 ^a	622·5 ^a	29·3

^a From special reports of 28th April 1909, obtained for the National Monetary Commission. Prior to 1909, statistics for State banks from a number of States include loan and trust companies.

^b From report of capital and deposits made to Commissioner of Internal Revenue for purposes of taxation.

^c 30th November 1882.

TABLE IX

GOLD HOLDINGS OF THE BANK OF ENGLAND, AND BANK RATE

Date.	Total Coin and Bullion.	Average Rate of Discount.	Date.	Total Coin and Bullion.	Average Rate of Discount.
1844	£14,664,000	£2 10 0	1882	£21,992,000	£4 2 8
1845	15,243,000	2 13 8	1883	22,227,000	3 11 4
1846	14,785,000	3 6 6	1884	22,907,000	2 19 1
1847	10,428,000	5 8 6	1885	24,173,000	2 17 7
1848	13,872,000	3 14 5	1886	21,018,000	3 1 0
1849	15,161,000	2 18 7	1887	21,779,000	3 7 0
1850	16,636,000	2 10 1	1888	20,770,000	3 5 11
1851	14,564,000	3 0 0	1889	21,410,000	3 10 11
1852	20,587,000	2 3 0	1890	21,818,000	4 10 5
1853	17,516,000	3 13 10	1891	24,863,000	3 5 2
1854	13,977,000	5 2 3	1892	25,519,000	2 10 7
1855	14,181,000	4 17 10	1893	26,425,000	3 1 0
1856	10,932,000	6 1 2	1894	34,809,000	2 2 3
1857	10,118,000	6 13 3	1895	38,951,000	2 0 0
1858	17,847,000	3 4 7	1896	44,334,000	2 9 8
1859	17,928,000	2 14 7	1897	35,571,000	2 12 8
1860	15,239,000	4 3 7	1898	33,561,000	3 4 10
1861	13,009,000	5 5 4	1899	32,268,000	3 15 0
1862	16,380,000	2 10 7	1900	33,321,000	3 19 6
1863	14,567,000	4 8 2	1901	35,830,000	3 14 4
1864	13,482,000	7 8 0	1902	35,644,000	3 6 7
1865	14,546,000	4 15 4	1903	34,415,000	3 15 0
1866	14,887,000	6 19 0	1904	34,412,000	3 6 1
1867	21,353,000	2 10 9	1905	35,668,000	3 0 1
1868	20,838,000	2 1 11	1906	33,942,000	4 5 3
1869	18,825,000	3 4 2	1907	34,917,000	4 18 5
1870	20,776,000	3 2 0	1908	32,724,000	3 0 4
1871	23,588,000	2 17 8	1909	37,414,000	3 2 0
1872	22,585,000	4 2 0	1910	31,355,545	3 14 5
1873	22,665,000	4 16 10	1911	32,438,162	3 9 4
1874	22,294,000	3 13 10	1912	31,300,487	3 15 5
1875	23,923,000	3 4 8	1913	34,983,149	4 15 5
1876	28,695,000	2 12 1	1914	69,493,610	4 0 9
1877	25,374,000	2 18 0	1915	51,476,407	5 0 0
1878	23,952,000	3 15 8	1916	54,304,915	5 0 3
1879	32,452,000	2 10 4	1917	58,337,469	5 3 0
1880	27,636,000	2 16 4	1918	79,110,764	5 0 0
1881	24,580,000	3 10 0	1919	91,342,155	5 3 0

TABLE X

GOLD HOLDINGS OF THE REICHSBANK, THE BANK OF FRANCE,
AND THE UNITED STATES TREASURY

Year.	Reichsbank.	Bank of France.	United States Treasury.
	In Million £.	In Million £.	In Million £.
1878	9·8	37·9	26·0
1879	10·4	28·5	29·0
1880	10·7	27·9	27·8
1881	9·8	23·3	33·7
1882	9·9	35·2	31·7
1883	13·4	37·8	39·5
1884	13·3	39·3	43·1
1885	13·1	42·4	49·3
1886	13·3	50·3	48·9
1887	22·4	45·7	57·1
1888	28·9	41·9	64·0
1889	27·8	44·5	62·9
1890	24·7	48·4	62·2
1891	28·0	54·2	53·3
1892	29·3	59·9	51·7
1893	25·0	59·9	37·8
1894	29·4	65·0	29·0
1895	33·5	70·4	27·5
1896	28·6	78·3	30·9
1897	28·1	76·2	37·2
1898	27·7	75·7	47·2
1899	27·2	72·2	62·2
1900	27·1	71·9	87·0
1901	31·6	81·3	102·1
1902	34·5	93·0	114·3
1903	30·9	95·9	129·5
1904	32·4	99·1	139·3
1905	35·4	110·1	141·9
1906	32·1	111·0	163·9
1907	30·1	104·1	183·7
1908	37·3	117·8	203·0
1909	38·6	141·3	208·5
1910	38·9	136·0	...
1911	41·4	128·2	...
1912	44·0	129·6	...
1913	58·5	140·3	...
1914	104·6	169·4	...
1915	122·3	200·6	...
1916	126·0	203·0	...
1917	120·3	214·2	...
1918	118·1	219·1	...
1919	54·6	228·1	...

TABLE XI
NET IMPORTS AND EXPORTS OF GOLD COIN AND BULLION IN £
 (000's omitted.)

+ = Balance of Imports. - = Balance of Exports.

Date.	United Kingdom.	U.S.A.	Germany.	France.
	£	£	£	£
1858	+10,226			
1859	+ 4,216			
1860	- 3,056			
1861	+ 925			
1862	+ 3,891			
1863	+ 3,839			
1864	+ 3,621			
1865	+ 5,992			
1866	+10,767			
1867	+ 7,911	- 9,300		
1868	+ 4,427	-10,262		
1869	+ 5,297	- 3,625		
1870	+ 3,973	- 5,535		
1871	+ 920	- 7,815		
1872	- 1,279	-11,492		
1873	+ 1,589	- 962		
1874	+ 7,439	- 7,144		
1875	+ 4,493	- 7,813		
1876	+ 6,960	- 1,511		
1877	- 4,919	- 1,470		
1878	+ 5,902	+ 364		
1879	- 4,210	+14,930		
1880	- 2,373	+14,116	- 440	
1881	- 5,585	+11,559	- 1,580	
1882	+ 2,352	+ 5,064	- 530	
1883	+ 664	+ 3,201	- 660	
1884	- 1,268	+ 2,593	- 603	
1885	+ 1,445	+ 2,445	+ 900	
1886	- 391	+ 5	+ 1,320	
1887	+ 631	+ 7,149	+ 2,045	
1888	+ 846	+ 4,715	+ 1,555	
1889	+ 3,290	+ 7,736	+ 690	
1890	+ 9,261	- 766	+ 3,015	- 5,324
1891	+ 6,047	- 6,823	+ 4,970	+ 5,080
1892	+ 6,638	-11,816	+ 1,435	+11,056
1893	+ 4,670	- 1,384	+ 1,925	+ 7,544
1894	+11,924	-16,126	+12,560	+14,156
1895	+14,036	-14,114	+ 755	+ 376
1896	- 5,037	+ 9,295	+ 1,135	- 400
1897	..	- 61	+ 1,600	+ 9,352
1898	+ 7,132	+28,894	+ 5,225	- 4,552
1899	+10,397	+ 1,101	+ 6,780	+ 6,272
1900	+ 7,793	+ 2,523	+ 6,370	+ 5,840
1901	+ 6,750	- 604	+10,260	+11,356
1902	+ 6,219	+ 1,632	+ 1,645	+12,536
1903	+ 890	+ 4,184	+ 9,455	+ 7,372
1904	+ 837	+ 7,232	+19,440	+21,843
1905	+ 7,738	+ 699	+ 3,080	+25,924
1906	+ 3,425	+21,774	+12,490	+10,516
1907	+ 6,222	+17,636	- 350	+11,592
1908	- 3,885	- 6,183	+15,410	+39,764
1909	+ 7,442	-17,759	+ 1,480	+ 7,281
1910	+ 6,423	-15,045	+ 9,110	+ 2,316
1911	+ 8,593	+ 10,219	+ 6,234	+ 5,004
1912	+ 6,150	- 1,673	+ 3,333	+ 8,786
1913	+13,446	- 1,718	..	..
1914	+23,043	- 9,099	..	..
1915	-28,890	+ 5,073	..	..
1916	-20,659	+30,752	..	..
1917	..	+187,051	..	..
1918	..	+ 4,220	..	..
1919	..	-58,330	..	..

BIBLIOGRAPHICAL NOTE

Monetary statistics are discussed very fully in Fisher's *Purchasing Power of Money*, especially in chap. x., in which an estimate is made of the rapidity of circulation of gold and of bank deposits in the United States. In the footnotes to that chapter will be found references to similar estimates that have previously been made, and in particular to the work of Pierre D'Essay, who has investigated the rapidity of bank circulation in France in times of boom throughout the nineteenth century (*Journal de la Société de Statistique de Paris*, 1895).

Kemmerer, *Money and Prices*, is valuable for its statistical estimates.

APPENDIX E

STATISTICS OF PRODUCTION

It is impossible to estimate with anything like accuracy the number of business transactions taking place in the world, or even in a single country, for no estimate is in the least degree possible in regard to personal services or to the number of times that goods change hands in passing from producer to consumer. Even so far as material goods are concerned, statistics of production are only obtainable in regard to a very limited number of the leading raw materials and agricultural products. Such figures have considerable importance in regard to special industries, but we cannot argue that the rate of increase of such commodities is any indication of the production of other goods. Nor, on the other hand, do we know, even in respect to these commodities themselves, how much industry and commerce may be based upon them; that is to say, we neither know how many times they change hands before reaching the ultimate consumer, nor how many different manufacturing processes may be employed upon them before they reach the ultimate consumer. The case of coal may serve as a simple example. The improvement in science which leads to a greater power being extracted from a given quantity of coal will produce a change in the proportion of goods which may be manufactured by the energy it produces, but such a change will not be indicated by the figures of production of raw coal. Similarly, the spinning of finer cotton yarns in Lancashire means that statistics of raw cotton consumption do not give an exact picture of the amount of productive work done by the cotton industry. The tables which are given below, however, may serve to show that the

world's production of materials and food products has not shown any very obvious signs of slackening. In the case of cotton, production has, however, quite clearly not kept pace with the world's demand. This is shown by comparing the three sets of figures—(1) the total crop itself, (2) the increasing demand of various countries, (3) the rise of the average value of the crop. If the United States were the only source of wheat the same thing would be found to apply in the case of that commodity; but, though the world's demand shows a similar increase, the statistics of the world's wheat crop, which is also given below, show that other countries—particularly Russia in 1909 and 1910—made up the deficiency from the United States. The statistics of mineral production of the chief countries show also a very rapid increase, though, as a result of natural causes, the production of minerals in England has expanded less rapidly than in either Germany or the United States, both of which have enormously larger resources than this country.

Table I. is based on the annual estimate in Dornbusch's *Floating Cargo List*. Table II. is from the volume of American statistics published by the National Monetary Commission of the United States. Tables III., IV., V., VI., and VII. are from the third series of statistical tables on British and foreign industry (1909) published by the Board of Trade.

TABLE I
WORLD'S WHEAT PRODUCTION

	Million Quarters.		Million Quarters
1888	283	1904	396
1889	273	1905	416
1890	288	1906	424
1891	309	1907	389
1892	314	1908	398
1893	319	1909	454
1894	327	1910	458
1895	305	1911	440
1896	298	1912	475
1897	286	1913	503
1898	366	1914	446
1899	328	1915	532
1900	332	1916	411
1901	347	1917	405
1902	396	1918	458
1908	407	1919	(est.) 403

TABLE II

AVERAGE ANNUAL QUANTITY AND FARM VALUE OF LEADING CROPS IN THE UNITED STATES

	Maize.		Wheat.		Cotton.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Million Bushels.	Million £.	Million Bushels.	Million £.	Thousand Bales.	Million £.
1870-4	922	90.6	261	50.4	3,852	49.4
1875-9	1377	96.4	363	68.9	4,942	44.0
1880-4	1575	140.9	464	83.6	6,086	58.8
1885-9	1831	126.7	435	65.1	6,908	54.5
1890-4	1602	136.2	477	64.4	8,368	56.5
1895-9	2068	108.7	529	67.6	9,580	61.2
1900-4	2173	189.2	626	86.6	10,844	96.6
1905-9	2734	275.6	693	116.4	11,835	119.6
1910-14	2752	315.4	728	125.9	12,933	...
1915-18	2727	572.6	804	255.7	12,396	...

TABLE III

1. CONSUMPTION OF WHEAT IN QUINQUENNIAL AVERAGES

Years.	United Kingdom.	United States.	Germany.	France.
	Thousand Cwts.	Bushels.*	Thousand Cwts.	Thousand Cwts.
1880-84	114,213	323,971,634	54,157	184,640
1885-89	116,220	322,202,792	56,632	176,376
1890-94	125,021	310,674,540	71,728	183,089
1895-99	127,824	349,947,222	86,187	184,544
1900-04	134,145	463,008,108	103,266	173,894
1905-09	112,400	560,571,380	111,565	181,146
1910-12	117,668	566,867,080	117,032	181,119

* These are Winchester bushels. The Winchester bushel = $\frac{1}{16}$ of the imperial bushel.

TABLE IV

2. CONSUMPTION OF RAW COTTON IN QUINQUENNIAL AVERAGES

Years.	United Kingdom.	United States.	Germany.	France.
	Million Cwts.	Million Cwts.	Million Cwts.	Million Cwts.
1855-59	7·9	3·6	... ^a	1·6
1860-64	6·5	1·8	1·0	1·4
1865-69	8·0	3·4	1·2	1·7
1870-74	10·7	5·0	2·1	1·5
1875-79	10·9	6·2	2·4	1·8
1880-84	12·9	8·3	2·9	2·0
1885-89	13·1	10·0	3·7	2·2
1890-94	14·2	11·7	4·8	3·0
1895-99	15·0	14·5	5·9	3·2
1900-04	14·3	18·2	6·8	3·6
1909-13	17·6	23·8	8·1	4·7
1914-18	15·7	31·3	...	5·5

^a Cannot be given.

Note.—As regards the figures for France and Germany, no allowance has been made for the variations of spinners' stocks.

TABLE V

1. OUTPUT OF COAL IN QUINQUENNIAL AVERAGES

Years.	United Kingdom.	United States. ^a	Germany.	France.
	Million Tons.	Million Tons.	Million Tons.	Million Tons.
1855-59	66·1	12·4	...	7·5 ^c
1860-64	84·9	16·7	15·4	9·8 ^c
1865-69	103·0	26·7	23·5	12·4 ^c
1870-74	120·7	43·1	31·8	15·1 ^c
1875-79	133·3	52·2	38·4	16·3
1880-84	156·4	88·7	51·3	19·3
1885-89	165·2	115·3	60·9	20·7
1890-94	180·3	153·3	72·0	25·4
1895-99	201·9	189·1	89·3	29·6
1900-04	226·8	281·0	110·7	31·8
1905-09	256·0	383·4	137·5	35·1
1910-14	269·9	462·7	166·0	36·9
1915-19	243·8	537·5	147·4 ^d	23·1 ^e

^a Includes a small quantity of lignite throughout the period.

^b Cannot be given.

^c Includes a small quantity of lignite.

^d Does not include production of surrendered districts after Oct. 1918.

^e Includes production of Lorraine in 1919.

TABLE VI

2. OUTPUT OF PIG-IRON IN QUINQUENNIAL AVERAGES

Years.	United Kingdom.	United States.	Germany.	France.
	Million Tons.	Million Tons.	Million Tons.	Million Tons.
1855-59	3.5	0.7	... ^a	0.9
1860-64	4.1	0.8	0.7	1.1
1865-69	4.9	1.3	1.1	1.2
1870-74	6.4	2.2	1.8	1.2
1875-79	6.4	2.2	2.0	1.4
1880-84	8.1	4.2	3.2	1.9
1885-89	7.7	6.0	4.0	1.6
1890-94	7.3	8.1	4.8	2.0
1895-99	8.6	10.6	6.7	2.3
1900-04	8.6	16.4	8.9	2.6
1905-09	9.7	23.2	12.0	3.4
1910-14	9.5	27.0	16.0	4.2
1915-19	8.7	35.5	11.1 ^d	1.5 ^e

^a Cannot be given.^d Does not include production of surrendered districts after Oct. 1918.^e Includes production of Lorraine in 1919.

TABLE VII

3. OUTPUT OF STEEL IN QUINQUENNIAL AVERAGES

Years.	United Kingdom.	United States.	Germany.	France.
	Million Tons.	Million Tons.	Million Tons.	Million Tons.
1855-59	... ^a	...	...^a	0.02
1860-64	... ^a	...	...^a	0.04
1865-69	0.2	0.3	0.2	0.06
1870-74	0.5	0.14	0.3	0.13
1875-79	0.9	0.6	0.4	0.3
1880-84	1.8	1.6	0.8	0.4
1885-89	3.0	2.3	1.1	0.5
1890-94	3.2	4.3	2.3	0.3
1895-99	4.2	7.6	5.1	1.3
1900-04	4.9	13.4	7.3	1.7
1905-09	6.0	21.0	11.1	2.6
1910-14	7.0	27.2	15.7	4.2
1915-19	8.9	39.7	13.75 ^d	1.5 ^e

^a Cannot be given.^d Does not include production of surrendered districts after Oct. 1918.^e Includes production of Lorraine in 1919.

APPENDIX F

STATISTICS ILLUSTRATING THE PROGRESS OF THE WORKING CLASSES

A LARGE quantity of statistics are available showing wage changes during the nineteenth century, and the careful statistical scrutiny to which they have been put by Mr. Bowley, and subsequently by Mr. G. H. Wood, has established the general movement of wages in a number of specific occupations beyond doubt. The records for half a century ago are not so full or so authentic as they are to-day, and a margin of error of about 5 per cent must be allowed for. But with this proviso they may be regarded as accurate for the trades to which they refer.

There are, however, one or two qualifications to be borne in mind before they are taken bodily as an indication of the average earnings of the working-classes. In the first place, nearly all the statistics refer to average earnings in a full week, and make no allowance for persons working only part of their time or for seasons of unemployment. In the second place, it is doubtful how far these figures are applicable to other trades than those to which they refer. Several great sections of the occupied population are excluded from the investigation through lack of adequate data. Practically all engaged in the transport industry are excluded for this reason, while domestic servants, commercial clerks, shop assistants and others engaged in retail trade are also left out of account. A certain number of unskilled persons are included, but no satisfactory means has been found of ascertaining the earnings of casual labourers. Whether the earnings of persons engaged

in industrial employment are typical of these various classes, it is difficult to say with certainty, but there are several small subsidiary investigations that have been made which tend to show a similar movement of wages in these decentralised and comparatively unorganised occupations. In a few cases, such as railway service, wages appear to have lagged behind the general movement. In domestic service, on the other hand, they have probably risen more rapidly. The wages of casual workers such as dock labourers, etc., are higher to-day than fifty years ago, but no investigation has been made to show whether the rise is anything like equivalent to the upward movement of general wages.

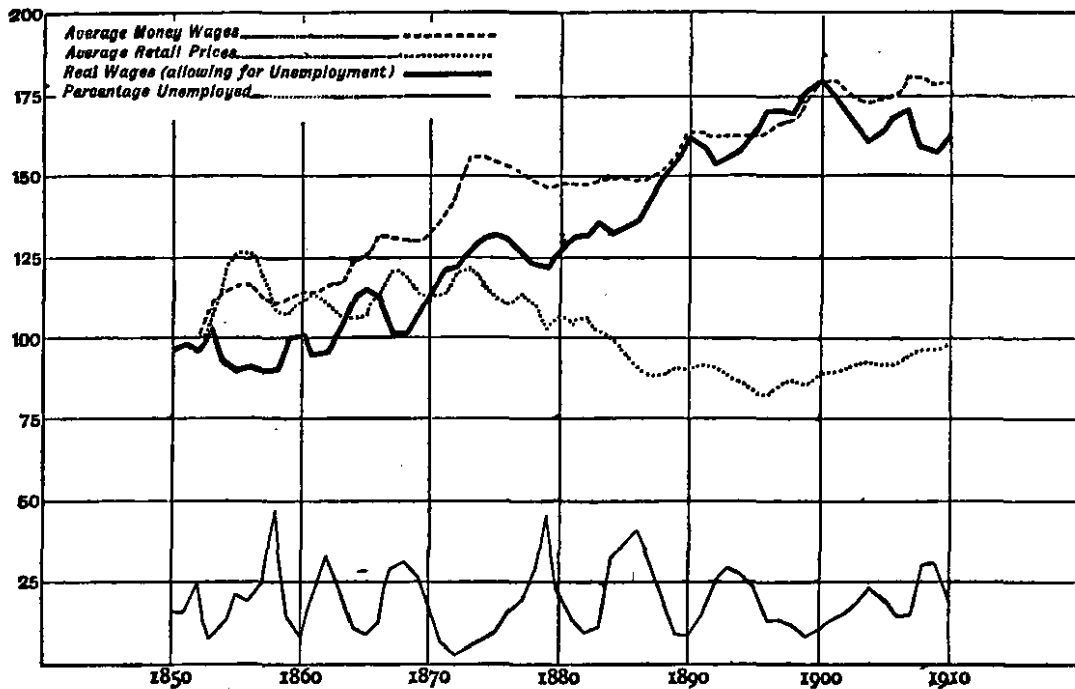
The second of these qualifications is thus a serious one, but the first can be met by making an allowance for unemployment based upon the Board of Trade unemployment figure. This has been done by Mr. G. H. Wood in an article in the *Statistical Journal* for 1909, in which he has also attempted to estimate the real value of wages by calculating the rise and fall of the retail prices. He has assumed that in 1850 four-fifths of the wages of the working-classes were spent on commodities other than housing accommodation, and that the remaining one-fifth has risen steadily on account of the increase in rent. Whether this is the right allowance to make for rent is a matter for discussion, but his calculation gives some indication, at all events, of the variation of real wages. His figures, which are given in Table I., finish in 1903, but the calculation has been brought up to date by means of the Board of Trade wages and retail prices index numbers. These figures are represented on the accompanying chart, in which the thick black line represents the course of real wages since 1850. This curve shows that the rise of real wages was most rapid in the period 1870 to 1896, while a comparison with the money wages curve shows that, except in the first few years, this improvement was due more to the fall of prices than to an increase in money wages. The detrimental effect of rising prices is shown by the fall in the real wages curve during the last decade.

Table II. contains a summary by Mr. Bowley of the course of money wages, prices, and real wages during the nineteenth century in the form of a tabular statement, from which the various periods of rapid or slow advance, or of retrogression, can be clearly picked out. It, moreover, makes

TABLE I

Year.	Average Money Wages 1850=100.	Average Retail Prices 1850=100.	Percentage Unem- ployed.	Real Wages :	
				Of those in Full Work 1850=100.	Allowing for Unem- ployment.
1850	100.0	100.0	(4.07)	100	96
1851	100	97	3.9	102	98
1852	100	97	6.0	102	96
1853	110	106	1.7	105	102
1854	114	122	2.9	98	93
1855	116	128	5.4	95	90
1856	116	126	4.7	95	91
1857	112	119	6.0	96	90
1858	110	109	11.9	102	90
1859	112	107	3.8	104	90
1860	114	111	1.9	108	100
1861	114	114	5.2	100	101
1862	116	111	8.4	105	95
1863	117	107	6.0	109	96
1864	124	106	2.7	117	108
1865	126	107	2.1	117	113
1866	132	114	3.3	116	115
1867	131	121	7.4	109	112
1868	130	119	7.9	110	101
1869	130	118	6.7	115	107
1870	138	118	3.9	118	113
1871	138	118	1.6	121	120
1872	146	120	.9	122	121
1873	155	122	1.2	128	127
1874	156	117	1.7	138	131
1875	164	115	2.4	135	132
1876	152	110	3.7	137	131
1877	151	118	4.7	133	127
1878	148	110	6.8	132	123
1879	146	108	11.4	137	121
1880	147	107	5.5	134	127
1881	147	105	3.5	136	131
1882	147	106	2.3	135	132
1883	149	102	2.6	139	136
1884	150	100	8.1	144	132
1885	149	96	9.3	148	134
1886	148	92	10.2	151	136
1887	149	89	7.0	155	143
1888	151	69	4.0	157	149
1889	156	91	2.1	159	155
1890	163	91	2.1	166	162
1891	168	92	3.5	164	169
1892	162	92	6.2	163	158
1893	163	89	7.5	167	155
1894	162	87	6.9	170	153
1895	162	84	5.8	174	163
1896	163	88	3.2	176	170
1897	166	86	3.3	176	170
1898	167	87	2.8	174	169
1899	172	86	2.0	180	176
1900	179	89	2.5	183	179
1901	179	90	3.3	181	175
1902	176	91	4.0	177	170
1903	174	92	4.7	172	164
1904	173	92	6.0	170	160
1905	174	92	5.0	172	163
1906	176	92	3.6	174	168
1907	182	95	3.7	176	170
1908	181	97	7.8	172	159
1909	179	97	7.7	170	157
1910	179½	98	4.7	169	161

MONEY WAGES, REAL WAGES, RETAIL PRICES, AND UNEMPLOYMENT (G. H. WOOD).



NOTE.—Scale of Unemployment curve multiplied fourfold.

TABLE II

Periods.	Nominal Wages.	Prices.*	Real Wages.
1790-1810	Rising fast	Rising very fast	Falling slowly
1810-1830	Falling	Falling fast	Rising slowly
1830-1852	Nearly stationary	Falling slowly	"
1852-1870	Rising fast	Rising	Rising considerably
1870-1873	Rising very fast	Rising fast	Rising fast
1873-1879	Falling fast	Falling fast	Nearly stationary
1879-1887	Nearly stationary	Falling	Rising
1887-1892	Rising	Rising and falling	"
1892-1897	Nearly stationary	Falling	"
1897-1900	Rising fast	Rising	"
1900-1904	Falling a little	Falling and rising	Stationary

* This column is based on the price index numbers of Jevons and of the *Economist*.

it clear at a glance what part has been played by rising or falling money wages and rising and falling prices. The statement is taken from the article on "Wages" in the Supplement to Palgrave's *Dictionary of Political Economy*, where references to the chief sources of wage statistics are also given.

The rise of real wages has been accompanied by an increase in the consumption of common necessities, and as many of such articles are entirely imported, and the national consumption, therefore, accurately known, it has been possible to calculate the *per capita* consumption for the country as a whole. The consumption of wheat and meat can also be estimated, and figures for these articles are included with imported articles in Table III. The figures in this table are mainly influenced by the consumption of the working-classes, which thus confirms the conclusion arrived at from the statistics in Table I., that there has been a rise in the standard of life; for it is quite evident that the upper classes, who, after all, form a very small fraction of the population, do not increase their consumption of food as wealth increases. Money may be spent on expensive commodities, but there is no doubt that the consumption of tea, sugar, currants, rice, tobacco, beer, etc., is mainly influenced by the prosperity or otherwise of the working-classes.

APP. PROGRESS OF THE WORKING CLASSES 187

It is exceedingly difficult to give any precise statistics of the income of non-wage-earners, for they are all different and vary so much in time and place. The income-tax statistics give some indication of the total income received by persons earning taxable incomes, but it is not definitely known how many

TABLE IV

WAGES BILL AND INCOME OF INCOME-TAX PAYERS (MILLION £)

	Wages Bill allowing for changes in Employ- ment.	Corrected totals of In- come subject to Tax.		Wages Bill allowing for changes in Employ- ment.	Corrected totals of In- come subject to Tax.
1860	300	290	1881	455	575
1861	300	320	1882	470	590
1862	300	335	1883	470	585
1863	310	360	1884	450	580
1864	320	375	1885	440	580
1865	340	385	1886	440	580
1866	350	395	1887	455	595
1867	350	400	1888	500	615
1868	340	410	1889	530	640
1869	350	445	1890	550	640
1870	365	460	1891	555	635
1871	390	490	1892	545	625
1872	440	525	1893	545	630
1873	485	545	1894	560	645
1874	470	555	1895	580	660
1875	465	560	1896	595	680
1876	460	560	1897	605	715
1877	460	555	1898	650	735
1878	440	540	1899	675	765
1879	430	545	1900	710	790
1880	440	560	1901	705	800

persons share it among them. The various statistics available at the present day are rapidly revealing the secret of the distribution of the nation's income, but there was very little known on this point fifty years ago. The available data have, however, all been drawn upon by Mr. Bowley, who made a careful estimate in the *Economic Journal* for 1904 of the total amount of the national income taken by income-tax payers over a series of years, together with an estimate of the nation's

wages bill. The calculation only goes back to 1860, but it clearly brings out the enormous increase in profits (which form the greater part of the receipts of income-tax payers) between 1860 and 1875. During these years the wages bill increased at a more moderate rate, for whereas in 1860 the wages bill was equal to the total receipts of income-tax payers, in 1875 the wages bill had risen to £465,000,000, while the income of tax payers was £560,000,000. Between 1875 and 1895, the wages bill apparently began to catch up the income of tax payers, the rate of increase during these twenty years being 25 per cent in the case of the wages bill and 18 per cent in the case of the income subject to tax. Since that time the income-tax receipts have risen faster than the wages bill, a tendency which would be more markedly shown if the calculation had been continued to the year 1910.

Table V. shows the increase of the population since 1801.

TABLE V
POPULATION OF THE UNITED KINGDOM AT DECENNIAL CENSUSES

Census Years.	Total for United Kingdom.	England and Wales.	Scotland.	Ireland.	Census Years.
1801	...	8,892,536	1,608,420	... ^a	1801
1811	...	10,164,256	1,805,864	... ^a	1811
1821	20,893,584	12,000,236	2,091,521	6,801,827	1821
1831	24,028,584	13,896,797	2,364,386	7,767,401	1831
1841	26,709,456	15,914,148	2,620,184	8,175,124	1841
1851	27,368,736	17,927,609	2,888,742	6,552,385	1851
1861	28,927,486	20,066,224	3,062,294	5,798,967	1861
1871	31,484,861	22,712,266	3,360,018	5,412,377	1871
1881	34,884,848	25,974,439	3,735,573	5,174,836	1881
1891	37,732,922	29,002,525	4,025,647	4,704,750	1891
1901	41,458,721	32,527,843	4,472,103	4,458,776	1901
1911	45,216,741	36,075,269	4,759,521	4,381,951	1911
1920	46,500,000 ^b				

^a The census of Ireland in 1821 is the first which was made on such a basis as to afford a comparison with those of subsequent decades.

^b Estimate.

BIBLIOGRAPHICAL NOTE

The bibliography of wage statistics in Mr. Bowley's article on Wages, in the *Dictionary of Political Economy*, has already been referred to; but special reference may be made to the same author's *Wages in the United Kingdom*, which discusses the statistical value of existing wage statements, and among official publications to the Board of Trade *Fourteenth Abstract of Labour Statistics*, which summarises the latest available official figures.

APPENDIX G

THE "ECONOMIST" INDEX NUMBER OF WHOLESALE PRICES, 1901-5=100.

Study of Prices

Date.	Cereals and Meat.									
	Wheat.		Flour.	Barley.	Oats.	Potatoes.	Rice.	Beef.	Mutton.	Pork.
	Foreign.	English.								
1914										
August 1	150	121	124	108	118	97	108	119	120	98
October 1	158	136	146	128	142	97	138	116	124	107
1915										
January 1	178	155	160	129	148	93	185	130	117	134
April 1	225	193	204	139	174	119	185	139	142	160
July 1	180	185	178	149	182	106	198	166	134	160
October 1	200	154	172	172	149	93	221	146	131	182
1916										
January 1	220	192	200	207	176	125	225	138	129	182
April 1	218	191	196	233	174	125	258	156	166	182
July 1	176	165	168	214	176	275	249	205	166	189
October 1	230	212	220	235	177	162	261	175	157	209
1917										
January 1	303	267	236	294	230	300	308	186	134	240
April 1	274	286	240	285	268	275	408	223	134	229
July 1	294	279	240	327	316	300	404	258	225	222
October 1	252	252	177	247	261	181	404	223	193	253
1918										
January 1	265	254	177	250	251	166	404	301	252	253
April 1	275	258	177	246	234	169	404	204	175	284
July 1	276	266	177	254	272	219	404	221	175	284
October 1	276	259	177	262	235	150	404	221	175	284
1919										
January 1	230	258	177	263	288	218	404	223	175	320
April 1	273	259	177	261	264	250	404	223	175	284
July 1	266	262	177	272	277	256	500	223	175	268
October 1	212	262	177	411	350	225	498	225	175	268
1920										
January 1	200	259	177	460	326	255	509	233	134	280

THE "ECONOMIST" INDEX NUMBER OF WHOLESALE PRICES, 1901-5=100—continued.

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Date.	Other Food-stuffs, &c.						Textiles.									
	Tea.	Coffee.	Sugar C.	Sugar B.	Butter.	Tobacco.	Cotton A.	Cotton E.	Yarn.	Cloth.	Wool, Eng.	Ans. Wool.	Silk.	Flax.	Hemp.	Jute.
1914																
August 1 . . .	129	138	84	101	122	130	125	116	117	117	166	123	111	98	73	187
October 1 . . .	126	138	132	...	126	130	101	105	105	110	166	111	111	103	77	234
1915																
January 1 . . .	138	132	131	...	140	130	82	83	87	99	186	96	92	103	74	116
April 1 . . .	168	143	125	...	180	130	100	104	100	108	208	114	92	103	117	148
July 1 . . .	186	142	114	...	140	130	96	100	101	105	223	114	92	103	117	151
October 1 . . .	162	134	171	...	185	130	124	123	123	119	239	117	94	108	117	170
1916																
January 1 . . .	142	122	198	...	142	130	140	135	145	135	239	134	116	103	134	181
April 1 . . .	163	132	265	...	159	130	142	147	150	136	261	140	133	103	160	226
July 1 . . .	175	150	265	...	162	130	150	153	154	142	244	157	126	103	154	200
October 1 . . .	158	144	275	...	194	144	173	188	171	156	246	170	133	260	160	221
1917																
January 1 . . .	184	142	275	...	203	144	194	271	207	184	292	239	133	269	172	233
April 1 . . .	274	152	286	...	207	144	234	309	210	183	292	239	141	269	274	286
July 1 . . .	333	155	301	...	192	166	354	386	291	246	292	265	141	330	241	286
October 1 . . .	337	161	318	...	278	200	333	372	309	265	292	265	216	434	241	286
1918																
January 1 . . .	284	178	318	...	234	200	419	434	450	370	292	265	192	420	241	286
April 1 . . .	284	200	318	...	234	200	450	421	514	427	292	265	192	420	286	287
July 1 . . .	266	200	396	...	234	266	421	393	597	467	292	265	192	420	286	287
October 1 . . .	266	204	396	...	234	266	446	415	631	558	292	265	208	420	286	287
1919																
January 1 . . .	266	210	396	...	234	266	404	376	500	496	292	265	200	505	286	287
April 1 . . .	266	210	396	193	234	266	294	373	303	347	292	265	172	505	166	287
July 1 . . .	300	211	396	193	234	266	380	373	479	446	292	255	220	505	157	376
October 1 . . .	316	230	396	193	234	266	365	414	515	470	292	354	272	653	140	480
1920																
January 1 . . .	355	232	454	222	234	266	560	743	672	622	292	373	368	653	171	406

THE "ECONOMIST" INDEX NUMBER OF WHOLESALE PRICES, 1901-5=100—continued.

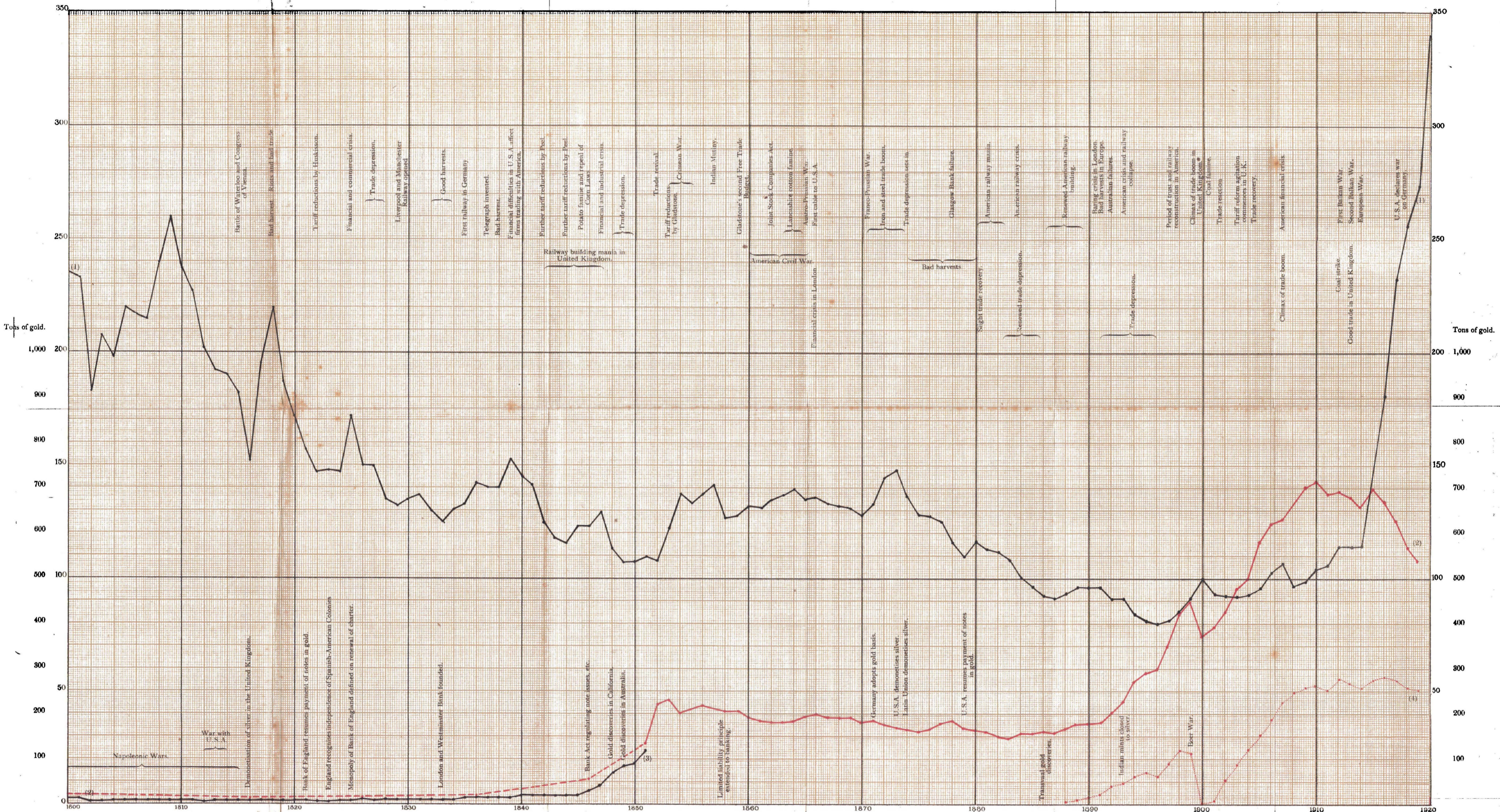
Data.	Minerals.								Miscellaneous.									
	Pig-iron.	Iron Bars.	Steel Rails.	Coal, Steam.	H. Coal.	Lead.	Tin.	Copper.	Railroad Timber.	American Timber.	Leather.	Petroleum.	OIL.	Oil Seed.	Tallow.	Indigo.	Crystals.	Rubber.
1914																		
August 1 . . .	110	108	94	141	126	152	103	95	123	185	103	121	112	108	112	86	79	71
October 1 . . .	110	112	123	123	126	159	104	88	128	185	124	121	107	118	104	260	79	70
1915																		
January 1 . . .	116	106	123	118	126	155	113	95	136	185	142	131	113	107	109	800	79	71
April 1 . . .	144	138	125	273	166	192	134	116	157	185	154	138	123	141	134	423	79	62
July 1 . . .	144	161	133	186	153	200	134	137	200	185	166	146	108	131	120	360	79	63
October 1 . . .	140	176	150	170	153	212	117	121	200	185	152	158	108	117	123	360	79	59
1916																		
January 1 . . .	167	200	183	204	153	244	131	141	200	185	144	166	131	168	158	373	79	93
April 1 . . .	194	207	161	327	153	290	156	194	200	185	155	183	148	176	173	394	142	75
July 1 . . .	188	211	188	500	153	242	136	172	335	225	156	200	126	149	160	394	209	67
October 1 . . .	188	229	188	363	159	258	137	197	370	237	166	225	122	160	152	373	209	81
1917																		
January 1 . . .	183	230	183	273	141	253	140	231	370	232	158	225	149	202	180	366	209	82
April 1 . . .	183	230	188	269	141	258	163	227	500	232	179	233	201	224	205	345	241	78
July 1 . . .	199	230	188	277	141	240	190	217	500	360	179	241	192	239	205	326	241	74
October 1 . . .	199	230	188	272	141	240	191	184	500	360	184	341	198	234	252	300	258	82
1918																		
January 1 . . .	205	211	182	272	156	240	229	184	500	360	190	325	205	249	266	274	258	70
April 1 . . .	205	211	182	272	141	232	245	184	500	360	168	325	202	249	252	254	258	70
July 1 . . .	205	213	182	295	152	232	260	184	500	360	168	375	202	230	236	254	258	73
October 1 . . .	205	227	182	295	153	232	264	221	500	360	168	375	202	230	316	230	227	79
1919																		
January 1 . . .	205	227	182	295	152	300	134	136	500	360	168	275	202	230	316	230	227	66
April 1 . . .	205	273	225	295	152	224	135	130	500	360	168	275	201	248	263	230	227	61
July 1 . . .	345	315	250	295	162	186	186	146	500	360	168	275	272	417	232	266	192	60
October 1 . . .	345	338	275	350	135	214	217	170	500	360	168	303	233	342	232	240	192	63
1920																		
January 1 . . .	345	346	291	345	127	371	271	194	500	360	181	350	290	404	232	333	192	65

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CHART OF AVERAGE WHOLESALE PRICES AND WORLD'S GOLD PRODUCTION SINCE 1800.



(1) Price Index Number Curve. Prices of 1900=100.

(2) Annual Gold Production of the World (Estimates of Soetbeer, and from Bartholomew's Atlas of the World's Commerce).

(3) Annual Gold Production, 1800 to 1851 (Del Mar's Estimate)

(4) Annual Gold Production of South Africa.

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