

PART I  
ANALYSIS

I  
TRENDS IN THE BRITISH ECONOMY:  
1790-1914

I

BRITISH industrial production, and the national income, did not expand continuously from 1790 to 1914, nor was the trend rate of increase constant. In some phases, further, the trends in commodity prices and interest rates were upward, in others they declined. The rate and the direction of the movement of real wages and the terms of trade varied as well. It is the view here that the diverse movements among the principal variables within the economy can be related to each other in a co-ordinate way, and to the whole character of economic development in Britain, and in the world economy.

In order to examine trend movements the era 1790-1914 is divided into five phases. The first runs from about 1790 to 1815; the second to the end of the forties; the third to 1873; the fourth to 1900; the fifth to 1914. No very special connotations attach to the particular years chosen as points of demarcation. They do roughly mark, however, moments when the direction or rate of movement of certain principal variables within the economy altered; and the periods they contain form useful analytic units for the examination of trends.

The accompanying table (I) sets out annual average percentage rates of change for a number of series which reflect, with greater or lesser accuracy, the movements of certain variables believed relevant to trend analysis. These variables are calculated between five-year averages, rather than between individual years, in order to avoid arbitrary bias due to short-run fluctuations; and the centre year is, in

## Analysis

TABLE I

*Trends in the British Economy: 1793-1912*

The following table gives measurements for annual average percentage rate of change in the case of certain key economic variables within the British economy, on which reasonably accurate quantitative data exist for continuous periods. Except where indicated below the rates are averaged as between five-year intervals centred on the indicated year; e.g. figures for the period ending '1815' represent the rate of change between 1791-5 and 1813-17.

*Annual Average Percentage Rate of Change*  
(plus, unless otherwise indicated)

For period ending	Population U.K.	Total industrial production	Consumers-goods production	Producers-goods production	Volume imports
	%	%	%	%	%
'1815'	1.4	2.1	1.9	2.3	2.6
'1847'	1.1	3.5	3.2	4.4	3.7
'1873'	0.7	3.2	2.6	4.1	4.4
'1900'	0.9	1.7	1.3	2.2	2.8
'1912'	0.9	1.5	1.0	1.9	1.2
'1793-1912'	1.0	2.6	2.2	3.2	3.1

For period ending	Volume exports	Gross barter terms of trade	Yield on Consols	Bank rate	General prices	Real wages		Output per capita employed
						Tucker	Wood	
	%	%	%	%	%	%	%	%
'1815'	4.1	1.6	0.8	..	1.8	-0.5	..	..
'1847'	2.8	-0.8	-1.1	-1.2	-1.4	0.7	..	(0.6)
'1873'	4.9	0.6	-0.05	0.3	0.6	0.6	1.1	1.1
'1900'	1.7	-1.0	-0.7	-0.1	-1.5	1.2	1.3	1.6
'1912'	2.7	1.5	1.5	0.7	1.5	-0.5	-0.5	0.6
'1793-1912'	3.3	..	..	..	..	..	..	..

NOTE: 1. The figures for U.K. population are affected by the rise in the population of Ireland, until the 1840's, and by its subsequent absolute decline. For these purposes the nearest census-year figures (e.g. 1801, 1811, &c.) have been taken. Population for 1791 is roughly calculated at 13.5 million.

2. The statistics for industrial production used are those of Walter Hoffmann, 'Ein Index der Industriellen Produktion', *Weltwirtschaftliches Archiv*, 1934.

3. The statistics for the volume of imports and exports are those of Werner Schlote, *Entwicklung und Strukturwandlungen des englischen Aussenhandels* (Jena), 1938. In the foreign trade calculations '1815' consists of the average figures for 1814-16.

4. The gross barter terms of trade represent the volume of exports over the volume of imports. A 'favourable' movement—that is, an increase in imports with respect to exports—is represented by a decline.

5. The general price indexes used are A. D. Gayer (unpublished) to 1815;

each instance, at or close to the peak year in the proximate major cycle.<sup>1</sup>

It will be noted that the turning-points employed here conform, generally, to those in price trends, which have for long been familiar. The rise in prices during the period of the French wars; the falling trend to the late forties; the rise to 1873; the fall to the late nineties; and the rise to the outbreak of the First World War have, for some time, been the subject of remark and speculation.<sup>2</sup> Although the trend periods chosen here conform to the long movements of prices, the analysis employed is not concerned exclusively, or even primarily, with the level of general prices.

Nor is any considerable attention given to the long-run forces determining the level of the real national income. Its rate of increase, like that of population, to which it closely relates, appears to be subject to laws of growth outside the

<sup>1</sup> The net effect of this procedure is to damp, in certain cases, the amplitude of the indicated trend movement; for, in effect, some years from the succeeding trend period are included within each turning-point averaged, except '1847' and '1912'. Since the analysis is primarily concerned with the direction of trend movements rather than their absolute amplitude or rate, this characteristic is not regarded as significant for present purposes. For a more refined analysis of trends the technique of overlapping averages employed by Arthur F. Burns, *Production Trends in the United States since 1870*, would have been more appropriate.

<sup>2</sup> See J. A. Schumpeter, *Business Cycles*, for the most extensive recent discussion of trend periods and their literature; also, N. D. Kondratieff, 'The Long Waves in Economic Life', *Review of Economic Statistics*, 1935, pp. 105-15, translated and digested by W. F. Stolper from 'Die langen Wellen der Konjunktur', *Archiv für Sozialwissenschaft und Sozialpolitik*, 1926, and G. Garvy, 'Kondratieff's Theory of Long Cycles', *Review of Economic Statistics*, 1943.

W. Layton and G. Crowther for the balance of the period (*An Introduction to the Study of Prices*, appendix A, table 11).

6. Real wages are calculated from R. S. Tucker's figures representing London artisans only, 'Real Wages of Artisans in London, 1729-1935', *Journal of the American Statistical Association*, vol. xxxi; from 1850 the more general calculations of G. H. Wood (full work) are also presented (reproduced, W. Layton and G. Crowther, *op. cit.*, appendix E, table 1). '1847' consists of the average figures for 1850-2.

7. Output *per capita* figures are those of Colin Clark (*National Income and Outlay*, pp. 232 and 247); the rate for the period up to 1847 is limited in the time covered, and is particularly suspect, given the nature of available data. From 1815' to '1847' consists of the rate from 1830-9 to 1840-9; '1873' consists of 1870-6; '1900', of 1894-1903; '1912', of 1911-13.

scope of the present analysis.<sup>1</sup> The focus is, rather, the complex of forces affecting the course of real wages; and in exposing those forces emphasis is placed on the scale and character of investment, the course of interest rates and commodity prices, and the terms of trade.

Such an investigation would, of course, be much strengthened if adequate data on the national income were available: its real size, composition, and distribution; but the national-income statistics, in their present form, are inadequate. There are, to be sure, occasional estimates of great interest for particular years, as far back as the Reverend Beke and Patrick Colquhoun in the opening years of the nineteenth century.<sup>2</sup> But unless national-income estimates are continuous through time, uniform in construction, and broken down to appropriate components they are not very useful for important types of analysis.

## II

At its core the theoretical framework employed in this analysis of trends is exceedingly simple, however complex the body of fact it is designed to inform. It might be described as a dynamic version of the elementary theory of diminishing returns.

In a closed community, with constant population, working force, and money incomes, with full employment maintained by private or communal action, with all expenditures except those on consumption going into productive investment, and with no changes in knowledge, we would expect prices to fall, over a period of time, and real wages to rise. We would also expect the yield on new investment to fall, as the expected return on new investment fell towards the point

<sup>1</sup> The long-run growth-pattern for certain important British series is measured in S. Kuznets, *Secular Movements in Production and Prices*. See also P. Douglas, *The Theory of Wages*, especially chaps. xiii-xv.

<sup>2</sup> Rev. H. Beke, *Observations on the Produce of the Income Tax*; P. Colquhoun, *Treatise on the Wealth, Power, and Resources of the British Empire*, p. 65 for summary table, pp. 89-101 for detailed calculations. See also R. Giffen, for a survey of previous estimates to 1889, *The Growth of Capital*; A. L. Bowley, *Wages and Income in the U.K. since 1860*; and Colin Clark, *National Income and Outlay*, chap. x.

where known possibilities of new productive investment were exhausted or the return so small that leisure was preferred to further investment outlays.

If such a community were to divert the whole of its income, over and above consumption, to the prosecution of a civil war, or to the building of pyramids or churches, we would expect prices to cease their decline. And if such enterprise were expanded to a scale larger than the previous allocation to new productive investment, we would expect prices to rise and real wages to fall.

Assume that the closed community is an island, devoted exclusively to the production and consumption of wheat, which has been devoting a fixed amount of its labour and other resources to the clearing and planting of additional inferior wheat land, on the island. The land brought into cultivation is progressively less productive; but, nevertheless, the productivity of labour, and the total wheat supply is increasing each year. The wheat price is falling, if at a diminishing rate, so long as the fixed labour supply is not spread so thin that additional increments of land fail to yield some positive increase in production.

Assume, further, that another island is discovered nearby, with virgin soil, of distinctly higher potential productivity. It is found that two years' work by the whole normal investment force is required to clear the first plot on the island, and another year will pass before the first harvest is in. Over the period when the new island is being prepared and planted, the fall in the wheat price and rise in total consumption would cease; and it would be resumed, at an accelerated rate, when the crop from the new island was, at last, harvested. If, excited by the vista, the islanders were to devote an increased proportion of their total effort to clearing the new island, the wheat price would rise over the shortened period of development.

The data are not sufficient, of course, progressively and systematically to relax the assumptions governing this primitive parable to a point closely approximating the turbulent developments of the British economy in the nineteenth century. It is evident that the British economy was not closed;

that the population and working force and money incomes were not constant; that full employment was not continuously maintained;<sup>1</sup> that the proportion of the national income spent for purposes other than consumption varied;<sup>2</sup> and that the state of knowledge was almost constantly enlarged. The parable has been cited, however, because it is central to the subsequent analysis that outlays for purposes other than consumption be distinguished with respect to their being productive or non-productive; and that attention be focused on the relative productivity of the productive outlays, and the quantity of resources and time periods required before they yielded their productive results. It is the view here that the main trends in the British economy, over the period 1790-1914, are best understood in terms of the shifting balance between productive and unproductive outlays; and among types of productive outlays with differing yields and differing periods of gestation.

This approach to the British economy, or to virtually any other economy in modern times, has what is perhaps an important implication for the study of economic history. Much of Britain's investment was foreign investment, related to developments on distant continents, in which Britain participated, but which British initiative did not wholly determine. And the course of events at home, in other respects as well, derived in part from forces generated

<sup>1</sup> Chapter II (pp. 46-50), below, examines evidence on the average level of employment in the various trend periods. Significant differences in the level of employment would affect the validity of an analysis which put primary emphasis on the character of investment rather than its volume. No significant distinctions on existing evidence are found.

<sup>2</sup> It seems quite possible that the conclusions set out below may, in the future, be modified somewhat, by the extension and refinement of knowledge concerning the proportion of the national income invested. Adequate data do not now exist for any of the trend periods examined. The most promising calculations available cover the period from the sixties to 1914: for the national income, C. Clark, *National Income and Outlay*; for new investment, P. Douglas, 'An Estimate of the Growth of Capital in the U.K., 1865-1909', *Journal of Economic and Business History*, 1930. Clark speculates briefly about their relationship, *op. cit.*, pp. 272-3. Douglas's interesting calculations do not appear satisfactory for these purposes, however, because they exclude building, and because the procedures followed for capitalizing and deflating the income from capital may well result in bias, as between periods of rising and falling prices and profit margins.

abroad. The fluctuations and trends in Britain were shared, with variations, by most other areas in the world. It is likely that the optimum unit for the study of economic history is not the nation, but the whole inter-related trading area; certainly that is the frame within which many of the most important national, regional, or even industrial problems must be placed, if they are fully to be understood.<sup>1</sup>

III

The trend movements that must be explained, over the period from about 1790 to 1815, are the following: a rapid rise in production, within both industry and agriculture; a substantially greater increase in exports than in imports; a rise in interest rates and prices; a falling tendency in real wages.

The central economic characteristic of these years is that it was a period of war. From that fact the following four consequences may be traced:

1. The establishment of British men regularly in service was raised well over 500,000, perhaps 400,000 more than the peace-time establishment.<sup>2</sup> Depending on the population base taken, the mobilized force constituted

<sup>1</sup> An interesting and suggestive study, in terms of the world economy from 1870, is *Industrialization and Foreign Trade* (League of Nations), mainly the work of Folke Hilgerdt.

<sup>2</sup> Colquhoun, op. cit., p. 47, gives the following figures for men in arms in the British Empire in 1814:

British Army . . .	301,000	<i>East India Company</i>	
Local Militia . . .	196,446	British Troops . . .	20,000
Volunteers, G.B. . .	88,000	Native Troops . . .	140,000
Ireland . . .	80,000	Marines . . .	913
Colonies . . .	25,000		160,913
Foreign Troops . . .	39,741		
	<u>721,187</u>	GRAND TOTAL	1,062,020
Navy . . .	147,252		
Marines . . .	32,668		
	<u>179,920</u>		

A substantial part of the force based on U.K. was not steadily withdrawn from the labour force. Colquhoun estimated (p. 66) that in 1811 640,500 military men were being fed, in addition to the working population and their families. This would include foreign troops, but exclude that portion of forces overseas subsisting on the land they occupied.

- between 3 per cent. and 5 per cent. of the total population and, of course, a much larger proportion of the total working force.
2. The real cost of certain basic commodities rose: imports, because of the circuitous and often dangerous routes followed, the necessity for convoys, and the consequently very large increases in freight rates; foodstuffs, because of the obstruction of imports from the Baltic, and the necessity for diverting resources into expansion of British agriculture caused by this factor in conjunction with a rapidly rising population. The rise in the prices of foodstuffs was accentuated by chronically bad harvests over the war years.
  3. Large resources were diverted into ship-building, to replace war losses and to support an artificially expanded foreign trade; into the expansion of dock facilities; into armament manufacture, and to other manufactures consumed by British and Allied armies.
  4. Substantial general resources were diverted abroad, by means of loans and subsidies to allies on the Continent.

The British foreign balance was kept in equilibrium, without large bullion movements, by an extraordinary increase in British exports and especially in re-exports.<sup>1</sup>

<sup>1</sup> The extent and significance of the rise in re-exports may be seen from the fact that, whereas the volume of British goods exported, from 1793 to 1815, rose at an annual percentage rate of 3.8 per cent. per annum, total exports, including re-exports, rose at an annual rate of 4.1 per cent. Colquhoun, explaining the failure of this rise, which was at a greater rate than for imports, in value as well as in volume, to yield an influx of bullion, wrote (p. 85): 'On a minute investigation of the British commerce it will be found, that the exports are more valuable than the public documents make them, while the imports are less; and hence the balance is greater in favour of the country than is generally supposed; but in a war so extensive, and with colonies, dependencies, and navies and armies in every quarter of the world, this balance has for the last twenty years been swallowed up by the enormous drafts upon the British treasury for subsidies to foreign princes, for the expenses of the army, navy, and ordnance abroad,—the allowance to British governors and courts of justice, fortifications, and expensive barrack establishments,—the salaries of various officers in the revenue and other civil departments, ramifying in all directions, and amounting to many millions yearly, independently of the payment of the dividends on the public debt due to foreigners.' The balance of trade, therefore, is not remitted in bullion in this country in the present state of things, but is actually paid out of the revenues of the country.'



Britain enjoyed a virtual monopoly in West Indian products which, for the most part, were sold through the various entrepot ports: at first Hamburg, and then the arc of peripheral ports, from Scandinavia to the Ionian islands. The profits in this trade, coupled with those in the export of British manufactures, largely financed the war-time outlays abroad. There was, indeed, a great boom in trade; but the resources needed to sustain it, in ships, manpower, and newly constructed docks served simply to meet the deficit in the foreign balance caused by the extent and character of the war effort. They did not generate an equivalent rise in imports for the British economy. Thus exports increase more than imports; that is, the gross barter terms of trade turn unfavourable.

And, on the whole, the behaviour of the variables in the economy follows closely that which one would expect from a shift in investment to what are called, above, unproductive outlays, or to outlays which did not yield fully their productive results within the trend period. The course of the British economy during the French wars conforms well to what textbooks in international trade would call 'a case in capital exports'; or to the pattern of lend-lease.

There was, of course, a very substantial increase in total production, related to and required by the great population increase of this period. These were the years when the effects of abundant American cotton, released by the invention of the cotton gin, in combination with the new textile machinery and the steam engine, began to transform the cotton industry. The volume of exports of British cotton goods rose at an annual rate of 10.6 per cent., from 1793 to 1815. Iron output, freed of its dependence on Swedish ore, also increased rapidly. But on balance the wastes of the war years, and the diversion of resources to uses less productive than those of peace, were so great that the level of real wages could not be fully maintained; and there are evidences, as well, that various types of investment at home languished, under competition from more profitable adventures in agriculture, foreign trade, and the limited portion of industry directly affected by war contracts. H. A. Shannon's index of brick

production shows no trend increase over this period, despite the substantial general growth in the economy.<sup>1</sup>

It is easy, in the examination of trends, to lapse into a vocabulary which appears to imply that the movements within the economy were smooth, and at constant rates. This is an incorrect conception for all the trend periods. In the French wars the decade from 1793 to 1803 is dominated by large outlays abroad, and a concomitant boom in foreign trade, based largely on Hamburg.<sup>2</sup> Then there is an interval, to about 1808, when outlays abroad are on a modest scale, trade is inhibited, and a revealing passage occurs, in 1807, when frustrated investors turned briefly to the flotation of joint stock companies at home. Two cycles follow, with peaks in 1810 and 1815, against a background of steadily increasing outlays abroad: the first looking to Latin America, as a means of evading Napoleon's briefly effective warfare against the British balance of payments; the second, to American and continental markets, in successive years (1814, 1815) on the coming of peace. The bulk of the price rise occurred swiftly, in the period up to 1803; and the trend over the next decade was relatively steady. And within the general price-index the cost-reducing processes of the Industrial Revolution were already beginning to bring down the prices of cotton textiles and iron from about the turn of the century.

<sup>1</sup> Average annual brick production for the years 1791-5 and 1813-17 are virtually identical, being, on Shannon's figures, 751 million bricks and 751·2, respectively (*Economica*, 1934, 'Bricks—A Trade Index'). Shannon quotes Mrs. Dorothy George, *London Life in the Eighteenth Century*, p. 79, for evidence that not only the French wars but also previous eighteenth-century wars had limited construction: 'Each war is said to have checked building operations in London; builders' labourers joined the army or navy and materials became dearer, while peace brought a renewed outburst of building.' In 1816 brick production was 673 million; in 1819, exhibiting a typical lag at the cyclical peak (1818), the figure was a new high level of 1,101·6 million, a remarkable post-war 'outburst'.

<sup>2</sup> Short-term movements of the economy during the war years are summarized in 'Adjustments and Maladjustments after the Napoleonic Wars', *American Economic Review*, Supplement, March 1942, by the author. See also 'Trade Cycle Index', pp. 124-5 below.

IV

Perhaps the most suggestive commentary on the trends of the economy during the French wars is their course in the three decades that followed. Without exception higher rates of increase in industrial production prevail than during the war years; and real wages, which actually fell to 1815, rise substantially. Brick production, stagnant in the previous quarter century, leaps forward, at an annual rate of 2·8 per cent., and with it a wide range of domestic investment. As can be seen in Table I, this was the period when the rates of increase in industrial production were at a maximum for the whole era to 1914. These were truly years of Industrial Revolution.

The period between 1815 and 1847 was one of uninterrupted peace for Britain; and there were only minor wars elsewhere. Investment outlays were thus almost wholly productive. Investment was, for Britain, heavily concentrated, too, in enterprises which yielded their cost-reducing results within a fairly short period. The installation of machinery in cotton textiles; the enlargement and improvement of metallurgical plant; the introduction of Nielson's hot blast; the building of bridges, roads, and even of the British railways—all these brought lower real costs; and the period of gestation for such investment was relatively short. It was natural that the price trend should be downward. As a writer in the *Edinburgh Review* asked, in reply to contemporary arguments for national policies of inflation and protection, 'What but the facilitating of production, or, in other words, the reduction of price, is the object of inventions and discoveries of the arts?'<sup>1</sup> And the natural downward trend was strengthened by the tariff reformers, from the twenties onward.

The course of prices was not, of course, downward continuously, or at a constant rate. There was a period of rapid

<sup>1</sup> Vol. IV, July 1832, p. 425. The evidence before the Committee on Manufactures (1833) contains substantial data on the decline in real costs over the previous two decades, strikingly similar to that before the Commission on Depression (1885); and in a much wider sense the periods after 1815 and after 1873 are analogous.

decline, beginning in the latter years of war and extending into the twenties; a slower trend decline in the thirties and forties. Each of the major trade cycle expansions yielded, for a part of their duration, upward breaks in the powerful downward trend: in 1818, during the brief post-war boom; in 1825, at the peak of the long expansion of the early twenties; then most notably in the thirties. The great British railway boom of the forties caused only a very slight rise in prices, until bad harvests and the continued American boom, which affected the quantity and prices of British exports, brought prices up in 1847, well after the British cyclical turning point in 1845.<sup>1</sup>

It is significant that the thirties saw the most substantial and sustained rise in prices of this whole trend period. For in that decade a larger proportion of British investment was directed abroad than in any other between the war years and the fifties. This was not, to be sure, the first British adventure in foreign securities in the nineteenth century. Immediately after 1815, with the Government removed as a borrower from the capital markets, greatly developed by the experience of meeting the large requirements for war finance, London had granted loans to various continental countries; and there had been the considerable Latin American flotations of 1824-5. In the thirties, however, a great and protracted wave of 'internal improvements', sponsored by the not wholly reliable American state governments, caught the eye of British promoters and of the broadened investment public.<sup>2</sup> The balance of investment outlays shifted somewhat from home to abroad; and from projects which would yield their cost-reducing results in a relatively short period, to the relatively longer period involved in the opening up of new territories, the building of its canals and roads, and the clearing of its rivers. Thus, for a time, prices rose.

<sup>1</sup> See below, p. 38, n. 3, for the possibility of defining a second cycle in the forties, with a peak in 1847.

<sup>2</sup> For the scale and direction of the land sales, in these years, see W. B. Smith and A. H. Cole, *Fluctuations in American Business, 1790-1860*, pp. 55-8. In terms of the analysis used here it is the whole complex of investment involved in the opening and improving of the new territories which is relevant; not, simply, the portion of that investment financed from London.

But over the period as a whole, not only prices in their downward trend, but the course of interest rates, real wages, and the terms of trade conform roughly to the stylized conception of these three post-1815 decades as a period of intensive domestic development. Interest rates fall; real wages rise; and the terms of trade shift favourably to Britain.

These years, however, have a bad name in economic history. In part that repute stems from factors which do not belong within the scope of this analysis; namely, the conditions of housing and of health in portions of the new industrial cities. In part it stems from intervals of severe unemployment, bad harvests, and high food prices.<sup>1</sup> In part it stems from the unhappy position of portions of the agricultural community, readjusting to the unfavourable position in post-war grain markets. In part, it stems from the pressure on industrial prices and profit margins, imposed by rapidly expanding industrial capacity, exploiting successively more efficient methods, in a régime of relatively free competition. Here, however, the focus of analysis is the rate of change in industrial production, the volume of imports and exports, and the level of real wages. And in terms of these related criteria the period emerges as one of extraordinary development, perhaps the most rapid rate of development of domestic resources throughout the whole of Britain's economic history.

Lower duties on grain imports would, surely, have meant a higher level of real wages; nevertheless, despite a number of difficult years, real wages rose for a rapidly expanding population. This took the form of a relatively lesser decline in money wages than in retail prices. The inflated money wages of the war years, which had inadequately compensated the working classes for the rise in living costs, did fall away, especially in the period of adjustment, immediately following upon the end of war. Costs of living, however, fell to a greater extent. And the calculated rise in Tucker's index for London artisans is supported by a wider range of evidence.<sup>2</sup>

<sup>1</sup> See below, Chapter V.

<sup>2</sup> The average annual percentage rate of change for tea consumption was upwards, at the rate of 1.3 per cent., between 1793 and 1815; 2.1 per cent. from

The third trend period embraces what is usually referred to, with some considerable ambiguity, as the great mid-Victorian boom, running from about 1850 to the crisis of 1873. As Table I indicates, the rates of growth in production were only slightly less than for the previous trend period. In the other variables we find a worsening in the gross barter terms of trade and a rise in general prices. The interest rates of which continuous record exists exhibit no clear-cut trend movement: the Bank rate, and the open market rate on good three months' bills, in net, rise very slightly; the yield on Consols falls very slightly. All that can be said firmly, from these rough measures, is that the previous downward trend in interest rates was arrested. And, from the sixties, at least, real wages rose.

As a first approximation, the period may certainly be characterized as one in which an increased proportion of the investment outlays, of the world community, went into unproductive ventures, or to ventures which yielded their results only over a long period of time. For Britain this was a notable period of capital exports, concentrated particularly in the fifties and the early seventies.

Taking the world economy as a whole three factors can usefully be distinguished. First, there were wars: principally, the Crimean War; the American Civil War; and the sequence of Prussian campaigns that ended with the French defeat in 1870. By present severe standards these wars—excepting the American Civil War—were minor affairs. They undoubtedly wasted, however, a significant portion of the resources normally available for productive investment, in the years over which they took place, and within the countries directly affected; and these effects were transmitted, through the international markets, to the rest of the world.<sup>1</sup>

1815 to 1847, measurements in each case being between five-year averages centred on the indicated year. For wine consumption the trend figure is minus 2.1 per cent. for the first period, due in part to war-time obstructions in supply, plus 0.9 per cent. for the second. See also J. H. Clapham, *An Economic History of Modern Britain*, vol. 1, pp. 560-2; and G. D. H. Cole, *A Short History of the British Working Class Movement*, vol. 1, pp. 177-88.

<sup>1</sup> If, in fact, reductions in consumption and in average unemployment com-

Second, there was gold-mining. The economic effects of gold-mining over this era have by no means been fully or satisfactorily explored.<sup>1</sup> In general, however, its consequences are clear. Gold, for those who mined it, was a useful product, capable of exchange for goods and services, including imports. The United States financed a part of its trade deficit and capital imports by mining and exporting gold, as did Australia. India, which absorbed large quantities of the new-mined gold, surrendered for it exports of goods. The real effort required by Australia and the United States in mining gold was quite probably less than that necessary to purchase an equivalent volume of imports by growing and exporting, say, additional wheat or wool or cotton; although there were significant wastes of manpower and resources among the prospectors who did not strike it rich. On the whole, however, it is likely to prove the case, on close investigation, that in terms of the mining area the production of gold was a thoroughly reasonable enterprise, in the nineteenth century.

For the world as a whole, however, gold-mining constituted, in part, a tax on resources, capricious in its incidence, for the maintenance of the gold standard. Leaving aside, for the moment, the requirements of the banking systems for new gold, and its effects on the supply and terms of credit, it is evident that, except in its limited ornamental or industrial uses, gold supplied no service to the world: neither food, shelter, nor clothing. In this limited perspective the pursuit of gold absorbed resources without producing an enlargement or cheapening in supply of commodities or of services. To the extent, of course, that India wanted gold, and was satisfied to surrender other resources for it, and to the extent

pensated fully for the outlay of resources on war and for the destruction of capital caused, then no effect on the course of trends would be expected except for real wages. But this seems very doubtful.

<sup>1</sup> William Newmarch's analysis, in vol. vi, pt. vii, of Tooke and Newmarch, *History of Prices*, remains still the best consideration of this question. See also W. Layton and G. Crowther, *An Introduction to the Study of Prices*, pp. 67-70 (1938 ed.); the excellent discussions in the *Economist*, 1849, pp. 4-5, 320-1; 1850, pp. 1010-11, 1317-18, 1373-4; 1851, p. 1425; 1852, pp. 1, 6-7; 557-8, 1061-2; 1853, pp. 1934, 221-2, 642-3, 985; 1855, pp. 977-9.

that gold elsewhere was used for ornamental or industrial purposes this stricture does not apply.

The issue, then, narrows to the question of whether the banking systems of the nineteenth century required gold on the scale in which it was mined, in order to avoid the imposition, for technical reasons, of deflationary policies. This, too, is a question which deserves further exploration; but the evidence strongly suggests that men in the past have, on the whole, and over a period of time, been sensible enough to adjust their monetary institutions to their requirements.<sup>1</sup> Over the era under consideration here, it seems very doubtful if mankind was crucified on a cross of gold, except, perhaps, that too large a proportion of resources was expended in pursuing and mining it.

Even if one assumes that the new gold was, in fact, required for the successful working of the banking systems of the world, mining would still constitute a tax; a drain on resources from alternative uses. And in this aspect, like a war, or the building of a pyramid, gold was a price-raising factor, quite apart from any possible effects it might have had on central bank reserves, the rates of interest, and the willingness of banking systems to lend.

Nor is there satisfactory evidence that the effect of the new gold on bank lending was of any considerable significance. In this trend period, for example, one cannot trace an effect from the gold influx on short-term interest rates, through bank reserves, prolonging or accelerating cyclical expansions, beyond the point to which they would otherwise have proceeded, or shortening the periods of cyclical depression. Gold-mining in California and Australia, and the concurrent development of those territories in other directions, certainly constituted, at the time, a significant and attractive form of investment; and it was a form of investment tending to raise world prices, both because gold-mining was involved, and because of the considerable period of gestation involved in the opening up of new territories. On the other hand, the strictly monetary effects of the new gold, operating through

<sup>1</sup> See especially J. T. Phinney, 'Gold Production and the Price Level', *Quarterly Journal of Economics*, 1933.



central bank reserves and interest rates, do not appear to have been important.

The third great new factor in this trend period was, of course, railway building. Some 21,000 miles of railway-line were laid in the United States in the fifties, firmly binding the north-west to the north-east, on the eve of Civil War: a fact of political and military, as well as economic significance. At the time of the crisis in 1857 it was estimated that fully £80 million in American railway securities were held in Britain. This was also the period when Thomas Brassey crossed the Channel, and with British funds and even some British labour, began laying track on the Continent. In 1852 Brassey held contracts for 264 miles of French line; and later in the decade there was at least one British director on the board of nineteen Continental railway companies.

It is suggested, then, that the upward trend in prices, as well as the trend of the other variables, in the quarter century before 1873 was due mainly to a shift, essentially on a world-wide scale, towards unproductive outlays in war, and in a limited sense, in gold-mining; and to extensive investment, serving to lay railways and to open new territories, which yielded their consequences for the position of supply curves, in individual markets, more fully in the period after 1873 than in the quarter century which preceded it.

As in the other trend periods, the variables did not move continuously. Prices, for example, rise very rapidly from 1852 to 1854; but the trend, from that time until the final stages of the boom of the early seventies, some two decades later, is steady. The pattern of the sixties, like the first decade of the century and the thirties, constitutes in many ways an exception to the main trends of the period within which it lies. The glamorous external developments of the fifties and the early seventies were lacking, inhibited in part by war in the United States, and the various enterprises of Prussia on the Continent. Britain turned, for the time, to homely domestic tasks. There was an expansion in ship-building which doubled the tonnage of steam vessels in British registry between 1860 and 1868. Another 5,000 miles of British railways were laid. And a wide variety of domestic

developments were centred in a company floatation boom, which crashed in 1866. Whereas the crisis of 1866 was largely a British phenomenon, those of 1857 and 1873 were world-wide; and, in this, each conforms to the character of the expansion which preceded it. It was in this decade, significantly, that real wages resumed their rise. Over the fifties they had, in net, been stagnant:<sup>1</sup>

The great cyclical expansion, from 1868 to 1873, in many ways repeated the phenomena of the fifties, with developments external to Britain commanding the stage, especially in the latter stages of the boom (1871-3). There is, however, an important exception to this parallelism. The powerful forces set in motion earlier, to open new grain lands, were already operative; and in the United States they were released from the obstructive influence of war. Food prices rose less than money wages, in the course of the expansion, and real wages continued the upward course of the early sixties. But prices in general rose, and exports increased more rapidly than imports.

<sup>1</sup> The net rise in real wages, over this trend period, breaks the symmetry of the analysis, in a sense, and constitutes an apparent exception; that is, real wages in Britain appear to fall during the other two secular periods characterized by war and extensive or unproductive investment: 1793-1815, and 1900-12. In fact the analysis used here does not call for an absolute fall in real wages, upon a shifting in the balance of investment away from productive types of short period of gestation, but simply for pressure in that direction. In the quarter century before 1873, in net, such pressure was overcome: in part, for Britain, due to further tariff reductions; in part due to the partial effects within the trend period of the opening up of new areas; in part due to the productivity of other types of investment which were taking place, for example, the new British ships of the sixties, which lowered the real cost of imports. Nevertheless the pressures on real wages were sufficient to prevent their rise, in the fifties. The following table indicates the extent to which the rise in real wages indicated in Table I, above, was concentrated in the latter years of the trend period, and in the two years of the subsequent trend period, following the crisis of 1873:

	<i>Real Wages</i>	
	<i>(Wood)</i>	<i>(Tucker)</i>
1850 . . . . .	100	100
1855 . . . . .	95	93
1860 . . . . .	103	96
1865 . . . . .	117	100
1868 . . . . .	110	102
1870 . . . . .	118	113
1873 . . . . .	128	116
1875 . . . . .	135	128

VI

The fourth of the trend periods runs from 1873 to the eve of the Boer War, in 1898. It is more usual practice to date the ending of this phase with the middle nineties. On close examination, however, the character of the expansion running from 1894 through 1898 belongs, in the character of its investment and the behaviour of the principal variables, rather with the Great Depression period, than with the phase of war and capital exports, which give a distinctive character to the fifteen years preceding the outbreak of the First World War.

The phenomena to be explained here are essentially the same as those which dominated the period from 1815 to the end of the forties: a favourable shift in the terms of trade; a fall in interest rates and commodity prices; a maintained rise in real wages.<sup>1</sup> In terms of the primitive model set forth earlier there is no doubt that Britain, over these years, turned on the whole to internal developments, yielding their results over a relatively short period. These were the years of steel, the iron and steel freighter, and the machine tool; of the telephone and the electricity company; and, in the nineties, of the bicycle. Gradually, in the eighties, South Africa and other parts of the Empire began to claim an increasing proportion of British enterprise; and in the late eighties, briefly, the trend movements were broken by the Argentine boom, which left the house of Baring tottering in its wake. But the evidence for a net shift towards intensive investment at home is undeniable; and, moreover, these were not only years of peace, but the world was spared until the nineties, any substantial new diversion of enterprise to the pursuit of gold. Falling prices and rising real wages are to be expected.

Nor was this simply a characteristic of British enterprise. The United States, recovered from Civil War, devoted itself to the exploitation of the great Western Empire. Grain prices fell almost steadily, which aided the working classes throughout the world, but turned the American farmer, for

<sup>1</sup> For a more complete analysis of this period see Chapters III and IV. The course of events in the years 1874-9 are described in some detail in Chapter IX.

three decades, into something of a political radical. In the East great new industries, their foundations laid or strengthened during the Civil War, grew rapidly. And in Germany a similar process of domestic development and exploitation took place.

The rate of rise of total industrial production in Britain fell off sharply in this period; but it rose in output *per capita* and in real wages. The rate of increase of both imports and exports declined; but the gross barter terms of trade moved favourably to Britain. For these years there is available, as well, the net barter terms of trade; that is, the relation between import and export prices.<sup>1</sup> These show, as would be expected, a greater fall in import than in export prices. The whole behaviour of Britain's foreign balance conforms to what one would, theoretically, expect of a shift in the character of its investment flows from foreign to domestic enterprise, and to what one would expect in a world consolidating and exploiting, on the whole, its previously opened resources, rather than breaking new ground.

## VII

The fifth trend period covers the interval from the outbreak of the Boer War to the First World War. Here there is a clean reversal in the trends of interest rates, prices, the terms of trade, and even in real wages.

The character of new enterprise reveals the same three elements that characterized the mid-Victorian quarter century. Again there are wars: the Boer War, the Spanish American War, the Russo-Japanese War, and the Balkan wars. In addition, military budgets claimed an increasing amount of the national expenditure throughout the world. Second, there was gold, not only from South Africa, but also an increased flow from the other producing areas, as more efficient techniques of mining were introduced. Third, there was another world-wide wave of extensive investment, involving Africa, South America, Canada, Australia, and India.

The capital market had no sooner freed itself of the brief but real burden of financing the Boer War when, roughly in

<sup>1</sup> See below, pp. 102-3.

1905, foreign governments, railways, and mining enterprises came to London on a large scale, with attractive prospects. Interest rates rose, and British investors were, in part, driven from the capital market. Industrial floatations at home continued through the boom to 1907, on a small scale; but floatations by home railways, gas works, and water companies fell off very sharply, to reappear in the slump of 1908, when their modest but solid appeal again seemed attractive to the briefly disillusioned investor. Although the expansion which ran from 1908 to 1913 saw some increase in domestic investment, there is no doubt that the diversion of funds abroad was at some real short-run cost to the development of the British economy. G. T. Jones, tracing the course of the Lancashire cotton industry and the building industry in London, found a cessation in the decline of real costs at about the turn of the century.<sup>1</sup> And unemployment in the building trades, which had been down to less than 1 per cent. in 1898, perhaps the last authentic year of the Great Depression, was never less than 3 per cent. from 1901 to 1914; and it averaged almost 7.5 per cent. throughout the general business expansion, from 1904 to 1907.<sup>2</sup>

On the other hand, the export branches of British trade enjoyed very great prosperity, and the rate of increase in the volume of exports was considerably greater than in the previous trend period. The increase in imports, however, was at a lesser rate. Both the gross barter and the net terms of trade turned unfavourably to Britain; and real wages, in net, declined.<sup>3</sup> This decline, although mitigated by a shortening

<sup>1</sup> *Increasing Return*, pts. ii and iii.

<sup>2</sup> The components of the trades' union figure for average unemployment are reproduced accessibly in A. C. Pigou, *Industrial Fluctuations*, appendix, table 1, pp. 381-2. While the number of workers in the mining, engineering, and textile industries rose substantially between 1901 and 1911, those in the building trades fell from 1,124,327 to 1,037,080 (Page, *op. cit.*, vol. 1, p. 3).

<sup>3</sup> The course of world trade, for the period from the mid-seventies to 1911-13, broken into primary products and manufactured articles, reveals the Great Depression as an interval of more rapid increase of trade in primary products than in manufactured articles, the years after the turn of the century showing the more rapid increase in manufactured articles (*Industrialization and Foreign Trade* (League of Nations), especially pp. 14-20). This evidence is consistent with that relating to the British economy alone; and it is consistent with the analysis presented here of the causal forces operative in the two trend periods.

of work hours, increased social services, and a more equitable tax structure was real; and it can be seen in the figures for *per capita* consumption of sugar, meat, and beer, as well as in calculated indexes of real wages.

Whether Britain, in some sense, exported too much capital in the decade preceding 1914 is a matter for judgement. In any such calculus, however, the long-run effects of those investments, in strengthening the economies within the Empire, in opening new sources of supply for British imports, and in increasing the national holdings of negotiable international wealth would have to be taken fully into account. It is clear, however, that in the context of the development of the world economy as a whole, the rate of growth of capital within Britain, and the real wages of the British working classes, were adversely affected in this period.<sup>1</sup>

### VIII

Taking the century and a quarter as a whole, from 1790 to 1914, one can trace in population and total industrial production a long-term movement, reaching its peak rate of increase, for population, during the second decade of the nineteenth century, and for production, in the three decades after 1815; and from that time forward one observes, in general, expansion at a declining rate of increase. Throughout this era the British economy was an important, and perhaps the decisive segment, of a world economy, to which the rate and character of its development is related.

Within this majestic framework of growth five trend periods can be distinguished: analytically by the character of investment outlays, and statistically by trends in real wages, the terms of trade, and the rates of interest. The parallclisms between the first, third, and fifth of these trend periods, and between the second and the fourth are interesting and even striking.

Professor Schumpeter, in his study, *Business Cycles*, has raised the question of whether the whole of this trend

<sup>1</sup> See below, pp. 103-7, for Bowley's calculations of the unfavourable shift for labour, in the distribution of the national income between 1900 and 1913.

sequence should not be regarded as part of a series of long cycles, each somewhat more than fifty years in length. In that case, the era examined here would comprise about two and a half cycles.

There are a number of objections to Schumpeter's system and to his formulation of it, among which are these:

First, there are grave ambiguities as to just what fluctuates in the course of the long cycle: employment, real wages, interest rates, the rate of increase in production, prices?<sup>1</sup>

Second, he adduces no intrinsic reasons for a recurrent cycle of this length, or for that cycle to have a relatively constant periodicity;

Third, the scale and consequences of innovations, in the technical sense in which Schumpeter uses the term, are demonstrably inadequate to explain the central phenomena of several of the trend periods, if they are examined in detail; e.g. the innovations of the Industrial Revolution, during the French wars, and the role of electricity and the automobile in the fifteen years before 1914.

Fourth, if the concept of innovations is broadened until it approximates to what are called here outlays for purposes other than consumption, or investment outlays, the theory would have to be broadened to include the timing and character of wars, as well as other more or less adventitious events, without which a satisfactory historical explanation of these years is impossible.

It is possible that Schumpeter, while recognizing the force of some of these strictures, would insist that they are irrelevant to his purpose of presenting a stylized but unified and

<sup>1</sup> Historically the conception of the long cycle begins with trend movements in prices; although Schumpeter's system is designed to account for a much wider range of evidence. The ambiguity which attaches to the concept of the long cycle is dramatized in *Business Cycles*, vol. 1, p. 213, in a chart in which the three types of cycles which Schumpeter adduces, are, in abstract form, superimposed. The short and medium cycles (Kitchins and Juglars) are superimposed on the long wave (Kondratieff), yielding a composite curve. The short and medium cycles are conventional cycles in employment and production. The long cycle, as described by Schumpeter, is not, essentially, a cycle in either. What meaning, then, attaches to the composite curve?

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suggestive view of the course of economic development. Whether the long cycle sequence, as a formal structure for modern economic history, illuminates more than it conceals, is a matter of judgement. At the least Schumpeter's formulation raises questions to which the historian and the economist have thus far given inadequate answers.